Scoping and Environmental Impact Assessment for the Proposed Development of the 240 MW Kaladokhwe Wind Energy Facility 3 near Nxuba (Cradock) in the Eastern Cape

DRAFT SCOPING REPORT

October 2022

Prepared for:
Kaladokhwe Wind 3 (Pty) Ltd

Prepared by:
Council for Scientific and Industrial Research (CSIR)

CSIR
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SCOPING AND ENVIRONMENTAL IMPACT ASSESSMENT

for the

Proposed Development of the 240 MW Kaladokhwe Wind Energy Facility 3 and associated infrastructure near Nxuba (previously Cradock) in the Eastern Cape

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Report details

Title:	Scoping and Environmental Impact Assessment (EIA) for the proposed development of the 240 MW Kaladokhwe Wind Energy Facility 3 with associated infrastructure near Nxuba (previously Cradock) in the Eastern Cape: DRAFT SCOPING REPORT
Purpose of this report:	The purpose of this Draft Scoping Report is to: • Present the details of and the need for the proposed project; • Describe the affected environment at a sufficient level of detail based on scoping level specialist input to facilitate informed decision-making; • Provide an overview of the Scoping and EIA Process being followed, including public consultation; • Provide an overview of the potential positive and negative impacts of the proposed project on the environment; • Provide recommendations to avoid or mitigate negative impacts and to enhance the positive benefits of the project; and • Provide the Plan of Study for the EIA Phase for the proposed project. The Draft Scoping Report is now available to all Interested and/or Affected Parties (I&APs), Organs of State and relevant stakeholders for a 30-day review period extending from **21 October 2022 to 21 November 2022**, excluding public holidays. All comments submitted during the 30-day review will be incorporated in a detailed Comments and Responses Report, and addressed, as applicable and where relevant, and be included in the Final Scoping Report. The Final Scoping Report will be submitted to the National Department of Forestry, Fisheries and the Environment (DFFE) for decision-making.
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PART B: APPENDICES

Executive Summary

PROJECT OVERVIEW

Kaladokhwe Wind 3 (Pty) Ltd (hereinafter referred to as "the Project Applicant") is proposing the development of a commercial Wind Energy Facility (WEF) and associated infrastructure approximately 20 km northeast of the town of Nxuba (previously Cradock) in the Eastern Cape Province in the Chris Hani District Municipality.

Two additional WEF's are concurrently being considered on the surrounding properties and are assessed by way of separate impact assessment processes. These projects are known as Kaladokhwe WEF 1 and Kaladokhwe WEF 2. It is proposed that each WEF will have a contracted generation capacity of up to 240 MW.

The proposed Kaladokhwe WEF 3 will have a permanent development footprint of about 61 hectares, approximately 1.2% of the total assessed study area. This excludes access roads leading to the site. The proposed project will make use of wind technology to generate electricity from wind energy. Once a Power Purchase Agreement (PPA) is awarded, the proposed WEF will generate electricity for a minimum period of 20 years. The construction phase for the proposed project is expected to extend approximately 24-30 months.

The project details are provided in Table A below. **It must be noted that this report only covers the proposed 240 MW Kaladokhwe Wind Energy Facility 3 ('Kaladokhwe WEF 3'), as detailed below. Separate reports are provided for the remaining WEF projects.**

Table A. Project Name, Applicant and the main Affected Farm Portions

WEF Project Name	Project Applicant	Affected Farm Portions
Kaladokhwe WEF 3	Kaladokhwe Wind 3 (Pty) Ltd	• Farm Ossen Kraal No. 40 / 1, 6 • Farm Ruigte Fontein No. 150 / RE, 1, 3 • Farm De Bruins Requist No. 168 / RE • Farm Gunsteling No. 165 / 1 (RE) • Farm Lange Hoek No. 183 / RE • Farm Lange Hoek No. 171 / 7 • Farm Roland No. 169 / RE • Farm No. 166 / 1, 2 • Farm No. 607 / RE (0)

The proposed Kaladokhwe WEF 3, which can be accessed via an existing public road off the R61 provincial tar road connecting Nxuba (previously Cradock) and Tarkastad, will be located within the Inxuba Yethemba Local Municipality. The proposed Kaladokhwe WEF 1 and Kaladokhwe WEF 2 will be located within both the Inxuba Yethemba Local Municipality and the Enoch Mgijima Local Municipality.

The proposed project does not fall within any of the Renewable Energy Development Zones (REDZs), which were promulgated in Government Gazette 41445, Government Notice (GN) R114 on 16 February 2018. The proposed Kaladokhwe WEF 3 project site is located approximately 30 km away (at its closest point) from

the Stormberg REDZ. In addition, the proposed Kaladokhwe WEF 3 project site is located approximately 2.5 km away (at its closest point) from the Eastern Strategic Transmission Corridor (as gazetted on 16 February 2018, GN R113). Therefore, the project's proximity to the Stormberg REDZ and the Eastern Strategic Transmission Corridor supports the development of a large-scale renewable energy project at the proposed location. The proposed project is therefore linked to the national planning vision for large-scale wind and solar development in South Africa. As a result, a full Scoping and EIA Process in terms of Appendix 2 and 3 of the 2014 NEMA EIA Regulations (as amended) is being undertaken for each of the three proposed WEFs with a 107 decision-making timeframe, as opposed to a Basic Assessment Process and 57-day decision-making timeframe allowed for in the REDZs and strategic transmission corridors. The Competent Authority for this proposed project is the National Department of Forestry, Fisheries and the Environment (DFFE). An integrated Public Participation Process is being undertaken for the proposed project.

The Draft Scoping Report is being released to all Interested and/or Affected Parties (I&APs), Organs of State and relevant stakeholders for a 30-day review period, extending from 21 October 2022 to 21 November 2022, excluding public holidays. All comments received during the 30-day review will be incorporated into a detailed Comments and Responses Report, and addressed, as applicable and where relevant, and will be included with the Final Scoping Report. The Final Scoping Report will be submitted to the DFFE, in accordance with Regulation 21 (1) of the 2014 NEMA EIA Regulations (as amended), for decision-making.

PROJECT LOCATION

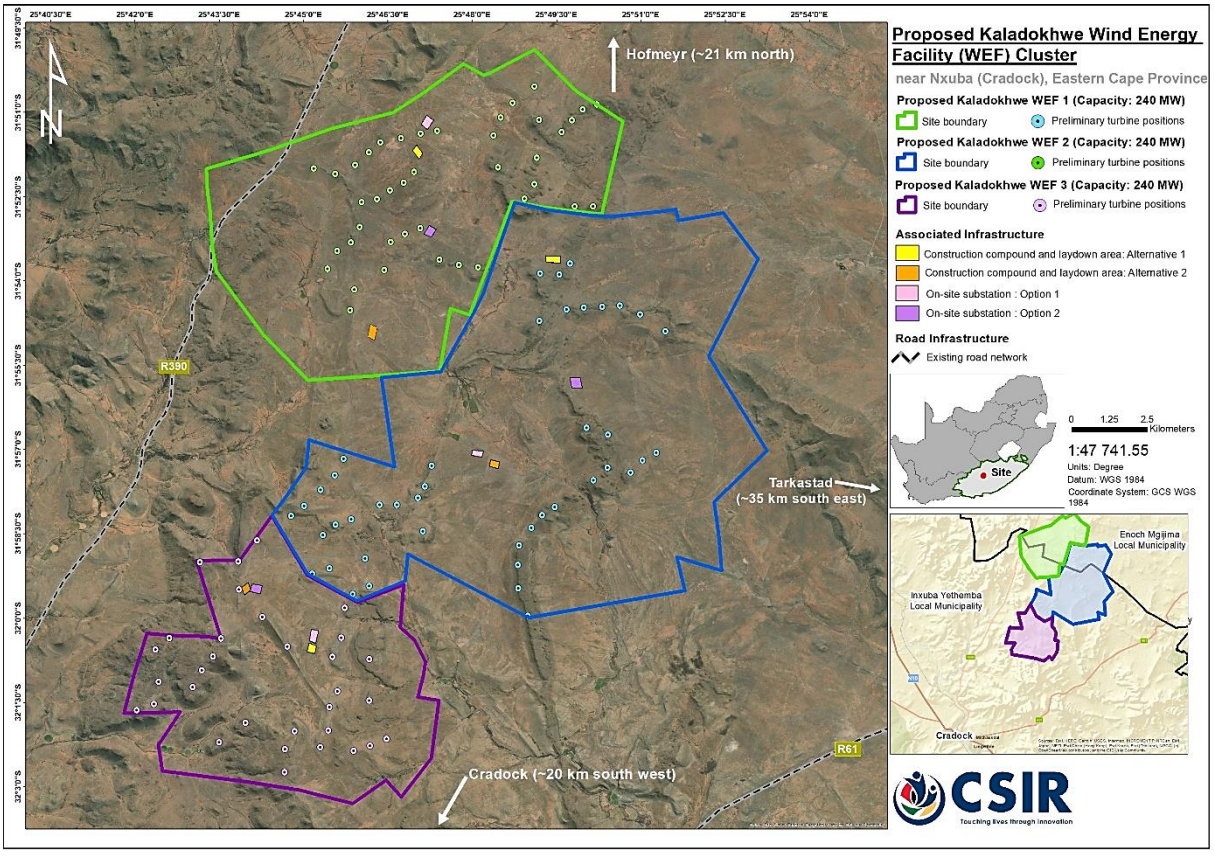

Figure A. Locality Map of the Proposed Kaladokhwe WEF 1-3 Projects, near Nxuba (previously Cradock) in the Eastern Cape.

The locality of the proposed Kaladokhwe WEF 3 project is shown in Figure A. The co-ordinates of the proposed project site are detailed in Chapter 2 of the Draft Scoping Report.

PROJECT ENVIRONMENTAL IMPACT ASSESSMENT TEAM

In accordance with Regulation 12 (1) of the 2014 NEMA EIA Regulations (as amended), the Project Applicant has appointed the Council for Scientific and Industrial Research (CSIR) to undertake the required Scoping and EIA Process in order to determine the potential biophysical, social and economic impacts associated with undertaking the proposed development. The project team, including the relevant specialists, is indicated in Table B below.

Table B. Project Team for the Kaladokhwe WEF 3 Scoping and EIA Process

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN
Environmental Management Services (CSIR)		
Paul Lochner *(Registered EAP (2019/745))*	CSIR	Technical Advisor and Quality Assurance
Rohaida Abed (*Pr.Sci.Nat.)*	CSIR	Project Review
Lizande Kellerman (*Pr.Sci.Nat.)*	CSIR	Project Manager
Suvasha Ramcharan	CSIR	Project Officer
Dhiveshni Moodley *(Cand.Sci.Nat.)*	CSIR	GIS Specialist
Specialists		
Johann Lanz (*Pr.Sci.Nat.)*	Private	Agriculture and Soils Compliance Statement
Jaco van der Walt	Beyond Heritage	Heritage Impact Assessment (Archaeology, Palaeontology and Cultural Landscape)
Jon Smallie	Wildskies Ecological Services	Avifauna Impact Assessment
Werner Marais	Animalia	Bat Impact Assessment
Gerhard Botha	Nkurenkuru Ecological and Biodiversity	Aquatic Biodiversity
Tarryn Martin and Amber Jackson	Biodiversity Africa	Terrestrial Biodiversity and Species
Morné De Jager	Enviro Acoustic Research	Noise Impact Assessment
Lourens du Plessis	LOGIS	Visual Impact Assessment
Iris Wink	Iris Wink Consulting	Traffic Impact Assessment
Tony Barbour	Tony Barbour Environmental Consulting	Socio-Economic Impact Assessment
Lizande Kellerman *(Pr.Sci.Nat.)* and Suvasha Ramcharan	CSIR	Civil Aviation Site Sensitivity Verification
Lizande Kellerman *(Pr.Sci.Nat.)* and Suvasha Ramcharan	CSIR	Defence Site Sensitivity Verification

PROJECT DESCRIPTION

It is important to point out at the outset that the exact specifications of the proposed project components will be determined during the detailed design and engineering phase prior to construction (subsequent to the issuing of EA, should it be granted for the proposed project).

A summary of the key components of the proposed Kaladokhwe WEF 3 project is provided in Table C below.

Table C. Summary of the proposed Kaladokhwe WEF 3 project components and associated infrastructure

Infrastructure	Description
Number of turbines:	32
Turbine Capacity:	Up to 8 MW
Hub Height:	Up to 160 m
Rotor (Blade) Diameter:	Up to 200 m
Blade length:	Up to 100 m
WEF Project Size / Generation Capacity:	Up to 240 MW
Reinforced foundation diameter:	32 m per turbine
Crane hardstand:	70 m x 45 m per turbine
Blade hardstand:	80 m x 45 m per turbine
On-site substation hubs:	The proposed project will include two on-site substation hubs incorporating the facility substation, switchyard, collector infrastructure, BESS and associated O&M buildings. Each substation hub will comprise an area of 4 ha. The substation-built infrastructure will have a maximum height of 10 m. **Two** possible locations or placement options for the on-site substation hubs have been identified and will be assessed during the EIA Phase.
Capacity of on-site substation:	33/132 kV
Area occupied by construction compound and lay down area:	Size = Six (6) ha (i.e. 300 m x 200 m) **Two** possible locations or placement alternatives for the construction compound and laydown area have been identified and will be assessed during the EIA Phase.
Internal service roads:	The Kaladokhwe WEF 3 will have a total internal service road network of up to 40 km. Permanent service roads will be 6 m wide and may require side drains on one or both sides. All service roads will be gravel and may have underground cables running alongside them. During construction, a 12 m road corridor may be temporarily impacted upon which will be rehabilitated to a width of 6 m after construction has been completed. Temporary clearing of up to 50 m may be required in areas where cut and fill may be required as well for the construction of the bell mouth road junction, turning circles and temporary passing lanes on site. The existing internal service road network, in addition to whether additional internal service roads are to be constructed on the project site will be confirmed by the Project Developer during the EIA Phase. The specialists will assess all proposed internal service roads during the EIA Phase.
Concrete batching plant:	One (1) ha
Operational and Maintenance (O&M) Building:	Two (2) ha

Battery Energy Storage System (BESS):	The BESS will cover an area of approximately five (5) ha, have a maximum height of 8 m (as recommended) and have a storage capacity of at least 1000 MWh. The BESS technologies that are being considered include: - Lead Acid and Advanced Lead Acid - Lithium ion, NiCd, NiMH-based Batteries (*preferred*) - High Temperature (NaS, Na-$NiCl_2$, Mg/PB-Sb)
Site Access:	The proposed Kaladokhwe WEFs and associated infrastructure will be located approximately 30 km northeast of the town of Nxuba (previously Cradock) in the Eastern Cape Province. Access to the proposed Kaladokhwe WEF 3 project site will be facilitated via an existing public road off the R61 road connecting Nxuba (previously Cradock) and Tarkastad. The main access road to the WEF will comprise a gravel road with a maximum width of 10 m. The length of the main access road is yet to be confirmed.
Proximity to grid connection:	To facilitate the connection of the proposed Kaladokhwe WEF 3 project to the national electrical grid network, the Project Applicant is proposing the construction of a 132 kV overhead transmission powerline, to be located within a 300 m assessment corridor, and its associated electrical infrastructure. This 132 kV overhead transmission powerline will connect at the on-site substations at the Kaladokhwe WEF 3 and extends approximately 60 km in a north-westerly direction to connect at a newly proposed 132 kV / 400 kV Main Transmission Substation (MTS) located to the west of the N10 national road including from the newly proposed MTS, the connection into the two existing Hydra and Poseidon 400 kV overhead transmission powerlines will be facilitated through a 400 kV Loop-In-Loop-Out (LILO) connection, all of which will form part of a separate Application for Environmental Authorisation (EA). ***Note from the CSIR:*** *A separate Environmental Assessment Process will be undertaken once the grid connection and the 132 kV power line routing for the proposed Kaladokhwe WEF 3 has been confirmed, and hence does not form part of this S&EIA Process.*
Fencing:	For various reasons such as security, public protection and lawful requirements, the proposed built infrastructure on site will be secured via the installation of appropriate fencing. Existing livestock fencing on the affected farms portions may be upgraded in places where deemed insufficiently secure, whereas permanent fencing will be required around the O&M areas and on-site substation hubs. Access points will be managed and monitored by an appointed security service provider. The type and height of fencing to be installed will be

	confirmed during the detailed design phase prior to construction.

NEED FOR THE ENVIRONMENTAL IMPACT ASSESSMENT

As noted above, in terms of the 2014 NEMA EIA Regulations (as amended) published in GN R326, R327, R325 and R324, a full Scoping and EIA Process is required for the proposed project. The need for the Scoping and EIA is triggered by, amongst others, the inclusion of Activity 1 listed in GN R325 (Listing Notice 2):

- *"The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs (a) within an urban area; or (b) on existing infrastructure".*

Chapter 4 of the Draft Scoping Report contains the detailed list of activities contained in GN R327, R325 and R324 which are triggered by the various project components and thus form part of this Scoping and EIA Process.

The purpose of the Scoping and EIA Process is to identify, assess and report on any potential impacts the proposed project, if implemented, may have on the receiving environment. The Scoping and EIA therefore needs to show the Competent Authority, the National DFFE; and the Project Applicant, Kaladokhwe Wind 3 (Pty) Ltd, what the consequences of their choices will be in terms of impacts on the biophysical and socio-economic environment and how such impacts can be, as far as possible, enhanced or mitigated and managed as the case may be.

POTENTIAL ISSUES AND HIGH-LEVEL IMPACT ASSESSMENT

Potential issues and impacts associated with the proposed Kaladokhwe WEF 3 project have been identified based on scoping level assessment of the environmental status quo of the receiving environment (environmental, social and heritage features present on site – as discussed in Chapter 3 of this Scoping Report) as well as input from specialists that form part of the EIA project team. These potential issues and impacts, summarised in Table D below, will be assessed in further detail during the EIA Phase through the specialist assessments and are included in Chapter 6 of this Scoping Report. It must be noted that additional issues may be raised during the Scoping Phase, which could potentially be assessed during the EIA Phase. The Terms of Reference (ToRs) for the various Specialist Assessments are included in Chapter 7 of this Scoping Report.

Table D. Summary of Issues to be addressed during the EIA Phase as part of the Specialist Assessments

Specialist Assessment / Input	Key issues to be addressed
Agriculture and Soils	**Construction and Operational Phases:** ▪ Loss of agricultural land use; ▪ Soil degradation including erosion, topsoil loss and contamination; and ▪ Increased financial security for farming operations[1].
Aquatic Biodiversity	**Construction Phase:**

[1] This potential issue is considered to have a positive impact because of the proposed development.

Specialist Assessment / Input	Key issues to be addressed
	▪ Disturbance and possible loss of aquatic habitats within the watercourses with the associated impact to sensitive aquatic biota; ▪ The removal of indigenous riparian and instream vegetation that has the potential to reduce the ecological integrity and functionality of the watercourses; ▪ Water demand for construction could place stress on the existing available water resources should external water sources not be utilised; ▪ Road crossing structures if not adequately designed could impede flow in the watercourses; ▪ Alien vegetation infestation within the aquatic features due to disturbance; and ▪ Increased sedimentation and risks of contamination of surface water runoff during construction. **Operational Phase:** ▪ Ongoing disturbance of aquatic features and associated vegetation along access roads or adjacent to the infrastructure that needs to be maintained; ▪ Modified runoff characteristics from hardened surfaces at the turbines and the substations, as well as along the access roads that have the potential to result in erosion of hillslopes and watercourses; and ▪ Possible increased potential for water quality impacts such as contamination from sewage generated on site because of the operation on site. **Decommissioning Phase:** ▪ An increased disturbance of aquatic habitat due to the increased activity on the site; and ▪ Increased sedimentation and risks of contamination of surface water runoff.
Terrestrial Biodiversity and Species (including Animal and Plant Species)	**Construction Phase:** ▪ The clearing of natural vegetation and resultant loss of faunal habitat; ▪ The loss of endangered, threatened, protected and endemic plants/animals; ▪ Direct faunal mortalities due to construction activities and increased vehicle traffic; ▪ Increased human activity, noise and light levels; ▪ Increased dust deposition; ▪ Establishment of alien vegetation as a result of the clearing of the vegetation; ▪ Increased stormwater run-off and erosion; and ▪ Changes in animal behaviour. **Operational Phase:** ▪ Direct faunal mortalities; ▪ Increased human activity, light and noise levels; ▪ Establishment of alien vegetation will continue; and ▪ Changes in animal behaviour. **Decommissioning Phase:**

Specialist Assessment / Input	Key issues to be addressed
	▪ Some clearing of natural vegetation due to removal of infrastructure; ▪ Possible ingestion or ensnarement of animals due to waste material lying around; ▪ Establishment of alien invasive vegetation; and ▪ Increased erosion and stormwater run-off.
Avifauna	**Construction Phase:** ▪ Total or partial displacement of avifauna due to habitat transformation associated with the presence of the wind turbines and associated infrastructure; ▪ The noise and movement associated with the construction activities at the project footprint will be a source of disturbance, which would lead to the displacement of avifauna from the area. **Operational Phase:** ▪ Avifauna mortality and injury through collisions with the wind turbines; and ▪ Electrocution of priority species on the internal electrical grid network. **Decommissioning Phase:** ▪ The noise and movement associated with the activities at the study area will be a source of disturbance, which would lead to the displacement of avifauna from the area.
Bats	**Construction Phase:** ▪ Displacement of bats due to habitat loss / habitat transformation; ▪ Roost disturbance; and ▪ Roost destruction. **Operational Phase:** ▪ Mortality of bats due to turbine collisions while commuting/foraging and/or due to barotrauma; ▪ Mortality of bats due to turbine collisions during migrations; and ▪ Light pollution associated risks including loss of insect prey and increased collision risks for bats foraging closer to turbines. **Decommissioning Phase:** ▪ Displacement of bats due to disturbance associated with the decommissioning activities.
Heritage (including Archaeology and Cultural Landscape)	**Construction and Decommissioning Phases:** ▪ The destruction or disturbance of archaeological artefacts or sites; ▪ The destruction or disturbance of graves or burial sites; ▪ The destruction or disturbance of historic built infrastructure; ▪ Visual intrusion of visually sensitive heritage resources and/or cultural landscape features, which might erode its association with intangible heritage.
Palaeontology	**Construction and Decommissioning Phases:** ▪ Damage and/or destruction of scientifically valuable fossils preserved at or beneath the ground due to surface clearance or excavations.
Noise	**Construction and Decommissioning Phases:** ▪ Noise pollution i.e. increase in ambient sound levels due to construction activities (e.g. equipment and vehicle noise).

Specialist Assessment / Input	Key issues to be addressed
	Operational Phase: ▪ Mechanical and aerodynamic noise from the operation of the wind turbine components.
Socio-Economic	**Construction Phase:** ▪ Investment and the contribution to the national, regional and local economy[1]; ▪ Generation of employment, income and skills[1]; and ▪ Pressures on community fabric and resources due to an influx of jobseekers. **Operational Phase:** ▪ Lower national CO_2 emissions per unit of energy generated[1]; ▪ Investment and the contribution to the national, regional and local economy[1]; ▪ Generation of employment, income and skills[1]; and ▪ Improvement of community facilities and prospects through funding of social upliftment projects[1]. **Decommissioning Phase:** ▪ Loss of employment due to decommissioning of the facility.
Traffic	**Construction and Decommissioning Phases:** ▪ Increase in vehicle traffic due to construction activities – Potential traffic congestion and delays on the surrounding road network and associated noise and dust pollution. **Operational Phase:** ▪ Potential traffic congestion and delays on the surrounding road network due to increased vehicle traffic[2].
Visual	**Construction Phase:** ▪ Visual intrusion and potential flicker effect by wind turbines and associated structures and infrastructure on visual receptors; ▪ Visual intrusion by wind turbines and associated structures and infrastructure on landscape receptors; ▪ Potential visual impact of security and construction lighting on the nightscape of the region; ▪ Potential scarring in the landscape caused by earthworks and excavations; and ▪ Increased dust emissions from heavy machinery and vehicle traffic. **Operational Phase:** ▪ Visual intrusion and potential flicker effect by wind turbines and associated structures and infrastructure on visual receptors; ▪ Visual intrusion by wind turbines and associated structures and infrastructure on landscape receptors; and ▪ Potential visual impact of on-site security lighting and red-flashing warning lights on top of the turbine hubs on the rural nightscape of the region. **Decommissioning Phase:**

[2] Note that the traffic generated because of the development during the operational phase will be minimal and will not have a significant impact on the surrounding road network in light of the remote and rural setting of the area.

Specialist Assessment / Input	Key issues to be addressed
	▪ Visual intrusion and increased dust emissions due to decommissioning activities including disassembly of project components, heavy machinery, increased vehicle traffic and rehabilitation; and ▪ Potential visual impact of security and construction lighting on the nightscape of the region.

The effect of potential on-site impacts can be limited or reduced to acceptable levels through avoidance, minimisation and the implementation of appropriate mitigation measures and management actions during the construction, operational and decommissioning phases of this proposed development.

Therefore, based on the scoping level specialist input assessed and provided during the Scoping Phase, potential negative impacts associated with the proposed Kaladokhwe WEF 3 project are anticipated to be generally of **Moderate to Low significance after mitigation**, whilst some positive socio-economic impacts of moderate significance are expected.

Summary of where requirements of Appendix 2 of the 2014 NEMA EIA Regulations (as amended, GN R326) are provided in this Scoping Report

Section of the EIA Regulations	Requirements for a Scoping Report in terms of Appendix 2 of the 2014 NEMA EIA Regulations (as amended, GN R326)	Chapter / Appendix	YES / NO
Appendix 2 - (1)(a)	Details of - i. the EAP who prepared the report; and ii. the expertise of the EAP, including a curriculum vitae;	**Appendix A and Appendix B**	**Yes**
Appendix 2 - (1)(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 coordinates of the boundary of the property or properties;	**Chapter 1 and Chapter 2**	**Yes**
Appendix 2 - (1)(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;	**Chapter 2**	**Yes**
Appendix 2 - (1)(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;	**Chapter 2 and Chapter 4.2**	**Yes**
Appendix 2 - (1)(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;	**Chapter 4.1**	**Yes**
Appendix 2 - (1)(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;	**Chapter 1.7**	**Yes**
Appendix 2 - (1)(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 all the alternatives considered; ii. details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	**i) Chapter 5.1** **ii) Chapter 4.4; Appendix D; and Appendix E** **iii) Chapter 6.1 to 6.16** **iv) Chapter 3 and Appendix F**	**Yes**

Section of the EIA Regulations	Requirements for a Scoping Report in terms of Appendix 2 of the 2014 NEMA EIA Regulations (as amended, GN R326)	Chapter / Appendix	YES / NO
	iii. a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; iv. the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; v. the impacts and risks which have informed the identification of each alternative, including 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; 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; 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; viii. the possible mitigation measures that could be applied and level of residual risk; ix. the outcome of the site selection matrix; x. if no alternatives, including alternative locations for the activity, were investigated, the motivation for not considering such and xi. a concluding statement indicating the preferred alternatives, including the preferred location of the activity;	**v) Chapter 6 and Appendix F** **vi) Chapter 7.5** **vii) Chapter 6 and Appendix F** **viii) Chapter 6.14 and 6.15** **ix) Chapter 5.2 and 5.3** **x) Chapter 5.1 and 5.3** **xi) Not applicable. The preferred alternatives will be confirmed during the EIA Phase following detailed specialist assessment.**	
Appendix 2 - (1)(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. a description of the aspects to be assessed as part of the environmental impact assessment process; iii. aspects to be assessed by specialists;	**Section 7.1 - 7.8**	**Yes**

Section of the EIA Regulations	Requirements for a Scoping Report in terms of Appendix 2 of the 2014 NEMA EIA Regulations (as amended, GN R326)	Chapter / Appendix	YES / NO
	iv. a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists; v. a description of the proposed method of assessing duration and significance; vi. an indication of the stages at which the competent authority will be consulted; vii. particulars of the public participation process that will be conducted during the environmental impact assessment process; and viii. a description of the tasks that will be undertaken as part of the environmental impact assessment process; ix. 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.		
Appendix 2 - (1)(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 B**	**Yes**
Appendix 2 - (1)(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 B**	**Yes**
Appendix 2 - (1)(k)	Where applicable, any specific information required by the competent authority.	**N/A**	**X**
Appendix 2 - (1)(l)	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	**N/A**	**X**
Appendix 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.	**Not applicable in terms of the actual Scoping Report, but various gazetted assessment and reporting protocols have been complied with for the specialist studies. Refer to Chapter 4 of this Scoping Report.**	**Yes**

Scoping and Environmental Impact Assessment for the Proposed Development of the 240 MW Kaladokhwe Wind Energy Facility 3 near Nxuba (Cradock) in the Eastern Cape

DRAFT SCOPING REPORT

PART A: MAIN REPORT





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Scoping and Environmental Impact Assessment for the Proposed Development of the 240 MW Kaladokhwe Wind Energy Facility 3 near Nxuba (Cradock) in the Eastern Cape

DRAFT SCOPING REPORT

CHAPTER 1: Introduction





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1. INTRODUCTION

Kaladokhwe Wind 3 (Pty) Ltd (hereinafter referred to as "the Project Applicant") is proposing the development of a commercial Wind Energy Facility (WEF) and associated infrastructure approximately 20 km northeast of the town of Cradock in the Eastern Cape Province in the Chris Hani District Municipality (Figure 1.1).

Two additional WEF's are concurrently being considered on the surrounding properties and are assessed by way of separate impact assessment processes. These projects are known as Kaladokhwe WEF 1 and Kaladokhwe WEF 2. It is proposed that each WEF will comprise of up to 41 turbines with a contracted capacity of up to 240 MW.

The proposed Kaladokhwe WEF 3, which can be accessed via existing public roads off the R390 provincial tar road connecting Nxuba (previously Cradock) and Hofmeyr, will be located within the Inxuba Yethemba Local Municipality. The proposed Kaladokhwe WEF 1 and Kaladokhwe WEF 2 will however be located within the Inxuba Yethemba Local Municipality and the Enoch Mgijima Local Municipality (previously the Tsolwana Local Municipality.

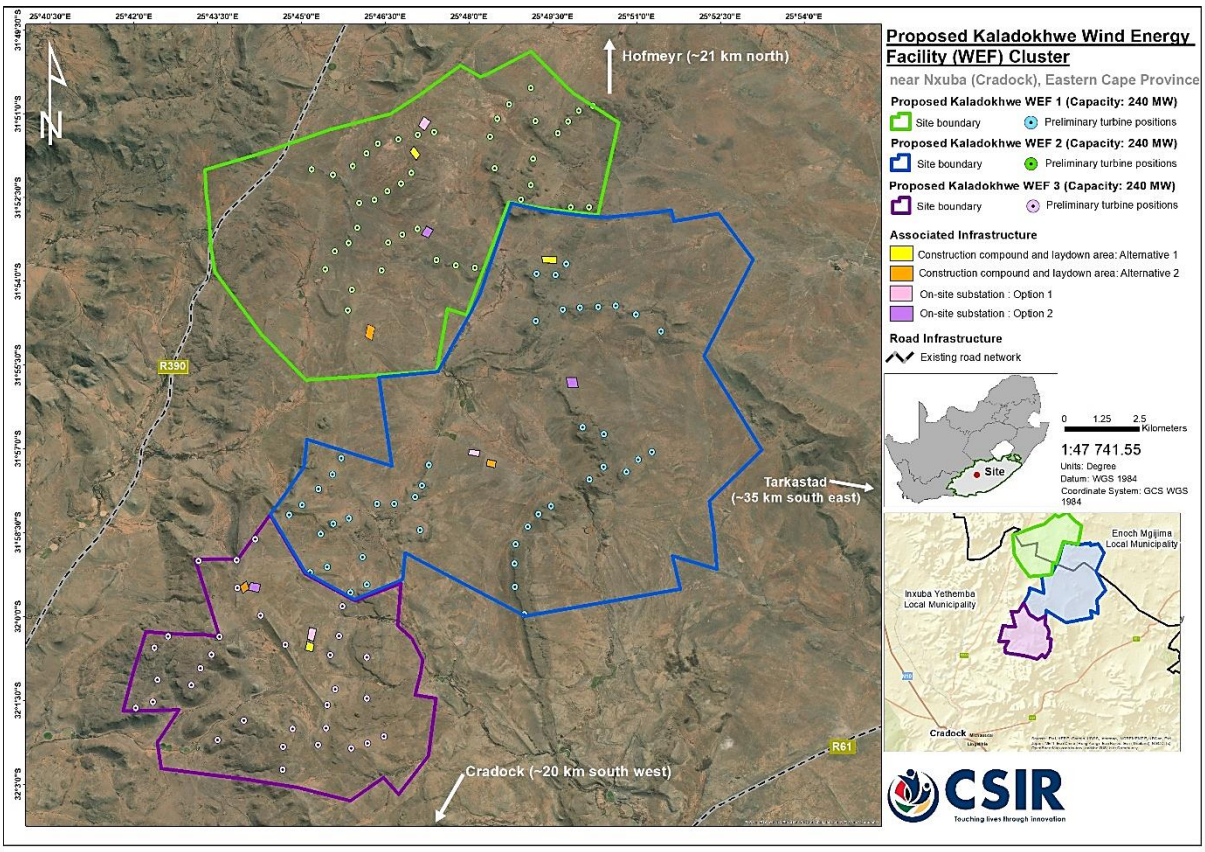

Figure 1.1: Map showing the location of the proposed Kaladokhwe Wind Energy Facilities 1-3, northeast of Nxuba (Cradock) in the Eastern Cape Province

The proposed project is being developed to generate electricity via wind energy, which will feed into and supplement the national electricity grid. This report comprises the Draft Scoping Report (DSR) for the proposed development of the 240 MW Kaladokhwe Wind Energy Facility 3 (hereafter, "Kaladokhwe WEF 3") (Figure 1.2).

Note: In order to evacuate the energy generated by the WEF to the national grid network, the Project Applicant is proposing the construction of a 132 kV / 400 kV overhead transmission powerline and its associated infrastructure, to be located within a 300 m assessment corridor, from the Switching Station on site at the WEF to a newly proposed 132 kV / 400 kV Main Transmission Substation (MTS) to be located northwest of the WEF, and adjacent to the two existing Hydra – Poseidon 400 kV overhead transmission powerlines, which runs parallel to the west of the N10 main road. A separate Scoping and Environmental Impact Assessment Process will be undertaken for the grid connection.

The proposed Kaladokhwe WEF 3 covers approximately 5 039 ha and will be developed on the following land portions:

- Portion 1 of the Farm Ossen kraal No. 40 (Surveyor General 21 Digit Code: C02200000000004000001);
- Portion 1 of the Farm Ruigte Fontein No. 150 (Surveyor General 21 Digit Code: C02200000000015000001);
- Remaining Extent of the Farm Ruigte Fontein No. 150 (Surveyor General 21 Digit Code: C02200000000015000000);
- Gunsteling, being Portion 1 (Remaining Extent) of the Farm No. 165 (Surveyor General 21 Digit Code: C02200000000016500001);
- Farm 166, being Portion 2 of the Farm No. 166 (Surveyor General 21 Digit Code: C02200000000016600002);
- Farm 166, being Portion 1 of the Farm No. 166 (Surveyor General 21 Digit Code: C02200000000016600001);
- Ruigte Fontein, being Portion 3 of the Farm No. 150 (Surveyor General 21 Digit Code: C02200000000015000003);
- Farm 607, being the Remaining Extent (Portion 0) (Surveyor General 21 Digit Code: C02200000000060700000);
- Roland, being the Remaining Extent (Portion 0) of the Farm No. 169 (Surveyor General 21 Digit Code: C02200000000016900000);
- De Bruins Requist, being the Remaining Extent (Portion 0) of the Farm No. 168 (Surveyor General 21 Digit Code: C02200000000016800000); and
- Lange Hoek, being Portion 7 of the Farm No. 171 (Surveyor General 21 Digit Code: C02200000000017100007).

Access to the proposed project site will be facilitated via existing public roads off the R390 provincial tar road connecting the towns of Nxuba (Cradock) and Hofmeyr. The main access road to the wind farm cluster will comprise a gravel road with a width of 8 – 10 m. The length of the main access road is yet to be confirmed.

This chapter provides an introduction (project overview) of the proposed Kaladokhwe WEF 3, and includes the following:

- An overview of the proposed WEF;

- The legal requirements for an Environmental Impact Assessment (EIA);
- Information on the Project Applicant;
- The EIA project team;
- Project Motivation;
- Need and Desirability;
- The objectives of the Scoping Report; and the
- Requirements for a Scoping Report in terms of Appendix 2 of the 2014 National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) EIA Regulations (as amended, GN R326).

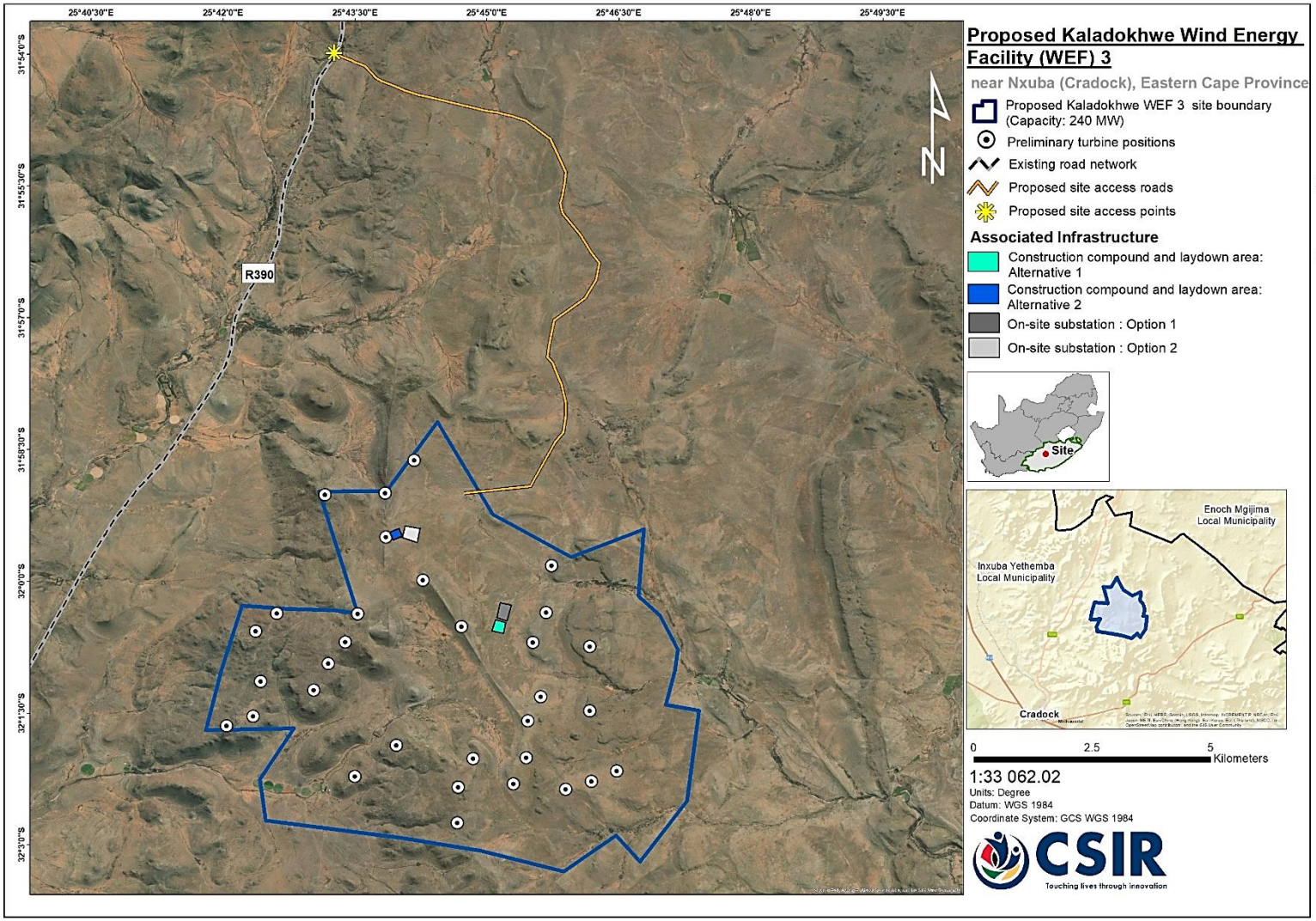

Figure 1.2: Locality map for the proposed Kaladokhwe WEF 3 near Nxuba (Cradock) in the Eastern Cape.

1.1. Project Motivation

The need for renewable energy is becoming increasingly apparent, in both local and international context, with South Africa becoming an integral part of the global transition towards renewable sources of electricity generation. The urgency behind this evolution can be appreciated considering that South Africa is one of the largest emitters of greenhouse gases in Africa[1], and is also estimated to rank amongst the top 20 largest emitters of greenhouse gases in the world. These emissions are largely a result of an energy-intensive economy and high dependence on coal-based electricity generation. The South African government is therefore committed to supplementing the existing generation capacity of thermal and nuclear power plants with renewable energy power generation, thus creating the framework that will lead to an increase in the supply of clean energy for the nation. The development of renewable energy is important for South Africa to reduce its overall environmental footprint from power generation (including externality costs), and thereby to steer the country on a pathway towards sustainability.

The Integrated Resource Plan (IRP) for South Africa for the period 2010 to 2030 (referred to as "IRP2010") was released by government in 2010, and a draft of an updated report was published in 2013, which proposes to secure 17 800 MW of renewable energy capacity by 2030 (including wind, solar and other energy sources). In August 2011, the Department of Energy (DoE) (currently operating as the Department of Mineral Resources and Energy (DMRE)) launched the Renewable Energy Independent Power Producer Programme (REIPPPP) and invited potential Independent Power Producers (IPPs) to submit proposals for the financing, construction, operation, and maintenance of the first 3 725 MW of onshore wind, solar thermal, PV, biomass, biogas, landfill gas or small hydropower projects. On 18 August 2015, an additional procurement target of 6 300 MW to be generated from renewable energy sources was added to the REIPPPP for the years 2021 - 2025, as published in Government Gazette 39111. Of this, the additional target allocated for wind energy is 3 040 MW.

The most recent update to the IRP, the Integrated Resource Plan 2019 (IRP 2019), was gazetted by the Minister of Mineral Resources and Energy, Gwede Mantashe, in October 2019, updating the energy forecast for South Africa from the current period to the year 2030. Provision has been made for new additional capacity by 2030 including in particular 14 400 MW of wind (which is based on a consistent annual allocation of 1 600 MW commencing in the year 2022 up to 2030), 6 000 MW of solar PV, and 2 088 MW for storage. The IRP 2019 also notes that for wind energy, 1 980 MW is installed capacity, and 1 362 MW is committed/already contracted capacity. In terms of the REIPPPP, submitted proposals are then evaluated according to a Request for Proposal (RFP). Based on previous bidding windows of the REIPPPP, the two main evaluation criteria for compliant proposals are price and economic development with a point allocation of 70/30 (DoE, 2013), with other selection criteria including technical feasibility and grid connectivity, environmental acceptability, black economic empowerment, community development, and local economic and manufacturing propositions. The bidders whose responses rank the highest (according to the aforementioned criteria) generally have the greatest potential to be appointed as "Preferred Bidders" by the DMRE. It is intended that this project will be bid into a future bidding program such as the REIPPPP or another suitable tender process. According to the amended RFP published on 9 September

[1] https://ourworldindata.org/co2/country/south-africa?country=ZAF~NGA~KEN~ZWE~IRN~LBY~GIN~LBR~MWI~TGO~BWA~BFA~BDI~CMR~SDN#citation
[2] https://www.dmr.gov.za/news-room/post/1989

2022, in terms of the REIPPPP, Bid Window 6 calls for the generation capacity procurement of up to 4 200 MW, comprising 3 200 MW of wind energy and 1 000 MW of solar energy[2].

Additionally, the project would contribute towards meeting the national energy target as set by the DMRE and assist the government in achieving its proposed renewable energy targets.

Should the proposed Kaladokhwe WEF 3 identified by the Project Applicant, Kaladokhwe Wind 3 (Pty) Ltd be acceptable and authorised, it is considered viable that long-term benefits for the community and society in the Nxuba (Cradock) area would be realised. The proposed project will provide an opportunity for additional employment in an area where job creation is identified as a key priority. Approximately 300 to 400 employment opportunities will be created during the construction phase and approximately 40 to 50 employment opportunities during the operational period of the proposed WEF. The proposed project will make use of local labour as much as possible. The majority of low-skilled and semi-skilled employment opportunities will be available to local residents during the construction and operational phases. In addition, there will be opportunities for skills development and training and these programmes will be planned in detail prior to the construction phase.

The proposed project would also have international significance as it contributes to South Africa being able to meet some of its international obligations by aligning domestic policy with internationally agreed strategies and standards as set by the United Nations Framework Convention on Climate Change (UNFCCC), the Paris Agreement on Climate Change, Kyoto Protocol, and United Nations Convention on Biological Diversity (UNCBD), all of which South Africa is a signatory to. Renewable energy is critical to South Africa as this source of energy is recognised as a major contributor to climate protection, has a much lower environmental impact significance, as well as advancing economic and social development.

In order to submit a bid in terms of the REIPPPP, the Project Applicant is required to have obtained an Environmental Authorisation (EA) in terms of the 2014 NEMA EIA Regulations (as amended), as well as several additional authorisations or consents.

1.2. An Overview of the Proposed Kaladokhwe Wind Energy Facility 3

The proposed Kaladokhwe WEF 3 will comprise of a maximum of 32 turbines with a hub height and rotor diameter of up to 160 m and up to 200 m, respectively. The blade length will be up to 100 m. The development footprint of the proposed WEF will be approximately 61 ha. The key components of the proposed WEF are discussed in more detail in Chapter 2 of this DSR.

1.3. Legal Requirements for an EIA

Section 24(1) of the NEMA, states that “In order to give effect to the general objectives of integrated environmental management laid down in this Chapter, the potential impact on the environment of listed activities must be considered, investigated, assessed and reported to the competent authority charged by this Act with granting the relevant EA”. The reference to “listed activities” relates to the regulations promulgated in Government Notice (GN) R982, R983, R984 and R985 in Government Gazette 38282, dated 4 December 2014, which came into effect on 8 December 2014. These were amended in April 2017, specifically promulgated in GN R326, R327, R325 and R324 in Government Gazette 40772, dated 7 April

2017. GN R327 and GN R324 includes listed activities that trigger the need for a Basic Assessment (BA) Process, whereas GN R325 includes listed activities that trigger the need for a full Scoping and EIA Process.

In terms of the NEMA and the 2014 NEMA EIA Regulations (as amended), a full **Scoping and EIA Process** is required for the construction of the proposed Kaladokhwe WEF 3.

The proposed Kaladokhwe WEF 3 is not located within any of the Renewable Energy Development Zones (REDZs) gazetted in Gazette 41445, GN R114 on 16 February 2018; and Gazette 44191, GN R144 on 26 February 2021. The proposed Kaladokhwe WEF 3 is also not located within any of the strategic power corridors gazetted in Gazette 41445, GN R113 on 16 February 2018. Therefore, a full Scoping and EIA Process is being undertaken for the project and a 107-day decision-making timeframe applies, as opposed to a BA Process and 57-day decision-making timeframe allowed for in the REDZs and strategic power corridors.

The need for the full Scoping and EIA is triggered by, amongst others, the inclusion of Activity 1 listed in GN R325 (Listing Notice 2):

"The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, *excluding where such development of facility or infrastructure is for photovoltaic installations and occurs (a) within an urban area; or (b) on existing infrastructure".*

The Project Applicant has appointed the Council for Scientific and Industrial Research (CSIR) to undertake the Scoping and EIA Process for this proposed project in order to determine the potential biophysical, social and economic impacts associated with undertaking the proposed activities. Given that energy related projects have been elevated to national strategic importance in terms of the Scoping and EIA Process, the proposed WEF requires EA from the National Department of Forestry, Fisheries, and the Environment, (DFFE) as the Competent Authority (CA), acting in consultation with other spheres of government.

Chapter 4 of this Scoping Report contains the detailed list of activities contained in R327, R325, and R324, as amended, which may be triggered by the various project components and thus form part of the Scoping and EIA Process.

The purpose of the Scoping and EIA Process is to identify, assess and report on any potential impacts the proposed project, if constructed and implemented, may have on the receiving environment. The environmental assessment, therefore, needs to show the CA what the potential biophysical and socio-economic impacts will be of the proposed WEF. It also needs to show the CA how such impacts can be avoided, remedied, mitigated, or managed, and how positive impacts can be enhanced.

1.4. Project Applicant

The Project Applicant seeking EA for the proposed Kaladokhwe WEF 3 project is Kaladokhwe Wind 3 (Pty) Ltd with registration number 2022/256664/07.

1.5. EIA Project Team

As previously noted, the CSIR has been appointed by the Project Applicant to undertake the Scoping and EIA (S&EIA) Process required for the proposed Kaladokhwe WEF 3 project. Public participation forms an integral part of the S&EIA Process and assists in identifying issues and possible alternatives to be considered during the S&EIA Process. The CSIR is undertaking the Public Participation Process (PPP) for this S&EIA Process. Details on the PPP are included in Chapter 4 of this DSR.

The project team, which is involved in this S&EIA Process is listed in Table 1.1 below. This team includes a number of specialists who have extensive experience in conducting specialist studies for renewable energy projects in South Africa.

Table 1.1: The EIA Project Team

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN
Environmental Management Services (CSIR)		
Paul Lochner *(Registered EAP (2019/745))*	CSIR	Technical Advisor and Quality Assurance
Rohaida Abed (*Pr.Sci.Nat.)*	CSIR	Project Review
Lizande Kellerman (*Pr.Sci.Nat.)*	CSIR	Project Manager
Suvasha Ramcharan	CSIR	Project Officer
Dhiveshni Moodley *(Cand.Sci.Nat.)*	CSIR	GIS Specialist
Specialists		
Johann Lanz (*Pr.Sci.Nat.)*	Private	Agriculture and Soils Compliance Statement
Jaco van der Walt	Beyond Heritage	Heritage Impact Assessment (Archaeology, Palaeontology and Cultural Landscape)
Jon Smallie	Wildskies Ecological Services	Avifauna Impact Assessment
Werner Marais	Animalia	Bat Impact Assessment
Gerhard Botha	Nkurenkuru Ecological and Biodiversity	Aquatic Biodiversity
Tarryn Martin and Amber Jackson	Biodiversity Africa	Terrestrial Biodiversity and Species
Morné De Jager	Enviro Acoustic Research	Noise Impact Assessment
Lourens du Plessis	LOGIS	Visual Impact Assessment
Iris Wink	Iris Wink Consulting	Traffic Impact Assessment
Tony Barbour	Tony Barbour Environmental Consulting	Socio-Economic Impact Assessment
Lizande Kellerman *(Pr.Sci.Nat.)*	CSIR	Civil Aviation Site Sensitivity Verification
Lizande Kellerman *(Pr.Sci.Nat.)*	CSIR	Defence Site Sensitivity Verification

Feedback on the specialist studies commissioned as part of this S&EIA Process is also included in Chapter 4, Chapter 6, and Chapter 7 of this DSR. Chapter 4 also includes motivation for not undertaking certain studies identified by the Screening Tool.

1.6. Details and Expertise of the CSIR EIA Project Management Team

This section provides information on the expertise of the CSIR EIA Project Management Team and EAPs, consisting of Paul Lochner, Lizande Kellerman, Suvasha Ramcharan and Dhiveshni Moodley.

Paul Lochner *EAPASA* (Technical Advisor and Quality Assurance):

Paul Lochner is an environmental assessment practitioner (EAP) at the CSIR in Stellenbosch, with more than 30 years of experience in a wide range of environmental assessment and management studies. Paul commenced work at CSIR in 1992, after completing a B.Sc. degree in Civil Engineering and a Masters in Environmental Science, both at the University of Cape Town. His initial work at focused on wetlands and estuarine management; environmental engineering in the coastal zone; and coastal zone management plans. Since 2008, Paul has been the leader and manager of the Environmental Management Services (EMS) group within CSIR that has been at the forefront of advancing environmental assessment in South Africa. This group currently consists of approximately 10 to 20 environmental scientists, planners, and engineers, with offices in Stellenbosch, Cape Town, and Durban. Paul's particular experience is in environmental planning and assessment for renewable energy, electricity grid infrastructure, desalination, oil & gas, wetlands & coastal zone management, and industrial & port development. He has been closely involved in the research and application of Strategic Environmental Assessment (SEA) in South Africa, and also has wide experience in Environmental & Social Impact Assessment, Environmental Management Programmes (EMPRs) and Environmental Screening Studies. He has been the project leader for over 40 SEAs and EIAs over the past 28 years. He also served as project leader for a suite of SEAs commissioned by the DFFE from 2014 to 2020.

Paul is a Registered EAP (#2019/745) with the Environmental Assessment Practitioners Association of South Africa (EAPASA).

Lizande Kellerman *Pr. Sci. Nat*. (Project Manager):

Lizande Kellerman is an environmental scientist at the CSIR in Stellenbosch, with more than 12 years of experience in environmental impact studies, primarily in the planning, preparation and management of BAs, EIAs, and SEAs, as well as EMPrs, Screening/Fatal Flaw Studies, Biodiversity Risk Assessments, Biodiversity Resource Assessments and license applications for agriculture, atmospheric emissions, water use, waste management, mining, bioprospecting and biodiversity permitting, for numerous projects in the agricultural (including aquaculture), construction, conservation, mining and renewable energy sectors.

Lizande holds a BSc degree in Zoology and Entomology, with an Honours and Masters in Botany both at the University of Pretoria. She is currently working towards completing her PhD in Conservation Ecology. She commenced work at the CSIR in 2012 after spending three years working as an environmental scientist in the private sector. She has published several articles, both peer reviewed scientific and popular, and presented at five international conferences. She has also lectured on biodiversity, ecological and EIA at various universities in South Africa. Her training and experience as a qualified terrestrial ecologist has enabled her to provide expert input into ecological impact assessments and to perform specialist reviews of various terrestrial biodiversity and ecology impact assessments as part of BAs, EIAs and SEA.

Lizande is a registered Professional Natural Scientist (#400046/10) with the South African Council for Natural Scientific Professions (SACNASP).

Suvasha Ramcharan (Project Officer):

Suvasha Ramcharan is an environmental scientist at the CSIR in Durban. Suvasha holds a BSc, BSc Honours, and MSc (*cum laude*) degrees in Environmental Science from the University of KwaZulu-Natal. Her Honours research focused on the use of multispectral remote sensing in land use and landcover change detection studies and the implications of land use change on water quality. Her MSc research focused on the use of

hyperspectral remote sensing in water quality and sediment quality studies. She is passionate about environmental sustainability and has a keen interest in working on environmental impact assessment projects to help mitigate and manage human impacts on the environment so that current natural resources and biodiversity can be safeguarded for the benefit of future generations. Suvasha is currently doing an internship in Environmental Science with the Environmental Management Services group at the CSIR.

Dhiveshni Moodley *Cand. Sci. Nat*. (GIS Specialist):

Dhiveshni Moodley is environmental scientist at the CSIR in Durban. Dhiveshni holds a BSc, BSc Honours (*cum laude*) and MSc (*cum laude*) degrees in Environmental Science from the University of KwaZulu-Natal. She has more than two year's work experience in flood risk, hydropedological- and wetland functional assessment specialist studies, as well as conducting BAs and S&EIAs in the Renewable Energy sector. Her key interest lies in applying GIS analyses analysing the formation of accurate, feasible solutions to complex environmental challenges.

Dhiveshni is registered as a Candidate Natural Scientist (#1472997/19) with the SACNASP.

1.7. Need and Desirability

It is an important requirement in the S&EIA Process to review the need and desirability of the proposed project. Guidelines on Need and Desirability were published by the DEA (now operating as the DFFE) in 2017[2]. These guidelines list specific questions to determine need and desirability of proposed developments. This checklist is a useful tool in addressing specific questions relating to the need and desirability of a project and assists in explaining that need and desirability at the provincial and local context. Need and desirability answer the question of whether the activity is being proposed at the right time and in the right place.

Table 1.2 includes a list of questions based on the DFFE's Guideline to determine the need and desirability of the proposed project. It should be noted this table will be informed by the outcomes of the Scoping and EIA Processes and will be updated once the relevant impact assessment has been received.

Table 1.2: The Guideline on the Need and Desirability's list of questions to determine the "Need and Desirability" of a proposed project

NEED AND DESIRABILITY	
Question	**Response**
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?	
1.1. How were the following ecological integrity considerations taken into account? 1.1.1. Threatened Ecosystems,	The environmental sensitivities, in particular the aquatic and terrestrial biodiversity and ecological sensitivities present on site will be assessed in detail within the Aquatic Biodiversity and Terrestrial

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

NEED AND DESIRABILITY	
Question	**Response**
1.1.2. Sensitive, vulnerable, highly dynamic, or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure, 1.1.3. Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs"), 1.1.4. Conservation targets, 1.1.5. Ecological drivers of the ecosystem, 1.1.6. Environmental Management Framework, 1.1.7. Spatial Development Framework, and 1.1.8 Global and international responsibilities relating to the environment (e.g., RAMSAR sites, Climate Change, etc.).	Biodiversity Impact Assessments to be included in the EIA Report. The specialists will identify all aquatic and terrestrial biodiversity sensitive areas on site that should be avoided by the proposed development, as well as any other ecologically sensitive areas and how to suitably develop within these areas so that the ecological integrity of the areas is maintained. The Aquatic and Terrestrial Biodiversity specialists have prepared scoping inputs and these inputs have been included in Appendix F of this Scoping Report. Should any of the proposed project infrastructure as per the indicative development footprint be in any identified CBAs on site, however extremely limited, the proposed project layout will be revised to avoid the CBAs as far as possible so as to limit significant impact on identified CBAs. In addition, it is not likely that the proposed development would compromise the functioning of identified ESAs given that the current proposed project layout will be refined to avoid these areas as far as possible. It is the specialists' opinion that the proposed development of the project is considered compatible with the aims and objectives of ESAs and ONAs, from an aquatic and terrestrial biodiversity point of view. The preliminary sensitivity map is included in Chapter 5 of this DSR and will be further refined during the EIA Phase following detailed assessments to be completed by the specialists on the EIA project team. The specialists provided scoping inputs, which informed the current preliminary sensitivity map. Such inputs to the DSR are included in Appendix F.
1.2. How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Environmental sensitivities such as ESAs and CBAs present were identified by the Aquatic and Terrestrial Biodiversity specialists and are discussed in the Scoping inputs provided in Appendix F of this DSR. Detailed Aquatic and Terrestrial Biodiversity Impact Assessments will be undertaken and included in the EIA Report. The Aquatic and Terrestrial Biodiversity specialists will identify all ecological sensitive areas on site that should be avoided by the proposed development and propose mitigation measures to reduce or

NEED AND DESIRABILITY	
Question	**Response**
	minimise impacts to ensure that the ecological integrity of the areas is maintained. The preliminary sensitivity map is included in Chapter 5 of this DSR and will be further refined during the EIA Phase. Measures to avoid, remedy, mitigate and manage impacts will be included in the Environmental Management Programme (EMPr) that will be compiled during the EIA Phase and included within the EIA Report.
1.3. How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Measures to avoid, remedy, mitigate or manage biophysical impacts will be included in the EMPr that will be compiled during the EIA Phase and included within the EIA Report.
1.4. What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether; what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	Waste will mostly be generated during the construction and decommissioning phases of the project. Measures to avoid, remedy, mitigate or manage waste will be included within the EMPr that will be compiled during the EIA Phase and included within the EIA Report. Waste generated on site will be disposed of at a licenced landfill site.
1.5. How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	A Heritage Impact Assessment (HIA) will be undertaken during the EIA Phase to assess potential archaeological, palaeontological, and cultural impacts resulting from the proposed development during the EIA Phase. Scoping inputs have been provided by the heritage and palaeontological specialists and are included in Appendix F of this DSR. It will be further refined during the EIA Phase and the full HIA will be included in the EIA Report. The HIA will also be sent to the Eastern Cape Heritage Resources Authority (ECPHRA) and the South African Heritage Resources Agency (SAHRA) for comment during the EIA Phase.
1.6. How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including	Measures to avoid, remedy, mitigate or manage impacts on non-renewable natural resources will be included in the EMPr that will be compiled during the EIA Phase and included within the EIA Report.

NEED AND DESIRABILITY	
Question	**Response**
offsetting) the impacts? What measures were explored to enhance positive impacts?	
1.7. How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts? 1.7.1. Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e., de-materialised growth)? (Note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life) 1.7.2. Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e., what are the opportunity costs of using these resources of the proposed development alternative?) 1.7.3. Do the proposed location, type and scale of development promote a reduced dependency on resources?	South Africa has heavily relied on coal as a source of electricity for decades. Due to the nature of coal as a non-renewable resource that causes major environmental degradation, there is therefore a need to identify alternative resources that could promote sustainable energy sources as well as cleaner energy production mechanisms. The proposed project aims to harness the wind resource available in the area for the generation of electricity. This project is seen as a source of 'clean energy' and reduces the dependence on non-renewable sources. The proposed project is a sustainable option for the area and the footprint will as far as possible, avoid areas of very high environmental sensitivity. Where impacts cannot be avoided, the footprint will be placed to minimise, mitigate, or manage potential impacts to the receiving environment.
1.8. How were a risk-averse and cautious approach applied in terms of ecological impacts? 1.8.1. What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	The precautionary approach has been adopted for this study, i.e., assuming the worst-case scenario will occur and then identifying ways to mitigate or manage these impacts. Current gaps in knowledge include confirmation on the preferred turbine types to be used at this site.

NEED AND DESIRABILITY	
Question	**Response**
1.8.2. What is the level of risk associated with the limits of current knowledge? 1.8.3. Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	Ways in which these gaps are addressed are to consider the worst-case scenarios as noted above in terms of turbine size and generation capacity. A range of specifications have been provided as new technology may also come onto the market closer to the construction period (should the proposed WEF be approved).
1.9. How will the ecological impacts resulting from this development impact on people's environmental right in terms following: 1.9.1. Negative impacts: e.g., access to resources, opportunity costs, loss of amenity (e.g., open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts? 1.9.2. Positive impacts: e.g., improved access to resources, improved amenity, improved air, or water quality, etc. What measures were taken to enhance positive impacts?	A detailed Socio-Economic Impact Assessment will be included in the EIA Report. A preliminary socio-economic profile is included in Chapter 3 of this DSR and will be further refined during the EIA Phase. Scoping inputs have been provided by the Socio-Economic specialist and have been included in Appendix F of the DSR.
1.10. Describe the linkages and dependencies between human wellbeing, livelihoods, and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g., on livelihoods, loss of heritage site, opportunity costs, etc.)?	Linkages and dependencies between human wellbeing, livelihoods, and ecosystem services applicable to the area will be considered as part of the Socio-Economic Impact Assessment undertaken for this project and will be included within the EIA Report.
1.11. Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives / targets / considerations of the area?	The impacts on ecological integrity objectives of the area will be considered as part of the Aquatic and Terrestrial Biodiversity Impact Assessments undertaken for this project and will be included within the EIA Report.
1.12. Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?	Please refer to Chapter 5 of this DSR where the alternatives are discussed.

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1.13. Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?	Please refer to Chapter 7 of this DSR where the potential cumulative impacts are discussed for this project. Table 7.3 in Chapter 7 also contains a list of all the other renewable energy projects that have received EA and projects whose EA status is pending.
2.1. What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?	
2.1.1. The IDP (and its sector plans' vision, objectives, strategies, indicators, and targets) and any other strategic plans, frameworks of policies applicable to the area,	The Kaladokhwe WEF 3 facility is located within the Inxuba Yethemba Local Municipality (IYLM). The IYLM Integrated Development Plan (IDP) (2022-2027) recognises renewable energy projects as potential sustainable economic development opportunities. The development of the Kaladokhwe WEF 3 will therefore also be in line with the vision of the IYLM to diversify the job market by creating and supporting sustainable economic growth and development opportunities. One of the economic priority issues identified within the IYLM IDP (2017-2022) is the fairly high level of unemployment. The IDP identifies low economic growth as one of the main reasons for the lack of new labour entrants into the economy. The IYLM has experienced an increase in the average annual employment growth rate of 1.69% from 2006 to 2016 which resulted in the unemployment rate decreasing from 20.4% in 2006 to 16.8% in 2016. The unemployment rate of 16.8% was lower than that of the CHDM (30.8%) and the provincial average unemployment rate (29.34%) in 2016 (IYLM IDP, 2022-2027). The proposed Kaladokhwe WEF 3 project will create job opportunities and economic spin offs during the construction and operational phases (if an EA is granted by the DFFE). It is estimated that approximately 300 to 400 employment opportunities will be created during the construction phase and approximately 40 to 50 employment opportunities during the operational phase. It should, however, be noted that

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	employment during the construction phase will be temporary, whilst 40 to 50 employment opportunities being long-term during the operational phase. Therefore, the proposed WEF would help to address the need for increased electricity supply to the national grid while also providing advanced skills transfer and training to the local communities and creating contractual and permanent employment in the area. The proposed project will therefore be supportive of the IDP's objective of facilitating job creation to address the high unemployment rate.
2.1.2. Spatial priorities and desired spatial patterns (e.g., need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),	This is not applicable as the proposed project is located within a rural area and the site is zoned for agricultural use.
2.1.3. Spatial characteristics (e.g., existing land uses, planned land uses, cultural landscapes, etc.)	As indicated above, the current land use on the proposed site is agriculture, predominantly livestock farming. The impact of the proposed project on cultural or heritage areas (including archaeology and palaeontology) will be assessed as part of the HIA during the EIA Phase. Should the proposed project proceed, only approximately 61 ha of the land will be developed (comprising 1.2% of the total farming area that constitutes the properties relevant to the Kaladokhwe WEF 3). It is therefore unlikely that any agricultural activities present on site will be affected in any way. An Agricultural Compliance Statement will however be included within the EIA Report to reflect the potential impact of the proposed project in terms of the land capability and overall agricultural potential. Scoping level inputs have been provided by the Agricultural and Soil specialist, which found that the proposed WEF project site is identified as being of predominantly low and medium sensitivity for agricultural resources. As noted, an EMPr will be compiled for the proposed project to ensure that all potential negative impacts identified are suitably managed and mitigated, and potential positive impacts are enhanced. The impact on the sense of place is difficult to predict and would

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	potentially be ambiguous. This is due to the subjective nature of perceptions regarding the relative attraction or disturbance of the WEF in a rural landscape. The visual impact and associated considerations will be further assessed as part of the Visual Impact Assessment to be undertaken during the EIA Phase of this project. A preliminary environmental sensitivity map was prepared during the Scoping Phase based on the input obtained from the various scoping level specialist studies. The map will be updated in the EIA Phase to ensure that sensitive features will be identified and avoided by the project layout, as best as possible.
2.1.4. Municipal Economic Development Strategy ("LED Strategy").	The LED Strategy will be considered, and potential alignment will be discussed in the Socio-Economic Impact Assessment that will be included in the EIA Report.
2.2. Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area? 2.2.1. Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	This will be addressed within the Socio-Economic Impact Assessment that will be included in the EIA Report.
2.3. How will this development address the specific physical, psychological, developmental, cultural, and social needs and interests of the relevant communities?	These needs and interests of the relevant communities will be addressed within the Socio-Economic Impact Assessment that will be included in the EIA Report. Any potential issues and/or concerns raised by I&APs to this effect will also be addressed and included in the EIA Report.
2.4. Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long term? Will the impact be socially and economically sustainable in the short- and long-term?	This will be addressed in the Socio-Economic Impact Assessment that will be included in the EIA Report.
2.5. In terms of location, describe how the placement of the proposed development will:	
2.5.1. result in the creation of residential and employment opportunities in close proximity to or integrated with each other,	Local employment opportunities will be provided as far as possible. Approximately 300 to 400, and 40 to 50 employment opportunities will be generated in the construction and operational phases of the project, respectively.
2.5.2. reduce the need for transport of people and goods,	This is not applicable as the proposed project is located within a remote rural area and the development site is zoned for agricultural use. This project is a renewable energy project proposal.

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2.5.3. result in access to public transport or enable non-motorised and pedestrian transport (e.g., will the development result in densification and the achievement of thresholds in terms public transport),	This is not applicable as the proposed project is located within a remote rural area and the site is zoned for agricultural use. This project is a renewable energy project proposal.
2.5.4. compliment other uses in the area,	Even though the site includes some minor areas of high agricultural sensitivity, the overall sensitivity of the site will have minimal influence on the layout constraints for a WEF. The protocol, that prescribes the assessment and minimum reporting requirements for potential development impacts on agricultural resources, imposes allowable development limits on different agricultural sensitivity categories of land. The allowable development footprint is the area of a particular sensitivity category of land that can be directly occupied by the physical footprint of a renewable energy development. Therefore, high sensitivity agricultural land can be utilised by the footprint of the proposed WEF, as long as it is within the allowable limits set by the protocol. On this site earmarked for the proposed development of the Kaladokhwe WEF 3 project, the area of high sensitivity agricultural land is so small that any WEF layout will be within the allowable limits and therefore the sensitivity will effectively impose no constraint on the layout of the facility footprint. Even though this is the case, it is still advisable to avoid those very limited areas on the site that are rated as high sensitivity, as a result of their cultivation status. These are, however, associated with and in close proximity to the farmsteads that are likely to be avoided by the footprint of the development, anyway.
2.5.5. be in line with the planning for the area,	
2.5.6. for urban related development, make use of the underutilised land available with the urban edge,	This is not applicable as the proposed project is located within a remote rural area and the site is zoned for agricultural use.
2.5.7. optimise the use of existing resources and infrastructure,	The proposed project will inject power into a newly proposed 132 kV / 400 kV Main Transmission Substation (MTS) located northwest of the Kaladokhwe WEF cluster, and adjacent to the two existing Hydra – Poseidon 400 kV overhead transmission powerlines. There is an existing Iziko Series Capacitor Station located along the 400 kV Hydra/Poseidon overhead transmission powerlines that is situated northwest of the proposed Kaladokhwe WEF cluster. Eskom's Grid Access Unit

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	(GAU) has confirmed that Eskom will be establishing a new MTS north of the existing Poseidon MTS, due to the existing Poseidon MTS being physically constrained. This aligns to Eskom's Transmission Development Plan (TDP) 2022-2031 that identifies this proposed MTS as the "Poseidon North 132 kV / 400 kV Substation" proposed to be located at or near the existing Iziko Series Capacitor Station. The Project Developer will undertake a separate Scoping and Environmental Impact Assessment to assess the grid connection route from the onsite substation hub at Kaladokhwe WEF 3, via the Kaladokhwe WEF 1 and the Kaladokhwe WEF 2 to the newly proposed MTS.
2.5.8. opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g., not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),	The project is a renewable energy project and not related to bulk infrastructure expansion.
2.5.9. discourage "urban sprawl" and contribute to compaction/densification,	This will be addressed in the Socio-Economic Impact Assessment that will be included in the EIA Report.
2.5.10. contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,	N/A - the proposed project is located within a remote rural area and the site is zoned for agricultural use.
2.5.11. encourage environmentally sustainable land development practices and processes,	The development of a renewable energy facility is a sustainable land development practice provided it is constructed and operated in an environmentally friendly manner.
2.5.12. take into account special locational factors that might favour the specific location (e.g., the location of a strategic mineral resource, access to the port, access to rail, etc.),	Please refer to Chapter 5 for a description of the process undertaken to identify the site as a preferred site for a WEF.
2.5.13. the investment in the settlement or area in question will generate the highest socio-economic returns (i.e., an area with high economic potential),	This will be addressed within the Socio-Economic Impact Assessment that will be included within the EIA Report.
2.5.14. impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and	The impact of the proposed project on cultural areas and heritage resources (archaeology and palaeontology), as well as on the sense of place will be assessed in the HIA and Visual Impact Assessment (VIA) which will be included in the EIA Report.

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2.5.15. in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	On 26 February 2021, Minister Barbara D. Creecy published Government Gazette 44191, GN R144 for notification of the identification of three new Renewable Energy Development Zones (REDZs) additional to the eight existing REDZs that were gazetted under GN R114 in Government Gazette 41445 of 16 February 2018. Although the proposed WEF project site is not located within any of the gazetted REDZs, it will significantly contribute to introducing renewable energy development into an area with optimal wind resource and a need for socio-economic growth.
2.6. How were a risk-averse and cautious approach applied in terms of socio-economic impacts?	
2.6.1. What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	This will be addressed within the Socio-Economic Impact Assessment that will be included in the EIA Report.
2.6.2. What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability, and sustainability) associated with the limits of current knowledge?	
2.6.3. Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	
2.7. How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:	
2.7.1. Negative impacts: e.g., health (e.g., HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	This will be addressed within the Socio-Economic Impact Assessment that will be included in the EIA Report.
2.7.2. Positive impacts. What measures were taken to enhance positive impacts?	
2.8. Considering the linkages and dependencies between human wellbeing, livelihoods, and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socioeconomic impacts will	

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result in ecological impacts (e.g., over utilisation of natural resources, etc.)?	
2.9. What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	
2.10. What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	
2.11. What measures were taken to pursue equitable access to environmental resources, benefits, and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	
2.12. What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	
2.13. What measures were taken to:	
2.13.1. ensure the participation of all interested and affected parties,	The Public Participation Process that is undertaken as part of the Scoping Phase to date and to be undertaken in the EIA Phase is included in Chapter 4 and Chapter 7 of the DSR. Various methods are employed to notify potential I&APs of the proposed project and the opportunity to comment on the DSR, namely, through notices in the local newspaper, sites notices, emails, as well as SMS and Whatsapp text messages.
2.13.2. provide all people with an opportunity to develop the understanding, skills, and capacity necessary for achieving equitable and effective participation,	
2.13.3. ensure participation by vulnerable and disadvantaged persons,	
2.13.4. promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,	The S&EIA Process will take cognisance of all interests, needs, and values espoused by all I&APs. Opportunity for public participation will be provided to all I&APs throughout the S&EIA Process in terms of the 2014 NEMA EIA Regulations (as amended) for the proposed Kaladokhwe WEF projects.

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2.13.5. ensure openness and transparency, and access to information in terms of the process,	The Public Participation Process that is undertaken as part of the Scoping Phase to date and to be undertaken in the EIA Phase is included in Chapter 4 and Chapter 7 of the DSR. Various methods are employed to notify potential I&APs of the proposed project and the opportunity to comment on the DSR, namely, through notices in the local newspaper, sites notices, emails, as well as SMS and Whatsapp text messages.
2.13.6. ensure that the interests, needs and values of all interested and affected parties were taken into account and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge,	The S&EIA Process will take cognisance of all interests, needs and values adopted by all I&APs.
2.13.7. ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein was promoted.	Public participation of all I&APs will be promoted and opportunities for engagement will be provided during the S&EIA Process.
2.14. Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g., a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	This will be addressed within the Socio-Economic Impact Assessment that will be included within the EIA Report.
2.15. What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	An EMPr will be developed to address health and safety concerns. An Environmental Control Officer (ECO) will be appointed to monitor compliance with the EMPr and EA (should such authorisation be granted) during the construction and operational phases.
2.16. Describe how the development will impact on job creation in terms of, amongst other aspects:	
2.16.1. the number of temporary versus permanent jobs that will be created,	This will be addressed within the Socio-Economic Impact Assessment that will be included within the EIA Report.
2.16.2. whether the labour available in the area will be able to take up the job opportunities (i.e., do the required skills match the skills available in the area),	

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2.16.3. the distance from where labourers will have to travel,	
2.16.4. the location of jobs opportunities versus the location of impacts (i.e., equitable distribution of costs and benefits),	
2.16.5. the opportunity costs in terms of job creation (e.g., a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).	
2.17. What measures were taken to ensure:	
2.17.1. that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment,	The different government departments have been listed as I&APs and are given the opportunity to comment on the DSR and will be given the opportunity to comment on the Draft EIA Report during the respective 30-day public comment periods.
2.17.2. that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?	This will be determined during the EIA Phase (following the public participation process undertaken as part of the Scoping Phase).
2.18. What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	The proposed WEF will adhere to the principles of environmental management. Measures taken to ensure adherence to the principles of NEMA will be determined during the EIA Phase.
2.19. Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	It would be premature to decide whether proposed mitigation measures of the WEF are realistic prior to the completion of the Impact Assessment Phase of this S&EIA Process. Therefore, the practicality of mitigation measures shall be determined during the EIA Phase. The proposed mitigation measures to be included in the EMPr that will be included in the EIA Report will be informed by the specialist studies undertaken. This will include a detailed assessment of the environment as well as the impacts associated with the proposed development. WEFs can be dismantled and completely removed from the site leased for the development and do not permanently prevent alternative land-uses on the same land parcel.
2.20. What measures were taken to ensure that he costs of remedying pollution, environmental degradation and consequent adverse health effects	The EMPr of this proposed project, to be included in the EIA Report, must form part of the contractual

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and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	agreement and be adhered to by both the contractors/workers and the Project Applicant.
2.21. Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	Agriculture on site is influenced by climatic variables and limitations. Renewable energy development is a suitable land use option for the site. The proposed WEF would be more robust in terms of economic viability and profitability while also being largely uninfluenced by climate change variables. The proposed project would also provide the farm owners with additional income by way of lease agreements with each Project Applicant and will also contribute to local socio-economic upliftment through job creation.
2.22. Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope, and nature of the project in relation to its location and other planned developments in the area?	The potential cumulative impacts resulting from the proposed project can only be objectively determined at the end of the S&EIA Process. These will be assessed as part of the EIA Phase. The cumulative impacts of similar types of projects that have received EA or whose EA status is pending at the start of this S&EIA Process (e.g., other renewable energy projects within 30 km of the proposed project) will be assessed in the EIA Report.

1.8. Objectives for this Scoping Report

The Scoping Phase of the EIA refers to the process of determining the spatial and temporal boundaries for the EIA. In broad terms, the objectives of the Scoping Process in terms of the 2014 NEMA EIA Regulations (as amended) are to:

- Confirm the process to be followed and opportunities for stakeholder engagement;
- Clarify the project scope to be covered;
- Identify and confirm the preferred activity and technology alternative;
- Identify and confirm the preferred site for the preferred activity;
- Identify the key issues to be addressed in the impact assessment phase and the approach to be followed in addressing these issues; and
- Confirm the level of assessment to be undertaken during the impact assessment.

This is achieved through parallel initiatives of consulting with:

- The lead authorities involved in the decision-making for this EIA application;
- The public to ensure that local issues are well understood; and
- The EIA specialist team to ensure that technical issues are identified.

The Scoping Process is supported by a review of relevant background literature on the local area. Through this comprehensive process, the environmental assessment can identify and focus on key issues requiring further assessment during the EIA Phase.

The primary objective of the Scoping Report is to present key stakeholders (including affected organs of state) with an overview of the proposed project and key issues that require assessment in the EIA Phase and allows the opportunity for the identification of additional issues that may require assessment.

Issues that will be raised in response to the Draft Scoping Report that is being released for a 30-day comment period will be captured in the Comments and Responses Report that will be included in the Final Scoping Report and Plan of Study for EIA. The Final Scoping Report will be submitted to the DFFE for decision-making (i.e., approval or rejection) in line with Regulation 21 (1) of GN R326. This approval is planned to mark the end of the Scoping Phase after which the EIA Process moves into the impact assessment and reporting phase.

In terms of legal requirements, a crucial objective of the Scoping Report is to satisfy the requirements of Appendix 2 of the 2014 NEMA EIA Regulations (as amended), as noted in Regulation 21 (3) of the GN R326. This section regulates and prescribes the content of the Scoping Report and specifies the type of supporting information that must accompany the submission of the Scoping Report to the authorities. An overview of where the requirements of Appendix 2 of the 2014 NEMA EIA Regulations (as amended) are addressed in this Scoping Report is presented at the beginning of this report.

Furthermore, this process is designed to satisfy the requirements of Regulations 41, 42, 43 and 44 of the 2014 NEMA EIA Regulations (as amended) relating to the PPP and, specifically, the registration of and submissions from I&APs.

References

Ritchie, H. and Roser, M. 2020. "CO_2 and Greenhouse Gas Emissions". Published online at OurWorldInData.org. viewed 07 April 2021 <https://ourworldindata.org/co2-and-other-greenhouse-gas-emissions>

Scoping and Environmental Impact Assessment for the Proposed Development of the 240 MW Kaladokhwe Wind Energy Facility 3 near Nxuba (Cradock) in the Eastern Cape

DRAFT SCOPING REPORT

CHAPTER 2: Project Description

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2. PROJECT DESCRIPTION

This chapter provides an overview of the conceptual project design and an overview of the site and technology selection process for the proposed Kaladokhwe Wind Energy Facility 3 ("Kaladokhwe WEF 3"), as provided by the Project Developer, Atlantic Renewable Energy Partners (Pty) Ltd (hereafter "AEP").

The purpose of this chapter is to present sufficient project information on the proposed Kaladokhwe WEF 3 (including the facility itself and the associated infrastructure) to inform the EIA Process in terms of design parameters applicable to the project.

As noted in Chapter 1 of this Scoping Report, the Project Applicant, Kaladokhwe Wind 3 (Pty) Ltd is proposing the construction of the Kaladokhwe WEF 3 and associated infrastructure, near Nxuba (Cradock) in the Eastern Cape Province. In order to facilitate the connection of the proposed Kaladokhwe WEF 3 project to the national electrical grid network, the Project Developer is proposing the construction of one 132 kV / 400 kV overhead transmission powerline, to be located within a 300 m assessment corridor, and its associated electrical grid infrastructure from the onsite substation hubs at the WEF to a newly proposed 132 kV / 400 kV Main Transmission Substation (MTS) to be located northwest of the Kaladokhwe WEF project cluster, and adjacent to the two existing Hydra – Poseidon 400 kV powerlines. A separate Application for Environmental Authorisation (EA) and a Scoping and Environmental Impact Assessment Process will be undertaken for the grid connection.

The proposed Kaladokhwe WEF 3 will consist of a maximum of 41 individual turbines, which will be positioned at strategic locations on site that will be informed by the assessment inputs provided by the specialists on the EIA project team during the EIA Phase. While the exact type of turbine technology is yet to be finalised, the WEF is expected to have a total generating output capacity of 240 MW. The proposed location of the Kaladokhwe WEF 3 is shown in Figure 1.1 and Figure 1.2 in Chapter 1.

Table 2.1 shows the co-ordinates of the preferred project site.

Table 2.1: Co-ordinates of the Corner Points of the Preferred Project Site

Project Site	Point	Decimal Degrees		Degrees, minutes, seconds	
		Longitude (x)	Latitude (y)	Longitude (x)	Latitude (y)
Kaladokhwe WEF 3	Kd-3-1	25.77895184	-32.05306386	25° 46 ' 44"	33° 56 ' 49"
	Kd-3-2	25.77443236	-32.04810759	25° 46 ' 28"	33° 57 ' 7"
	Kd-3-3	25.76448415	-32.05494042	25° 45 ' 52"	33° 56 ' 42"
	Kd-3-4	25.73375371	-32.04860378	25° 44 ' 2"	33° 57 ' 5"
	Kd-3-5	25.70798831	-32.04531964	25° 42 ' 29"	33° 57 ' 17"
	Kd-3-6	25.70689088	-32.03755205	25° 42 ' 25"	33° 57 ' 45"
	Kd-3-7	25.71339289	-32.02785531	25° 42 ' 48"	33° 58 ' 20"
	Kd-3-8	25.69669888	-32.02817874	25° 41 ' 48"	33° 58 ' 19"
	Kd-3-9	25.70354553	-32.00452337	25° 42 ' 13"	33° 59 ' 44"
	Kd-3-10	25.724915	-32.005979	25° 43 ' 30"	33° 59 ' 38"
	Kd-3-11	25.72544509	-32.00587037	25° 43 ' 32"	33° 59 ' 39"
	Kd-3-12	25.71812178	-31.9829192	25° 43 ' 5"	32° 1 ' 1"

	Kd-3-13	25.73094565	-31.98287557	25° 43 ' 51"	32° 1 ' 2"
	Kd-3-14	25.74056991	-31.96967308	25° 44 ' 26"	32° 1 ' 49"
	Kd-3-15	25.75105129	-31.98725866	25° 45 ' 4"	32° 0 ' 46"
	Kd-3-16	25.76592636	-31.99535643	25° 45 ' 57"	32° 0 ' 17"
	Kd-3-17	25.77965305	-31.99005909	25° 46 ' 47"	32° 0 ' 36"
	Kd-3-18	25.77863993	-32.00272755	25° 46 ' 43"	33° 59 ' 50"
	Kd-3-19	25.78278298	-32.00646225	25° 46 ' 58"	33° 59 ' 37"
	Kd-3-20	25.78612702	-32.01289625	25° 47 ' 10"	33° 59 ' 14"
	Kd-3-21	25.78383579	-32.0233883	25° 47 ' 2"	33° 58 ' 36"
	Kd-3-22	25.79012239	-32.0244629	25° 47 ' 24"	33° 58 ' 32"
	Kd-3-23	25.7878433	-32.04163988	25° 47 ' 16"	33° 57 ' 30"
	Kd-3-24	25.77895184	-32.05306386	25° 46 ' 44"	33° 56 ' 49"

2.1 Key components of the proposed Kaladokhwe WEF 3

A summary of the key components of the proposed project is described below. It is important to note at the outset that the exact specifications of the proposed project components will be determined during the detailed engineering phase (subsequent to the issuing of an Environmental Authorisation (EA), should such an authorisation be granted for the proposed project, and shortly before construction commences). In line with the precautionary approach and in order to ensure that any environmental impacts which may arise as a result of the project are adequately assessed during the EIA Phase, worst-case scenarios and estimates have been provided in this section. For example, the current project description is representative of a worst-case scenario in terms of the total number of turbines proposed for implementation, as it reflects the maximum number of wind turbines that may be implemented i.e., 41 turbines. The hub height is up to 160 m, the rotor diameter is up to 200 m, and the blade length is up to 100 m.

The total physical development footprint of the proposed project (i.e., maximum 43 turbines and supporting infrastructure) is estimated to comprise approximately 82 ha. As discussed in Chapter 1 of this Scoping Report, once the commercial operation date is achieved, the proposed facility will generate electricity for a minimum period of 20 years. The properties to be affected by the development of the proposed WEF will be leased from the property owners by the Project Applicant for the life span of the WEF project. As the proposed Kaladokhwe WEF 3 requires a permanent development footprint of approximately 61 ha, which is about 1.2% of the total assessed study area that is approximately 5 039 ha in extent, there is ample spatial scope to avoid major environmental constraints through optimisation of the final design, if required. Figure 2.2 indicates the preliminary project layout including the associated infrastructure for the proposed Kaladokhwe WEF 3.

All high resource areas within the relevant affected properties, as well as potential locations for all relevant supporting infrastructure have been assessed during the Scoping Phase. Based on the initial findings of the specialist assessments, a preliminary combined environmental sensitivity map was prepared and is included in Chapters 3 and 5 of this Scoping Report. This map shows the environmental sensitivities (*inter alia* avifauna, bats, terrestrial biodiversity, watercourses, heritage features, etc.) within the larger study area that was assessed during Scoping. Based on this map, the preferred development footprint for the Kaladokhwe WEF 3 will be revised to avoid (where possible) the most sensitive features that were identified by the specialists within the original assessed study area. This revised development footprint and

associated project infrastructure layout will be taken forward into the EIA Phase for further assessment by the specialist team.

The Kaladokhwe WEF 3 will typically consist of some of the illustrated components shown in Figure 2.1 below.

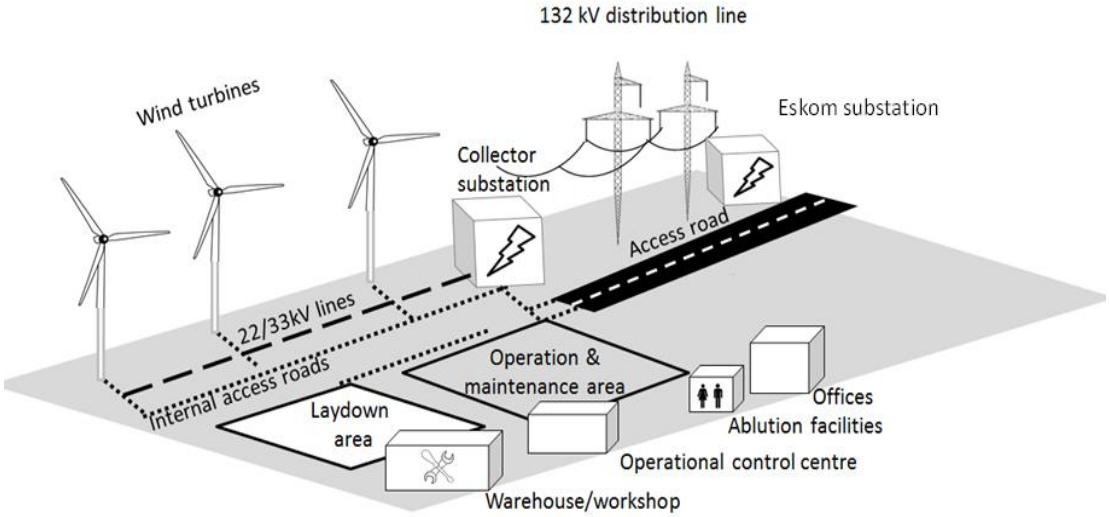

Figure 2.1: Typical components of a Wind Energy Facility (*Source*: Tennessee Valley Authority, Wikimedia)

An overview of the key components of the proposed Kaladokhwe WEF 3 project are discussed in Section 2.1.1 to 2.1.3 below.

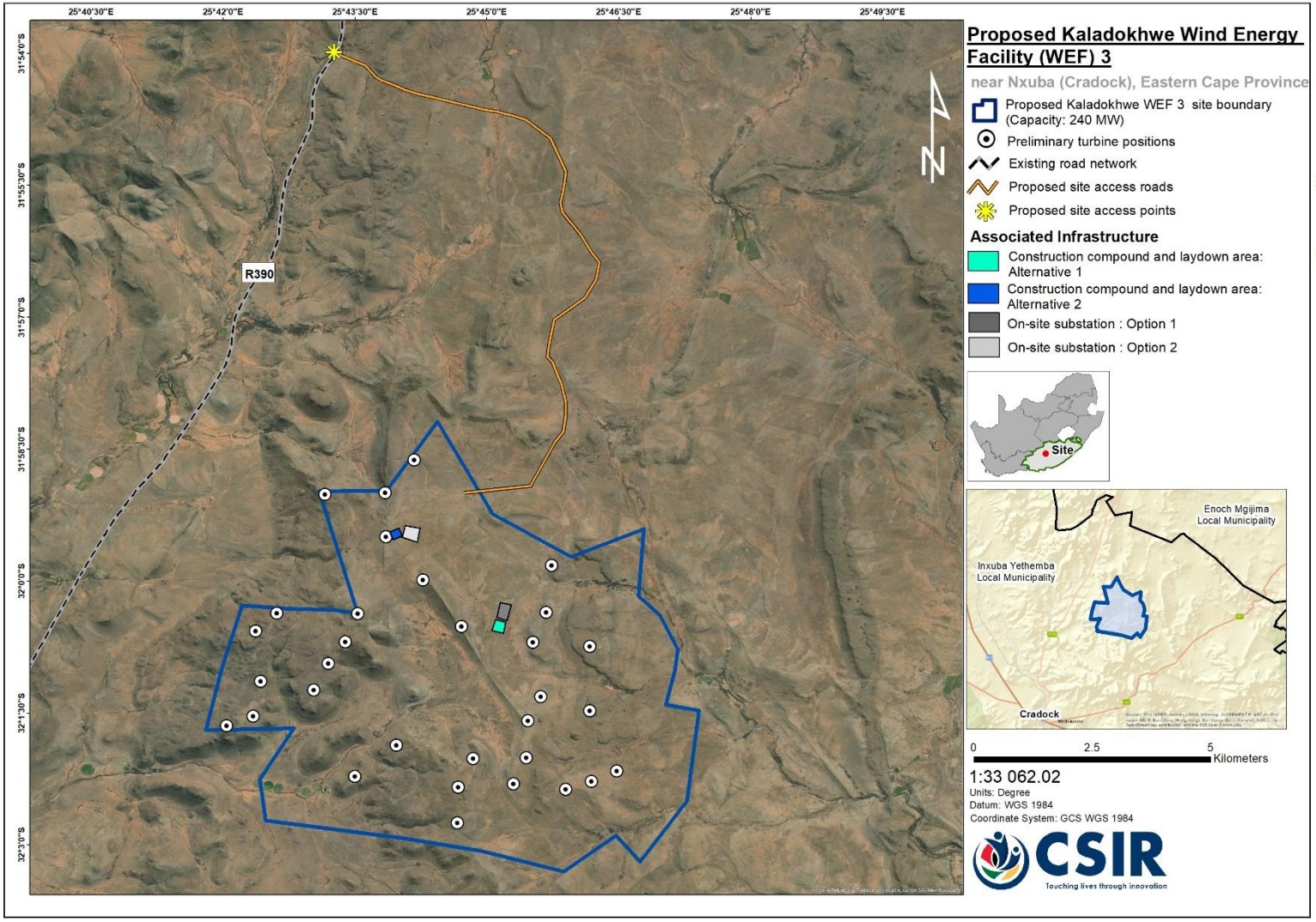

Figure 2.2: Preliminary project layout of the proposed Kaladokhwe WEF 3 development footprint as assessed during the Scoping Phase

2.1.1 General Description of a Wind Turbine and Wind Turbine Technology

Wind turbines generate electricity by converting movement or kinetic energy produced by the wind into electricity. Different turbine technologies achieve this through slightly different means. A typical horizontal-axis wind turbine consists of a number of components, which work together to generate electricity as depicted in Figure 2.3 below. When the rotor spins the shaft, the shaft spins the assembly of magnets, which generate voltage in the coil of wire. This voltage provides alternating electrical current, which could then be distributed through powerlines. The wind turbine tower supports the rotor and nacelle and provides the height for the rotor blades to clear the ground safely, and to capitalise on atmospheric wind resources, which occur approximately 80 - 200 m above the earth's surface.

It is anticipated that the individual wind turbines planned for the proposed Kaladokhwe WEF 3 will have the following **approximate** specifications:

- Number of turbines: 32
- Hub height: Up to 160 m
- Rotor diameter: Up to 200 m
- Blade length: Up to 100 m
- Turbine capacity: Up to 8 MW
- Reinforced foundation diameter: 32 m per turbine
- Crane hardstand: 70 m x 45 m per turbine
- Blade hardstand: 80 m x 45 m per turbine

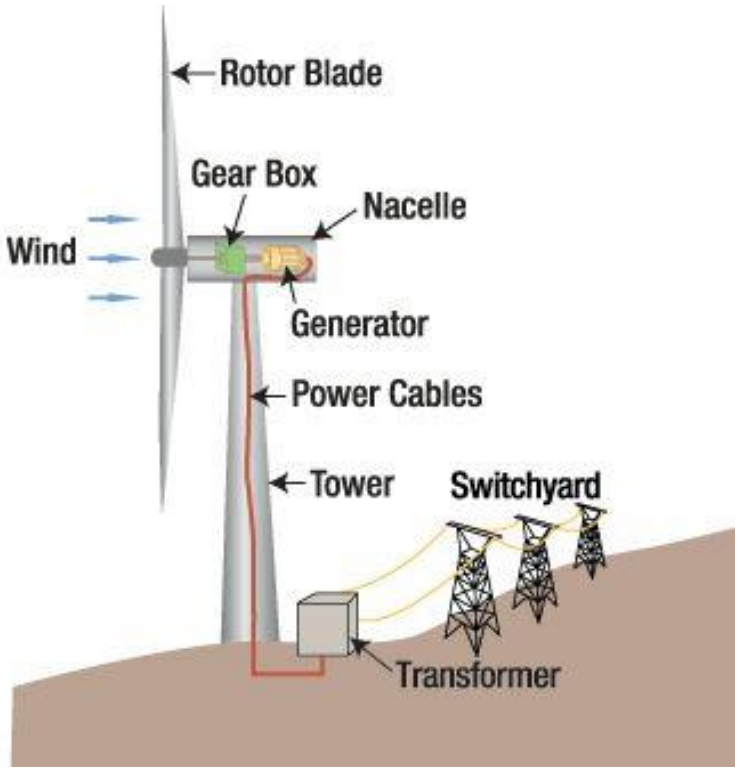

Figure 2.3: Generic design for a wind turbine (*Source*: Tennessee Valley Authority, Wikimedia)

The energy output of a wind turbine ultimately depends on the size of the generator, velocity of the wind, the height of the hub, and the length of the rotor blades. Wind turbines operate at a range of wind speeds and have a start-up speed, which is the speed at which the blades and rotor start to rotate, and a cut-in speed, which reflects the minimum wind speed at which usable power is generated. This is typically about 3 - 4 m/s with full power output occurring at higher wind speeds of approximately 10 to 12 m/s. Wind turbines are also equipped with a cut-out speed or pitch control system as a safety feature to prevent mechanical damage at high or turbulent wind speeds. The cut-out speed is the highest wind speed after which a wind turbine will stop producing power, and a braking system will be activated. This is typically between 25 and 28 m/s depending on the manufacturer and type of turbine selected for implementation. The pitch control system will turn the rotor out of the mean wind direction and change the orientation of the blades so the rotor will capture lower wind speeds and the output power of generator stays within the allowed range. Once the wind drops below the cut-out speed back to a safe level, the turbine can resume normal operation.

Even though wind turbines are relatively tall they do not require extensive land space. Each turbine will have a circular foundation with a diameter of up to 32 m and this will be placed alongside the 45 m wide hardstand resulting in an area of about 32 m x 45 m that will be permanently disturbed for the turbine foundation. The combined permanent footprint for the turbines will be approximately 5.9 ha for the WEF. Each turbine will have a crane hardstand of 70 m x 45 m. The permanent footprint for turbine crane hardstands will be approximately 12.9 ha for the WEF. Each turbine will also have a blade hardstand of 80 m x 45 m. The permanent footprint for turbine blade hardstands will be approximately 14.8 ha for the WEF.

The comparatively small base of the turbine allows other activities to continue uninterrupted in the space underneath and around the turbine. Conventional large-scale development footprints often lead to habitat fragmentation and interference with fauna. As such, the micro-siting of the wind turbines will be in an optimum position that minimises the possibility of habitat fragmentation and interference with movement of fauna on the ground.

In terms of wind turbine technology to be used as part of the proposed development, the Project Developer is currently considering a range of wind turbine designs and generation capacity. The exact turbine specifications have not yet been confirmed. Some turbine specifications will only be finalised during the detailed design phase closer to construction. However, the “worst-case scenario” is presented and will be assessed by the specialists during the EIA Phase. The turbine technology selection process shall be subjected to further wind analysis and is also dependent on technical, commercial and site suitability assessment that will, in part, be informed by the EIA Process.

2.1.2 Associated Infrastructure

2.1.2.1 Hardstand Areas

The hardstand area at each turbine will be established adjacent to each wind turbine base. This area will comprise a crane platform (approximately 70 m x 45 m) and a blade storage area (approximately 80 m x 45 m), totalling approximately 28 ha for the WEF. This hardstand area will be utilised by the auxiliary cranes for assembly of turbine components, off-loading and storage during the construction phase, and possibly for maintenance during the operational phase. A schematic illustration of a typical hardstand area and crane platform is provided in Figure 2.4 below.

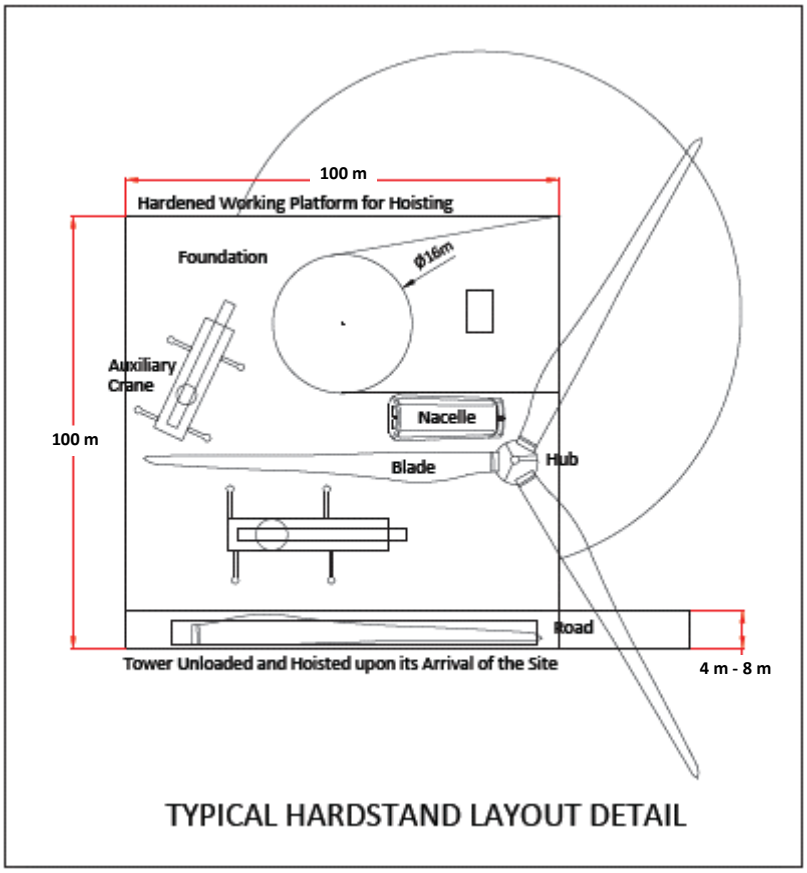

Figure 2.4: Example of a typical hardstand area at each turbine location

2.1.2.2 Construction Compound and Laydown Areas

During the construction phase, the proposed development will require the establishment of at least one construction compound and one laydown area, each with an approximate temporary footprint of up to six (6) ha. This area that will be fenced with access control. Two construction compound and laydown area alternatives have been identified at the proposed Kaladokhwe WEF 3 project site and will be taken forward into the EIA Phase for detailed specialist assessment.

2.1.2.3 Operations and Maintenance (O&M) Area

The on-site Operations and Maintenance (O&M) area is required to support the functioning of the proposed Kaladokhwe WEF 3 and provide services to personnel who will be responsible for the construction as well as operation and routine maintenance of the facility during its lifespan. The proposed O&M area will have a footprint of up to two (2) ha, will be fenced with access control and will typically comprise of the following:

- Operational and Maintenance (O&M) building (including a control centre, site offices, warehouses, workshop, visitors centre, etc);
- Worker amenities (e.g., canteen, ablution facilities, changing room, etc.);
- Storage structures for equipment, materials, fuel, oil, machinery etc. (e.g., containers, skips etc.);
- Security office and boom gate (up to approx. 0.5 ha);
- Parking area;

- A concrete batching plant of 1 ha in size (100 m x 100 m);
- Water storage (likely in 10 000 L above ground conventional (plastic) storage tanks); and
- Central waste collection and storage area.

It is anticipated that the O&M building complex, which will form part of the development footprint earmarked for the construction of the substation hub, will include the installation of a communications tower on site with a maximum height of 32 m. The maximum height of onsite buildings and other related infrastructure is not likely to exceed 10 m.

2.1.2.4 Site Access Roads

The proposed Kaladokhwe WEFs and associated infrastructure will be located approximately 30 km northeast of the town of Nxuba (Cradock) in the Eastern Cape Province. Access to the proposed Kaladokhwe WEF 3 project site will be facilitated via existing public roads off the R390 provincial tar road connecting Nxuba (Cradock) and Hofmeyr, and potentially also the R61 road connecting Nxuba (Cradock) and Tarkastad. The main access road to the WEF will comprise a gravel road with a maximum width of 10 m. The length of the main access road is yet to be confirmed.

2.1.2.5 Internal Service Roads

The Kaladokhwe WEF 3 will have a total internal service road network of up to 40 km. Permanent service roads will be 6 m wide and may require side drains on one or both sides. All service roads will be gravel and may have underground cables running alongside them. During construction, a 12 m road corridor may be temporarily impacted upon which will be rehabilitated to a width of 6 m after construction has been completed. Temporary clearing of up to 50 m may be required in areas where cut and fill may be required as well for the construction of the bell mouth road junction, turning circles and temporary passing lanes on site. The existing internal service road network, in addition to whether additional internal service roads are to be constructed on the project site will be confirmed by the Project Developer during the EIA Phase. The specialists will assess all proposed internal service roads during the EIA Phase.

2.1.2.6 Stormwater Channels and Water Pipelines

Stormwater drainage systems will be constructed 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. Temporary water pipelines will be installed on site during construction for water supply to inter alia the concrete batching plant and the O&M building complex for domestic use and sanitation. Possible groundwater abstraction on site for purposes of the batching plant could be considered, if required, taking into account any necessary and relevant legal requirements.

2.1.2.7 Fencing

For various reasons such as security, public protection and lawful requirements, the proposed built infrastructure on site will be secured via the installation of appropriate fencing. Existing livestock fencing on the affected farms portions may be upgraded in places deemed insufficiently secure, whereas permanent fencing will be required around the O&M building complex and on-site substation hubs. Access points will be managed and monitored by an appointed security service provider. The type and height of fencing to be installed will be confirmed during detailed design as the development progresses.

2.1.2.8 Sewage or Liquid Effluent

The proposed project 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) and/or temporary conservancy tanks will be used during the construction phase, which will be regularly serviced and emptied by a registered contractor for disposal of at a registered municipal sewerage treatment facility. Due to the remote location of the project site, a waterproof conservancy tank system will be employed on site during the operational phase of the WEF for which a registered company will be contracted to store and transport sewage from site to an appropriate municipal wastewater treatment facility.

2.1.2.9 Solid Waste Generation

Solid waste generation on site during the construction and operational phases will be managed according to the EMPr, which will be included in the EIA Report.

During the construction period, it is estimated that the proposed project would generate approximately 50 m^3 of solid waste per month. Solid waste 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 facility 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 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.

2.1.3 Electrical Components and Connection to the Grid

Note from the CSIR: The electrical components are discussed below to provide a holistic overview of the proposed Kaladokhwe WEF 3 and for the sake of completeness. However, as noted in Chapter 1, the electrical grid infrastructure (EGI) component of the proposed Kaladokhwe WEF projects will form part of a separate Application for EA and a separate Scoping and Environmental Impact Assessment Process.

2.1.3.1 Electrical Grid Infrastructure

The proposed Kaladokhwe Wind Farm Cluster is located approximately 50 km southeast of two existing 400 kV overhead transmission powerlines (i.e., referred to as Hydra and Poseidon, respectively) that run between the existing Hydra and Poseidon Main Transmission Substations (MTS), which are two significant substations located in the Northern Cape and Eastern Cape, respectively.

There is an existing Iziko Series Capacitor Station located along the 400 kV Hydra/Poseidon powerlines, that is situated northwest of the proposed Kaladokhwe Wind Farm Cluster. Eskom's Grid Access Unit (GAU) has confirmed that Eskom will be establishing a new MTS north of the existing Poseidon MTS, due to the existing Poseidon MTS being physically constrained. This aligns with Eskom's Transmission Development Plan (TDP) 2022-2031 that identifies this proposed MTS as the "Poseidon North 132 kV / 400 kV Substation", proposed to be located at or near the Iziko Series Capacitor Station.

In order to evacuate the energy generated by the proposed WEFs to the national grid, a separate S&EIA Process will be undertaken to assess the grid connection route which consists of a 132 kV / 400 kV overhead transmission powerline, to be located within a 300 m wide assessment corridor of approximately 52 km in length from the on-site substation hub at Kaladokhwe WEF 3 to the newly proposed 132 kV / 400 kV Poseidon North MTS (location as described above).

2.1.3.2 On-site Substations

The proposed project will include two on-site substation hubs incorporating the facility substation, switchyard, collector infrastructure and associated O&M buildings. The substation locations will have a maximum development footprint of up to 4 ha and the general height of the substation will be a maximum of 10 m. It is likely to also include switchgear portals up to 15 m in height and lightning masts up to 25 m in height.

The construction of the on-site substation hubs would require the following activities:

- A survey of the study areas on which the proposed on-site substations will be constructed;
- Site clearing and levelling;
- Construction of access roads to the proposed substation sites (where required);
- Construction of substation terraces and foundations;
- Assembly and installation of equipment (including transformers);
- Connection of conductors to equipment;
- Testing of equipment; and
- Rehabilitation of any disturbed areas and protection of erosion sensitive areas.

Two locations have been identified at the proposed Kaladokhwe WEF 3 project site for the construction of the two on-site substation hubs, both of which will be taken forward into the EIA Phase for detailed specialist assessment.

2.1.3.3 Battery Energy Storage System (BESS)

BESS offer a wide range of advantages to South Africa including electricity supply reliability and quality improvement. The main purpose of the BESS is to mitigate intermittency of wind- and solar PV -energy generation by storing and dispatching of electricity when needed i.e., to contribute to the grid 24 hours/day, during peak demand at night or during power outages. In essence, BESS technology allows renewable energy to enter the completely independent power generation market.

The proposed Kaladokhwe WEF 3 will also include one electrochemical BESS. The BESS will comprise an area of up to five (5) ha that is most likely to be included within the perimeter of an on-site substation hub (see Section 2.1.3.2 above). The BESS will have a maximum height of 8 m (as recommended) and a storage capacity of at least 1000 MWh.

Considering the nature of the project, a solid-state technology type would be envisaged for implementation. The technology includes batteries housed within containers which are fully enclosed and self-contained. Therefore, the assessment proposes all solid-state technologies for authorisation to allow the precise technology to be selected when the project is implemented, on the understanding that further investigation into the specific technologies available at the time of being awarded preferred bidder status will allow for one or more to be selected and ultimately develop.

The electrochemical BESS technologies that are generally considered for WEFs include:

- Lead Acid and Advanced Lead Acid BESS

Lead acid batteries are solid-state batteries which consist of a negative electrode which is comprised of Lead, a positive electrode, which is comprised of Lead oxide, electrolyte (i.e., sulphuric acid) and separators (i.e., insulating material between oppositely charged plates which allow electrolyte to pass through) (Garche and Brandt, 2018). The submersion of the electrodes/ plates in electrolyte allows for the generation and storage of energy during charge and discharge cycles. There are two types of lead acid batteries; Flooded Lead Acid (FLA) and Valve Regulated Lead Acid (VRLA) batteries. FLA and VRLA batteries have the same operating principle; however, the main components of VRLA batteries are enclosed in solid sealed systems with a pressure-regulating valve unlike FLA batteries in which hydrogen is vented (Martin *et al.*, 2010). VRLA batteries are more commonly used as large standby power supplies (i.e., BESS).

It is proposed that the BESS would be housed in containers along with its associated operational, safety and control infrastructure. Should this BESS type be the preferred BESS alternative, the BESS will be pre-assembled off site and delivered to site for placement as per specifications of the supplier and remain sealed during operations.

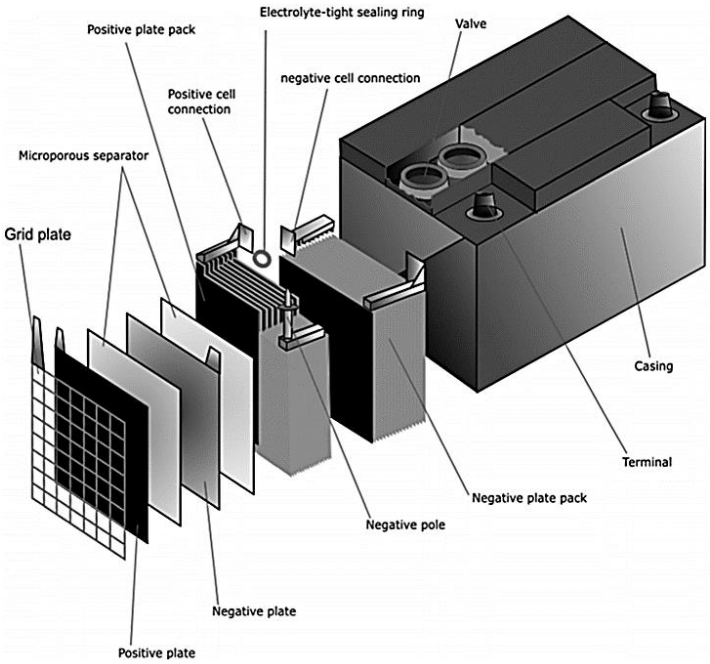

Figure 2.5: Schematic diagram of a typical Lead acid battery (Source: Martin *et.al*, 2010)

- Lithium-Ion Batteries

Lithium-Ion batteries are also sealed systems i.e., pre-assembled off site and then delivered to site for placement. This BESS system consists of multiple battery cells that are assembled together to form modules. A module may consist of several cells working in conjunction. Each cell contains a positive electrode, a negative electrode, and an electrolyte. The negative electrode for a lithium-ion cell is typically carbon. The positive electrode can be lithium iron phosphate or a lithium metal oxide. The electrolyte is usually a lithium salt dissolved in an organic solvent.

If the Lithium-ion BESS is the preferred BESS alternative, the BESS will be pre-assembled off site, delivered to site for placement and will remain sealed during operations.

- Nickel based batteries (i.e., Nickel-Cadmium (NiCd) and nickel–metal hydride (NiMH))

The positive electrodes of Nickel based NiCd battery cells are composed of a nickel-oxyhydroxide, which is the active material, and the negative electrodes are composed of metallic cadmium. The positive and negative plates are separated from each other by a continuous strip of porous plastic and an aqueous solution of potassium hydroxide (i.e., electrolyte). Similar to the NiCd BESS, the Nickel based NiMH BESS comprises of positive electrodes made of nickel hydroxide and an aqueous solution of potassium hydroxide functioning as the electrolyte. However, the NiMH BESS differs in that the negative electrodes are composed of metal hydride (Parsons, 2017). Sealed and vented designs of NiMH ad NiCd batteries are used commercially. Vented nickel-based batteries are often used for large power storage (i.e., wind generated power storage). Vented systems contain a low-pressure release valve, which facilitates the release of oxygen and hydrogen produced at the negatives electrode in cases of overcharging or rapid discharging. This release system results in the BESS being safer and more economical (Parsons, 2017)

In addition, should any of the two nickel based BESSs discussed here be the preferred BESS alternative, the BESS will be pre-assembled off site and will remain sealed during operations.

- High Temperature (NaS, Na-$NiCl_2$, Mg/PB-Sb) BESS

Similar to the Lithium-ion BESS and Lead Acid BESS, High Temperature batteries are also sealed battery energy storage systems. Sodium Sulphur (NaS) batteries are considered the most advanced High Temperature BESS technology of the three types of technology being considered. This type of BESS comprises of sodium at the negative electrode and molten sulphur at the positive electrode. The electrodes are separated by a solid beta alumina ceramic electrolyte, which only allows positively charged sodium ions to pass through and combine with the molten sulphur to form sodium polysulfides. The general high fire risk associated with High Temperature BESS's is also mitigated by the NaS BESS as the structure comprises of a double-walled airtight enclosure that contains the NaS cells in a series-parallel array formation. The cells are also surrounded with sand both to mitigate fire and to anchor the cells (Parsons, 2017).

The Mg/PB-Sb BESS, unlike the NaS BESS, comprises of two liquid metal electrodes of different densities and a molten salt electrolyte, which separates the electrodes. The differences in density and the immiscibility of the three materials result in three distinct layers, which remain separate.

The third type of High Temperature BESS is the Na-$NiCl_2$ BESS that is also referred to as the ZEBRA battery. This BESS technology comprises of a negative electrode of molten sodium and a porous solid nickel chloride

positive electrode. A ceramic electrolyte, similar to that found in a NaS BESS, separates the electrodes and only allows sodium ions to pass through (Parsons, 2017).

High temperature BESS technologies are all similar in that the systems are required to operate at high temperatures (approximately 300°C), therefore require active heating in order to facilitate ion transfer and maintain the molten state of some/all of the BESS components (Parsons, 2017). This may increase operational costs and increase the risk of fires; however, these High Temperature BESS technologies are considered extremely efficient as less degradation of electrodes may be experienced in the long-term. These BESS systems also comprise of cells that are hermetically sealed and contain fire mitigation measures.

Should any of the High Temperature BESS discussed above be the preferred BESS alternative, the BESS will be pre-assembled off site, delivered to site for placement and will remain sealed during operations.

The preferred type of BESS technology to be installed at the Kaladokhwe WEF 3 project as well as the preferred BESS supplier to be contracted will be confirmed during the detailed design phase after Environmental Authorisation (EA) has been obtained (should such EA be granted). The potential risks associated with the various BESS technologies being considered, and the required mitigation measures will be included in the EIA Report, as well as the Environmental Management Programme (EMPr).

2.1.4 Site Access and Transportation of Wind Turbine Components to Site

2.1.4.1 Site Access

iWink Consulting (Pty) Ltd has been appointed to undertake a Transportation Impact Assessment (TIA) for the proposed Kaladokhwe WEF 3. The TIA will assess the expected traffic related impacts of the proposed facility during the construction, operational and subsequent decommissioning phases. The purpose of the TIA is also to consider the traffic impact that the WEF would have on the surrounding road network and receiving environment during the construction of the access roads, construction and installation of the turbines, as well as for maintenance during the operational phase.

Several possible access points to the proposed Kaladokhwe WEF 3 project site have been proposed. The preliminary site layout indicates three possible entries via existing turnoffs from the R390 provincial tar road that is located to the west of the WEF project site. The R390 runs in a north-south direction connecting the towns of Nxuba (previously Cradock) and Hofmeyr. A fourth possible access point is located southeast of the WEF project site allowing access via an existing turnoff from the R61 provincial tar road running in an east-west direction connecting the towns of Nxuba (Cradock) and Tarkastad.

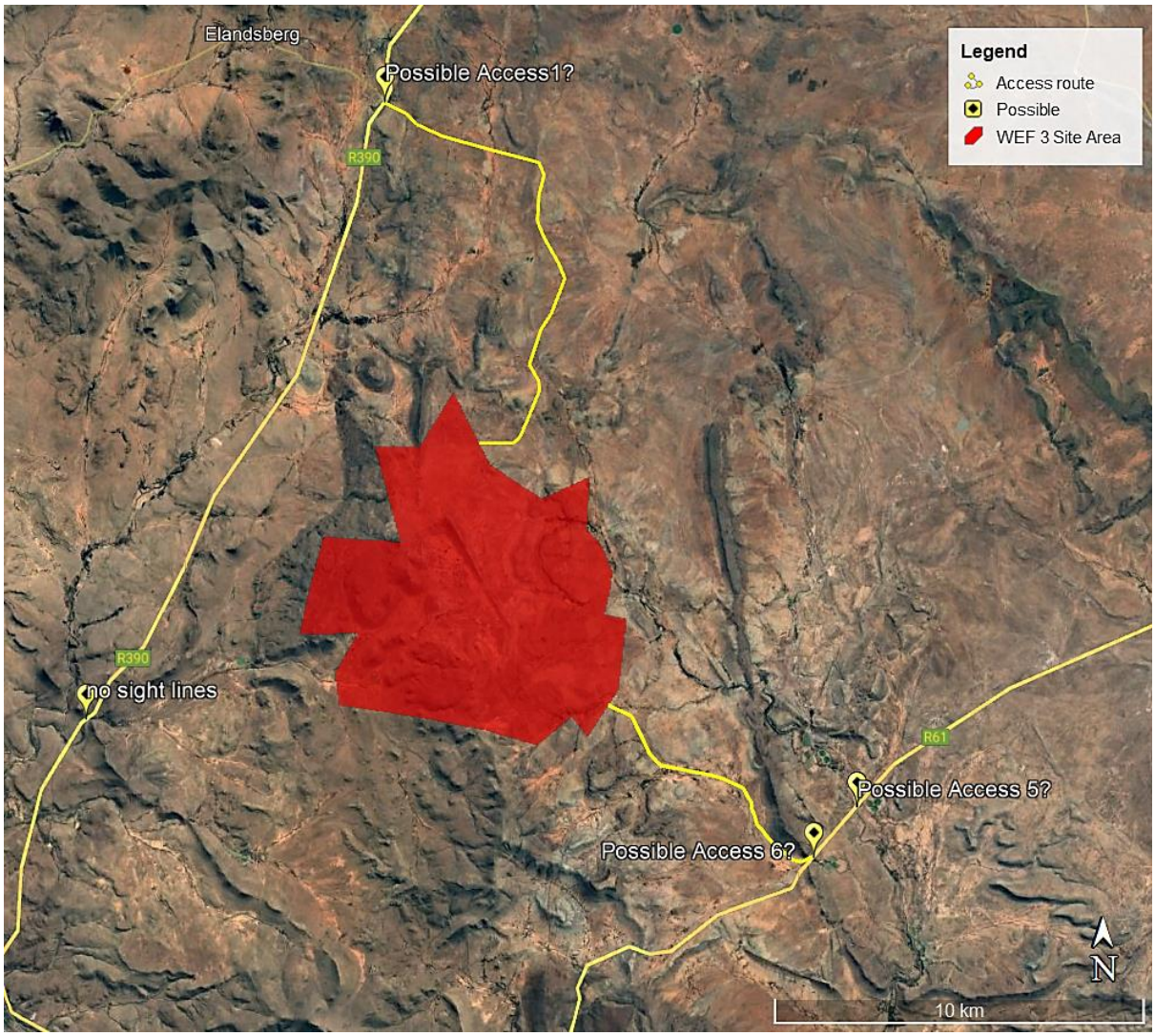

Figure 2.6: Main roads and proposed access points to the proposed Kaladokhwe WEF 3 (Source: iWink Consulting (Pty) Ltd, 2022)

The nearest town in relation to the proposed Kaladokhwe WEF 3 project site is Nxuba (Cradock), which is situated approximately 20 km travel distance from the proposed Kaladokhwe WEF 3. It is envisaged that the majority of materials, plants and labour would be sourced from Nxuba (Cradock) as far as possible and transported to the proposed WEF site via the R390 provincial road, with the other nearby towns of Hofmeyr and Tarkastad to serve as alternatives.

2.1.4.2 Port of Entry

The most suitable South African port to import the turbine components to South Africa is the Port of Ngqura, which is located near Gqeberha in the Eastern Cape, and which is located approximately 270 km travel distance from the proposed development site. This Port is a deep-water port geared for handling large container ships and has large laydown areas available for storage of wind turbine components. The Port forms part of the Coega Industrial Development Zone (CIDZ) and is operated by Transnet National Ports Authority. The Port also services the industrial bulk commodity requirements of the regional and national hinterland. Containers handled include imports and exports from across the globe as well as

transhipment cargoes serving primarily East and West coast traffic, as well as inter-line traffic from South America to Asia.

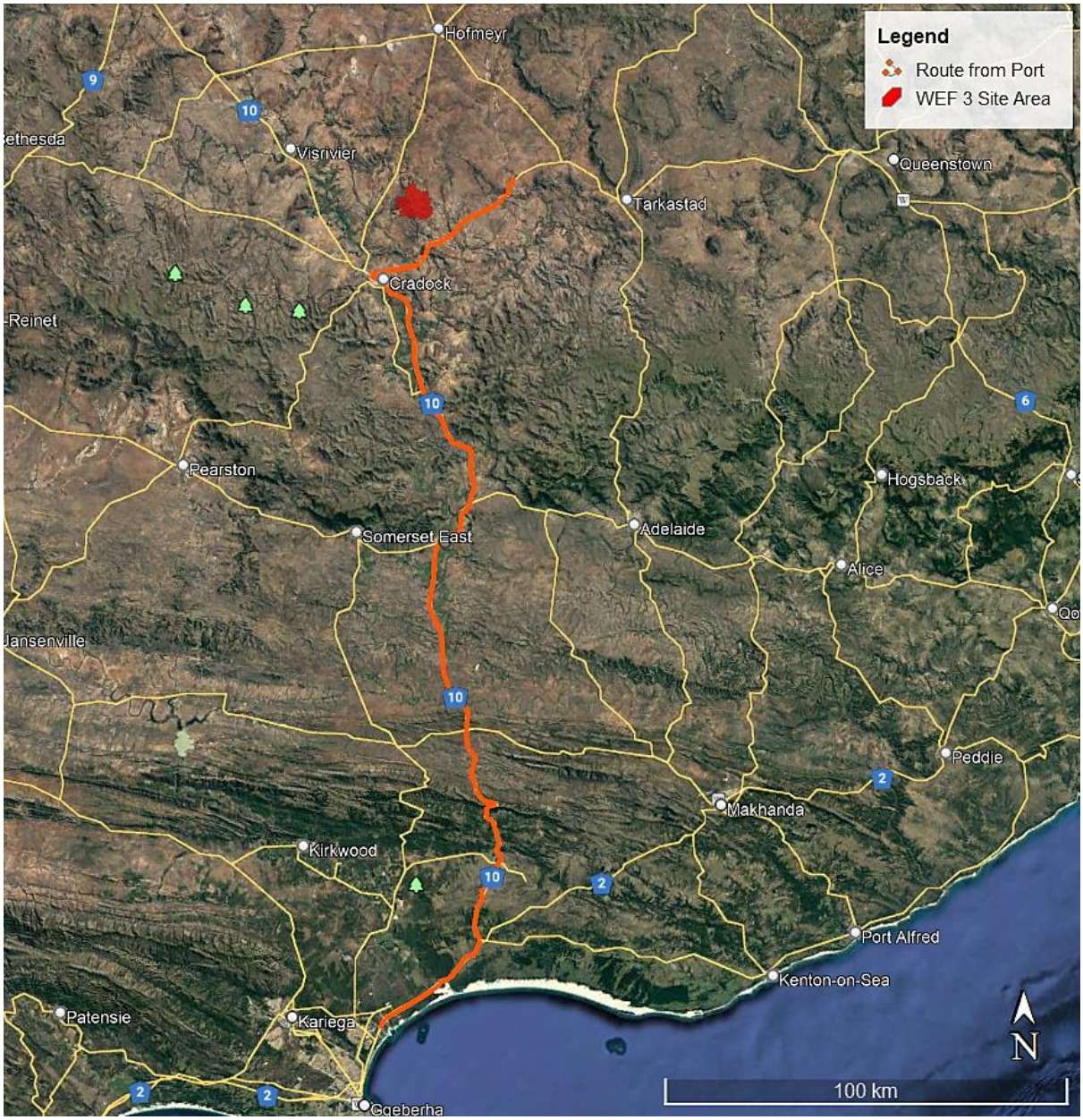

Figure 2.7: Route for the turbine components from the Port of Ngqura to the proposed Kaladokhwe WEF 3 project site (Source: iWink Consulting (Pty) Ltd, 2022)

Most shipping vessels importing the turbine components will be equipped with on-board cranes to do all the safe off-loading of Wind Turbine Generator (WTG) components onto the abnormal transport vehicles, parked adjacent to the shipping vessels (Figure 2.8). The imported turbine components may be temporarily stored at the nearest laydown area within the port's bounds or transported directly from the Port of Entry to the laydown area at the proposed project site. Mobile cranes will be required at these laydown areas to position the respective turbine components at their temporary storage location.

The most likely route for abnormal load vehicles will be from the port, heading east on the R102 towards Albany Road and then merging onto the M4 via the ramp to Grahamstown. Taking the 751B exit and merging onto the N2 towards Grahamstown. On the N2 towards Grahamstown, the abnormal load vehicles will continue onto the N10 and the proposed project site via the R390 provincial tar road traversing the affected farm portions.

Figure 2.8: Example of cranes at Port of Entry (Source: iWink Consulting (Pty) Ltd, 2022)

2.1.4.3 Transportation of Wind Turbines

Wind turbine components can be transported in a number of ways with different truck / trailer combinations and configurations, which will need to be investigated at a later stage when the transporting contractor and the plant hire companies apply for the necessary permits from the Permit Issuing Authorities.

For the transportation of the turbines from the Port of Entry to the proposed WEF site, the blades are the longest and possibly most vulnerable components of a wind turbine and hence needs to be transported with utmost care. The blades need to be transported on an extendible blade transport trailer or in a rigid container with rear steerable dollies. The blades can be transported individually, in pairs or in threes, although different manufacturers have different methods of packaging and transporting the blades.

In terms of the National Road Traffic Act, 1996 (Act No. 93 of 1996), the trucks delivering turbine components will be considered as abnormal loads. Approval i.e., relevant permits may have to be obtained from National, Provincial and/or Local Competent Authorities for the transportation of abnormal heavy components. This is normally the responsibility of the logistics company in charge of these components.

Figures 2.9 to 2.12 below provide examples of transportation of some of the turbine components.

Figure 2.9: Example of a tower section being transported (Source: Google Images, 2022)

Figure 2.10: Example of a wind turbine blade being transported on an extendible trailer (Source: Google Images, 2022)

Figure 2.11: Example of a nacelle being transported (Source: Google Images, 2022)

Figure 2.12: Example of a hub and rotary units being transported (Source: Google Images, 2022)

2.1.5 Water Requirements

Water will be required during the construction phase, primarily for the purposes of concrete production and curing for the construction of turbine foundations, road construction as well as road compaction and dust suppression, earthworks and human consumption. High water usage is only anticipated during the first 6-12 months whereafter the monthly water usage will decrease drastically. The monthly water use requirement during the construction phase for a 24-month period is an estimated average of 2 500 m^3.

The water use requirement during the operational phase will be primarily for human consumption and sanitation purposes. The total water consumption estimated for the operational phase of the WEF is 0.9 kl / day, for the 20-year operational lifespan of the WEF.

It is proposed that water preferably be sourced from the Inxuba Yethemba Local Municipality and/or the Enoch Mgijima Local Municipality, and specific arrangements will be agreed upon with the relevant local municipality in a Service Level Agreement (SLA), following the appointment of the proposed WEF as a preferred bidder during the financial close period, prior to construction. In case municipal water supply cannot be confirmed, the Project Applicant will then investigate other sources of water supply for construction and operations of the proposed WEF considering any necessary licencing applications required in terms of relevant environmental legislation including but not limited to the National Water Act (Act No. 39 of 1998). Other possible sources include (i) water supply from a Private Contractor, which may include extraction from any available bulk water supply lines in the vicinity of the project site, (ii) water abstraction from existing boreholes on site, and/or (iii) water abstraction from one or more new boreholes located on site.

2.2 Overview of Project Development Cycle

This section provides an outline of the main activities that are proposed during each phase of the proposed project, i.e., extending from the Planning and Design phase through to the Decommissioning phase. The operational life of the WEF is expected to be a minimum of 20 years, which could be extended through regular maintenance and/or upgrades in technology.

2.2.1 Detailed Planning and Design

The project layout, including the exact placement of each individual turbine, building infrastructure and the proposed internal service road network will be finalised in the EIA Phase. The project layout will be informed by the findings of the specialist impact assessments, which includes the identification of sensitive biophysical areas that need to be avoided i.e., 'no-go' areas. The specialists will be requested to comment on the final project layout. The turbine manufacturer and turbine generation capacity to be used will be dependent on availability of turbines in the international market, suitability to the South African wind climate, and service levels and experience available in South Africa, and will only be confirmed during the detailed design phase prior to construction (after EA, should such EA be granted).

2.2.2 Construction Phase

The construction phase will take place subsequent to the issuing of an EA from the DFFE, should such EA be granted, and once a power purchase agreement (PPA) with a suitable energy off-taker which could be either the national government or private, is signed. The construction phase for the proposed Kaladokhwe WEF 3 project is expected to extend over 24 to 30 months; however, the construction period is subject to the actual number of turbines to be erected, the final requirements of Eskom and the REIPPPP RfP provisions at that time.

The main activities that are proposed to take place during the construction phase will entail the clearance of vegetation within the approved development footprint to facilitate the construction and/or establishment of infrastructure including but not limited to the turbine locations, construction compound,

temporary laydown area (for the storage of construction equipment, materials, machinery, and turbine components), internal service roads and all relevant built structures. Next, the wind turbine foundations will be constructed at each approved turbine location with the aid of a mechanical excavator. Then follows the construction of the on-site substations. The construction of the substation buildings will entail construction of the foundations and building structure as well as the installation of electrical infrastructure such as transformers, conductors, etc. Subsequently, the trenches for the installation of the electrical cabling to facilitate the connection of the wind turbines to the on-site substations will be excavated at a maximum depth of approximately 1.5 m between each wind turbine.

The construction phase will also involve the transportation of personnel, construction materials and equipment to and from the site. All efforts will be made to ensure that all construction work will be undertaken in compliance with local, provincial, and national legislation, local and international best practice, as well as the approved EMPr that will be compiled and included in the EIA Report. An independent Environmental Control Officer (ECO) will be appointed during the construction phase and will monitor compliance with the recommendations and conditions of the EMPr and EA, respectively.

Skilled as well as unskilled temporary employment opportunities will be created during the construction phase. It is difficult to specify the actual number of employment opportunities that will be created at this stage; however, it is estimated that up to 400 employment opportunities are expected to be created during the construction phase. Of these 15% will comprise skilled, 30% semi-skilled, and 55% low-skilled employment opportunities. The proposed construction and operational phases will make use of local labour (including female labour) as far as possible. A majority of the low-skilled and semi-skilled employment opportunities will be made available to local residents. All non-local workers will be housed in rental accommodation in the nearby town i.e., Nxuba (Cradock), and will be transported to site by bus daily. The Engineering, Procurement and Construction (EPC) contractor will arrange daily transport of these workers to and from the site by buses. No workers will be accommodated in worker amenities on site during construction.

2.2.3 Operational Phase

The following activities will occur during the operational phase:

- Operation of the WEF and generation of electricity to add to the national grid;
- Storage of energy generated by the WEF in electrochemical batteries;
- Routine maintenance of the WEF; and
- Unscheduled maintenance of the WEF.

The operational lifespan of the proposed Kaladokhwe WEF 3 is expected to be a minimum of 20 years. Wind turbines will be operational for this entire period except under circumstances of mechanical breakdown, extreme weather conditions and/or maintenance activities. Wind turbines will be subject to regular maintenance and inspection (i.e., routine servicing) to ensure the continued optimal functioning of the turbine components. It is expected that the WEF will operate throughout the day and night (24 hours). During the operational phase of the WEF, agricultural land use activities on site as well as eco-tourism activities in the area would be able to continue uninterrupted. The only development related activities on site will be routine servicing and maintenance.

The projected operations are expected to provide several services and added economic spin offs (as highlighted in Chapter 1 of this Scoping Report). Approximately 40 to 50 employment opportunities will be created during the operational phase of the project. Of these, 10% will comprise skilled, 40% semi-skilled and 50% low-skilled employment opportunities. A majority of the low-skilled and semi-skilled employment opportunities will be made available to local residents.

2.2.4 Decommissioning Phase

At the end of the operational phase, the WEF may be decommissioned, or may be repowered i.e., redesigned and refitted so as to operate for a longer period. The main aim of decommissioning is to return the land to its original, pre-construction condition. Should the unlikely need for decommissioning arise i.e., if the facility becomes outdated or the land needs to be used for other purposes, the decommissioning procedures will be undertaken in line with the approved EMPr and the site will be rehabilitated and returned to its pre-construction state.

Various components of the proposed Kaladokhwe WEF 3, which are to be decommissioned will be reused, recycled, or disposed of in accordance with the relevant regulatory requirements. All of the components of the wind turbines are considered to be reusable or recyclable. The turbines may also be traded or sold as there is an active second-hand market for wind turbines and/or it may be used as scrap metal. The decommissioning phase of the project is also expected to create temporary skilled and unskilled employment opportunities.

Scoping and Environmental Impact Assessment for the Proposed Development of the 240 MW Kaladokhwe Wind Energy Facility 3 near Nxuba (Cradock) in the Eastern Cape

DRAFT SCOPING REPORT

CHAPTER 2: Project Description

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2. PROJECT DESCRIPTION

This chapter provides an overview of the conceptual project design and an overview of the site and technology selection process for the proposed Kaladokhwe Wind Energy Facility 3 ("Kaladokhwe WEF 3"), as provided by the Project Developer, Atlantic Renewable Energy Partners (Pty) Ltd (hereafter "AEP").

The purpose of this chapter is to present sufficient project information on the proposed Kaladokhwe WEF 3 (including the facility itself and the associated infrastructure) to inform the EIA Process in terms of design parameters applicable to the project.

As noted in Chapter 1 of this Scoping Report, the Project Applicant, Kaladokhwe Wind 3 (Pty) Ltd is proposing the construction of the Kaladokhwe WEF 3 and associated infrastructure, near Nxuba (Cradock) in the Eastern Cape Province. In order to facilitate the connection of the proposed Kaladokhwe WEF 3 project to the national electrical grid network, the Project Developer is proposing the construction of one 132 kV / 400 kV overhead transmission powerline, to be located within a 300 m assessment corridor, and its associated electrical grid infrastructure from the onsite substation hubs at the WEF to a newly proposed 132 kV / 400 kV Main Transmission Substation (MTS) to be located northwest of the Kaladokhwe WEF project cluster, and adjacent to the two existing Hydra – Poseidon 400 kV powerlines. A separate Application for Environmental Authorisation (EA) and a Scoping and Environmental Impact Assessment Process will be undertaken for the grid connection.

The proposed Kaladokhwe WEF 3 will consist of a maximum of 32 individual turbines, which will be positioned at strategic locations on site that will be informed by the assessment inputs provided by the specialists on the EIA project team during the EIA Phase. While the exact type of turbine technology is yet to be finalised, the WEF is expected to have a total generating output capacity of 240 MW. The proposed location of the Kaladokhwe WEF 3 is shown in Figure 1.1 and Figure 1.2 in Chapter 1.

Table 2.1 shows the co-ordinates of the preferred project site.

Table 2.1: Co-ordinates of the Corner Points of the Preferred Project Site

Project Site	Point	Decimal Degrees		Degrees, minutes, seconds	
		Longitude (x)	Latitude (y)	Longitude (x)	Latitude (y)
Kaladokhwe WEF 3	Kd-3-1	25.77895184	-32.05306386	25° 46 ' 44"	33° 56 ' 49"
	Kd-3-2	25.77443236	-32.04810759	25° 46 ' 28"	33° 57 ' 7"
	Kd-3-3	25.76448415	-32.05494042	25° 45 ' 52"	33° 56 ' 42"
	Kd-3-4	25.73375371	-32.04860378	25° 44 ' 2"	33° 57 ' 5"
	Kd-3-5	25.70798831	-32.04531964	25° 42 ' 29"	33° 57 ' 17"
	Kd-3-6	25.70689088	-32.03755205	25° 42 ' 25"	33° 57 ' 45"
	Kd-3-7	25.71339289	-32.02785531	25° 42 ' 48"	33° 58 ' 20"
	Kd-3-8	25.69669888	-32.02817874	25° 41 ' 48"	33° 58 ' 19"
	Kd-3-9	25.70354553	-32.00452337	25° 42 ' 13"	33° 59 ' 44"
	Kd-3-10	25.724915	-32.005979	25° 43 ' 30"	33° 59 ' 38"
	Kd-3-11	25.72544509	-32.00587037	25° 43 ' 32"	33° 59 ' 39"
	Kd-3-12	25.71812178	-31.9829192	25° 43 ' 5"	32° 1 ' 1"

	Kd-3-13	25.73094565	-31.98287557	25° 43 ' 51"	32° 1 ' 2"
	Kd-3-14	25.74056991	-31.96967308	25° 44 ' 26"	32° 1 ' 49"
	Kd-3-15	25.75105129	-31.98725866	25° 45 ' 4"	32° 0 ' 46"
	Kd-3-16	25.76592636	-31.99535643	25° 45 ' 57"	32° 0 ' 17"
	Kd-3-17	25.77965305	-31.99005909	25° 46 ' 47"	32° 0 ' 36"
	Kd-3-18	25.77863993	-32.00272755	25° 46 ' 43"	33° 59 ' 50"
	Kd-3-19	25.78278298	-32.00646225	25° 46 ' 58"	33° 59 ' 37"
	Kd-3-20	25.78612702	-32.01289625	25° 47 ' 10"	33° 59 ' 14"
	Kd-3-21	25.78383579	-32.0233883	25° 47 ' 2"	33° 58 ' 36"
	Kd-3-22	25.79012239	-32.0244629	25° 47 ' 24"	33° 58 ' 32"
	Kd-3-23	25.7878433	-32.04163988	25° 47 ' 16"	33° 57 ' 30"
	Kd-3-24	25.77895184	-32.05306386	25° 46 ' 44"	33° 56 ' 49"

2.1 Key components of the proposed Kaladokhwe WEF 3

A summary of the key components of the proposed project is described below. It is important to note at the outset that the exact specifications of the proposed project components will be determined during the detailed engineering phase (subsequent to the issuing of an Environmental Authorisation (EA), should such an authorisation be granted for the proposed project, and shortly before construction commences). In line with the precautionary approach and in order to ensure that any environmental impacts which may arise as a result of the project are adequately assessed during the EIA Phase, worst-case scenarios and estimates have been provided in this section. For example, the current project description is representative of a worst-case scenario in terms of the total number of turbines proposed for implementation, as it reflects the maximum number of wind turbines that may be implemented i.e., 41 turbines. The hub height is up to 160 m, the rotor diameter is up to 200 m, and the blade length is up to 100 m.

The total physical development footprint of the proposed project (i.e., maximum 32 turbines and supporting infrastructure) is estimated to comprise approximately 61 ha. As discussed in Chapter 1 of this Scoping Report, once the commercial operation date is achieved, the proposed facility will generate electricity for a minimum period of 20 years. The properties to be affected by the development of the proposed WEF will be leased from the property owners by the Project Applicant for the life span of the WEF project. As the proposed Kaladokhwe WEF 3 requires a permanent development footprint of approximately 61 ha, which is about 1.2% of the total assessed study area that is approximately 5 039 ha in extent, there is ample spatial scope to avoid major environmental constraints through optimisation of the final design, if required. Figure 2.2 indicates the preliminary project layout including the associated infrastructure for the proposed Kaladokhwe WEF 3.

All high resource areas within the relevant affected properties, as well as potential locations for all relevant supporting infrastructure have been assessed during the Scoping Phase. Based on the initial findings of the specialist assessments, a preliminary combined environmental sensitivity map was prepared and is included in Chapters 3 and 5 of this Scoping Report. This map shows the environmental sensitivities (*inter alia* avifauna, bats, terrestrial biodiversity, watercourses, heritage features, etc.) within the larger study area that was assessed during Scoping. Based on this map, the preferred development footprint for the Kaladokhwe WEF 3 will be revised to avoid (where possible) the most sensitive features that were identified by the specialists within the original assessed study area. This revised development footprint and

associated project infrastructure layout will be taken forward into the EIA Phase for further assessment by the specialist team.

The Kaladokhwe WEF 3 will typically consist of some of the illustrated components shown in Figure 2.1 below.

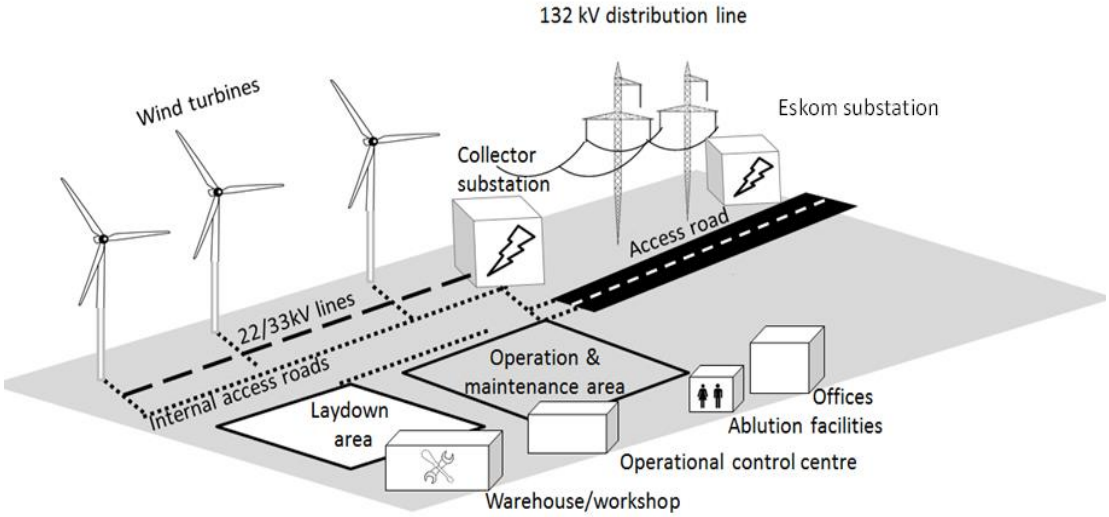

Figure 2.1: Typical components of a Wind Energy Facility (*Source*: Tennessee Valley Authority, Wikimedia)

An overview of the key components of the proposed Kaladokhwe WEF 3 project are discussed in Section 2.1.1 to 2.1.3 below.

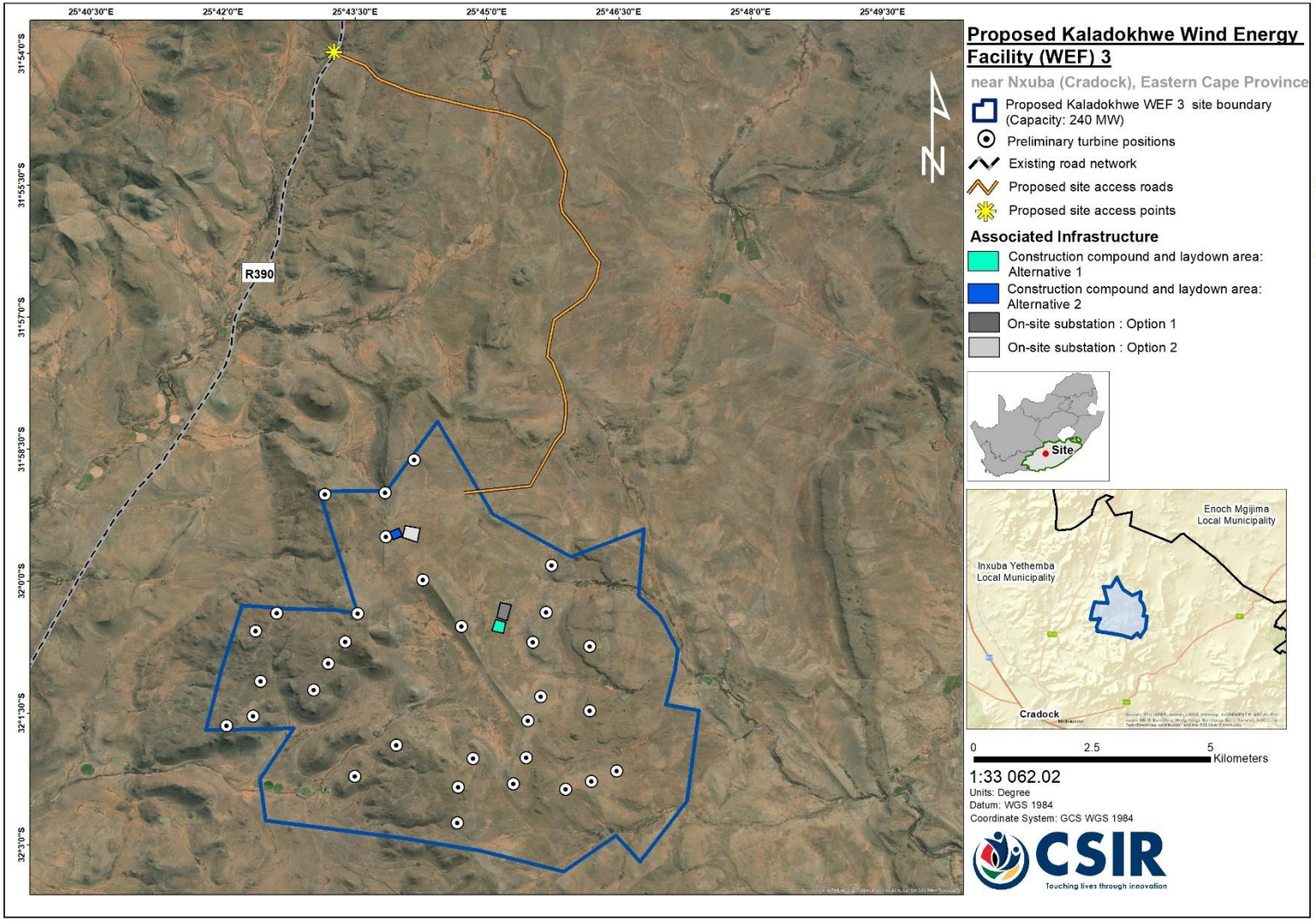

Figure 2.2: Preliminary project layout of the proposed Kaladokhwe WEF 3 development footprint as assessed during the Scoping Phase

2.1.1 General Description of a Wind Turbine and Wind Turbine Technology

Wind turbines generate electricity by converting movement or kinetic energy produced by the wind into electricity. Different turbine technologies achieve this through slightly different means. A typical horizontal-axis wind turbine consists of a number of components, which work together to generate electricity as depicted in Figure 2.3 below. When the rotor spins the shaft, the shaft spins the assembly of magnets, which generate voltage in the coil of wire. This voltage provides alternating electrical current, which could then be distributed through powerlines. The wind turbine tower supports the rotor and nacelle and provides the height for the rotor blades to clear the ground safely, and to capitalise on atmospheric wind resources, which occur approximately 80 - 200 m above the earth's surface.

It is anticipated that the individual wind turbines planned for the proposed Kaladokhwe WEF 3 will have the following **approximate** specifications:

- Number of turbines: 32
- Hub height: Up to 160 m
- Rotor diameter: Up to 200 m
- Blade length: Up to 100 m
- Turbine capacity: Up to 8 MW
- Reinforced foundation diameter: 32 m per turbine
- Crane hardstand: 70 m x 45 m per turbine
- Blade hardstand: 80 m x 45 m per turbine

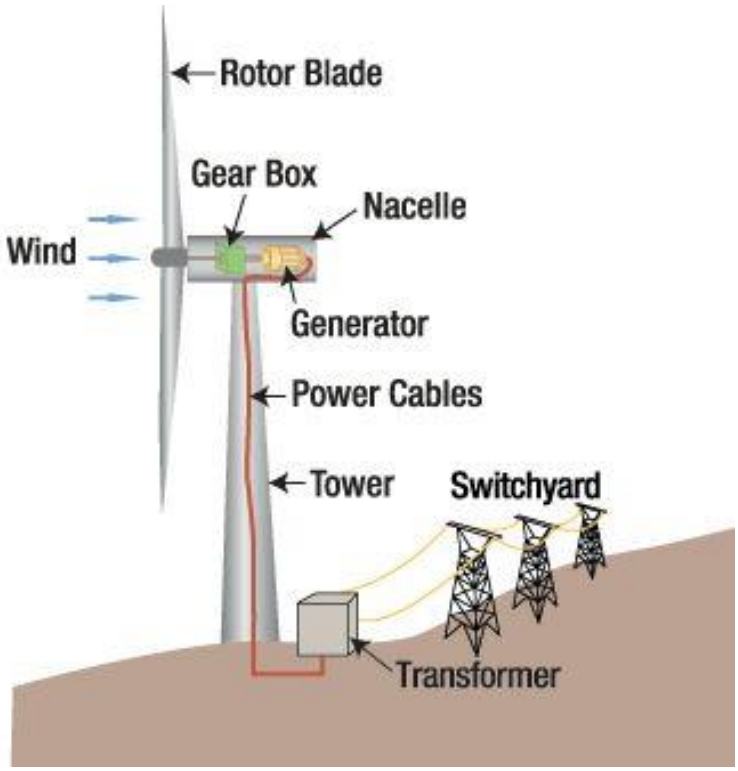

Figure 2.3: Generic design for a wind turbine (*Source*: Tennessee Valley Authority, Wikimedia)

The energy output of a wind turbine ultimately depends on the size of the generator, velocity of the wind, the height of the hub, and the length of the rotor blades. Wind turbines operate at a range of wind speeds and have a start-up speed, which is the speed at which the blades and rotor start to rotate, and a cut-in speed, which reflects the minimum wind speed at which usable power is generated. This is typically about 3 - 4 m/s with full power output occurring at higher wind speeds of approximately 10 to 12 m/s. Wind turbines are also equipped with a cut-out speed or pitch control system as a safety feature to prevent mechanical damage at high or turbulent wind speeds. The cut-out speed is the highest wind speed after which a wind turbine will stop producing power, and a braking system will be activated. This is typically between 25 and 28 m/s depending on the manufacturer and type of turbine selected for implementation. The pitch control system will turn the rotor out of the mean wind direction and change the orientation of the blades so the rotor will capture lower wind speeds and the output power of generator stays within the allowed range. Once the wind drops below the cut-out speed back to a safe level, the turbine can resume normal operation.

Even though wind turbines are relatively tall they do not require extensive land space. Each turbine will have a circular foundation with a diameter of up to 32 m and this will be placed alongside the 45 m wide hardstand resulting in an area of about 32 m x 45 m that will be permanently disturbed for the turbine foundation. The combined permanent footprint for the turbines will be approximately 5.9 ha for the WEF. Each turbine will have a crane hardstand of 70 m x 45 m. The permanent footprint for turbine crane hardstands will be approximately 12.9 ha for the WEF. Each turbine will also have a blade hardstand of 80 m x 45 m. The permanent footprint for turbine blade hardstands will be approximately 14.8 ha for the WEF.

The comparatively small base of the turbine allows other activities to continue uninterrupted in the space underneath and around the turbine. Conventional large-scale development footprints often lead to habitat fragmentation and interference with fauna. As such, the micro-siting of the wind turbines will be in an optimum position that minimises the possibility of habitat fragmentation and interference with movement of fauna on the ground.

In terms of wind turbine technology to be used as part of the proposed development, the Project Developer is currently considering a range of wind turbine designs and generation capacity. The exact turbine specifications have not yet been confirmed. Some turbine specifications will only be finalised during the detailed design phase closer to construction. However, the “worst-case scenario” is presented and will be assessed by the specialists during the EIA Phase. The turbine technology selection process shall be subjected to further wind analysis and is also dependent on technical, commercial and site suitability assessment that will, in part, be informed by the EIA Process.

2.1.2 Associated Infrastructure

2.1.2.1 Hardstand Areas

The hardstand area at each turbine will be established adjacent to each wind turbine base. This area will comprise a crane platform (approximately 70 m x 45 m) and a blade storage area (approximately 80 m x 45 m), totalling approximately 28 ha for the WEF. This hardstand area will be utilised by the auxiliary cranes for assembly of turbine components, off-loading and storage during the construction phase, and possibly for maintenance during the operational phase. A schematic illustration of a typical hardstand area and crane platform is provided in Figure 2.4 below.

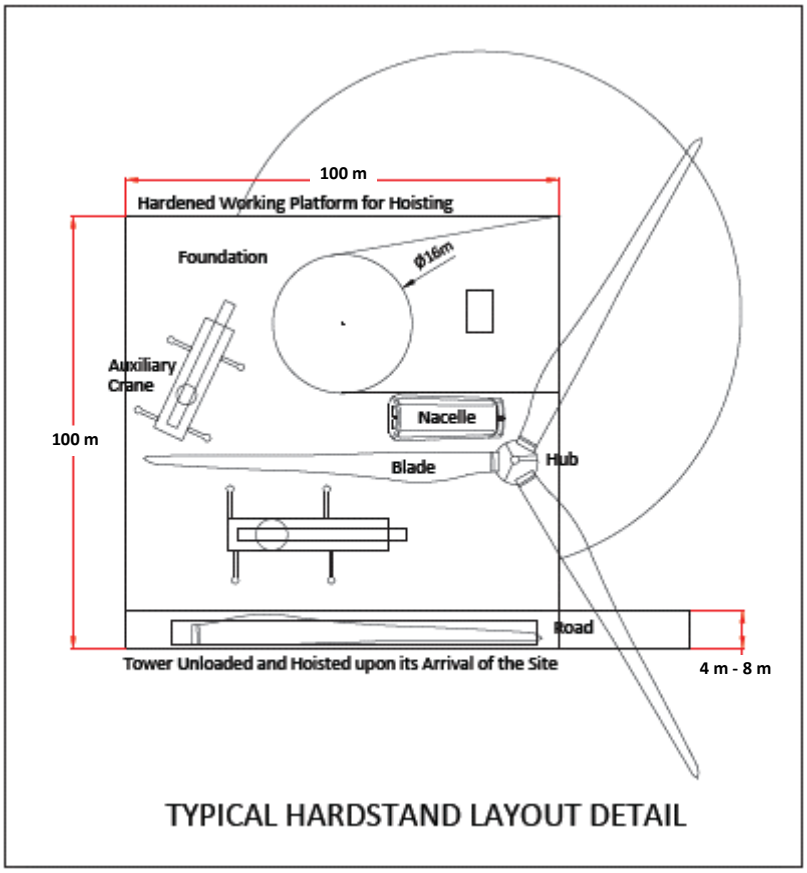

Figure 2.4: Example of a typical hardstand area at each turbine location

2.1.2.2 Construction Compound and Laydown Areas

During the construction phase, the proposed development will require the establishment of at least one construction compound and one laydown area, each with an approximate temporary footprint of up to six (6) ha. This area that will be fenced with access control. Two construction compound and laydown area alternatives have been identified at the proposed Kaladokhwe WEF 3 project site and will be taken forward into the EIA Phase for detailed specialist assessment.

2.1.2.3 Operations and Maintenance (O&M) Area

The on-site Operations and Maintenance (O&M) area is required to support the functioning of the proposed Kaladokhwe WEF 3 and provide services to personnel who will be responsible for the construction as well as operation and routine maintenance of the facility during its lifespan. The proposed O&M area will have a footprint of up to two (2) ha, will be fenced with access control and will typically comprise of the following:

- Operational and Maintenance (O&M) building (including a control centre, site offices, warehouses, workshop, visitors centre, etc);
- Worker amenities (e.g., canteen, ablution facilities, changing room, etc.);
- Storage structures for equipment, materials, fuel, oil, machinery etc. (e.g., containers, skips etc.);
- Security office and boom gate (up to approx. 0.5 ha);
- Parking area;

- A concrete batching plant of 1 ha in size (100 m x 100 m);
- Water storage (likely in 10 000 L above ground conventional (plastic) storage tanks); and
- Central waste collection and storage area.

It is anticipated that the O&M building complex, which will form part of the development footprint earmarked for the construction of the substation hub, will include the installation of a communications tower on site with a maximum height of 32 m. The maximum height of onsite buildings and other related infrastructure is not likely to exceed 10 m.

2.1.2.4 Site Access Roads

The proposed Kaladokhwe WEFs and associated infrastructure will be located approximately 30 km northeast of the town of Nxuba (Cradock) in the Eastern Cape Province. Access to the proposed Kaladokhwe WEF 3 project site will be facilitated via existing public roads off the R390 provincial tar road connecting Nxuba (Cradock) and Hofmeyr, and potentially also the R61 road connecting Nxuba (Cradock) and Tarkastad. The main access road to the WEF will comprise a gravel road with a maximum width of 10 m. The length of the main access road is yet to be confirmed.

2.1.2.5 Internal Service Roads

The Kaladokhwe WEF 3 will have a total internal service road network of up to 40 km. Permanent service roads will be 6 m wide and may require side drains on one or both sides. All service roads will be gravel and may have underground cables running alongside them. During construction, a 15 m road corridor may be temporarily impacted upon which will be rehabilitated to a width of 6 m after construction has been completed. Temporary clearing of up to 50 m may be required in areas where cut and fill may be required as well for the construction of the bell mouth road junction, turning circles and temporary passing lanes on site. The existing internal service road network, in addition to whether additional internal service roads are to be constructed on the project site will be confirmed by the Project Developer during the EIA Phase. The specialists will assess all proposed internal service roads during the EIA Phase.

2.1.2.6 Stormwater Channels and Water Pipelines

Stormwater drainage systems will be constructed 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. Temporary water pipelines will be installed on site during construction for water supply to inter alia the concrete batching plant and the O&M building complex for domestic use and sanitation. Possible groundwater abstraction on site for purposes of the batching plant could be considered, if required, taking into account any necessary and relevant legal requirements.

2.1.2.7 Fencing

For various reasons such as security, public protection and lawful requirements, the proposed built infrastructure on site will be secured via the installation of appropriate fencing. Existing livestock fencing on the affected farms portions may be upgraded in places deemed insufficiently secure, whereas permanent fencing will be required around the O&M building complex and on-site substation hubs. Access points will be managed and monitored by an appointed security service provider. The type and height of fencing to be installed will be confirmed during detailed design as the development progresses.

2.1.2.8 Sewage or Liquid Effluent

The proposed project 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) and/or temporary conservancy tanks will be used during the construction phase, which will be regularly serviced and emptied by a registered contractor for disposal of at a registered municipal sewerage treatment facility. Due to the remote location of the project site, a waterproof conservancy tank system will be employed on site during the operational phase of the WEF for which a registered company will be contracted to store and transport sewage from site to an appropriate municipal wastewater treatment facility.

2.1.2.9 Solid Waste Generation

Solid waste generation on site during the construction and operational phases will be managed according to the EMPr, which will be included in the EIA Report.

During the construction period, it is estimated that the proposed project would generate approximately 50 m^3 of solid waste per month. Solid waste 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 facility 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 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.

2.1.3 Electrical Components and Connection to the Grid

Note from the CSIR: The electrical components are discussed below to provide a holistic overview of the proposed Kaladokhwe WEF 3 and for the sake of completeness. However, as noted in Chapter 1, the electrical grid infrastructure (EGI) component of the proposed Kaladokhwe WEF projects will form part of a separate Application for EA and a separate Scoping and Environmental Impact Assessment Process.

2.1.3.1 Electrical Grid Infrastructure

The proposed Kaladokhwe Wind Farm Cluster is located approximately 50 km southeast of two existing 400 kV overhead transmission powerlines (i.e., referred to as Hydra and Poseidon, respectively) that run between the existing Hydra and Poseidon Main Transmission Substations (MTS), which are two significant substations located in the Northern Cape and Eastern Cape, respectively.

There is an existing Iziko Series Capacitor Station located along the 400 kV Hydra/Poseidon powerlines, that is situated northwest of the proposed Kaladokhwe Wind Farm Cluster. Eskom's Grid Access Unit (GAU) has confirmed that Eskom will be establishing a new MTS north of the existing Poseidon MTS, due to the existing Poseidon MTS being physically constrained. This aligns with Eskom's Transmission Development Plan (TDP) 2022-2031 that identifies this proposed MTS as the "Poseidon North 132 kV / 400 kV Substation", proposed to be located at or near the Iziko Series Capacitor Station.

In order to evacuate the energy generated by the proposed WEFs to the national grid, a separate S&EIA Process will be undertaken to assess the grid connection route which consists of a 132 kV / 400 kV overhead transmission powerline, to be located within a 300 m wide assessment corridor of approximately 52 km in length from the on-site substation hub at Kaladokhwe WEF 3 to the newly proposed 132 kV / 400 kV Poseidon North MTS (location as described above).

2.1.3.2 On-site Substations

The proposed project will include two on-site substation hubs incorporating the facility substation, switchyard, collector infrastructure and associated O&M buildings. The substation locations will have a maximum development footprint of up to 4 ha and the general height of the substation will be a maximum of 10 m. It is likely to also include switchgear portals up to 15 m in height and lightning masts up to 25 m in height.

The construction of the on-site substation hubs would require the following activities:

- A survey of the study areas on which the proposed on-site substations will be constructed;
- Site clearing and levelling;
- Construction of access roads to the proposed substation sites (where required);
- Construction of substation terraces and foundations;
- Assembly and installation of equipment (including transformers);
- Connection of conductors to equipment;
- Testing of equipment; and
- Rehabilitation of any disturbed areas and protection of erosion sensitive areas.

Two locations have been identified at the proposed Kaladokhwe WEF 3 project site for the construction of the two on-site substation hubs, both of which will be taken forward into the EIA Phase for detailed specialist assessment.

2.1.3.3 Battery Energy Storage System (BESS)

BESS offer a wide range of advantages to South Africa including electricity supply reliability and quality improvement. The main purpose of the BESS is to mitigate intermittency of wind- and solar PV -energy generation by storing and dispatching of electricity when needed i.e., to contribute to the grid 24 hours/day, during peak demand at night or during power outages. In essence, BESS technology allows renewable energy to enter the completely independent power generation market.

The proposed Kaladokhwe WEF 3 will also include one electrochemical BESS. The BESS will comprise an area of up to five (5) ha that is most likely to be included within the perimeter of an on-site substation hub (see Section 2.1.3.2 above). The BESS will have a maximum height of 8 m (as recommended) and a storage capacity of at least 1000 MWh.

Considering the nature of the project, a solid-state technology type would be envisaged for implementation. The technology includes batteries housed within containers which are fully enclosed and self-contained. Therefore, the assessment proposes all solid-state technologies for authorisation to allow the precise technology to be selected when the project is implemented, on the understanding that further investigation into the specific technologies available at the time of being awarded preferred bidder status will allow for one or more to be selected and ultimately develop.

The electrochemical BESS technologies that are generally considered for WEFs include:

- Lead Acid and Advanced Lead Acid BESS

Lead acid batteries are solid-state batteries which consist of a negative electrode which is comprised of Lead, a positive electrode, which is comprised of Lead oxide, electrolyte (i.e., sulphuric acid) and separators (i.e., insulating material between oppositely charged plates which allow electrolyte to pass through) (Garche and Brandt, 2018). The submersion of the electrodes/ plates in electrolyte allows for the generation and storage of energy during charge and discharge cycles. There are two types of lead acid batteries; Flooded Lead Acid (FLA) and Valve Regulated Lead Acid (VRLA) batteries. FLA and VRLA batteries have the same operating principle; however, the main components of VRLA batteries are enclosed in solid sealed systems with a pressure-regulating valve unlike FLA batteries in which hydrogen is vented (Martin *et al.*, 2010). VRLA batteries are more commonly used as large standby power supplies (i.e., BESS).

It is proposed that the BESS would be housed in containers along with its associated operational, safety and control infrastructure. Should this BESS type be the preferred BESS alternative, the BESS will be pre-assembled off site and delivered to site for placement as per specifications of the supplier and remain sealed during operations.

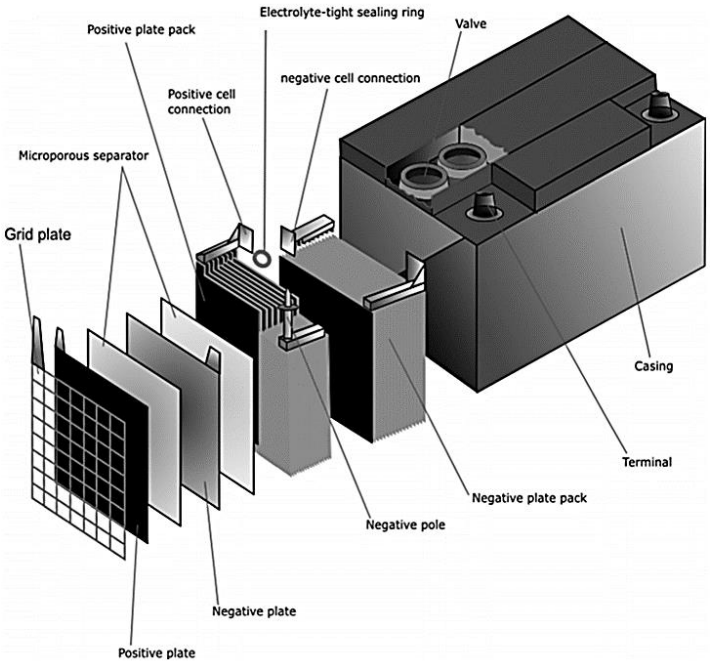

Figure 2.5: Schematic diagram of a typical Lead acid battery (Source: Martin *et.al*, 2010)

- Lithium-Ion Batteries

Lithium-Ion batteries are also sealed systems i.e., pre-assembled off site and then delivered to site for placement. This BESS system consists of multiple battery cells that are assembled together to form modules. A module may consist of several cells working in conjunction. Each cell contains a positive electrode, a negative electrode, and an electrolyte. The negative electrode for a lithium-ion cell is typically carbon. The positive electrode can be lithium iron phosphate or a lithium metal oxide. The electrolyte is usually a lithium salt dissolved in an organic solvent.

If the Lithium-ion BESS is the preferred BESS alternative, the BESS will be pre-assembled off site, delivered to site for placement and will remain sealed during operations.

- Nickel based batteries (i.e., Nickel-Cadmium (NiCd) and nickel–metal hydride (NiMH))

The positive electrodes of Nickel based NiCd battery cells are composed of a nickel-oxyhydroxide, which is the active material, and the negative electrodes are composed of metallic cadmium. The positive and negative plates are separated from each other by a continuous strip of porous plastic and an aqueous solution of potassium hydroxide (i.e., electrolyte). Similar to the NiCd BESS, the Nickel based NiMH BESS comprises of positive electrodes made of nickel hydroxide and an aqueous solution of potassium hydroxide functioning as the electrolyte. However, the NiMH BESS differs in that the negative electrodes are composed of metal hydride (Parsons, 2017). Sealed and vented designs of NiMH ad NiCd batteries are used commercially. Vented nickel-based batteries are often used for large power storage (i.e., wind generated power storage). Vented systems contain a low-pressure release valve, which facilitates the release of oxygen and hydrogen produced at the negatives electrode in cases of overcharging or rapid discharging. This release system results in the BESS being safer and more economical (Parsons, 2017)

In addition, should any of the two nickel based BESSs discussed here be the preferred BESS alternative, the BESS will be pre-assembled off site and will remain sealed during operations.

- High Temperature (NaS, Na-$NiCl_2$, Mg/PB-Sb) BESS

Similar to the Lithium-ion BESS and Lead Acid BESS, High Temperature batteries are also sealed battery energy storage systems. Sodium Sulphur (NaS) batteries are considered the most advanced High Temperature BESS technology of the three types of technology being considered. This type of BESS comprises of sodium at the negative electrode and molten sulphur at the positive electrode. The electrodes are separated by a solid beta alumina ceramic electrolyte, which only allows positively charged sodium ions to pass through and combine with the molten sulphur to form sodium polysulfides. The general high fire risk associated with High Temperature BESS's is also mitigated by the NaS BESS as the structure comprises of a double-walled airtight enclosure that contains the NaS cells in a series-parallel array formation. The cells are also surrounded with sand both to mitigate fire and to anchor the cells (Parsons, 2017).

The Mg/PB-Sb BESS, unlike the NaS BESS, comprises of two liquid metal electrodes of different densities and a molten salt electrolyte, which separates the electrodes. The differences in density and the immiscibility of the three materials result in three distinct layers, which remain separate.

The third type of High Temperature BESS is the Na-$NiCl_2$ BESS that is also referred to as the ZEBRA battery. This BESS technology comprises of a negative electrode of molten sodium and a porous solid nickel chloride

positive electrode. A ceramic electrolyte, similar to that found in a NaS BESS, separates the electrodes and only allows sodium ions to pass through (Parsons, 2017).

High temperature BESS technologies are all similar in that the systems are required to operate at high temperatures (approximately 300°C), therefore require active heating in order to facilitate ion transfer and maintain the molten state of some/all of the BESS components (Parsons, 2017). This may increase operational costs and increase the risk of fires; however, these High Temperature BESS technologies are considered extremely efficient as less degradation of electrodes may be experienced in the long-term. These BESS systems also comprise of cells that are hermetically sealed and contain fire mitigation measures.

Should any of the High Temperature BESS discussed above be the preferred BESS alternative, the BESS will be pre-assembled off site, delivered to site for placement and will remain sealed during operations.

- Redox Flow Batteries (RFB): Vanadium-Vanadium Redox Flow Battery (VRFB), Zinc-iron Flow Battery (Zn-Fe), Zinc-Bromine Flow Battery (Zn-Br)

Flow batteries generally comprise of three major components: a cell stack, auxiliary parts, and electrolyte storage. The active chemical species in a flow battery are stored mostly externally in above-ground storage tanks. The energy is stored in two chemical components, which are dissolved in a liquid to form electrolytes during operation. The energy density of a RFB is thus dependent on the size of the storage tanks (Parsons, 2017).

There are two types of RFB's i.e., a 'true' RFB and a hybrid RFB. In a 'true' RFB the electro-active materials used to store energy remain dissolved in solution. Therefore, the energy is determined by the volumes of electrolyte available. Examples of a 'true' RFB is the VRFB and iron-chromium systems. Hybrid RFBs deposit at least one chemical species as a solid during the charge cycle, therefore preventing the complete separation of power and energy characteristics (Parsons, 2017). Examples of a hybrid RFB is the Zn-Br RFB and the Zn-Fe RFB. Examples of electrolytes for RFBs include Hydrochloric Acid and Sulphuric Acid, which are considered as dangerous goods in terms of the 2014 NEMA EIA Regulations (as amended).

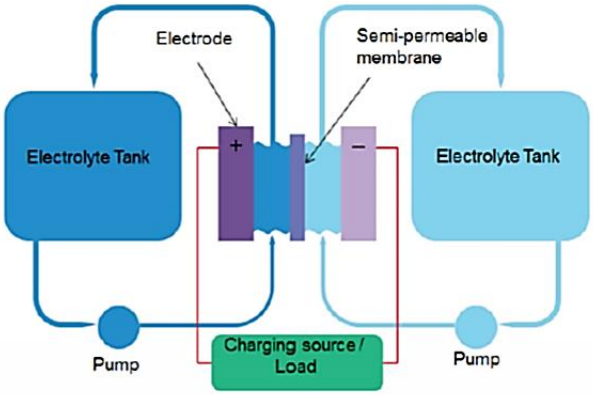

Figure 2.6: Schematic diagram of a typical Redox Flow Battery (Source: Parsons, 2017)

The preferred type of BESS technology to be installed at the Kaladokhwe WEF 3 project as well as the preferred BESS supplier to be contracted will be confirmed during the detailed design phase after Environmental Authorisation (EA) has been obtained (should such EA be granted). The potential risks associated with the various BESS technologies being considered, and the required mitigation measures will be included in the EIA Report, as well as the Environmental Management Programme (EMPr).

2.1.4 Site Access and Transportation of Wind Turbine Components to Site

2.1.4.1 Site Access

iWink Consulting (Pty) Ltd has been appointed to undertake a Transportation Impact Assessment (TIA) for the proposed Kaladokhwe WEF 3. The TIA will assess the expected traffic related impacts of the proposed facility during the construction, operational and subsequent decommissioning phases. The purpose of the TIA is also to consider the traffic impact that the WEF would have on the surrounding road network and receiving environment during the construction of the access roads, construction and installation of the turbines, as well as for maintenance during the operational phase.

Several possible access points to the proposed Kaladokhwe WEF 3 project site have been proposed. The preliminary site layout indicates three possible entries via existing turnoffs from the R390 provincial tar road that is located to the west of the WEF project site. The R390 runs in a north-south direction connecting the towns of Nxuba (Cradock) and Hofmeyr. A fourth possible access point is located southeast of the WEF project site allowing access via an existing turnoff from the R61 provincial tar road running in an east-west direction connecting the towns of Nxuba (Cradock) and Tarkastad.

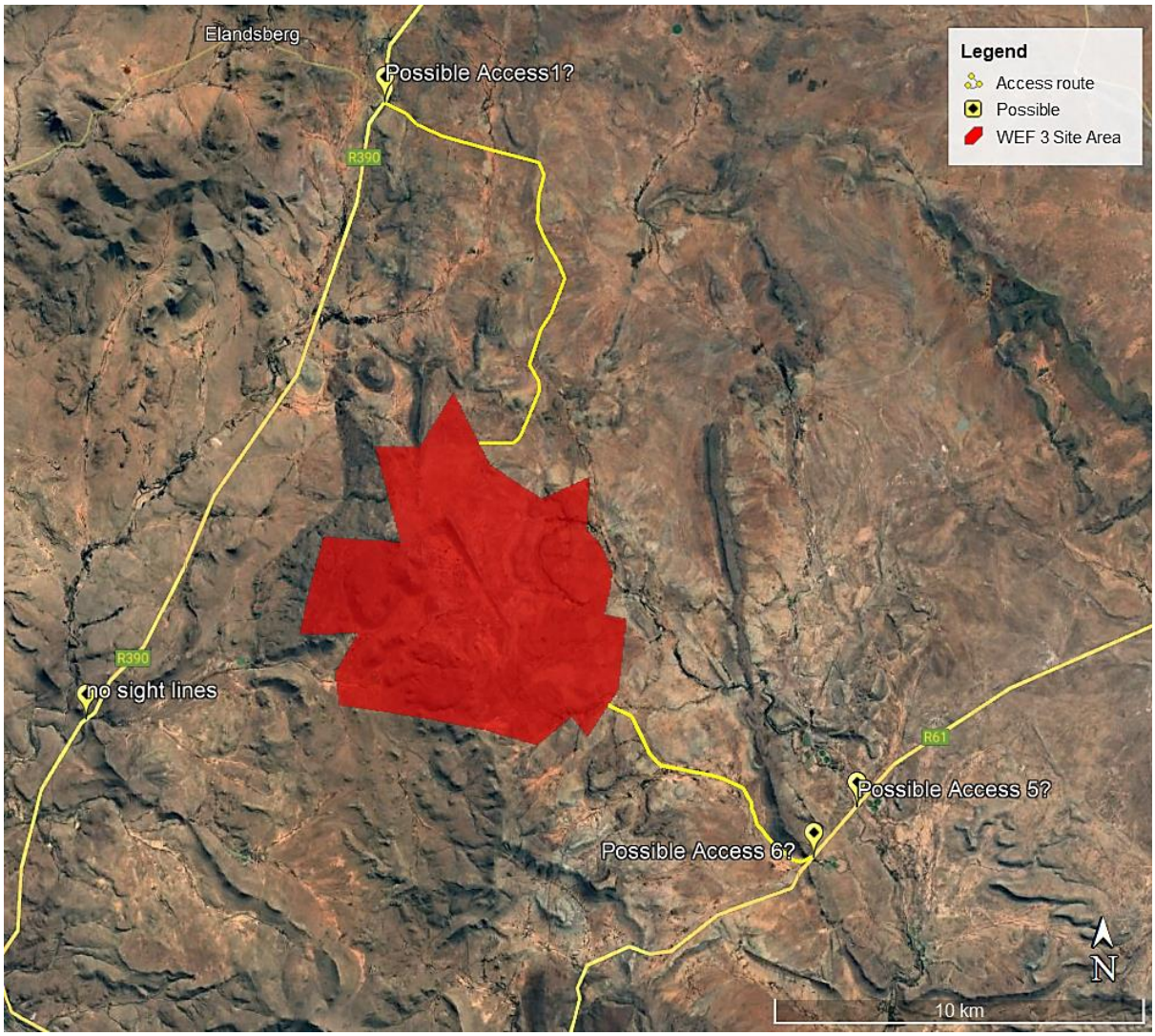

Figure 2.7: Main roads and proposed access points to the proposed Kaladokhwe WEF 3 (Source: iWink Consulting (Pty) Ltd, 2022)

The nearest town in relation to the proposed Kaladokhwe WEF 3 project site is Nxuba (Cradock), which is situated approximately 20 km travel distance from the proposed Kaladokhwe WEF 3. It is envisaged that the majority of materials, plants and labour would be sourced from Nxuba (Cradock) as far as possible and transported to the proposed WEF site via the R390 provincial road, with the other nearby towns of Hofmeyr and Tarkastad to serve as alternatives.

2.1.4.2 Port of Entry

The most suitable South African port to import the turbine components to South Africa is the Port of Ngqura, which is located near Gqeberha in the Eastern Cape, and which is located approximately 270 km travel distance from the proposed development site. This Port is a deep-water port geared for handling large container ships and has large laydown areas available for storage of wind turbine components. The Port forms part of the Coega Industrial Development Zone (CIDZ) and is operated by Transnet National Ports Authority. The Port also services the industrial bulk commodity requirements of the regional and national hinterland. Containers handled include imports and exports from across the globe as well as

transhipment cargoes serving primarily East and West coast traffic, as well as inter-line traffic from South America to Asia.

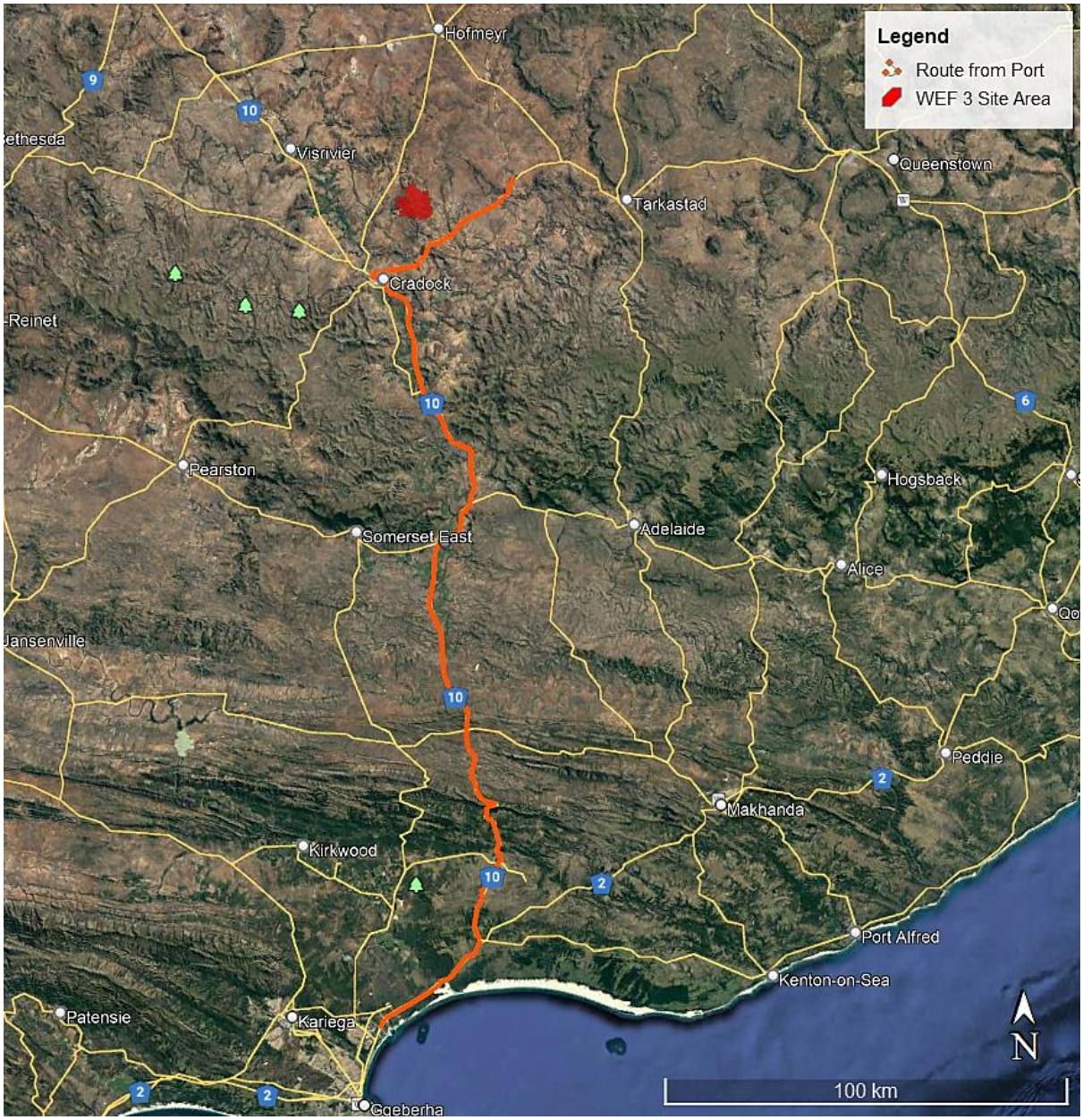

Figure 2.8: Route for the turbine components from the Port of Ngqura to the proposed Kaladokhwe WEF 3 project site (Source: iWink Consulting (Pty) Ltd, 2022)

Most shipping vessels importing the turbine components will be equipped with on-board cranes to do all the safe off-loading of Wind Turbine Generator (WTG) components onto the abnormal transport vehicles, parked adjacent to the shipping vessels (Figure 2.9). The imported turbine components may be temporarily stored at the nearest laydown area within the port's bounds or transported directly from the Port of Entry to the laydown area at the proposed project site. Mobile cranes will be required at these laydown areas to position the respective turbine components at their temporary storage location.

The most likely route for abnormal load vehicles will be from the port, heading east on the R102 towards Albany Road and then merging onto the M4 via the ramp to Grahamstown. Taking the 751B exit and merging onto the N2 towards Grahamstown. On the N2 towards Grahamstown, the abnormal load vehicles will continue onto the N10 and the proposed project site via the R390 provincial tar road traversing the affected farm portions.

Figure 2.9: Example of cranes at Port of Entry (Source: iWink Consulting (Pty) Ltd, 2022)

2.1.4.3 Transportation of Wind Turbines

Wind turbine components can be transported in a number of ways with different truck / trailer combinations and configurations, which will need to be investigated at a later stage when the transporting contractor and the plant hire companies apply for the necessary permits from the Permit Issuing Authorities.

For the transportation of the turbines from the Port of Entry to the proposed WEF site, the blades are the longest and possibly most vulnerable components of a wind turbine and hence needs to be transported with utmost care. The blades need to be transported on an extendible blade transport trailer or in a rigid container with rear steerable dollies. The blades can be transported individually, in pairs or in threes, although different manufacturers have different methods of packaging and transporting the blades.

In terms of the National Road Traffic Act, 1996 (Act No. 93 of 1996), the trucks delivering turbine components will be considered as abnormal loads. Approval i.e., relevant permits may have to be obtained from National, Provincial and/or Local Competent Authorities for the transportation of abnormal heavy components. This is normally the responsibility of the logistics company in charge of these components.

Figures 2.10 to 2.13 below provide examples of transportation of some of the turbine components.

Figure 2.10: Example of a tower section being transported (Source: Google Images, 2022)

Figure 2.11: Example of a wind turbine blade being transported on an extendible trailer (Source: Google Images, 2022)

Figure 2.12: Example of a nacelle being transported (Source: Google Images, 2022)

Figure 2.13: Example of a hub and rotary units being transported (Source: Google Images, 2022)

2.1.5 Water Requirements

Water will be required during the construction phase, primarily for the purposes of concrete production and curing for the construction of turbine foundations, road construction as well as road compaction and dust suppression, earthworks and human consumption. High water usage is only anticipated during the first 6-12 months whereafter the monthly water usage will decrease drastically. The monthly water use requirement during the construction phase for a 24-month period is an estimated average of 2 500 m^3.

The water use requirement during the operational phase will be primarily for human consumption and sanitation purposes. The total water consumption estimated for the operational phase of the WEF is 0.9 kl / day, for the 20-year operational lifespan of the WEF.

It is proposed that water preferably be sourced from the Inxuba Yethemba Local Municipality and/or the Enoch Mgijima Local Municipality, and specific arrangements will be agreed upon with the relevant local municipality in a Service Level Agreement (SLA), following the appointment of the proposed WEF as a preferred bidder during the financial close period, prior to construction. In case municipal water supply cannot be confirmed, the Project Applicant will then investigate other sources of water supply for construction and operations of the proposed WEF considering any necessary licencing applications required in terms of relevant environmental legislation including but not limited to the National Water Act (Act No. 39 of 1998). Other possible sources include (i) water supply from a Private Contractor, which may include extraction from any available bulk water supply lines in the vicinity of the project site, (ii) water abstraction from existing boreholes on site, and/or (iii) water abstraction from one or more new boreholes located on site.

2.2 Overview of Project Development Cycle

This section provides an outline of the main activities that are proposed during each phase of the proposed project, i.e., extending from the Planning and Design phase through to the Decommissioning phase. The operational life of the WEF is expected to be a minimum of 20 years, which could be extended through regular maintenance and/or upgrades in technology.

2.2.1 Detailed Planning and Design

The project layout, including the exact placement of each individual turbine, building infrastructure and the proposed internal service road network will be finalised in the EIA Phase. The project layout will be informed by the findings of the specialist impact assessments, which includes the identification of sensitive biophysical areas that need to be avoided i.e., 'no-go' areas. The specialists will be requested to comment on the final project layout. The turbine manufacturer and turbine generation capacity to be used will be dependent on availability of turbines in the international market, suitability to the South African wind climate, and service levels and experience available in South Africa, and will only be confirmed during the detailed design phase prior to construction (after EA, should such EA be granted).

2.2.2 Construction Phase

The construction phase will take place subsequent to the issuing of an EA from the DFFE, should such EA be granted, and once a power purchase agreement (PPA) with a suitable energy off-taker which could be either the national government or private, is signed. The construction phase for the proposed Kaladokhwe WEF 3 project is expected to extend over 24 to 30 months; however, the construction period is subject to the actual number of turbines to be erected, the final requirements of Eskom and the REIPPPP RfP provisions at that time.

The main activities that are proposed to take place during the construction phase will entail the clearance of vegetation within the approved development footprint to facilitate the construction and/or establishment of infrastructure including but not limited to the turbine locations, construction compound,

temporary laydown area (for the storage of construction equipment, materials, machinery, and turbine components), internal service roads and all relevant built structures. Next, the wind turbine foundations will be constructed at each approved turbine location with the aid of a mechanical excavator. Then follows the construction of the on-site substations. The construction of the substation buildings will entail construction of the foundations and building structure as well as the installation of electrical infrastructure such as transformers, conductors, etc. Subsequently, the trenches for the installation of the electrical cabling to facilitate the connection of the wind turbines to the on-site substations will be excavated at a maximum depth of approximately 1.5 m between each wind turbine.

The construction phase will also involve the transportation of personnel, construction materials and equipment to and from the site. All efforts will be made to ensure that all construction work will be undertaken in compliance with local, provincial, and national legislation, local and international best practice, as well as the approved EMPr that will be compiled and included in the EIA Report. An independent Environmental Control Officer (ECO) will be appointed during the construction phase and will monitor compliance with the recommendations and conditions of the EMPr and EA, respectively.

Skilled as well as unskilled temporary employment opportunities will be created during the construction phase. It is difficult to specify the actual number of employment opportunities that will be created at this stage; however, it is estimated that up to 400 employment opportunities are expected to be created during the construction phase. Of these 15% will comprise skilled, 30% semi-skilled, and 55% low-skilled employment opportunities. The proposed construction and operational phases will make use of local labour (including female labour) as far as possible. A majority of the low-skilled and semi-skilled employment opportunities will be made available to local residents. All non-local workers will be housed in rental accommodation in the nearby town i.e., Nxuba (Cradock), and will be transported to site by bus daily. The Engineering, Procurement and Construction (EPC) contractor will arrange daily transport of these workers to and from the site by buses. No workers will be accommodated in worker amenities on site during construction.

2.2.3 Operational Phase

The following activities will occur during the operational phase:

- Operation of the WEF and generation of electricity to add to the national grid;
- Storage of energy generated by the WEF in electrochemical batteries;
- Routine maintenance of the WEF; and
- Unscheduled maintenance of the WEF.

The operational lifespan of the proposed Kaladokhwe WEF 3 is expected to be a minimum of 20 years. Wind turbines will be operational for this entire period except under circumstances of mechanical breakdown, extreme weather conditions and/or maintenance activities. Wind turbines will be subject to regular maintenance and inspection (i.e., routine servicing) to ensure the continued optimal functioning of the turbine components. It is expected that the WEF will operate throughout the day and night (24 hours). During the operational phase of the WEF, agricultural land use activities on site as well as eco-tourism activities in the area would be able to continue uninterrupted. The only development related activities on site will be routine servicing and maintenance.

The projected operations are expected to provide several services and added economic spin offs (as highlighted in Chapter 1 of this Scoping Report). Approximately 40 to 50 employment opportunities will be created during the operational phase of the project. Of these, 10% will comprise skilled, 40% semi-skilled and 50% low-skilled employment opportunities. A majority of the low-skilled and semi-skilled employment opportunities will be made available to local residents.

2.2.4 Decommissioning Phase

At the end of the operational phase, the WEF may be decommissioned, or may be repowered i.e., redesigned and refitted so as to operate for a longer period. The main aim of decommissioning is to return the land to its original, pre-construction condition. Should the unlikely need for decommissioning arise i.e., if the facility becomes outdated or the land needs to be used for other purposes, the decommissioning procedures will be undertaken in line with the approved EMPr and the site will be rehabilitated and returned to its pre-construction state.

Various components of the proposed Kaladokhwe WEF 3, which are to be decommissioned will be reused, recycled, or disposed of in accordance with the relevant regulatory requirements. All of the components of the wind turbines are considered to be reusable or recyclable. The turbines may also be traded or sold as there is an active second-hand market for wind turbines and/or it may be used as scrap metal. The decommissioning phase of the project is also expected to create temporary skilled and unskilled employment opportunities.

Scoping and Environmental Impact Assessment for the Proposed Development of the 240 MW Kaladokhwe Wind Energy Facility 3 near Nxuba (Cradock) in the Eastern Cape

DRAFT SCOPING REPORT

CHAPTER 4: Approach to EIA Process and Public Participation

CSIR
Touching lives through innovation

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4 APPROACH TO THE EIA PROCESS AND PUBLIC PARTICIPATION

This chapter presents the Environmental Impact Assessment (EIA) Process to be conducted for the proposed development and gives particular attention to the legal context and guidelines that apply to this EIA, the steps in the Scoping and Public Participation component of the EIA (in accordance with Regulations 41, 42, 43 and 44 of GN R326 of the 2014 NEMA EIA Regulations, as amended) and the schedule for the EIA Process.

4.1 Legislation, Policies and Guidelines Pertinent to this EIA

The scope and content of this Scoping Report has been informed by the following legislation, policies, guidelines, and information series documents:

4.1.1 National Legislation

4.1.1.1 The Constitution of the Republic of South Africa (Act 108 of 1996)

The Constitution, which is the supreme law of the Republic of South Africa, provides the legal framework for legislation regulating environmental management in general, against the backdrop of the fundamental human rights. Section 24 of the Constitution states that:

- "Everyone has the right:
  - to an environment that is not harmful to their health or well-being; and
  - to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that –
    - prevent pollution and ecological degradation;
    - promote conservation; and
    - secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

Section 24 of the Bill of Rights therefore guarantees the people of South Africa the right to an environment that is not detrimental to human health or well-being, and specifically imposes a duty on the State to promulgate legislation and take other steps that ensure that the right is upheld and that, among other things, ecological degradation and pollution are prevented.

In support of the above rights, the environmental management objectives of the proposed project are to protect ecologically sensitive areas and support sustainable development and the use of natural resources, whilst promoting justifiable socio-economic development in the towns nearest to the project site.

4.1.1.2 NEMA and EIA Regulations published on 8 December 2014 (as amended on 7 April 2017; GN R327, GN R326, GN R325 and GN R324)

Chapter 1, Section 2 of the National Environmental Management Act (Act 107 of 1998) (NEMA) sets out a number of principles to give guidance to developers, private landowners, members of the public and authorities. The proclamation of the NEMA gives expression to an overarching environmental law. Various

mechanisms, such as cooperative environmental governance, compliance and non-compliance, enforcement, and regulating government and business impacts on the environment, underpin NEMA. NEMA, as the primary environmental legislation, is complemented by a number of sectoral laws governing marine living resources, mining, forestry, biodiversity, protected areas, pollution, air quality, waste and integrated coastal management. Principle number 3 determines that a development must be socially, environmentally, and economically sustainable. Principle Number 4(a) states that all relevant factors must be considered, *inter alia* i) that the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied; ii) that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied; vi) that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised; and viii) that negative impacts on the environment and on peoples' environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.

These Regulations contain the relevant listed activities that are triggered, thus requiring a full Scoping and EIA Process. Refer to Table 4.1 of this chapter for the complete list of listed activities. Refer to Section 4.2 of this chapter for additional information on the 2014 NEMA EIA Regulations, as amended.

4.1.1.3 Government Notice (GN) 960 (published 5 July 2019)

GN 960 was published on 5 July 2019 and came into effect for compulsory use of the National Web Based Environmental Screening Tool from 4 October 2019. The notice outlines the requirement to submit a report generated by the National Web Based Environmental Screening Tool, in terms of Section 24(5)(h) of the NEMA and Regulation 16(1)(b)(v) of the 2014 NEMA EIA Regulations, as amended, when submitting an application for Environmental Authorisation (EA) in terms of Regulations 19 and 21 of the 2014 NEMA EIA Regulations, as amended. As such, the Application for EA for the proposed Kaladokhwe WEF 3 project has been run through the National Web Based Environmental Screening Tool, and the associated report generated and attached to the Application for EA, which is being submitted to the DFFE with the Draft Scoping Report.

4.1.1.4 Government Notice (GN) 320 (20 March 2020)

GN 320 prescribes the general requirements for undertaking site sensitivity verification and protocols for the assessment and minimum report content requirements for identified environmental impacts for environmental themes in terms of sections 24(5)(a) and (h) and 44 of NEMA, when applying for EA.

The Specialist Assessments undertaken as part of this Scoping and EIA Process comply with GN 320, where applicable, including Aquatic Biodiversity, Terrestrial Biodiversity, Noise Impact, Agriculture and Avifauna. The remaining specialist assessments comply with Appendix 6 of the 2014 NEMA EIA Regulations, and where relevant, Part A of GN 320 which contains site sensitivity verification requirements where a Specialist Assessment is required but no specific assessment protocol has been prescribed. The site sensitivity verifications required for Defence and Civil Aviation also comply with GN 320. The protocols were enforced within 50 days of publication of the notice i.e., on 9 May 2020.

4.1.1.5 Government Notice (GN) 1150 (30 October 2020)

GN 1150 prescribes procedures and protocols in respect of specific environmental themes for the assessment of, as well as the minimum criteria for reporting on identified environmental themes in

terms of sections 24(5)(a) and (h) and 44 of the NEMA, when applying for EA. GN 1150 includes a protocol for the specialist assessment and minimum report content requirements for environmental impacts on a) Terrestrial Animal Species and b) Terrestrial Plant Species. The requirements of these protocols apply from the date of publication (i.e., from 30 October 2020), except where the Project Applicant provides proof to the Competent Authority that the specialist assessment affected by these protocols had been commissioned prior to the date of publication of these protocols in the Government Gazette, in which case Appendix 6 of the 2014 NEMA EIA Regulations will apply to such applications.

4.1.1.6 National Environmental Management: Biodiversity Act (Act 10 of 2004)

The National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA) provides for "the management and conservation of South Africa's biodiversity within the framework of the NEMA, the protection of species and ecosystems that warrant national protection, and the use of indigenous biological resources in a sustainable manner, amongst other provisions". The Act states that the state is the custodian of South Africa's biological diversity and is committed to respect, protect, promote, and fulfil the constitutional rights of its citizens.

Chapter 1 sets out the objectives of the Act, and they are aligned with the objectives of the Convention on Biological Diversity, which are the conservation of biodiversity, the sustainable use of its components, and the fair and equitable sharing of the benefits of the use of genetic resources. The Act also gives effect to CITES, the Ramsar Convention, and the Bonn Convention on Migratory Species of Wild Animals. The State is endowed with the trusteeship of biodiversity and has the responsibility to manage, conserve and sustain the biodiversity of South Africa.

This Act therefore serves to control the disturbance and land utilisation within certain habitats, as well as the planting and control of certain exotic species. Effective disturbance and removal of threatened or protected species encountered on or around the sites, will require specific permission from the applicable authorities.

Furthermore, NEMBA states that the loss of biodiversity through habitat loss, degradation or fragmentation must be avoided, minimised or remedied. The loss of biodiversity includes *inter alia* the loss of endangered, threatened or protected plant and animal species.

Chapter 5 of NEMBA (Sections 73 to 75) regulates activities involving invasive species, and lists duty of care as follows:

- the landowner/land user must take steps to control and eradicate the invasive species and prevent their spread, which includes targeting offspring, propagating material and regrowth, in order to prevent the production of offspring, formation of seed, regeneration or re-establishment;
- take all required steps to prevent or minimise harm to biodiversity; and
- ensure that actions taken to control/eradicate invasive species must be executed with caution and in a manner that may cause the least possible harm to biodiversity and damage to the environment.

An amendment to the NEMBA has been promulgated in 2011, which lists about 225 threatened or protected ecosystems based on vegetation types present within these ecosystems. Should a project fall within a vegetation type or ecosystem that is listed as being threatened or protected, actions in terms of NEMBA are triggered. Based on the preliminary sensitivity screening and site sensitivity verifications that were undertaken for the proposed development site during the Scoping Phase, none of the listed threatened ecosystems was found to occur within the proposed Kaladokhwe WEF 3 study area. However, the proposed development site does provide potential habitat to several terrestrial animal and plant species of conservation concern (SCC). This will be confirmed as part of the Terrestrial Biodiversity Impact Assessment to be undertaken during the EIA Phase.

4.1.1.7 The National Heritage Resources Act (Act 25 of 1999)

The National Heritage Resources Act (Act 25 of 1999) (NHRA) introduces an integrated and interactive system for the management of national heritage, archaeological and palaeontological resources (which include landscapes and natural features of cultural significance).

Parts of sections 35(4), 36(3) (a) and 38(1) of the NHRA apply to the proposed project:

Archaeology, palaeontology, and meteorites:
Section 35 (4) – No person may, without a permit issued by the responsible heritage resources authority:

a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
c) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects or use such equipment for the recovery of meteorites.

Burial grounds and graves:
Section 36 (3) (a) No person may, without a permit issued by South African Heritage Resources Agency (SAHRA) or a provincial heritage resources authority:

a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
b) destroy, damage, alter, exhume, remove from its original position, or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

Heritage resources management:
38 (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as:

a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
b) the construction of a bridge or similar structure exceeding 50 m in length;
c) any development or other activity which will change the character of the site –
    (i) exceeding 5 000 m^2 in extent, or

(ii) involving three or more erven or subdivisions thereof; or
(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA, or a provincial resources authority;

d) the re-zoning of a site exceeding 10 000 m^2 in extent; or
e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development.

While landscapes with cultural significance do not have a dedicated Section in the NHRA, they are protected under the definition of the National Estate (Section 3). Section 3(2)(c) and (d) list "historical settlements and townscapes" and "landscapes and natural features of cultural significance" as part of the National Estate. Furthermore, Section 3(3) describes the reasons a place or object may have cultural heritage value. Section 38 (2a) of the NHRA states that if there is reason to believe that heritage resources will be affected then an impact assessment report must be submitted.

The Eastern Cape Heritage Resources Authority (ECPHRA) is required to provide comment on the proposed project. An integrated Heritage Impact Assessment (HIA) including archaeology, palaeontology, cultural landscape and visual aesthetics will be undertaken during the EIA Phase. The HIA Report should be submitted, as part of the Draft EIA Report and EMPr, to the provincial heritage resources authority if established in the province i.e., ECPHRA as well as to the South African Heritage Resources Agency (SAHRA) for comment. SAHRA will ultimately be responsible for the evaluation of Phase 1 HIA Reports upon which review comments will be issued.

SAHRA as a commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) requires all environmental documents, complied in support of an Application for Environmental Authorisation as defined by Section 40 (1) and (2) of the 2014 NEMA EIA Regulations (as amended), to be submitted to SAHRA. As such, the EIA Report inclusive of its appendices as well as the EMPr must be submitted to the relevant case officer upon completion by the Environmental Assessment Practitioner (EAP).

In addition, comment will also be sought from the Inxuba Yethemba Local Municipality and the Enoch Mgijima Local Municipality, as well as from any local heritage conservation bodies within or nearest to the jurisdiction of the proposed project, if and where relevant, during the 30-day comment period in the EIA Phase. All comments received will be incorporated into the Comments and Responses Report that will be submitted with the Final EIA Report to National DFFE for decision-making.

The proposed project may require a permit in terms of the NHRA prior to any fossils or artefacts being removed by professional palaeontologists and archaeologists. If archaeological mitigation is needed, then the appointed archaeologist will need to submit a Work Plan to the ECPHRA or SAHRA to conduct the work. This must be carried out well in advance of construction to ensure that there is enough time for ECPHRA or SAHRA to approve the mitigation work before construction commences.

Should professional palaeontological mitigation be necessary during the construction phase, the palaeontologist concerned will need to apply for a Fossil Collection Permit from ECPHRA or SAHRA.

Palaeontological collection should comply with international best practice. All fossil material collected must be deposited, together with key collection data, in an approved depository (museum / university). Palaeontological mitigation work including the ensuing Fossil Collection reports should comply with the minimum standards specified by ECPHRA, if any, and SAHRA (2013).

4.1.1.8 National Forests Act (Act 84 of 1998)

The National Forest Act (Act 84 of 1998) (NFA) allows for the protection of certain tree species of conservation concern. The Minister has the power to declare a particular tree to be a protected tree. According to Section 12 (1) d (read with Sections (5) 1 and 62 (2) (c)) of the NFA, a licence is required to remove, cut, disturb, damage, or destroy any of the listed protected trees. The most recent list of protected tree species was published in 2019. The Department of Agriculture, Land Reform and Rural Development (DALRRD) is authorised to issue licences for any removal, cutting, disturbance, damage to or destruction of any protected trees. Therefore, the removal of any protected tree species listed within the NFA will require a tree removal permit, which can be obtained from the DALRRD.

4.1.1.9 Conservation of Agricultural Resources Act (Act 43 of 1983)

The objectives of the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) are to provide for the conservation of the natural agricultural resources of South Africa by the:

- maintenance of the production potential of land;
- combating and prevention of erosion and weakening or destruction of the water sources; and
- protection of the vegetation and the combating of weeds and invader plants.

The CARA states that no land user shall utilise the vegetation of wetlands (a watercourse or pans) in a manner that will cause its deterioration or damage. This includes cultivation, overgrazing, diverting water run-off and other developments that damage the water resource. The CARA includes regulations on alien invasive plants. According to the amended regulations (GN R280 of March 2001), declared weeds and invader plants are divided into three categories:

- Category 1 may not be grown and must be eradicated and controlled,
- Category 2 may only be grown in an area demarcated for commercial cultivation purposes and for which a permit has been issued, and must be controlled, and
- Category 3 plants may no longer be planted, and existing plants may remain as long as their spread is prevented, except within the flood line of watercourses and wetlands. It is the legal duty of the land user or landowner to control invasive alien plants occurring on the land under their control.

Should alien plant species occur within the development footprint, it will be managed in line with the Environmental Management Programme (EMPr). Rehabilitation after disturbance to agricultural land is also managed by CARA. The DALRRD reviews and approves applications in terms of these Acts according to their Guidelines for the evaluation and review of applications pertaining to renewable energy on agricultural land, dated September 2011.

4.1.1.10 National Water Act (Act 36 of 1998)

One of the important objectives of the National Water Act (Act 36 of 1998) (NWA) is to ensure the protection of the aquatic ecosystems of South Africa's water resources. Section 21 of this Act identifies certain land uses, infrastructural developments, water supply/demand and waste disposal as 'water uses' that require authorisation (licensing) by the Department of Water and Sanitation (DWS). Chapter 4 (Part 1) of the NWA sets out general principles for the regulation of water use. Water use is defined broadly in the NWA, and includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering the bed, banks, course, or characteristics of a watercourse, removing water found underground for certain purposes, and recreation. In general, a water use must be licensed unless it is listed in Schedule I, is an existing lawful use, is permissible under a general authorisation, or if a responsible authority waives the need for a licence. The Minister may limit the amount of water which a responsible authority may allocate. In making regulations the Minister may differentiate between different water resources, classes of water resources and geographical areas.

All water users who are using water for agriculture: aquaculture, agriculture: irrigation, agriculture: watering livestock, industrial, mining, power generation, recreation, urban and water supply service must register their water use. This covers the use of surface- and groundwater.

Section 21 of the NWA lists the following water uses that need to be licensed:

a) taking water from a water resource;
b) storing water;
c) impeding or diverting the flow of water in a watercourse;
d) engaging in a stream flow reduction activity contemplated in section 36;
e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
g) disposing of waste in a manner which may detrimentally impact on a water resource;
h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
i) altering the bed, banks, course or characteristics of a watercourse;
j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
k) using water for recreational purposes.

Any activities that take place within a watercourse, or within 100 m of the edge of a watercourse, or within 500 m of a delineated wetland boundary, will require a water use authorisation in terms of Section 21 (c) and Section 21 (i) of the NWA. An application for water use authorisation for the proposed Kaladokhwe WEF 3 might be required should any of the planned structures or infrastructure associated with the proposed project trigger water uses in terms of Section 21 (c) and Section 21 (i) of the NWA. The need for a General Authorisation or Water Use License will be confirmed during the EIA Phase.

4.1.1.11 Water Services Act (Act 108 of 1997)

Water will be required during the construction, operational and decommissioning phases of the proposed project. Potable water is only to be utilised for human consumption purposes, whereas greywater is to be

used for earthworks, dust suppression, etc. Water is likely to be sourced from the Inxuba Yethemba Local Municipality and/or the Enoch Mgijima Local Municipality. Compliance with this Act will be undertaken during the relevant phase of the project, in consultation with the local and district municipalities.

4.1.1.12 Hazardous Substances Act (Act 15 of 1973)

During the proposed project, fuel and diesel will be utilised to power vehicles, generators, and equipment. In addition, potential spills of hazardous materials could occur during the relevant phases. Such management actions will be recommended in the EMPr, which will be included as an Appendix to the EIA Report.

4.1.1.13 Subdivision of Agricultural Land Act (Act 70 of 1970)

The Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA) requires that any long-term lease associated with the renewable energy facility be approved by the DALRRD. The SALA consent is separate from the Application for EA and needs to be applied for and obtained separately. An application for the change of land use (re-zoning) for the development on agricultural land will be lodged by the Project Applicant for approval in terms of the SALA as required.

4.1.1.14 National Environmental Management: Waste Act (Act 59 of 2008) (NEMWA)

General and hazardous waste will be generated during the construction, operational and decommissioning phases, which will require proper management. Such management actions will be recommended in the EMPr, which will be included as an Appendix to the EIA Report.

4.1.1.15 National Environmental Management: Air Quality Act (Act 39 of 2004)

The proposed stockpiling activities, including earthworks, may result in the unsettling of, and temporary exposure to, dust. Appropriate dust control methods will need to be applied. Such management actions will be recommended in the EMPr, which will be included as an Appendix to the EIA Report.

4.1.1.16 Development Facilitation Act (Act 67 of 1995)

The Development Facilitation Act (Act 67 of 1995) (DFA) sets out a number of key planning principles which have a bearing on assessing proposed developments in light of the national planning requirements. The planning principles most applicable to the study area include:

- Promoting the integration of the social, economic, institutional and physical aspects of land development;
- Promoting integrated land development in rural and urban areas in support of each other;
- Promoting the availability of residential and employment opportunities in close proximity to or integrated with each other;
- Optimising the use of existing resources including such resources relating to agriculture, land, minerals, bulk infrastructure, roads, transportation and social facilities;
- Contributing to the correction of the historically distorted spatial patterns of settlement in the Republic and to the optimum use of existing infrastructure in excess of current needs;
- Promoting the establishment of viable communities; and
- Promoting sustained protection of the environment.

4.1.1.17 Other Applicable Legislation

Other applicable national legislation that may apply to the proposed project include:

- Advertising on Roads and Ribbons Act (Act 21 of 1940);
- Electricity Act (Act 41 of 1987);
- Electricity Regulations Amendments (August 2009);
- Energy Efficiency Strategy of the Republic of South Africa (Department of Minerals and Energy (DME), March, 2005);
- Environment Conservation Act (Act 73 of 1989);
- Promotion of Administrative Justice Act (Act 2 of 2000);
- Civil Aviation Act (Act 13 of 2009) and Civil Aviation Regulations (CAR) of 1997;
- Civil Aviation Authority Act (Act 40 of 1998);
- White Paper on Renewable Energy (2003);
- Integrated Resource Plan for South Africa (2010);
- Occupational Health and Safety Act (Act 85 of 1993), as amended by Occupational Health and Safety Amendment (Act 181 of 1993);
- Road Safety Act (Act 93 of 1996);
- Fencing Act (Act 31 of 1963);
- National Environmental Management: Protected Areas Act (NEM:PA) (Act 31 of 2004); and
- National Road Traffic Act (Act 93 of 1996).

4.1.2 Provincial Legislation

4.1.2.1 Eastern Cape Nature and Environmental Conservation Ordinance (No. 19 of 1974) and the Eastern Cape Nature Conservation Laws Amendment Act (Act No. 3 of 2000)

This Act should be given consideration following EA with particular respect to its Chapters IV (The protection of wild animals other than fish) and Chapter VI (The protection of flora). The requirement for permits when removing and relocating specific flora that may be encountered or alternatively addressing fauna that may be encountered around the sites would require due consideration.

The Eastern Cape Nature Conservation Laws Amendment Act (2000) provides for the amendment of various laws on nature conservation in order to transfer the administration of the provisions of those laws to the Eastern Cape Nature Conservation Board, which includes various regulations pertaining to wild plants and animals including avifauna.

4.1.2.2 Draft Eastern Cape Environmental Management Bill (7 May 2019)

The purpose of the Draft Eastern Cape Environmental Management Bill, 2019 is to rationalise, consolidate and reform the law regulating environmental management and to provide for the harmonisation of provincial legislation with national legislation regulating protected areas, biodiversity, waste management and air quality; and to provide for matters connected therewith. This bill has not yet been promulgated; however, some aspects of its Chapter 3 (Biodiversity: Listing of provincially protected species, restricted activities involving provincially protected and endangered species, general powers in respect of species, and the management of flora not listed as protected and endangered), in particular, may apply to the affected sites, once promulgated.

4.1.3 Local Planning Legislation

4.1.3.1 Environmental Management Framework

Research indicates that there is no Environmental Management Framework (EMF) available for the Chris Hani District Municipality. The Screening Tool also notes that no intersections with EMF areas have been found.

4.1.3.2 Inxuba Yethemba Local Municipality Integrated Development Plan (Inxuba Yethemba Local Municipality 2017-2022)

The **vision** of the Inxuba Yethemba Local Municipality Integrated Development Plan (IYLM IDP) 2017-2022 is to be a *Municipality working together with its citizens to ensure the provision of sustainable, equitable and quality services to all.*

Further unpacking of the vision indicates the provision of directives regarding the growth of the economy and ensuring financial sustainability among other areas in which development is required.

The five key performance areas from the five-year local government strategic agenda are:

1. Municipal transformation and organisational development
2. Infrastructure development and service delivery
3. Local economic development
4. Municipal financial viability and management
5. Good governance and public participation

4.1.3.3 Enoch Mgijima Local Municipality Integrated Development Plan (Enoch Mgijima Local Municipality 2017-2022)

The **vision** of the Enoch Mgijima Local Municipality Integrated Development Plan (EMLM IDP) 2017-2022 is to be *a developmental regional economic hub which is customer focused and committed to service excellence in delivering quality and sustainable services.*

Further unpacking of the vision indicates the provision of directives regarding the growth of the economy and ensuring financial sustainability among other areas in which development is required. The EMLM IDP (2017-2022) recognises renewable energy projects as having the potential to improve and stimulate sustainable growth and development of the economy.

The following points are provided in the EMLM IDP (2017-2022), outlining the Development strategy of the local municipality which is guided by the National Development Plan (2030):

- *"Creating jobs and improving livelihoods.*
- *Expanding infrastructure.*
- *Transition to a low carbon economy.*
- *Transforming urban and rural spaces.*
- *Improving education and training.*
- *Providing quality health care.*
- *Fighting corruption and enhancing accountability.*
- *Transforming society and uniting the nation."*

In addition, the EMLM developed five Strategic Focus Areas (SFA) including:

1. Rural Development and Agrarian Reform
    1.1. Village secondary cooperative movement and village-based commodity primary cooperative movement.
    1.2. Cooperative farming marketing system
    1.3. Cooperative farming services
2. Township Economies through small business center and spatial planning
3. SMME and Cooperatives Development.
4. Tourism and heritage development.
5. Investment Promotion, Industrial development, economic growth, and Job creation

The main priority issues identified within the Enoch Mgijima Local Municipality Integrated Development Plan (IDP) (2017-2022) can be summarized under the umbrellas of, improvement of service delivery and sustainable economic development. In terms of employment, the number of people employed in the formal sector comprised 77.56% of the total employment within the EMLM, whilst the number of people employed in the informal sector comprised 22.44% of the total employment in 2016. The EMLM has seen an increase in informal sector employment between 2006 and 2016. Although it is more desirable to see an increase in formal sector employment, the formal sector is not growing fast enough to generate enough jobs; therefore, the informal sector is seen as a survival mechanism for residents in the EMLM[2]. In 2016, it was estimated that 18.59% of households in the EMLM were living on R30 000 or less per annum. In addition, the EMLM is recorded as having a higher per capita income than both the Eastern Cape and the Chris Hani District Municipality and a lower per capita income than South Africa as a whole, in 2016[1].

The proposed Kaladokhwe WEF 3 project will create job opportunities and economic spin offs during the construction and operational phases (if an EA is granted by the DFFE). The proposed Kaladokhwe WEF 3 project would help to address the need for sustainable economic growth by leveraging competitive advantages of the region, in terms of harnessing the characteristic strong winds in the area to generate electricity. The proposed project will also help to address the need to improve basic service delivery and infrastructure development through increased electricity supply while also providing advanced skills transfer and training to the local communities and creating contractual and permanent employment in the area. It is estimated that up to 400 employment opportunities will be created during the construction phase and up to 50 during the operational phase. The proposed project will therefore be supportive of the IDP's priority areas of facilitating job creation to address the high unemployment rate, improving infrastructure development, and promoting financial sustainability.

4.1.3.4 Guidelines, Frameworks and Protocols

- DEA Public Participation Guideline published in terms of the NEMA EIA Regulations (DEA, 2012 and DEA, 2017);
- DEA&DP and DEA Guidelines published in terms of the NEMA EIA Regulations, in particular:
    - Guideline on Alternatives (DEA, 2014);
    - Guideline on Transitional Arrangements (DEA&DP, 2013);
    - Guideline on Alternatives (DEA&DP, 2013);

[1] Enoch Mgijima Local Municipality, (2017-2022). Enoch Mgijima Local Municipality Integrated Development Plan

[2] Enoch Mgijima Local Municipality, (2017). Enoch Mgijima Local Municipality Socio Economic Review and Outlook.

  - Guideline on Public Participation (DEA&DP, 2013);
  - National Noise Control Regulations (GN R154 of 1992) and SANS 10103:2008;
  - South African Best Practice Guidelines for Pre-Construction Monitoring of Bats at Wind Energy Facilities (2020);
  - South African Good Practice Guidelines for Operational Monitoring for Bats at Wind Energy Facilities (2020);
  - Best practice guidelines for avian (bird) monitoring and impact mitigation at proposed wind energy development areas in southern Africa (2015);
  - Guideline on Need and Desirability (DEA&DP, 2013);
  - Guideline on Need and Desirability (DEA, 2017).
- Information Document on Generic Terms of Reference for EAPs and Project Schedules (March 2013);
- Integrated Environmental Management Information Series (Booklets 0 to 23) (Department of Environmental Affairs and Tourism (DEAT), 2002 – 2005);
- Guidelines for Involving Specialists in the EIA Processes Series (DEA&DP; CSIR and Tony Barbour, 2005 – 2007);
- United Nations Framework Convention on Climate Change (1997); and
- Kyoto Protocol (which South Africa acceded to in 2002).

4.1.4 International Finance Corporation Performance Standards

In order to promote responsible environmental stewardship and socially responsible development, the proposed Kaladokhwe WEF 3 will as far as practicable incorporate the environmental and social policies of the International Finance Corporation (IFC). These policies provide a frame of reference for lending institutions to review environmental and social risks of projects, particularly those undertaken in developing countries.

Through the Equator Principles, the IFC's standards are now recognised as international best practice in project finance. The IFC screening process categorises projects into A, B or C in order to indicate relative degrees of environmental and social risk. The categories are:

- *Category A* - Projects expected to have significant adverse social and/or environmental impacts that are diverse, irreversible, or unprecedented;
- *Category B* - Projects expected to have limited adverse social and/or environmental impacts that can be readily addressed through mitigation measures; and
- *Category C* - Projects expected to have minimal or no adverse impacts, including certain financial intermediary projects.

Accordingly, projects such as the proposed Kaladokhwe WEF 3 are categorised as Category B projects. The EIA Process for Category B projects examines the project's potential negative and positive environmental impacts. As required for Category B projects, a Scoping and EIA Process is being undertaken for the proposed Kaladokhwe WEF 3 project.

Other Acts, standards and/or guidelines which may also be applicable will be reviewed in more detail as part of the specialist studies to be conducted for the EIA Process.

4.2 Legal Context for this EIA

Section 24(1) of the NEMA, as amended states that "*In order to give effect to the general objectives of integrated environmental management laid down in this Chapter, the potential impact on the environment of listed activities must be considered, investigated, assessed and reported to the Competent Authority charged by this Act with granting the relevant EA*". The reference to "listed activities" relates to the regulations promulgated in Government Notice (GN) R982, R983, R984 and R985 in Government Gazette 38282, dated 4 December 2014, which came into effect on 8 December 2014. These were amended in April 2017, specifically promulgated in GN R326, R327, R325 and R324 in Government Gazette 40772, dated 7 April 2017. GN R327 and GN R324 includes listed activities that trigger the need for a Basic Assessment (BA) Process, whereas GN R325 includes listed activities that trigger the need for a full Scoping and Environmental Impact Assessment (S&EIA) Process.

In terms of the NEMA, as amended and the 2014 NEMA Environmental Impact Assessment (EIA) Regulations as amended, a full S&EIA Process is required for the construction of the proposed Kaladokhwe WEF 3 project.

The need for the full S&EIA Process is triggered by, amongst others, the inclusion of Activity 1 listed in GN R325 (Listing Notice 2):

"The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facility or infrastructure is for photovoltaic installations and occurs (a) within an urban area; or (b) on existing infrastructure".

Note that the proposed Kaladokhwe WEF 3 project is not located within any of the 11 Renewable Energy Development Zones (REDZs) gazetted in GN 114 on 16 February 2018 and GN 144 on 26 February 2021, nor is it located within any of the strategic power corridors gazetted in GN 113 on 16 February 2018; therefore, a full Scoping and EIA Process is being undertaken for the proposed WEF, subjected to a 107-day decision-making timeframe.

All the listed activities forming part of this proposed development and therefore requiring EA are included in the Application Form for EA that has been prepared and has been submitted to the DFFE with this Draft Scoping Report. The listed activities triggered by the proposed Kaladokhwe WEF 3 are indicated in Table 4.1.

Table 4.1: Listed Activities in GN R327, GN R325, and GN R324 that will be potentially triggered by the proposed Kaladokhwe Wind Energy Facility 3

Listed Activity Number	Listed Activity Description	Description of the project activity that potentially triggers the relevant listed activity
GN R327 (LISTING NOTICE 1)		
Activity 11 (i)	The development of facilities or infrastructure for the transmission and distribution of electricity - (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is — (a) temporarily required to allow for maintenance of existing infrastructure; (b) 2 kilometres or shorter in length; (c) within an existing transmission line servitude; and (d) will be removed within 18 months of the commencement of development.	The proposed project will entail the construction of two 33 kV / 132 kV on-site substation hubs incorporating the facility substation, switchyard and collector infrastructure. The proposed project will be constructed on various farm portions approximately 30 km northeast of Nxuba (previously Cradock) within the Inxuba Yethemba Local Municipality and Enoch Mgijima Local Municipality, Eastern Cape Province and is therefore situated outside of the urban edge. This activity would therefore be applicable.
Activity 12 (ii) (a) and (c)	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; b) in front of a development setback; or c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding - (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the	The proposed project will be constructed across various farm portions located approximately 30 km northeast of Nxuba (previously Cradock) within the Inxuba Yethemba Local Municipality and the Enoch Mgijima Local Municipality, both of which fall within the Chris Hani District Municipality, in the Eastern Cape Province. Hence, the proposed project will be developed outside of an urban area. The proposed WEF will entail the construction of built infrastructure and structures (such as wind turbines, hardstands, offices, workshops, Operations and Maintenance (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 32 m of small drainage features and/or other watercourses. This activity is therefore applicable. The National Web-based Screening Tool shows some rivers and wetlands are present within the study area. Refer to the map included in Appendix 11 of this form. This will be confirmed and verified during the detailed specialist assessments.

Listed Activity Number	Listed Activity Description	Description of the project activity that potentially triggers the relevant listed activity
	commencement of development and where indigenous vegetation will not be cleared.	**Note from the CSIR: Additional information regarding the presence of watercourses on site is provided in the Specialist Aquatic Biodiversity and Terrestrial Biodiversity scoping inputs, which are included in the Draft Scoping Report (as Appendix F.5 and Appendix F.6.)**
Activity 14	The development of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	The proposed WEF project will include the installation of a Battery Energy Storage System (BESS). The BESS will comprise of a selection of electrochemical batteries together with chargers, inverters and related equipment. The BESS will have a maximum height of 8 m (as recommended) and cover an area of approximately five (5) ha. **Note from CSIR: This activity is only applicable to the flow BESS and not any of the other BESS types being assessed as the materials to be stored in the tanks, that is likely to have a combined capacity of more than 80 m3 but not exceeding 500 m3, might be considered a dangerous good in terms of the SANS definition in the regulations.** This activity is therefore applicable.
Activity 19 (i)	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from (i) a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving- a) will occur behind a development setback; b) is for maintenance purposes undertaken in accordance with a maintenance management plan; c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	The proposed WEF project will entail the excavation, removal and moving of more than 10 m^3 of soil, sand, pebbles, or rock from nearby watercourses on site, mainly for the purpose of constructing access roads. As a result, the proposed WEF project could potentially also entail the infilling of more than 10 m^3 of material into the nearby watercourses. The National Web-based Screening Tool (ST) shows some rivers and wetlands are present within the study area. Refer to the ST map included in Appendix 11 of this form. This will be confirmed and verified during detailed specialist assessments. Details of the infilling of and excavations from the to be affected watercourses/drainage features will be confirmed during the detailed engineering design phase, post EA, prior to construction. This activity is therefore applicable. **Note from the CSIR: Additional information regarding the presence of watercourses on site is provided in the Specialist Aquatic Biodiversity and Terrestrial Biodiversity scoping inputs, which are included in the Draft Scoping Report (as Appendix F.5 and Appendix F.6.)**
Activity 24 (ii)	The development of a road –	A temporary road corridor of up to 15 m will be impacted during the construction phase. This will

Listed Activity Number	Listed Activity Description	Description of the project activity that potentially triggers the relevant listed activity
	(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding a road– a) which is identified and included in activity 27 in Listing Notice 2 of 2014; or b) where the entire road falls within an urban area; or which is 1 km or shorter.	be rehabilitated after the completion of construction activities to allow for a permanent 6 m wide road surface, with side drains on one or both sides where necessary. This activity is therefore applicable.
Activity 27	The clearance of an area of 1 hectare (ha) or more, but less than 20 ha of indigenous vegetation, except where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	The proposed WEF project will entail the construction of infrastructure with a combined physical footprint of more than 1 ha that will require clearance of indigenous vegetation. This activity is therefore applicable.
Activity 28 (ii)	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.	The proposed WEF project will take place outside of an urban area and across several adjoining farm portions. The proposed WEF, which is considered as a commercial / industrial development, will have an estimated total permanent development footprint of more than 20 ha. The proposed project will also entail the construction of two on-site substations (with a combined footprint of up to 8 ha), as well as a BESS (up to 5 ha footprint), and various associated structures and infrastructure. This will constitute infrastructure with a total physical footprint of more than 1 ha. This activity is therefore applicable.
Activity 48 (i) (a) and (c)	The expansion of (i) infrastructure or structures where the physical footprint is expanded by 100 square metre or more, (a) within a watercourse and (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.	The proposed project 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 in excess of 100 m^2 within a watercourse, or within 32 m of a watercourse. This activity is therefore applicable.
Activity 56 (i) (ii)	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre -	The proposed WEF project and associated infrastructure will be located approximately 30 km northeast of the town of Nxuba (previously

Listed Activity Number	Listed Activity Description	Description of the project activity that potentially triggers the relevant listed activity
	(i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur inside urban areas.	Cradock) in the Eastern Cape Province. Access to the proposed Kaladokhwe WEF 3 project site will be facilitated via existing public roads off the R390 provincial tar road connecting Nxuba (previously Cradock) and Hofmeyr, and potentially also the R61 road connecting Nxuba (previously Cradock) and Tarkastad. The main access road to the WEF will comprise a gravel road with a maximum width of 10 m. In addition to the existing internal service 'farm' roads on site, which will be extended to a maximum width of 10 m and potentially lengthened by more than a kilometre, additional internal service roads are to be constructed on the project site of which the width will not exceed 10 m including road reserve. The length of the internal service road network for the proposed Kaladokhwe WEF 3 is approximately 40 km. This activity is therefore applicable.
GN R325 (LISTING NOTICE 2)		
Activity 1	The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for PV installations and occurs (a) within an urban area or; (b) on existing infrastructure.	The proposed project will entail the development of a wind energy facility (WEF). The proposed WEF will comprise a maximum generation capacity of 240 MW (i.e., facility for the generation of electricity from a renewable resource). Also, the proposed WEF project will take place outside of an urban area. This activity is therefore applicable.
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: (i) the undertaking of a linear activity; or (i) maintenance purposes undertaken in accordance with a maintenance management plan.	The total permanent development footprint of the proposed WEF is expected to be more than 20 ha. As a result, more than 20 ha of indigenous vegetation will be removed for the construction of the proposed project. This activity is therefore applicable.
GN R324 (LISTING NOTICE 3)		
Activity 4 (a) (i) and (ee)	The development of a road wider than 4 metres with a reserve less than 13,5 metres. a. Eastern Cape i. Areas outside urban areas:	A 12 m road corridor may be temporarily impacted upon during construction and rehabilitated to 6 m wide after construction. The Kaladokhwe WEF 3 will have a total road network of up to 40 km. The proposed project will take place outside of an urban area in the Eastern Cape, on sites that appear to contain indigenous vegetation, as well as Ecological Support Areas (ESAs) and Critical

Listed Activity Number	Listed Activity Description	Description of the project activity that potentially triggers the relevant listed activity
	(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;	Biodiversity Areas (CBAs) in terms of the 2019 Eastern Cape Biodiversity Conservation Plan (ECBCP). This activity is therefore applicable.
Activity 10 (a) (i) (ee)	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 – a. Eastern Cape i. Outside urban areas: (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;	The proposed WEF will include the installation of a BESS. The BESS will comprise of a selection of electrochemical batteries together with chargers, inverters, and related equipment. The BESS will cover an area of up to five (5) ha, have a maximum height of 8 m (as recommended) and have a capacity of 1000 MWh. The proposed project will take place outside of an urban area in the Eastern Cape, on sites that contain ESAs and CBAs in terms of the 2019 ECBCP. This activity is therefore applicable.
Activity 12 (a) and (ii)	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. a. Eastern Cape ii. Within critical biodiversity areas identified in bioregional plans;	The proposed WEF will have an estimated total permanent development footprint of more than 20 ha. As a result, more than 300 m^2 of indigenous vegetation will be removed for the construction of the proposed WEF and its associated infrastructure. The proposed project will take place outside of an urban area in the Eastern Cape, on sites that contain ESAs and CBAs in terms of the 2019 ECBCP. This activity is therefore applicable.
Activity 14 (ii) (a) and (c); (a), (i) and (ff)	The development of – (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs – (a) within a watercourse; (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; a. Eastern Cape i. Outside urban areas: (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity	The proposed project will be constructed across various farm portions and located approximately 30 km northeast of Nxuba (previously Cradock), within the Inxuba Yethemba Local Municipality and the Enoch Mgijima Local Municipality, both of which fall within the Chris Hani District Municipality. Hence, the proposed project will take place outside of an urban area. The proposed WEF will entail the construction of built infrastructure and structures (such as a temporary site camp, concrete batching plants, offices, workshops, O&M buildings, ablution facilities, on-site substations, laydown area and security enclosures etc.). The infrastructure and structures are expected to exceed a footprint of 10 m^2 and some may occur within small drainage features and/or within 32 m of the watercourses.

Listed Activity Number	Listed Activity Description	Description of the project activity that potentially triggers the relevant listed activity
	plans adopted by the competent authority or in bioregional plans	The National Web-based Screening Tool (ST) shows some rivers and wetlands are present within the study area. Refer to the ST map included in Appendix 11 of this form. This will be confirmed and verified during detailed specialist assessments. Also, the proposed WEF project will take place outside of an urban area in the Eastern Cape, on sites that contain ESAs and CBAs in terms of the 2019 ECBCP. This activity is therefore applicable.
Activity 18 (a) (i) (ee)	The widening of a road by more than 4 meters, or the lengthening of a road by more than 1 kilometer. a. Eastern Cape i. All areas outside urban areas: (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans	Existing roads will be used as far as practically achievable and will be upgraded where needed. There is a possibility that the existing roads will be widened by more than 4 m or lengthened by more than 1 km. The proposed WEF project will take place outside of an urban area in the Eastern Cape, on sites that may contain indigenous vegetation and contain ESAs and CBAs in terms of the 2019 ECBCP. This activity is therefore applicable.

Notes regarding the identification of potential listed activities:

- *It should be noted that a precautionary approach was followed when identifying listed activities (for inclusion in the Application for EA and to be assessed as part of the Scoping and EIA Process), i.e., if the activity potentially forms part of the project, it is listed. However, the final project description will be shaped by the findings of the EIA Process and certain activities may be added or removed from the project proposal, followed by the submission of an Amended Application Form for EA to the DFFE, as required.*
- *Also important to note is that the assessment for and inclusion of relevant listed activities applicable to the construction of the proposed transmission powerlines and associated electrical grid infrastructure (EGI) for purposes of the proposed Kaladokhwe WEF 3 project does not form part of this Scoping and EIA Process and are therefore excluded from Table 4.1. The EGI component to the proposed Kaladokhwe WEF 3 project is still to be confirmed by the Project Developer and will therefore form part of a separate Environmental Assessment Process, which will be undertaken at a later stage.*

4.3 National Web-Based Environmental Screening Tool

As noted above, GN 960 (dated 5 July 2019) published a notice of the compulsory requirement (as from 4 October 2019) to submit a report generated by the National Web Based Environmental Screening Tool, when submitting an Application for EA. The proposed Kaladokhwe WEF 3 project site has accordingly been run through the National Web Based Environmental Screening Tool, and the associated report generated and attached to the Application for EA.

Based on the selected classification, the National Web Based Environmental Screening Tool provides a list of specialist assessments that should be undertaken as part of the Scoping and EIA Process, as well as identifies the sensitivities on site that need to be verified by either the EAP or the specialists, where

relevant, as noted in the Assessment Protocols of 20 March 2020 (GN 320) and 30 October 2020 (GN 1150). The classification that applies to the proposed project is **Utilities Infrastructure; Electricity; Generation; Renewable; and Wind**.

The following list of Specialist Assessments have been identified by the National Web Based Environmental Screening Tool for inclusion in the Scoping and EIA Report (Table 4.2). The National Web Based Environmental Screening Tool Report notes that it is the responsibility of the EAP to confirm this list and to motivate in the Scoping Report, the reason for not including any of the identified specialist assessments, where relevant.

Table 4.2: List of Specialist Assessments identified by the Screening Tool for the proposed Kaladokhwe Wind Energy Facility 3

Specialist Assessment Required by the Screening Tool		Assessment undertaken in Scoping and EIA Process	Type of Assessment undertaken in Scoping and EIA Process	Appendix of Scoping Report
1	Agriculture and Soils	Yes	Protocol GN 320 – Part A: Site Sensitivity Verification; and Part B – Agriculture (Protocol for the Specialist Assessment and Minimum Report Content Requirements of Environmental Impacts on Agricultural Resources by Onshore Wind Energy Generation Facilities where the Electricity Output is 20 Megawatts or more): Compliance Statement	Appendix F.1
2	Landscape/Visual Impact Assessment	Yes	Protocol GN 320 – Part A: Site Sensitivity Verification; and Appendix 6: Impact Assessment	Appendix F.8
3	Flicker Impact Assessment	Yes		
4	Archaeological and Cultural Heritage Impact Assessment	Yes	Protocol GN 320 – Part A: Site Sensitivity Verification; and Appendix 6: Impact Assessment In line with ECPHRA and SAHRA requirements, an integrated Heritage Impact Assessment including Archaeology, Palaeontology and Cultural Landscape will be undertaken.	Appendix F.2
5	Palaeontology Impact Assessment	Yes		
6	Terrestrial Biodiversity Impact Assessment	Yes	Protocol GN 320 – Part A: Site Sensitivity Verification; and Part B – Biodiversity (Protocol for the specialist assessment and impacts on terrestrial biodiversity): Impact Assessment The Terrestrial Biodiversity Impact Assessment includes feedback on Terrestrial Plant and Animal Species as per the Species Protocol gazetted in GN 1150 dated 30 October 2020 (as discussed above in Section 4.1.1.5). The Impact Assessment to be undertaken as part of this Scoping and EIA Process is referred to as a Terrestrial Biodiversity and Species Impact Assessment.	Appendix F.6
7	Plant Species Assessment	Yes		
8	Animal Species Assessment	Yes		
9	Aquatic Biodiversity Impact Assessment	Yes	Protocol GN 320 – Part A: Site Sensitivity Verification; and Part B - Biodiversity (Protocol for	Appendix F.5

Specialist Assessment Required by the Screening Tool		Assessment undertaken in Scoping and EIA Process	Type of Assessment undertaken in Scoping and EIA Process	Appendix of Scoping Report
			the specialist assessment and impacts on aquatic biodiversity): Impact Assessment The Impact Assessment to be undertaken as part of this Scoping and EIA Process is referred to as an Aquatic Biodiversity Impact Assessment. Note there is currently no Species Protocol applicable to Aquatic Plants and Animals.	
10	Avifauna Impact Assessment	Yes	Protocol GN 320 – Part A: Site Sensitivity Verification; and Part B – Avifauna (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 20 Megawatts or more): Impact Assessment Minimum report content requirements for environmental impacts on avifaunal species by onshore wind energy generation facilities (i.e. the Kaladokhwe WEF 3) as prescribed in GN 320 indicates that an "Avifaunal Specialist Assessment must be undertaken based on the results of a site specific Pre-Application Avifaunal Monitoring Plan that is informed by a Reconnaissance Study, as well as data collected over four seasons (i.e. summer, autumn, winter and spring) on the preferred site and the control site". As such, this study was commissioned by the Project Developer in 2020 already in accordance with GN 320, prior to the appointment of the EAP (i.e., CSIR) in 2022 to conduct this Scoping and EIA Process.	Appendix F.3
11	Noise Impact Assessment	Yes	Protocol GN 320 – Part A: Site Sensitivity Verification; and Part B – Noise (Protocol for the specialist assessment and minimum report content requirements for noise impacts): Impact Assessment	Appendix F.7
12	Bat Impact Assessment	Yes	Protocol GN 320 – Part A: Site Sensitivity Verification; and Appendix 6: Impact Assessment A pre-construction monitoring plan was designed to monitor bat activity across the entire area of interest proposed by the Kaladokhwe WEF 3. The baseline environment is being investigated by using acoustic monitoring to document bat activity over a period of 12 months. The monitoring is being undertaken in accordance with the South African Best Practice Guidelines for Pre-Construction Monitoring of Bats at Wind Energy Facilities (2020).	Appendix F.4

Specialist Assessment Required by the Screening Tool		Assessment undertaken in Scoping and EIA Process	Type of Assessment undertaken in Scoping and EIA Process	Appendix of Scoping Report
13	Socio-Economic Assessment	Yes	Appendix 6: Impact Assessment There are no themes on the Screening Tool that currently relate to Socio-Economic features that could be verified on site. Hence, Part A of GN 320 (Site Sensitivity Verification) is not applicable in this regard.	Appendix F.10
14	Traffic Impact Assessment	Yes	Appendix 6: Impact Assessment There are no themes on the Screening Tool that currently relate to traffic or transport features that could be verified on site. Hence, Part A of GN 320 (Site Sensitivity Verification) is not applicable in this regard.	Appendix F.9
15	Civil Aviation Assessment	Yes	Protocol GN 320 – Part A: Site Sensitivity Verification; and Part B – Civil Aviation (Protocol for the specialist assessment and minimum report content requirements for environmental impacts on civil aviation installations): No further assessment requirements are identified as the entire area of interest for the proposed Kaladokhwe WEF 3 project site is mainly classified as 'low' sensitivity, except for a small portion in the southernmost part of the project site that is classified as 'medium' sensitivity. Note that the EAP has disputed this finding based on a site sensitivity verification conducted during a site visit from 19-21 September 2022. Therefore, only a site sensitivity verification is provided to confirm the entire site as a low sensitivity, as required by GN 320.	Appendix F.11
16	Defence Assessment	Yes	Protocol GN 320 – Part A: Site Sensitivity Verification; and Part B - Defence (Protocol for the specialist assessment and minimum report content requirements for environmental impacts on defence installations): No further assessment requirements are identified as the entire area of interest for the proposed Kaladokhwe WEF 3 project site is classified as 'low' sensitivity. Only a site sensitivity verification is provided to confirm the site as a low sensitivity, as required by GN 320.	Appendix F.12
17	Radio Frequency Interference (RFI) Assessment	No	Motivation not to undertake this specialist assessment is provided in Section 4.3.1 below.	Not Applicable

4.3.1 Square Kilometer Array and Radio Frequency Interference

In 2012, South Africa and eight (8) partner countries (Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Namibia, and Zambia) were selected as the preferred site for hosting the Square Kilometre Array (SKA), the world's largest and most sensitive radio telescope. Five countries submitted responded to

an invitation to submit proposals to host the SKA in 2003. The original bid proposal was submitted and endorsed by South African Cabinet in 2003 in line with the national research and development strategy, published in 2002 and the Government's Astronomy Geographic Advantage Programme (AGA) ((DFFE, 2019: Part 3, Page 2).

The Astronomy Geographic Advantage (AGA) Act (Act 21 of 2007) aims to provide for the preservation and protection of areas within the Republic that are uniquely suited for optical and radio astronomy; to provide for intergovernmental co-operation and public consultation on matters concerning nationally significant astronomy advantage areas; and to provide for matters connected therewith. The purpose of the AGA Act is to preserve the geographic advantage areas that attract investment in astronomy. The AGA Act also notes that declared astronomy advantage areas are to be protected and properly maintained in terms of Radio Frequency Interference (RFI). The AGA Act is administered by the Department of Science and Innovation (previously the Department of Science and Technology).

According to the CSIR Wind and Solar Phase 2 SEA (DFFE, 2019: Part 3, Page 2), the majority of the mid-frequency dish array of the Square Kilometre Array (SKA) will be constructed in the core which is located in the Northern Cape; with dish antennas being located in the spiral arms. The South African component of the SKA will consist of approximately 3 000 receptors comprising dish antennas, each with a diameter of 15 m, and radio receptors known as dense aperture-arrays. The outer stations in the spiral arms will extend beyond the borders of South Africa and at least 3 000 km from the core area. About 80% of the receptors, including a dense core and up to five (5) spiral arms, will be located in the Karoo Central Astronomy Advantage Area (KCAAA) (DFFE, 2019: Part 3, Page 2).

The KCAAA, which is located between Brandvlei, Van Wyksvlei, Carnarvon, and Williston in the Northern Cape Province, was officially declared in 2014 by the Minister of Science and Technology in terms of the AGA Act for the purposes of protection RFI and Electromagnetic Interference (EMI). The declaration of the KCAAA ensures the long-term viability of the area to be used for astronomical installations (DFFE, 2019: Part 3, Page 2).

Table 4.3: SKA sensitivity distance guidelines (Source: DFFE, 2019: Part 3, Page 2)

Colour	Sensitivity	Distance from SKA Facility	
		Wind	Other Solar PV
Dark Red	Very High	Less than 18 km	Less than 8 km
Red	High	Between 18 and 26 km	Between 8 and 14 km
Orange	Medium	Between 26 and 48 km	Between 14 and 32 km
Green	Low	Greater than 48 km	Greater than 32 km

The location of the proposed Kaladokhwe WEF 3 project does not pose an EMI or RFI risk to the SKA, as the proposed project is located outside of the Northern Cape as well as the KCAAA. Refer to Figure 4.1 for the location of the proposed project in relation to the SKA and KCAAA. Furthermore, the proposed project site falls within an area of low sensitivity in terms of RFI sensitivity for the development of wind energy (Table 4.3). This also aligns with the findings of the Screening Tool (i.e., the proposed project site is characteristic of overall low sensitivity in terms of the relative RFI theme sensitivity except for two small areas indicated

as high sensitivity in terms of RFI sensitivity with the designation "Within 1 km of a telecommunication facility").

During the pre-application consultation undertaken with DFFE during in September 2022, it was explained that it is not intended to commission a RFI study for the proposed WEF project due to (i) the location of the proposed project being entirely within the Eastern Cape and far away from the SKA and KCAAA; (ii) the findings of the Screening Tool; (iii) the findings of the Wind and Solar Phase 1 SEA (DEA, 2015); and (iv) the Wind and Solar Phase 2 SEA (DFFE, 2019).
Note that during a site visit undertaken by the EAP in September 2022 the location of the RFI beacons as per the findings of the Screening Tool have been confirmed and it was found that the development of the proposed project will not pose a risk to any one of these RFI features and therefore the sensitivity of the project site should be considered low sensitivity in terms of the relative RFI theme sensitivity entirely.

Furthermore, the South African Radio Astronomy Observatory (SARAO) is registered on the project I&AP database as a key stakeholder and will be informed of the availability of the Draft Scoping Report for a 30-day comment period. Therefore, the SARAO can provide comment on the project during the 30-day comment period.

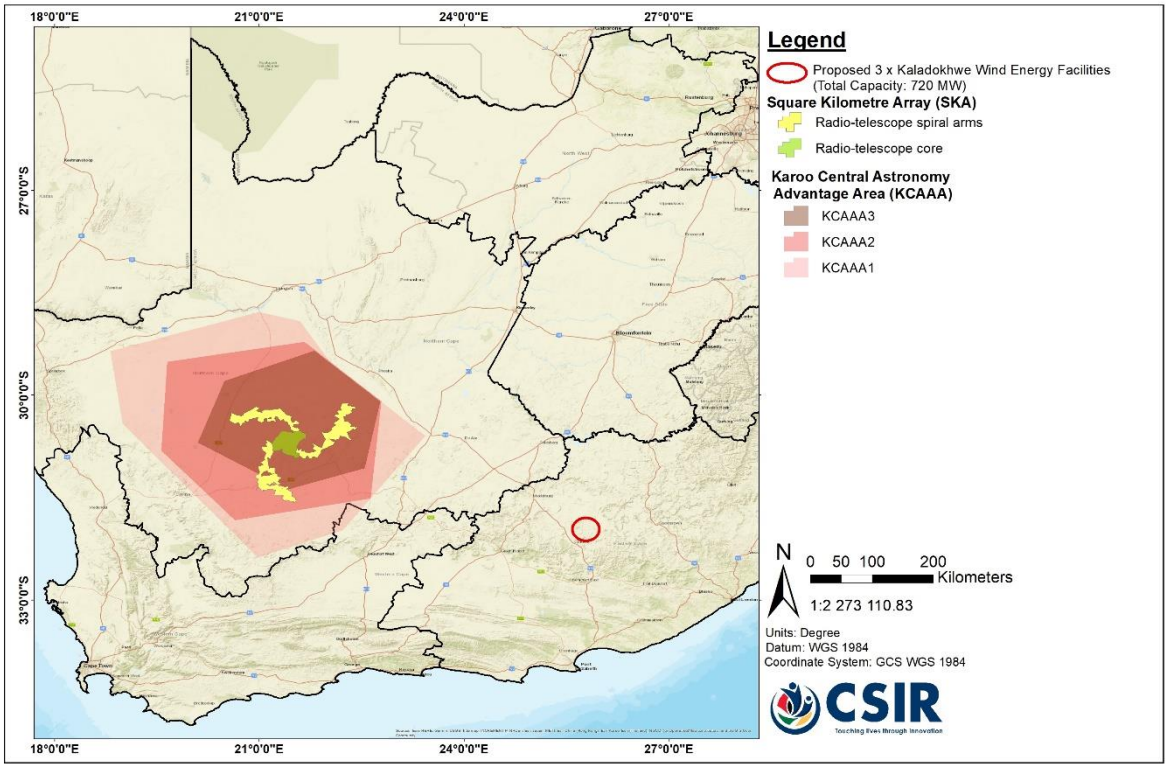

Figure 4.1: Location of the proposed Kaladokhwe WEF 3 project in relation to the SKA and KCAAA

4.4 Principles for Scoping and Public Participation

4.4.1 Objectives of the Scoping Phase

This Scoping Process is being planned and conducted in a manner that is intended to identify and provide sufficient information to enable the authorities to reach a decision regarding the scope of issues to be

addressed in this EIA Process, and in particular to convey the range of specialist assessments that will be included as part of the Environmental Impact Reporting Phase of the EIA, as well as the approach to these specialist assessments.

As highlighted in Chapter 1 of this Scoping Report, within this context, the objectives of this Scoping Process (as per the 2014 NEMA EIA Regulations, as amended) are to:

- Identify the relevant policies and legislation relevant to the proposed development;
- 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 inform a broad range of stakeholders about the proposed development;
- Confirm the process to be followed and opportunities for stakeholder engagement;
- Clarify the project scope to be covered;
- 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 for the preferred activity, through a detailed site selection process, which includes an identification of impacts and risks inclusive of identification of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
- Clarify the alternatives being considered and ensure due consideration of alternative options regarding the proposed development, including the "No-go" option;
- Conduct an open, participatory and transparent approach and facilitate the inclusion of stakeholder issues in the decision-making process;
- Identify and document the key issues to be addressed in the impact assessment phase (through a process of broad-based consultation with stakeholders) and the approach to be followed in addressing these issues;
- Confirm the level of assessment to be undertaken during the impact assessment, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
- Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

4.4.2 Introduction to the Public Participation Process

This section provides an overview of the tasks being undertaken in the Scoping Phase, with a particular emphasis on providing a clear record of the public participation process (PPP) followed. As discussed in Chapter 1 of this Scoping Report, separate EIA processes are being undertaken for each of the proposed Kaladokhwe WEF 1, the Kaladokhwe WEF 2 and the Kaladokhwe WEF 3 projects. As such, separate applications for Scoping and EIA will be submitted to the DFFE for the three proposed Kaladokhwe WEF projects, respectively.

An integrated PPP is however being undertaken for the proposed WEF project cluster and its associated infrastructure, which entails that all public participation documents (such as newspaper advertisements, site notices, notification letters, emails, etc.) will serve to notify the I&APs and Organs of State of the joint availability of the reports for the abovementioned projects and will provide I&APs with an opportunity to comment on the reports. This approach was undertaken due to the close proximity of the sites (i.e., the proposed projects will take place within the same geographical area and on adjoining farm properties) and that the proposed projects entail the same activity (i.e., generation of energy using a renewable source (i.e., Wind)).

The PPP for this Scoping and EIA Process is being driven by a stakeholder engagement process that will include inputs from authorities, I&APs, technical specialists, and the project proponent. Guideline 4 on "*Public Participation in support of the EIA Regulations*" published by the Department of Environmental Affairs and Tourism (DEAT) in May 2006, states that public participation is one of the most important aspects of the EA Process. This stems from the requirement that people have a right to be informed about potential decisions that may affect them and that they must be afforded an opportunity to influence those decisions. Effective public participation also improves the ability of the Competent Authority (CA) to make informed decisions and results in improved decision-making as the view of all parties are considered.

An effective PPP could therefore result in stakeholders working together to produce better decisions than if they had worked independently. The DEAT guideline states the following in terms of PPP:

- "Provides an opportunity for I&APs, EAPs and the CA to obtain clear, accurate and understandable information about the environmental impacts of the proposed activity or implications of a decision;
    - Provides I&APs with an opportunity to voice their support, concern and question regarding the project, application or decision;
    - Enables an applicant to incorporate the needs, preferences and values of affected parties into its application;
    - Provides opportunities for clearing up misunderstanding about technical issues, resolving disputes and reconciling conflicting interests;
    - Is an important aspect of securing transparency and accountability in decision-making; and
    - Contributes toward maintaining a health, vibrant democracy."

To the above, one can add the following universally recognised principles for public participation:

- Inclusive consultation that enables all sectors of society to participate in the consultation and assessment processes;
- Provision of accurate and easily accessible information in a language that is clear and sufficiently non-technical for I&APs to understand, and that is sufficient to enable meaningful participation;
- Active empowerment of grassroots people to understand concepts and information with a view to active and meaningful participation;

- Use of a variety of methods for information dissemination in order to improve accessibility, for example, by way of discussion, documents, meetings, workshops, focus group discussions, and the printed and broadcast media;
- Affording I&APs sufficient time to study material, to exchange information, and to make contributions at various stages during the assessment process;
- Provision of opportunities for I&APs to provide their inputs via a range of methods, for example, via briefing sessions, public meetings, written submissions, or direct contact with members of the EIA team; and
- Public participation is a process and vehicle to provide sufficient and accessible information to I&APs in an objective manner to assist I&APs to identify issues of concern, to identify alternatives, to suggest opportunities to reduce potentially negative or enhance potentially positive impacts, and to verify that issues and/or inputs have been captured and addressed during the assessment process.

At the outset it is important to highlight two key aspects of public participation:

- There are practical and financial limitations to the involvement of all individuals within a PPP. Hence, the PPP aims to generate issues that are representative of societal sectors, not each individual and will be designed to be inclusive of a broad range of sectors relevant to the proposed project; and
- The PPP will aim to raise a diversity of perspectives and will not be designed to force consensus amongst I&APs. Indeed, diversity of opinion rather than consensus building is likely to enrich ultimate decision-making. Therefore, where possible, the PPP will aim to obtain an indication of trade-offs that all stakeholders (i.e., I&APs, technical specialists, the authorities, and the development proponent) are willing to accept with regard to the ecological sustainability, social equity and economic growth associated with the project.

The Department of Environmental Affairs (2017), Public Participation guideline in terms of the NEMA EIA Regulations is also being considered during this Scoping and EIA Process. According to Section (2)(4)(f) and (o) of NEMA, (i) the participation of all interested and affected parties (I&APs) in environmental governance must be promoted and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured, and (ii) the environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage. Therefore, public participation is a crucial aspect of the EIA Process to ensure that all information that reasonably has or may have the potential to influence any decision with regard to an EA, unless access to that information is protected by law, is made available to all registered I&APs, and that they be afforded an opportunity to engage and provide input on matters that they are interested in or potentially affected by.

The key steps in the PPP for this Scoping and EIA Process are described below. This approach is structured in line with the requirements of Chapter 6 (PPP) of the 2014 NEMA EIA Regulations (as amended, i.e., GN R326). Various mechanisms will be undertaken to provide notice to all potential and registered I&APs of the proposed project, as described below.

This S&EIA Process commenced in September 2022, whereas the specialist assessments were commissioned in May 2022, and whereby the Scoping Report was being compiled. The Draft Scoping Report is currently being released to all registered I&APs, key stakeholders and Organs of State (including the National DFFE) for a 30-day comment period. The Application for EA will be submitted to the National DFFE at the same time as the Draft Scoping Report.

4.4.3 Pre-Application Consultation with the DFFE

A request for a Pre-Application Meeting was submitted to the DFFE on 13 September 2022 after which the EAP received written response from the DFFE on 16 September 2022 (Reference Number: 2022-09-0016) confirming a Pre-Application Meeting with the DFFE to be held on 22 September 2022 at 10h00. Subsequent liaison with the DFFE was undertaken following the Pre-Application Meeting in order to discuss and agree on various aspects prior to the release of the Draft Scoping Report. The following points were discussed with the DFFE:

- An overview of the project description;
- Findings of the National Web-Based Screening Tool Reports;
- Discussion and confirmation on the specialist assessments and compliance statements to be undertaken;
- Approach to the Public Participation Process;
- Discussion and confirmation on the proposed project schedule and overall process for the Scoping and EIAs, including the applicable Listed Activities and Cumulative Impact Assessment approach; and
- Points for clarification.

Refer to Appendix E.1 of this Scoping Report for a copy of the Pre-Application Meeting Request Form and Document Control Form submitted to the DFFE; Appendix E.2 for a copy of the PowerPoint presentation submitted to DFFE via email during the Pre-Application Consultation with the DFFE; and Appendix E.3 for a copy of the correspondence from the DFFE with Approval of the Pre-Application Meeting Presentation and Notes.

4.4.4 Landowner Written Consent

Regulation 39(1) of the 2014 NEMA EIA Regulations (as amended) states that "*if the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land*".

Regulation 39 (2) of the 2014 NEMA EIA Regulations (as amended) further states that "*sub-regulation (1) does not apply in respect of: (a) linear activities; (b) activities constituting, or activities directly related to prospecting or exploration of a mineral and petroleum resource or extraction and primary processing of a mineral or petroleum resource; and (c) strategic integrated projects as contemplated in the Infrastructure Development Act, 2014*".

The proposed Kaladokhwe WEF 3 project traverses various farm portions and landowner consent is therefore required for the following land portions:

- Portion 1 of the Farm Ossen Kraal No. 40;

- Portion 1 of the Farm Ruigte Fontein No. 150;
- Remaining Extent of the Farm Ruigte Fontein No. 150;
- Portion 3 of the Farm Ruigte Fontein No. 150;
- Portion 7 of the Farm Lange Hoek No. 171;
- Remaining Extent of the Farm Lange Hoek No. 183;
- Remaining Extent (Portion 0) of the Farm No. 607;
- Remaining Extent of the Farm Roland No. 169;
- Remaining Extent of the Farm De Bruins Requist No. 168;
- Portion 1 (Remaining Extent) of the Farm Gunsteling No. 165;
- Portion 1 of the Farm No. 166; and
- Portion 2 of the Farm No. 166.

Written consent has been obtained from the respective landowners of the affected farm portions on which the non-linear infrastructure is proposed to be located. The written consent has been included as an appendix to the Application for EA, which is being submitted to the DFFE, together with the Draft Scoping Report for comment.

4.4.5 Determination of Appropriate Consultation Measures, and I&AP Identification, Registration, and the Creation of an Electronic Database

In line with Regulation 41 (2) (b) of GN R326 and prior to the commencement of the Scoping and EIA Processes (and advertising the EA Processes in the local print media), an initial database of I&APs (including key stakeholders and Organs of State) was developed for the Scoping and EIA Processes. This was undertaken based on research. Appendix C of this Scoping Report includes a copy of the I&AP Database, which indicates interaction with I&APs, key stakeholders and all I&APs that have been added to the project database.

In line with Regulation 41 (2) (b) of GN R326, the database includes the details of the following:

- Landowners of the affected farm portions;
- Occupiers of the affected farm portions;
- Landowners and/or occupiers of the neighbouring adjacent farm portions;
- The municipal councillor of the ward in which the proposed project will be undertaken (Ward 9 of the Inxuba Yethemba Local Municipality and Ward 21 of the Enoch Mgijima Local Municipality);
- The local municipality which has jurisdiction in the area (i.e., Inxuba Yethemba Local Municipality and the the Enoch Mgijima Local Municipality);
- The district municipality which has jurisdiction in the area (i.e., Chris Hani District Municipality);
- Relevant Organs of State that have jurisdiction in respect of any aspect of the activity; and
- Any other party as required by the Competent Authority.

The I&AP database contains, as a minimum, the Competent Authority (i.e., DFFE); relevant state departments (e.g., Department of Agriculture, Rural Development and Land Reform (DARDLR); Department of Water and Sanitation (DWS); Department of Mineral Resources and Energy (DMRE), etc.); relevant Organs of State (e.g., Inxuba Yethemba Local Municipality, Enoch Mgijima Local Municipality, Chris Hani District Municipality, Eskom SOC Ltd, etc.); as well as potential and registered I&APs (e.g., landowners, neighbours etc.). The above stakeholders, Organs of State and registered I&APs will accordingly receive

written notification of the commencement of the Scoping and EIA Processes, and the release of the Draft Scoping Report as well as Draft EIA Report for comment.
While I&APs have been encouraged to register their interest in the project from the start of the process, following the public announcements, the identification and registration of I&APs is ongoing for the duration of the study. Stakeholders from a variety of sectors, geographical locations and/or interest groups are expected to show an interest in the proposed project, for example:

- Provincial and Local Government Departments;
- Local interest groups, for example, Councillors and Rate Payers associations;
- Surrounding landowners;
- Farmer Organisations;
- Environmental Groups and NGOs; and
- Grassroots communities and structures.

As per Regulation 42 of the GN 326, in terms of the electronic database, I&AP details will be captured and automatically updated as and when information is distributed to or received from I&APs. This ongoing record of communication is an important component of the PPP. It must be noted that while not required by the regulations, those I&APs proactively identified at the outset of the Scoping and EIA Process will remain on the project database throughout the process and will be kept informed of all opportunities to comment and will only be removed from the database by request.

In order to accommodate the varying needs of I&APs and develop their capacity to participate in the process, information sharing forms an integral and ongoing component of the EIA Process to ensure effective public participation.

4.4.6 Site Notices

One specific mechanism of informing I&APs of the proposed projects includes the placement of site notice boards. Regulation 41 (2) (a) of the 2014 NEMA EIA Regulations (as amended) requires that a notice board providing information on the project and the Scoping and EIA Process being undertaken is fixed at a place that is conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of the site where the application will be undertaken or any alternative site.

Notice boards in the Afrikaans and English languages were placed at the entrances and/or along the fences of the key affected farm portions on which the proposed project will be constructed, as well as at other strategic locations, as well as government and public facilities in Nxuba (previously Cradock), Hofmeyr and Tarkastad. The site notice boards were placed on 20 and 21 September 2022. Table 4.4 provides a breakdown of the locations at which the site notice boards were placed. A copy of the site notice boards as well as proof of placement of site notice boards are included in Appendix D.1 of this Scoping Report.

Table 4.4: Site Notice Board Placement for the proposed Kaladokhwe WEF 3

#	Locality/ Description	Coordinates
1	Entrance of the Inxuba Yethemba Local Municipality offices, Cradock	32°10'11.10"S; 25°37'1.69"E
2	Entrance of the Enoch Mgijima Local Municipality offices, Hofmeyr	31°39'14.00"S; 25°48'12.84"E

#	Locality/ Description	Coordinates
3	Entrance of the Enoch Mgijima Local Municipality offices, Tarkastad	32°0'31.20"S; 26°15'42.34"E
4	Entrance of the Cradock Public Library, Cradock	32°10'11.10"S; 25°37'1.69"E
5	Entrance of the Hofmeyr Public Library, Hofmeyr	31°39'12.16"S; 25°48'11.16"E
6	Entrance of the Tarkastad Public Library, Tarkastad	32°0'31.00"S; 26°15'43.89"E
7	Entrance of the Cradock OVK Trade, Cradock	32°9'52.97"S; 25°36'59.47"E
8	Entrance gate to Kaladokhwe WEF 3 project site	32°2'12.88"S; 25°42'15.27"E
9	Entrance gate to Kaladokhwe WEF 2 (Possible Site Access Point 1)	31°53'59.49"S; 25°43'16.33"E
10	Entrance gate to Kaladokhwe WEF 1 (Possible Site Access Point 2)	31°52'27.29"S; 25°43'59.67"E
11	Entrance gate to Kaladokhwe WEF 1 (Possible Site Access Point 3)	31°50'37.96"S; 25°45'10.77"E
12	Fence of Kaladokhwe WEF 2 project site	31°53'37.91"S; 25°53'11.04"E
13	R61 Turnoff (Possible Site Access Point 4)	31°57'46.75"S; 26° 0'6.34"E
14	Fence where proposed powerline corridor cross (± 20 km from Hofmeyr)	31°49'34.70"S; 25°45'38.70"E
15	Fence where proposed powerline corridor cross (± 20 km from Hofmeyr)	31°49'34.70"S; 25°45'38.70"E

4.4.7 Technical Scoping with the Project Proponent and EIA Team

The scoping process has been designed to incorporate two complementary components: a stakeholder engagement process that includes the relevant authorities and wider I&APs; and a technical process involving the EIA team and the project proponent.

The purpose of the technical scoping process is to draw on the past experience of the EIA team and the project proponent to identify environmental issues and concerns related to the proposed project and confirm that the necessary specialist assessments have been identified. Most of the specialists have worked with the CSIR on several other projects, as well as having experience from EIAs for other renewable energy projects in the Eastern Cape. The specialists were therefore able to identify issues (as shown in Chapter 6 of this Scoping Report) to be addressed in the EIA Phase based on their experience and knowledge of the area and type of activity. Their inputs have informed the scope and Terms of Reference for the specialist assessments (as included in Chapter 7 of this Scoping Report). The findings of the scoping process with input from the stakeholders and the authorities will inform the specialist assessments, which will only be completed after the 30-day public comment period on the Draft Scoping Report has been finalised.

4.4.8 Scoping Report Phase – Review of the Draft Scoping Report

In terms of Regulation 41 (6) of GN R326 the section below outlines the PPP for this assessment in order to provide potential I&APs, Stakeholders and Organs of State access to information on the project and the opportunity to comment at the various stages of the assessment process.

As noted above, the Scoping Reports for the proposed projects are currently being released to I&APs, Stakeholders and Organs of State for a 30-day comment period. The section below summarises the PPP for the review of the Scoping Reports.

- **Database Development and Maintenance:** In line with Regulation 41 (2) (b) of GN R326, an initial database of potential I&APs was developed for the Scoping and EIA Process and will be updated throughout the process.
- **Site Notice Boards:** As noted in Section 4.4.7 above, notice boards were placed for the proposed project. A copy of the notice boards is included in Appendix D.1 of this Scoping Report.
- **Advertisements to Register Interest:** An advertisement will be placed in the Afrikaans, English and isiXhosa languages in at least one local newspaper (e.g., Midlands News) at the commencement of the 30-day comment period for the Draft Scoping Report. A copy of the content of the advertisement is included in Appendix D.2 of this Scoping Report.
- **Letter 1 to I&APs (Commencement of the Scoping and EIA Process):** Written notification of the availability of the Draft Scoping Report (i.e., Letter 1) will be sent to all potential and registered I&APs and Organs of State included on the project database via email, where email addresses are available. This letter will be sent at the commencement of the 30-day review period on the Draft Scoping Report and will include information on the proposed project and notification of the release and availability of the report for comment. Letter 1 will be written in English. Proof of email, as well as copies of the Letter 1 and emails sent will be included in the Final Scoping Report that will be submitted to the DFFE for decision-making.
- **Text Messaging:** SMS texts will also be sent to all potential and registered I&APs on the database, where cell phone numbers are available, to inform them of the proposed project and how to access the Draft Scoping Report.
- **Executive Summary of the Scoping Report:** An Executive Summary of the Scoping Report will be emailed to potential and registered I&APs on the database, where email addresses are available, and uploaded to the project website.
- **30-day Comment Period:** As noted above, potential and registered I&APs, including relevant authorities and Organs of State will be notified via Letter 1 of the 30-day comment and registration period, extending from 21 October 2022 to 21 November 2022 (excluding public holidays), within which to submit comments on the Draft Scoping Report and/or to register on the I&AP database.
- **Availability of Information:** The Draft Scoping Report is currently being made available for a 30-day comment period, extending from **21 October 2022 to 21 November 2022** (excluding public holidays), and is being distributed to ensure access to information on the project and to communicate the Plan of Study for the EIA Phase. The Draft Scoping Report inclusive of all its appendices will be uploaded to the project website (i.e., https://www.csir.co.za/environmental-impact-assessment) for I&APs to access it. As a supplementary mechanism, the Draft Scoping Report will also be uploaded to other alternative web-platforms such as Dropbox, Google Drive or OneDrive/SharePoint. If an I&AP cannot access the report via the project website or via the alternative web-platforms such as Dropbox, Google Drive or OneDrive/SharePoint, and if additional information is required (other than what is provided in the Executive Summaries), then the I&AP can contact the EAP, who will then make an electronic copy available (where feasibly possible).
- **Comments Received:** A key component of the Scoping and EIA Process is documenting and responding to the comments received from I&APs, stakeholders, and the authorities. Copies of all comments received during the review of the Draft Scoping Report will be collated and

included in the Comments and Response Report which will be appended to the Final Scoping Report that will be submitted to DFFE for decision-making.

4.4.9 Compilation of Final Scoping Report for Submission to the DFFE

Following the 30-day commenting period of the Draft Scoping Report and incorporation of the comments received into the report, the Final Scoping Report will be submitted to the DFFE in line with Regulation 21 (1) of the 2014 NEMA EIA Regulations (as amended). The Final Scoping Report inclusive of all its appendices will be submitted electronically to the DFFE via the Novell S-Filr system, as recommended by the DFFE since June 2020.

In line with best practice, I&APs on the project database will be notified via Letter 2 via email (where email addresses are available) of the submission of the Final Scoping Report to the DFFE for decision-making. To ensure ongoing access to information, copies of the Final Scoping Report that will be submitted for decision-making, will be placed on the project website (i.e., https://www.csir.co.za/environmental-impact-assessment). As a supplementary mechanism, the Final Scoping Report will also be uploaded to other alternative web-platforms such as Dropbox, Google Drive or OneDrive/SharePoint.

The Final Scoping Report that will be submitted for decision-making to the DFFE will include proof of the PPP that was undertaken to inform Organs of State, key stakeholders, and all registered I&APs of the availability of the Draft Scoping Report for the 30-day review period (as explained above).

The DFFE will have 43 days (from receipt of the Final Scoping Report) to either a) accept the scoping report, with or without conditions, and advise the Project Applicant to proceed with the tasks contemplated in the Plan of Study for EIA; or b) refuse EA (respectively in line with Regulation 22 (a) and (b) of the 2014 NEMA EIA Regulations, as amended). In line with best practice, I&APs on the project database will be notified via Letter 3 via email (where email addresses are available) of the outcome of the decision-making on the Final Scoping Report.

This step marks the end of the PPP for the Scoping Phase. The PPP for the subsequent EIA Phase is presented in the Plan of Study for the EIA i.e., Chapter 7 of this Scoping Report.

4.5 Schedule for the Scoping and EIA Process

The proposed schedule for the Scoping and EIA Processes, based on the legislated EIA timeframes, is presented in Table 4.5. It should be noted that this schedule could be revised during the EIA Process, depending on factors such as the time required for decisions from authorities.

Table 4.5: Provisional Schedule for the proposed Kaladokhwe Wind Energy Facility 3 (including the Scoping and EIA Phases)

			May - July 2022				Aug 2022				Sep 2022				Oct 2022				Nov 2022				Dec 2022				Jan 2023				Feb 2023				Mar 2023				Apr 2023				May 2023				Jun 2023				Jul 2023				Aug 2023				Sep 2023			
	EAP Timeframes																																																											
	PPP Timeframes																																																											
	Competent Authority Timeframes																																																										
	DFFE Shutdown Period (15 December to 5 January)																																																										
Phase	**Task**	**Days**	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Project Inception Phase (Pre-Application)	Appointment of the CSIR by AEP and provision of the requested project information by AEP to CSIR	80																																																									
	Appointment of Specialists by AEP (using TORs as prepared by the CSIR)																																																										
	Specialists to undertake fieldwork and submit inputs into Draft Scoping Reports incl. addressing comments following AEP & CSIR review																																																									
	Pre-application Consultation with DFFE																																																									
	Project Announcement (Compile Newspaper Advert, Undertake Site Visit, Placement of Site Notice Boards)																																																									
	Prepare Scoping Reports and Plan of Study for EIA (PSEIA) (x3) incl. final specialist inputs after review																																																									
End of Project Inception Phase	Prepare EIA Applications (x3) and get all Scoping Phase documents ready for release for public comment	7																																																								
Scoping Phase	PPP 1 (30 days): Submit Draft Scoping Reports (x3) and EIA Applications (x3) to DFFE and Release of Draft Scoping Reports to I&APs for Public Comment for 30 days	44																																																								
	Collate comments received and integrate into Final Scoping Reports (x3)																																																										
	Submission of Final Scoping Reports and PSEIA to Competent Authority (x3)																																																									
End of Scoping Phase	Competent Authority to Accept Scoping Reports or Refuse EA	43																																																								
EIA Phase **	Specialists to submit final impact assessment reports for inclusion in Draft EIA Reports, including addressing comments following AEP & CSIR review	106																																																								
	12-month Pre-Construction Bat Monitoring completed, review and receive Final Bat Impact Assessment Report																																																									
	Compile Draft EIA Reports and EMPRs (x3)																																																									
	PPP 2 (30 days): Submit Draft EIA Reports and EMPRs (x3) to DFFE for comment, and Release of Draft EIA Reports and EMPRs (x3) to I&APs for Public Comment for 30 days																																																								
	Collate comments received and integrate into Final EIA Reports and EMPRs (x3)																																																									
	Submission of Final EIA Reports and EMPRs (x3) to Competent Authority																																																									
End of EIA Phase	Competent Authority to Grant or Refuse EA	107																																																								
Notification Phase	Competent Authority to provide written feedback	5																																																							
	Notify I&APs of the EA decision	14																																																							

In terms of Regulation 23(1)(b) and 23(2) of the 2014 NEMA EIA Regulations (as amended) an additional 50 days can be added to this phase under exceptional circumstances (i.e., when there are substantial changes required to the EIRs after the 30-day comment period).

Scoping and Environmental Impact Assessment for the Proposed Development of the 240 MW Kaladokhwe Wind Energy Facility 3 near Nxuba (Cradock) in the Eastern Cape

DRAFT SCOPING REPORT

CHAPTER 5: Project Alternatives

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5 APPROACH TO THE ASSESSMENT OF ALTERNATIVES

This chapter discusses the alternatives that have been considered as part of the Scoping Phase, as well as the selection process of the preferred alternatives that will be considered and assessed as part of the EIA Phase. Sections 24(4) (b) (i) and 24(4A) of the NEMA require an Environmental Assessment to include investigation and assessment of impacts associated with alternatives to the proposed project. In addition, Section 24O (1)(b)(iv) also requires that the Competent Authority, when considering an application for EA, takes into account "*where appropriate, any feasible and reasonable alternatives to the activity which is the subject of the application and any feasible and reasonable modifications or changes to the activity that may minimise harm to the environment*".

Therefore, the assessment of alternatives should, as a minimum, include the following:

- The consideration of the no-go alternative as a baseline scenario;
- A comparison of the reasonable and feasible alternatives; and
- Providing a methodology for the elimination of an alternative.

The 2014 NEMA EIA Regulations (as amended) define "alternatives", in relation to a proposed activity, "as different means of meeting the general purpose and requirements of the activity, which may include alternatives to the:

- property on which or location where the activity is proposed to be undertaken;
- type of activity to be undertaken;
- design or layout of the activity;
- technology to be used in the activity;
- operational aspects of the activity; and
- includes the option of not implementing the activity".

Appendix 2 of the 2014 NEMA EIA Regulations (as amended) provides the following objectives, inter alia, of the Scoping Process in relation to alternatives:

- To identify and confirm the preferred activity and technology alternative through an identification of impacts and risks and ranking process of such impacts and risks; and
- To identify and confirm the preferred site, through a detailed site selection process, which includes an identification of impacts and risks inclusive of identification of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment.

The Scoping Report is therefore required to provide a full description of the process followed to reach the proposed preferred activity and technology alternative, site, and location of the development footprint within the site, including details of all the alternatives considered and the outcome of the site selection matrix.

5.1 Assessment of Alternatives

5.1.1 No-go Alternative

The no-go alternative assumes that the proposed project will not go ahead i.e., it is the option of not developing the proposed Kaladokhwe WEF 3 project. 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. The following implications will occur if the no-go alternative is implemented (i.e., the proposed project does not proceed):

- No benefits will be derived from the implementation of an additional land-use;
- No additional power will be generated or supplied through means of renewable energy resources by this project at this location;
- The no-go alternative will not contribute to and assist the government in achieving its stated target of 17 742 MW total installed (i.e., including installed capacity; committed/already contracted capacity and new additional capacity) for Wind energy capacity by 2030 (Integrated Resource Plan-IRP, 2019);
- Electricity generation on the proposed development site will remain at zero and as a result the local economy will not be diversified, while existing electricity generation sources nationally will age and degrade over time, with maintenance requirements potentially leading to outages;
- There will be lost opportunity for skills transfer and education/training of local communities;
- The positive socio-economic impacts likely to result from the project such as increased local spending and the creation of local employment opportunities will not be realized;
- There will be no opportunity for additional employment in an area, where job creation is identified as a key priority;
- Loss of economic benefit to participating landowners due to the revenue that will be gained from leasing the land to the developer.
- The local economic benefits associated with the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) will not be realized, and socio-economic contribution payments into the local community trust will not be realized;
- The development of WEFs instead of coal fired power stations can directly contribute to South Africa's response to climate mitigation; and
- Wind and solar energy are the cheapest source of electricity in South Africa. The development of the proposed WEF can contribute to the competitive nature of the REIPPPP to drive prices down even further to ensure that South Africans have access to affordable yet clean electricity.

Converse to the above, the following benefits could occur if the no-go alternative is implemented:

- Only the agricultural land use (livestock farming) will remain thus no impact on agricultural land use will occur;
- No biodiversity (fauna and flora) will be removed or disturbed during the development of this proposed facility;

- No aquatic resources will be impacted upon during the construction of the proposed WEF and associated infrastructure;
- No birds or bats will be impacted upon – either through the loss of their habitat which can lead to displacement, mortalities due to collisions with wind turbines, or caused by barotrauma for bats;
- No change to the current landscape will occur – the visual character of the area will remain unchanged;
- No heritage artefacts or palaeontological resources will be impacted on;
- No noise impacts will occur either during the construction phase or during the operational phase when wind turbines are rotating;
- No additional traffic will be generated; and
- No additional water use will be required.

The no-go alternative means no addition of renewable energy, which means further reliance on fossil fuels that will continue to have a negative environmental impact. While the no-go alternative i.e., not developing the proposed WEF will not result in any negative environmental impacts in the area, it will also not have any positive community development or socio-economic benefits. In addition, it will not assist government in addressing climate change, reaching its set targets for renewable energy, nor will it assist in supplying the increasing electricity demand within the country. **Hence, the no-go alternative is not currently the preferred alternative**.

5.1.2 Land-use Alternatives

5.1.2.1 Agriculture

All farm portions forming part of the proposed WEF project is zoned for agricultural land-use in a livestock farming agricultural region, which is the dominant agricultural land use on the site and surrounds. Soils of the proposed WEF site are predominantly shallow soils on underlying rock. The major limitations to agriculture are the shallow, rocky soils and the limited climatic moisture availability as the proposed project site is located in an arid climate with low rainfall of approximately 295 to 315 mm per annum and high evaporation of approximately 1330 mm per annum. Because of these limitations, the study area is unsuitable for crop production and agricultural land use is limited to moderate capacity grazing.

As noted in Chapter 3 of this Scoping Report, agricultural potential is uniformly low across the affected farms and the choice of placement of the proposed WEF on the farms is therefore likely to have agricultural impacts of low significance. The predominant land capability of the proposed project site is 4 to 6, but ranges from 1 to 7 i.e., land with very limited agricultural crop potential and in most cases utilisable wilderness land. The grazing capacity of the area is classified as moderate at 14 to 16 hectares per large stock unit. **Hence, agricultural land use is not a preferred alternative**.

However, the proposed WEF will generate an additional income stream to the landowners and is therefore considered **the preferred land use alternative** and will not impede on the existing land use activities as the proposed WEF can co-exist with continued livestock farming on site.

5.1.3 Type of Activity Alternatives

In terms of the type of activity, this relates to the generation of electricity from a renewable energy source, and in this particular case, from wind. As indicated in Chapter 1 of this DSR, the Project Applicant focuses on solar and wind technologies and works with landowners, technology providers, regulators and investors to source and develop renewable energy projects. Therefore, the **generation of electricity from a renewable energy source** was the only activity considered by the Project Applicant, and thus considered in this DSR. No other activity types were considered or deemed appropriate based on the expertise of the Project Applicant. Refer to the section below that provides a description on the selection of wind energy as the preferred alternative.

5.1.4 Renewable Energy Alternatives

Where the "activity" is the generation of electricity from a renewable energy source, possible alternatives that could potentially be considered on the proposed project site include renewable energy technologies such as Biomass, Hydro Energy, Wind Energy and Solar Energy. However, based on the preliminary investigations undertaken by the Project Applicant, **Wind Energy development is the preferred technology alternative** and no other renewable energy technologies are deemed to be appropriate for the site. The unsuitability of other renewable energy technologies for the site, and impacts of each, are discussed below.

5.1.4.1 Biomass Energy

The proposed project site does not contain any abundant or sustainable supply of biomass. According to the South African Renewable Energy Resource Database (SARERD, 2016), the proposed project area does not have any cumulative biomass energy potential. **Therefore, the implementation of a Biomass Energy Facility at the proposed site is <u>not</u> considered to be a reasonable and feasible alternative to be assessed as part of this S&EIA Process.**

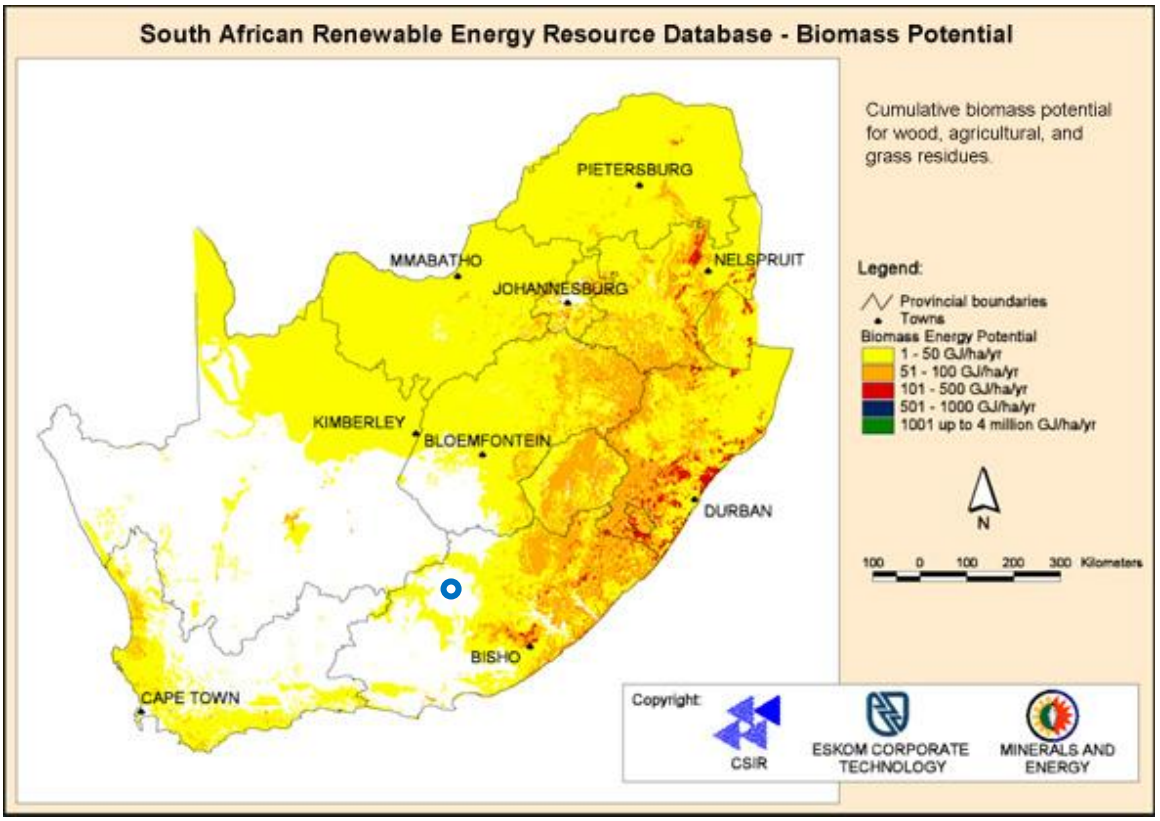

Figure 5.1: Biomass Potential – location of the proposed Kaladokhwe WEF 3 indicated in blue circle (Source: SARERD, 2016)

5.1.4.2 Hydro Energy

The proposed project site does not contain any large inland water bodies, which excludes the possibility of renewable energy from small- or large-scale hydro energy generation. In terms of micro hydropower potential, the SARERD (2016) has classified the proposed project area as "Not Suitable". **Therefore, the implementation of a Hydro Energy Facility at the proposed site is <u>not</u> considered to be a reasonable and feasible alternative to be assessed as part of this S&EIA Process.**

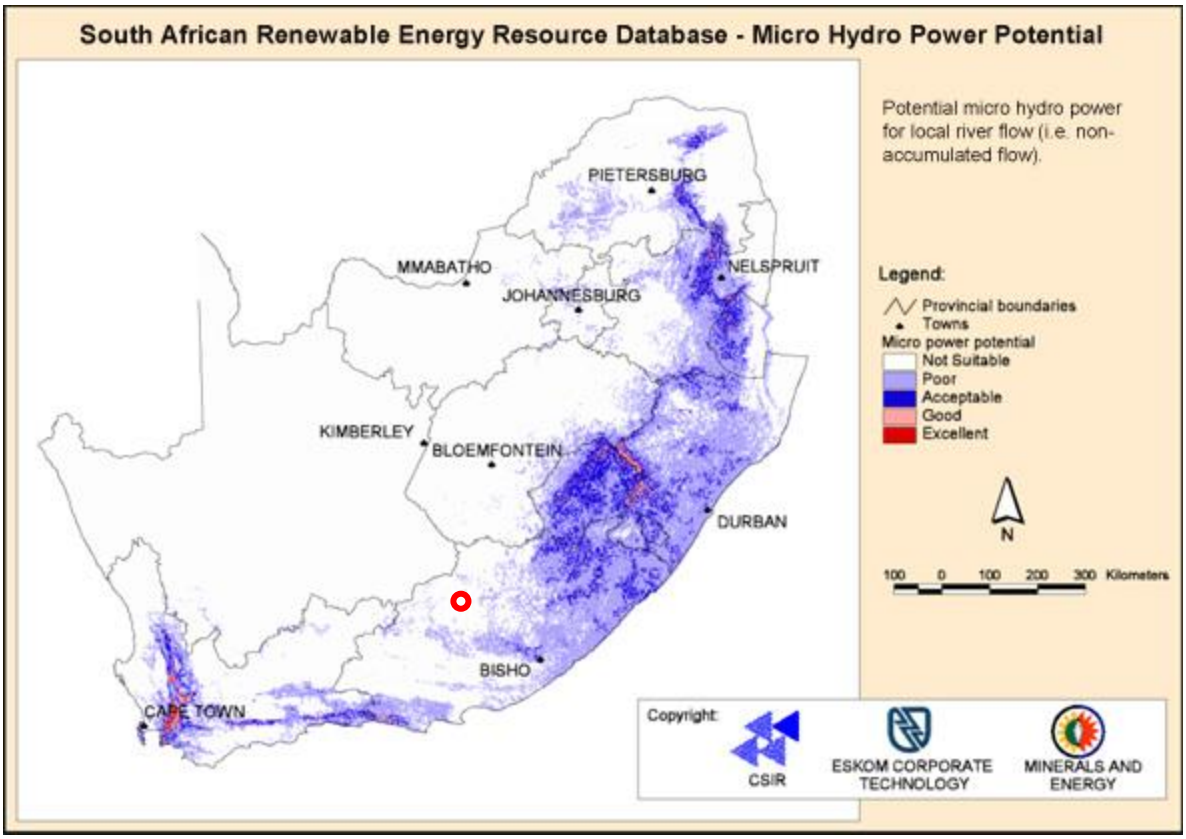

Figure 5.2: Micro Hydropower Potential – location of the proposed Kaladokhwe WEF 3 indicated in red circle (Source: SARERD, 2016)

5.1.4.3 Wind and Solar Energy

- *2019 IRP*

The 2019 IRP proposes to secure 26 630 MW of renewable energy capacity by 2030 (for Wind, Solar Photovoltaic (PV) and Concentrated Solar Power). This amount excludes Hydropower and Storage. Of this total, 1 474 MW of Solar PV, 1 980 MW of Wind and 300 MW of Concentrated Solar Power is already installed capacity. In addition, of the 26 630 MW, approximately 814 MW of Solar PV, 1 362 MW of Wind and 300 MW of Concentrated Solar Power (CSP) is committed or already contracted capacity. Furthermore, of the 26 630 MW total, and 6 000 MW is allocated to solar PV, and 14 400 MW is allocated to wind as new additional capacity, which is based on a consistent annual allocation of 1 600 MW from 2022 up to 2030. Linked to the 2010 IRP, the Department of Mineral Resources and Energy (DMRE) entered into a bidding process for the procurement of 3 725 MW of renewable energy from Independent Power Producers (IPPs) by 2016 and beyond. On 18 August 2015, an additional procurement target of 6 300 MW to be generated from renewable energy sources was added to the REIPPPP for the years 2021 - 2025, as published in Government Gazette 39111. The additional target allocated for wind energy, solar PV energy, and solar CSP energy is 3 040 MW, 2 200 MW, and 600 MW respectively.

On 7 July 2020, in Government Gazette 43509 and GN R753, the Minister of Mineral Resources and Energy, in consultation with the National Energy Regulator of South Africa (NERSA), determined that new generation capacity needs to be procured to contribute towards energy security. Specifically, 2 000 MW

will be procured from a range of energy source technologies in accordance with the short-term risk mitigation capacity allocated for the years 2019 to 2022 (under "other" in the allocation table contained in 2019 IRP). In line with this, the Risk Mitigation IPP Procurement Programme (RMIPPPP) was designed and launched in August 2020 by the DMRE in order to fulfil the GN R753 Ministerial Determination.

5.1.4.4 Solar Energy

In terms of the suitability of solar energy development at this location, the proposed project area has a fairly average Global Horizontal Irradiation (GHI) relevant to PV installations (Figure 5.3). As indicated in Figure 5.3, the site has a GHI of between 1900 and 2 100 kWh/m^2 in terms of the long-term yearly total. The GHI recorded in the area in which the proposed project is located indicates that the generation of renewable energy from solar energy may be feasible. However the associated grid connection costs associated with establishing a new 400/132 kV Main Transmission Substation (MTS) located North West of the WEF and adjacent to the Hydra – Poseidon 400 kV lines would be not economically feasible for a solar PV development. The current land-use activities in the area indicates the suitability of the land to wind energy technology as opposed to solar energy technology.

The land earmarked for the development of the proposed Kaladokhwe WEF 3 is currently used for low-density livestock grazing. Such land is generally preferred for wind energy developments as the grazing activities can continue on the land together with the operation of the WEF. In addition, the area selected for the development of the proposed Kaladokhwe WEF 3 receives very good wind resources, which indicates viability for wind energy developments (Figure 5.4), as discussed in Section 5.1.4.5.

The area in which the proposed WEF is to be developed is also relatively water scarce. It is therefore proposed that water be trucked to the proposed project site from the local municipality for consumptive and construction purposes. Solar panels require regular cleaning in order to function optimally. Therefore, obtaining a sufficient amount of water to comply with annual cleaning requirements of solar panels is deemed unfeasible.

Overall, solar energy development can occur within this area but other localities in South Africa may be more favourable for solar energy development. Site-specific requirements for **solar energy facilities** however makes this proposed project site **a less feasible alternative** when compared to the potential of WEFs at this specific project site.

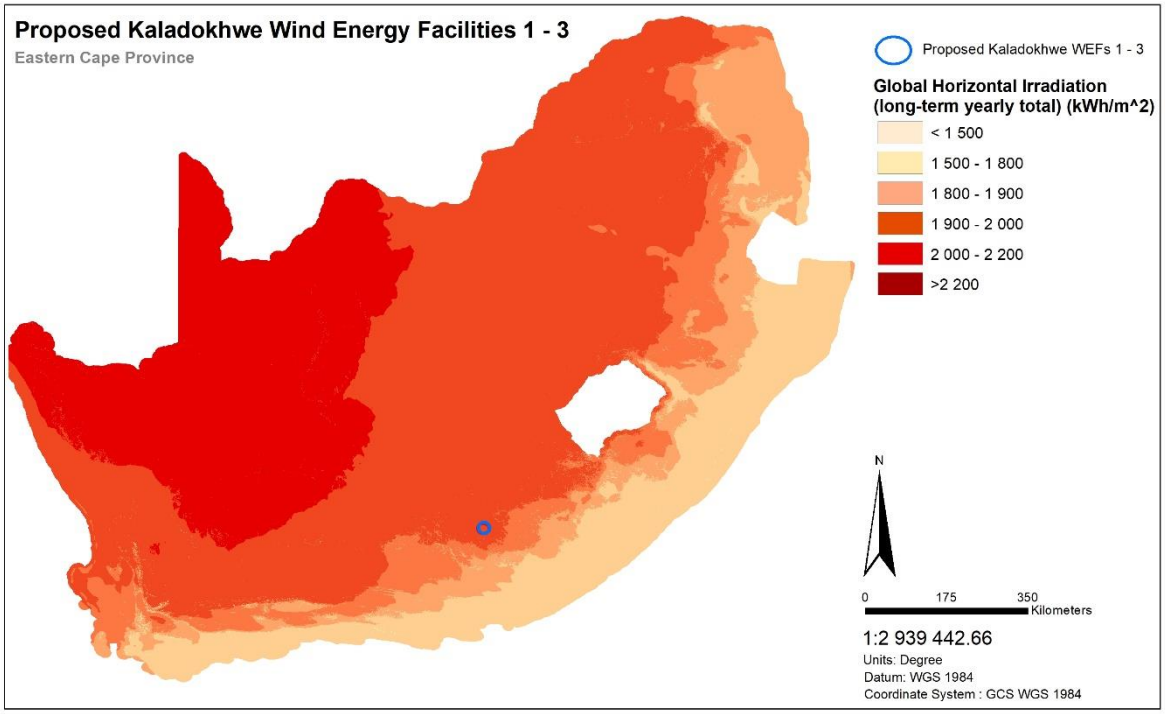

Figure 5.3: Solar Resource Availability in South Africa – location of the proposed Kaladokhwe WEF 3 indicated in blue circle (*Source*: CSIR, 2018)

5.1.4.5 Wind Energy

Wind resource is defined in terms of average wind speed and includes Weibull distribution (used to describe wind speed distributions); turbulence, wind direction, and pattern of wind direction (as depicted by a wind rose). These factors are all key considerations used in determining whether a site is suitable for the development of a WEF. A mean wind power density map has also been created (CSIR, 2018), which is not related to any specific turbine type and demonstrates the wind resource of the country. The mean wind power density map shows that the project area falls within an area of 400 – 500 W/m^2, which is considered as good viability for a wind energy project (Figure 5.4).

Based on the research conducted by the Project Applicant, the proposed affected land portions located to the north-east of Nxuba (Cradock) were selected based on the area having a good wind resource. Three on-site wind measuring meteorological (met) masts have been installed, one mast on each of the three proposed Kaladokhwe WEF project sites, to provide wind- and meteorological measurements to verify the presence of the resource. The process of collecting on-site wind data is necessary to confirm both the presence of the wind resource on-site and the bankable viability of the proposed project. The provision of at least 12 months' on-site wind monitoring data is also a requirement of the REIPPPP. Data received from consistent measurements for a year indicated that the wind resource at the proposed Kaladokhwe WEF 3 project site is more than adequate for the development of a WEF.

Furthermore, the 2019 IRP indicated a higher allocation target to wind energy compared to solar energy for new additional capacity from 2022 to 2030 (i.e., 14 400 MW as opposed to 6 000 MW) which further supports the development of a WEF at this location.

Therefore, the implementation of a WEF at the proposed project site is more favourable and feasible than solar energy, biomass, or hydropower development. Therefore, the proposed WEF is considered to be the most feasible and preferred technology alternative as it would be able to generate sufficient energy to support an economically viable wind energy project.

Finally, since the alternative renewable energy generation activities considered were deemed not to be reasonable and feasible for the area and the specific site, no other renewable energy technology alternatives were further assessed during the EIA Phase i.e., only Wind.

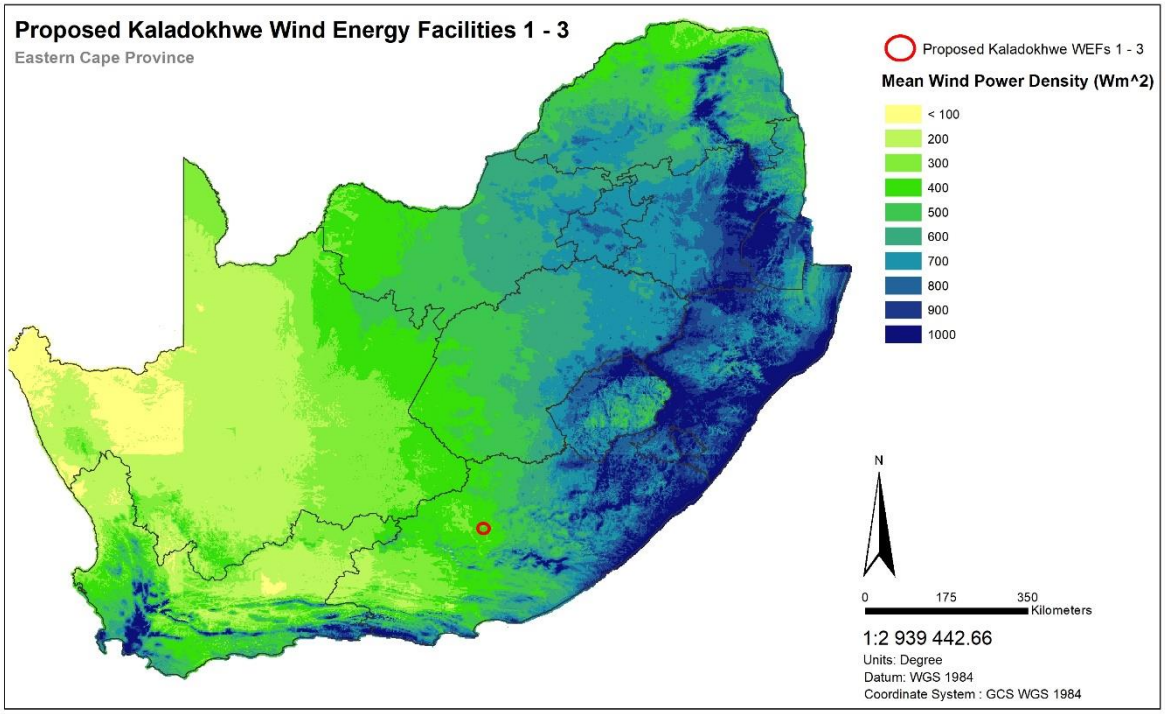

Figure 5.4: Mean Wind Power Density for South Africa – location of the proposed Kaladokhwe WEF 3 indicated in red circle (Source: CSIR, 2018).

5.1.4.6 Summary of the Renewable Energy Alternatives

Table 5.1 presents a summary and an evaluation matrix for the possible renewable energy alternatives with regards to resource suitability and availability, and potential risks and impacts.

Table 5.1: Summary of Evaluation of Potential Risks and Impacts for Renewable Energy Alternatives

Type of Renewable Energy Alternative	Are suitable resources available at the proposed project site?	Main Potential Impacts and Risks	Is this the preferred Alternative?
Biomass Energy	▪ No – not suitable	▪ Significant Waste Generation ▪ Air Emissions	▪ No
Hydro Energy	▪ No – not suitable	▪ Not suitable	▪ No
Wind Energy	▪ Yes - 400 – 500 W/m^2	▪ Visual	▪ Yes

Type of Renewable Energy Alternative	Are suitable resources available at the proposed project site?	Main Potential Impacts and Risks	Is this the preferred Alternative?
		▪ Noise Generation ▪ Bird and bat collisions ▪ Loss of agricultural land ▪ Impacts on aquatic and terrestrial ecology	
Solar Energy	▪ Yes - <1 500 kWh/m^2	▪ Visual ▪ Loss of agricultural land ▪ Impacts on heritage resources ▪ Impacts on the water balance ▪ Impacts on avifauna, aquatic ecology and terrestrial ecology	▪ No

5.1.5 Site Alternatives

As per the requirements listed within Appendix 2 – [(1) (d)] and [(2) (1) (g) (ix)] of the 2014 NEMA EIA Regulations (as amended), a site selection matrix should be provided to show how the preferred site was determined through a site selection process. Within this context, it is understood that the "site" referred to in the Regulations are the farms or land portions earmarked for the development of the proposed Kaladokhwe WEF 3 project.

A detailed screening phase and iterative design approach was adopted, which integrated the screening and assessment of environmental impacts of the technical components of the project, early in the project lifecycle. An initial area of approximately 48 000 ha was identified and screened for approximately 150 turbines to make up four (4) x 240 MW wind energy facilities. An Avifaunal Specialist was appointed to conduct a site sensitivity screening visit which covered the initial project development area to identify any key priority bird species nesting within the project study area or neighbouring properties which may require buffering out large portions of the proposed project site. Three Verreaux's eagle nests, which required a 5.2 km 'No-Go' buffer, and two Martial Eagle nests, which required a 5.6 km buffer, were identified within the initial project study area during the screening study. The Project Applicant has subsequently revised the Kaladokhwe WEF project boundary to avoid the delineated 'No-Go' buffers and thus refined the project development footprint for further detailed specialist assessment (also refer to Section 5.1.6 below).

Another factor which the Project Applicant took into considering during the site selection process for the WEF was its proximity to the Mountain Zebra National Park (MZNP) to ensure the proposed development does not fall within the visual setback buffer that is included in the MZNP Environmental Management Plan. The outcome of the site selection process was the identification of approximately 28 000 ha potentially developable area on which three WEF projects are being proposed, one of which is the Kaladokhwe WEF 3.

Through this process the most environmentally and socio-economically favourable site layout was thus identified for detailed assessment in this S&EIA Process. On this basis, the preferred layouts of the Kaladokhwe WEFs will each be assessed against the 'No-Go' alternative. The 'No-Go' alternative is the option of not constructing the proposed project where the status quo of the current farming activities on the site would continue (refer to Section 5.1.1 above). On a site-specific level, the site selection factors of

land availability, environmental sensitivities, distance to the national grid, site accessibility, topography, fire risk, current land use and landowner willingness were all considered to determine the feasible i.e., preferred site.

5.1.5.1 Site Specific Considerations

The preferred site for the proposed Kaladokhwe WEF 3 extends over the following farm portions:

- Portion 1 of the Farm Ossen Kraal No. 40;
- Portion 1 of the Farm Ruigte Fontein No. 150;
- Remaining Extent of the Farm Ruigte Fontein No. 150;
- Gunsteling, being Portion 1 (Remaining Extent) of the Farm No. 165;
- Portion 2 of the Farm No. 166;
- Portion 1 of the Farm No. 166;
- Ruigte Fontein, being Portion 3 of the Farm No. 150;
- Remaining Extent (Portion 0) of the Farm No. 607;
- Roland, being the Remaining Extent (Portion 0) of the Farm No. 169;
- De Bruins Requist, being the Remaining Extent (Portion 0) of the Farm No. 168;
- Gunsteling, being Portion 1 (Remaining Extent) of the Farm No. 165;
- Lange Hoek, being the Remaining Extent of Farm No. 183; and
- Lange Hoek, being Portion 7 of the Farm No. 171.

At a specific (local) level, sites on the aforementioned farm portions were deemed suitable due to all the site selection factors noted above (i.e. land availability, environmental sensitivities, distance to the national grid, site accessibility, topography, current land use and landowner willingness) being favourable. The site selection criteria considered by the Project Applicant are discussed in detail below in Table 5.2.

Table 5.2: Site selection factors and suitability of the site for the development of the proposed Kaladokhwe WEF 3

FACTOR	SUITABILITY OF THE PREFERRED SITE
Land Availability	The abovementioned farm portions are of a suitable size for the proposed project. The land available for the development of the proposed Kaladokhwe WEF 3 is approximately 5 039 ha in extent. Although this total area was preliminarily assessed by the specialists during the Scoping Phase and will be assessed in detail during the EIA Phase, only approximately 61 ha (about 1.2% of the total available assessed area) will be required for the permanent development footprint of the proposed WEF and its associated infrastructure.
Environmental Sensitivity	Although the proposed Kaladokhwe WEF 3 site does contain environmental features that will have to be avoided due to its high and very high environmental sensitivities, following these exclusions sufficient suitable land is still available to ensure the development feasibility of the project (see Section 5.1.5 below).
Wind speed Levels	Good to Very Good
Distance to and availability of the Grid	The proposed Kaladokhwe WEF 3 is located approximately 60 km east of the Iziko Capacitor Station, as outlined in the Eskom Transmission Development Plan (TDP) 2022 - 2031. A new Major Transfer Station (MTS), to be known as "Poseidon North MTS", is proposed to be established in close proximity, and to the south of, the Iziko Capacitor Station. It is proposed that the two existing Hydra - Poseidon 400 kV

FACTOR	SUITABILITY OF THE PREFERRED SITE
	overhead transmission powerlines will loop-in-loop-out (LILO) of the new Poseidon North MTS. *Note from the CSIR: A separate Environmental Assessment Process will be undertaken once the grid connection and the 132 kV power line routing for the proposed Kaladokhwe WEF 3 has been confirmed, and hence does not form part of this Scoping and EIA Process.*
Site Accessibility	The main routes providing access to the proposed Kaladokhwe WEF 3 is facilitated via existing public roads off the R390 provincial tar road connecting Nxuba (previously Cradock) and Hofmeyr. There are several possible access points available to access the Kaladokhwe WEF 3 site. Possible Access Point 1 follows an existing gravel road and is an established approach at an intersection with the R390 and another farm road. Access point 1 is situated closest to the Kaladokhwe WEF 1 boundary and is the preferred access point option. Possible Access Point 2 is located along the straight stretch of the R390 and a new access road with a maximum width of 12 m will need to be constructed to facilitate the connection between the WEF project site and the existing R390 provincial tar road. Possible Access Point 3 is located at an existing access road and could be used as a combined access for Kaladokhwe WEF 1 and Kaladokhwe WEF 2 for the operational phase. In addition to the existing internal service 'farm' roads on site, which will be extended to a maximum width of 10 m, where necessary, additional internal service roads are planned to be constructed on the project site of which the width will not exceed 12 m. The length of the total road network for the proposed Kaladokhwe WEF 3 is approximately 40 km.
Topography	The proposed Kaladokhwe WEF 3 project site is situated in the Nama Karoo biome. The broader study area is situated predominantly within the Eastern Upper Karoo vegetation type. Land cover consists primarily of low shrubland concentrated to the west and south, interspersed with naturally occurring bare rock and soil concentrated on the tops of the escarpments. Grasslands are found near the centre of the study area and up to the north, while dryland and irrigated agriculture occur along the banks of the Great Fish River and Tarka River in the west and south. The altitude of the proposed study area ranges from 900 m above sea level in the southern portion of the study area to approximately 2 100 m above sea level on the tops of the mountains to the northeast. The proposed development site itself is located at an average elevation of 1440 m above sea level, with hills to the west. The study area is largely in a natural state, with agriculture specializing in the production of wool, mohair and cattle farming being the predominant land use.
Fire Risk	Nxuba (previously Cradock) is located in the Central Midland portion of the East Cape Midlands. The site is located in the Eastern Upper Karoo vegetation type. The terrain surrounding the site is predominately undulating plains with hills and rocky areas and is dominated by grasslands and low shrublands. Fossiliferous shales and mudstones of the Beaufort Group of the Karoo Supergroup cover the entire East Cape Midlands area. Shallow soils leave large areas as uncovered rock. The exposed bedrock in addition to a low shrubland vegetation cover makes this area of extremely low fire risk.
Current Land Use	Agriculture (mainly moderate capacity livestock grazing)

FACTOR	SUITABILITY OF THE PREFERRED SITE
Landowner Willingness	All affected landowners have given their consent and have signed letters of consent for the undertaking of the S&EIA Process and the subsequent development of the proposed Kaladokhwe WEF 3, should EA be granted.

Furthermore, the proposed Kaladokhwe WEF 3 forms part of a larger WEF cluster that is being proposed by the Project Applicant (i.e., the development of three WEFs, namely the Kaladokhwe WEF 1, the Kaladokhwe WEF 2 and the Kaladokhwe WEF 3). The main determining points for the Project Applicant was to find suitable, developable land in one contiguous block to (i) optimize design, (ii) minimize construction and operational costs, and (iii) minimize sprawling development and limit the impact footprints. In addition, the proximity to the Iziko Capacitator Station and the newly proposed Poseidon North MTS to be established in close proximity to the Iziko Capacitator Station were also major determinants for identifying suitable sites for the proposed WEF development.

It is important to note that the National Department of Environmental Affairs (DEA) in discussion with the Department of Energy (DoE) (now respectively operating as the DFFE and DMRE), was mandated by MinMec to commission a Strategic Environmental Assessment (SEA) to identify the areas in South Africa that are of strategic importance for Wind and Solar PV development. The Phase 1 Wind and Solar PV SEA was completed in 2015 and was in support of the Strategic Infrastructure Plan (SIP) 8, which focuses on the promotion of green energy in South Africa. The SEA aimed to identify strategic geographical areas best suited for the roll-out of large-scale wind and solar PV energy projects, referred to as Renewable Energy Development Zones (REDZs). Through the identification of the REDZs, the key objective of the SEA was to enable strategic planning for the development of large-scale wind and solar PV energy facilities in a manner that avoids or minimises significant negative impact on the environment while being commercially attractive and yielding the highest possible social and economic benefit to the country – for example through strategic investment to lower the cost and reduce timeframes of grid access. Following the completion of the SEA, the REDZs were gazetted in February 2018 in GN R114 by the Minister of Environmental Affairs. Following this, the Phase 2 Wind and Solar SEA was commissioned by the DFFE in 2016 and was completed in 2019, which resulted in the identification of three additional REDZs. These REDZs were gazetted for implementation in Government Gazette 44191, Government Notice 142, dated 26 February 2021. One of these REDZs is the Stormberg REDZ, which allows for both Wind and Solar developments.

The proposed project does not fall within any of the Renewable Energy Development Zones (REDZs), which were promulgated in Government Gazette 41445, Government Notice (GN) R114 on 16 February 2018. The proposed Kaladokhwe WEF 3 project site is located approximately 30 km away (at its closest point) from the Stormberg REDZ. In addition, the proposed Kaladokhwe WEF 3 project site is located approximately 2.5 km away (at its closest point) from the Eastern Strategic Transmission Corridor (as gazetted on 16 February 2018, GN R113). Therefore, the project's proximity to the Stormberg REDZ and the Eastern Strategic Transmission Corridor supports the development of a large-scale renewable energy project at the proposed location. The proposed project is therefore linked to the national planning vision for large-scale wind and solar development in South Africa.

Given the site selection requirements associated with WEFs and the suitability of the land available on the aforementioned land portions, and the fact that **no initial fatal flaws are present on the proposed Kaladokhwe WEF 3 project site**, no other site alternatives were considered as part of this S&EIA Process.

Therefore, the Kaladokhwe WEF 3 project site was deemed feasible and selected as the preferred site i.e., no other site alternatives will be considered in the EIA Phase.

5.1.6 Location Alternatives

5.1.6.1 Development Footprint within the Preferred Site

As an initial step, the Project Applicant consulted the National Web-Based Environmental Screening Tool (https://screening.environment.gov.za/screeningtool/#/pages/welcome) to determine a baseline description of the prevalent environmental sensitivities within the proposed preferred project site. Subsequent consultation with the affected landowners was then also undertaken in order to identify possible areas within the proposed project site boundary that should be excluded from development. This then guided the selection of the best suitable developable footprint to be assessed by the specialists from an environmental sensitivities and practical/technical perspective. The study area that is being subjected to specialist assessment for purposes of this S&EIA Process comprises the aforementioned affected farm portions (see Section 5.1.5.1) and covers approximately 7 381 ha.

The main project components are the wind turbines themselves, which inform the layout of associated infrastructure such as roads, crane platforms, construction compound and laydown area and substation hubs. Detailed consideration was given to selecting areas that would be suitable for turbine placement or project infrastructure. In the selection process, some areas within the preferred project site were eliminated for the following reasons:

- Wind resources: To ensure that a project has a good chance of being constructed in the highly competitive REIPPPP space, wind turbines must be placed in the areas with the highest wind resources. Typically, ridgelines prove most suitable in this respect due to flow acceleration effects whereas average wind speeds in the valleys between tend to be very low for the opposite reasons.
- Buildable areas: Consideration of all preliminary technical and environmental parameters (prior to the S&EIA Process) which demarcate where turbine placement is feasible and exclude areas where not. This is based on maximum allowable slopes, setbacks from farmsteads, setbacks from neighbouring farms required by provincial land-use regulations and finally required buffers from Eskom power lines. In addition, the process of identifying buildable areas takes into account certain 'No-Go' zones to avoid potential environmental sensitivities identified by specialists.
- Landowner input: The landowners were provided with the opportunity to state preference for certain areas of their properties to be excluded from the development. This meant that some areas of potential development would be excluded due to landowner preferences.

Initial specialist assessment of the study area during the Scoping Phase through desktop-based analysis and fieldwork methodologies (where required) resulted in the determination and preliminary verification of environmental sensitivities present on site. The proposed permanent development footprint is based on an indicative project layout of the proposed Kaladokhwe WEF 3, which was assessed by the specialists

during the Scoping Phase to indicate potential sensitive areas that should preferably be avoided and comprises an estimated 61 ha which is approximately 1.2% of the total study area. Based on these scoping level findings from the specialist assessments, a preliminary combined environmental features map has been produced (included as Figure 5.5 below). Also, a preliminary combined environmental sensitivity map has been produced (included as Figure 5.6 below). Figure 5.6 shows the identified and assessed environmental sensitivities such as agricultural potential, terrestrial biodiversity, watercourse features, avifauna and bats 'No-Go' areas present within the study area, and sensitive noise and visual features that is associated with a typical wind farm development. This map therefore indicates that the inherent sensitivity of the preferred project site to the proposed development footprint is generally medium to low and is therefore more than suited for the development of the proposed WEF project given that all measures be taken to avoid, manage or mitigate potential impacts that may be imposed by the proposed development.

During the EIA Phase, the specialists will, based on their preliminary impact assessment of the proposed development footprint of the Kaladokhwe WEF 3 following the Scoping Phase, refine their sensitivity mapping of the proposed project layout with recommendations regarding micro siting and selection of infrastructure location alternatives, as well as required mitigation measures and management actions. As a result, the preferred project layout of the proposed Kaladokhwe WEF 3 within the identified development footprint will be determined, whereby any sensitive features identified and confirmed by the specialist impact assessments, will be avoided, remedied, or mitigated by the proposed project layout. Although all existing access roads will be utilised for the proposed project and have been assessed during the Scoping Phase, the planned internal road network including all additional service roads to be constructed will be confirmed as part of the project layout, which will also be subjected to detailed specialist assessment during the EIA Phase.

The preferred indicative development footprint of the Kaladokhwe WEF 3 project is shown in Figure 5.6. Therefore, **no other alternative development footprints within the preferred project site** will be considered during the EIA Phase, except for micro siting of project infrastructure required based on the impact assessment findings of the specialist team following detailed site surveys. The **proposed layout of the Kaladokhwe WEF 3 project infrastructure** is also shown in Figure 5.6 below. Therefore, **no other alternative project layouts within the preferred development footprint** will be considered during the EIA Phase, except for micro siting of project infrastructure required based on the impact assessment findings of the specialist team following detailed site surveys.

5.1.6.2 Project Infrastructure Location Alternatives

Various infrastructure alternatives are being considered and will be assessed in this S&EIA Process. These include alternative locations for the construction compound and laydown area at the WEF, as well as alternative technologies for the Battery Energy Storage Systems (BESS).

- **Construction Compound and Laydown Area:**

Two possible locations or placement alternatives for the construction compound and laydown area have been identified at the proposed Kaladokhwe WEF 3 project site and will be taken forward into the EIA Phase for detailed specialist assessment. The construction compound and laydown area will comprise an approximate footprint of up to 38 ha.

- **Substation Hubs**

The proposed project will include two on-site substation hubs incorporating a facility substation, switchyard, collector infrastructure and associated operation and maintenance (O&M) buildings. Each substation location will have a maximum development footprint of up to 4 ha each and built infrastructure will not exceed 12 m in height. Two possible locations or placement options for the substation hubs have been identified at the proposed Kaladokhwe WEF 3 project site and will be taken forward into the EIA Phase for detailed specialist assessment. **Note** that both these substation locations will be put forward to the Competent Authority for approval.

5.1.7 Technology Alternatives

The Project Applicant is considering several types of electrochemical BESS technologies for inclusion at the proposed Kaladokhwe WEF 3. The electrochemical BESS technologies that are being considered in the EIA include the following:

- Lead Acid and Advanced Lead Acid BESS;
- Lithium ion BESS;
- Nickel based BESS (i.e. Nickel-Cadmium (NiCd) and nickel–metal hydride (NiMH)); and
- High Temperature (NaS, Na-NiCl2, Mg/PB-Sb) BESS.

The preferred BESS technology to be employed at the Kaladokhwe WEF 3 will be confirmed during the EIA Phase. A Technical Development Report on Battery Storage Systems that has reference to the proposed Kaladokhwe WEF projects is included in Appendix G of this Scoping Report.

Table 5.3: Advantages and disadvantages associated with the BESS technologies being considered for the proposed Kaladokhwe WEF 3 (Sources: Parsons, 2017; Zhang *et al*., 2016)

BESS technologies being considered	Advantages	Disadvantages
Lead Acid and Advanced Lead Acid BESS (Valve regulated (VRLA and fluid lead acid (FLA))	▪ Mature technology. ▪ Relatively low cost associated to production of the BESSs. ▪ Advanced Lead Acid BESS have a longer operational life span, better temperature performance and lower initial costs than traditional Lead Acid BESS. ▪ VRLA BESS are solid-state i.e. pose less risk to the environment in terms of spillages.	▪ Contain toxic chemicals, which can be harmful to humans and the environment. ▪ Lack of adequate maintenance can cause leakage of electrolytes. ▪ FLA BESS require high maintenance therefore are not preferred for large scale energy storage.
Lithium-ion BESS	▪ Sealed systems i.e., pre-assembled off site and delivered to site for placement (i.e., carries less potential risk to the environment in terms of spillages). ▪ Does not require active cooling unlike other BESS technologies.	▪ Explosions and fires can occur as result of electrolytes mixing when a breach occurs. A breach can be caused by: - improper maintenance near operating temperature, - thermal expansion, or - freeze thaw cycles.

Nickel based BESS (Nickel-Cadmium (NiCd) and nickel–metal hydride (NiMH))	▪ Vented nickel-based BESS are considered safer and more economical due to low-pressure release valve facilitating the release of oxygen and hydrogen in cases of overcharging or rapid discharging. ▪ NiMH BESS cells do not contain any toxic chemicals, unlike NiCd BESS, which contain cadmium.	▪ NiCd BESS cells contain cadmium, which is considered toxic and harmful.
High Temperature	▪ Sealed system i.e., pre-assembled off site and then delivered to site for placement poses less risk to the environment in terms of spillages. ▪ Well-known for its long-term efficiency and minimal electrode degradation. The liquid nature of the components results in minimal stress experienced by the electrodes, which would otherwise degrade and crack if in a solid state. ▪ BESS comprise of cells that are hermetically sealed and contain fire mitigation measures such as cells being surrounded with sand (e.g., NaS BESS).	▪ General high fire risk associated with High Temperature BESS technologies. ▪ Operate at high temperatures (approximately 300°C). This therefore require active heating in order to facilitate ion transfer and maintain the molten state of some/all of the BESS components increase operational costs.

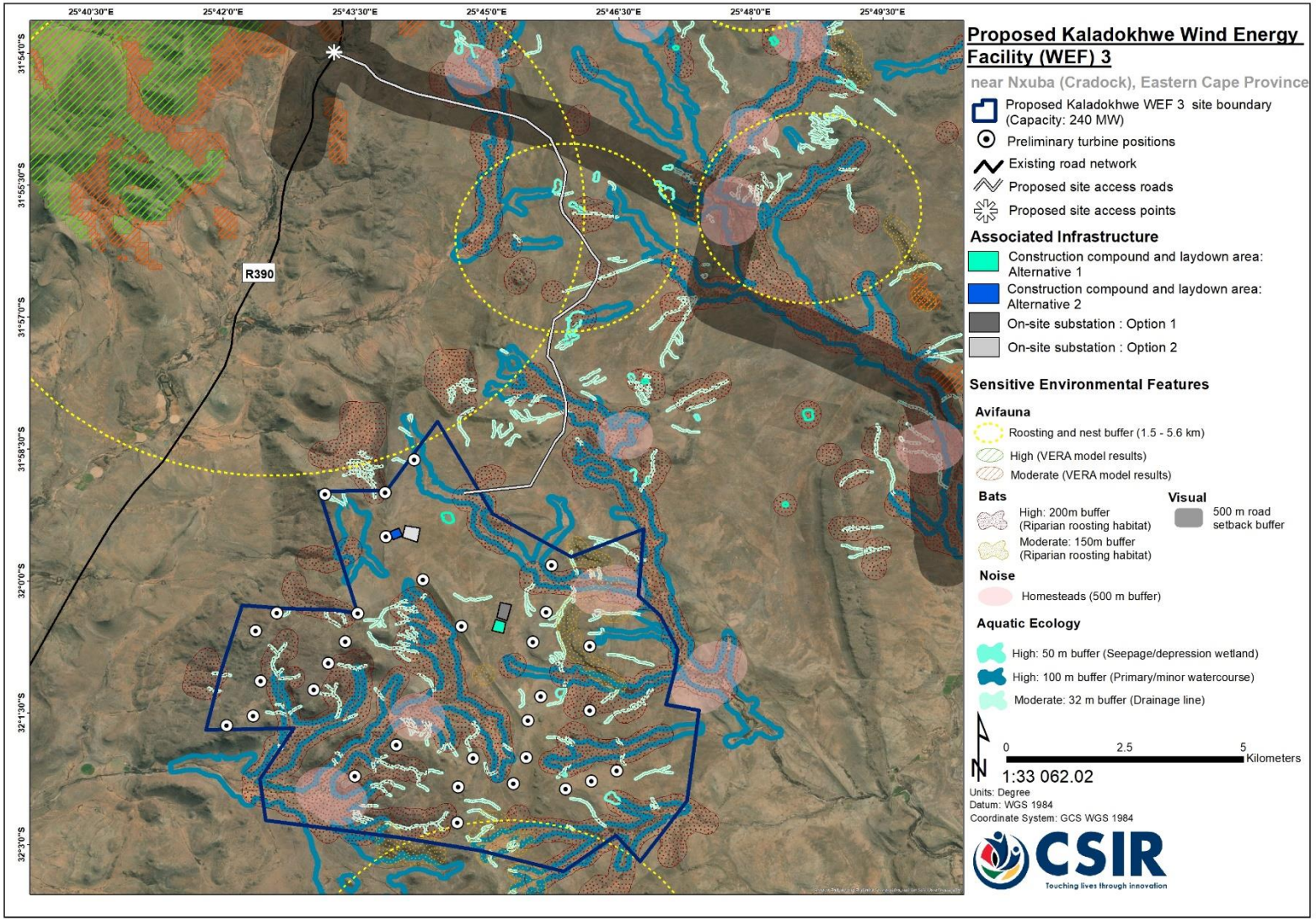

Figure 5.5: Preliminary combined environmental features map for the proposed Kaladokhwe WEF 3 project site.

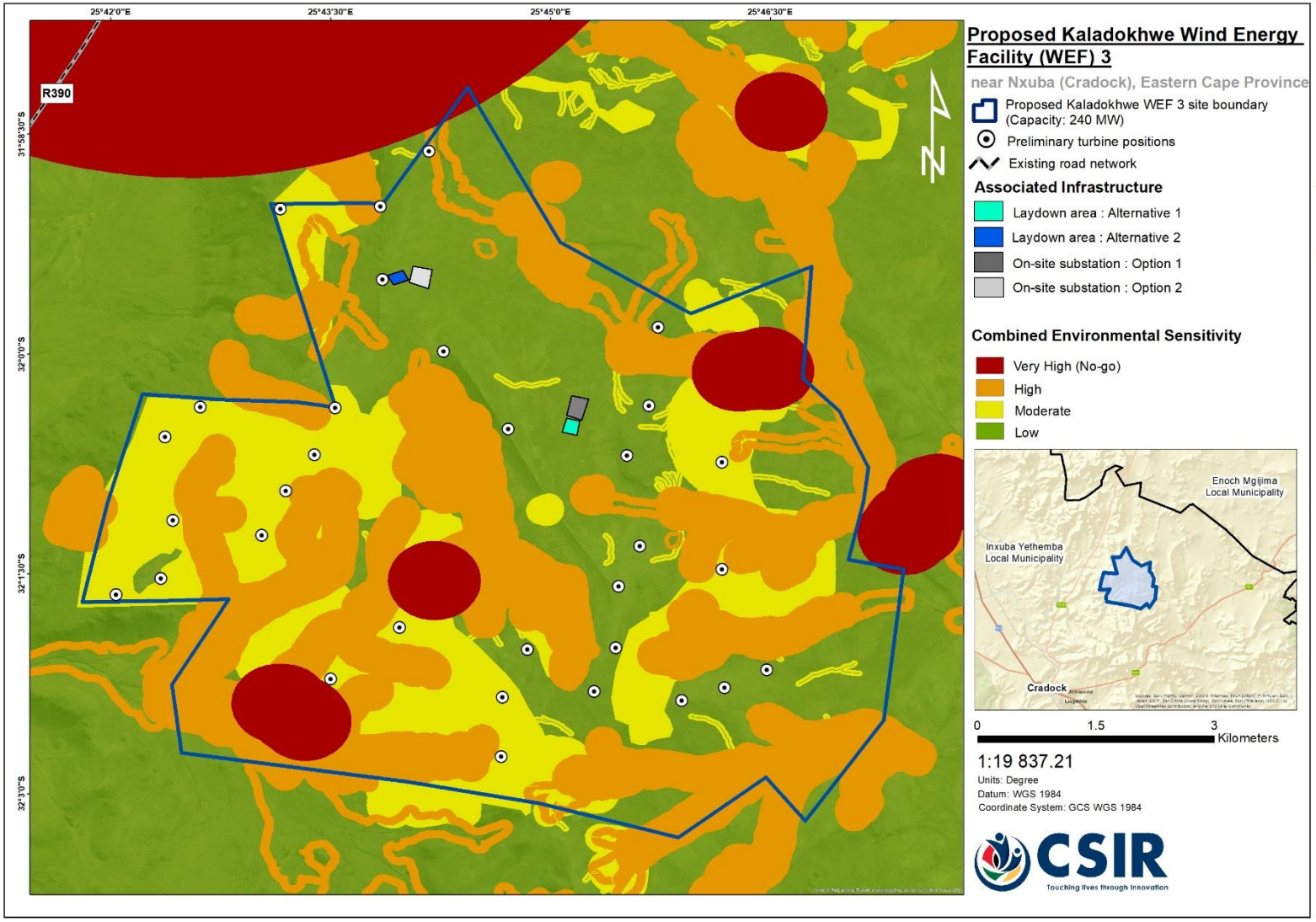

Figure 5.6: Preliminary combined environmental sensitivity map for the proposed Kaladokhwe WEF 3 project site.

5.2 Summary of Legislative Requirements for the Assessment of Alternatives

As noted in Chapter 1 of this Scoping Report, the 2014 NEMA EIA Regulations (as amended) have certain requirements in terms of the selection of the **proposed preferred activity, site, and location of the development footprint within the site**. Table 5.4 below indicates the requirements of the 2014 NEMA EIA Regulations (as amended) in terms of the process leading to the preferred activity, site, and development footprint location alternatives. Table 5.4 also includes a response from the EAP showing how the requirements of the 2014 NEMA EIA Regulations (as amended) have been addressed in this report.

Table 5.4: Requirements for the consideration of Alternatives based on the 2014 NEMA EIA Regulations (as amended)

	Section of the EIA Regulations	Requirements for a Scoping Report in terms of Appendix 2 of the 2014 NEMA EIA Regulations (GN R982)	Response from EAP
1	Appendix 2 – 2 – 1 – g – (i)	2. (1) A scoping report must contain the 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: (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 all the alternatives considered;	Refer to Sections 5.1, 5.2 (i.e., this section) and 5.3 of this chapter which provides a description of the process that led to the identification of the preferred alternatives and which alternatives will be taken further into the EIA Phase for assessment.
2	Appendix 2 – 2 – 1 – g – (ii)	(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Refer to Chapter 4 of this Scoping Report and Appendix D, which details the process followed in terms of Public Participation and includes the supporting documentation.
3	Appendix 2 – 2 – 1 – g – (iii)	(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;	This will be completed following the release of the Draft Scoping Report, and a Comments and Responses Report will be included in the Final Scoping Report.
4	Appendix 2 – 2 – 1 – g – (iv)	(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Refer to Section 5.1.6 and 5.1.7 of this chapter for a description of the environmental sensitivities associated with the preferred site. Section 5.1.5 of this chapter also provides information on environmental attributes that were considered in the selection of the preferred site for the proposed WEF. Chapter 3 of this Scoping Report also includes a description of the wider affected

	Section of the EIA Regulations	Requirements for a Scoping Report in terms of Appendix 2 of the 2014 NEMA EIA Regulations (GN R982)	Response from EAP
			environment linked to the proposed Kaladokhwe WEF 3.
5	Appendix 2 – 2 – 1 – g – (v)	(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;	In terms of the No-Go alternative, this is not considered as the preferred alternative, as discussed in Section 5.1.1 of this chapter. The impacts and risks of both adopting and not adopting the No-Go alternative have been discussed in this section. Feedback on the impacts and risks that informed the identification of the preferred activity (i.e., generation of energy from wind resources) is provided in Section 5.1.4 above. Such feedback relating to the preferred site and location of the development footprint within the site is captured in Chapter 6 of this Scoping Report. This chapter includes a high-level assessment of impacts and risks of the Kaladokhwe WEF 3 at the preferred site and location of the development footprint within the site, and it includes a description and assessment of the nature, significance, consequence, extent, duration and probability of the identified impacts for the preferred alternatives, as well as an assessment of the reversibility and irreplaceability of the potential identified impacts, as well as the degree to which the identified impacts can be avoided, managed or mitigated. Furthermore, various technologies for the BESS will be assessed in terms of impacts and risks in the EIA Phase. In addition, four location alternatives for the construction compound and laydown area, and six location alternatives for the substation hubs will be assessed in terms of impacts and risks in the EIA Phase. The preferred BESS technology, substation locations, and construction compound and laydown area will be confirmed in the EIA Phase.
6	Appendix 2 – 2 – 1 – g – (vi)	(vi) the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and	Refer to Chapter 7 of this Scoping Report for the impact assessment methodology that was used in the assessment of impacts captured in Chapter 6. The same impact assessment methodology will be

	Section of the EIA Regulations	Requirements for a Scoping Report in terms of Appendix 2 of the 2014 NEMA EIA Regulations (GN R982)	Response from EAP
		probability of potential environmental impacts and risks associated with the alternatives;	used in the EIA Phase and as such has only been mentioned once in the Scoping Report.
7	Appendix 2 – 2 – 1 – g – (vii)	(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;	Feedback on the impacts and risks that informed the identification of the preferred activity (i.e., generation of energy from wind resources) is provided in Section 5.1.4 above. Such feedback relating to the preferred site and location of the development footprint within the site is captured in Chapter 6 of this Scoping Report. This chapter includes a high-level assessment of impacts and risks of the Kaladokhwe WEF 3 at the preferred site and location of the development footprint within the site.
8	Appendix 2 – 2 – 1 – g – (viii)	(viii) the possible mitigation measures that could be applied and level of residual risk;	Feedback on the impacts and risks that informed the identification of the preferred activity (i.e., generation of energy from wind resources) is provided in Section 5.1.4 above. Such feedback relating to the preferred site and location of the development footprint within the site is captured in Chapter 6 of this Scoping Report. This chapter includes a high-level assessment of impacts and risks of the Kaladokhwe WEF 3 at the preferred site and location of the development footprint within the site.
9	Appendix 2 – 2 – 1 – g – (ix)	(ix) the outcome of the site selection matrix;	Refer to Section 5.1.5 of this chapter for information on the process that led to the identification of the preferred site.
10	Appendix 2 – 2 – 1 – g – (x)	(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	Where no further alternatives were considered, a motivation has been provided in this chapter.
11	Appendix 2 – 2 – 1 – g – (xi)	(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Refer to Section 5.3 of this chapter for a concluding statement.

5.3 Concluding Statement of Preferred Alternatives

As per Appendix 2, Section 2 (1) (g) (xi) of the 2014 NEMA EIA Regulations (as amended), and based on Section 5.1 above, the following alternatives will be taken forward into the EIA Phase for further assessment:

- **No-Go Alternative:**

- The no-go alternative assumes that the proposed project will not go ahead i.e., it is the option of not constructing the proposed Kaladokhwe WEF 3. This alternative would result in no environmental impacts on the site or surrounding local area as a result of the WEF. It will provide a baseline against which other alternatives will be compared and considered during the EIA Phase. The no-go alternative will be assessed in detail by all the specialists on the project team.

- **Land-Use Alternative:**
  - The current land-use is agriculture, specifically low-density livestock grazing and this has been identified as an alternative land-use for the site. The agricultural potential of the site is found to be generally low and not deemed feasible to assess further during the EIA Phase. The development of a WEF at the proposed project site is more favourable than the agricultural land-use alternative, and the WEF is therefore the preferred land-use alternative.

- **Type of Activity Alternative:**
  - This relates to the generation of electricity from a renewable energy source, and in this particular case, from wind. The generation of electricity from a renewable energy source was the only activity considered by the Project Applicant, and thus considered in this DSR. No other activity types were considered or deemed appropriate based on the expertise of the Project Applicant.

- **Renewable Energy Alternatives:**
  - Given the above, the development of a WEF is the preferred and only renewable energy technology to be developed on site because:
    - The site has a good sufficient wind resource based on on-site measurements and wind resource modelling with limited environmental impact;
    - Solar energy, a potential developable technology on site, would not be as economically viable compared to wind development at this location mainly due to the scarcity of water; and
    - The 2019 IRP indicates a higher allocation target towards wind energy compared to solar energy.

- **Preferred Site and Development Footprint within the site:**
  - The preferred project site for the proposed Kaladokhwe WEF 3 comprises the following farm portions:
    - Portion 1 of the Farm Ossen Kraal No. 40;
    - Portion 1 of the Farm Ruigte Fontein No. 150;
    - Remaining Extent of the Farm Ruigte Fontein No. 150;
    - Gunsteling, being Portion 1 (Remaining Extent) of the Farm No. 165;
    - Portion 2 of the Farm No. 166;
    - Portion 1 of the Farm No. 166;
    - Ruigte Fontein, being Portion 3 of the Farm No. 150;

- Remaining Extent (Portion 0) of the Farm No. 607;
- Roland, being the Remaining Extent (Portion 0) of the Farm No. 169;
- De Bruins Requist, being the Remaining Extent (Portion 0) of the Farm No. 168;
- Gunsteling, being Portion 1 (Remaining Extent) of the Farm No. 165;
- Lange Hoek, being the Remaining Extent of the Farm No. 183; and
- Lange Hoek, being Portion 7 of the Farm No. 171.

- The development footprint within the preferred project site was determined through a screening exercise of the project study area by the specialist team (specialists' input have been provided during the Scoping Phase and are included in Appendix F of this Scoping Report) as well as through consultation with the affected landowners to identify sensitive areas that should preferably be avoided and thus are excluded from development (i.e., 'No-Go' areas). The proposed permanent development footprint of the proposed Kaladokhwe WEF 3 will comprise approximately 61 ha.
- The preferred indicative project layout for the proposed Kaladokhwe WEF 3 will be determined and confirmed following detailed assessment inputs from the various specialists during the EIA Phase. The specialist assessments will aim to identify various environmental sensitivities within the proposed development footprint that should be avoided, which will be taken into consideration during the determination and refinement of the preferred project layout of the WEF.
- Although all existing access roads are likely to be utilised for the proposed project and have been assessed during the Scoping Phase, the planned internal road network on site including all new additional service roads to be constructed will be confirmed as part of the project layout, which will be subject to detailed specialist assessment during the EIA Phase.

- **Project Infrastructure Location Alternatives**
  - Two possible locations for the construction compound and laydown area will be assessed in the EIA Phase and the preferred alternative will thereafter be selected.
  - Two location options for the substation hubs will be assessed in the EIA Phase. **Note** that both these substation locations will be put forward to the Competent Authority for approval.

- **Technology Alternatives**
  - The following types of electrochemical BESS technologies will be assessed in the EIA Phase and the preferred alternative will thereafter be selected:
    - Lead Acid and Advanced Lead Acid BESS;
    - Lithium-ion BESS;
    - Nickel based BESS (i.e., Nickel-Cadmium (NiCd) and nickel–metal hydride (NiMH)); and
    - High Temperature (NaS, Na-$NiCl_2$, Mg/PB-Sb) BESS.

Scoping and Environmental Impact Assessment for the Proposed Development of the 240 MW Kaladokhwe Wind Energy Facility 3 near Nxuba (Cradock) in the Eastern Cape

DRAFT SCOPING REPORT

CHAPTER 6: Issues and Potential Impacts

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6 ISSUES AND POTENTIAL IMPACTS

The purpose of this chapter is to present a synthesis of the key issues and potential impacts that have been identified thus far as part of the Scoping Process. These issues and impacts have been identified via the environmental status quo of the receiving environment (environmental, social and heritage features present on site) (discussed in Chapter 3 of this Scoping Report), a review of environmental impacts from other similar wind energy projects, and scoping inputs from the specialists that form part of the project team. The Terms of Reference (ToRs) for the Specialist Assessments that have been deemed necessary, based on the relevant issues and impacts discussed within this chapter, are incorporated into the Plan of Study for the EIA (PSEIA) that is discussed in Chapter 7 of this Scoping Report.

6.1 Aquatic and Terrestrial Biodiversity and Species

6.1.1 Key Issues

The proposed Wind Energy Facility (WEF) 1 development will result in a number of actions that will arise in both the construction and operational phases of the project and include inter alia:

- Possible levelling of topographic features;
- Some clearance of vegetation;
- Establishment of hard panned roadways and related surfaces;
- Excavation and construction of structures using wet trades;
- Establishment of transformers and substations;
- Establishment of wind turbines and crane platforms;
- Cabling at a sub-surface level;
- Fencing of the site; and
- Other supportive infrastructure.

The construction phase is a relatively short-term undertaking, although “intensive” in terms of the rapid physical changes that arise on site. The operational phase is more benign in nature, with limited staff and minor activity in and around the proposed project. Given this situation, it is expected that the following impacts of an ecological nature may arise during the construction and operational phases.

6.1.2 Aquatic Biodiversity Impacts

Most of the potential aquatic ecosystem impacts of the proposed project are likely to take place during the construction phase. The potential aquatic ecosystem impacts of all the proposed activities include:

Construction Phase:

- Disturbance and possible loss of aquatic habitats within the watercourses with the associated impact to sensitive aquatic biota (fauna and flora);
- The removal of indigenous riparian and instream vegetation that has the potential to reduce the ecological integrity and functionality of the watercourses;

- Impact on localized surface water quality due to construction activities;
- Water demand for construction could place stress on the existing available water resources should external water sources not be utilised;
- Road crossing structures if not adequately designed could impede flow in the watercourses;
- Alien vegetation infestation within the aquatic features due to disturbance; and
- Increased sedimentation and risks of contamination of surface water runoff during construction.

Operational Phase:

- Ongoing disturbance of aquatic features and associated vegetation along access roads or adjacent to the infrastructure that needs to be maintained;
- Modified runoff characteristics from hardened surfaces at the turbines and the substations, as well as along the access roads that have the potential to result in erosion of hillslopes and watercourses; and
- Possible increase in water consumption and potential for water quality impacts (such as contamination from sewage generated on site) as a result of the operation of the site.

Decommissioning Phase:

- An increased disturbance of aquatic habitat due to the increased activity on the site; and
- Increased sedimentation and risks of contamination of surface water runoff.

6.1.2.1 Assessment to be undertaken during the EIA Phase

The Specialist is required to compile an Aquatic Biodiversity Impact Assessment in adherence to the gazetted Environmental Assessment Protocols, specifically the 'Protocol for the Specialist Assessment and Minimum Report Content Requirements of Environmental Impacts on Aquatic Biodiversity' (GG 43110 / GN R320, 20 March 2020). This protocol replaces the requirements of Appendix 6 of the 2014 NEMA EIA Regulations, as amended. The relevant mitigation and management actions will be incorporated into the EMPr that will form part of the EIA Report. Refer to Section 7.7.3 in Chapter 7 of this Scoping Report for the ToRs specified for the Aquatic Biodiversity Impact Assessment to be undertaken.

6.1.3 Terrestrial Biodiversity and Species Impacts

The following is a list of potential impacts on the terrestrial ecosystems and species that may occur due to the proposed development:

Construction Phase:

- The direct and permanent loss of vegetation types and associated plant species, including species of conservation concern;
- The direct and permanent loss of faunal habitat;
- Clearing of vegetation resulting in breaks in habitat that will lead to habitat fragmentation and edge effects;
- Heavy machinery associated with clearing of vegetation and construction of the WEF facility and access roads causing an increase in dust emissions resulting in impacts on plant productivity;
- Faunal mortality due to roadkill and persecution; and

- Disturbance to faunal species due to construction and operation activities that generate noise, dust, vibrations and lighting. This disturbance may cause faunal species to leave the area or disrupt foraging and/or breeding behaviour of those that remain.

Operational Phase:

- Direct faunal mortalities;
- Increased human activity, light and noise levels; and
- Changes in animal behaviour due to clearing of vegetation and subsequent disturbance to the soil, and therefore seed bank, leading to the infestation of alien invasive plant species and other ruderal species.

Decommissioning Phase:

- The direct and permanent loss of vegetation types and associated plant species, including species of conservation concern;
- The direct and permanent loss of faunal habitat;
- Increase in dust emissions, noise and vibrations could cause disturbance to faunal species resulting in them leaving an area or disrupting foraging and/or breeding behaviour of those that remain; and
- Increased erosion and stormwater run-off.

6.1.3.1 Assessment to be undertaken during the EIA Phase

The Specialist is required to compile a Terrestrial Biodiversity and Species Impact Assessment in adherence to the gazetted Environmental Assessment Protocols, specifically the 'Protocol for the Specialist Assessment and Minimum Report Content Requirements of Environmental Impacts on Terrestrial Biodiversity' (GG 43110 / GN R320, 20 March 2020)). This protocol replaces the requirements of Appendix 6 of the 2014 NEMA EIA Regulations, as amended. The relevant mitigation and management actions will be incorporated into the EMPr that will form part of the EIA Report. Refer to Section 7.7.2 in Chapter 7 of this Scoping Report for the ToRs specified for the Terrestrial Biodiversity and Species Impact Assessment to be undertaken.

6.2 Visual Impacts

6.2.1 Key Issues

Activities that will be undertaken as part of the construction and operational phases of the proposed project that will result in potential visual impacts are discussed below. The key visual issues identified by the Specialist during the Scoping Phase of this EIA process include the following:

- Potential scarring in the landscape caused by site clearance and earthworks for inter alia access roads, laydown areas, construction camps, foundations and assembly platforms;
- Potential visual intrusion and increased dust emissions during construction from heavy machinery and vehicle traffic; and

- Potential visual intrusion in the landscape during operations from inter alia the wind turbines, on-site substations, and operational and maintenance structures.

The following potential direct impacts on visually sensitive and landscape receptors due to the proposed development include:

Construction Phase:

- Visual intrusion and potential flicker effect by wind turbines and associated structures and infrastructure on existing visual receptors;
- Visual intrusion by wind turbines and associated structures and infrastructure on landscape receptors;
- Potential scarring in the landscape caused by earthworks and excavations;
- Potential visual impact of security and construction lighting on the nightscape of the region; and
- Increased dust emissions from heavy machinery and vehicle traffic.

Operational Phase:

- Visual intrusion and potential flicker effect by wind turbines and associated structures and infrastructure on existing visual receptors;
- Visual intrusion by wind turbines and associated structures and infrastructure on landscape receptors; and
- Potential visual impact of on-site security lighting and red-flashing warning lights on top of the turbine hubs on the rural nightscape of the region.

Decommissioning Phase:

- Visual intrusion and increased dust emissions due to decommissioning activities including disassembly of project components, heavy machinery, increased vehicle traffic and rehabilitation; and
- Potential visual impact of security and construction lighting on the nightscape of the region.

6.2.2 Assessment to be undertaken during the EIA Phase

The Specialist is required to undertake a Visual Impact Assessment in adherence to the gazetted Environmental Assessment Protocols, specifically with 'Part A - General Protocol for the Site Sensitivity Verification and Minimum Report Content Requirements where a Specialist Assessment is required but no specific Environmental Theme Protocol has been prescribed' (GG 43110 / GNR 320, 20 March 2020), as well as in terms of Appendix 6 of the 2014 NEMA EIA Regulations, as amended. The relevant mitigation and management actions will be incorporated into the EMPr that will form part of the EIA Report. Refer to Section 7.7.11 in Chapter 7 of this Scoping Report for the ToRs specified for the Visual Impact Assessment to be undertaken.

6.3 Heritage (including Archaeology and Cultural Landscape)

6.3.1 Key Issues

Both direct (destruction through the proposed project activities) and indirect (destruction through unintended consequences or deviations from the authorised work and footprint, and through visual intrusion into a sensitive area) impacts may occur mainly during the construction and decommissioning phases of the proposed project.

The potential direct heritage impacts identified during the Scoping Phase of this EIA process include:

- **Construction Phase:**
  - The destruction or disturbance of archaeological artefacts or sites;
  - The destruction or disturbance of graves or burial sites;
  - The destruction or disturbance of historic built infrastructure; and
  - Visual intrusion of visually sensitive heritage resources and/or cultural landscape features, which might erode its association with intangible heritage.
- **Operational and Decommissioning Phases:**
  - Visual intrusion of visually sensitive heritage resources and/or cultural landscape features, which might erode its association with intangible heritage.

6.3.2 Assessment to be undertaken during the EIA Phase

The Heritage Specialist is required to undertake a Specialist Assessment in adherence to the gazetted Environmental Assessment Protocols, specifically with 'Part A - General Protocol for the Site Sensitivity Verification and Minimum Report Content Requirements where a Specialist Assessment is required but no specific Environmental Theme Protocol has been prescribed' (GG 43110 / GNR 320, 20 March 2020), as well as in terms of Appendix 6 of the 2014 NEMA EIA Regulations, as amended. The relevant mitigation and management actions will be incorporated into the EMPr that will form part of the EIA Report. Refer to Section 7.7.6 in Chapter 7 of this Scoping Report for the ToRs specified for the Heritage Impact Assessment to be undertaken.

6.4 Palaeontology

6.4.1 Key Issues

The destruction or disturbance of palaeontological resources (isolated fossil materials) is considered the key potential impact from the proposed development, either directly or indirectly and mainly during the construction and decommissioning phases.

The potential direct impacts identified during the scoping assessment are:

- **Construction and Decommissioning Phases:**
  - Damage and/or destruction of scientifically valuable fossils preserved at or beneath the ground due to surface clearance or excavations.

6.4.2 Assessment to be undertaken during the EIA Phase

The Palaeontologist is required to undertake a Specialist Assessment in adherence to the gazetted Environmental Assessment Protocols, specifically with 'Part A - General Protocol for the Site Sensitivity Verification and Minimum Report Content Requirements where a Specialist Assessment is required but no specific Environmental Theme Protocol has been prescribed' (GG 43110 / GNR 320, 20 March 2020), as well as in terms of Appendix 6 of the 2014 NEMA EIA Regulations, as amended. The Palaeontological Impact Assessment will form part of the Heritage Impact Assessment as described in Section 6.3 above. The relevant mitigation and management actions will be incorporated into the EMPr that will form part of the EIA Report. Refer to Section 7.7.7 in Chapter 7 of this Scoping Report for the ToRs specified for the Palaeontological Impact Assessment to be undertaken.

6.5 Bats

6.5.1 Key Issues

Wind energy facilities have the potential to affect bats directly through collisions and barotrauma resulting in mortality, and indirectly through the modification of habitats. Habitat loss and displacement impacts for the proposed project are relatively small and should not pose a significant risk because the development footprint (i.e. turbines, roads, buildings, etc.) is relatively small. Direct impacts to bats will be limited to species that make use of the airspace in the rotor-swept zone of the wind turbines. The key potential direct impacts on bats from the proposed development activities that have been identified in the Scoping Phase include:

- **Construction Phase:**
  - Roost disturbance;
  - Roost destruction; and
  - Displacement of bats due to habitat loss / habitat transformation.

- **Operational Phase:**
  - Mortality of bats due to turbine collisions while commuting/foraging and/or due to barotrauma;
  - Mortality of bats due to turbine collisions during migrations; and
  - Light pollution associated risks including loss of insect prey and increased collision risks for bats foraging closer to turbines.

- **Decommissioning Phase:**
  - Displacement of bats due to disturbance associated with the decommissioning activities.

6.5.2 Assessment to be undertaken in the EIA phase

A 12-month pre-construction bat monitoring programme was designed and acoustic monitoring was undertaken across the entire project study area in accordance with the 5th Edition of the *"South African Good Practice Guidelines for Pre-construction Monitoring of Bats at Wind Energy Facilities" (MacEwan et.al. 2020).* The bat monitoring commenced in March 2022 and will be completed by March 2023. The findings

from the bat monitoring programme obtained so far has informed the scoping level assessment of potential impacts on bats for the proposed project.

The Bat Specialist is required to undertake a Specialist Assessment in adherence to the gazetted Environmental Assessment Protocols, specifically with 'Part A - General Protocol for the Site Sensitivity Verification and Minimum Report Content Requirements where a Specialist Assessment is required but no specific Environmental Theme Protocol has been prescribed' (GG 43110 / GNR 320, 20 March 2020), as well as in terms of Appendix 6 of the 2014 NEMA EIA Regulations, as amended. The relevant mitigation and management actions will be incorporated into the EMPr that will form part of the EIA Report. Refer to Section 7.7.9 in Chapter 7 of this Scoping Report for the ToRs specified for the Bats Impact Assessment to be undertaken.

6.6 Avifauna

6.6.1 Key Issues

It is important to assess the impacts of wind energy facilities, and to base this assessment on a thorough investigation of the local avifauna prior to construction, which was sufficiently done for the proposed WEF development. An initial pre-feasibility or screening survey was conducted by the Avifaunal Specialist in June 2020 which included a survey for large eagle nests and other avifaunal constraints on site and within approximately six kilometres of the proposed project site. The buildable area was refined by the Project Developer based on the findings of these early studies. Then a further twelve months (6 x field surveys) of pre-construction bird monitoring was initiated on site in November 2020 and completed in September 2021. The 12-month pre-construction monitoring programme was designed in accordance with the latest version of the "*Best Practice Guidelines for Avian Monitoring and Impact Mitigation at proposed Wind Energy Development Areas in Southern Africa*" (Jenkins *et.al.* 2015). During 2020 and 2021, several additional shorter site visits were made by the Avifaunal Specialist to examine specific avifaunal aspects of the proposed project site, and a Final Pre-construction Bird Monitoring Report was compiled during October 2021 and submitted to the Project Developer. However, due to the risk identified for Cape Vulture at the proposed project site, a second year (i.e., additional 12 months) of pre-construction bird monitoring was initiated in March 2022 and is currently underway.

The key potential impacts on the avifauna, that are all considered direct impacts, identified for the proposed WEF and its associated infrastructure include:

- **Construction Phase:**
  - Total or partial displacement of avifauna due to habitat destruction associated with the presence of the wind turbines and associated infrastructure; and
  - The noise and movement associated with the construction activities at the project site will be a source of disturbance, which would lead to the displacement of avifauna from the area.

- **Operational Phase:**
  - Disturbance of avifauna during operations of the wind turbines and associated infrastructure;

- Avifauna mortality and injury through collisions with the wind turbines;
- Total or partial displacement of avifauna due to operations of the wind turbines and associated infrastructure; and
- Avifauna collisions and electrocution on the internal electrical grid infrastructure.

- **Decommissioning Phase:**
  - The noise and movement associated with the activities at the project site will be a source of disturbance, which would lead to the displacement of avifauna from the area.

Based on the findings from the first 12-month pre-construction avifaunal monitoring, the Avifaunal Specialist has concluded that the level of avifaunal activity and overall abundance of priority species at the proposed project site is regarded as low. Impacts at this stage are not viewed as being of an extent or significance so as to preclude development and it is the Specialist' expert opinion that the project may proceed to the EIA Phase.

6.6.2 Assessment to be undertaken during the EIA Phase

The Avifauna Specialist is required to compile a Specialist Assessment in adherence to the gazetted Environmental Assessment Protocols, specifically the 'Protocol for the Specialist Assessment and Minimum Report Content Requirements of Environmental Impacts on Avifauna by Onshore Wind and/or Solar PV Energy Generation Facilities where the Electricity Output is 20 MW or more' (GG 43110 / GN R320, 20 March 2020). This protocol replaces the requirements of Appendix 6 of the 2014 NEMA EIA Regulations, as amended. The relevant mitigation and management actions will be incorporated into the EMPr that will form part of the EIA Report. Refer to Section 7.7.4 in Chapter 7 of this Scoping Report for the ToRs specified for the Avifaunal Impact Assessment to be undertaken.

6.7 Soils and Agricultural Potential

The significance of all potential impacts on agricultural resources is considered low and is mitigated by two factors; (a) the fact that the proposed development site is situated on land of low agricultural potential owing to its unsuitability for crop production and is limited to moderate capacity grazing, and (b) the agricultural footprint of the proposed development (including all associated infrastructure and road network), that results in the exclusion of land from potential grazing, is very small in relation to the surface area of the affected farms. The WEF infrastructure will only occupy approximately 1% of the total surface area, according to the typical surface area requirements of WEFs in South Africa. Therefore, all agricultural impacts, including loss of agricultural land use, erosion and soil degradation will not be widespread and can at worse only affect a very limited proportion (1%) of the surface area. All agricultural activities will be able to continue unaffectedly on all parts of the farms other than the small development footprint for the duration of and after the project.

Two potential negative agricultural impacts have been identified, that are considered direct impacts:

- Loss of agricultural land use;

  - Agricultural land directly occupied by the development infrastructure will become unavailable for agricultural use; and
  - This impact is relevant only in the construction phase. No further loss of agricultural land use occurs in subsequent phases.
- Soil degradation;
  - Soil can be degraded by impacts in three different ways: erosion; topsoil loss; and contamination;
  - Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads;
  - Loss of topsoil can result from poor topsoil management during construction related excavations;
  - Hydrocarbon spillages from construction activities can contaminate soil. Soil degradation will reduce the ability of the soil to support vegetation growth; and
  - This impact is relevant only during the construction and decommissioning phases.

One positive agricultural impact has been identified, that is considered an indirect impact:

- Increased financial security for farming operations;
  - Reliable income will be generated by the farming enterprises through the lease of the land to the wind energy facility; and
  - This is likely to increase their cash flow and financial security and thereby could improve farming operations.

Due to the generally low agricultural potential of the site, and the consequent low agricultural impact, there are no restrictions relating to agriculture, which could preclude authorisation of the proposed development and therefore, from an agricultural impact point of view, the development should proceed to the EIA Phase.

6.7.1 Assessment to be undertaken during the EIA Phase

The Agricultural Specialist is required to compile an Agricultural Compliance Assessment in adherence to the gazetted Environmental Assessment Protocols, specifically the 'Protocol for the Specialist Assessment and Minimum Report Content Requirements of Environmental Impacts on Agricultural Resources by Onshore Wind Energy Generation Facilities where the Electricity Output is 20 MW or more' (GG 43110 / GN R320, 20 March 2020). This protocol replaces the requirements of Appendix 6 of the 2014 NEMA EIA Regulations, as amended. The relevant mitigation and management actions will be incorporated into the EMPr that will form part of the EIA Report. Refer to Section 7.7.1 in Chapter 7 of this Scoping Report for the ToRs specified for the Agricultural Compliance Statement to be undertaken.

6.8 Socio-Economic

6.8.1 Key Issues

An assessment of the social and economic factors (both positive and negative) is being undertaken to determine the potential social and economic impacts and/or benefits that may occur due to the development of the proposed project.

The following potential socio-economic impacts of the proposed development were identified during the Scoping Phase and include:

- **Construction Phase:**
  - Investment and the contribution to the national, regional and local economy;
  - Generation of employment, income and skills; and
  - Pressures on community fabric and resources due to an influx of jobseekers.

- **Operational Phase:**
  - Lower national CO_2 emissions per unit of energy generated;
  - Investment and the contribution to the national, regional and local economy;
  - Generation of employment, income and skills; and
  - Improvement of community facilities and prospects through funding of social upliftment projects.

- **Decommissioning Phase:**
  - Loss of employment due to decommissioning of the facility.

6.8.2 Assessment to be undertaken during the EIA

The Socio-Economic Specialist is required to undertake a Specialist Assessment in adherence to Appendix 6 of the 2014 NEMA EIA Regulations, as amended, as well as to any other additional relevant legislation, policies and guidelines that may be deemed necessary, if applicable. The relevant mitigation and management actions will be incorporated into the EMPr that will form part of the EIA Report. Refer to Section 7.7.8 in Chapter 7 of this Scoping Report for the ToRs specified for the Socio-Economic Impact Assessment to be undertaken.

6.9 Traffic

6.9.1 Key Issues

The proposed main routes via which the proposed Kaladokhwe WEF 3 project site could be accessed will be along the R390, which is situated to the west of the site, and via the R61, located to the southeast of the site. The existing road network on the proposed project site consists of several unsurfaced gravel roads that traverse the various farm portions. However, the planned internal access road network for purposes of the WEF and associated infrastructure is yet to be confirmed as part of the final project layout and will be assessed during the EIA Phase.

The potential traffic related issues identified during the Scoping Phase include:

- **Construction Phase:**
  - Noise, dust and exhaust pollution due to construction related traffic including transportation of people, construction materials, water and equipment to and from the development site, as well as abnormal trucks delivering turbine components to the site;
  - Noise, dust and exhaust pollution due to the construction of access roads, excavations of turbine foundations, trenching for electrical cables and other ancillary construction works that will temporarily generate increased traffic; and
  - Potential traffic congestion and delays on the surrounding road network due to increase in vehicle traffic during the construction phase.

- **Operational Phase:**
  - Potential traffic congestion and delays on the surrounding road network due to increased vehicle traffic (*Note that the traffic generated because of the development during the operational phase will be minimal and will not have a significant impact on the surrounding road network in light of the remote and rural setting of the area*).

- **Decommissioning Phase:**
  - Noise, dust and exhaust pollution due to construction related traffic including transportation of people, construction materials, water and equipment to and from the development site, as well as abnormal trucks transporting turbine components from the site; and
  - Potential traffic congestion and delays on the surrounding road network due to increased vehicle traffic because of decommissioning activities.

It is critical to ensure that the abnormal load vehicles will be able to move safely and without obstruction along the preferred routes.

6.9.2 Assessment to be undertaken during the EIA Phase

The Traffic Specialist is required to undertake a Specialist Assessment in adherence to Appendix 6 of the 2014 NEMA EIA Regulations, as amended, as well as to any other additional relevant legislation, policies and guidelines that may be deemed necessary, if applicable. The relevant mitigation and management actions will be incorporated into the EMPr that will form part of the EIA Report. Refer to Section 7.7.10 in Chapter 7 of this Scoping Report for the ToRs specified for the Traffic Impact Assessment to be undertaken.

6.10 Noise

6.10.1 Key Issues

Potential noise-related impacts resulting from the construction and operational phases of this proposed WEF project can only be modelled and correctly calculated once more information regarding the duration of construction, equipment to be used and possible locations of major ancillary activity sites are known and confirmed. It is anticipated that during operation of the development, the large majority of the project site will continue with small density livestock farming as it is the current land use. The only development

related activities on site during the operational phase would entail routine servicing and unscheduled maintenance. The noise impact from maintenance activities is considered to be insignificant, with the main noise source being the operating wind turbine blades and the nacelle.

The key potential noise impacts resulting from the proposed development, which are all considered direct impacts, include the following:

- **Construction Phase:**
  - Noise pollution i.e. increase in ambient sound levels due to construction activities (e.g. equipment and vehicle noise).
- **Operational Phase:**
  - Mechanical and aerodynamic noise from the operation of the wind turbine components (*Note that this impact is difficult to determine at this stage, as noise modelling has not been conducted during the scoping phase. These impacts will be confirmed once modelling has been completed during the EIA Phase*).
- **Decommissioning Phase:**
  - Noise pollution i.e. increase in ambient sound levels due to decommissioning activities (e.g. equipment and vehicle noise).

Based on a scoping level desktop assessment, as well as a basic predictive model to identify potential issues of concern, the proposed project will result in increased noise levels in the area as wind turbines do emit noises at sufficient levels to propagate over large distances. The fact that there would be a number of wind turbines operating simultaneously in an area where there are noise-sensitive developments increase the possibility that a noise impact could occur. However, at this preliminary stage it is impossible to determine whether the significance of this noise impact would be low, medium or high and what potential impact it could have on the quality of living for the surrounding receptors. Previous studies have indicated that with the implementation of correct mitigation measures (especially a sufficient setback or buffer zone) it would be possible to minimize the potential noise risks and reduce the noise impacts to a more acceptable medium or low significance. Considering this, the impact assessment provided in this section is based on a scoping level desktop assessment and the impact ratings will be confirmed and detailed during the EIA Phase based on more information gathered.

6.10.2 Assessment to be undertaken during the EIA Phase

The Noise Specialist is required to compile a Specialist Assessment in adherence to the gazetted Environmental Assessment Protocols, specifically the 'Protocol for the Specialist Assessment and Minimum Report Content Requirements for Noise Impacts' (GG 43110 / GN R320, 20 March 2020). This protocol replaces the requirements of Appendix 6 of the 2014 NEMA EIA Regulations, as amended. In addition, the Specialist Assessment should also take into consideration any additional relevant legislation and guidelines that may be deemed necessary (e.g. noise standards, measurements and calculations stipulated in SANS 10103:2008 Version 6 and SANS 10357:2004 Version 2.1). The relevant mitigation and management actions will be incorporated into the EMPr that will form part of the EIA Report. Refer to Section 7.7.5 in Chapter 7 of this Scoping Report for the ToRs specified for the Noise Impact Assessment to be undertaken.

6.11 Civil Aviation

Civil Aviation Assessments are required to comply with the gazetted Environmental Assessment Protocols, specifically the 'Protocol for the Specialist Assessment and Minimum Report Content Requirements of Environmental Impacts on Civil Aviation Installations" (GG 43110 / GN R320, 20 March 2020). As indicated in Chapter 3 and Chapter 4 of this Scoping Report, the findings from the National Web-Based Screening Tool have indicated that the proposed Kaladokhwe WEF 3 project site is mainly of 'low' sensitivity with respect to Civil Aviation with only a very small portion in the southern parts of the project site that has a 'medium' sensitivity. This sensitivity is ascribed to the southernmost part of the project site being located "between 8 and 15 km of other civil aviation aerodrome". The low sensitivity was verified by the EAP during a site visit undertaken on 19 to 21 September 2022. However, the medium sensitivity is disputed as the EAP has verified that the civil aviation aerodrome located outside Nxuba (previously Cradock) is an unlicenced aerodrome that is no longer in operation and as a result, the sensitivity of the entire Kaladokhwe WEF 3 project site is considered low sensitivity in terms of Civil Aviation. Therefore, in line with GN R320, a site sensitivity verification confirming the overall low sensitivity is necessary. A site sensitivity verification is provided in Appendix F.11 of this Scoping Report.

6.12 Defence

Defence Assessments are required to comply with the gazetted Environmental Assessment Protocols, specifically the 'Protocol for the Specialist Assessment and Minimum Report Content Requirements of Environmental Impacts on Defence Installations" (GG 43110 / GN R320, 20 March 2020). However, as indicated in Chapter 3 and Chapter 4 of this Scoping Report, the entire area of interest for the proposed Kaladokhwe WEF 3 project site is classified as 'low' sensitivity on the National Web-Based Screening Tool. The low sensitivity was verified by the EAP during a site visit undertaken from the 19th to 21st of September 2022. Therefore, in line with GN R320, only a site sensitivity verification is necessary to confirm the site as a low sensitivity. A site sensitivity verification is provided in Appendix F.12 of this Scoping Report.

6.13 Impacts relating to BESS

The Specialists will assess the inclusion of battery energy storage systems (BESS) as part of their respective specialist assessments of the proposed project components during the EIA Phase. However, to ensure that all aspects and impacts are covered, additional potential impacts or risks relating to the BESS have been identified by the EAP and will be discussed in more detail in the EIA Report. These include the following:

- Risk of fire, explosion or release of toxic gas;
- Spillage of electrolytes; and
- Waste generation.

6.14 Scoping-level Impact Assessment

Based on the scoping-level inputs from the various specialists, a **high-level preliminary** scoping impact assessment was conducted and outlined in Table 6.1 below. The impact assessment provided in this section

is based on a scoping level desktop assessment and the impact ratings will be confirmed and detailed during the EIA Phase based on more detailed studies being undertaken, including modelling where required. The mitigation measures provided in this section are also high-level for the purposes of Scoping and will be detailed during the EIA Phase.

Please see Chapter 7 of this Scoping Report for the Plan of Study (PoS) for EIA, which includes the Methodology for the assessment of impacts (Section 7.4) and the ToR for the specialist assessments (Section 7.7).

Table 6-1: Scoping level assessment of potential risks/impacts of the proposed Kaladokhwe WEF 3 project, including high-level mitigation measures

Note from the CSIR: The information provided below is representative of available specialist inputs based on a high-level impact assessment undertaken during the Scoping Phase of this project, much of which is derived only from a desktop level assessment. Detailed Specialist Impact Assessments will be undertaken during the EIA Phase and comprehensive impact assessment findings based on field observations will be included in the Draft EIA Report.

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
AQUATIC BIODIVERSITY						
CONSTRUCTION AND DECOMMISSIONING PHASE						

Disturbance to and loss of wetland vegetation	***Status***	*Negative*	***Very Low (5)***	• *The recommended buffer areas between the delineated freshwater resource features and proposed project activities should be maintained:*
				  ○ *Ephemeral Washes with 100 m Buffer;*
				  ○ *Depression and Seepage Wetlands with 50 m Buffer; and*
				  ○ *Drainage lines with 35 m Buffer.*
				• *Vegetation clearing to be kept to a minimum. No unnecessary vegetation to be cleared.*
				• *The potential stormwater impacts of the proposed developments areas should be mitigated on-site to address any erosion or water quality impacts.*
				• *Good housekeeping measures as stipulated in the EMPr for the project should be in place where construction activities take place to prevent contamination of any freshwater features.*
				• *Where possible, infrastructure should coincide with existing infrastructure or areas of disturbance (such as existing roads).*
				• *Disturbed areas should be rehabilitated through reshaping of the surface to resemble that prior to the disturbance and vegetated with suitable local indigenous vegetation.*
					Very Low (5)	***tbc***

	Spatial Extent	*Local*				
	Duration	*Long term*				
	Consequence	*Very low*				
	Probability	*tbc*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				
Impact on freshwater resource systems through the possible	***Status***	*Negative*	***Very Low (5)***	• *The recommended buffer areas between the delineated freshwater resource features and proposed project activities should be maintained:*	***Very Low (5)***	***tbc***

Impact	***Impact Criteria***		***Significance and Ranking (Pre-Mitigation)***	***Potential mitigation measures***	***Significance and Ranking (Post-Mitigation)***	***Confidence Level***
increase in surface water runoff	***Spatial Extent***	*Local and immediate*		○ *Ephemeral Washes with 100 m Buffer;* ○ *Depression and Seepage Wetlands with 50 m Buffer; and* ○ *Drainage lines with 35 m Buffer.* ● *Vegetation clearing to be kept to a minimum. No unnecessary vegetation to be cleared.* ● *The potential stormwater impacts of the proposed developments areas should be mitigated on-site to address any erosion or water quality impacts.* ● *Good housekeeping measures as stipulated in the EMPr for the project should be in place where construction activities take place to prevent contamination of any freshwater features.* ● *Where possible, infrastructure should coincide with existing infrastructure or areas of disturbance (such as existing roads).* *Disturbed areas should be rehabilitated through reshaping of the surface to resemble that prior to the disturbance and vegetated with suitable local indigenous vegetation.*		
	Duration	*Long term*				
	Consequence	*Very low*				
	Probability	*tbc*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				
Increase sedimentation and erosion	***Status***	*Negative*	***Very Low (5)***	● *The recommended buffer areas between the delineated freshwater resource features and proposed project activities should be maintained:* ○ *Ephemeral Washes with 100 m Buffer;* ○ *Depression and Seepage Wetlands with 50 m Buffer; and* ○ *Drainage lines with 35 m Buffer.* ● *Vegetation clearing to be kept to a minimum. No unnecessary vegetation to be cleared.* ● *The potential stormwater impacts of the proposed developments areas should be mitigated on-site to address any erosion or water quality impacts.* ● *Good housekeeping measures as stipulated in the EMPr for the project should be in place where construction activities take place to prevent contamination of any freshwater features.* ● *Where possible, infrastructure should coincide with existing infrastructure or areas of disturbance (such as existing roads).*	***Very Low (5)***	***tbc***
	Spatial Extent	*Local and immediate*				
	Duration	*Long term*				
	Consequence	*Very low*				
	Probability	*tbc*				
	Reversibility	*tbc*				

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
	Irreplaceability	*tbc*		*Disturbed areas should be rehabilitated through reshaping of the surface to resemble that prior to the disturbance and vegetated with suitable local indigenous vegetation.*		
Impact on localized surface water quality	***Status***	*Negative*	***Very Low (5)***	● *The recommended buffer areas between the delineated freshwater resource features and proposed project activities should be maintained:* ○ *Ephemeral Washes with 100 m Buffer;* ○ *Depression and Seepage Wetlands with 50 m Buffer; and* ○ *Drainage lines with 35 m Buffer.* ● *Vegetation clearing to be kept to a minimum. No unnecessary vegetation to be cleared.* ● *The potential stormwater impacts of the proposed developments areas should be mitigated on-site to address any erosion or water quality impacts.* ● *Good housekeeping measures as stipulated in the EMPr for the project should be in place where construction activities take place to prevent contamination of any freshwater features.* ● *Where possible, infrastructure should coincide with existing infrastructure or areas of disturbance (such as existing roads).* *Disturbed areas should be rehabilitated through reshaping of the surface to resemble that prior to the disturbance and vegetated with suitable local indigenous vegetation.*	***Very Low (5)***	***tbc***
	Spatial Extent	*Local and immediate*				
	Duration	*Long term*				
	Consequence	*Very low*				
	Probability	*tbc*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				
Loss of habitat for fauna dependent on such habitats	***Status***	*Negative*	***Very Low (5)***	● *The recommended buffer areas between the delineated freshwater resource features and proposed project activities should be maintained:* ○ *Ephemeral Washes with 100 m Buffer;* ○ *Depression and Seepage Wetlands with 50 m Buffer; and* ○ *Drainage lines with 35 m Buffer.* ● *Vegetation clearing to be kept to a minimum. No unnecessary vegetation to be cleared.*	***Very Low (5)***	***tbc***
	Spatial Extent	*Local*				
	Duration	*Long term*				

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
	Consequence	*Very low*		• *The potential stormwater impacts of the proposed developments areas should be mitigated on-site to address any erosion or water quality impacts.* • *Good housekeeping measures as stipulated in the EMPr for the project should be in place where construction activities take place to prevent contamination of any freshwater features.* • *Where possible, infrastructure should coincide with existing infrastructure or areas of disturbance (such as existing roads).* *Disturbed areas should be rehabilitated through reshaping of the surface to resemble that prior to the disturbance and vegetated with suitable local indigenous vegetation.*		
	Probability	*tbc*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				
OPERATIONAL PHASE						

Impact on freshwater resource systems through the possible increase in surface water runoff needs to be maintained	***Status***	*Negative*	***Very Low (5)***	• *The recommended buffer areas between the delineated freshwater resource features and proposed project activities should be maintained:*
				  ○ *Ephemeral Washes with 100 m Buffer;*
				  ○ *Depression and Seepage Wetlands with 50 m Buffer; and*
				  ○ *Drainage lines with 35 m Buffer.*
				• *Vegetation clearing to be kept to a minimum. No unnecessary vegetation to be cleared.*
				• *The potential stormwater impacts of the proposed developments areas should be mitigated on-site to address any erosion or water quality impacts.*
				• *Good housekeeping measures as stipulated in the EMPr for the project should be in place where construction activities take place to prevent contamination of any freshwater features.*
				• *Where possible, infrastructure should coincide with existing infrastructure or areas of disturbance (such as existing roads).*
				Disturbed areas should be rehabilitated through reshaping of the surface to resemble that prior to the disturbance and vegetated with suitable local indigenous vegetation.
					Very Low (5)	

	Spatial Extent	*Local and immediate*				
	Duration	*Long term*				
	Consequence	*Very low*				
	Probability	*tbc*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
Impact on localized surface water quality	***Status***	*Negative*	***Very low (5)***	• *The recommended buffer areas between the delineated freshwater resource features and proposed project activities should be maintained:* ○ *Ephemeral Washes with 100 m Buffer;* ○ *Depression and Seepage Wetlands with 50 m Buffer; and* ○ *Drainage lines with 35 m Buffer.* • *Vegetation clearing to be kept to a minimum. No unnecessary vegetation to be cleared.* • *The potential stormwater impacts of the proposed developments areas should be mitigated on-site to address any erosion or water quality impacts.* • *Good housekeeping measures as stipulated in the EMPr for the project should be in place where construction activities take place to prevent contamination of any freshwater features.* • *Where possible, infrastructure should coincide with existing infrastructure or areas of disturbance (such as existing roads).* *Disturbed areas should be rehabilitated through reshaping of the surface to resemble that prior to the disturbance and vegetated with suitable local indigenous vegetation.*	***Very Low (5)***	
	Spatial Extent	*Local and immediate*				
	Duration	*Long term*				
	Consequence	*Very low*				
	Probability	*tbc*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				
TERRESTRIAL BIODIVERSITY AND SPECIES						
CONSTRUCTION PHASE						
Loss of Eastern Upper Karoo Vegetation	***Status***	*Negative*	***Low***	• *Construction vehicles and machinery must not encroach into identified 'no-go' areas or areas outside the project footprint.* • *Topsoil (20 cm, where possible) must be collected and stored in an area of low (preferable) and medium sensitivity and used to rehabilitate impacted areas that are no longer required during the operational phase (e.g. laydown areas).*	***Low***	***High***
	Spatial Extent	*Site Specific*				

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
	Duration	*Long Term*		• *Only indigenous species must be used for rehabilitation.* • *Where possible, lay down areas must be located within previously disturbed sites.* • *Employees must be prohibited from making open fires during the construction phase.* • *Employees must be prohibited from collecting plants. It is recommended that spot checks of pockets and bags are done on a regular basis to ensure that no unlawful harvesting of plant species is occurring.* • *An alien invasive management plan for the site must be created.* • *An in-situ search and rescue plan must be developed and implemented for succulents and geophytes that will be impacted by the construction of the project site.* • *Plant translocation to adjacent suitable habitat may only be done for species that are not range restricted and for populations that have not been quantified as regionally significant.* • *In such cases that this is not feasible, any requirement for translocation must be discussed with the relative authorities prior to translocation taking place.*		
	Consequence	*Moderate*				
	Probability	*Very Likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
Loss of Tarkastad Montane Shrubland	***Status***	*Negative*	***Low***	• *Construction vehicles and machinery must not encroach into identified 'no-go' areas or areas outside the project footprint.* • *Topsoil (20 cm, where possible) must be collected and stored in an area of low (preferable) and medium sensitivity and used to rehabilitate impacted areas that are no longer required during the operational phase (e.g. laydown areas).* • *Only indigenous species must be used for rehabilitation.* • *Where possible, lay down areas must be located within previously disturbed sites.*	***Low***	***High***
	Spatial Extent	*Site Specific*				
	Duration	*Long Term*				

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
	Consequence	*Moderate*		• *Employees must be prohibited from making open fires during the construction phase.* • *Employees must be prohibited from collecting plants. It is recommended that spot checks of pockets and bags are done on a regular basis to ensure that no unlawful harvesting of plant species is occurring.* • *An alien invasive management plan for the site must be created.* • *An in-situ search and rescue plan must be developed and implemented for succulents and geophytes that will be impacted by the construction of the project site.* • *Plant translocation to adjacent suitable habitat may only be done for species that are not range restricted and for populations that have not been quantified as regionally significant.* • *In such cases that this is not feasible, any requirement for translocation must be discussed with the relative authorities prior to translocation taking place.*		
	Probability	*Very Likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
Loss of Southern Karoo Riviere	***Status***	*Negative*	***Very Low***	• *Construction vehicles and machinery must not encroach into identified 'no-go' areas or areas outside the project footprint.* • *Topsoil (20 cm, where possible) must be collected and stored in an area of low (preferable) and medium sensitivity and used to rehabilitate impacted areas that are no longer required during the operational phase (e.g. laydown areas).* • *Only indigenous species must be used for rehabilitation.* • *Where possible, lay down areas must be located within previously disturbed sites.* • *Employees must be prohibited from making open fires during the construction phase.*	***Very Low***	***High***
	Spatial Extent	*Site Specific*				
	Duration	*Long Term*				
	Consequence	*Moderate*				

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
	Probability	*Unlikely*		• *Employees must be prohibited from collecting plants. It is recommended that spot checks of pockets and bags are done on a regular basis to ensure that no unlawful harvesting of plant species is occurring.* • *An alien invasive management plan for the site must be created.* • *An in-situ search and rescue plan must be developed and implemented for succulents and geophytes that will be impacted by the construction of the project site.* • *Plant translocation to adjacent suitable habitat may only be done for species that are not range restricted and for populations that have not been quantified as regionally significant.* • *In such cases that this is not feasible, any requirement for translocation must be discussed with the relative authorities prior to translocation taking place.*		
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
Loss of faunal habitat	***Status***	*Negative*	***Moderate***	• *The development must consolidate road networks to minimise the loss of faunal habitat.* • *All construction and construction related activities (including parking of vehicles and machinery) must remain within the approved project footprint.* • *No construction and construction related activities are permitted within identified 'no-go' areas and a fine system must be put in place for transgressions by the developer and included in contractual agreements with all staff and contractors.* • *Microhabitats (e.g. rock stacks and logs) in the clearing footprint must be relocated to the same habitat immediately adjacent to the removal site. E.g. Rock stacks should be restacked.* • *Rehabilitation efforts must provide habitat for faunal species by placing logs and rocks at strategic sites to provide shelter for small mammals and reptiles.* • *Employees must be prohibited from making open fires during the construction phase to prevent uncontrolled run-away fires.*	***Moderate***	***High***
	Spatial Extent	*Site Specific*				
	Duration	*Long Term*				
	Consequence	*Substantial*				
	Probability	*Very Likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				

Impact	***Impact Criteria***		***Significance and Ranking (Pre-Mitigation)***	***Potential mitigation measures***	***Significance and Ranking (Post-Mitigation)***	***Confidence Level***
Loss of Plant Species of Conservation Concern	***Status***	*Negative*	***Moderate***	• *An ecological walkdown of project infrastructure must be undertaken prior to construction. If any of these species are recorded, project infrastructure must be realigned to avoid these populations which have very specific habitat requirements.*	***Low***	***High***
	Spatial Extent	*Regional*				
	Duration	*Permanent*				
	Consequence	*Severe*				
	Probability	*Unlikely*				
	Reversibility	*Unlikely*				
	Irreplaceability	*Moderate*				
Loss of Faunal Species of Conservation Concern	***Status***	*Negative*	***Moderate***	• *A clause must be included in contracts for ALL personnel (i.e. including contractors) working on site stating that: "no wild animals will be hunted, killed, poisoned or captured. No wild animals will be imported into, exported from or transported in or through the province. No wild animals will be sold, bought, donated and no person associated with the development will be in possession of any live wild animal, carcass or anything manufactured from the carcass." A clause relating to fines, possible dismissal and legal prosecution must be included should any of the above transgressions occur, especially for SCC.*	***Moderate***	***Moderate***
	Spatial Extent	*Regional*				
	Duration	*Medium*				
	Consequence	*Substantial*				
	Probability	*Likely*				
	Reversibility	*Low*				
	Irreplaceability	*Moderate*				
Disruption of Ecosystem Function and Process	***Status***	*Negative*	***Low***	• *Construction vehicles and machinery must not encroach into identified 'no-go' areas or areas outside the project footprint.* • *Topsoil (20 cm, where possible) must be collected and stored in an area of low (preferable) and medium sensitivity and used to rehabilitate impacted areas that are no longer required during the operational phase (e.g. laydown areas).* • *Only indigenous species must be used for rehabilitation.* • *Where possible, lay down areas must be located within previously disturbed sites.* • *Employees must be prohibited from making open fires during the construction phase.*	***Low***	***High***
	Spatial Extent	*Site Specific*				
	Duration	*Long Term*				

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
	Consequence	*Moderate*		• *Employees must be prohibited from collecting plants. It is recommended that spot checks of pockets and bags are done on a regular basis to ensure that no unlawful harvesting of plant species is occurring.* • *An alien invasive management plan for the site must be created.* • *An in-situ search and rescue plan must be developed and implemented for succulents and geophytes that will be impacted by the construction of the project site.* • *Plant translocation to adjacent suitable habitat may only be done for species that are not range restricted and for populations that have not been quantified as regionally significant.* • *In such cases that this is not feasible, any requirement for translocation must be discussed with the relative authorities prior to translocation taking place.* • *Rehabilitate laydown areas.* • *Use existing access roads and upgrade these where necessary*		
	Probability	*Likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
Disturbance to faunal species and their livelihood activities (shelter, foraging and breeding) due to construction related noise, vibrations, dust, night lighting and obstructions.	***Status***	*Negative*	***Moderate***	• *Dust suppression measures must be implemented in the dry and/or windy months.* • *All machinery, vehicles and earth moving equipment must be maintained and the noise these create must meet industry minimum standards. e.g. the sound generated by a machine must be below a certain decibel as prescribed in the relevant noise control regulations.* • *A Storm Water Management Plan must be drafted and implemented to prevent runoff entering aquatic systems and causing siltation and pollution of this faunal habitat. Hard surfaces should be avoided.* • *Should any fauna be encountered during construction and operation, these must be recorded (i.e. be photographed, GPS co-ordinates taken) and placed on iNaturalist.* • *No construction night lighting must be allowed. If required, minimise lighting in open space areas within development and any external lights*	***Moderate***	***High***
	Spatial Extent	*Site Specific*				
	Duration	*Medium*				

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
	Consequence	*Substantial*		*must be down lights placed as low as possible and installation of low UV emitting lights, such as most LEDs.* ● *Development must be designed to allow unencumbered movement, especially of small faunal species. e.g.* ○ *Permeable internal and external fences/walls (if any) must be implemented to allow for the movement of fauna through the development. These must have ground level gaps of 10cm x 10cm at 10m intervals. These gaps must be kept free of obstructions, including plant growth and debris.* ○ *All guttering and kerbstones must sloped i.e. must be less than 450 on either side or kerbstones should be slanted or lowered (less than 10cm) at 10m intervals to allow for easy movement of toads.* ○ *Steep sided drains, gutters, canals and open pits/trenches must be covered with mesh (5mm x 5mm) to prevent fauna falling in and getting stuck. No unnecessary structures that would act as pitfall traps for animals must be constructed.* ○ *If there are retaining walls, steps should be formed to allow for toads to move over them. These must be vegetated with plant species that offer cover.*		
	Probability	*Very Likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
Mortality of faunal species due to project related activities	***Status***	*Negative*	***High***	● *Refer to mitigation listed under "Loss of Faunal Species of Conservation Concern"* ● *Speed restrictions within the residential development for all vehicles (30km/h is recommended) should be in place to reduce the impact of killed fauna on the project roads.* ● *Any faunal species that may die as a result of construction must be recorded (i.e. be photographed, GPS co-ordinates taken) and if somewhat intact preserved and donated to the nearest university, museum or SANBI.* ● *A trained snake handler must be onsite during construction to remove any snakes within construction areas.*	***Low***	***High***
	Spatial Extent	*Site Specific*				
	Duration	*Medium*				
	Consequence	*Severe*				
	Probability	*Likely*				
	Reversibility	*Non-Replaceable*				

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
	Irreplaceability	*Moderate*		• *A clause relating to fines, possible dismissal and legal prosecution must be included in all contracts for ALL personnel (i.e. including contractors) working on site should any speeding or persecution of animals occur.*		
OPERATIONAL PHASE						
Infestation of alien invasive plant species	***Status***	*Negative*	***High***	• *Construction vehicles and machinery must not encroach into identified 'no-go' areas or areas outside the project footprint.* • *Topsoil (20 cm, where possible) must be collected and stored in an area of low (preferable) and medium sensitivity and used to rehabilitate impacted areas that are no longer required during the operational phase (e.g. laydown areas).* • *Only indigenous species must be used for rehabilitation.* • *Where possible, lay down areas must be located within previously disturbed sites.* • *Employees must be prohibited from making open fires during the construction phase.* • *Employees must be prohibited from collecting plants. It is recommended that spot checks of pockets and bags are done on a regular basis to ensure that no unlawful harvesting of plant species is occurring.* • *An alien invasive management plan for the site must be created.* • *An in-situ search and rescue plan must be developed and implemented for succulents and geophytes that will be impacted by the construction of the project site.* • *Plant translocation to adjacent suitable habitat may only be done for species that are not range restricted and for populations that have not been quantified as regionally significant.* • *In such cases that this is not feasible, any requirement for translocation must be discussed with the relative authorities prior to translocation taking place.* • *Rehabilitate all temporary laydown areas.*	***Very Low***	***High***
	Spatial Extent	*Site Specific*				
	Duration	*Long Term*				
	Consequence	*Severe*				
	Probability	*Very Likely*				

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
	Reversibility	*High*		• *Use existing access roads and upgrade these where necessary* • *The site must be checked regularly for the presence of alien invasive species. When alien invasive species are found, immediate action must be taken to remove them.* • *The prickly pears currently noted on site must be removed and disposed of.* • *An alien invasive management plan must be incorporated into the EMPr.* • *The ECO must create a list with accompanying photographs of possible alien invasive species that could occur on site prior to construction. This photo guide must be used to determine if any alien invasive species are present.*		
	Irreplaceability	*Low*				
Mortality of faunal species due to operational project related activities	***Status***	*Negative*	***High***	• *Speed restrictions within the residential development for all vehicles (30km/h is recommended) should be in place to reduce the impact of killed fauna on the project roads.* • *No night driving should be permitted, if unavoidable, this must be restricted, and speed limits adhered to.* • *Any faunal species that may die as a result of construction must be recorded (i.e. be photographed, GPS co-ordinates taken) and if somewhat intact preserved and donated to the nearest university, museum or SANBI.* • *A clause relating to fines, possible dismissal and legal prosecution must be included in all contracts for ALL personnel (i.e. including contractors) working on site should any speeding or persecution of animals occur.*	***Low***	***High***
	Spatial Extent	*Site Specific*				
	Duration	*Medium*				
	Consequence	*Severe*				
	Probability	*Likely*				
	Reversibility	*Non-Replaceable*				
	Irreplaceability	*Moderate*				
DECOMMISSIONING PHASE						
Loss of indigenous vegetation and species of conservation concern	***Status***	*Negative*	***Low***	• *Construction vehicles and machinery must not encroach into identified 'no-go' areas or areas outside the project footprint.* • *Topsoil (20 cm, where possible) must be collected and stored in an area of low (preferable) and medium sensitivity and used to rehabilitate impacted areas that are no longer required during the operational phase (e.g. laydown areas).*	***Low***	***High***
	Spatial Extent	*Site Specific*				

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
	Duration	*Long Term*		• *Only indigenous species must be used for rehabilitation.* • *Where possible, lay down areas must be located within previously disturbed sites.* • *Employees must be prohibited from making open fires during the construction phase.* • *Employees must be prohibited from collecting plants. It is recommended that spot checks of pockets and bags are done on a regular basis to ensure that no unlawful harvesting of plant species is occurring.* • *An alien invasive management plan for the site must be created.* • *An in-situ search and rescue plan must be developed and implemented for succulents and geophytes that will be impacted by the construction of the project site.* • *Plant translocation to adjacent suitable habitat may only be done for species that are not range restricted and for populations that have not been quantified as regionally significant.* • *In such cases that this is not feasible, any requirement for translocation must be discussed with the relative authorities prior to translocation taking place.*		
	Consequence	*Moderate*				
	Probability	*Very Likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
Disturbance to faunal species and potential reduction in abundance and mortality of faunal species	***Status***	*Negative*	***Moderate***	• *Construction vehicles and machinery must not encroach into identified 'no-go' areas or areas outside the project footprint.* • *Topsoil (20 cm, where possible) must be collected and stored in an area of low (preferable) and medium sensitivity and used to rehabilitate impacted areas that are no longer required during the operational phase (e.g. laydown areas).*	***Moderate***	***High***

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
	Spatial Extent	*Site Specific*		• *Only indigenous species must be used for rehabilitation.* • *Where possible, lay down areas must be located within previously disturbed sites.* • *Employees must be prohibited from making open fires during the construction phase.* • *Employees must be prohibited from collecting plants. It is recommended that spot checks of pockets and bags are done on a regular basis to ensure that no unlawful harvesting of plant species is occurring.* • *An alien invasive management plan for the site must be created.* • *An in-situ search and rescue plan must be developed and implemented for succulents and geophytes that will be impacted by the construction of the project site.* • *Plant translocation to adjacent suitable habitat may only be done for species that are not range restricted and for populations that have not been quantified as regionally significant.* • *In such cases that this is not feasible, any requirement for translocation must be discussed with the relative authorities prior to translocation taking place.* • *Dust suppression measures must be implemented in the dry and/or windy months.* • *All machinery, vehicles and earth moving equipment must be maintained and the noise these create must meet industry minimum standards. e.g. the sound generated by a machine must be below a certain decibel as prescribed in the relevant noise control regulations.*		
	Duration	*Medium*				
	Consequence	*Substantial*				
	Probability	*Very Likely*				

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
	Reversibility	*Moderate*		• *Should any fauna be encountered during construction and operation, these must be recorded (i.e. be photographed, GPS co-ordinates taken) and placed on iNaturalist.* • *No night lighting must be allowed. If required, minimise lighting in open space areas within development and any external lights must be down lights placed as low as possible and installation of low UV emitting lights, such as most LEDs.* • *All decommissioning related activities (including parking of vehicles and machinery) must remain within the approved project footprint.* • *No decommissioning related activities are permitted within identified 'no-go' areas and a fine system must be put in place for transgressions by the developer and included in contractual agreements with all staff and contractors.* • *Rehabilitation efforts must provide microhabitats (e.g. rock stacks and logs) within the cleared footprint e.g. Rock stacks and stumperies but must not disrupt adjacent habitat to create these.*		
	Irreplaceability	*Low*				
VISUAL						
GENERAL IMPACTS						
The potential visual impact of the construction of the facility and ancillary infrastructure on sensitive visual receptors in close proximity	***Status***	*Negative*	***tbc***	• *Given their height, effective mitigation measures for the visual impact of the proposed wind turbines is not possible. However, impacts can be minimised to some extent in terms of where the turbines are positioned.* • *Detailed mitigation measures for visual impacts as a result of associated infrastructure must be developed in the next phase of the EIA process.*	***tbc***	***Moderate to High***
	Spatial Extent	*tbc*				
	Duration	*tbc*				
	Consequence	*tbc*				
	Probability	*tbc*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				
The visibility of the facility and ancillary	***Status***	*Negative*	***tbc***		***tbc***	***Moderate to High***
	Spatial Extent	*tbc*				

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
infrastructure to, and potential visual impact on observers travelling along the national, main roads, as well as, secondary roads within the study area	***Duration***	*tbc*		• *Given their height, effective mitigation measures for the visual impact of the proposed wind turbines is not possible. However, impacts can be minimised to some extent in terms of where the turbines are positioned.* • *Detailed mitigation measures for visual impacts as a result of associated infrastructure must be developed in the next phase of the EIA process.*		
	Consequence	*tbc*				
	Probability	*tbc*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				
The visibility of the operational facility and ancillary infrastructure to, and potential visual impact on observers (homesteads and farmsteads) in close proximity	***Status***	*Negative*	***tbc***	• *Given their height, effective mitigation measures for the visual impact of the proposed wind turbines is not possible. However, impacts can be minimised to some extent in terms of where the turbines are positioned.* • *Detailed mitigation measures for visual impacts as a result of associated infrastructure must be developed in the next phase of the EIA process.*	***tbc***	***Moderate to High***
	Spatial Extent	*tbc*				
	Duration	*tbc*				
	Consequence	*tbc*				
	Probability	*tbc*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				
The visibility of the operational facility and ancillary infrastructure to, and potential visual impact on observers within the region	***Status***	*Negative*	***tbc***	• *Given their height, effective mitigation measures for the visual impact of the proposed wind turbines is not possible. However, impacts can be minimised to some extent in terms of where the turbines are positioned.* • *Detailed mitigation measures for visual impacts as a result of associated infrastructure must be developed in the next phase of the EIA process.*	***tbc***	***Moderate to High***
	Spatial Extent	*tbc*				
	Duration	*tbc*				
	Consequence	*tbc*				
	Probability	*tbc*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				
The potential visual impact of operational, safety and security lighting of the facility and ancillary infrastructure at night on sensitive visual	***Status***	*Negative*	***tbc***	• *Given their height, effective mitigation measures for the visual impact of the proposed wind turbines is not possible. However, impacts can be minimised to some extent in terms of where the turbines are positioned.* • *Detailed mitigation measures for visual impacts as a result of associated infrastructure must be developed in the next phase of the EIA process.*	***tbc***	***Moderate to High***
	Spatial Extent	*tbc*				
	Duration	*tbc*				
	Consequence	*tbc*				
	Probability	*tbc*				
	Reversibility	*tbc*				

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
receptors residing in the region	***Irreplaceability***	*tbc*				
The potential visual impacts of shadow flicker on sensitive and potentially sensitive visual receptors in close proximity	***Status***	*Negative*	***tbc***	• *Given their height, effective mitigation measures for the visual impact of the proposed wind turbines is not possible. However, impacts can be minimised to some extent in terms of where the turbines are positioned.* • *Detailed mitigation measures for visual impacts as a result of associated infrastructure must be developed in the next phase of the EIA process.*	***tbc***	***Moderate to High***
	Spatial Extent	*tbc*				
	Duration	*tbc*				
	Consequence	*tbc*				
	Probability	*tbc*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				
The potential visual impact of the facility on conversation area and/or tourist routes within the region	***Status***	*Negative*	***tbc***	• *Given their height, effective mitigation measures for the visual impact of the proposed wind turbines is not possible. However, impacts can be minimised to some extent in terms of where the turbines are positioned.* • *Detailed mitigation measures for visual impacts as a result of associated infrastructure must be developed in the next phase of the EIA process.*	***tbc***	***Moderate to High***
	Spatial Extent	*tbc*				
	Duration	*tbc*				
	Consequence	*tbc*				
	Probability	*tbc*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				
The potential visual impact of the facility and ancillary infrastructure on the visual character of the landscape and sense of place of the region	***Status***	*Negative*	***tbc***	• *Given their height, effective mitigation measures for the visual impact of the proposed wind turbines is not possible. However, impacts can be minimised to some extent in terms of where the turbines are positioned.* • *Detailed mitigation measures for visual impacts as a result of associated infrastructure must be developed in the next phase of the EIA process.*	***tbc***	***Moderate to High***
	Spatial Extent	*tbc*				
	Duration	*tbc*				
	Consequence	*tbc*				
	Probability	*tbc*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				
HERITAGE, ARCHAEOLOGY, PALAEONTOLOGY AND CULTURAL LANDSCAPE						
GENERAL IMPACTS						

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
Homesteads could potentially be older than 60 years, and that might contain burial sites. These are not listed in the scoping report as these will be avoided by the Project.	***Status***	*Negative*	***tbc***	• *The HIA will provide management and mitigation measures should any significant sites be impacted upon, ensuring that all the requirements of the SAHRA are met.*	***tbc***	***tbc***
	Spatial Extent	*tbc*				
	Duration	*tbc*				
	Consequence	*tbc*				
	Probability	*Medium to High*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				
Locations of high archaeological potential could be present near dolerite dykes and sills	***Status***	*Negative*	***tbc***	• *The HIA will provide management and mitigation measures should any significant sites be impacted upon, ensuring that all the requirements of the SAHRA are met.*	***tbc***	***tbc***
	Spatial Extent	*tbc*				
	Duration	*tbc*				
	Consequence	*tbc*				
	Probability	*tbc*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				
it is expected that several unrecorded Stone Age sites occur in the study area, but their locations cannot be verified at a scoping level	***Status***	*Negative*	***tbc***	• *The HIA will provide management and mitigation measures should any significant sites be impacted upon, ensuring that all the requirements of the SAHRA are met.*	***tbc***	***tbc***
	Spatial Extent	*tbc*				
	Duration	*tbc*				
	Consequence	*tbc*				
	Probability	*tbc*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				
BATS						
CONSTRUCTION PHASE						
	Status	*Negative*	***Low (4)***		***Low (4)***	***High***

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
Loss of foraging habitat by clearing of vegetation.	***Spatial Extent***	*Site*		• *Adhere to the sensitivity map criteria. Rehabilitate cleared vegetation where possible at areas such as laydown yards. The ECO on site during construction must ensure that the sensitivity map is adhered to during construction.*		
	Duration	*Medium term*				
	Consequence	*Moderate*				
	Probability	*Very Unlikely*				
	Reversibility	*High*				
	Irreplaceability	*Low*				
Roost destruction during earthworks.	***Status***	*Negative*	***Moderate (3)***	• *Avoid No-go areas by adhering to the sensitivity map. The ECO on site during construction must ensure that the sensitivity map is adhered to during construction.*	***Low (4)***	***Medium***
	Spatial Extent	*Site specific*				
	Duration	*Medium term*				
	Consequence	*Substantial*				
	Probability	*Unlikely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Moderate*				
OPERATIONAL PHASE						
Bat mortalities during foraging	***Status***	*Negative*	***High (2)***	• *Avoid no-go areas by adhering to the sensitivity map. Where needed, and if indicated through operational monitoring, reducing blade movement at selected turbines and high-risk bat activity times/weather conditions. Acoustic deterrents are developed well enough to be trialled and may be recommended during operational monitoring.*	***Low (4)***	***High***
	Spatial Extent	*Local*				
	Duration	*Long term*				
	Consequence	*Severe*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Moderate*				
Bat mortalities during migration.	***Status***	*Negative*	***Moderate (3)***	• *Avoid no-go areas by adhering to the sensitivity map. Where needed, if indicated through operational monitoring, reducing blade movement at selected turbines and high-risk bat activity times/weather conditions.*	***Low (4)***	***Low***
	Spatial Extent	*Regional*				
	Duration	*Long term*				

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
	Consequence	*Severe*		*Acoustic deterrents are developed well enough to be trialled and may be recommended during operational monitoring. Each WEF in a migration path should apply appropriate mitigation measures to ensure that each facility's bat mortalities are below a sustainable threshold.*		
	Probability	*Unlikely*				
	Reversibility	*Low*				
	Irreplaceability	*Moderate*				
Increased bat mortalities due to light attraction and habitat creation.	***Status***	*Negative*	***High (2)***	• *During the planning phase for each wind farm it must become mandatory to only use lights with low sensitivity motion sensors that switch off automatically when no persons are nearby, to prevent the creation of regular insect gathering pools. This applies to the turbine bases (if applicable) and other infrastructure/buildings. Aviation lights should remain as required by aviation regulations. Floodlights should be down-hooded and where possible, lights with a colour (lighting temperature) that attract less insects should be used.* • *Bi-annual visits to the facility at night must be conducted for the operational lifetime of the facility, to assess the lighting setup and whether the passive motion sensors are functioning correctly. The bat specialist conducting the operational bat mortality monitoring must conduct visits to site during night-time to assess the placement and setup of outside lights on the facility. When lights are replaced and maintenance on lights is conducted, these mitigation measures must be consulted.*	***Low (4)***	***High***
	Spatial Extent	*Site specific*				
	Duration	*Long term*				
	Consequence	*Severe*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Moderate*				
AVIFAUNA						
CONSTRUCTION PHASE						
Habitat destruction	***Status***	*Negative*	***Low (4)***	• *The Very High sensitivity areas identified by this study (which build on those identified in the screening phase) should be adhered to.* • *A pre-construction avifaunal walk down should be conducted to confirm final layout and identify any sensitivities that may arise between the conclusion of the EIA process and the construction phase.* • *All construction activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.* • *Use should be made of existing roads as far as possible.*	***Low (4)***	***High***
	Spatial Extent	*Local*				
	Duration	*Short term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*Low*				

Impact	*Impact Criteria*		*Significance and Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance and Ranking (Post-Mitigation)*	*Confidence Level*
	Irreplaceability	*Moderate*		• *Any underground cabling should follow roads at all times to reduce the impact on the habitat by grouping these linear infrastructures.* • *A post construction site inspection must be conducted by an avifaunal specialist to confirm that all aspects have been appropriately handled and in particular that road and hard stand verges do not provide additional substrate for raptor prey species.* • *A bird fatality threshold and adaptive management policy must be designed by an ornithologist for the project prior to the Commercial Operation Date (COD).* • *A 'Cape Vulture Food Management Programme' must be implemented on site to ensure all dead livestock/wildlife on site are removed as soon as possible and made unavailable to vultures for feeding.* • *An Observer Led Turbine Shutdown on Demand (OLSDOD) programme must be implemented on site from COD.* • *The combination of hub height and rotor diameter must be optimised to maximise the lower blade tip height above ground.* • *All turbine blades must be painted according to a protocol currently under development by the South African Wind Energy Association (SAWEA) from* • *the outset.* • *Any residual impacts after all possible mitigation measures have been implemented will need to be mitigated off-site.* • *No internal medium voltage power lines should be overhead. Only the 132 kV collector lines and grid connection power line should be above ground.* • *Any overhead conductors or earth wires should be fitted with an Eskom approved anti bird collision line marking device to make cables more visible to birds in flight and reduce the likelihood of collisions.* • *The pole design of any overhead power line should be approved by an ornithologist in terms of the electrocution risk it may pose to large birds such as vultures.* • *The during construction and post construction monitoring programme outlined in Appendix 6 should be implemented according to the latest available version of the best practice guidelines at the time.*		

Disturbance	***Status***	*Negative*	***Low (4)***	• *The Very High sensitivity areas identified by this study (which build on those identified in the screening phase) should be adhered to.*	***Low (4)***	***High***
	Spatial Extent	*Local*				

	Duration	*Medium term*		● *A pre-construction avifaunal walk down should be conducted to confirm final layout and identify any sensitivities that may arise between the conclusion of the EIA process and the construction phase.* ● *All construction activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.* ● *Use should be made of existing roads as far as possible.* ● *Any underground cabling should follow roads at all times to reduce the impact on the habitat by grouping these linear infrastructures.* ● *A post construction site inspection must be conducted by an avifaunal specialist to confirm that all aspects have been appropriately handled and in particular that road and hard stand verges do not provide additional substrate for raptor prey species.* ● *A bird fatality threshold and adaptive management policy must be designed by an ornithologist for the project prior to the Commercial Operation Date (COD).* ● *A 'Cape Vulture Food Management Programme' must be implemented on site to ensure all dead livestock/wildlife on site are removed as soon as possible and made unavailable to vultures for feeding.* ● *An Observer Led Turbine Shutdown on Demand (OLSDOD) programme must be implemented on site from COD.* ● *The combination of hub height and rotor diameter must be optimised to maximise the lower blade tip height above ground.* ● *All turbine blades must be painted according to a protocol currently under development by the South African Wind Energy Association (SAWEA) from* ● *the outset.* ● *Any residual impacts after all possible mitigation measures have been implemented will need to be mitigated off-site.* ● *No internal medium voltage power lines should be overhead. Only the 132 kV collector lines and grid connection power line should be above ground.* ● *Any overhead conductors or earth wires should be fitted with an Eskom approved anti bird collision line marking device to make cables more visible to birds in flight and reduce the likelihood of collisions.* ● *The pole design of any overhead power line should be approved by an ornithologist in terms of the electrocution risk it may pose to large birds such as vultures.* ● *The during construction and post construction monitoring programme outlined in Appendix 6 should be implemented according to the latest available version of the best practice guidelines at the time.*		
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
OPERATIONAL PHASE						
Disturbance	***Status***	*Negative*	***Low (4)***		***Low (4)***	***High***

	Spatial Extent	*Local*		● *The Very High sensitivity areas identified by this study (which build on those identified in the screening phase) should be adhered to.* ● *A pre-construction avifaunal walk down should be conducted to confirm final layout and identify any sensitivities that may arise between the conclusion of the EIA process and the construction phase.* ● *All construction activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.* ● *Use should be made of existing roads as far as possible.* ● *Any underground cabling should follow roads at all times to reduce the impact on the habitat by grouping these linear infrastructures.* ● *A post construction site inspection must be conducted by an avifaunal specialist to confirm that all aspects have been appropriately handled and in particular that road and hard stand verges do not provide additional substrate for raptor prey species.* ● *A bird fatality threshold and adaptive management policy must be designed by an ornithologist for the project prior to the Commercial Operation Date (COD).* ● *A 'Cape Vulture Food Management Programme' must be implemented on site to ensure all dead livestock/wildlife on site are removed as soon as possible and made unavailable to vultures for feeding.* ● *An Observer Led Turbine Shutdown on Demand (OLSDOD) programme must be implemented on site from COD.* ● *The combination of hub height and rotor diameter must be optimised to maximise the lower blade tip height above ground.* ● *All turbine blades must be painted according to a protocol currently under development by the South African Wind Energy Association (SAWEA) from* ● *the outset.* ● *Any residual impacts after all possible mitigation measures have been implemented will need to be mitigated off-site.* ● *No internal medium voltage power lines should be overhead. Only the 132 kV collector lines and grid connection power line should be above ground.* ● *Any overhead conductors or earth wires should be fitted with an Eskom approved anti bird collision line marking device to make cables more visible to birds in flight and reduce the likelihood of collisions.* ● *The pole design of any overhead power line should be approved by an ornithologist in terms of the electrocution risk it may pose to large birds such as vultures.* ● *The during construction and post construction monitoring programme outlined in Appendix 6 should be implemented according to the latest available version of the best practice guidelines at the time.*		
	Duration	*Medium term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				

Displacement	***Status***	*Negative*	***Low (4)***	• *The Very High sensitivity areas identified by this study (which build on those identified in the screening phase) should be adhered to.* • *A pre-construction avifaunal walk down should be conducted to confirm final layout and identify any sensitivities that may arise between the conclusion of the EIA process and the construction phase.* • *All construction activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.* • *Use should be made of existing roads as far as possible.* • *Any underground cabling should follow roads at all times to reduce the impact on the habitat by grouping these linear infrastructures.* • *A post construction site inspection must be conducted by an avifaunal specialist to confirm that all aspects have been appropriately handled and in particular that road and hard stand verges do not provide additional substrate for raptor prey species.* • *A bird fatality threshold and adaptive management policy must be designed by an ornithologist for the project prior to the Commercial Operation Date (COD).* • *A 'Cape Vulture Food Management Programme' must be implemented on site to ensure all dead livestock/wildlife on site are removed as soon as possible and made unavailable to vultures for feeding.* • *An Observer Led Turbine Shutdown on Demand (OLSDOD) programme must be implemented on site from COD.* • *The combination of hub height and rotor diameter must be optimised to maximise the lower blade tip height above ground.* • *All turbine blades must be painted according to a protocol currently under development by the South African Wind Energy Association (SAWEA) from* • *the outset.* • *Any residual impacts after all possible mitigation measures have been implemented will need to be mitigated off-site.* • *No internal medium voltage power lines should be overhead. Only the 132 kV collector lines and grid connection power line should be above ground.* • *Any overhead conductors or earth wires should be fitted with an Eskom approved anti bird collision line marking device to make cables more visible to birds in flight and reduce the likelihood of collisions.* • *The pole design of any overhead power line should be approved by an ornithologist in terms of the electrocution risk it may pose to large birds such as vultures.* • *The during construction and post construction monitoring programme outlined in Appendix 6 should be implemented according to the latest available version of the best practice guidelines at the time.*	***Low (4)***	***Medium***
	Spatial Extent	*Local*				
	Duration	*Long term*				
	Consequence	*Moderate*				
	Probability	*Likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
	Status	*Negative*	***High (2)***		***High (2)***	***Medium***

Turbine collision fatality	***Spatial Extent***	*Regional*		• *The Very High sensitivity areas identified by this study (which build on those identified in the screening phase) should be adhered to.* • *A pre-construction avifaunal walk down should be conducted to confirm final layout and identify any sensitivities that may arise between the conclusion of the EIA process and the construction phase.* • *All construction activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.* • *Use should be made of existing roads as far as possible.* • *Any underground cabling should follow roads at all times to reduce the impact on the habitat by grouping these linear infrastructures.* • *A post construction site inspection must be conducted by an avifaunal specialist to confirm that all aspects have been appropriately handled and in particular that road and hard stand verges do not provide additional substrate for raptor prey species.* • *A bird fatality threshold and adaptive management policy must be designed by an ornithologist for the project prior to the Commercial Operation Date (COD).* • *A 'Cape Vulture Food Management Programme' must be implemented on site to ensure all dead livestock/wildlife on site are removed as soon as possible and made unavailable to vultures for feeding.* • *An Observer Led Turbine Shutdown on Demand (OLSDOD) programme must be implemented on site from COD.* • *The combination of hub height and rotor diameter must be optimised to maximise the lower blade tip height above ground.* • *All turbine blades must be painted according to a protocol currently under development by the South African Wind Energy Association (SAWEA) from the outset.* • *Any residual impacts after all possible mitigation measures have been implemented will need to be mitigated off-site.* • *No internal medium voltage power lines should be overhead. Only the 132 kV collector lines and grid connection power line should be above ground.* • *Any overhead conductors or earth wires should be fitted with an Eskom approved anti bird collision line marking device to make cables more visible to birds in flight and reduce the likelihood of collisions.* • *The pole design of any overhead power line should be approved by an ornithologist in terms of the electrocution risk it may pose to large birds such as vultures.* • *The during construction and post construction monitoring programme outlined in Appendix 6 should be implemented according to the latest available version of the best practice guidelines at the time.*		
	Duration	*Long term*				
	Consequence	*Severe*				
	Probability	*Very likely*				
	Reversibility	*Non reversible*				
	Irreplaceability	*High*				
	Status	*Negative*	***High (2)***		***Low (4)***	***High***

Collision and electrocution on overhead powerlines	***Spatial Extent***	*Regional*		● *The Very High sensitivity areas identified by this study (which build on those identified in the screening phase) should be adhered to.* ● *A pre-construction avifaunal walk down should be conducted to confirm final layout and identify any sensitivities that may arise between the conclusion of the EIA process and the construction phase.* ● *All construction activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.* ● *Use should be made of existing roads as far as possible.* ● *Any underground cabling should follow roads at all times to reduce the impact on the habitat by grouping these linear infrastructures.* ● *A post construction site inspection must be conducted by an avifaunal specialist to confirm that all aspects have been appropriately handled and in particular that road and hard stand verges do not provide additional substrate for raptor prey species.* ● *A bird fatality threshold and adaptive management policy must be designed by an ornithologist for the project prior to the Commercial Operation Date (COD).* ● *A 'Cape Vulture Food Management Programme' must be implemented on site to ensure all dead livestock/wildlife on site are removed as soon as possible and made unavailable to vultures for feeding.* ● *An Observer Led Turbine Shutdown on Demand (OLSDOD) programme must be implemented on site from COD.* ● *The combination of hub height and rotor diameter must be optimised to maximise the lower blade tip height above ground.* ● *All turbine blades must be painted according to a protocol currently under development by the South African Wind Energy Association (SAWEA) from* ● *the outset.* ● *Any residual impacts after all possible mitigation measures have been implemented will need to be mitigated off-site.* ● *No internal medium voltage power lines should be overhead. Only the 132 kV collector lines and grid connection power line should be above ground.* ● *Any overhead conductors or earth wires should be fitted with an Eskom approved anti bird collision line marking device to make cables more visible to birds in flight and reduce the likelihood of collisions.* ● *The pole design of any overhead power line should be approved by an ornithologist in terms of the electrocution risk it may pose to large birds such as vultures.* ● *The during construction and post construction monitoring programme outlined in Appendix 6 should be implemented according to the latest available version of the best practice guidelines at the time.*		
	Duration	*Long term*				
	Consequence	*Severe*				
	Probability	*Very likely*				
	Reversibility	*Non-reversible*				
	Irreplaceability	*High*				
DECOMMISSIONING PHASE						

Disturbance	***Status***	*Negative*	***Low (4)***	• *The Very High sensitivity areas identified by this study (which build on those identified in the screening phase) should be adhered to.* • *A pre-construction avifaunal walk down should be conducted to confirm final layout and identify any sensitivities that may arise between the conclusion of the EIA process and the construction phase.* • *All construction activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.* • *Use should be made of existing roads as far as possible.* • *Any underground cabling should follow roads at all times to reduce the impact on the habitat by grouping these linear infrastructures.* • *A post construction site inspection must be conducted by an avifaunal specialist to confirm that all aspects have been appropriately handled and in particular that road and hard stand verges do not provide additional substrate for raptor prey species.* • *A bird fatality threshold and adaptive management policy must be designed by an ornithologist for the project prior to the Commercial Operation Date (COD).* • *A 'Cape Vulture Food Management Programme' must be implemented on site to ensure all dead livestock/wildlife on site are removed as soon as possible and made unavailable to vultures for feeding.* • *An Observer Led Turbine Shutdown on Demand (OLSDOD) programme must be implemented on site from COD.* • *The combination of hub height and rotor diameter must be optimised to maximise the lower blade tip height above ground.* • *All turbine blades must be painted according to a protocol currently under development by the South African Wind Energy Association (SAWEA) from* • *the outset.* • *Any residual impacts after all possible mitigation measures have been implemented will need to be mitigated off-site.* • *No internal medium voltage power lines should be overhead. Only the 132 kV collector lines and grid connection power line should be above ground.* • *Any overhead conductors or earth wires should be fitted with an Eskom approved anti bird collision line marking device to make cables more visible to birds in flight and reduce the likelihood of collisions.* • *The pole design of any overhead power line should be approved by an ornithologist in terms of the electrocution risk it may pose to large birds such as vultures.* • *The during construction and post construction monitoring programme outlined in Appendix 6 should be implemented according to the latest available version of the best practice guidelines at the time.*	***Low (4)***	***High***
	Spatial Extent	*Local*				
	Duration	*Medium term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
AGRICULTURE AND SOILS						

DIRECT IMPACTS - CONSTRUCTION PHASE						
Loss of agricultural land use and land degradation	***Status***	*Negative*	***tbc***	• *A system of stormwater management, which will prevent erosion, will be an inherent part of the road engineering on site. Any occurrences of erosion must be attended to immediately and the integrity of the erosion control system at that point must be amended to prevent further erosion from occurring there.* • *Any excavations done during the construction phase, in areas that will be re-vegetated at the end of the construction phase, must separate the upper 30 cm of topsoil from the rest of the excavation spoils and store it in a separate stockpile. When the excavation is back-filled, the topsoil must be back-filled last, so that it is at the surface. Topsoil should only be stripped in areas that are excavated. Across the majority of the site, including construction lay down areas, it will be much more effective for rehabilitation, to retain the topsoil in place. If levelling requires significant cutting, topsoil should be temporarily stockpiled and then re-spread after cutting, so that there is a covering of topsoil over the entire surface.*	***tbc***	***tbc***
	Spatial Extent	*tbc*				
	Duration	*tbc*				
	Consequence	*tbc*				
	Probability	*tbc*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				

SOCIO-ECONOMIC						
CONSTRUCTION PHASE						
Creation of employment and business opportunities	***Status***	*Positive*	***Low (4)***	***Employment*** • *Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.* • *Where reasonable and practical, the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories. However, due to the low skills levels in the area, the majority of skilled posts are likely to be filled by people from outside the area.* • *Where feasible, efforts should be made to employ local contractors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria.* • *Before the construction phase commences the proponent should meet with representatives from the MM to establish the existence of a skills database for the area. If such a database exists, it should be made available to the contractors appointed for the construction phase.* • *The local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project.*	***Moderate (3)***	***High***
	Spatial Extent	*Regional*				
	Duration	*Medium term*				
	Consequence	*Moderate*				
	Probability	*Likely*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				

				• *Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the construction phase.* • *The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.* ***Business*** • *The proponent should liaise with the MM regarding the establishment of a database of local companies, specifically BBBEE companies, which qualify as potential service providers (e.g., construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction service providers. These companies should be notified of the tender process and invited to bid for project-related work.*		
Presence of construction workers and potential impacts on family structures and social networks	***Status***	*Negative*	***Low (4)***	• *Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.* • *Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.* • *The SEP and CHSSP should include a Grievance Mechanism that enables stakeholders to report and resolve incidents.* • *Where possible, the proponent should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories.* • *The proponent should consider the option of establishing a Monitoring Committee (MC) for the construction phase with representatives from local landowners, farming associations, and the local municipality. This MC should be established prior to commencement of the construction phase and form part of the SEP.* • *The proponent and contractor should develop a Code of Conduct (CoC) for construction workers. The code should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be subject to appropriate disciplinary action and/or dismissed. All dismissals must comply with the South African labour legislation. The CoC should be signed by the proponent and the contractors before the contractors move onto site. The CoC should form part of the CHSSP.* • *The proponent and the contractor should implement an HIV/AIDS, COVID-19 and Tuberculosis (TB) awareness programme for all construction workers at the outset of the construction phase. The programmes should form part of the CHSSP.* • *The contractor should provide transport for workers to and from the site on a daily basis. This will enable the contractor to effectively manage and monitor the movement of construction workers on and off the site.*	***Low (4)***	***High***
	Spatial Extent	*Regional*				
	Duration	*Medium term*				
	Consequence	*Slight*				
	Probability	*Unlikely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				

				• *The contractor must ensure that all construction workers from outside the area are transported back to their place of residence within 2 days for their contract coming to an end.* • *No construction workers, with the exception of security personnel, should be permitted to stay overnight on the site.*		
Influx of jobseekers and potential impacts on family structures, social networks and community services	***Status***	*Negative*	***Low (4)***	• *The proponent should ensure that the employment criteria favour residents from the area.* • *Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.* • *Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.* • *The proponent, in consultation with the LM, should investigate the option of establishing a MC to monitor and identify potential problems that may arise due to the influx of job seekers to the area. The MC should also include the other proponents of solar energy projects in the area.* • *The proponent should implement a "locals first" policy, specifically with regard to unskilled and low skilled opportunities.* • *The proponent should implement a policy that no employment will be available at the gate.*	***Low (4)***	***High***
	Spatial Extent	*Regional*				
	Duration	*Medium term*				
	Consequence	*Slight*				
	Probability	*Unlikely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Low*				
Safety risk, stock theft and damage to farm infrastructure associated with presence of construction workers	***Status***	*Negative*	***Moderate (3)***	• *Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.* • *Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.* • *The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences.* • *All farm gates must be closed after passing through.* • *Contractors appointed by the proponent should provide daily transport for low and semi-skilled workers to and from the site.* • *The proponent should establish a MC and CoC for workers (see above).* • *The proponent should hold contractors liable for compensating farmers and communities in full for any stock losses and/or damage to farm infrastructure that can be linked to construction workers. This should be contained in the Code of Conduct to be signed between the proponent, the contractors, and neighbouring landowners. The agreement should also cover losses and costs associated with fires caused by construction workers or construction related activities (see below).* • *The proponent should implement a Grievance Mechanism that provides local farmers with an effective and efficient mechanism to address issues*	***Low (4)***	***High***
	Spatial Extent	*Local*				
	Duration	*Medium term*				
	Consequence	*Slight*				
	Probability	*Unlikely*				
	Reversibility	*High*				
	Irreplaceability	*Replaceable*				

				related to report issues related to damage to farm infrastructure, stock theft and poaching etc. • *The Environmental Management Plan (EMP) must outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested.* • *Contractors appointed by the proponent must ensure that all workers are informed at the outset of the construction phase of the conditions contained in the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms.* • *Contractors appointed by the proponent must ensure that construction workers who are found guilty of stealing livestock and/or damaging farm infrastructure are dismissed and charged. This should be contained in the CoC. All dismissals must be in accordance with South African labour legislation.* • *It is recommended that no construction workers, with the exception of security personnel, should be permitted to stay overnight on the site.*		
Increased risk of grass fires	***Status***	*Negative*	***Moderate (3)***	• *Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.* • *Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.* • *The proponent should enter into an agreement with the local farmers in the area whereby damages to farm property etc., during the construction phase will be compensated for. The agreement should be signed before the construction phase commences.* • *Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas.* • *Smoking on site should be confined to designated areas.* • *Contractor should ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high-risk dry, windy summer months.* • *Contractor should provide adequate fire-fighting equipment on-site, including a fire fighting vehicle.* • *Contractor should provide fire-fighting training to selected construction staff.* • *No construction staff, with the exception of security staff, to be accommodated on site overnight.*	***Low (4)***	***High***
	Spatial Extent	*Local*				
	Duration	*Medium term*				
	Consequence	*Slight*				
	Probability	*Unlikely*				
	Reversibility	*High*				

	Irreplaceability	*Replaceable*		• *As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the fire-fighting costs borne by farmers and local authorities.*		
Impact of heavy vehicles and construction activities	***Status***	*Negative*	***Low (4)***	• *Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.* • *Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.* • *Timing of construction activities should be planned to avoid / minimise impact on key farming activities, including planting and harvesting operations.* • *The proponent should establish a MC to monitor the construction phase and the implementation of the recommended mitigation measures. The MC should be established before the construction phase commences, and should include key stakeholders, including representatives from local farmers and the contractor(s). The MF should also address issues associated with damage to roads and other construction related impacts.* • *Ongoing communication with landowners and road users during construction period. This should be outlined in the SEP.* • *The proponent should implement a Grievance Mechanism that provides local farmers and other road users with an effective and efficient mechanism to address issues related to construction related impacts, including damage to local gravel farm roads.*	***Low (4)***	***High***
	Spatial Extent	*Local*				
	Duration	*Medium term*				
	Consequence	*Slight*				
	Probability	*Unlikely*				
	Reversibility	*High*				
	Irreplaceability	*Replaceable*				
Loss of farmland	***Status***	*Negative*	***Moderate (3)***	• *The loss of high-quality agricultural land should be avoided and or minimised by careful planning of the final layout of the proposed WEF facilities. The recommendations of the agricultural / soil assessment should be implemented.* • *Affected landowners should be consulted about the timing of construction related activities in advance.* • *The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be minimised.* • *An Environmental Control Officer (ECO) should be appointed to monitor the establishment phase of the construction phase.* • *All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase.*	***Low (4)***	***High***
	Spatial Extent	*Local*				
	Duration	*Medium term*				
	Consequence	*Moderate*				
	Probability	*Likely*				

	Reversibility	*High*		• *The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. The specifications for the rehabilitation programme should be drawn up by the Environmental Consultants appointed to manage the EIA.* • *The implementation of the Rehabilitation Programme should be monitored by the ECO.*		
	Irreplaceability	*Low*				
OPERATIONAL PHASE						
Establish infrastructure to generate renewable energy	***Status***	*Positive*	***Moderate (3)***	*Should the project be approved, the proponent should:* • *Implement a skills development and training programme aimed at maximizing the number of employment opportunities for local community members.* • *Maximise opportunities for local content, procurement, and community shareholding.*	***Moderate (3)***	***High***
	Spatial Extent	*National*				
	Duration	*Long term*				
	Consequence	*Substantial*				
	Probability	*Very Likely*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				
Creation of employment and business opportunities during maintenance	***Status***	*Positive*	***Low (4)***	• *The mitigation measures listed in the creation of employment and business opportunities during the construction phase, also apply to the operational phase.* • *In addition, the proponent should investigate providing training and skills development to enable locally based service providers to provide the required services for the operational phase.*	***Moderate (3)***	***High***
	Spatial Extent	*Regional*				
	Duration	*Long term*				
	Consequence	*Slight*				
	Probability	*Very Likely*				
	Reversibility	*tbc*				
	Irreplaceability	*tbc*				
Benefit associated with community trust	***Status***	*Positive*	***Moderate (3)***	*In order to maximise the benefits and minimise the potential for corruption and misappropriation of funds the following measures should be implemented:* • *The IYM should liaise with the proponents of other renewable energy projects in the area to investigate how best the Community Trusts can be established and managed so as to promote and support local, socio-economic development in the region as a whole.* • *The IYM should be consulted as to the structure and identification of potential trustees to sit on the Trust. The key departments in the IYM that should be consulted include the Municipal Managers Office, IDP Manager and LED Manager.* • *Clear criteria for identifying and funding community projects and initiatives in the area should be identified. The criteria should be aimed at maximising the*	***High (2)***	***High***
	Spatial Extent	*National*				
	Duration	*Long term*				
	Consequence	*Moderate*				
	Probability	*Very likely*				

	Reversibility	*tbc*		*benefits for the community as a whole and not individuals within the community.* • *Strict financial management controls, including annual audits, should be instituted to manage the funds generated for the Community Trust from the REF plant.*		
	Irreplaceability	*tbc*				
Benefits for landowners	***Status***	*Positive*	***Low (4)***	• *Implement agreements with affected landowners.* • *The loss of high-quality agricultural land should be avoided and or minimised by careful planning in the final layout of the proposed WEF facilities. The recommendations of the agricultural / soil assessment should be implemented.* *Mitigation measures from agricultural and soil impact assessment include:* • *A system of stormwater management, which will prevent erosion, will be an inherent part of the road engineering on site. Any occurrences of erosion must be attended to immediately and the integrity of the erosion control system at that point must be amended to prevent further erosion from occurring there.* • *Any excavations done during the construction phase, in areas that will be re-vegetated at the end of the construction phase, must separate the upper 30 cm of topsoil from the rest of the excavation spoils and store it in a separate stockpile. When the excavation is back-filled, the topsoil must be backfilled last, so that it is at the surface. Topsoil should only be stripped in areas that are excavated. Across the majority of the site, including construction lay down areas, it will be much more effective for rehabilitation, to retain the topsoil in place. If levelling requires significant cutting, topsoil should be temporarily stockpiled and then re-spread after cutting, so that there is a covering of topsoil over the entire surface.*	***Moderate (3)***	***High***
	Spatial Extent	*Local*				
	Duration	*Long term*				
	Consequence	*Slight*				
	Probability	*Very Likely*				
	Reversibility	*n/a*				
	Irreplaceability	*n/a*				
Visual impact and impact on sense of place	***Status***	*Negative*	***Moderate (3)***	• *Detailed viewsheds and analysis of visual impacts is required in the EIA Phase of the project.* • *Given their height, effective mitigation measures for the visual impact of the proposed wind turbines is not possible. However, impacts can be minimised to some extent in terms of where the turbines are positioned.* • *Determination of the cumulative visual exposure for the three (3) WEFs that form part of the project cluster, as well as any other renewable projects within the area.* • *Detailed mitigation measures for visual impacts as a result of associated infrastructure must be developed in the next phase of the EIA process.*	***Moderate (3)***	***High***
	Spatial Extent	*Regional*				
	Duration	*Long term*				
	Consequence	*Slight*				
	Probability	*Likely*				
	Reversibility	*High*				
	Irreplaceability	*Low*				
Impact on property values	***Status***	*Negative*	***Moderate to (3) Low (4)***		***Low (4)***	***Moderate***

	Spatial Extent	*Regional*		• *Detailed viewsheds and analysis of visual impacts is required in the EIA Phase of the project.* • *Given their height, effective mitigation measures for the visual impact of the proposed wind turbines is not possible. However, impacts can be minimised to some extent in terms of where the turbines are positioned.* • *Determination of the cumulative visual exposure for the three (3) WEFs that form part of the project cluster, as well as any other renewable projects within the area.* • *Detailed mitigation measures for visual impacts as a result of associated infrastructure must be developed in the next phase of the EIA process.*		
	Duration	*Long term*				
	Consequence	*Slight*				
	Probability	*Unlikely*				
	Reversibility	*High*				
	Irreplaceability	*Low*				
Impact on tourism	***Status***	*Negative*	***Low (4)***	• *Detailed viewsheds and analysis of visual impacts is required in the EIA Phase of the project.* • *Given their height, effective mitigation measures for the visual impact of the proposed wind turbines is not possible. However, impacts can be minimised to some extent in terms of where the turbines are positioned.* • *Determination of the cumulative visual exposure for the three (3) WEFs that form part of the project cluster, as well as any other renewable projects within the area.* • *Detailed mitigation measures for visual impacts as a result of associated infrastructure must be developed in the next phase of the EIA process.*	***Low (4)***	***High***
	Spatial Extent	*Regional*				
	Duration	*Long term*				
	Consequence	*Slight - Moderate*				
	Probability	*Unlikely (regional level)*				
	Reversibility	*High*				
	Irreplaceability	*Low*				
DECOMMISSIONING PHASE						
Impacts associated with decommissioning	***Status***	*Negative*	***Low (4)***	• *The proponent should ensure that retrenchment packages are provided for all staff retrenched when the plant is decommissioned.* • *All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning.*	***Low (4)***	***High***
	Spatial Extent	*Local*				
	Duration	*Short term*				
	Consequence	*Slight*				
	Probability	*Likely*				
	Reversibility	*High*				
	Irreplaceability	*Low*				
NOISE						
CONSTRUCTION PHASE						

Increase in noise level at receptors. Disturbing noises. Noises exceeding rating level.	***Status***	*Negative*	***tbc***	***tbc***	***tbc***	***tbc***
	Spatial Extent	*Local*				
	Duration	*Short Term*				
	Consequence	*tbc*				
	Probability	*tbc*				
	Reversibility	*Highly Reversible*				
	Irreplaceability	*Resources are replaceable*				
OPERATIONAL PHASE						
Increase in noise level at receptors. Noises exceeding rating level.	***Status***	*Negative*	***tbc***	***tbc***	***tbc***	***tbc***
	Spatial Extent	*Local*				
	Duration	*Long Term*				
	Consequence	*tbc*				
	Probability	*tbc*				
	Reversibility	*Highly Reversible*				
	Irreplaceability	*Resources are replaceable*				

TRAFFIC
CONSTRUCTION PHASE

Noise, dust and exhaust pollution due to construction related traffic including transportation of people, construction materials, water and equipment to and from the development site, as well as abnormal trucks delivering turbine components to the site; Noise, dust and exhaust pollution due to the construction of access roads, excavations of turbine foundations, trenching for electrical cables and other ancillary construction works that will temporarily generate increased traffic; and Potential traffic congestion and delays on the surrounding road network due to increase in vehicle traffic	*Status*	*Negative*	***Moderate (3)***	• *Stagger turbine component delivery to site* • *Reduce the construction period to mitigate the increase in traffic due to construction activities* • *Stagger the construction of the turbines* • *The use of mobile batch plants and quarries in close proximity to the site would decrease the impact on the surrounding road network.* • *Staff and general trips should occur outside of peak traffic periods* • *Maintenance of haulage routes.* • *Properly design and continuously maintain the internal access road network.*	***Low (4)***	***Medium***
	Spatial Extent	*Regional*				
	Duration	*Medium term*				
	Consequence	*Substantial*				
	Probability	*Very likely*				
	Reversibility	*High*				
	Irreplaceability	*Replaceable*				
OPERATIONAL PHASE						
	Status	*Neutral*	***Low (4)***		***Very Low (5)***	***High***

Potential traffic congestion and delays on the surrounding road network due to increased vehicle traffic[1]	*Spatial Extent* *Duration* *Consequence* *Probability* *Reversibility* *Irreplaceability*	*Local* *Long term* *Slight* *Very likely* *High* *Replaceable*		• *Stagger delivery of water to the site* • *Schedule trips outside of peak traffic periods* • *Use on-site water sources (i.e., borehole water) if possible*		
DECOMMISSIONING PHASE						
Noise, dust and exhaust pollution due to construction related traffic including transportation of people, construction materials, water and equipment to and from the development site, as well as abnormal trucks transporting turbine components from the site; and Potential traffic congestion and delays on the surrounding road network due to	*Status* *Spatial Extent* *Duration* *Consequence* *Probability* *Reversibility* *Irreplaceability*	*Negative* *Regional* *Medium term* *Substantial* *Very likely* *High* *Replaceable*	***Moderate (3)***	• *Stagger turbine component removal from the site* • *Reduce the decommissioning period* • *Stagger the removal of the turbines* • *The use of mobile batch plants and quarries in close proximity to the site would decrease the impact on the surrounding road network.* • *Staff and general trips should occur outside of peak traffic periods* • *Maintenance of haulage routes.* • *Properly design and continuously maintain the internal access road network.*	***Low (4)***	***Medium***

[1] Note that the traffic generated because of the development during the operational phase will be minimal and will not have an impact on the surrounding road network in light of the remote and rural setting of the area.

increase in vehicle traffic						

6.15 Conclusion

The effect of potential on-site impacts can be limited or reduced to acceptable levels through avoidance, minimisation and the implementation of appropriate mitigation measures and management actions during the construction, operational and decommissioning phases of this proposed development. Therefore, based on the scoping level specialist input potential negative impacts associated with the Kaladokhwe WEF 3 project are anticipated to mainly be of **Moderate to Low significance after mitigation**, whilst some positive socio-economic impacts of moderate significance are expected.

6.16 Cumulative Impacts

The Specialists will assess potential cumulative impacts by identifying other renewable energy generation facilities, within a 30 km radius of the proposed Kaladokhwe WEF 3 project, that have been approved (i.e., positive EA has been issued) or which have a BA/EIA process underway as at 30 September 2022.

Cumulative impacts, which were identified by the Specialists during the Scoping Phase and that are associated with these similar types of development projects include *inter alia*:

- Habitat destruction, modification, loss and fragmentation;
- Removal of vegetation and impact on or loss of fauna and flora SCC;
- Compromising the integrity of CBAs, ESAs, FEPAs, NPAES and SWSAs;
- Possible loss of landscape connectivity and disruption of broad-scale ecological processes;
- Impact on terrestrial fauna, including mortality and displacement;
- Avifaunal displacement, collisions (injuries, electrocution) and mortalities (birds and bats);
- Impact on aquatic resources and reducing the integrity of watercourses;
- Impact on heritage resources (including archaeology, palaeontology and cultural landscape);
- Loss of agricultural land;
- Increase in stormwater run-off and soil erosion;
- Increase in water requirements;
- Increased vehicle traffic and associated impacts on roads;
- Increased noise levels;
- Visual intrusion and potential flicker effect;
- Light pollution;
- Dust pollution;
- Socio-economic impacts including social upliftment and job creation, skills development and training, as well as the generation of additional income stream for the landowners;
- Increased investment and the contribution to the national, regional and local economy; and
- Upgrade of infrastructure and contribution of renewable energy into the National Electrical Grid, as well as lower national CO_2 emissions per unit of energy generated.

The proposed renewable energy projects located within 30 km of the proposed Kaladokhwe WEF 3 project that will be considered in the Cumulative Impact Assessment are detailed in Table 7.3 and shown in Figure 7.1 within Chapter 7 of this Scoping Report.

Scoping and Environmental Impact Assessment for the Proposed Development of the 240 MW Kaladokhwe Wind Energy Facility 3 near Nxuba (Cradock) in the Eastern Cape

DRAFT SCOPING REPORT

CHAPTER 7: Plan of Study for EIA





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7 PLAN OF STUDY FOR THE EIA

This chapter presents the Plan of Study for the Environmental Impact Assessment (PSEIA), which sets out the process to be followed in the Environmental Impact Assessment (EIA) Phase as required by the 2014 National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) EIA Regulations, as amended. The PSEIA is based on the outcomes of the Scoping Phase (to date) and provides the Terms of Reference (ToR) for the specialist assessments that have been identified, the alternatives that will be considered and assessed, as well as the public participation process (PPP) that will be undertaken during the EIA Phase.

7.1 Purpose of EIA and Requirements of the EIA Regulations

"The purpose of the EIA Phase is to, through a consultative process:

- Determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- Describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the development footprint on the approved site as contemplated in the accepted scoping report;
- Identify the location of the development footprint within the approved site as contemplated in the accepted scoping report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- Determine the—
    i. nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
    ii. degree to which these impacts—
    (aa) can be reversed;
    (bb) may cause irreplaceable loss of resources, and
    (cc) can be avoided, managed or mitigated;
- Identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during the assessment;
- Identify, assess and rank the potential impacts that the activity will impose on the development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity;
- Identify suitable measures to avoid, manage or mitigate identified impacts; and
- Identify residual risks that need to be managed and monitored."

The EIA Phase consists of three parallel and overlapping processes:

- Central assessment process through which inputs are integrated and presented in an EIA Report that is submitted for approval to the national Department of Forestry, Fisheries and the

Environment (DFFE) (previously the Department of Environment, Forestry and Fisheries) and other commenting authorities (Sections 7.2, 7.3 and 7.4);

- Undertaking of a PPP whereby findings of the EIA Phase are communicated and discussed with Interested and Affected Parties (I&APs) and responses are documented (Section 7.3); and
- Undertaking of specialist assessments that provide additional information/assessments required to address the issues raised in the Scoping Phase (Sections 7.5, 7.6 and 7.8).

Table 7.1 below shows the requirements for the PSEIA in accordance with Appendix 2 (2) (1) (h) of the 2014 NEMA EIA Regulations, as amended.

Table 7.1: Requirements for the Plan of Study for EIA in accordance with the 2014 NEMA EIA Regulations, as amended

Section of the EIA Regulations: Appendix 2 (2) (1) (h)	Requirements for a PSEIA in the Scoping Report in terms of Appendix 2 of the 2014 NEMA EIA Regulations, as amended (GN R326)	Section of this Chapter of the PSEIA in which the required information is discussed
H	A plan of study for undertaking the EIA 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;	Section 7.7
Ii	a description of the aspects to be assessed as part of the environmental impact assessment process;	Section 7.5
Iii	aspects to be assessed by specialists;	Section 7.5 and Section 7.7
Iv	a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;	Section 7.4
V	a description of the proposed method of assessing duration and significance;	Section 7.4
Vi	an indication of the stages at which the Competent Authority will be consulted;	Section 7.3 and Section 7.4
Vii	particulars of the public participation process that will be conducted during the environmental impact assessment process;	Section 7.3
Viii	a description of the tasks that will be undertaken as part of the environmental impact assessment process; and	Section 7.2, Section 7.3, Section 7.5 and Section 7.8.
Ix	identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	Section 7.8 (note that Chapter 6 includes high-level management actions identified during the Scoping Phase. Section 7.8 of this chapter highlights which specialist studies will include such measures)

7.2 Overview of Approach to Preparing the EIA Report and EMPr

The specialist studies are being undertaken based on compliance with relevant legislation and based on the Terms of Reference indicated in Section 7.7 of this chapter. The results of the specialist assessments and other relevant project information and research undertaken for the proposed Kaladokhwe WEF 3 will be integrated into the Draft EIA Report. The Draft EIA Report will be released for a 30-day I&AP and authority comment period, as outlined in Sections 7.3 and 7.4 of this chapter. I&APs registered on the project database will be notified in writing of the release of the Draft EIA Report for comment.

Comments raised, through written correspondence (emails and comments) will be captured in a Comments and Responses Report for inclusion in the Final EIA Report that will be submitted to the DFFE for decision-making. Refer to Section 7.3.2 for additional information regarding this process.

The Draft and Final EIA Reports will include an Environmental Management Programme (EMPr), which will be prepared in compliance with the relevant regulations (i.e. Appendix 4 of the 2014 NEMA EIA Regulations, as amended). This EMPr will be based broadly on the environmental management philosophy presented in the ISO 14001 standard, which embodies an approach of continual improvement. Actions in the EMPr will be drawn primarily from the management actions in the specialist assessments for the construction and operational phases of the project. If the project components are decommissioned or re-developed this will need to be done in accordance with the relevant environmental standards and clean-up/remediation requirements applicable at the time. However, general management actions for the decommissioning phase will be provided.

7.3 Public Participation Process

The PPP in the EIA Phase will be undertaken in compliance with Chapter 6 of the 2014 NEMA EIA Regulations (as amended).

The key steps in the PPP for the EIA Phase are described below.

The PPP for the Scoping Phase is described in detail in Chapter 4 of this Scoping Report. As discussed in Chapter 1 and Chapter 4 of this Scoping Report, an integrated PPP is being undertaken for the proposed wind energy facilities (WEFs) and associated infrastructure, which will entail that all public participation documents will serve to notify the I&APs and Organs of State of the joint availability of the reports for the Kaladokhwe WEF 1, Kaladokhwe WEF 2 and Kaladokhwe WEF 3 projects and will provide I&APs with an opportunity to comment on the reports. This approach was undertaken due to the close proximity of the sites (i.e. the proposed projects will take place within the same geographical area and on adjoining farm properties) and that the proposed projects entail the same activity (i.e. generation of energy using a renewable source (i.e. Wind).

Please note: Separate Scoping and Environment Impact Assessment (S&EIA) processes are being undertaken for each of the proposed Kaladokhwe WEF 1, Kaladokhwe WEF 2 and Kaladokhwe WEF 3 projects. As such, separate applications for Scoping and EIA will be submitted to the DFFE for the three proposed Kaladokhwe WEF projects, respectively.

7.3.1 Task 1 – I&AP Review of the EIA Report and EMPr

The first stage in the process will entail the release of the Draft EIA Report for a 30-day I&AP and stakeholder comment period. As discussed in Chapter 4, an initial database of I&APs (including key stakeholders and Organs of State) was developed prior to the commencement of the S&EIA processes, and advertising the EA processes in the local print media, in line with Regulation 41 (2) (c) of GN R326. Appendix C of this Scoping Report includes a copy of the I&AP database, which indicates interaction with I&APs, key stakeholders and all I&APs that have been added to the electronic project database.

While I&APs have been encouraged to register their interest in the project from the start of the process, following the public announcements, the identification and registration of I&APs is ongoing for the duration of the study. As a result, I&AP details will be captured and automatically updated as and when information is distributed to or received from I&APs as per Regulation 42 of the GN R326, in terms of the electronic database. I&APs will only be removed or de-registered from the database, upon request.

Relevant stakeholders, Organs of State and I&APs will be informed of the review period in the following manner:

- **Database Maintenance:** As indicated above, in line with Regulation 42 of GN R326, an initial database of potential I&APs was developed for the S&EIA processes and will be updated throughout the process. The updated database will be used to provide written notification of the release of the Draft EIA Reports for comment.
- **Advertisements to Register Interest:** An advertisement will be placed in the Afrikaans, English and isiXhosa languages in at least one local newspaper, 'Midlands News' at the commencement of the 30-day comment period for the Draft EIA Reports. A copy of the content of the advertisement will be included as an Appendix in the Draft EIA Reports.
- **Letter 3 to I&APs (Outcome of decision-making on Final Scoping Report (FSR) and commencement of EIA Phase**): Written notification of the outcome of decision-making on the FSR and the commencement of the EIA Phase (i.e. Letter 3) will be sent to all I&APs and Organs of State included on the updated project database via email, where email addresses are available. This letter will be sent once the outcome of decision making on the FSR is received by the CA (i.e. at most 43 days after acknowledgment of receipt of scoping report by CA). Letter 3 will include information on the proposed projects and notification of the commencement of the EIA Phase. Letter 3 will be written in the English language. Proof of email, as well as copies of the Letter 3 and emails sent will be included in the Final EIA Reports that will be submitted to the DFFE for decision-making.
- **Letter 4 to I&APs (Availability of the Draft EIA Reports for public comment):** Written notification of the availability of the Draft EIA Reports (i.e. Letter 4) will be sent to all I&APs and Organs of State included on the updated project database via email, where email addresses are available. This letter will be sent at the commencement of the 30-day comment period on the Draft EIA Reports, and will include information on the proposed projects and notification of the release and availability of the reports. Letter 4 will be written in the English language. Proof of email, as well as copies of the Letter 4 and emails sent will be included in the Final EIA Reports that will be submitted to the DFFE for decision-making.

- **Text Messaging:** SMS texts will also be sent to all I&APs on the updated project database, where cell phone numbers are available, to inform them of the proposed projects and how to access the Draft EIA Reports.
- **Executive Summaries of the EIA Reports:** Executive Summaries of the Draft EIA Reports will be emailed to I&APs on the project database (where email addresses are available), and uploaded to the project website.
- **Local Networks**: Where possible, communication will be made with the Ward Councillor's to request that they send notifications of the projects, availability of the reports and executive summaries via their local networks (such as WhatsApp groups, Neighbourhood Watch groups, other social media mechanisms etc.).
- **30-day Comment Period:** As noted above, potential I&APs, including authorities and Organs of State will be notified via Letter 4, of the 30-day comment and registration period within which to submit comments on the Draft EIA Reports.
- **Availability of Information:** The Draft EIA Reports will be uploaded to the project website (i.e. https://www.csir.co.za/environmental-impact-assessment) for I&APs to access it. As a supplementary mechanism, the Draft EIA Reports will also be uploaded to other alternative web-platforms such as Dropbox, Google Drive or OneDrive/SharePoint. If an I&AP cannot access the reports via the project website, via the alternative web-platforms such as Dropbox or Google Drive, and if additional information is required (other than what is provided in the Executive Summaries), then the I&AP can contact the EAP, who will then make an electronic copy available (where feasibly possible).

7.3.2 Task 2 – Comments and Responses Report

A key component of the S&EIA process is documenting and responding to the comments received from I&APs and the authorities. Copies of all written comments received during the review of the Draft EIA Reports will be compiled into a Comments and Responses Report for inclusion in an appendix to the Final EIA Reports that will be submitted to the DFFE for decision-making. The Comments and Responses Report will indicate the nature of the comment, as well as when and who raised the comment. The comments received will be considered by the EIA team and appropriate responses provided by the relevant member of the EIA team, the Project Developer and/or specialists. The response provided will indicate how the comment received has been dealt with in the EIA Process, and considered in the Final EIA Reports and in the project design or EMPrs. Should the comment received fall beyond the scope of this EIA, clear reasoning will be provided.

7.3.3 Task 3 – Compilation of the Final EIA Reports for Submission to DFFE

Following the 30-day commenting period of the Draft EIA Reports and incorporation of the comments received into the reports, the Final EIA Reports will be submitted to the DFFE for decision-making in line with Regulation 23 (1) (a) of the 2014 NEMA EIA Regulations, as amended. The reports will be submitted electronically to the DFFE via the Novell S-Filer system, as recommended by the DFFE since June 2020.

In line with best practice, I&APs on the project database will be notified via **Letter 5** via email (where email addresses are available) of the submission of the Final EIA Reports to the DFFE for decision-making. To ensure ongoing access to information, copies of the Final EIA Reports that have been submitted for

decision-making and the Comments and Response Reports (detailing comments received during the EIA Phase and responses thereto) will be placed on the project website (i.e. https://www.csir.co.za/environmental-impact-assessment). As a supplementary mechanism, the Final EIA Reports will also be uploaded to other alternative web-platforms such as Dropbox, Google Drive or OneDrive/SharePoint.

The Final EIA Reports, which have been submitted for decision-making to the DFFE, will include proof of the PPP that was undertaken to inform Organs of State, Stakeholders and I&APs of the availability of the Draft EIA Reports for the 30-day comment period (as explained above).

The DFFE will have 107 days (from receipt of the Final EIA Reports) to either grant or refuse EA (in line with Regulation 24 (1) of the 2014 NEMA EIA Regulations, as amended).

7.3.4 Task 4 – Environmental Authorisation (EA) and Appeal Process

Subsequent to the decision-making phase, if EAs are granted by the DFFE for the proposed projects, all registered I&APs, Organs of State and Stakeholders on the project database will receive notification of the issuing of the EAs and the associated appeal period. The 2014 NEMA EIA Regulations, as amended (i.e. Regulation 4 (1)) states that after the Competent Authority has reached a decision, it must inform the Project Applicant of the decision, in writing, within 5 days of such decision. Regulation 4 (2) of the 2014 NEMA EIA Regulations, as amended stipulates that I&APs need to be informed of the EA and associated appeal period within 14 days of the date of the decision. All registered I&APs will be informed of the outcome of the EAs and the appeal procedure, as well as the respective timelines.

The distribution of the EAs (should such authorisations be granted by the DFFE), as well as the notification of the appeal period, will include a letter (i.e. **Letter 6** (Release of EA and Notification of Opportunity to Appeal)) to be sent via email to all registered I&APs, Stakeholders and Organs of State on the project database, where email addresses are available. The letter will include information on the appeal period, as well as details regarding where to obtain a copy of the EAs. A copy of the EAs will also be emailed with Letter 6. The EAs will also be uploaded to the project website (i.e. https://www.csir.co.za/environmental-impact-assessment), and a similar supplementary mechanism (as explained above). SMS texts will also be sent to all I&APs on the database, where cell phone numbers are available, to inform them of the EAs (should they be granted).

At the end of the Appeal period, in line with best practice, I&APs on the project database will be notified of the outcome of the Appeal period, via **Letter 7** via email (where email addresses are available).

7.3.5 Consultation with National and Provincial Heritage Resource Authorities

An integrated Heritage Impact Assessment (HIA) including archaeology, palaeontology, cultural landscape and visual aesthetics will be undertaken during the EIA Phase. The HIA Report should be submitted, as part of the Draft EIA Report and EMPr, to the provincial heritage resources authority if established in the province i.e., the Eastern Cape Provincial Heritage Resources Authority (ECPHRA) and/or to the South African Heritage Resources Agency (SAHRA). SAHRA will ultimately be responsible for the evaluation of Phase 1 HIA Reports upon which review comments will be issued.

SAHRA as a commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) requires all environmental documents, complied in support of an Application for Environmental Authorisation as defined by Section 40 (1) and (2) of the 2014 NEMA EIA Regulations (as amended), to be submitted to SAHRA. As such, the EIA Report inclusive of its appendices as well as the EMPr must be submitted to the relevant case officer upon completion by the Environmental Assessment Practitioner (EAP).

In addition, comment will also be sought from the Inxuba Yethemba Local Municipality and the Enoch Mgijima Local Municipality, as well as from any local heritage conservation bodies within or nearest to the jurisdiction of the proposed project, if and where relevant, during the 30-day comment period in the EIA Phase. All comments received will be incorporated into the Comments and Responses Report that will be submitted with the Final EIA Report to National DFFE for decision-making.

7.4 Authority Consultation during the EIA Phase

Authority consultation is integrated into the PPP, with additional meetings held on online platforms with the lead authorities, where necessary. It is proposed that the CA (DFFE) as well as other lead authorities will be consulted at various stages during the EIA Process, if required. At this stage, the following authorities have been identified for the purpose of this EIA Process (additional authorities might be added to this list as the EIA Process proceeds):

- Air Traffic and Navigational Services (ATNS);
- Birdlife South Africa (Eastern Region);
- Chris Hani District Municipality;
- Department of Agriculture, Rural Development and Land Reform (Eastern Cape);
- Department of Mineral Resources and Energy (Eastern Cape);
- DFFE Biodiversity and Conservation Directorate;
- Earthlife Africa;
- Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (ECDEDEAT);
- Eastern Cape Department of Transport;
- Eastern Cape Provincial Heritage Resource Authority (ECPHRA);
- Endangered Wildlife Trust;
- Enoch Mgijima Local Municipality;
- Eskom Holdings SOC Ltd;
- Independent Communications Authority of South Africa (ICASA);
- Inxuba Yethemba Local Municipality;
- Department of Water and Sanitation;
- National Energy Regulator of South Africa (NERSA);
- South African National Roads Authority (SANRAL);
- South African Civil Aviation Authority (CAA);
- South African Heritage Resource Agency (SAHRA);
- South African Local Government Association (SALGA) (Eastern Cape)
- South African National Parks (SANParks);
- South African Radio Astronomy Observatory (SARAO);

- Transnet SOC Ltd; and
- Wildlife and Environmental Society of South Africa (WESSA).

The authority consultation process for the EIA Phase is outlined in Table 7.2 below.

Table 7.2: Authority Communication Schedule

STAGE IN EIA PHASE	FORM OF CONSULTATION
During the EIA Process	Site visit with authorities (including DFFE), if required.
During preparation of EIA Report	Communication (via email or online platforms (i.e. Microsoft Teams) with the DFFE on the outcome of Specialist Studies, if required.
On submission of EIA Report for decision-making	Online meetings with dedicated departments, if requested by the DFFE, with jurisdiction over particular aspects of the project (e.g. Local Authority) and potentially including relevant specialists.

7.5 Approach to the Impact Assessment Methodology and Specialist Assessments

This section outlines the assessment methodology and legal context for specialist assessments, as recommended by the then Department of Environmental Affairs (DEA) 2006 Guideline on Assessment of Impacts.

7.5.1 Impact Assessment Methodology

The Impact Assessment Methodology has been aligned with the requirements for EIA Reports as stipulated in Appendix 3 (3) (1) (j) of the 2014 NEMA EIA Regulations, as amended, which states the following:

"An environmental impact assessment report must contain the information that is necessary for the Competent Authority to consider and come to a decision on the application, and must include an assessment of each identified potentially significant impact and risk, including-

(i) cumulative impacts;
(ii) the nature, significance and consequences of the impact and risk;
(iii) the extent and duration of the impact and risk;
(iv) the probability of the impact and risk occurring;
(v) the degree to which the impact and risk can be reversed;
(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and
(vii) the degree to which the impact and risk can be mitigated".

The identification of potential impacts includes impacts that may occur during the construction, operational and decommissioning phases of the development. The assessment of impacts includes direct, indirect as well as cumulative impacts. In order to identify potential impacts (both positive and negative) it

is important that the nature of the proposed project is well understood so that the impacts associated with the project can be assessed. The process of identification and assessment of impacts will include:

- Determining the current environmental conditions in sufficient detail so that there is a baseline against which impacts can be identified and measured;
- Determining future changes to the environment that will occur if the activity does not proceed;
- Develop an understanding of the activity in sufficient detail to understand its consequences; and
- The identification of significant impacts, which are likely to occur if the activity is undertaken.

As per the then Department of Environmental Affairs and Tourism (DEAT) Guideline 5: Assessment of Alternatives and Impacts, the following methodology is applied to the prediction and assessment of impacts and risks. Potential impacts and risks have been rated in terms of direct, indirect and cumulative impacts:

- **Direct impacts** are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.
- **Indirect impacts** of an activity are indirect or induced changes that may occur as a result of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.
- **Cumulative impacts** are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

The cumulative impacts will be assessed by identifying other renewable energy projects, that are in different stages of planning and/or development as well as other relevant electricity grid projects, such as construction and upgrade of electricity generation, and transmission or distribution facilities within 30 km of the proposed Kaladokhwe WEF project cluster. Note that there are currently no operational WEFs located within 30 km of the proposed Kaladokhwe WEF projects.

The approach for the S&EIA is that the assessment will include all renewable energy projects within 30 km that have received an EA, or has a BA/EIA process in progress as at 30 September 2022, including the three proposed Kaladokhwe WEF project developments. The information has been sourced from the National DFFE Renewable Energy EIA Application (REEA) database, 2022 Quarter 2; as well as from the South African Heritage Resources Information System (SAHRIS). Table 7.3 provides more details; and Figure 7.1 provides an illustration of the projects that will be considered in the cumulative impact assessment.

Table 7.3: Proposed renewable energy projects, located within 30 km of the proposed Kaladokhwe WEF project cluster, that will be considered in the Cumulative Impact Assessment (Source: DFFE REEA Quarter 2, 2022; SAHRIS)

DFFE REFERENCE	EA PROCESS	PROJECT TITLE	APPLICANT	EAP	PROVINCE	TECHNOLOGY	MW	STATUS
14/12/16/3/3/2/333 14/12/16/3/3/2/333/A2	S&EIA (and Amendments)	Proposed Dobbin PV Solar Facility	AF-Rom Energy (Pty) Ltd	SRK Consulting (Pty) Ltd	Eastern Cape	Solar PV	75	Approved

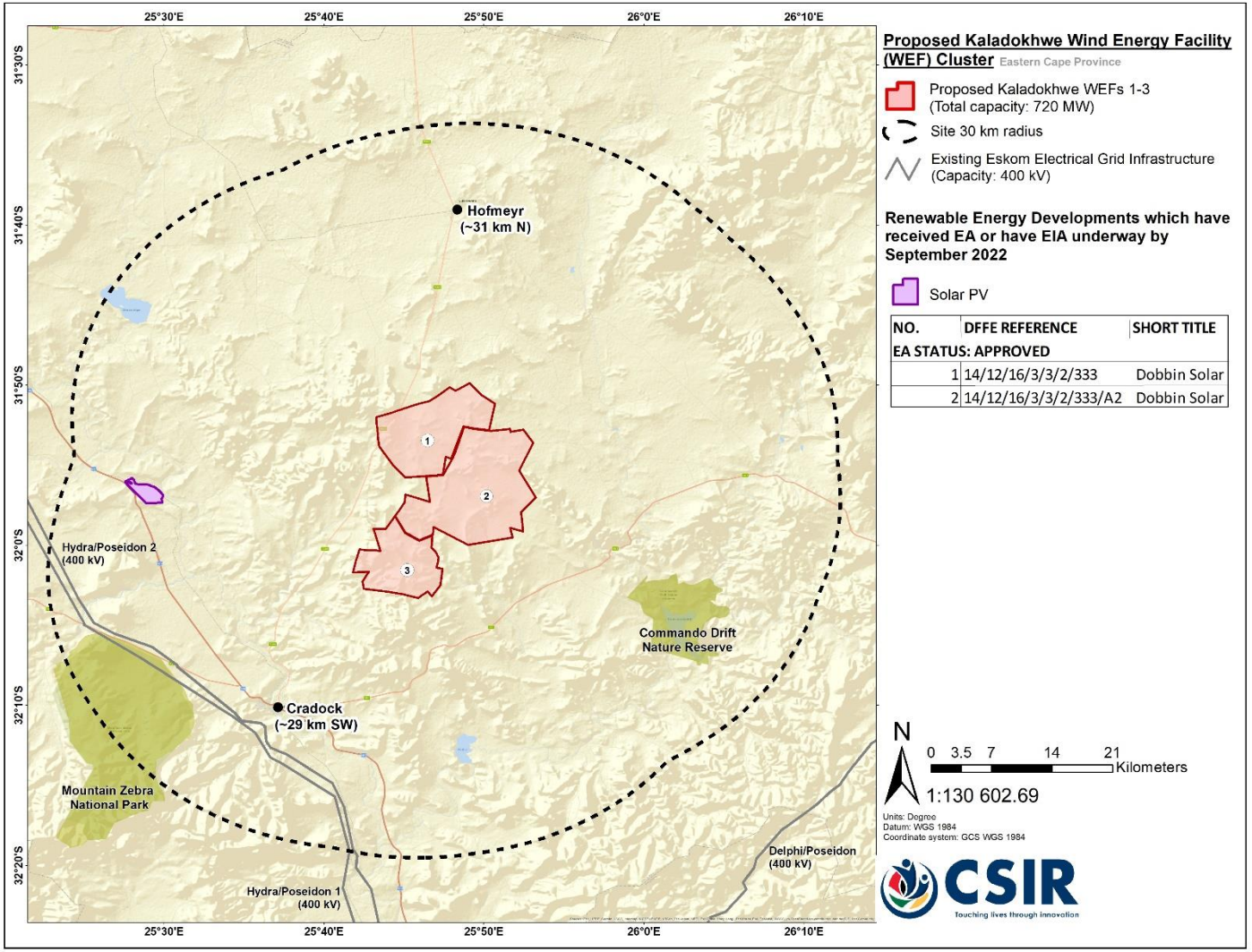

Figure 7.1: Renewable Energy projects within the 30 km radius considered for the Cumulative Impact Assessment (Source: DFEE REEA Quarter 2, 2022; SAHRIS).

In addition to the above, the Impact Assessment Methodology includes the following aspects:

Nature of impact - this reviews the type of effect that a proposed activity will have on the environment and should include "what will be affected and how?"

Status - Whether the impact on the overall environment (social, biophysical and economic) will be:

- Positive - environment overall will benefit from the impact;
- Negative - environment overall will be adversely affected by the impact; or
- Neutral - environment overall will not be affected.

Spatial extent – The size of the area that will be affected by the impact:

- Site specific;
- Local (<10 km from site);
- Regional (<100 km of site);
- National; or
- International (e.g. Greenhouse Gas emissions or migrant birds).

Duration – The timeframe during which the impact/risk will be experienced:

- Very short term (instantaneous);
- Short term (less than 1 year);
- Medium term (1 to 10 years);
- Long term (the impact will cease after the operational life of the activity (i.e. the impact or risk will occur for the project duration)); or
- Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient (i.e. the impact will occur beyond the project decommissioning)).

Consequence – The anticipated severity of the impact/risk:

- Extreme (extreme alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they permanently cease);
- Severe (severe alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they temporarily or permanently cease);
- Substantial (substantial alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they temporarily or permanently cease);
- Moderate (notable alteration of natural systems, patterns or processes, i.e. where the environment continues to function but in a modified manner); or
- Slight (negligible alteration of natural systems, patterns or processes, i.e. where no natural systems/environmental functions, patterns, or processes are affected).

Reversibility of the Impacts - the extent to which the impacts are reversible assuming that the project has reached the end of its life cycle (decommissioning phase) will be:

- High reversibility of impacts (impact is highly reversible at end of project life, i.e. this is the most favourable assessment for the environment). For example, the nuisance factor caused by noise

impacts associated with the operational phase of an exporting terminal can be considered to be highly reversible at the end of the project life);

- Moderate reversibility of impacts;
- Low reversibility of impacts; or
- Impacts are non-reversible (impact is permanent, i.e. this is the least favourable assessment for the environment). The impact is permanent. For example, the loss of a palaeontological resource on the site caused by building foundations could be non-reversible).

Irreplaceability of Resource Loss caused by impacts – the degree to which the impact causes irreplaceable loss of resources assuming that the project has reached the end of its life cycle (decommissioning phase) will be:

- High irreplaceability of resources (project will destroy unique resources that cannot be replaced, i.e. this is the least favourable assessment for the environment);
- Moderate irreplaceability of resources;
- Low irreplaceability of resources; or
- Resources are replaceable (the affected resource is easy to replace/rehabilitate, i.e. this is the most favourable assessment for the environment).

Using the criteria above, the impacts/risk will further be assessed in terms of the following:

Probability – The probability of the impact occurring:

- Extremely unlikely (little to no chance of occurring);
- Very unlikely (<30% chance of occurring);
- Unlikely (30-50% chance of occurring)
- Likely (51 – 90% chance of occurring); or
- Very likely (>90% chance of occurring regardless of prevention measures).

To determine the significance of an identified impact/risk, the consequence is multiplied by probability (qualitatively as shown in Figure 7.2 below). The significance is rated qualitatively against a predefined set of criteria (i.e. probability and consequence) as indicated in Figure 7.2. The approach incorporates internationally recognised methods from the Intergovernmental Panel on Climate Change (IPCC) (2014) assessment of the effects of climate change and is based on an interpretation of existing information in relation to the proposed activity, to generate an integrated picture of the risks related to a specified activity in a given location, with and without mitigation. Risk is assessed for each significant stressor (e.g. physical disturbance), on each different type of receiving entity (e.g. the municipal capacity, a sensitive wetland), qualitatively (very low, low, moderate, high, very high) against a predefined set of criteria (as shown in Figure 7.2 below).

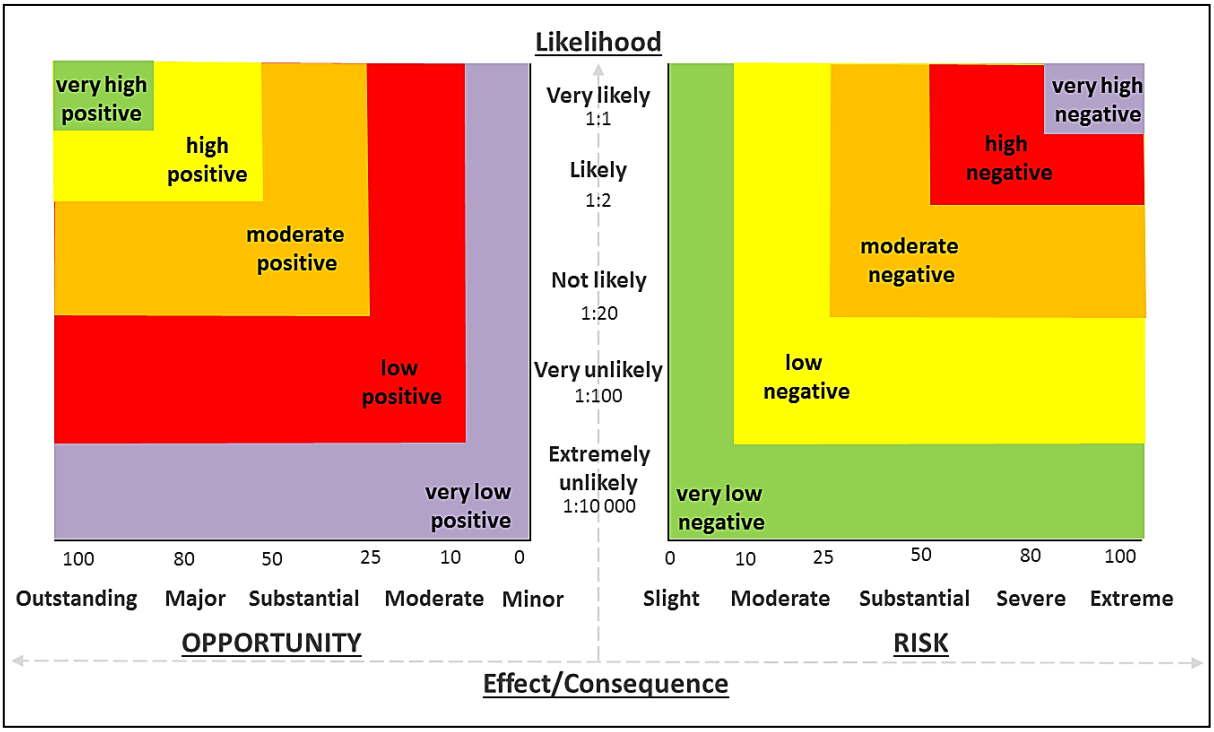

Figure 7.2: Guide to assessing risk/impact significance as a result of consequence and probability

Significance – Will the impact cause a notable alteration of the environment?

- Very low (the risk/impact may result in very minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making);
- Low (the risk/impact may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making);
- Moderate (the risk/impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated);
- High (the risk/impacts will result in a considerable alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making); or
- Very high (the risk/impacts will result in very major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making (i.e. the project cannot be authorised unless major changes to the engineering design are carried out to reduce the significance rating)).

With the implementation of mitigation measures, the residual impacts/risks must be ranked as follows in terms of significance (based on Figure 7.2):

- Very low = 5;
- Low = 4;

- Moderate = 3;
- High = 2; and
- Very high = 1.

Confidence – The degree of confidence in predictions based on available information and specialist knowledge:

- Low;
- Medium; or
- High.

Other aspects to be taken into consideration in the assessment of impact significance are:

- Impacts are to be evaluated for the construction, operational and decommissioning phases of the development. The assessment of impacts for the decommissioning phase will be brief, as there is limited understanding at this stage of what this might entail. The relevant rehabilitation guidelines and legal requirements applicable at the time will need to be applied;
- Impacts will be evaluated with and without mitigation in order to determine the effectiveness of mitigation measures on reducing the significance of a particular impact;
- The impact evaluation will, where possible, take into consideration the cumulative effects associated with this and other facilities/projects which are either developed or in the process of being developed in the local area (i.e. within 50 km from the proposed Kaladokhwe projects); and
- The impact assessment will attempt to quantify the magnitude of potential impacts (direct, indirect and cumulative effects) and outline the rationale used. Where appropriate, national standards are to be used as a measure of the level of impact.

Impacts will then be collated into the EMPr and these will include the following:

- Quantifiable standards for measuring and monitoring mitigatory measures and enhancements will be set. This will include a programme for monitoring and reviewing the recommendations to ensure their ongoing effectiveness;
- Identifying negative impacts and prescribing mitigation measures to avoid or reduce negative impacts. Where no mitigatory measures are possible this will be stated; and
- Positive impacts will be identified and augmentation measures will be identified to potentially enhance positive impacts where possible.

A generic EMPr was compiled for the development and expansion of (a) overhead electricity transmission and distribution infrastructure; and (b) substation infrastructure for the transmission and distribution of electricity. On 2 March 2018, these two Generic EMPrs were gazetted in Government Gazette 41473, GN R162 and GN R163, for public comment for a period of 45 days. On 22 March 2019, these two Generic EMPrs were gazetted for implementation in Government Gazette 42323, GN R435. Since the proposed project components include on-site substations, the gazetted EMPr for substations will be adhered to should any of the substations exceed 33kV.

Table 7.4 below will be used by the specialists for the rating of impacts.

Table 7.4: Example of Table for Assessment of Impacts/Risks

Impact	***Impact Criteria***		***Significance and Ranking (Pre-Mitigation)***	***Potential mitigation measures***	***Significance and Ranking (Post-Mitigation)***	***Confidence Level***
CONSTRUCTION PHASE						
Habitat and species loss as a result of clearance of vegetation for the PV Facility	***Status***	*Negative*	*Moderate (3)*	*Plant search and rescue (EMPr)*	*Low (4)*	*Medium*
	Spatial Extent	*Site Specific*				
	Duration	*Long-term*				
	Consequence	*Substantial*				
	Probability	*Very likely*				
	Reversibility	*Moderate*				
	Irreplaceability	*Moderate*				
OPERATIONAL PHASE						
	Status					
	Spatial Extent					
	Duration					
	Consequence					
	Probability					
	Reversibility					
	Irreplaceability					
DECOMMISSIONING PHASE						
	Status					
	Spatial Extent					
	Duration					
	Consequence					
	Probability					
	Reversibility					
	Irreplaceability					

7.6 Issues or Impacts to be assessed as part of the EIA Process

The issues and impacts presented in this Section have been identified based on scoping level assessment of the environmental status quo of the receiving environment (environmental, social and heritage features present on site – as discussed in Chapter 3 of this Scoping Report) and input from specialists that form part of the EIA project team. These issues and impacts will be assessed in further detail during the EIA Phase through the specialist assessments and are included in Chapter 6 of this Scoping Report; however, they have been summarised below in Table 7.5 for ease of reference. It must be noted that additional issues may be raised during the Scoping Phase, which could potentially be assessed during the EIA Phase.

Table 7.5: Summary of Issues to be addressed during the EIA Phase as part of the specialist assessments / input

Specialist Assessment / Input	Key issues to be addressed
Agriculture and Soils	**Construction and Operational Phases:** ▪ Loss of agricultural land use; ▪ Soil degradation including erosion, topsoil loss and contamination; and ▪ Increased financial security for farming operations[1].
Aquatic Biodiversity	**Construction Phase:** ▪ Disturbance and possible loss of aquatic habitats within the watercourses with the associated impact to sensitive aquatic biota; ▪ The removal of indigenous riparian and instream vegetation that has the potential to reduce the ecological integrity and functionality of the watercourses; ▪ Water demand for construction could place stress on the existing available water resources should external water sources not be utilised; ▪ Road crossing structures if not adequately designed could impede flow in the watercourses; ▪ Alien vegetation infestation within the aquatic features due to disturbance; and ▪ Increased sedimentation and risks of contamination of surface water runoff during construction. **Operational Phase:** ▪ Ongoing disturbance of aquatic features and associated vegetation along access roads or adjacent to the infrastructure that needs to be maintained; ▪ Modified runoff characteristics from hardened surfaces at the turbines and the substations, as well as along the access roads that have the potential to result in erosion of hillslopes and watercourses; and

[1] This potential issue is considered to have a positive impact because of the proposed development.

Specialist Assessment / Input	Key issues to be addressed
	▪ Possible increased potential for water quality impacts such as contamination from sewage generated on site because of the operation on site. **Decommissioning Phase:** ▪ An increased disturbance of aquatic habitat due to the increased activity on the site; and ▪ Increased sedimentation and risks of contamination of surface water runoff.
Terrestrial Biodiversity and Species (including Animal and Plant Species)	**Construction Phase:** ▪ The clearing of natural vegetation and resultant loss of faunal habitat; ▪ The loss of endangered, threatened, protected and endemic plants/animals; ▪ Direct faunal mortalities due to construction activities and increased vehicle traffic; ▪ Increased human activity, noise and light levels; ▪ Increased dust deposition; ▪ Establishment of alien vegetation as a result of the clearing of the vegetation; ▪ Increased stormwater run-off and erosion; and ▪ Changes in animal behaviour. **Operational Phase:** ▪ Direct faunal mortalities; ▪ Increased human activity, light and noise levels; ▪ Establishment of alien vegetation will continue; and ▪ Changes in animal behaviour. **Decommissioning Phase:** ▪ Some clearing of natural vegetation due to removal of infrastructure; ▪ Possible ingestion or ensnarement of animals due to waste material lying around; ▪ Establishment of alien invasive vegetation; and ▪ Increased erosion and stormwater run-off.
Avifauna	**Construction Phase:** ▪ Total or partial displacement of avifauna due to habitat transformation associated with the presence of the wind turbines and associated infrastructure; ▪ The noise and movement associated with the construction activities at the project footprint will be a source of disturbance, which would lead to the displacement of avifauna from the area. **Operational Phase:** ▪ Avifauna mortality and injury through collisions with the wind turbines; and ▪ Electrocution of priority species on the internal electrical grid network.

Specialist Assessment / Input	Key issues to be addressed
	Decommissioning Phase: ▪ The noise and movement associated with the activities at the study area will be a source of disturbance, which would lead to the displacement of avifauna from the area.
Bats	**Construction Phase:** ▪ Displacement of bats due to habitat loss / habitat transformation; ▪ Roost disturbance; and ▪ Roost destruction. **Operational Phase:** ▪ Mortality of bats due to turbine collisions while commuting/foraging and/or due to barotrauma; ▪ Mortality of bats due to turbine collisions during migrations; and ▪ Light pollution associated risks including loss of insect prey and increased collision risks for bats foraging closer to turbines. **Decommissioning Phase:** ▪ Displacement of bats due to disturbance associated with the decommissioning activities.
Heritage (including Archaeology and Cultural Landscape)	**Construction and Decommissioning Phases:** ▪ The destruction or disturbance of archaeological artefacts or sites; ▪ The destruction or disturbance of graves or burial sites; ▪ The destruction or disturbance of historic built infrastructure; ▪ Visual intrusion of visually sensitive heritage resources and/or cultural landscape features, which might erode its association with intangible heritage.
Palaeontology	**Construction and Decommissioning Phases:** ▪ Damage and/or destruction of scientifically valuable fossils preserved at or beneath the ground due to surface clearance or excavations.
Noise	**Construction and Decommissioning Phases:** ▪ Noise pollution i.e. increase in ambient sound levels due to construction activities (e.g. equipment and vehicle noise). **Operational Phase:** ▪ Mechanical and aerodynamic noise from the operation of the wind turbine components.
Socio-Economic	**Construction Phase:** ▪ Investment and the contribution to the national, regional and local economy[1]; ▪ Generation of employment, income and skills[1]; and ▪ Pressures on community fabric and resources due to an influx of jobseekers. **Operational Phase:** ▪ Lower national CO_2 emissions per unit of energy generated[1]; ▪ Investment and the contribution to the national, regional and local economy[1];

Specialist Assessment / Input	Key issues to be addressed
	▪ Generation of employment, income and skills[1]; and ▪ Improvement of community facilities and prospects through funding of social upliftment projects[1]. **Decommissioning Phase:** ▪ Loss of employment due to decommissioning of the facility.
Traffic	**Construction and Decommissioning Phases:** ▪ Increase in vehicle traffic due to construction activities – Potential traffic congestion and delays on the surrounding road network and associated noise and dust pollution. **Operational Phase:** ▪ Potential traffic congestion and delays on the surrounding road network due to increased vehicle traffic[2].
Visual	**Construction Phase:** ▪ Visual intrusion and potential flicker effect by wind turbines and associated structures and infrastructure on visual receptors; ▪ Visual intrusion by wind turbines and associated structures and infrastructure on landscape receptors; ▪ Potential visual impact of security and construction lighting on the nightscape of the region; ▪ Potential scarring in the landscape caused by earthworks and excavations; and ▪ Increased dust emissions from heavy machinery and vehicle traffic. **Operational Phase:** ▪ Visual intrusion and potential flicker effect by wind turbines and associated structures and infrastructure on visual receptors; ▪ Visual intrusion by wind turbines and associated structures and infrastructure on landscape receptors; and ▪ Potential visual impact of on-site security lighting and red-flashing warning lights on top of the turbine hubs on the rural nightscape of the region. **Decommissioning Phase:** ▪ Visual intrusion and increased dust emissions due to decommissioning activities including disassembly of project components, heavy machinery, increased vehicle traffic and rehabilitation; and ▪ Potential visual impact of security and construction lighting on the nightscape of the region.

[2] Note that the traffic generated because of the development during the operational phase will be minimal and will not have a significant impact on the surrounding road network in light of the remote and rural setting of the area.

7.7 Alternatives to be assessed in the EIA Phase

A description of the alternatives that will be assessed or considered during the EIA Phase is provided in Chapter 5 of this Scoping Report. However, they have been summarised below for ease of reference:

- **No-go Alternative:**
  - The no-go alternative assumes that the proposed project will not go ahead i.e. it is the option of not developing the proposed Kaladokhwe WEF 3. This alternative would result in no environmental impacts from the proposed project on the site or surrounding local area. It will provide a baseline against which other alternatives will be compared and considered during the EIA Phase. The no-go alternative will be assessed by all the specialists on the project team.
- **Land Use Alternative:**
  - All farm portions forming part of the proposed project is zoned for agricultural land-use, and is mainly used for low-density livestock farming. As discussed in Chapter 3 of this Scoping Report, the soils of the proposed project site are predominantly very shallow and rocky with limited climatic moisture availability. These soil characteristics present major limitations to agriculture, as such cultivation and agricultural potential is uniformly very low across the study area. Agricultural land use is limited to low-density grazing i.e. 30 hectares per large stock unit. Hence, the agricultural land use is not a preferred alternative. The proposed project will generate an additional income stream to the landowners and is therefore considered the preferred land use alternative and will not impede on the existing land use activities as the proposed project can co-exist with continued low-density livestock farming on site.
- **Type of Activity Alternative:**
  - This relates to the generation of electricity from a renewable energy source, and in this particular case, from wind. The **generation of electricity from a renewable energy source** was the only activity considered by the Project Developer, and thus considered in this DSR. No other activity types were considered or deemed appropriate based on the expertise of the Project Developer.
- **Renewable Energy Alternatives:**
  - Data received from consistent measurements recorded by three on-site wind measuring meteorological masts (i.e. one mast on each of the three proposed WEF project sites) for a minimum period of 12 months has indicated that the wind resource at the proposed Kaladokhwe WEF 3 project site is more than adequate for the development of a WEF. In addition, the IRP2019 gazetted by the Minister of Mineral Resources and Energy, Gwede Mantashe, in October 2019, indicated that the highest renewable energy target capacity is allocated to wind energy (i.e. 17 742 MW total installed wind energy capacity by 2030). The proposed Kaladokhwe WEF 3 will therefore contribute toward achieving the total installed capacity target set out in the IRP2019, should the project receive preferred bidder status in terms of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or similar process. Therefore, in terms of project and location compatibility, the proposed project is considered to be the most feasible renewable energy activity alternative. No other renewable energy technology alternatives will be further assessed during the EIA Phase.
- **Preferred Site and Development Footprints within the Study Area:**

- The preferred site for the proposed Kaladokhwe WEF 3 extends over the following farm portions:
  - Farm Ossen Kraal No. 40 / 1
  - Farm Ruigte Fontein No. 150 / RE, 1, 3
  - Farm De Bruins Requist No. 168 / RE
  - Farm Gunsteling No.165 / 1 (RE)
  - Farm Lange Hoek No.171 / 7
  - Farm Roland No. 169 / RE
  - Farm No.166 / 1, 2
  - Farm No. 607 / RE (0)
- At a specific (local) level, sites on the above listed farm properties were deemed suitable due to all the site selection factors (such as land availability, distance to the national grid, site accessibility, topography, current land use and landowner willingness) being favourable. The development footprint within the proposed project site has been determined through a screening exercise of the project site by the specialist team (specialists' input have been provided during the Scoping Phase and are included in Appendix F of this Scoping Report), and through consultation with the affected landowners to identify sensitive areas that should preferably be avoided and thus are excluded from development (i.e. 'no-go' areas). The current proposed permanent development footprint of the proposed Kaladokhwe WEF 3 is approximately 61 ha (i.e. approximately 1.2% of the combined area of the affected farm portions listed above).

- **Layout Alternatives:**
  - The preferred layout alternatives for the proposed WEF project will be determined and confirmed following the input from the various specialists. The specialist assessments will aim to identify various environmental sensitivities within the development footprint that should be avoided, which will be taken into consideration during the determination and refinement of the preferred project layout of the proposed WEF.
  - Although all existing access roads will be utilised for the proposed project and have been assessed during the Scoping Phase, the internal road network on site will be confirmed in the revised project layout, which will be taken forward into the EIA Phase for detailed specialist assessment.

- **Project Infrastructure Location Alternatives:**
  - Various infrastructure alternatives are being considered and will be assessed in this S&EIA Process. These include development footprints for construction compound, laydown area and substations, as well as alternative technologies for the battery energy storage systems (BESS).
  - Two construction compound and laydown area locations will be assessed in the EIA Phase and the preferred alternative will thereafter be selected.
  - Two substation locations will be assessed in the EIA Phase for approval.

- **Technology Alternatives:**
  - The following types of electrochemical BESS technologies will be assessed in the EIA Phase and the preferred alternative will thereafter be selected:
    - Lead Acid and Advanced Lead Acid BESS;
    - Lithium ion BESS;
    - Nickel based BESS (i.e. Nickel-Cadmium (NiCd) and nickel–metal hydride (NiMH));
    - High Temperature (NaS, Na-$NiCl_2$, Mg/PB-Sb) BESS; and

- Redox Flow Batteries (RFB): Vanadium-Vanadium Redox Flow Battery (VRFB), Zinc-iron Flow Battery (Zn-Fe), Zinc-Bromine Flow Battery (Zn-Br).

It is important to note that where alternatives are not feasible or will not be assessed, a motivation has been provided in Chapter 5 of this Scoping Report. The preferred alternatives will be assessed during the EIA Phase.

7.8 Terms of Reference for the Specialist Assessments

The Terms of Reference (ToRs) for the Specialist Assessments will essentially consist of the generic assessment requirements and the specific issues identified for each discipline. The ToRs will be updated to include relevant comments received from I&APs and authorities during the 30-day commenting period of the Draft Scoping Report.

The following Specialist Assessments have been identified following consultation with the National Environmental Screening Tool[3] to determine a baseline description of the prevalent environmental sensitivities within the proposed project site. The ToR for each Specialist Assessment is discussed in detail below. The Specialist Assessments and associated Specialists are indicated in Table 7.6 below. Additional Specialist Assessments could possibly be commissioned as a result of concerns raised during the Scoping Phase.

Table 7.6: Specialist Assssments and associated Specialist Consultants commissioned to assess the environmental sensitivites identified by the National Web-Based Screening Tool

SPECIALIST ASSESSMENT	SPECIALIST CONSULTANT	SPECIALIST NAME
Agriculture and Soils Compliance Statement	Private	Johann Lanz
Aquatic Biodiversity Impact Assessment	Nkurenkuru Ecology and Biodiversity	Gerhard Botha
Avifauna Impact Assessment	WildSkies Ecological Services	Jon Smallie
Bats Impact Assessment	Animalia Consultants (Pty) Ltd	Werner Marais, Caroline Bell, Diane Smith
Civil Aviation Site Sensitivity Verification	CSIR	Lizande Kellerman
Defence Site Sensitivity Verification	CSIR	Lizande Kellerman
Heritage Impact Assessment (including Palaeontological Impact Assessment)	Beyond Heritage	Jaco van der Walt
Noise Impact Assessment	Enviro-Acoustic Research cc	Morné de Jager
Socio-Economic Impact Assessment	Tony Barbour Environmental Consulting	Tony Barbour
Terrestrial Biodiversity and Species Impact Assessment	Biodiversity Africa	Tarryn Martin, Amber Jackson
Traffic Impact Assessment	iWink Consulting (Pty) Ltd	Iris Wink
Visual & Flicker Impact Assessment	LOGIS	Lourens du Plessis

[3] The National Screening Tool can be accessed at https://screening.environment.gov.za/screeningtool/#/pages/welcome

The requirements for Specialist Assessments are specified in Appendix 6 of the 2014 NEMA EIA Regulations, as amended, as well as, where relevant, the Assessment Protocols that were published on 20 March 2020, in Government Gazette 43110, GN R320. These protocols stipulate the procedures for the assessment and Minimum Reporting Criteria for identified Environmental Themes in terms of Sections 24 (5) (A) and (H) as well as 44 of the NEMA, when applying for EA.

The Assessment Protocols in GN R320 include the following sections:

- **Part A**: This includes the Site Sensitivity Verification requirements where a Specialist Assessment is required but no Specific Assessment Protocol has been prescribed. The current use of the land and the environmental sensitivity of the site under consideration identified by the National Web-Based Screening Tool, where determined, must be verified and confirmed by undertaking a Site Sensitivity Verification. The Site Sensitivity Verification must be compiled and included as an appendix to the Specialist Assessment. However, in certain instances, there are no sensitivity layers on the Screening Tool for a particular Specialist Assessment. For example, as of October 2022, there are no sensitivity layers on the National Web-Based Screening Tool for socio-economic and traffic features. For all Specialist Assessments that fall within the ambit of Part A of GN R320, Appendix 6 of the 2014 NEMA EIA Regulations, as amended, must be complied with.
- **Part B**: This includes the Site Sensitivity Verification requirements as well as the Assessment and Minimum Reporting Criteria where a Specialist Assessment is required and a specific Assessment Protocol has been prescribed. The following protocols are prescribed and relevant to this S&EIA:
    - **Agriculture**: Site Sensitivity Verification Report required and specific Assessment Protocol to be followed. This applies to all onshore wind and/or solar PV energy activities requiring EA;
    - **Avifauna**: Specific Assessment Protocol to be followed. This applies to all onshore wind activities requiring EA (i.e. for onshore wind energy generation facilities, where the electricity output is 20 megawatts or more);
    - **Terrestrial Biodiversity**: Site Sensitivity Verification Report required and specific Assessment Protocol to be followed. This applies to all activities requiring EA (based on the classification identified by the Screening Tool);
    - **Aquatic Biodiversity**: Site Sensitivity Verification Report required and specific Assessment Protocol to be followed. This applies to all activities requiring EA (based on the classification identified by the Screening Tool);
    - **Noise**: Site Sensitivity Verification Report required and specific Assessment Protocol to be followed. This applies to all activities requiring EA (based on the classification identified by the Screening Tool);
    - **Defence**: Site Sensitivity Verification Report required and specific Assessment Protocol to be followed. This applies to all activities requiring EA (based on the classification identified by the Screening Tool); and
    - **Civil Aviation**: Site Sensitivity Verification Report required and specific Assessment Protocol to be followed. This applies to all activities requiring EA (based on the classification identified by the Screening Tool).

7.8.1 Agricultural Compliance Statement

The Agricultural Compliance Statement must comply with the Assessment Protocols that were published on 20 March 2020, in Government Gazette 43110, GN R320. This specifically includes the Agriculture Protocol that applies to all onshore wind and/or solar PV energy activities requiring EA. This protocol replaces the requirements of Appendix 6 of the 2014 NEMA EIA Regulations, as amended. The Agricultural Specialist is therefore also required to provide a Site Sensitivity Verification Report based on the requirements documented in the Assessment Protocol (GG 43110 / GN R320, 20 March 2020).

The Specialist conducted a scoping level assessment to identify the level of environmental sensitivity of the study area, and to verify and confirm the assigned sensitivity and current land-use of the study area as per the National Web-Based Screening Tool. Following the compilation of the Site Sensitivity Verification report (included in Appendix F.1), it was determined by the Specialist that the Kaladokhwe WEF 3 study area is of less than high agricultural sensitivity (except for isolated patches of cultivation) due to the climate and general soil conditions being unsuitable for cultivation. Therefore, a Compliance Statement is deemed sufficient for the purposes of the Agriculture and Soils Assessment for the EIA Phase of the proposed project. Therefore, the Specialist will during the EIA Phase compile an Agricultural Compliance Statement in accordance with said Assessment Protocol (GG 43110 / GN R320, 20 March 2020).

The Agricultural Compliance Statement will include the following tasks:

- Assessment of the preferred project layout following the site sensitivity verification and layout identification;
- Specification of development setbacks or buffers required, and clear motivations for these recommendations;
- A map showing the proposed development footprint (including supporting infrastructure) with a 50 m buffered development envelope, overlaid on the agricultural sensitivity map generated by the Screening Tool;
- Calculations of the physical development footprint area for each land parcel as well as the total physical development footprint area of the proposed development including supporting infrastructure;
- Confirmation that the development footprint is in line with the allowable development limits contained in GN R320;
- Description and mapping of soil types (soil forms), soil characteristics (soil depth, soil colour, limiting factors, and clay content of the top and sub soil layers), and degradation and erodibility of soils etc. to the extent necessary to inform this assessment;
- Assessment of the direct, indirect and cumulative impacts associated with the proposed development, where possible, (although an assessment and rating of impacts is not strictly required for a Compliance Statement stipulated in GN R320):
    - Cumulative impacts to be assessed by considering renewable energy projects and other applicable (and relevant) projects within 50 km of the proposed projects (refer to Table 7.3 above);
- Confirmation that all reasonable measures have been taken through micro siting to avoid or minimise fragmentation and disturbance of agricultural activities;

- A substantiated statement indicating the level of acceptability of the proposed development and a recommendation if the development should go ahead or not; as well as any conditions to which this statement is subjected;
- A description of assumptions, any uncertainties or gaps in knowledge or data, and limitations;
- A section indicating how the National Web-Based Screening Tool was interrogated and whether classification of the site is accurate or not. If not, it will be motivated why the classification is not accurate;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;
- Assessment of the project alternatives and identification of a preferred alternative with motivation for this selection;
- A signed Specialist Declaration of Independence and details and relevant expertise as well as the SACNASP registration number of the specialist, including a curriculum vitae;
- Provide recommendations with regards to potential monitoring programmes; and
- Determine mitigation and/or management measures, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts. This will be included in the EMPr, which will be appended to the EIA Report.

The Specialist is also required to:

- Incorporate and address all relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making; and
- Review the Generic EMPr for Substations (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPr (Part B – Section 1). If so, a list of the required specific impact management outcomes and actions must be provided.

7.8.2 Terrestrial Biodiversity and Species Impact Assessment

The Terrestrial Biodiversity Specialist is required to compile a Specialist Assessment in adherence to the following gazetted Environmental Assessment Protocols, which replace the requirements of Appendix 6 of the 2014 NEMA EIA Regulations, as amended:

- Protocol for the Specialist Assessment and Minimum Report Content Requirements of Environmental Impacts on Terrestrial Biodiversity (GG 43110 / GN R320, 20 March 2020);
- Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species (GG 43855 / GN R1150, 30 October 2020);
- Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant Species (GG 43855 / GN R1150, 30 October 2020).

The Specialist has conducted a site visit and fieldwork during the late flowering season from the 4th to 10th of July 2022 in order to identify the level of sensitivity assigned to the project study area, and to verify and

confirm this sensitivity and land use as per the National Web-Based Screening Tool. Based on the findings from the site visit and the Site Sensitivity Verification Report (included in Appendix F.6) prepared by the Specialist in accordance with the requirements documented in the Assessment Protocol (GG 43110 / GN R320 of 20 March 2020), it was confirmed that a Terrestrial Biodiversity and Species Impact Assessment (the input complying with the content requirements of the said Terrestrial Biodiversity Protocol) is required during the EIA Phase.

The Terrestrial Biodiversity and Species Impact Assessment is to be based on existing information, national and provincial databases, and professional experience and fieldwork conducted by the Specialist, as considered necessary and in accordance with relevant legislated requirements. The Impact Assessment Report must also be in adherence to any additional relevant legislation and guidelines that may be deemed necessary.

The Terrestrial Biodiversity and Species Impact Assessment will include the following:

- Contact details of the specialist, their SACNASP registration number, their field of expertise and a Curriculum Vitae;
- A signed statement of independence by the specialist;
- Liaison with the South African National Biodiversity Institute (SANBI) to obtain information on sensitive species flagged in the National Web-Based Screening Tool (where species names are obscured / only numbered);
- A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;
- A description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modelling used, where relevant;
- Description of the terrestrial ecosystem features of the project site, with focus on features that are to be potentially impacted by the proposed project. The description will include the major habitat forms within the study area, giving due consideration to terrestrial fauna and flora;
- Specification of development setbacks or buffers required, and clear motivations for these recommendations;
- A location of the areas not suitable for development, which are to be avoided during construction and operation (where relevant);
- Consideration of seasonal changes and long-term trends, such as due to climate change;
- Identification of any species of conservation concern (SCC) or protected species on site;
- Assessment of local and regional biodiversity conservation planning relevant to the project area;
- Identification and assessment of the potential direct, indirect and cumulative impacts of the proposed developments on terrestrial biodiversity and species:
    - Cumulative impacts to be assessed by considering renewable energy projects and other applicable (and relevant) projects within 50 km of the proposed projects (refer to Table 7.3 above).
    - Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project. The Impact Assessment Methodology to be followed is contained in Section 7.5.1 of this Chapter.
- An impact statement indicating the acceptability of the proposed development and a recommendation if the development should go ahead or not any conditions to which this statement is subjected;

- A description of assumptions and limitations in the report and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;
- A section indicating how the National Web-Based Screening Tool was interrogated and whether classification of the site is accurate or not. If not, it must be motivated why the classification is not accurate;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;
- Assessment of the project alternatives and identification of a preferred alternative with motivation for this selection;
- Specialist Declaration of Independence and Curriculum Vitae;
- Provision of recommendations with regards to potential monitoring programmes;
- Determine mitigation and/or management measures, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts. This will be included in the EMPr, which will be appended to the EIA Report.

The Specialist is also required to:

- Incorporate and address all relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making; and
- Review the Generic EMPr for Substations (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPr (Part B – Section 1). If so, a list of the required specific impact management outcomes and actions must be provided.

7.8.3 Aquatic Biodiversity Impact Assessment

The Aquatic Biodiversity Specialist is required to compile a Specialist Assessment in adherence to the gazetted Environmental Assessment Protocols, specifically the 'Protocol for the Specialist Assessment and Minimum Report Content Requirements of Environmental Impacts on Aquatic Biodiversity' (GG 43110 / GN R320, 20 March 2020). This protocol replaces the requirements of Appendix 6 of the 2014 NEMA EIA Regulations, as amended.

The Specialist has conducted a site visit and fieldwork from the 20th to 23rd of June 2022 in order to identify the level of sensitivity assigned to the project study area, and to verify and confirm this sensitivity and land use as per the National Web-Based Screening Tool. Based on the findings from the site visit and the Site Sensitivity Verification Report (included in Appendix F.5) prepared by the Specialist in accordance with the requirements documented in the Assessment Protocol (GG 43110 / GN R320 of 20 March 2020), it was confirmed that an Aquatic Biodiversity Impact Assessment (the input complying with the content requirements of the said Aquatic Biodiversity Protocol) is required during the EIA Phase.

The Aquatic Biodiversity Impact Assessment is to be based on existing information, national and provincial databases, and professional experience and fieldwork conducted by the Specialist, as considered necessary and in accordance with relevant legislated requirements. The Impact Assessment Report must also be in adherence to any additional relevant legislation and guidelines that may be deemed necessary.

The Aquatic Biodiversity Impact Assessment will include the following:

- Description of the aquatic biodiversity and ecosystems of the project site, with focus on features that are to be potentially impacted by the proposed project. The description should include the aquatic ecosystem types, presence of aquatic species, the major habitat forms giving due consideration to the composition of aquatic species communities, their habitat, distribution and movement patterns within the study area, ;
- Specification of development setbacks or buffers required, and provide clear motivations for these recommendations;
- Indication of the historic ecological condition (reference) and the Present Ecological State (PES) of identified aquatic features (in- stream, riparian and floodplain habitat), wetlands and/or estuaries on site that are to be potentially impacted by the proposed project i.e. possible changes to the channel and flow regime (surface and groundwater); and comment on the recommended ecological condition of aquatic habitats to be achieved within the project area;
- A map describing the ecosystem processes that operate in relation to the aquatic ecosystems on and immediately adjacent to the project site (e.g. movement of surface and subsurface water, recharge, discharge, sediment transport, etc.
- an indication of the national and provincial priority status of the aquatic ecosystem, including a description of the criteria for the given status (i.e. if the site includes a wetland or a river freshwater ecosystem priority area or sub catchment, a strategic water source area, a priority estuary, whether or not they are free -flowing rivers, wetland clusters, a critical biodiversity or ecologically sensitivity area);
- Consideration of seasonal changes and long-term trends, such as due to climate change;
- Compilation of a Risk Matrix (Appendix A to GN R509 of 2016) and determining whether an application for Water Use Authorisation (e.g. General Authorisation or Water Use License) is required and if so, determining the requirements thereof;
- Assessment of local and regional biodiversity conservation planning relevant to the project area;
- Identify and assess the potential direct, indirect and cumulative impacts of the proposed development on aquatic biodiversity and species;
    - Cumulative impacts to be assessed by considering renewable energy projects and other applicable (and relevant) projects within 50 km of the proposed projects (refer to Table 7.3 above).
    - Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project. The Impact Assessment Methodology to be followed is contained in Section 7.5.1 of this Chapter.
- An impact statement indicating the acceptability of the proposed development and a recommendation if the development should go ahead or not;
- A description of assumptions and limitations in the report;
- A section indicating how the National Web-Based Screening Tool was interrogated and whether classification of the site is accurate or not. If not, it must be motivated why the classification is not accurate;

- The threat status of the ecosystem and species as identified by the screening tool;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;
- Assessment of the project alternatives and identification of a preferred alternative with motivation for this selection;
- Specialist Declaration of Independence and Curriculum Vitae;
- Provision of recommendations with regards to potential monitoring programmes; and
- Determine mitigation and/or management measures, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts. This will be included in the EMPr, which will be appended to the EIA Report.

The Specialist is also required to:

- Incorporate and address all relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making; and
- Review the Generic EMPr for Substations (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPr (Part B – Section 1). If so, a list of the required specific impact management outcomes and actions must be provided.

7.8.4 Avifauna Impact Assessment

The Avifauna Specialist is required to compile a Specialist Assessment in adherence to the gazetted Environmental Assessment Protocols, specifically the 'Protocol for the Specialist Assessment and Minimum Report Content Requirements of Environmental Impacts on Avifauna by Onshore Wind and/or Solar PV Energy Generation Facilities where the Electricity Output is 20 MW or more' (GG 43110 / GN R320, 20 March 2020). This protocol replaces the requirements of Appendix 6 of the 2014 NEMA EIA Regulations, as amended.

An Avifaunal Impact Assessment will be undertaken regardless of sensitivity ratings provided by the National Web-Based Screening Tool. Sensitivities provided by the Screening Tool are only to be used as a guide to focus the Avifaunal Impact Assessments.

The Avifaunal Impact Assessment will comprise of the following phases:

- Reconnaissance study;
- Preparation of a pre-application avifaunal monitoring plan; and
- Undertaking of avifaunal impact assessments and report compilation.

The reconnaissance study took place prior to the appointment of the EAP and included a site visit and a desktop study of relevant information. The occurrence of target species, their migratory patterns and seasonality of occurrence was also included. A reconnaissance report was compiled and included the 12-month pre-application avifaunal monitoring programme, which was conducted. The pre-application

Avifaunal monitoring plan outlines the 12-month pre-construction bird monitoring programme which was conducted, which followed the requirements of the latest Bird and Wind Energy Best Practice Guidelines applicable at the time of the surveys (Jenkins *et.al.,* 2015). Although the general bird community is considered, this assessment has special focus on the priority species, specifically those considered to be more sensitive to wind energy development related impacts. The 12-month pre-construction bird monitoring programme and reconnaissance report is included in Appendix F.3.

Data recorded during the 12-month pre-construction bird monitoring programme and reconnaissance study will inform the pre-application Avifaunal monitoring plan (which is required to be carried out for not less than four seasons) and include the Avifaunal Impact Assessment Report.

The Avifauna Impact Assessment will include the following tasks:

- Discussion of bird abundance and movement at the proposed site;
- Discussion of priority species flight activity at the proposed site discussion on presence of target or threatened species and their occurrence on the site at heights which could pose risks to collision;
- Description of methodology used in the 12-months pre-construction monitoring including a map showing the transects, vantage points and focal points used in the monitoring at the proposed site and the control site;
- Assessment of risk of identified to collision including the estimated of fatality rates of the identified priority species based on a suitable collision risk model, per species and for the site;
- Mapping of any migration or preferential flight paths or corridors, as well as all recorded flight activity of priority species;
- Discussion of potential displacement and collision mortality of priority species, where relevant;
- Mapping of areas identified within the site as having a very high sensitivity for bird collision or displacement and in which the development of turbines should be avoided, where relevant;
- Identification and assessment of the potential direct, indirect and cumulative impacts of the proposed development on birds. Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project;
    - Cumulative impacts to be assessed by considering renewable energy projects and other applicable (and relevant) projects within 50 km of the proposed projects (refer to Table 7.3 above).
    - Discussion of cumulative impacts of other WEFs within a 50 km radius of the proposed development which includes:
        - Fatality rates for priority species at WEFs within a 10 km radius (if available);
        - Map of existing WEFs within a 10 km radius; and
        - Potential additional impacts, over and above existing impacts of operational WEFs, of the proposed facility on regional populations of priority species.
    - Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project. The Impact Assessment Methodology to be followed is contained in Section 7.5.1 of this Chapter.
- Operational monitoring plan for the proposed site and a control site which must include:
    - Time frames and monitoring intervals;

  - Number of turbines to be monitored, including any specific area for monitoring; (if available);
  - Methodology for searcher efficiency and scavenger removal;
  - Method for monitoring, i.e. transects or radial as well as extent of monitoring area
  - Results of monitoring compared against expected fatality rates per target species as well as general species
  - Reporting requirements, including organisations for submission of reports;
  - Years and intervals for monitoring to take place; and
  - Methodology for live bird monitoring to ensure comparability with pre-construction monitoring i.e. all methods used to estimate bird numbers and movements during reconnaissance and pre- application monitoring, which should be applied in exactly the same order to ensure the comparablity of these two data sets.
- An impact statement indicating the acceptability of the proposed development and a recommendation if the development should go ahead or not;
- A description of assumptions and limitations in the report;
- A section indicating how the National Web-Based Screening Tool was interrogated and whether classification of the site is accurate or not. If not, it must be motivated why the classification is not accurate;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;
- Assessment of the project alternatives and identification of a preferred alternative with motivation for this selection;
- Specialist Declaration of Independence and Curriculum Vitae;
- Recommendations for mitigation of impacts to acceptable levels (where possible).
- Management measures (including monitoring if required) which could be implemented to as far as possible reduce the effect of negative impacts and enhance the effect of positive impacts; and conditions to be included in the EMPr, which will be appended to the EIA Report.

The Specialist is also required to:

- Incorporate and address all relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making; and
- Review the Generic EMPr for Substations (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPr (Part B – Section 1). If so, a list of the required specific impact management outcomes and actions must be provided.

7.8.5 Noise Impact Assessment

The Noise Specialist is required to compile a Specialist Assessment in adherence to the gazetted Environmental Assessment Protocols, specifically the 'Protocol for the Specialist Assessment and Minimum Report Content Requirements for Noise Impacts' (GG 43110 / GN R320, 20 March 2020). This protocol replaces the requirements of Appendix 6 of the 2014 NEMA EIA Regulations, as amended. In addition, the Specialist Assessment should also take into consideration any additional relevant legislation and guidelines

that may be deemed necessary (e.g. noise standards, measurements and calculations stipulated in SANS 10103:2008 Version 6 and SANS 10357:2004 Version 2.1).

The Specialist conducted a scoping level assessment in order to estimate the potential impact that noise emissions from the proposed development could have on noise sensitive receptors within and beyond the project area, and to verify and confirm the assigned sensitivity and land use as per the National Web-Based Screening Tool. Based on the findings from the site visit and the Site Sensitivity Verification Report (included in Appendix F.7) prepared by the Specialist in accordance with the requirements documented in the Assessment Protocol (GG 43110 / GN R320 of 20 March 2020), it was confirmed that a Noise Impact Assessment (the input complying with the content requirements of the said Noise Protocol) is required during the EIA Phase. The Noise Impact Assessment is to be based on existing information, national and provincial databases, and professional experience and fieldwork conducted by the Specialist, as considered necessary and in accordance with relevant legislated requirements.

The Noise Impact Assessment will include the following tasks:

- The duration and date of the site inspection and the relevance of the season and weather conditions to the outcome of the assessment;
- A description of the methodology used to undertake the on–site assessment inclusive of the equipment and models used, as relevant, together with results of the noise assessment
- Description and assessment of the noise sensitive receptors located within as well as in the vicinity of the project area that are likely to be impacted by the proposed development;
- A map showing the proposed development footprint (including supporting infrastructure) with a 50m buffered development envelope;
- Specification of development setbacks or buffers required, and provide clear motivations for these recommendations;
- Identification and assessment of the potential direct, indirect and cumulative impacts of the proposed WEF development. Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project;
    - Cumulative impacts to be assessed by considering renewable energy projects and other applicable (and relevant) projects within 50 km of the proposed projects (refer to Table 7.3 above);
    - Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project. The Impact Assessment Methodology will follow that contained in Section 7.5.1 of this chapter.
- An impact a substantiated statement indicating the acceptability of the proposed development and a recommendation if the development should go ahead or not and any conditions to which this statement is subjected;
- A description of assumptions, limitations and/or any uncertainties or gaps in knowledge in the report;
- A section indicating how the National Web-Based Screening Tool was interrogated and whether classification of the site is accurate or not. If not, it must be motivated why the classification is not accurate;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;

- Assessment of the project alternatives and identification of a preferred alternative with motivation for this selection;
- A statement confirm that all reasonable measures have been considered, or not, in the micro-siting of the proposed development to minimise disturbance of receptors;
- Specialist Declaration of Independence and Curriculum Vitae;
- Provide recommendations with regards to potential monitoring programmes; and
- Determine mitigation and/or management measures, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts. This will be included in the EMPr, which will be appended to the EIA Report.

The Specialist is also required to:

- Incorporate and address all relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making; and
- Review of the Generic EMPr for Substations (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPr (Part B – Section 1). If so, a list of the required specific impact management outcomes and actions must be provided.

7.8.6 Heritage Impact Assessment

The Heritage Specialist is required to undertake a Specialist Assessment in adherence to the gazetted Environmental Assessment Protocols, specifically with 'Part A - General Protocol for the Site Sensitivity Verification and Minimum Report Content Requirements where a Specialist Assessment is required but no specific Environmental Theme Protocol has been prescribed' (GG 43110 / GNR 320, 20 March 2020).

The Specialist conducted a desktop study in order to identify the level of sensitivity assigned to the project area, and to verify and confirm this sensitivity and land use as per the National Web-Based Screening Tool. Based on the findings of the site visit, a Site Sensitivity Verification report (included as Appendix F.2) was prepared in accordance with 'Part A - General Protocol for the Site Sensitivity Verification and Minimum Report Content Requirements where a Specialist Assessment is required but no specific Environmental Theme Protocol has been prescribed' (GG 43110 / GNR 320, 20 March 2020).

As documented in the Assessment Protocols (GG 43110 / GNR 320, 20 March 2020);
"*where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations.*"

The Heritage Impact Assessment (HIA) Report will therefore be compiled in adherence to Appendix 6 of the 2014 NEMA EIA Regulations, as amended. The HIA must also comply with the requirements of Heritage Eastern Cape and must incorporate and integrate inputs from the Visual Impact Assessment and

Palaeontology Impact Assessment, as required. The HIA must also be in adherence to any other additional relevant legislation and guidelines that may be deemed necessary, if applicable.

The Heritage Impact Assessment must include the following:

- Description and assessment of the heritage features of the sites and surrounding area. This is to be based on desktop reviews, fieldwork, available databases and findings from other heritage studies in the area, where relevant. Reference to the grade of heritage feature and any heritage status the feature may have been awarded will be included;
- Specification of development setbacks or buffers required, and clear motivations for these recommendations;
- Identify and assess the potential direct, indirect and cumulative impacts of the proposed developments on the full scope of heritage features, including archaeology and the cultural-historical landscape, as required by heritage legislation:
    - Cumulative impacts to be assessed by considering renewable energy projects and other applicable (and relevant) projects within 50 km of the proposed projects (refer to Table 7.3 above).
    - Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project. The Impact Assessment Methodology to be followed is contained in Section 7.5.1 of this Chapter.
- Liaison with the relevant authorities (i.e. Eastern Cape Provincial Heritage Resources Authority) in order to obtain a letter of approval, comments or a Permit in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), including Regulations issued thereunder, as necessary.
- An impact statement indicating the acceptability of the proposed development and a recommendation if the development should go ahead or not;
- A description of assumptions and limitations in the report;
- A section indicating how the National Web-Based Screening Tool was interrogated and whether classification of the site is accurate or not. If not, it must be motivated why the classification is not accurate;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;
- Assessment of the project alternatives and identification of a preferred alternative with motivation for this selection;
- Specialist Declaration of Independence and Curriculum Vitae;
- Provide recommendations with regards to potential monitoring programmes.
- Determine mitigation and/or management measures, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts. This will be included in the EMPr, which will be appended to the EIA Report.

The Specialist is also required to:

- Incorporate and address all relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making; and

- Review the Generic EMPr for Substations (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPr (Part B – Section 1). If so, a list of the required specific impact management outcomes and actions must be provided.

7.8.7 Palaeontology Impact Assessment

The Palaeontologist is required to undertake a Specialist Assessment in adherence to the gazetted Environmental Assessment Protocols, specifically with 'Part A - General Protocol for the Site Sensitivity Verification and Minimum Report Content Requirements where a Specialist Assessment is required but no specific Environmental Theme Protocol has been prescribed' (GG 43110 / GNR 320, 20 March 2020).

The Palaeontologist conducted a desktop study in order to identify the level of sensitivity assigned to the project area, and to verify and confirm this sensitivity and land use as per the National Web-Based Screening Tool. Based on the findings of the site visit, a Site Sensitivity Verification report (included as Appendix F.2) was prepared in accordance with Part A of the aforementioned Assessment Protocols (GG 43110 / GNR 320, 20 March 2020).

As documented in the Environmental Assessment Protocols (GG 43110 / GNR 320, 20 March 2020);
"*where a specialist assessment is required and no specific environmental theme protocol has been prescribed, the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations."*

The Palaeontology Impact Assessment (PIA) Report will therefore be compiled in adherence to Appendix 6 of the 2014 NEMA EIA Regulations, as amended. The PIA must also comply with the requirements of Heritage Eastern Cape, as required. The PIA must also be in adherence to any other additional relevant legislation and guidelines that may be deemed necessary, if applicable.

The Palaeontology Impact Assessment must include the following tasks:

- Determine, describe and map the baseline environmental condition and palaeontological sensitivity of the study areas. Specify setbacks or buffers, and provide clear reasons for these recommendations;
- Assessment of the preferred project layout following the site sensitivity verification and layout identification;
- Describe the type and location of known palaeontology and fossil heritage sites in the study areas, and characterize all items that may be affected by the proposed projects;
- Note fossils and associated sedimentological features of palaeontological relevance (photos, maps, aerial or satellite images, and stratigraphic columns);
- Evaluate the potential for occurrence of palaeontology and fossil heritage features within the study areas;
- Identify and assess the potential direct, indirect and cumulative impacts of the proposed developments on palaeontology and fossil heritage during the construction, operational and decommissioning phases of the proposed Kaladokhwe WEF 3 project;

  - Cumulative impacts to be assessed by considering renewable energy projects and other applicable (and relevant) projects within 50 km of the proposed projects (refer to Table 7.3 above).
  - Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project. The Impact Assessment Methodology to be followed is contained in Section 7.5.1 of this Chapter.
- An impact statement indicating the acceptability of the proposed development and a recommendation if the development should go ahead or not;
- A description of assumptions and limitations in the report;
- A section indicating how the National Web-Based Screening Tool was interrogated and whether classification of the site is accurate or not. If not, it must be motivated why the classification is not accurate;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;
- Assessment of the project alternatives and identification of a preferred alternative with motivation for this selection;
- Specialist Declaration of Independence and Curriculum Vitae;
- Provide recommendations and suggestions regarding fossil heritage management on site, including conservation measures, as well as promotion of local fossil heritage (e.g. for public education, schools, etc.) to ensure that the impacts are limited;
- Provide recommendations with regards to potential monitoring programmes; and
- Determine mitigation and/or management measures, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts. This will be included in the EMPr, which will be appended to the EIA Report.

The Specialist is also required to:

- Incorporate and address all relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making; and
- Review the Generic EMPr for Substations (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPr (Part B – Section 1). If so, a list of the required specific impact management outcomes and actions must be provided.

7.8.8 Socio-Economic Impact Assessment

The Socio-Economic Specialist is required to undertake a Specialist Assessment in adherence to Appendix 6 of the 2014 NEMA EIA Regulations, as amended, as well as to any other additional relevant legislation and guidelines that may be deemed necessary, if applicable.

As at September 2022, the National Web-Based Screening Tool does not include any sensitivity layers relating to socio-economic information; therefore, a Site Sensitivity Verification is technically not possible.

Scoping level inputs provided by the Socio-Economic Specialist is included as Appendix F.10 to this Scoping Report.

The Socio-Economic Impact Assessment must include the following:

- Describe the socio-economic context of the study area, focusing on aspects that are potentially affected by the proposed project, and taking into consideration the current situation as well as the local trends, the local planning (Integrated Development Plans and Spatial Development Frameworks), and other developments in the area;
- Identify the potential social and economic impacts (including benefits) associated with the proposed project, including inter alia impacts associated with loss of farmland (grazing), contribution to economic growth and job creation, training and skills development opportunities, quality of life, local community income and influx of workers / job seekers;
- Apply a variety of appropriate options for sourcing information, such as review of analogous studies, available databases and social indicators, use of interviews with key stakeholders such as local landowners and government officials (local and regional), etc., where possible, to inform the assessment;
- Evaluate the implications of the social investment programme associated with REIPPPP projects on the local socio-economic context;
- Identify and assess the potential direct, indirect and cumulative impacts of the proposed development on the receiving environment from a socio-economic perspective:
    - Cumulative impacts to be assessed by considering renewable energy projects and other applicable (and relevant) projects within 50 km of the proposed projects (refer to Table 7.3 above).
    - Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project. The Impact Assessment Methodology to be followed is contained in Section 7.5.1 of this Chapter.
- An impact statement indicating the acceptability of the proposed development and a recommendation if the development should go ahead or not;
- A description of assumptions and limitations in the report;
- Identification of additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof, if any;
- Specialist Declaration of Independence and Curriculum Vitae;
- Provide recommendations with regards to potential monitoring programmes; and
- Determine mitigation and/or management measures, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts. This will be included in the EMPr, which will be appended to the EIA Report.

The Specialist is also required to:

- Incorporate and address all relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making.
- Review the Generic EMPr for Substations (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific

impact management outcomes and actions that are not included in the pre-approved generic EMPr (Part B – Section 1). If so, a list of the required specific impact management outcomes and actions must be provided.

7.8.9 Bat Impact Assessment

The Bat Specialist is required to undertake a Specialist Assessment in adherence to the gazetted Environmental Assessment Protocols, specifically with 'Part A - General Protocol for the Site Sensitivity Verification and Minimum Report Content Requirements where a Specialist Assessment is required but no specific Environmental Theme Protocol has been prescribed' (GG 43110 / GNR 320, 20 March 2020).

The pre-construction bat monitoring took place prior to the appointment of the EAP and included multiple site visits over a period of 12 months and a desktop study of relevant information, in accordance with the "*South African Best Practice Guidelines for Pre-construction Monitoring of Bats at Wind Energy Facilities*".

The Bat Impact Assessment Report must be compiled in adherence to Appendix 6 of the 2014 NEMA EIA Regulations, as amended, as well as any other additional relevant legislation and guidelines that may be deemed necessary, if applicable. Recommendations from the results obtained during the pre-construction bat monitoring programme and must be included in the Bat Impact Assessment Report will form part of the EMPr that will be included in the EIA Report.

The Bat Impact Assessment must include the following tasks:

- Description of the affected environment from a bat perspective, including consideration of the surrounding habitats and bat habitat/foraging features (e.g. caves, ridges, crevices, migration routes, feeding, roosting & nesting areas, etc.);
- Assessment of the preferred project layout following the site sensitivity verification and layout identification;
- Specification of development setbacks or buffers required, and provide clear motivations for these recommendations;
- Identification of any SCC or protected species on site;
- Identification of the potential direct, indirect and cumulative impacts of the proposed development on bats, including impacts that may be seasonal or diurnal, or linked to specific species and their feeding, roosting or nesting habitats and habits;
    - Cumulative impacts to be assessed by considering renewable energy projects and other applicable (and relevant) projects within 50 km of the proposed projects (refer to Table 7.3 above).
    - Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project. The Impact Assessment Methodology to be followed is contained in Section 7.5.1 of this Chapter.
- Assessment of and recommendations for definite measurements for the preferred hub height and rotor diameter of the wind turbines;
- An impact statement indicating the acceptability of the proposed development and a recommendation if the development should go ahead or not;
- A description of assumptions and limitations in the report;

- A section indicating how the National Web-Based Screening Tool was interrogated and whether classification of the site is accurate or not. If not, it must be motivated why the classification is not accurate;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;
- Specialist Declaration of Independence and Curriculum Vitae;
- Provision of recommendations with regards to potential monitoring programmes; and
- Determine mitigation and/or management measures, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts. This will be included in the EMPr, which will be appended to the EIA Report.

The Specialist is also required to:

- Incorporate and address all relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making; and
- Review the Generic EMPr for Substations (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPr (Part B – Section 1). If so, a list of the required specific impact management outcomes and actions must be provided.

7.8.10 Traffic Impact Assessment

The Traffic Specialist is required to undertake a Specialist Assessment in adherence to Appendix 6 of the 2014 NEMA EIA Regulations, as amended, as well as to any other additional relevant legislation and guidelines that may be deemed necessary, if applicable.

As at September 2022, the National Web-Based Screening Tool does not include any sensitivity layers relating to traffic information; therefore, a Site Sensitivity Verification is technically not possible. Scoping level inputs provided by the Traffic Specialist is included as Appendix F.9 to this Scoping Report.

The Traffic Impact Assessment must include the following tasks:

- Description of the identified traffic features including the surrounding road network and potential traffic disturbances of the local area;
- Assessment of the preferred project layout and how it relates to traffic impact;
- Specification of development setbacks or buffers required, and clear motivations for these recommendations;
- Identification and assessment of the potential direct, indirect and cumulative impacts of the proposed development on the receiving environment from a traffic perspective;
    - Cumulative impacts to be assessed by considering renewable energy projects and other applicable (and relevant) projects within 50 km of the proposed projects (refer to Table 7.3 above).

    - Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project. The Impact Assessment Methodology to be followed is contained in Section 7.5.1 of this Chapter.
- Determine the National and Local haulage routes between port of entry/manufacturer and site;
- Determine the Trip generation for the proposed development during construction and operation;
- Assessment of proposed internal roads and site access points;
- Assessment of internal circulation of trucks and proposed roads layout with specific regard to turbine positions and turbine laydown areas;
- Assessment of freight requirements and permitting needed for abnormal loads;
- A description of assumptions and limitations in the report;
- An impact statement indicating the acceptability of the proposed development and a recommendation if the development should go ahead or not;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;
- Specialist Declaration of Independence and Curriculum Vitae;
- Provide recommendations with regards to potential monitoring programmes; and
- Determine mitigation and/or management measures, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts. This will be included in the EMPr, which will be appended to the EIA Report.

The Specialist is also required to:

- Incorporate and address all relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making; and
- Review the Generic EMPr for Substations (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPr (Part B – Section 1). If so, a list of the required specific impact management outcomes and actions must be provided.

7.8.11 Visual Impact Assessment

The Visual Specialist is required to undertake a Specialist Assessment in adherence to the gazetted Environmental Assessment Protocols, specifically with 'Part A - General Protocol for the Site Sensitivity Verification and Minimum Report Content Requirements where a Specialist Assessment is required but no specific Environmental Theme Protocol has been prescribed' (GG 43110 / GNR 320, 20 March 2020).

The Specialist conducted a site visit on 13 July 2022 in order to identify the level of sensitivity assigned to the project area, and to verify and confirm this sensitivity and land use as per the National Web-Based Screening Tool.

The Visual Impact Assessment (VIA) Report must be compiled in adherence to Appendix 6 of the 2014 NEMA EIA Regulations, as amended, as well as to any other additional relevant legislation and guidelines that may be deemed necessary, if applicable.

The Visual Impact Assessment must include the following:

- Description of the visual character and visual absorption capacity of the local area. Any significant visual features or visual disturbances (e.g. flicker effect) must be identified, modelled and mapped, as well as any sensitive visual receptors within the proposed project area or within viewsheds of the proposed project;
- Assessment of the preferred project layout following the site sensitivity verification and layout identification;
- Viewshed for various elements of the proposed development must be calculated, defined and presented, and the varying sensitivities of these viewsheds must be highlighted;
- Specification of development setbacks or buffers required, and provide clear motivations for these recommendations;
- Identification and assessment of the potential direct, indirect and cumulative impacts of the proposed development on the receiving environment from a visual perspective;
    - Cumulative impacts to be assessed by considering renewable energy projects and other applicable (and relevant) projects within 50 km of the proposed projects (refer to Table 7.3 above).
    - Impact significance must be rated both without and with mitigation, and must cover the construction, operational and decommissioning phases of the project. The Impact Assessment Methodology to be followed is contained in Section 7.5.1 of this Chapter.
- Identification and presentation of schematic portrayals of the visual impact of the proposed project infrastructure on the different viewsheds. All impacts should be considered under varying conditions as appropriate to the assessment i.e. day, night, clear weather, cloudy weather, etc.
- Maps depicting viewsheds or line of sight across the sites should be generated and included in the VIA Report. These maps must indicate current viewsheds/visual landscape/obstructions, as well as expected visual impacts during the construction, operational and decommissioning phases of the proposed project.
- An impact statement indicating the acceptability of the proposed development and a recommendation if the development should go ahead or not;
- A description of assumptions and limitations in the report;
- A section indicating how the National Web-Based Screening Tool was interrogated and whether classification of the site is accurate or not. If not, it must be motivated why the classification is not accurate;
- Identification of any additional protocols, licensing and/or permitting requirements that are relevant to the project and the implications thereof;
- Specialist Declaration of Independence and Curriculum Vitae;
- Provide recommendations with regards to potential monitoring programmes; and
- Determine mitigation and/or management measures, which could be implemented to as far as possible, reduce the effect of negative impacts and enhance the effect of positive impacts. Also, identify best practice management actions, monitoring requirements, and rehabilitation guidelines for all identified impacts. This will be included in the EMPr, which will be appended to the EIA Report.

The Specialist is also required to:

- Incorporate and address all relevant comments and concerns raised by the stakeholders, commenting authorities and I&APs prior to submitting the Final EIA Report to the Competent Authority for decision-making; and
- Review the Generic EMPr for Substations (GN R435) and confirm if there are any specific environmental sensitivities or attributes present on the project site and any resultant site-specific impact management outcomes and actions that are not included in the pre-approved generic EMPr (Part B – Section 1). If so, a list of the required specific impact management outcomes and actions must be provided.

7.8.12 Defence

Defence Assessments are required to comply with the gazetted Environmental Assessment Protocols, specifically the 'Protocol for the Specialist Assessment and Minimum Report Content Requirements of Environmental Impacts on Defence Installations" (GG 43110 / GN R320, 20 March 2020). As indicated in Chapter 3 and Chapter 4 of this Scoping Report, the entire area of interest for the proposed Kaladokhwe WEF 3 project site is classified as 'low' sensitivity on the National Web-Based Screening Tool. The low sensitivity was verified by the EAP during a site visit undertaken on 19 to 21 September 2022. Therefore, in line with GN R320, only a site sensitivity verification is necessary to confirm the site as a low sensitivity. A site sensitivity verification is provided in Appendix F.12 of this Scoping Report.

7.8.13 Civil Aviation

Civil Aviation Assessments are required to comply with the gazetted Environmental Assessment Protocols, specifically the 'Protocol for the Specialist Assessment and Minimum Report Content Requirements of Environmental Impacts on Civil Aviation Installations" (GG 43110 / GN R320, 20 March 2020). As indicated in Chapter 3 and Chapter 4 of this Scoping Report, the findings from the National Web-Based Screening Tool have indicated that the proposed Kaladokhwe WEF 3 project site is mainly of 'low' sensitivity with respect to Civil Aviation with only a very small portion in the southern parts of the project site that has a 'medium' sensitivity. This sensitivity is ascribed to the southernmost part of the project site being located "between 8 and 15 km of other civil aviation aerodrome". The low sensitivity was verified by the EAP during a site visit undertaken on 19 to 21 September 2022. However, the medium sensitivity is disputed as the EAP has verified that the civil aviation aerodrome located outside Nxuba (previously Cradock) is an unlicenced aerodrome that is no longer in operation and as a result, the sensitivity of the entire Kaladokhwe WEF 3 project site is considered low sensitivity in terms of Civil Aviation. Therefore, in line with GN R320, a site sensitivity verification confirming the overall low sensitivity is necessary. A site sensitivity verification is provided in Appendix F.11 of this Scoping Report.