

Final Environmental Impact Assessment Report

Scoping and Environmental Impact
Assessment for the Proposed
Development of the 279 MW Wind
Energy Facility and associated
Infrastructure (i.e. Kwagga WEF 1),
near Beaufort West, Western Cape

DECEMBER 2021

Executive Summary

Prepared for:
Kwagga Wind Energy
Facility 1 (Pty) Ltd

Prepared by:
CSIR Environmental
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SCOPING AND ENVIRONMENTAL IMPACT ASSESSMENT

for the

Proposed Development of the 279 MW Kwagga Wind Energy Facility 1 and associated infrastructure near Beaufort West in the Western Cape

FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT

December 2021

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REPORT DETAILS

Title:	Scoping and Environmental Impact Assessment (EIA) for the proposed development of the 279 MW Kwagga Wind Energy Facility 1 with associated infrastructure near Beaufort West in the Western Cape: FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT
Purpose of this report:	<p>The purpose of this Final Environmental Impact Assessment Report is to:</p> <ul style="list-style-type: none"> • Present the details of and need for the proposed project; • Describe the affected environment, including the planning context, at a sufficient level of detail to facilitate informed decision-making; • Provide an overview of the EIA Process being followed, including public consultation; • Assess the predicted positive and negative impacts of the project on the environment; • Provide recommendations to avoid or mitigate negative impacts and to enhance the positive benefits of the project; and • Provide an Environmental Management Programme (EMPr) for the design, construction and operational phases of the project. <p>The Draft Environmental Impact Assessment (EIA) Report was made available to all Interested and Affected Parties (I&APs), Organs of State and stakeholders for a 30-day review period extending from 22 October to 22 November 2021 (excluding public holidays). All comments submitted during the 30-day review have been incorporated in a detailed Comments and Responses Report, and addressed, as applicable and where relevant, and included in this Final EIA Report. This Final EIA Report has been submitted to the National Department of Forestry, Fisheries and the Environment (DFFE) for decision-making.</p>
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KEY CHANGES MADE FROM THE DRAFT EIA REPORT THAT WAS ISSUED FOR I&AP, STAKEHOLDER AND ORGAN OF STATE REVIEW FROM 22 OCTOBER TO 22 NOVEMBER 2021

Section of Report	Key Change
EIA Report and Appendices	<ul style="list-style-type: none"> The term "Draft EIA Report" has been updated to "Final EIA Report", where applicable. The report date has been updated from "October 2021" to "December 2021".
EIA Report – Executive Summary	<ul style="list-style-type: none"> Updated Figure A - the locality map legend was corrected to reflect "Kwagga WEF 1 site" instead of "Kwagga WEF 1 development footprint".
EIA Report – Chapter 1	<ul style="list-style-type: none"> Updated Figure 1-2 – the locality map legend was corrected to reflect "Kwagga WEF 1 site" instead of "Kwagga WEF 1 development footprint". Updated Section 1.9 with details of the Public Participation Process undertaken thus far.
EIA Report – Chapter 2	<ul style="list-style-type: none"> Updated Section 2.1.2.3 with additional information about the use of a conservancy tank system during the operational phase of the proposed WEF project based on comments received from the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP).
EIA Report – Chapter 4	<ul style="list-style-type: none"> Updated Sections 4.2, 4.3, 4.5, 4.6 and 4.7 with additional information based on comments received mainly from the DFFE and Western Cape DEA&DP. Updated with additional information regarding the status and progress made on the EIA Reports, the submission of the amended Application for Environmental Authorisation to the DFFE, as well as DFFE's acknowledgment of receipt of the Scoping Reports, and DFFE's acceptance of the Final Scoping Reports and Plan of Study for EIA. Updated with details of the Public Participation Process undertaken thus far. Updated Table 4-1 based on comments received from DFFE during the review of the Draft EIA Reports regarding the inclusion of listed activities in terms of the 2014 NEMA EIA Regulations (as amended). A summary of responses to these comments raised are provided in the Comments and Response Report.
EIA Report – Chapter 5	<ul style="list-style-type: none"> Updated Section 5.3 – Renewable Energy Alternatives with expanded motivation for selecting wind energy as the preferred renewable energy alternative for the sites. Updated Section 5.3 – Project Infrastructure Location Alternatives with additional information in tabled format providing an assessment of the construction compound and laydown area layout alternatives considered and indicating the positive and negative impacts and risks associated with the construction compound and laydown area layout alternatives, and reasons as to why the Project Applicant has deemed the selected alternative as preferred. Updated Section 5.3 – Project Infrastructure Location Alternatives with additional information in tabled format providing an assessment of the on-site substation hub layout alternatives considered and indicating the positive and negative impacts and risks associated with the on-site substation hub layout alternatives, and reasons as to why the Project Applicant has deemed the selected alternative as preferred.
EIA Report – Chapter 20	<ul style="list-style-type: none"> Updated Figure 20-4 with an amended environmental features map to show the assigned buffers (including distances) as per the requirements of the Western Cape DEA&DP included in the comments received following the review of the Draft EIA Report. Updated Section 20.2 – Renewable Energy Alternatives with expanded motivation for selecting wind energy as the preferred renewable energy alternative for the sites. Updated Section 20.2– Project Infrastructure Location Alternatives with additional information in tabled format providing an assessment of the construction compound and laydown area layout alternatives considered and indicating the positive and negative impacts and risks associated with the construction compound and laydown area layout alternatives, and reasons as to why the Project Applicant has deemed the selected alternative as preferred.

	<ul style="list-style-type: none"> Updated Section 20.2– Project Infrastructure Location Alternatives with additional information in tabled format providing an assessment of the on-site substation hub layout alternatives considered and indicating the positive and negative impacts and risks associated with the on-site substation hub layout alternatives, and reasons as to why the Project Applicant has deemed the selected alternative as preferred.
Comments and Responses Report	<ul style="list-style-type: none"> The comments and/or issues raised by stakeholders and Interested and Affected Parties (I&APs) following the release of the Draft EIA Report for the 30-day public comment period, extending from 22 October 2021 to 22 November 2021 (excluding public holidays), together with the responses from the Environmental Impact Assessment (EIA) project team were collated into a Comments and Responses Report (CRR) that was compiled in terms of Annexure 1 of the DFFE comments letter (DFFE Reference No: 14/12/16/3/3/2/2070), and which was submitted separately from the main Final EIA Report as per the requirements from the DFFE. Note that comments received from I&APs following the closure date of the public comment period (i.e. up to and including 30 November 2021) have been considered and included in the CRR.
Appendix C	<ul style="list-style-type: none"> Updated the database of I&APs, Stakeholders and Organs of State to reflect stages of consultation, commenting, as well as additions to the database.
Appendix D	<ul style="list-style-type: none"> Updated with proof of placement of the newspaper advertisement for the release of the Draft EIA Reports for comment (Appendix D.5). Updated Appendix D.9 (Copies and Proof of Correspondence Sent to Stakeholders for the Release of the Draft EIA Report for Comment); and Appendix D.10 (Comments received from Stakeholders during the 30-day review of the Draft EIA Report). Added/updated Appendix D.8 (Proof of submission of the integrated Heritage Impact Assessment (HIA) to Heritage Western Cape (HWC) and Local Authorities for a 30-day consultation period. Added Appendix D.11 (Correspondence received from HWC and Local Authorities on the HIA following a 30-day consultation period).
Appendix F	<ul style="list-style-type: none"> Added Appendix F.4 (DFFE Acknowledgement of Receipt of the Application for Environmental Authorisation and EIA Report for Comment).
EMPRs	<ul style="list-style-type: none"> Updated the Environmental Management Programme (EMPr) for the WEF based on comments received from I&APs and Organs of State, following the 30-day public comment period on the Draft EIA Report, with additional mitigation measures and management actions as recommended by these authorities and stakeholders. Updated the Environmental Management Programme (EMPr) for the on-site Substation Hub based on comments received from I&APs and Organs of State, following the 30-day public comment period on the Draft EIA Report, with additional mitigation measures and management actions as recommended by these authorities and stakeholders. Updated Appendix D by adding the Avifauna Post-Construction Monitoring Protocol. Updated Appendix F.4 with an amended environmental features map to show the assigned buffers (including distances) as per the requirements of the Western Cape DEA&DP included in the comments received following the review of the Draft EIA Report.

Note from the CSIR: If sections are not mentioned in the above table, this means that either there have been no changes or no major changes to these sections were affected.

PROJECT OVERVIEW

The Project Developer, ABO Wind renewable energies (Pty) Ltd is proposing the construction of three Wind Energy Facilities (WEFs) and its associated infrastructure, on behalf of three separate Project Applicants, in the Central Karoo District Municipality situated to the south of Beaufort West in the Western Cape Province. The project details are provided in Table A below. **It must be noted that this report only covers the proposed 279 MW Kwagga Wind Energy Facility 1 ('Kwagga WEF 1'), as detailed below. Separate reports are provided for the remaining WEF projects.**

Table A. Project Names, Applicants and the main Affected Farm Portions

Project Name	Project Applicant	Capacity	Affected Farm Portions
Kwagga WEF 1 (facility)	Kwagga Wind Energy Facility 1 (Pty) Ltd	279 MW	<ul style="list-style-type: none"> Tyger Poort 376 / 3 Dwaalfontein Wes 377 / RE Dwaalfontein Wes 377 / 1 Dwaalfontein 379 / RE
Kwagga WEF 1 (access road)			<ul style="list-style-type: none"> Wolve Kraal 17 / RE Wolve Kraal 17 / 7, 8, 10, 11 and 12
Kwagga WEF 2	Kwagga Wind Energy Facility 2 (Pty) Ltd	341 MW	<ul style="list-style-type: none"> Wolve Kraal 17 / RE Wolve Kraal 17 / 1, 3, 6, 7, 8, 9, 10, 11, and 12 Annex Wolve Kraal 18 / RE Annex Welbedacht 19 / RE
Kwagga WEF 3	Kwagga Wind Energy Facility 3 (Pty) Ltd	204.6 MW	<ul style="list-style-type: none"> Arthurs Kraal 386 / 1, 2, 3 Annex Taaibos 21 / RE Cyferfontein 115 / 4, 5, 6, 8 Muis Kraal 373 / 5, 7

The three proposed Kwagga WEF projects (requiring a Scoping and EIA Process) are referred to as (together with the corresponding assigned DEFFE Reference Numbers):

- Kwagga Wind Energy Facility 1 (Pty) Ltd – DFFE Reference: 14/12/16/3/3/2/2070
- Kwagga Wind Energy Facility 2 (Pty) Ltd – DFFE Reference: 14/12/16/3/3/2/2071
- Kwagga Wind Energy Facility 3 (Pty) Ltd – DFFE Reference: 14/12/16/3/3/2/2072

The proposed Kwagga WEF 1 will be located in the Beaufort West Local Municipality, with the new access road to be constructed linking the proposed Kwagga WEF 1 project site with the R308 Rietbron bound public access road to the south of the site will be located in the Prince Albert Local Municipality, whereas the proposed Kwagga WEF 2 will be entirely located in the Prince Albert Local Municipality, and the Kwagga WEF 3 will be located in both these local municipalities.

The proposed Kwagga WEF 1, Kwagga WEF 2 and Kwagga WEF 3 are not located within any of the Renewable Energy Development Zones (REDZs) gazetted in Government Gazette 41445, GN R114 on 16 February 2018; and Gazette 44191, GN R144 on 26 February 2021. The proposed Kwagga WEFs are also not located within any of the Strategic Transmission Corridors gazetted in Government Gazette 41445, GN R113 on 16 February 2018. Therefore, a full Scoping and EIA Process in terms of Appendix 2 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 BA Process and 57-day decision-making timeframe allowed for in the REDZs and strategic transmission corridors. The Competent Authority for the proposed projects is the National Department of Forestry, Fisheries and the Environment (DFFE).

An integrated Public Participation Process is being undertaken for the proposed projects.

The Draft Scoping Report was released to all Interested and Affected Parties (I&APs), Organs of State and stakeholders for a 30-day review period, extending from 28 May to 28 June 2021 (excluding public holidays). All comments submitted during the 30-day review have been incorporated into a detailed Comments and Responses Report, and addressed, as applicable and where relevant, and were included with the Final Scoping Report. The Final Scoping Report has been submitted to the DFFE, in accordance with Regulation 21 (1) of the 2014 NEMA EIA Regulations (as amended), for decision-making on 12 July 2021. Notification of acceptance of the Final Scoping Report along with permission to proceed with the EIA Phase was provided by the DFFE on 18 August 2021.

The Draft Environmental Impact Assessment (EIA) Report was made available to all Interested and Affected Parties (I&APs), Organs of State and stakeholders for a 30-day review period extending from 22 October to 22 November 2021. All comments submitted during the 30-day review have been incorporated in a detailed Comments and Responses Report, and addressed, as applicable and where relevant, and included in the Final EIA Report. This Final EIA Report has been submitted to the National Department of Forestry, Fisheries and the Environment (DFFE) for decision-making.

PROJECT LOCATION

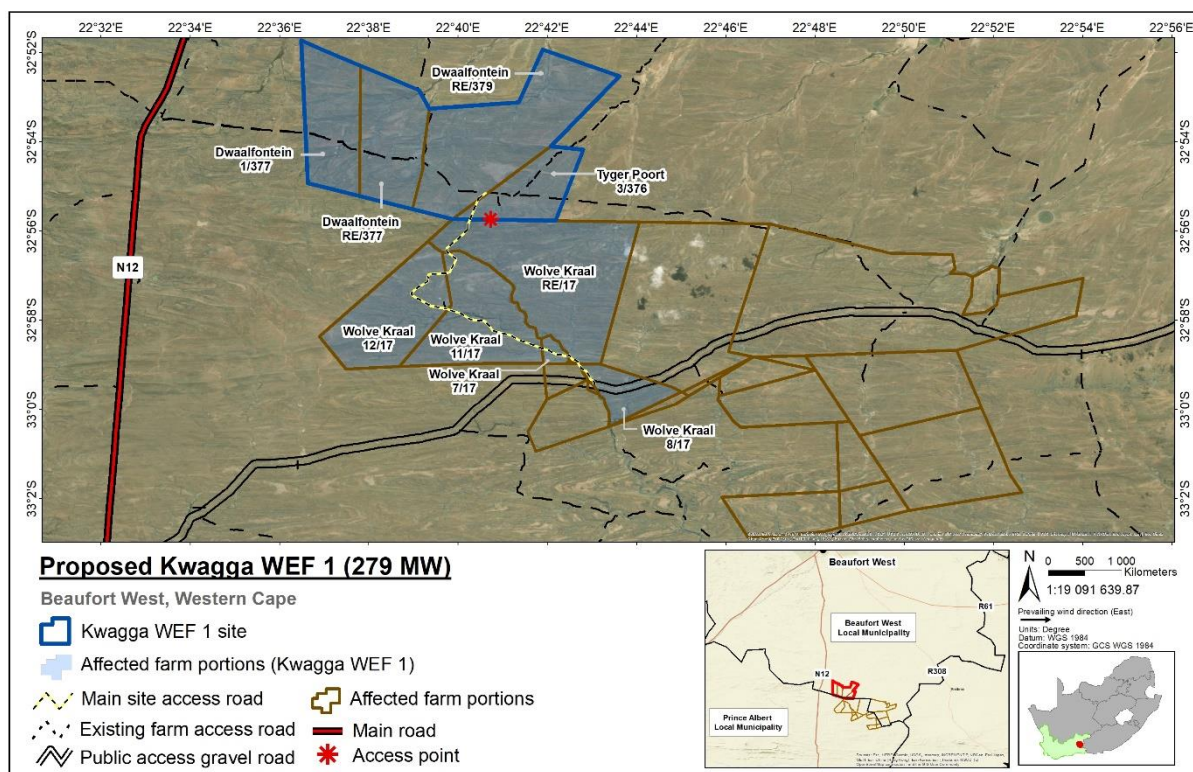


Figure A. Locality Map of the Proposed Kwagga WEF 1 Project near Beaufort West in the Western Cape.

The locality of the proposed Kwagga WEF 1 project is shown in Figure A. The co-ordinates of the proposed project site are detailed in Chapter 2 of this Final EIA Report.

PROJECT ENVIRONMENTAL IMPACT ASSESSMENT TEAM

In accordance with Regulation 12 (1) of the 2014 NEMA EIA Regulations (as amended), the Project Developer has appointed the Council for Scientific and Industrial Research (CSIR) to undertake the required Scoping and EIA Processes in order to determine the 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 Kwagga WEF 1 Scoping and EIA Process

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN
<i>Environmental Management Services (CSIR)</i>		
Paul Lochner (<i>Registered EAP (2019/745)</i>)	CSIR	Technical Advisor and Quality Assurance
Rohaida Abed (<i>Pr.Sci.Nat.</i>)	CSIR	Project Review
Lizande Kellerman (<i>Pr.Sci.Nat.</i>)	CSIR	Project Lead
Dhiveshni Moodley (<i>Cand.Sci.Nat.</i>)	CSIR	Project Manager
<i>Specialists</i>		
Johann Lanz (<i>Pr.Sci.Nat.</i>)	Private	Agriculture and Soils Compliance Statement
Dr Jayson Orton	ASHA Consulting (Pty) Ltd	Heritage Impact Assessment (Archaeology, Palaeontology and Cultural Landscape)
Dr John Almond	Natura Viva cc	
Chris van Rooyen, Albert Froneman (<i>Pr.Sci.Nat.</i>)	Chris van Rooyen Consulting	Avifauna Impact Assessment
Ashlin Bodasing, Michael Brits	ARCUS Consultancy Services Ltd	Bat Impact Assessment
Toni Belcher (<i>Pr.Sci.Nat.</i>)	Private	Aquatic Biodiversity Impact Assessment
Dr Noel van Rooyen (<i>Pr.Sci.Nat.</i>)	Ekotrust cc	Terrestrial Biodiversity and Species Impact Assessment
Dr Brett Williams	Safetrain cc T/A Safetech	Noise Impact Assessment
Menno Klapwijk	Bapela Cave Klapwijk cc	Visual Impact Assessment
Iris Wink, Adrian Johnson	JG Afrika (Pty) Ltd	Traffic Impact Assessment
Sue Reuther	SRK Consulting (Pty) Ltd	Socio-Economic Impact Assessment
Lizande Kellerman (<i>Pr.Sci.Nat.</i>)	CSIR	Civil Aviation Compliance Statement
Lizande Kellerman (<i>Pr.Sci.Nat.</i>)	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 Kwagga WEF 1 project is provided in Table C below.

Table C. Summary of the proposed Kwagga WEF 1 project components and associated infrastructure

Infrastructure	Description
Number of turbines:	45
Turbine Capacity:	Up to 10 MW
Hub Height:	Up to 180 m
Rotor (Blade) Diameter:	Up to 200 m
Blade length:	Up to 100 m
WEF Project Size / Generation Capacity:	Approximately 279 MW

On-site substation hub:	The proposed project will include one on-site substation hub incorporating the facility substation, switchyard, collector infrastructure, BESS and associated O&M buildings. Four possible locations or placement alternatives for the on-site substation hub have been identified and were assessed during the EIA Phase.
Area of on-site substation hub alternatives:	
Alternative 1	8.56 ha
Alternative 2	4.65 ha
Alternative 3	7.59 ha
Alternative 4	5.21 ha (<i>preferred</i>)
Height of substation hub:	Maximum 10 m
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) Three possible locations or placement alternatives for the construction compound and laydown area have been identified and were assessed during the EIA Phase. Construction Compound and Laydown Area No. 3 has been selected as the preferred alternative.
Internal service roads:	There are a number of existing gravel farm roads (some just jeep tracks) with widths ranging between 4 m and 6 m located around and within the proposed Kwagga WEF 1 project site boundary. The width of the existing internal service roads will be extended to a maximum width of 10 m, where necessary. The length of the internal service road network for the proposed Kwagga WEF 1 is approximately 45 km. The existing internal service road network in addition to all additional internal service roads that are to be constructed on the project site have been confirmed by the Project Developer following the outcome of the Scoping Phase, and were subjected to detailed specialist assessment during the EIA Phase.
Concrete batching plant:	50 m x 50 m (on-site batching) (0.25 ha)
Operational and Maintenance (O&M) Building:	1 ha
General temporary Hardstand Area (boom erection, storage, and assembly area):	1 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 up to 500 MW/500 MWh. The BESS technologies that were considered include: <ul style="list-style-type: none"> - Lead Acid and Advanced Lead Acid - Lithium ion, NiCd, NiMH-based Batteries (<i>preferred</i>) - High Temperature (NaS, Na-NiCl₂, Mg/PB-Sb) - Flow Batteries (VRFB, Zn-Fe, Zn-Br)

<p>Site Access:</p>	<p>The proposed Kwagga WEF 1 project site can be accessed via the N12 main road, which is situated to the west of the site, via the R308 Rietbron bound public access gravel road that is located to the south of the site. The N12 is a surfaced national road that connects Beaufort West and the N1 main road in the north with Klaarstroom, De Rust, Oudtshoorn and other Garden Route towns to the south. The R308 Rietbron bound public access road is a well-maintained gravel road with widths ranging between 6 m and 8 m and will be widened to a maximum width of 10 m, where necessary.</p> <p>A new access road, which will serve as the main access point to the Kwagga WEF 1 with a maximum width of 10 m will be constructed to facilitate the connection between the Kwagga WEF 1 project site, across the Kwagga WEF 2 site, and the existing R308 Rietbron bound public access gravel road located to the south. The affected farm portions that were assessed for purposes of this access road are:</p> <ul style="list-style-type: none"> • Wolve Kraal 17 / RE, 7, 8, 10, 11 and 12
<p>Proximity to grid connection:</p>	<p>Eskom's Droërvier Substation is ideally located within the Central Strategic Transmission Corridors (as gazetted on 16 February 2018, GN R113) and approximately 55 km north of the proposed Kwagga WEF 1. It is proposed that a 132kV overhead transmission line, which will be constructed for the proposed Kwagga WEF 1 at a later stage, will extend between the proposed on-site collector substation at the Kwagga WEF 1 and the existing Droërvier-Proteus 400 kV line that runs parallel to the N12 in a north-south direction and connects Beaufort West with the George/Mossel Bay area further south.</p> <p><i>Note from the CSIR:</i> A separate Environmental Assessment Process will be undertaken at a later stage once the grid connection and the 132 kV power line routing for the proposed Kwagga WEF 1 has been confirmed, and hence does not form part of this S&EIA Process.</p>
<p>Fencing:</p>	<p>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 area and on-site substation hub. 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.</p>

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 Final EIA 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 DFFE; and the project proponent, Kwagga Wind Energy Facility 1 (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.

APPROACH TO THE EIA PROCESS

The original Applications for EA for the three Scoping and EIA projects were submitted to the DFFE via the Novell S-Filer system, as recommended by the DFFE since June 2020, on 28 May 2021, together with the Scoping Reports for comment. The Scoping Reports were made available to Interested and Affected Parties (I&APs) and stakeholders for a 30-day comment period extending from 28 May 2021 to 28 June 2021 (excluding public holidays). Appendix F of this EIA Report includes the proof of submission (i.e. emails) of the original Applications for EA and the Scoping Reports to the DFFE. The DFFE acknowledged receipt of the Scoping Reports and original Applications for EA on 2 June 2021 via email (as included in Appendix F of this EIA Report). DFFE EIA Reference Numbers were assigned to each Scoping and EIA project, as noted above.

The comments received from I&APs and stakeholders during the 30-day review of the Scoping Reports were incorporated into the Comments and Responses Report (where required), and the finalised Scoping Reports were submitted to the DFFE on 12 July 2021, in accordance with Regulation 21 (1) of the 2014 NEMA EIA Regulations, for decision-making in terms of Regulation 22 of the 2014 NEMA EIA Regulations. The DFFE accepted the finalised Scoping Report and Plan of Study for EIA on 18 August 2021, which enabled the commencement of the impact assessment phase.

It is important to note that based on the design progression, certain listed activities as included in the original Application for EA are no longer triggered, and some additional listed activities have become applicable (thus triggered) since the submission of the original Application for EA. An amended Application for EA has therefore been submitted to the DFFE for decision-making together with the

finalised Scoping Reports also on 12 July 2021, and the DFFE also accepted the amended Application for EA along with the Final Scoping Report and Plan of Study for EIA on 18 August 2021.

The Draft EIA Reports have been released to I&APs and stakeholders for a 30-day comment period, extending from 22 October 2021 to 22 November 2021. The Draft EIA Reports have been 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 were also uploaded to other alternative web-platforms such as Google Drive. Written notification of the commencement of the EIA Phase, the availability of the Draft EIA Reports for comment and the outcome of decision-making on the Final Scoping Reports have been sent to all I&APs and Organs of State included on the project database via email, where email addresses are available. This notification was sent at the commencement of the 30-day comment period on the Draft EIA Reports and included information on the proposed projects and notification of the release and availability of the reports. Copies of all written comments received during the review of the Draft EIA Reports have been compiled into a Comments and Responses Report for inclusion as an annexure to the Final EIA Reports that have been submitted to the DFFE for decision-making.

The results of the specialist assessments and other relevant project information are summarised and integrated into this EIA Report. Part C of this EIA Report includes an Environmental Management Programme (EMPr). The EMPr is based on the recommendations made by specialists for design, construction, operation and decommissioning of the proposed WEF project.

IMPACT ASSESSMENT AND MANAGEMENT ACTIONS

This section provides a summary of the key impacts identified and assessed by the specialists in the EIA Report (Chapters 6 to 16 of the EIA Report). The significant impacts and corresponding impact significance ratings with the implementation of respective mitigation and enhancement measures as well as the key associated mitigation and management measures are summarised in this section.

Table D. Summary of Issues and Impacts that were addressed during the EIA Phase as part of the Specialist Impact Assessments

Specialist Assessment	Key Impacts	Main Mitigation Measures	Overall Impact Significance After Mitigation or Enhancement
Agriculture and Soils Compliance Statement	<u>Construction and Operational Phases:</u> <ul style="list-style-type: none"> Loss of agricultural land use; and Soil degradation including erosion, topsoil loss and contamination. 	<u>Design and Decommissioning Phases:</u> <ul style="list-style-type: none"> Design and implement an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion. Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion. 	Negative: Low
	<u>Construction and Operational Phases:</u> <ul style="list-style-type: none"> Increased financial security for farming operations¹. 	<u>Construction and Operational Phases:</u> <ul style="list-style-type: none"> Implement and maintain an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion. Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion. If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface. 	Positive: Low
Aquatic Biodiversity Impact Assessment	<u>Construction Phase:</u> <ul style="list-style-type: none"> 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; 	<u>Design Phase:</u> <ul style="list-style-type: none"> Ensure final WEF layout avoids watercourses and recommended buffers as far as possible; utilisation should be made of existing disturbed areas where possible. A comprehensive stormwater management plan should be compiled for the compacted surfaces within the site by the project engineer with input from the freshwater specialist. The plan should aim to reduce the intensity of runoff particularly on the steeper slopes and reduce the intensity of the discharge into the adjacent drainage lines. 	Negative: Very Low

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

Specialist Assessment	Key Impacts	Main Mitigation Measures	Overall Impact Significance After Mitigation or Enhancement
	<ul style="list-style-type: none"> 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. <p>Operational Phase:</p> <ul style="list-style-type: none"> 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. <p>Decommissioning Phase:</p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Water consumption requirements for the site for the construction and operation of the site if not obtained from an authorised water user within the area, must be authorised by the DWS. <p>Construction Phase:</p> <ul style="list-style-type: none"> For all project-related components within the site, the aquatic features of high sensitivity should be treated as no-go areas during the construction phase. Any activities that require construction within the delineated aquatic features and the recommended buffers should be described in method statements that are approved by the ECO. Rehabilitation of any the disturbed areas within the aquatic features and the recommended buffer areas should be undertaken immediately following completion of the disturbance activity according to rehabilitation measures as included in a method statement for that specific activity as described above; Proper waste management should be undertaken within the site with facilities provided for the on-site disposal of waste and the removal of stored waste to the nearest registered solid waste disposal facility. <p>Operational Phase:</p> <ul style="list-style-type: none"> Control and monitoring of invasive alien plants within the site should be undertaken according to an approved Alien and Invasive Plant Management Plan. Ongoing monitoring of the structures, in particular before the rainfall period, should be undertaken to ensure that the integrity of the structures is intact and that they are not blocked with sediment or debris. <p>Decommissioning Phase:</p> <ul style="list-style-type: none"> Any activities that require decommissioning within the delineated aquatic features and the recommended buffers should be demarcated and described in method statements that are approved by the ECO. Rehabilitation of any disturbed areas within the aquatic features and the recommended buffer areas should be undertaken immediately following completion of the disturbance activity according to rehabilitation measures as included in a method statement for that specific activity. Control of invasive alien plants within the site should be undertaken according to the approved plan. 	
Terrestrial Biodiversity and Species Impact Assessment	<p>Construction Phase:</p> <ul style="list-style-type: none"> The clearing of natural vegetation and resultant loss of faunal habitat; The loss of endangered, threatened, protected and endemic plants/animals; 	<p>Design Phase:</p> <ul style="list-style-type: none"> No development of WEF infrastructure, including the on-site substation hub, must take place within identified no-go areas. All no-go areas should be demarcated at construction by a suitably qualified person able to identify the SCC present at the site. 	Negative: Low to Very Low

Specialist Assessment	Key Impacts	Main Mitigation Measures	Overall Impact Significance After Mitigation or Enhancement
	<ul style="list-style-type: none"> Direct faunal mortalities due to construction activities and increased vehicle traffic; Increased human activity, noise and light levels; and 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. <p>Operational Phase:</p> <ul style="list-style-type: none"> Direct faunal mortalities; and Increased human activity, light and noise levels. Establishment of alien vegetation will continue; and Increased erosion and water run-off and <p>Decommissioning Phase:</p> <ul style="list-style-type: none"> Increased dust deposition; and Direct faunal mortalities Establishment of alien invasive vegetation; and Increased erosion and stormwater run-off. 	<ul style="list-style-type: none"> To avoid or minimise impacts on terrestrial biodiversity and species on site regarding the placement of the infrastructure. Avoiding ridges, cliffs and rocky sheets will reduce the chances of loss of protected species. Ecologist to review the final layout plan in relation to existing drainage patterns and comment accordingly on storm water management across the site. Ensure the necessary permits or licences are identified and applied for as applicable. Await response and provision of permit. Undertake plant rescue if and where required. Ensure compliance with relevant Environmental Specifications for the control and removal of alien invasive plant species. Appoint a specialist or contact relevant authorities to seek guidance on the removal of the alien vegetation on site. Compile and finalise invasive alien plant management programme. Where vegetation is cleared, measures to counteract aeolian (wind-blown) transport in the short and long term should be implemented, where necessary. Use of drift fence and related measures, where required. Appoint an Ecologist to advise on clearance and planting, where required. <p>Construction Phase:</p> <ul style="list-style-type: none"> Demarcate all infrastructure sites clearly to avoid unnecessary clearance of the vegetation. Permits have to be obtained for the removal of WCNECO protected species within the footprint of the development. Construction crew, in particular the drivers, should undergo environmental training (induction) to increase their awareness of environmental concerns. Holes and trenches should not be left open for long periods of time. These should be regularly inspected for the presence of trapped animals. Proper waste management procedures should be in place to avoid waste lying around and to remove all waste material from the site. Speed limits should be strictly adhered to (40km/h for cars and 30km/h for trucks). The proposed WEF is situated outside the known distribution range of the critically endangered riverine habitat (<i>Bunolagus monticularis</i>), although the species has been previously recorded in the wider region. But since the field assessment revealed that suitable habitat does not seem to be present on site, it is highly unlikely that the species could be impacted on by the proposed development. Furthermore, camera trap monitoring undertaken on the adjacent Beaufort West WEF and Trakas WEF project sites (located on neighbouring farm properties to the west of the proposed Kwagga WEF cluster) did not reveal the presence of the riverine rabbit. The buffer zones applicable to bat- and aquatic sensitivity along all major and minor watercourses on site are considered sufficient not to intrude into possible habitat of the riverine rabbit should it possibly be present on site. <p>Operational Phase:</p> <ul style="list-style-type: none"> Proper waste management procedures should be in place. 	

Specialist Assessment	Key Impacts	Main Mitigation Measures	Overall Impact Significance After Mitigation or Enhancement
		<ul style="list-style-type: none"> Appropriate lighting should be installed to minimise negative effects on nocturnal animals. Fences are to be erected around the substations and laydown areas. Implement a monitoring program for the early detection of alien invasive plant species and employ a control program to combat declared alien invasive plant species. the farm boundaries is considered adequate. <p>Decommissioning Phase:</p> <ul style="list-style-type: none"> Unnecessary clearance of natural vegetation should be avoided. Proper waste management procedures should be in place. Implement a monitoring program for the early detection of alien invasive plant species and employ a control program to combat declared alien invasive plant species. 	
Avifauna Impact Assessment	<p>Construction Phase:</p> <ul style="list-style-type: none"> 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. <p>Operational Phase:</p> <ul style="list-style-type: none"> Avifauna mortality and injury through collisions with the wind turbines; and Electrocution of priority species on the internal electrical grid network. <p>Decommissioning Phase:</p> <ul style="list-style-type: none"> 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. 	<p>Design Phase:</p> <ul style="list-style-type: none"> The results of the pre-construction monitoring must guide the lay-out of the turbines, especially as far as proposed no-turbine zones are concerned. No turbines must be constructed in the buffer zones which were identified based on the results of the pre-construction monitoring, with a specific view to limiting the risk of collisions to a variety of birds, including several Red Data species. Use underground cabling as much as is practically possible. Where the use of overhead lines is unavoidable due to technical reasons, the Avifaunal Specialist must be consulted to ensure that a raptor friendly pole design is used, and that appropriate mitigation is implemented pro-actively for complicated pole structures e.g. insulation of live components to prevent electrocutions on terminal structures and pole transformers. <p>Construction Phase:</p> <ul style="list-style-type: none"> A site-specific CEMPr must be implemented, which gives appropriate and detailed description of how construction activities must be conducted. All contractors are to adhere to the CEMPr and should apply good environmental practice during construction. The CEMPr must specifically include the following: <ul style="list-style-type: none"> No off-road driving. Maximum use of existing roads. Measures to control noise and dust according to latest best practice. Restricted access to the rest of the property. Strict application of all recommendations in the botanical specialist report pertaining to the limitation and rehabilitation of the footprint. <p>Operational Phase:</p> <ul style="list-style-type: none"> Develop a Habitat Restoration Plan (HRP) and ensure that it is approved. Monitor rehabilitation via site audits and site inspections to ensure compliance. Record and report any non-compliance. 	Negative: Low to Moderate

Specialist Assessment	Key Impacts	Main Mitigation Measures	Overall Impact Significance After Mitigation or Enhancement
		<ul style="list-style-type: none"> Once operational, vehicle and pedestrian access to the site should be controlled and restricted to the facility footprint as much as possible to prevent unnecessary destruction of vegetation. Formal live-bird monitoring should be resumed once the turbines have been constructed, as per the most recent edition of the Best Practice Guidelines (Jenkins <i>et al.</i> 2015). The purpose of this would be to establish if displacement of priority species has occurred and to what extent. The exact time when operational monitoring should commence, will depend on the construction schedule, and should commence when the first turbines start operating. The Best Practice Guidelines require that, as an absolute minimum, operational monitoring should be undertaken for the first two (preferably three) years of operation, and then repeated again in year 5, and again every five years thereafter for the operational lifetime of the facility. Formal live-bird monitoring and carcass searches should be implemented in the operational phase, as per the most recent edition of the Best Practice Guidelines at the time (Jenkins <i>et al.</i> 2015) to assess collision rates. If estimated annual collision rates indicate unacceptable mortality levels of priority species, i.e., if it exceeds the pre-determined threshold determined by the avifaunal specialist in consultation with BirdLife South Africa, additional measures will have to be implemented which could include shut down on demand or other proven measures. Conduct regular inspections of the overhead sections of the internal reticulation network to look for carcasses. <ul style="list-style-type: none"> Maximum use of existing roads during the decommissioning phase; Measures to control noise and dust according to latest best practice; Habitat can be rehabilitated to its former attractiveness (from a prey point of view) for the raptors); and Strict application of all recommendations in the Terrestrial Biodiversity Impact Assessment Report pertaining to rehabilitation of disturbed areas and erosion control measures. A site-specific CEMPr must be implemented, which gives appropriate and detailed description of how construction activities must be conducted. All contractors are to adhere to the CEMPr and should apply good environmental practice during construction. The CEMPr must specifically include the following: <ul style="list-style-type: none"> No off-road driving. Maximum use of existing roads. Measures to control noise and dust according to latest best practice. Restricted access to the rest of the property. Strict application of all recommendations in the botanical specialist report pertaining to the limitation of the footprint. 	
Bat Impact Assessment	<p>Construction Phase (Direct Impacts):</p> <ul style="list-style-type: none"> Displacement of bats due to habitat loss / habitat transformation; 	Design Phase:	Negative: Low to Very Low

Specialist Assessment	Key Impacts	Main Mitigation Measures	Overall Impact Significance After Mitigation or Enhancement
	<ul style="list-style-type: none"> Roost disturbance; and Roost destruction. <p>Operational Phase:</p> <ul style="list-style-type: none"> 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. <p>Decommissioning Phase:</p> <ul style="list-style-type: none"> Displacement of bats due to disturbance associated with the decommissioning activities. 	<ul style="list-style-type: none"> The final layout of the WEF must be designed and constructed in such a way as to avoid the destruction of potential and actual roosts, particularly large mature trees, buildings, rocky crevices (if blasting is required). Limit the removal of vegetation, particularly large mature trees within 50 m of turbine positions. <p>Construction Phase:</p> <ul style="list-style-type: none"> Avoid construction activities near roosts to limit roost abandonment. Large mature trees within 50 m of the turbine positions should be inspected for roosting bats. It is recommended that potential roosts, specifically buildings and rocky crevices, are buffered by 200 m, inside which no turbine infrastructure may be placed. No turbines should be installed within 50 m of large mature trees. <p>Operational Phase:</p> <ul style="list-style-type: none"> The height of the lower blade swept area must be maximised, and should not be lower than 30 m. If the minimum blade sweep is lower than 30 m, fatality thresholds would need to be evaluated every 3 – 4 months against the South African Bat Assessment Association fatality threshold guidelines (i.e. if they exceed an estimated 101 bat fatalities per year). Maintain a register of action taken regarding bat mortality/injury as well as queries or complaints. Operational monitoring should be done according to the guidelines for the first 2 years and every 5 years thereafter. Blade feathering should be implemented at the start of operation. Apply curtailment during spring, summer and autumn based on the below table if mortality occurs beyond threshold levels as determined based on applicable guidance (MacEwan <i>et al.</i> 2018). The threshold calculations must be done at a minimum of once a quarter (i.e. not only after the first year of operational monitoring) so that mitigation can be applied as quickly as possible should thresholds be reached. <ul style="list-style-type: none"> 1 September – 30 November (Spring): 19h00 – 00h00 (Time Period); Between 13°C and 23°C (Temperature); Below 4.5 m/s (Cut in Wind Speed) 1 December – 29 February (Summer): 20h00 – 01h00 (Time Period); Between 14 °C and 21°C (Temperature); Below 6.5 m/s (Cut in Wind Speed) 1 March – 31 May (Autumn): 20h00 – 01h00 (Time Period); Between 13.5 °C and 22.5°C (Temperature); Below 4.5 m/s (Cut in Wind Speed) Where lights need to be used such as at the collector substation and switching station and elsewhere, these should have low attractiveness for insects such as low-pressure sodium and warm white LED lights (Rydell 1992; Stone 2012). High pressure sodium and white mercury lighting is attractive to insects (Blake et al. 1994; Rydell 1992; Svensson & Rydell 1998) and should not be used as far as possible. 	

Specialist Assessment	Key Impacts	Main Mitigation Measures	Overall Impact Significance After Mitigation or Enhancement
Heritage Impact Assessment (including Archaeology and Cultural Landscape)	<p><u>Construction Phase:</u></p> <ul style="list-style-type: none"> The damage or destruction or disturbance of archaeological artefacts or sites; The damage or destruction or disturbance of graves or burial sites; The damage 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. <p><u>Operational Phase:</u></p> <ul style="list-style-type: none"> Visual intrusion of the WEF into the landscape. <p><u>Decommissioning Phase:</u></p> <ul style="list-style-type: none"> Visual intrusion of the WEF into the landscape. 	<p><u>Design and Construction Phases:</u></p> <ul style="list-style-type: none"> A pre-construction archaeological survey of the authorised layout must be commissioned to determine whether any significant archaeological sites still lie within the final footprint (mitigation recommendations will need to be made afterwards as necessary); If the historical rubbish midden at Waypoint 419 cannot be avoided then it should be excavated and recorded prior to construction; No materials (e.g. rocks or bricks) may be removed from any historical sites; The access road should be rerouted slightly so as to pass between the structures at Waypoint 309 in such a way that the distance between road and structures is maximised; The options for the substation hub and permanent laydown areas that are lowest in elevation are preferred; If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution. 	Negative: Low
Palaeontology Impact Assessment	<p><u>Construction and Operational Phases:</u></p> <ul style="list-style-type: none"> Damage and/or destruction of scientifically valuable fossils preserved at or beneath the ground due to surface clearance or excavations. 	<p><u>Construction and Operational Phases:</u></p> <ul style="list-style-type: none"> The ECO should be made aware of the possibility of important fossil remains (bones, teeth, petrified wood, plant-rich horizons, fossil termitaria etc.) being found or unearthed during the construction phase of the development. Monitoring for fossil material of all major surface clearance and deeper (>1m) excavations by the ECO on an on-going basis during the construction phase is recommended. Significant fossil finds should be safeguarded and reported at the earliest opportunity to Heritage Western Cape for recording and sampling by a professional palaeontologist. The palaeontologist must obtain a Fossil Collection Permit from Heritage Western Cape and all fossil material collected must be properly curated in an approved repository (museum / university collection). 	Negative: Very Low
Noise Impact Assessment	<p><u>Construction and Decommissioning Phases:</u></p> <ul style="list-style-type: none"> Noise pollution due to construction activities i.e. increase in ambient sound levels due to construction activities (e.g. equipment and vehicle noise). <p><u>Operational Phase:</u></p> <ul style="list-style-type: none"> Mechanical and aerodynamic noise from the operation of the wind turbine components. <p><u>Decommissioning Phase:</u></p>	<p><u>Construction Phase:</u></p> <ul style="list-style-type: none"> Conduct noise sensitivity training for all construction staff. No construction piling should occur at night. Piling should only occur during the hottest part of the day to take advantage of unstable atmospheric conditions. Ambient noise monitoring to be conducted. <p><u>Operational Phase:</u></p>	Negative: Low to Very Low

Specialist Assessment	Key Impacts	Main Mitigation Measures	Overall Impact Significance After Mitigation or Enhancement
	<ul style="list-style-type: none"> Mechanical and aerodynamic noise from the operation of the wind turbine components. 	<ul style="list-style-type: none"> Ambient noise monitoring to be conducted at Noise Sensitive Area (NSA) 6, 7 and 8 when operations of the WEF commence to verify the noise emissions meet the night time noise rating limit. Mitigation measures to be implemented if the noise impact exceeds the 35dB(A) night noise rating limit such as running the turbines in low power mode at certain wind speeds at night. 	
Socio-Economic Impact Assessment	<p>Construction Phase:</p> <ul style="list-style-type: none"> Negative impact: Social disruption and change in social dynamics. <p>Decommissioning Phase:</p> <ul style="list-style-type: none"> Negative impact: Loss of employment due to decommissioning of the facility. 	<p>Construction and Operational Phases:</p> <ul style="list-style-type: none"> The Project Developer should make every effort to ensure the majority of construction workers are de facto residents of the Beaufort West, Prince Albert and/or Klaarstroom region, and provide suitable training to construction workers and service providers, where possible and practicable. Where possible, source as many goods and services as possible from the local and regional economy (i.e. use local contractors, accommodation and equipment suppliers as far as possible and purchase perishable goods locally), and develop and implement a fair and transparent procurement policy. Central Karoo residents should be given preference in employment and gender equality: this will require an innovative recruitment process working together with impartial local representatives to identify local people during the recruitment process. Clearly communicate the project duration to staff and communities during the recruitment process. Provide ancillary training to workers on maximising the use of income and training to further future economic prospects, potentially through projects initiated as part of the social upliftment programme. Provide transport to site and other incentives to reduce the number of workers accommodated in EPC accommodation to an absolute minimum. Consult with the local municipalities regarding the capacity of existing services and infrastructure (e.g. provision of water, electricity, waste removal, sanitation and housing) to cope with additional workers brought into the area during the construction period. 	Negative: Low
	<p>Construction Phase:</p> <ul style="list-style-type: none"> Positive impact: Capital investment and the contribution to the national, regional and local economy¹; Positive impact: Generation of employment, income and skills¹ <p>Operational Phase:</p> <ul style="list-style-type: none"> Positive impact: Lower national CO₂ emissions per unit of energy generated¹; Positive impact: Investment and the contribution to the national, regional and local economy¹; Positive impact: Generation of employment, income and skills¹; and Positive impact: Increased community prosperity through contributions and income from the WEF Positive impact: Increased South African power generation reducing the probability of load shedding 		Positive: Low to Moderate
Traffic Impact Assessment	<p>Construction and Decommissioning Phases:</p> <ul style="list-style-type: none"> Increase in vehicle traffic due to construction activities – Potential traffic congestion and delays on the surrounding road network and associated noise and dust pollution. 	<p>Construction and Operational Phases:</p> <ul style="list-style-type: none"> Stagger delivery trips and schedule deliveries outside of the peak traffic periods. Staff trips should also occur outside of the peak hours where possible. Implement dust control on the gravel roads on site. 	Negative: Low to Very Low

Specialist Assessment	Key Impacts	Main Mitigation Measures	Overall Impact Significance After Mitigation or Enhancement
		<ul style="list-style-type: none"> Speed limits and stop and go facilities should be implemented to ensure reduced speeds along the roads on site. Ensure that there is regular maintenance of the gravel external access roads used to access the site by the contractor during the construction period and the operator during the operational phase. Ensure that there is upgrading of the internal farm access road to suitable standards as specified by the civil engineer and regular maintenance of the access road during all phases of the project, especially during the construction and decommissioning phases. The route to the site should be further investigated to ensure that the abnormal loads are not obstructed at any point by geometric, height and/or width limitations along the route. The applicable permits to transport the abnormal loads should be obtained. 	
Visual Impact Assessment	<p>Construction and Operational Phases:</p> <ul style="list-style-type: none"> 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; Visual intrusion by Access Road, Substations and Associated structures and infrastructure on visual and landscape receptors. <p>Decommissioning Phase:</p> <ul style="list-style-type: none"> 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. 	<p>Design, Construction and Operational Phases:</p> <ul style="list-style-type: none"> Locate the on-site substation hub and other buildings, as well as construction camps, batching plants and laydown areas, in unobtrusive (generally low-lying) positions in the landscape away from public roads, where possible. New access roads and disturbance generally should be kept to a minimum, where possible, for the proposed WEF. Site turbines to be positioned not closer than 500 m from any occupied homesteads, hospitality or tourism facility, where possible to reduce the impact of shadow flicker. A detailed landscape and rehabilitation plan should be developed timeously by a suitably qualified landscape architect to ensure that the project blends in physically and aesthetically with the surrounding environment. The cut and fill slopes should not be steeper than 1:2.5 vertical to horizontal as this allows vegetation to establish more easily and reduce erosion of the soil surface. Ensure dust suppression by regular wetting, possibly by means of a water bowser or by means of an environmental friendly soil binding compound. Manage the need for top of turbine red aviation hazard lighting to only when a plane enters the affected airspace rather than be permanently lit i.e. implementation of Audio Visual Warning System (AVWS) technology, if possible. 	Negative: Moderate to Very Low

OVERALL ENVIRONMENTAL IMPACT STATEMENT AND REASONED OPINION FROM THE EAP

The information presented in the EIA Report including its associated appendices contributes to this overall environmental impact statement and reasoned opinion from the EAP as to whether the proposed project should or should not be authorised, including any conditions that should be made in respect of the authorisation (should it be granted).

Based on the findings of the specialist assessments, which all recommend that the proposed WEF project can proceed and should be authorised by the DFFE, the proposed project is considered to have an **overall low to very low negative environmental impact** and an **overall low to moderate positive socio-economic impact** (with the implementation of respective mitigation and enhancement measures).

The proposed project will take place within the development footprint on the approved site as contemplated in the accepted Final Scoping Report, as discussed in Section 20.1 of Chapter 20 of the EIA Report. As indicated, the development footprint will avoid the sensitive features and associated buffers that were identified by the respective specialists.

This EIA has considered the nature, scale and location of the proposed development as well as the wise use of land. When considering the timing of this project, the IRP 2019 proposes to secure 17 800 MW of renewable energy capacity by 2030. As noted in the EIA Report, it is the Project Applicant's intention to bid this project (along with the proposed Kwagga WEF 2 and Kwagga WEF 3) in the future bidding rounds of the REIPPPP.

On a municipal planning level, the proposed project does not go against any of the objectives set within the Beaufort West Local Municipality's Integrated Development Plan (IDP) (2017-2022) and the Prince Albert Local Municipality's IDP (2017-2022). The proposed project will be in line with and will be supportive of the IDPs' objective of creating more job opportunities. The proposed WEF will assist in local job creation during the construction and operation phases of the project (if approved by the DFFE). It should however be noted that employment during the construction phase will be temporary.

Section 24 of the Constitutional Act 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 prevents pollution and ecological degradation; promotes conservation; and secures ecologically sustainable development and use of natural resources while promoting justifiable economic and social development"*. Based on this, this EIA was undertaken to ensure that these principles are met through the inclusion of appropriate management and mitigation measures, and monitoring requirements. These measures will be undertaken to promote conservation by avoiding the sensitive environmental features present on site and through appropriate monitoring and management plans (refer to the EMP in Part C of the EIA Report).

The outcomes of this project therefore succeeds in meeting the environmental management objectives of protecting the ecologically sensitive areas and supporting sustainable development and the use of natural resources, whilst promoting justifiable socio-economic development in the towns nearest to the project site. The findings of this EIA show that all natural resources will be used in a sustainable manner (i.e. this project is a renewable energy project and the majority of the negative site specific and cumulative environmental impacts are considered to be of low significance with mitigation measures implemented), while the benefits from the project will promote justifiable economic and social development.

Taking into consideration the findings of the S&EIA Process and given the national and provincial strategic requirements for infrastructure development, as well as the fact that the proposed Kwagga WEF 1 project will be closely located to the newly gazetted Beaufort West REDZ, it is the opinion of the EAP, that the project benefits outweigh the costs and that the project will make a positive contribution to sustainable infrastructure development in the Central Karoo, Beaufort West and Prince Albert regions. Provided that the specified mitigation measures are applied effectively, it is recommended that the proposed project receive EA in terms of the 2014 NEMA EIA Regulations (as amended) promulgated under the NEMA.

It is understood that the information contained in this EIA Report and appendices is sufficient to make a decision in respect of the activity applied for. It is recommended that the **EA be valid for a period of 10 years.**

Summary of where requirements of Appendix 3 of the 2014 NEMA EIA Regulations (GN R982, as amended in GN R326) are provided in this Environmental Impact Assessment Report

Section of the EIA Regulations	Requirements for an Environmental Impact Assessment Report in terms of Appendix 3 of the 2014 NEMA EIA Regulations (GN R982, as amended in GN R326)	Chapter / Appendix
Appendix 3 - (3) (1) (a)	Details of - i. the EAP who prepared the report; and ii. the expertise of the EAP, including a curriculum vitae;	Chapter 1: Section 1.7 Appendix A
Appendix 3 - (3) (1) (b)	The location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report, 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 Chapter 2: Table 2.1 and Figure 2.2
Appendix 3 - (3) (1) (c)	A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure 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 1: Section 1; Figure 1.3 Chapter 2: Section 2.1.2 Chapter 4: Section 4.2, Table 4.1
Appendix 3 - (3) (1) (d)	A description of the scope of the proposed activity, including – i. all listed and specified activities triggered and being applied for; ii. a description of the associated structures and infrastructure related to the development;	Chapter 2: Section 2.1.2 Chapter 4: Section 4.2 and Table 4.1
Appendix 3 - (3) (1) (e)	A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;	Chapter 1: Section 1.3 Chapter 4: Section 4.2; Section 4.3
Appendix 3 - (3) (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 development footprint within the approved site as contemplated in the accepted scoping report;	Chapter 1: Sections 1.1 and 1.8 Chapter 5
Appendix 3 – (3) (1) (g)	A motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report	Chapter 5: Section 5.1.5
Appendix 3 – (3) (1) (h)	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; 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 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;	(i). Chapter 5: Section 5.1 Chapter 4: Section 4.4
		(ii). Chapter 4: Section 4.6 Appendix D and Appendix E
		(iii). Appendix D: D.5 - D.10 Comments and Responses Report
		(iv). Chapters 3, 5 - 18
		(v). Chapter 6: Section 6.9
		(v). Chapter 7: Sections 7.6 - 7.8
		(v). Chapter 6 - 18

Section of the EIA Regulations	Requirements for an Environmental Impact Assessment Report in terms of Appendix 3 of the 2014 NEMA EIA Regulations (GN R982, as amended in GN R326)	Chapter / Appendix
	<ul style="list-style-type: none"> 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 a concluding statement indicating the preferred alternatives, including preferred location of the activity; 	<ul style="list-style-type: none"> (v). Chapter 8: Section 8.12.6 (vi). Chapters 6 - 16 (vii). Chapters 6 - 18 (ix) Chapter 5: Sections 5.2.1 Table 5.2 (x). Chapter 5
Appendix 3 - (3) (1) (i)	<p>A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including –</p> <ul style="list-style-type: none"> i. a description of all environmental issues and risks that were identified during the environmental impact assessment process; and i. an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures; 	Throughout Chapters 6 - 16
Appendix 3 - (3) (1) (j)	<p>An assessment of each identified potentially significant impact and risk, including-</p> <ul style="list-style-type: none"> 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; 	Throughout Chapters 10 -13, 15, 16, and 20
Appendix 3 - (3) (1) (k)	Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;	Throughout Chapter 20
Appendix 3 - (3) (1) (l)	<p>An environmental impact statement which contains-</p> <ul style="list-style-type: none"> i. a summary of the key findings of the environmental impact assessment; ii. a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers; and iii. a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives; 	Throughout Chapters 6 – 17 and 20 Part C.1 and C.2 of this EIA Report
Appendix 3 - (3) (1) (m)	Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMP as well as for inclusion as conditions of authorisation;	Chapter 5: Section 5.3
Appendix 3 - (3) (1) (n)	The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;	Throughout Chapter 20
Appendix 3 - (3) (1) (o)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Throughout Chapters 6 - 18

Section of the EIA Regulations	<u>Requirements for an Environmental Impact Assessment Report in terms of Appendix 3 of the 2014 NEMA EIA Regulations (GN R982, as amended in GN R326)</u>	Chapter / Appendix
Appendix 3 – (3) (1) (p)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Throughout Chapters 6 – 18 and 20
Appendix 3 – (3) (1) (q)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Not applicable
Appendix 3 – (3) (1) (r)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;	Not Applicable
Appendix 3 – (3) (1) (s)	An undertaking under oath or affirmation by the EAP in relation to - <ul style="list-style-type: none"> ii. the correctness of the information provided in the reports; iii. the inclusion of comments and inputs from stakeholders and interested and affected parties; iv. the inclusion of inputs and recommendations from the specialist reports where relevant; and v. 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
Appendix 3 – (3) (1) (t)	Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Not applicable
Appendix 3 – (3) (1) (u)	An indication of any deviation from the approved scoping report, including the plan of study, including - <ul style="list-style-type: none"> i. any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and ii. a motivation for the deviation; 	No applicable
Appendix 3 – (3) (1) (v)	Any specific information that may be required by the competent authority; and	Appendix D.1 – D.3 Appendix E Appendix H
Appendix 3 – (3) (1) (w)	Any other matters required in terms of section 24(4)(a) and (b) of the Act.	Throughout Chapters 6 -9, 14, 17 and 18
Appendix 3 – (3) (2)	Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to an environmental impact assessment report the requirements as indicated in such notice will apply.	No applicable at this stage