

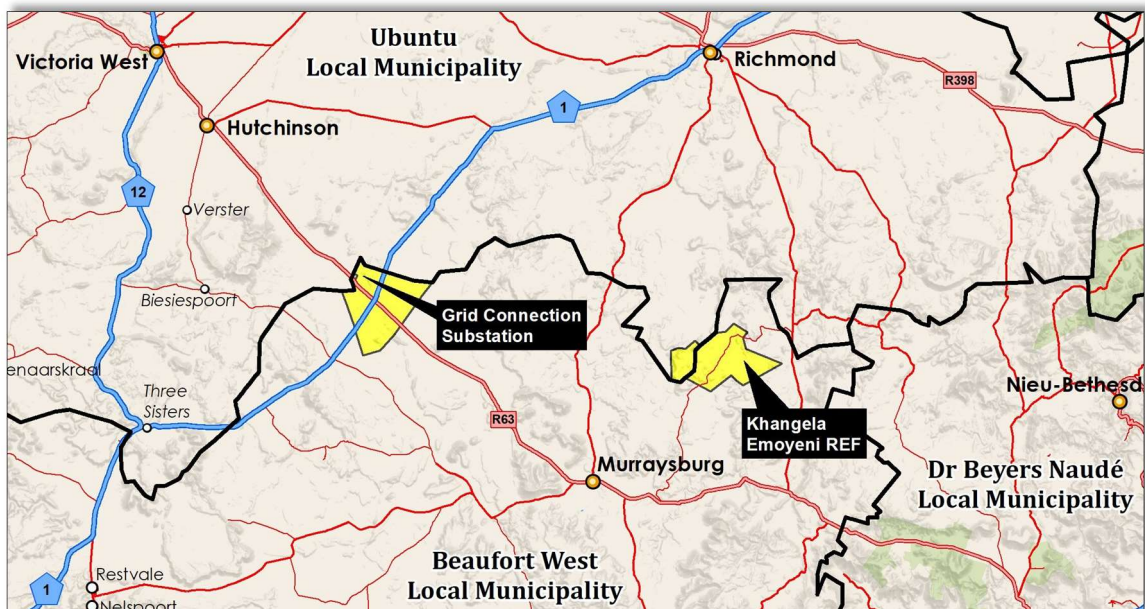
Khangela Emoyeni Renewable Energy Facility :

Application for :

- Consent Use : Renewable Energy Structure
- Consent Use : Utility Service

on :

- Portion 4 of Farm No. 26
- Remainder of Farm Swavel Kranse No. 28
- Portion 2 of Farm Swavel Kranse No. 28
- Portion 2 of Farm De Hoop No. 30
- Remainder of Farm Schietkuil No. 3



Report Number : 1755E/02

April 2022 (Revised)

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Report Title :	Khangela Emoyeni Renewable Energy Facility : Application for : <ul style="list-style-type: none"> • Consent Use : Renewable Energy Structure • Consent Use : Utility Service on : <ul style="list-style-type: none"> • Portion 2 of Farm Swavel Kranse No. 28 • Portion 4 of Farm No. 26 • Portion 2 of Farm De Hoop No. 30 • Remainder of Farm Swavel Kranse No. 28 • Remainder of Farm Schietkuil No. 3
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18. Grid Connection Servitude Exemption Application
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NOTE : Copies of Specialist Studies can be made available on request

1

Chapter 1 : Background

1.1 The Applicant

Urban Dynamics Eastern Cape (UDEC) has been commissioned by Emoyeni Wind Farm Project (Pty) Ltd, on behalf of the owners of various farms, 21 km north-west of Murraysburg to prepare and submit an application to obtain the necessary development rights to develop a wind farm for the generation of renewable energy, known as Khangela Emoyeni Renewable Energy Facility (REF).

Refer to Annexure 5 : Powers of Attorney

Urban Dynamics forms part of a professional consultant team that conducted various specialist studies, supplied supporting documentation and undertook detailed site analysis and design. The detailed professional work done will enable the Municipality to take an informed decision and grant the required development rights to implement this renewable energy project.

1.2 Background & Pre-Application Consultation

A pre-application consultation process, as contemplated in Section 37 of the Beaufort West SPLUM By-laws was conducted.

Refer to Annexure 4 : Pre-Application Consultation, Correspondence, Minutes & Attendance Register

The process confirmed that the application format (Consent Use) is correct and that Urban Dynamics EC can proceed with final submission.

The pre-application consultation noted the following issues that have been included and addressed in this final submission :

- Confirm authority of signatories on Powers of Attorney

Refer to Annexure 5 : Powers of Attorney

- Additional information to confirm that a Section 53 application will not be required with respect to utilisation of agricultural land

Refer to Annexure 16 : Soil, Land Use, Land Capability and Agricultural Potential Survey

Refer to Annexure 17 : LUPA Section 53 Confirmation of Agricultural Usage (Zutari)

- Confirmation that a final Site Development Plan will be submitted prior to construction (**noted**)
- The Beaufort West Municipality confirmed that they will circulate the application to the various Departments for a commenting period of 60 days, as identified by Department of Environmental Affairs & Development Planning (DEADP)

1.3 The Project & Location

The Khangela Emoyeni Renewable Energy Facility (REF) is situated in the Beaufort West (Western Cape) and Ubuntu (Northern Cape) Municipalities. This will require 2 separate applications in terms of the relevant By-laws of the Municipalities. The Khangela Emoyeni Renewable Energy Facility (REF), although situated in 2 municipal areas, will be managed as a single wind farm.

Khangela Emoyeni Renewable Energy Facility (REF), comprising of 6 farm portions (including a substation on Remainder of Farm Schietkuil No. 3), is situated approximately 21 km north-west of Murraysburg. One farm portion is situated in the Ubuntu municipal area (Northern Cape) and 1 farm portions are situated in the Beaufort West municipal area (Western Cape).

The total REF facility comprises of $\pm 7\,813.8210$ ha with potentially up to 33 wind turbines, access roads, power lines, support infrastructure, substation and buildings (appurtenant structures). The facility will have an export capacity of up to 140 MW and electricity will be evacuated to the Eskom Grid.

The REF will connect to the ESKOM grid via a substation on Remainder of the farm Schietkuil No. 3

Refer to Map 1 : Regional Locality

Refer to Map 2 : Property Description & Cadastral Information

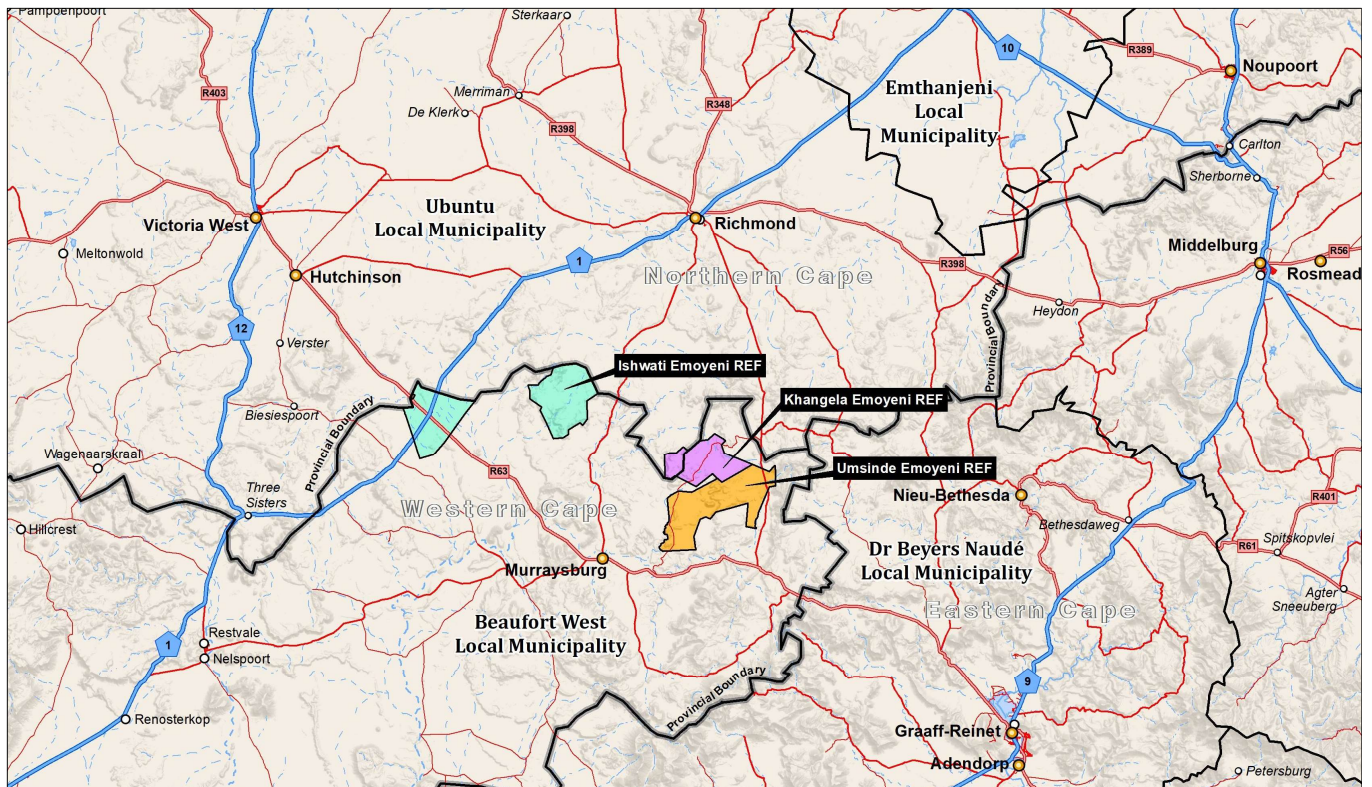
Refer to Map 3 : Property Description & Cadastral Information : Aerial

The Khangela Emoyeni REF is part of a cluster of three Renewable Energy Facilities that is proposed by Windlab (South Africa) in the Western and Northern Cape, between Murraysburg in the south and Richmond in the north.

The developments are :

- Ishwati Emoyeni REF
- Khangela Emoyeni REF (this application)
- Umsinde Emoyeni REF.

Separate applications will be submitted for these developments to ensure SPLUMA compliance.

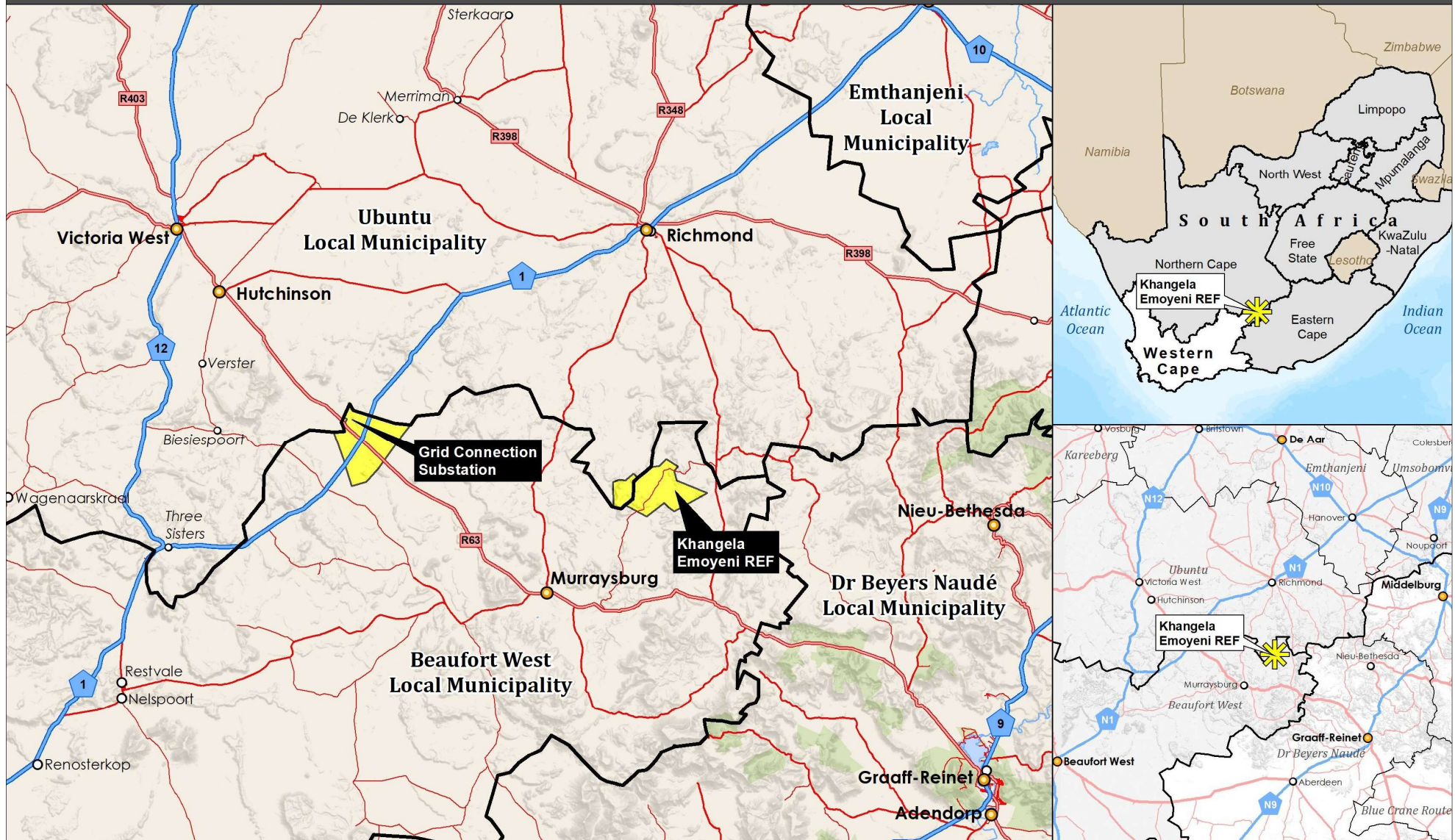


KHANGELA EMOYENI RENEWABLE ENERGY FACILITY

1

REGIONAL LOCALITY

Map No.:



Map 1 : Regional Locality

1.4 Property Descriptions, Ownership, Title Conditions & Bonds

The table below lists the affected properties, in the Beaufort West Municipality, including property ownership, Title Deed number, area and deed search results.

Khangela Emoyeni REF :

Property Description	Owner	Title Deed No.	Area (ha)	Restrictive Conditions
Portion 2 of Farm Swavel Kranse No. 28	Trouberg Trust	T4593/2001	1456,1044	None
Portion 4 of Farm No. 26			1046,5194	None
Portion 2 of Farm De Hoop No. 30	Alwyn Petrus van der Merwe Trustees	T36079/1974	1823,9671	None
Remainder of Farm Swavel Kranse No. 28		T4917/1964	2010,8516	None

Substation for the REF :

Property Description	Owner	Title Deed No.	Area (ha)	Restrictive Conditions
Remainder of Farm Schietkuil No. 3	Rooikop Trust	T76646/2003	8928,3221	None

The following property is situated in the Ubuntu municipal area (Northern Cape) :

- Portion 6 of Farm Klipplaat No. 109

An application for Rezoning of this property has been submitted to the Ubuntu Municipality.

Refer to Annexure 5 : Powers of Attorney

Refer to Annexure 6 : Deeds Office Enquiries

Refer to Annexure 7 : Title Deeds

Refer to Annexure 8 : Conveyancing Certificates

Refer to Annexure 9 : Cadastral Diagrams

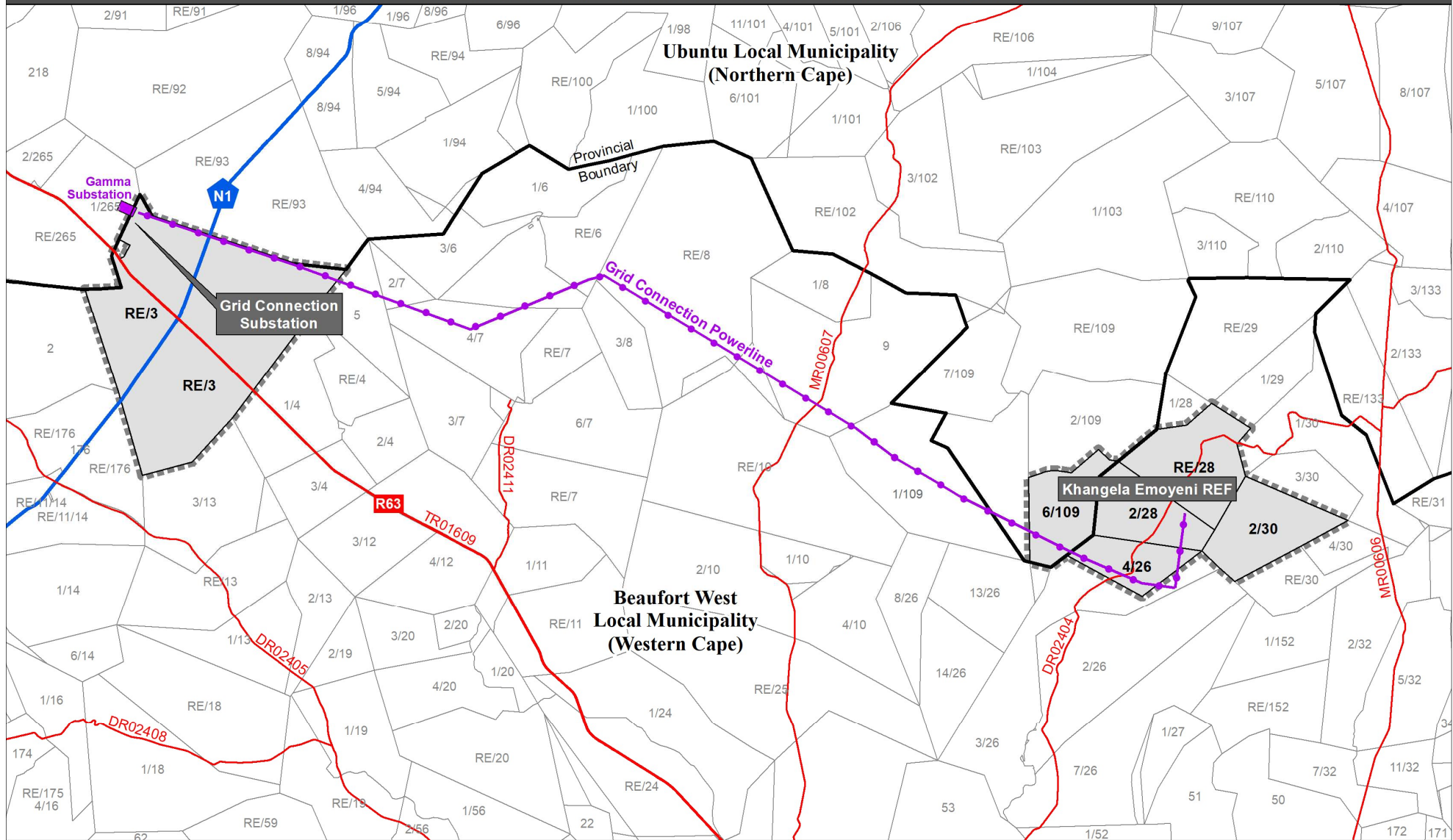
Note that confirmation of signatories for Trusts and Companies have been included, where applicable.

KHANGELA EMOYENI RENEWABLE ENERGY FACILITY

2

PROPERTY DESCRIPTION AND CADASTRAL INFORMATION

Map No.:



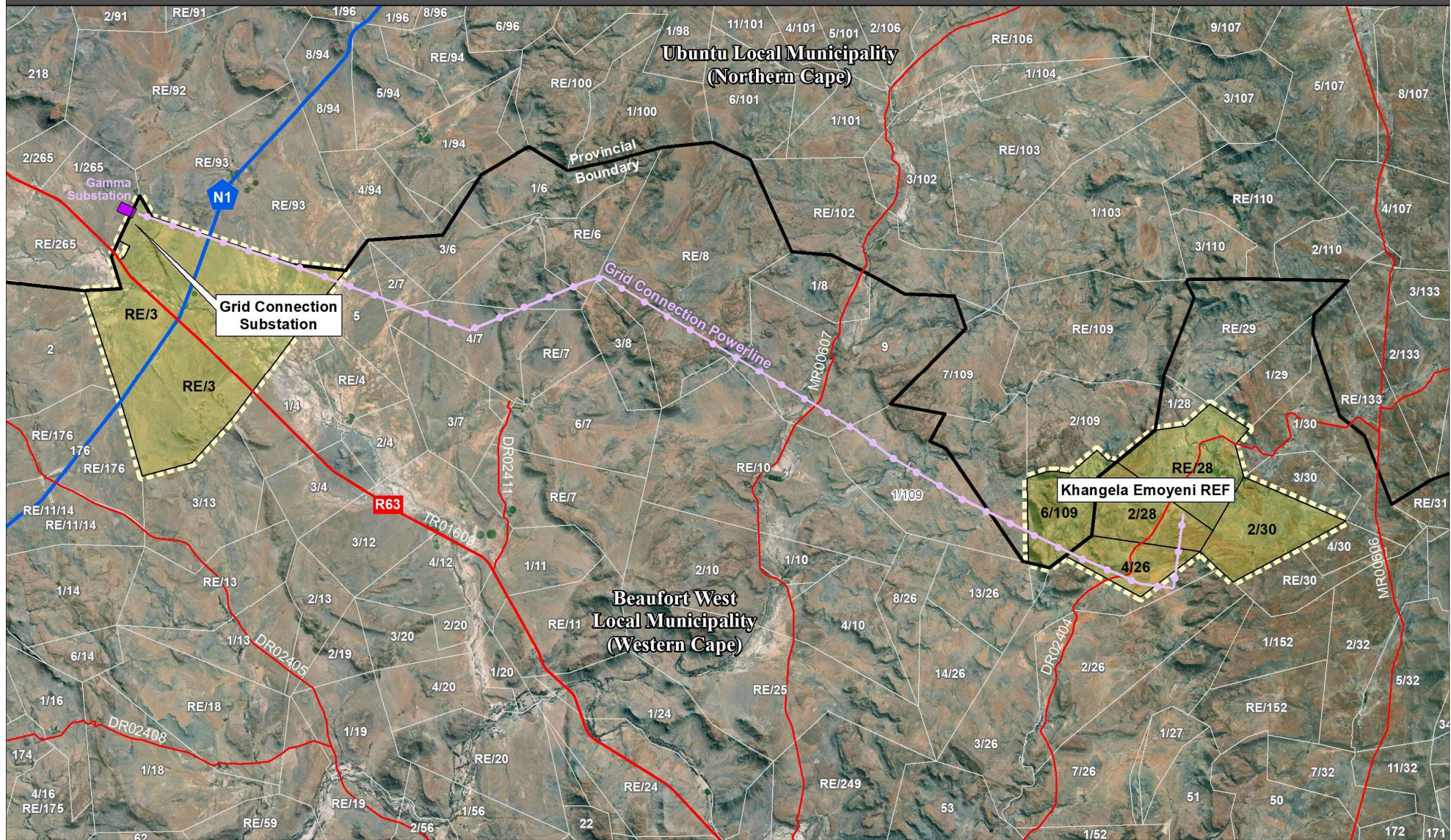
Map 2 : Property Description & Cadastral Information

KHANGELA EMOYENI RENEWABLE ENERGY FACILITY

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GRID CONNECTION PROPERTIES AND SERVITUDE

Map No.:



Map 3 : Property Description & Cadastral Information : Aerial

1.5 The Application

1.5.1 Objective

The objective of this application is to obtain the necessary development rights in terms of the Beaufort West Municipal Land Use Planning By-laws from the Beaufort West Municipality to implement, construct, operate and maintain a wind energy facility and associated infrastructure on the subject land portions.

The location of the wind farm site has been identified through a detailed wind data capturing and assessment process, which indicates that the site has an exceptional wind regime. The layout and siting of wind turbines was refined through an iterative process with input from various environmental and technical specialists as part of the design and Environmental Impact Assessment processes.

1.5.2 Legislation

Land use rights within the Beaufort West Municipality are managed through the :

- Spatial Planning & Land Use Management Act, 2013 (Act 16 of 2013) (SPLUMA)
- Western Cape Land Use Planning Act, 2014 (Act 3 of 2014) (LUPA)
- By-law on Municipal Land Use Planning for Beaufort West Municipality (2018)
- Beaufort West Standard Zoning Scheme By-Law (2020)

The relevant legislation, as indicated above, outlines the application procedures and processes, basis for decision making and various administrative arrangements through the application cycle, i.e. pre-application consultation, application, public participation, Municipal Planning Tribunal (MPT) decision making and conditions of implementation.

In order to construct, operate and maintain the Khangela Emoyeni Renewable Energy Facility, development approval is required for the following :

▣ **Consent Use : Renewable Energy Structure**

A wind energy facility, by its nature and location in the rural area, functions in harmony with the surrounding agriculture land uses. The agricultural and renewable energy facilities are therefore compatible land uses, in support of each other.

Land use rights within the Beaufort West Municipal area are managed by the By-law on Municipal Land Use Planning for Beaufort West Municipality and the Beaufort West Standard Zoning Scheme By-Law.

The Beaufort West Standard Zoning Scheme By-Law makes provision for “**Renewable energy structures**”, as a consent use, on agriculture land and is defined as :

*“any wind turbine, solar energy generating apparatus, including solar photo-voltaic and concentrated solar thermal, hydro turbines or bio mass facility or any grouping thereof, that captures and converts wind, solar radiation or bio mass into energy for commercial gain; and (b) includes any **appurtenant structure** necessary for, or directly associated with, generation of renewable energy, or any test facility or structure that may lead to the generation of energy on a commercial basis, excluding electrical grid connections”.*

“Appurtenant structures” means :

- *Equipment shelters, storage facilities, transformers and sub-stations must be architecturally compatible with the receiving environment as required by the Municipality, and contained within a renewable energy structure site development plan submitted for approval by the Municipality.*
- *Appurtenant structures may only be used for the storage of equipment or other uses directly related to the operation of the particular facility that they are associated with.*

The REF will include the following appurtenant structures : Operational Control Centre, Site Office, Storage, Ablution and Substation Compound (5ha).

Application for a Permanent Consent Use on the subject land portions zoned Agricultural Zone I will therefore establish permanent land use rights. This is supported based on the accepted permanent nature of wind turbine construction and the ongoing maintenance and lifecycle.

Application is not made for Subdivision of individual wind turbine footprint areas.

▣ **Consent Use : Utility Service**

The Beaufort West Standard Zoning Scheme By-Law makes provision for “Utility Service”, as a consent use, on agriculture land and is defined as :

*“a use or infrastructure that is required to provide engineering and associated services for the proper functioning of urban development and—
(a) includes a water reservoir and purification works, electricity substation.....”*

Application for Permanent Consent Use for a Utility Service on a portion of land zoned Agricultural Zone I (Remainder of Farm Schietkuil No. 3) will permit the construction of a substation to connect the REF with the ESKOM grid. The substation will be constructed in an existing Eskom servitude area.

▣ **Endorsement of Servitudes (Grid Connection Powerlines)**

Servitudes will be registered in favour of ESKOM for the grid connection power line. The Beaufort West Municipality By-laws make provision in terms of Section 24 for exemption of infrastructure by a service provider.

A separate request in terms of Section 24 for registering a servitude over various farm portions for the grid connection lines and substation has been submitted to the Beaufort West Municipality.

Refer to Annexure 18 : Grid Connection Servitude Exemption Application

▣ **Renewable Energy Structure : Development Parameter : Finishing, Colour & Design**

The Beaufort West Zoning Scheme By-law states that :

“A wind turbine structure must be treated with a neutral, non-reflective exterior colour and designed to blend in with the surrounding natural environment, to the satisfaction of the Municipality”.

The design and colour of the turbines are determined through detailed engineering design and technology advancement.

The visual impact of the turbines have been carefully assessed as part of the Environmental Impact Assessment process and approved through a positive Environmental Authorisation.

The Zoning Scheme includes the provision "to the satisfaction of the Municipality". It is requested, as part of this application, that the design and colour, as approved by the National Department of Environmental Affairs, be adopted for implementation purposes.

▣ **Endorsement of the Draft Site Plan**

The relevant Environmental Guidelines, Environmental Authorisation, final IPP Agreements and Government Departments might require final micro-siting and placement of turbines, roads, infrastructure and servitudes. It is anticipated that minor amendments will be made to the Site Plan, prior to construction and this will again be submitted to the Municipality for endorsement.

Refer to Map 4 : Site Plan (referenced 1755E/SDP)

▣ **Section 53 of Land Use Planning Act (LUPA) (Act 3 of 2014)**

Section 53 of LUPA requires an application to the Western Cape Provincial Government (Provincial Minister) if development will have a substantial effect on agriculture.

Section 10 (b) of the Western Cape Land Use Planning Regulation states that :

"proposed land development that utilises an area of five hectares or more of agricultural land that has been cultivated or irrigated during the 10-year period immediately preceding the proposed land development that involves urban development or urban expansion, including residential, resort, business, industrial and community development, utility services or transport uses, but excluding agricultural land uses or land development ordinarily associated with agricultural use such as agricultural storing and packing facilities, agricultural industries or accommodation for bona fide agricultural workers; [Para. (b) substituted by reg. 8(a) of the 2019 amendment regulations.]"

Through specialist studies and detailed agricultural / soil analysis, it was confirmed that a Section 53 application will not be triggered, i.e. not more than 5 ha of previously (10 years) cultivated or irrigated land will be utilised.

Refer to Annexure 16 : Soil, Land Use, Land Capability and Agricultural Potential Survey

Refer to Annexure 17 : LUPA Section 53 Confirmation of Agricultural Usage (Zutari)

▣ **Long Term Leases**

The wind farm developer will enter into a long term lease agreement (lifespan of the REF) with the farm owners for the entire farm. Based on discussions with the Department of Environmental Affairs & Development Planning (DEADP), long term leases on the entire farm will not require approval from the Beaufort West Municipality in terms of the Beaufort West SPLUM By-Laws.

Refer to Annexure 4 : Pre-Application Consultation, Correspondence, Minutes & Attendance Register

1.5.3 Application

Application is submitted for the following :

▣ **Permanent Consent Use : Renewable Energy Structures** on :

- Portion 2 of Farm Swavel Kranse No. 28, Murraysburg Division
- Portion 4 of Farm No. 26, Murraysburg Division
- Portion 2 of Farm De Hoop No. 30, Murraysburg Division
- Remainder of Farm Swavel Kranse No. 28, Murraysburg Division

in terms of Section 19 of the Beaufort West Land Use Planning By-laws (2015), as indicated on Site Plan No. 1755E/SDP dated 07/2021, including appurtenant structures and the development parameters and as indicated in **Table 1** below.

▣ **Consent Use : Utility Service (Substation)** on :

- Remainder of the farm Schietkuil No. 3, Murraysburg Division

in terms of Section 19 of the Beaufort West Land Use Planning By-laws (2015), as indicated on Site Plan No. 1755E/SDP dated 07/2021 and in **Table 2** below.

▣ **Endorsement of the Site Plan (Plan No. 1755E/SDP dated 07/2021)**

Table 1 : Development Parameters of Khangela Emoyeni REF, as indicated on the Site Plan (1755E/SDP dated 07/2021) :

Consent Use	Renewable Energy Structure	
Definitions	<p>Renewable Energy Structure means any wind turbine, solar energy generating apparatus, including solar photo-voltaic and concentrated solar thermal, hydro turbines or bio mass facility or any grouping thereof, that captures and converts wind, solar radiation or bio mass into energy for commercial gain; and (b) includes any appurtenant structure necessary for, or directly associated with, generation of renewable energy, or any test facility or structure that may lead to the generation of energy on a commercial basis, excluding electrical grid connections.</p> <p>Appurtenant structures means (a) Equipment shelters, storage facilities, transformers and sub-stations must be architecturally compatible with the receiving environment as required by the Municipality, and contained within a renewable energy structure site development plan submitted for approval by the Municipality; (b) Appurtenant structures may only be used for the storage of equipment or other uses directly related to the operation of the particular facility that they are associated with.</p>	
Total Farm Area	7813,8210 ha	
Appurtenant structures	Office compound, site offices, parking operation and maintenance facility, control room, substation compound	5 ha
	Permanent and construction laydown areas	0,9 ha
Design & Colour	As determined by the Environmental Impact Assessment and approved through the Environmental Authorisation	
Turbines	Up to 33 turbines	
Setback lines	Internal cadastral setback for REF : 0 m External cadastral setback for REF : 100 m	
Height	Hub height : up to 160 m Total height : up to 250m	
Internal Roads	Construction : Up to approximately 9m wide Permanent : Approximately 4m – 6m wide	
Site Access	Access from DR02404	
Grid Connection	Servitude width : 73 m Powerline : 132kV	

Table 2 : Utility Service (Substation), as indicated on the Site Plan (1755E/SDP dated 07/2021) :

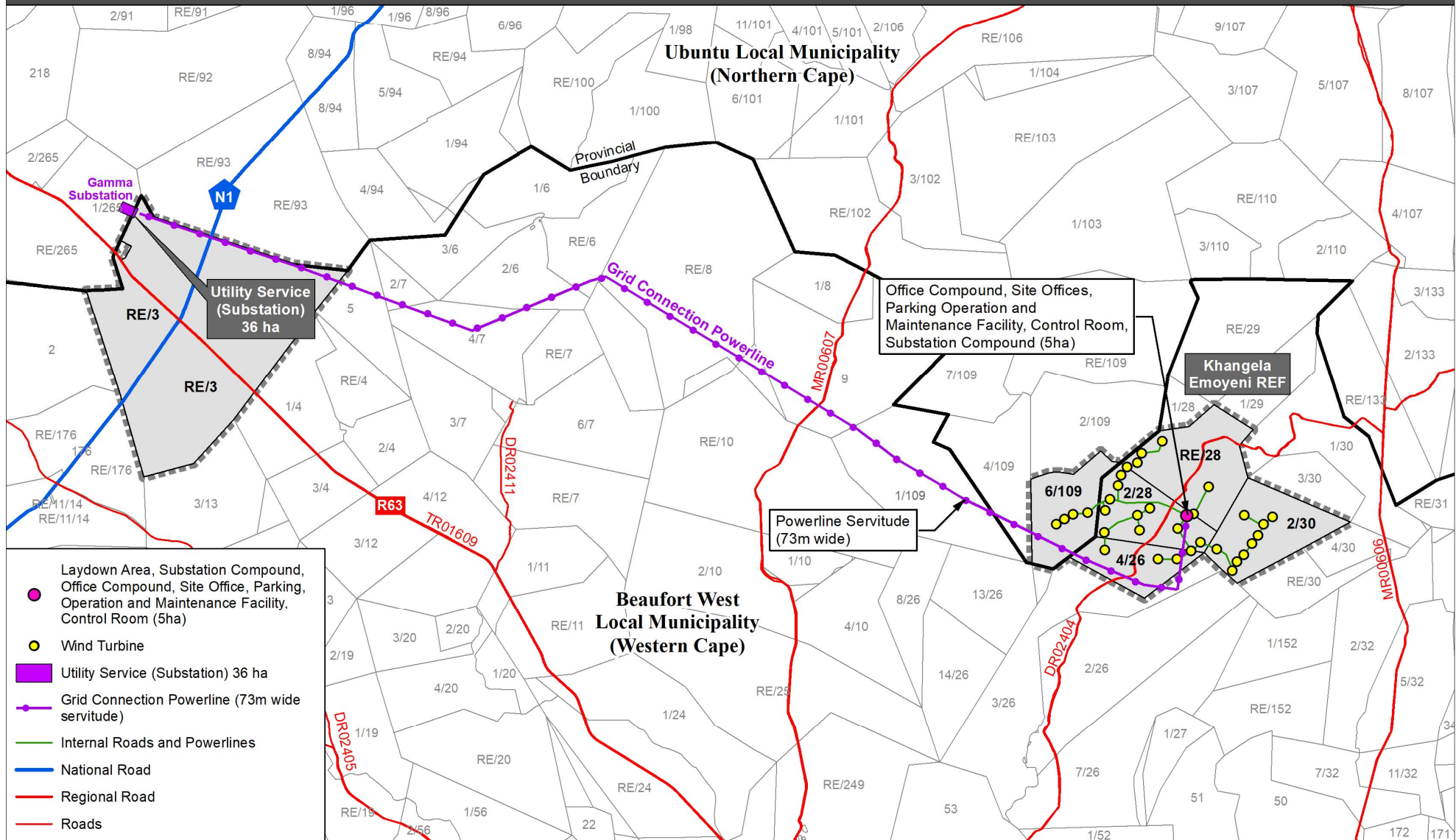
Consent Use	Utility Service (Substation)
Definitions	<p>Utility Services means “a use or infrastructure that is required to provide engineering and associated services for the proper functioning of urban development and— (a) includes a water reservoir and purification works, electricity substation……”</p>
Total Farm Area	8928,3221ha
Grid connection infrastructure (Substation)	400/132kV Substation Yard (Area : 36ha)

KHANGELA EMOYENI RENEWABLE ENERGY FACILITY

4

SITE PLAN

Map No.:



Map 4 : Site Plan (referenced 1755E/SDP)

1.5.4 Cross Boundary Operation

The Khangela Emoyeni REF, although situated in 2 municipal areas, will be managed as a single wind farm. Separate applications and approvals are requested from Beaufort West and Ubuntu Municipalities. The land use management legislation application process and content are basically the same for both Municipalities.

1.5.5 Independent Operation

Paragraph 1.2 indicates that the Khangela Emoyeni REF is part of a cluster of 3 REFs. The 3 REFs will use and share a number of support facilities and infrastructure (i.e. Substation, access roads, connecting power lines, etc.). However, the SPLUMA applications for the 3 REF are structured to function as independent stand-alone applications and approvals. This will create duplicate approvals in some cases, but at the same time, allow individual REFs to operate independently. It is unclear at this stage which of the facilities will be developed.

1.6 Existing Zoning & Land Use

1.6.1 Zoning

In terms of the Zoning Scheme and the Beaufort West Municipality Zoning Register, the properties are zoned Agricultural Zone 1, permitting development parameters in the Table below:

	Agricultural Zone 1
Primary Use	Agriculture
Definition	<i>Agriculture means the cultivation of land for raising crops and other plants, including plantations, the keeping and breeding of animals, birds or bees, stud farming, game farming, intensive horticulture; intensive animal farming; a riding school or natural veld.</i>
Building Lines	30 m

1.6.2 Existing Land Use

The Khangela Emoyeni Renewable Energy Facility comprises of 5 farm portions with a total area of 7 813,8210 ha.

The population density of the region is less than 1 person per km², and therefore the site is located in a sparsely populated region of the Western Cape. The environment has remained in a natural state with little or no large-scale development on the subject property. Sheep and goat farming is the predominant land use activity with supporting agricultural infrastructure and homesteads. The study area has a harsh, rugged character with vast expanses of natural and undeveloped landscape. The proposed development area is located at the foot of the Komsberg Mountains on the border of the Western and Northern Cape Provinces in the Moordenaars Karoo.

▣ Climate

Murraysburg like much of the Karoo has a dry arid to semi-arid climate meaning that precipitation is less than the rate of evaporation. Murraysburg experiences hot dry summers with temperatures rarely below 30°C; and mild wet winters with occasional snowfalls.

■ **Topography**

The landscape of the site is diverse and has a rugged topography with hills, drainage features and more flat areas repeatedly interspersed across the site. The majority of the turbines are located on the flatter open plains of the site which is considered least sensitive habitat.

The overall project area comprise of a varied topography: from high dolerite plateaus and ridges to canyons and plains.

■ **Soils and agricultural potential**

The entire development site is dominated by shallow and rocky soils as well as extensive rock outcrops. The only areas of significant soil profile development are drainage depressions where eroded soil material accumulates. These areas are also prone to severe erosion.

All the turbine positions are on rocky soil areas in the higher lying parts of the landscape, situated on rocky outcrops. The position of turbines are outside of drainage depressions and therefore areas with deeper and sensitive soils.

The agricultural potential of the site is directly linked to the soils. The shallow and rocky soils are of very low potential and the deeper sandy soils are of medium potential. The latter soils are very sensitive to erosion and due to the rainfall in the area these are only suited to extensive grazing. In very limited areas the deeper drainage depression soils could be suitable for irrigation purposes.

The Geology, Soils and Agriculture study (Chapter 9.1 of the EIAR) did not identify any approvals required in terms of the Land Use Planning Act, 2014 (Act 3 of 2014). The study provided the following conclusion :

"It is concluded that the proposed development of a wind energy facility on the site will have a small impact on agricultural activities as the soils are of very low potential and only suited to extensive grazing. The turbine footprints are limited to rocky and shallow soil areas with very limited grazing potential.

Regarding the construction of turbines and associated infrastructure the following recommendations are made :

- *Limit physical impacts to as small a footprint as possible;*
- *Site management has to be implemented with the appointment of a suitable environmental control officer (ECO) to oversee the process, address problems and recommend and implement corrective measures;*
- *Implement site specific erosion and water control measures to prevent excessive surface runoff from the site (turbines and roads);*
- *Plan the road and site layout in such a way as to make maximal use of existing roads and fence/border areas to minimise impacts and to keep grazing and natural units as intact as possible; and*
- *Prevent dust generation and vehicle associated pollution and spillages."*

Based on the above information it can be confirmed that the KHANGELA WEF will not utilize an area of 5 ha or more of agricultural land that has been cultivated or irrigated during the 10 years period immediately preceding the proposed development and therefor does not trigger a Provincial Development Application in terms of Sec 53(1) of the Land Use Planning Act, 2014 (Act 3 of 2014).

▣ **Vegetation**

According to the national vegetation map (Mucina & Rutherford 2006), only three different vegetation types occur within the study area, Upper Karoo Hardeveld, Eastern Upper Karoo and Southern Karoo Riviere. The site is dominated by Eastern Upper Karoo, which is the most extensive vegetation type in South Africa and forms a large proportion of the central and eastern Nama Karoo Biome. This vegetation type is classified as Least Threatened, and about 2 % of the original extent has been transformed largely for intensive agriculture.

The landscape of the site is diverse and has a rugged topography with hills, drainage features and more flat areas repeatedly interspersed across the site. The majority of the turbines are located on the flatter open plains of the site which is considered least sensitive habitat. However, there are also a number of turbines located on steeper slopes especially within dolerite outcrops. On the steeper slopes access roads and turbines will generate a significant erosion risk and have sensitive features present which include localised habitats such as rock fields and densely-vegetated south-facing slopes. The dolerite outcrops are considered sensitive as these habitats contain high diversity of fauna and flora.

The abundance of plant species of conservation concern is fairly low. Only five such species are known from the area, however *Gethyllis longistyla* which is classified as Rare was observed in the rock fields near one of the wind measuring masts near the eastern margin of the site.

▣ **Wetlands and freshwater**

The development site is located approximately 35 km north-west of the Murraysburg, with the REF site falling within three quaternary catchments of the Gamtoos Water Management area. Several main stem rivers are found within these catchments which form part of the Brak River. Water bodies and aquatic systems are found at the site. Most of the indicated wetlands are man-made systems. Based on this and field observations no natural wetlands would be affected by the proposed REF.

The proposed development from an aquatic vegetation point of view is dominated by species associated with the Nama Karoo vegetation ecosystem. These systems are thus usually devoid of any trees with strict riparian or wetland affiliations and this is due to the largely ephemeral nature of the rivers / water courses within the region.

2

Chapter 2 :

Development Concept and Informants

2.1 Professional Team

The process to obtain the necessary development rights and environmental authorisation are managed and implemented by a team of highly skilled professionals.

Environmental	<i>Argus Consultancy Services and Zutari (Pty) Ltd for amendments</i>
Visual Impact Assessment	<i>Bernard Oberholzer Landscape Architects Meirelles Lawson Burger Architects</i>
Aquatic Ecology	<i>EnviroSci (Pty) Ltd</i>
Terrestrial Ecology	<i>3Foxes Biodiversity Solutions (Pty) Ltd</i>
General Heritage and Archaeology	<i>ACO Associates</i>
Palaeontology Assessment	<i>Natura Viva cc</i>
Avifauna (Bird) Assessment	<i>Arcus Consulting</i>
Bat Assessment	<i>NSS Environmental</i>
Noise Assessment	<i>Enviro-Acoustic Research</i>
Town Planning	<i>Urban Dynamics EC</i>

The professional team conducted various specialist studies that form part of the Environmental Impact Assessment process, application for Consent Use to the Beaufort West Municipality and applications to the various Government Departments and institutions for comments / approvals.

The Revised Final Environmental Impact Assessment Report for the Proposed Umsinde Emoyeni Wind Energy Facility Phase Two : Executive Summary (February 2018) should be consulted and read in conjunction with this application.

Refer to Annexure 11 : Revised Final Environmental Impact Assessment Report for the Proposed Umsinde Emoyeni Wind Energy Facility Phase Two : Executive Summary (February 2018)

Copies of the Specialist Studies can be made available on request.

2.2 Activity Description & Parameters

The following table indicated the development parameters for the **Khangela Renewable Energy Facility**:

Table 1 : Development Parameters of Khangela Emoyeni REF, as indicated on the Site Plan (1755E/SDP dated 07/2021) :

Consent Use	Renewable Energy Structure	
Definitions	<p>Renewable Energy Structure means any wind turbine, solar energy generating apparatus, including solar photo-voltaic and concentrated solar thermal, hydro turbines or bio mass facility or any grouping thereof, that captures and converts wind, solar radiation or bio mass into energy for commercial gain; and (b) includes any appurtenant structure necessary for, or directly associated with, generation of renewable energy, or any test facility or structure that may lead to the generation of energy on a commercial basis, excluding electrical grid connections.</p> <p>Appurtenant structures means (a) Equipment shelters, storage facilities, transformers and sub-stations must be architecturally compatible with the receiving environment as required by the Municipality, and contained within a renewable energy structure site development plan submitted for approval by the Municipality; (b) Appurtenant structures may only be used for the storage of equipment or other uses directly related to the operation of the particular facility that they are associated with.</p>	
Total Farm Area	7813,8210 ha	
Appurtenant structures	Office compound, site offices, parking operation and maintenance facility, control room, substation compound	5 ha
	Permanent and construction laydown areas	0,9 ha
Design & Colour	As determined by the Environmental Impact Assessment and approved through the Environmental Authorisation	
Turbines	Up to 33 turbines	
Setback lines	Internal cadastral setback for REF : 0 m External cadastral setback for REF : 100 m	
Height	Hub height : up to 160 m Total height : up to 250m	
Internal Roads	Construction : Up to approximately 9m wide Permanent : Approximately 4m – 6m wide	
Site Access	Access from DR02404	
Grid Connection	Servitude width : 73 m Powerline : 132kV	

The following table indicated the development parameters for the **Substation** on Remainder of the farm Schietkuil No. 3:

Table 2 : Utility Service (Substation), as indicated on the Site Plan (1755E/SDP dated 07/2021) :

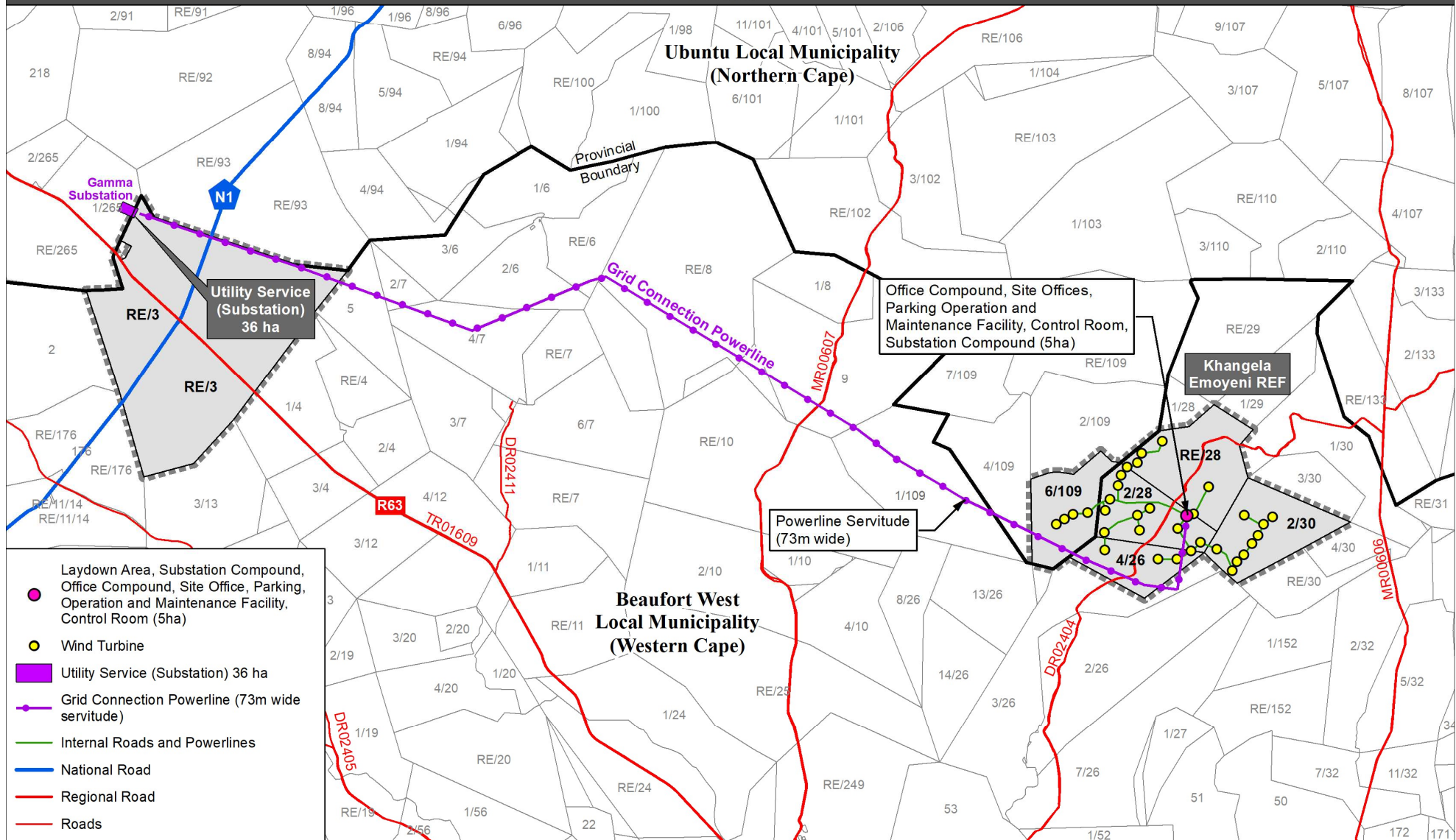
Consent Use	Utility Service (Substation)
Definitions	Utility Services means "a use or infrastructure that is required to provide engineering and associated services for the proper functioning of urban development and— (a) includes a water reservoir and purification works, electricity substation....."
Total Farm Area	8928,3221ha
Grid connection infrastructure (Substation)	400/132kV Substation Yard (Area : 36ha)

KHANGELA EMOYENI RENEWABLE ENERGY FACILITY

4

SITE PLAN

Map No.:



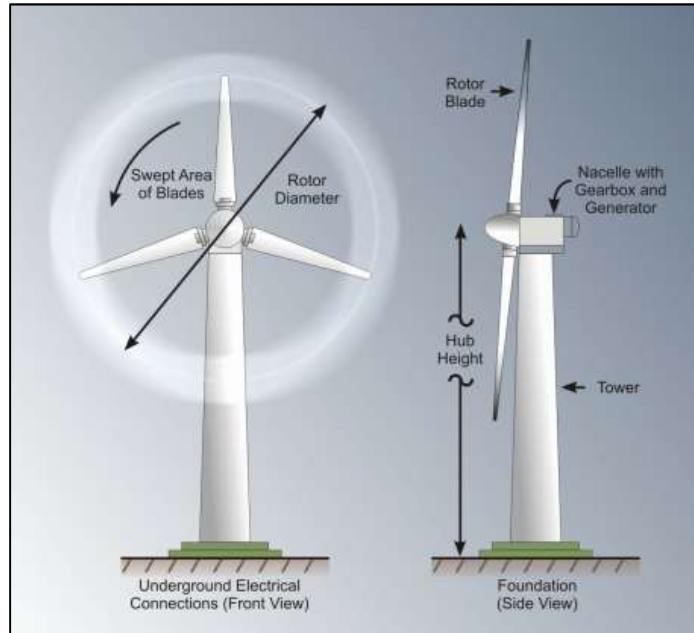
Map 4 : Site Plan (referenced 1755E/SDP)

2.2.1 Wind Farm Components

A wind farm requires a number of key components to facilitate the generation of electricity at a large scale. This includes wind turbines, powerlines and substation facilities to collect the generated electricity and distribute it to other users. The associated connecting infrastructure such as roads, transformers and cabling etc. are designed to ensure project and energy efficiency.

▣ Wind Turbines

Wind turbines generate electricity by converting movement or kinetic energy produced by the wind into electricity. A typical horizontal-axis wind turbine consists of a number of components, which work together to generate electricity as depicted in the figure. In conventional/geared wind turbines the kinetic energy of the wind rotates the rotor blades of the wind turbine around a horizontal hub, which is connected to a shaft, gearbox and generator located in the nacelle (turbine housing).



⇒ Rotor & Blades

The rotor has three blades that typically rotate at 5 – 25 revolutions per minute (rpm) depending on the make and set-up of the turbine, as well as the wind speed on site. The blades are usually coloured white or light grey.

⇒ Nacelle

Larger wind turbines are typically actively controlled to face the wind direction, which is measured by a wind measuring instrument (anemometer) situated on the back of the nacelle. By reducing the misalignment between wind and turbine pointing direction (yaw angle), the power output is maximised and non-symmetrical loads minimised. The nacelle turns the turbine to face into the wind ('yaw control'). The nacelle also contains the generator, control equipment, gearbox and wind speed instrument (anemometer) to monitor the wind speed and direction. The turbine controls the angle of the blades ('pitch control') to make optimal use of the available wind and avoid damage at high wind speeds.

⇒ Generator

The generator converts the turning motion of the blades into electricity. A gear box is commonly used for stepping up the speed of the generator. Each turbine has a transformer that steps up the voltage to match the powerline frequency and voltage for electricity evacuation / distribution. The transformer may be located inside the turbine tower, or within a small housing at the base of the tower.

⇒ Tower

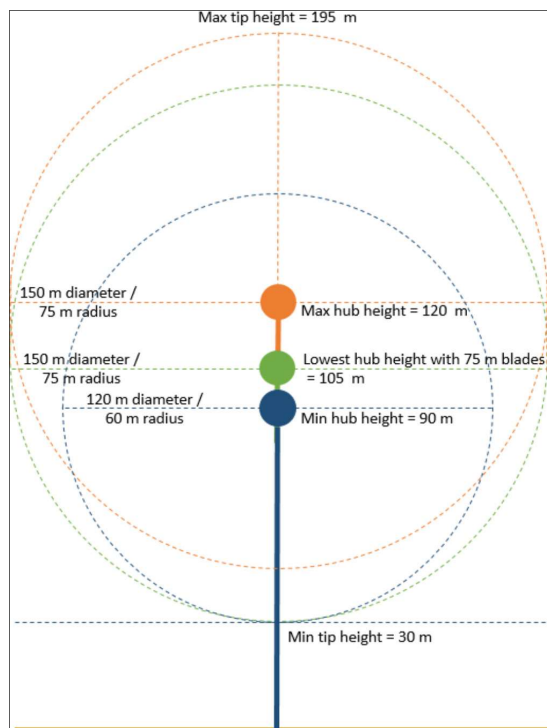
The tower is constructed from tubular steel and/or cast concrete and supports the rotor and nacelle. Towers can vary in height and are dependent on the selected turbine model. This height is referred to as “*hub height*.” Wind has greater velocity at higher altitudes, therefore increasing the height of a turbine increases the expected wind speeds and electricity output.

⇒ Foundation

Foundations are designed to factor in both weight (vertical load) and lateral wind pressure (horizontal load). Considerable attention is given when designing the footings to ensure that the turbines are adequately grounded to operate safely and efficiently. The final foundation design of the proposed turbines is dependent on a geotechnical investigation.

The foundations will be approximately 20 m in diameter and approximately 3 m deep per turbine.

⇒ Rotor Swept Area Envelope



Rotor Swept Area Envelope (example)

⇒ Hardstands

A hard standing area of up to 75 m x 50 m will be established next to each wind turbine. These hard standing areas will be utilised by cranes during the construction (and also possible maintenance) processes. Hard standing areas will be rehabilitated to their previous natural state once construction has been completed. In the event that the turbine technology selected for implementation does not incorporate transformers into the turbine tower or nacelle, each wind turbine may also require that a transformer of up to 5 m x 5 m be installed within the hard standing area.

Laydown areas of approximately 150 m x 60 m will be required during the construction phase. These areas will be compacted and levelled to be used as blade lay down areas and for the initial storage of wind turbine components. These laydown areas will also accommodate cranes required for tower/turbine assembly.

■ **Construction**

⇒ Preliminary Civil Works

Prior to the commencement of the main construction works, the Contractor may undertake vegetation clearance (if required) and site establishment works. The site establishment works may include the construction of one, or more, temporary construction compounds and laydown areas and the connection of services such as power and water to these compounds.

The construction footprint will include the platforms, or "crane pads" required to construct the wind turbines, new or upgraded access roads, lay-bys, component storage areas, turning heads and a substation to evacuate the electricity generated to the municipal or national grid.

⇒ Electrical Cabling

Electrical and communication cables are normally laid in trenches which run alongside the access roads as much as possible. All previous farming activities can continue unhindered on the ground above the cables during the operational phase.

⇒ Establishment of Hard Standing Surfaces & Laydown Areas

Laydown and storage areas will be required for the contractor's construction equipment and turbine components on site.

⇒ Establishment of Substation & Support Infrastructure

Ancillary infrastructure for the Khangela Emoyeni REF can include batching plants, laydown areas, substations, switch stations, operation and maintenance areas. Electricity will be evacuated to the national grid through the substation next to the Gamma Substation. The Site Plan indicates various alternatives for support infrastructure and power line routes.

The establishment of these facilities/buildings will require the clearing of vegetation and levelling of the development site and the excavation of foundations prior to construction.

⇒ Undertake Site Remediation

Once construction is completed and all construction equipment is removed, the site must be rehabilitated. On full commissioning of the facility, any access points to the site which are not required during the operational phase must be closed and rehabilitated.

⇒ Electrical Connections / Grid Connection

Each turbine is fitted with its own transformer that steps up the voltage usually to 33 kV. The entire wind farm is then connected to the "point of interconnection" which is the electrical boundary between the wind farm and the national grid. Most of these works will be carried out by Eskom or an Eskom-approved sub-contractor (line upgrade, connection to the substation, burial of the cables etc.).

Grid connection infrastructure is required to connect the proposed wind energy facility with the national electricity grid, thereby allowing for electricity generated by the facility to be fed into and distributed via the national electricity grid which is owned and operated by Eskom.

Grid connection infrastructure required for the proposed Khangela Emoyeni REF project includes the establishment of a 73 m wide servitude to allow for the phased construction of three double circuit 132 kV high voltage distribution powerlines from the Khangela Emoyeni REF onsite substation to Eskom's 400 kV Gamma Substation.

Eskom Holdings SOC Limited obtained Environmental Authorisation from the Department of Environmental Affairs (DEA) for Eskom Transmission and Eskom Distribution Grid Connection Infrastructure projects.

▣ **Operational Phase**

The operational lifespan of the Khangela Emoyeni Wind Energy Facility is expected to be approximately 20 to 30 years; with the option to extend. 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 to ensure the continued optimal functioning of the turbine components and operational monitoring of bird and bat populations will take place during the first years of operation (as recommended by the specialists).

▣ **Decommissioning of the Wind Farm**

The infrastructure would only be decommissioned once it has reached the end of its economic or technological life. If economically feasible, the decommissioning activities would comprise the disassembly and replacement of the individual components with more appropriate technology/infrastructure available at the time. This operation is referred to as 'facility re-powering'. However, if not deemed so, then the facility would be completely decommissioned.

2.2.2 Timeframes

It is unknown at this stage when construction would commence, as this would be dependent on the REIPPPP programme and other related permit requirements for a wind farm. However it is anticipated that construction would commence within the next five years. The construction period would be an anticipated duration of 18 – 24 months. Should decommissioning occur, this would only be likely after approximately 25 years.

2.3 Environmental Authorisation

- The project includes a number of 'listed activities' in terms of Section 24(5) of the National Environmental Management Act (107 of 1998) (NEMA), 'EIA Regulations' published in Government Notice (GN) No. R982, R983, R984 and R985 in the Government Gazette of 8 December 2014, as amended. Accordingly, the proposed project requires environmental authorisation before any activities can commence.
- An Independent Environmental Assessment Practitioner (EAP) has been commissioned to undertake the applications for environmental authorisation for the project on behalf of the applicant, as required in terms of NEMA. Argus Consultancy Services Ltd is the responsible EAP and has relied on inputs from a selected team of highly experienced specialists and multi-disciplinary practitioners to execute the project in a professional and unbiased manner. Zutari (Pty) Ltd is managing the amendment applications.

- The National Department of Environmental Affairs granted the original Environmental Authorisation for the development of the Khangela Emoyeni Renewable Energy Facility and associated infrastructure in September 2018.

The following Authorisations pertain to the Khangela Emoyeni REF :

- Environmental Authorisation 14/12/16/3/3/2/687 (dated 06.09.2018)
- Environmental Authorisation Eskom Distribution Grid Connection Infrastructure 14/12/16/3/3/2/685 (dated 06.09.2018)
- Amendments of the Environmental Authorisation 14/12/16/3/3/2/687AM1 (dated 30.03.2021)
- Environmental Authorisation Eskom Distribution Grid Connection Infrastructure (substation) 14/12/16/3/3/2/410 (dated 02.07.2015)
- Amendments of the Environmental Authorisation 14/12/16/3/3/2/410/AM1 (dated 06.11.2017)

Refer to Annexure 13 : Environmental Authorisation & Amendments

2.4 District Roads Engineer (DRE) & SANRAL

Access to the REF is obtained via DR02404 gravel road which connects the town of Murraysburg in the south to the town of Richmond in the north.

The Beaufort West Municipality will refer the application to the DRE and/or SANRAL in terms of the applicable legislation, as part of the public participation process.

2.5 Department of Agriculture, Land Reform & Rural Development (DALRRD)

The subject land portions are currently zoned for agricultural purposes and are classified as agricultural land by the Department of Agriculture, Land Reform & Rural Development.

The proposal to change the land use of the subject farms requires the Beaufort West Municipality to refer the application to Western Cape Department of Agriculture for comment as part of the public participation process.

2.6 Department of Mineral Resources & Energy (DMR)

Approval has been obtained from the Department of Mineral Resources, in terms of Section 53(1) of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002).

Refer to Annexure 14 : Department of Mineral Resources & Energy Approval

2.7 Civil Aviation Authority (CAA)

Approval has been obtained from the Civil Aviation Authority.

Refer to Annexure 15 : Civil Aviation Authority (CAA) Approval

2.8 Public Interest & Participation

Public participation with respect to an application for Consent Use is guided by the Beaufort West Municipality By-law on Municipal Land Use Planning (2020). Urban Dynamics EC, in consultation with the Beaufort West Municipality, will manage the notification and participation process as per the relevant legislation and guidelines.

Urban Dynamics EC, as the applicant, will assist the Municipality with the process. In the unlikely event of any objections received, the professional team will respond and address these objections.

It is noted that a public participation process has been extensively followed through the National Environmental Management Act, its regulations and procedures and all efforts will be made to align the professional responses and inputs for the Environmental Impact Assessment and Consent Use processes.

3.1 Renewable Energy in Context

Due to global concerns such as climate change, and the on-going exploitation of non-renewable resources, there is increasing international pressure on countries to increase their share of renewable energy generation. Renewable energy is recognised internationally as a major contributor in protecting the environment (including biophysical, social and economic), when compared to energy generation that relies on fossil fuels, such as coal fired power stations and the use of oil and gas. Renewable energy projects also provide a wide range of environmental, economic and social benefits that can contribute towards long-term global sustainability.

In South Africa, the national utility company, Eskom, sources up to 86.97% of its electricity needs from fossil fuels (World Atlas, 2016). Eskom recognises that it “is crucial that the private sector plays a role in addressing the future electricity needs of the country as this would reduce the funding burden on Government, relieve the borrowing requirements of Eskom and introduce generation technologies that Eskom may not consider part of its core function which may play a vital role in the future electricity supply options in the country” (Eskom, 2018).

As a result, the South African Government has developed an Integrated Resource Plan (IRP) (2010) in which a target was set to source 17.8 Gigawatts (GW) of the country's electricity supply from renewable energy sources, over a 20-year period from 2010 to 2030 (IPPPP, 2018). An update to the IRP was drafted by the Department of Energy (DoE) and circulated for a 60-day public comment period in August 2018. The updated draft IRP (2018) indicates that the expected electricity demand for South Africa has decreased and that no new nuclear will be planned up until 2030. Of the new build planned by 2030, 52% (18,746 MW) will come from renewable energy, half of which will be wind energy (9,462 MW).

In support of this strategic target, the Department of Energy (DoE) has to date issued three ministerial determinations for the procurement of 13,225 Megawatt (MW) of renewable energy, viz. 3,725 MW by 2016 (1,800 MW of which was allocated for onshore wind technology), 3,200 MW by 2020 (1,470 MW of which will be provided by onshore wind energy) and a further 6,300 MW of renewable energy to be procured by 2025 (3,040 MW of which is allocated to onshore wind power). These renewable energy targets are procured through a competitive tendering process called the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) run by the DoE in conjunction with the National Treasury and the Development Bank of Southern Africa (DBSA) (DoE, 2018a).

The proposed Khangela Emoyeni REF would therefore have global significance as it would contribute to South Africa's national commitment to transition to a low carbon economy. Investments in this technology will not only benefit our generation, but many generations to come.

In South Africa, renewable energy forms an important part of our energy mix. One of the reasons for this is the substantial foreign equity and financing that has been invested in Renewable Energy Independent Power Producer projects by which amounted to R201.8 billion (R75 billion of which has been wind energy) by June 2018 (DoE, 2018b).

Additionally, beyond the foreign investment, localised socio-economic benefits have also been realised through investment in socio-economic development initiatives and enterprise development programmes identified within each project's sphere of influence (R640.3 million socio-economic contribution made to mainly rural communities and R204.6 million contributions to enterprise development and building businesses by June 2018) (DoE, 2018b). In addition, approximately 36,528 direct job years (41,451 Full Time Equivalent jobs)¹ for South African citizens have been created to date, many of which are local to the respective projects. To date (June 2018), a total of 26,840 GWh has been generated by renewable energy, offsetting 27.2 Mton CO₂ emissions and saving 32.2 million kilolitres of water in relation to fossil fuel power generation (DoE, 2018b).

The environmental benefits associated with wind energy specifically, are considerable. As an example, 1,000 MW of wind energy (which could be generated by four or five wind farms), if replacing coal, would result in an estimated savings in emissions of 4.3 million CO₂e/MWh/annum, which removes 930,000 cars off the road per year (SAWEA, 2018). It would save 2.3 billion litres of water, which is the equivalent of the entire City of Cape Town's consumption over 5 days (SAWEA, 2018). Benefits are even more significant if extrapolated over time, and scaled in terms of generation.

3.2 Policy Framework & Context

▣ National Policy Framework Governing Renewable Energy in South Africa

- White Paper on the Energy Policy of the Republic of South Africa (December 1998)
- Renewable Energy White Paper (2003)
- National Climate Change Response Policy White Paper (2011)
- National Integrated Resource Plan (IRP) (2010, updated 2019)
- Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)

▣ Planning Context

The renewable energy industry has substantial support in the South African planning context, which is detailed in the following national plans :

- National Spatial Development Framework (2019)
- National Development Plan (2012)
- National Integrated Energy Plan (2016)
- National Integrated Resource Plan for Electricity (2010-2013) and updated Draft IRP (2018 and 2019)
- National Infrastructure Plan (2012)
- Western Cape Provincial Spatial Development Framework (2014)

More specifically, the proposed Khangela Emoyeni Renewable Energy Facility fall within the jurisdiction of the Beaufort West Local Municipality and the Central Karoo District Municipality. An evaluation of the "*need and desirability*" of the project considers the strategic context of the project with regards to municipal policy and development strategies.

- SPLUMA Chapter 2 Principles
- LUPA Chapter 6 Principles
- Central Karoo District Municipality SDF
- Beaufort West SDF

3.3 Guidelines for Decision Making

Decision making by the Beaufort West Municipality should be based, inter alia, on legislative guidelines and informants :

- Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013)
- Western Cape Land Use Planning Act 2014 (Act 3 of 2014) (LUPA)
- By-law on Municipal Land Use Planning for Beaufort West Municipality (2018)
- Beaufort West Standard Zoning Scheme By-Law (2020)

Although decision making on land use matters is a holistic and multi-disciplinary process, the above legislated criteria should form the basis for well-informed and sound decision making.

3.4 Spatial Planning & Land Use Management Act

Section 7 of SPLUMA stipulates :

The following principles apply to spatial planning, land development and land use management:

- *The principle of spatial justice*
- *The principle of spatial sustainability*
- *The principle of efficiency*
- *The principle of spatial resilience*
- *The principle of good administration*

Section 42 (1) of SPLUMA stipulates :

In considering and deciding an application a Municipal Planning Tribunal must –

- *be guided by the development principles set out in Chapter 2*
- *make a decision which is consistent with norms and standards, measures designed to protect and promote the sustainable use of agricultural land, national and provincial government policies and the municipal spatial development framework*
- *take into account –*
 - *the public interest*
 - *the constitutional transformation imperatives and the related duties of the State*
 - *the facts and circumstances relevant to the application*
 - *the respective rights and obligations of all those affected*
 - *the state and impact of engineering services, social infrastructure and open space requirements*
 - *any factors that may be prescribed, including timeframes for making decisions*

3.5 Western Cape Land Use Planning Act 2014

The Western Cape Land Use Planning Act, 2014 stipulates in Chapter VI that land use planning is guided by the following Land Use Planning Principles :

- Principle of spatial justice
- Principle of spatial sustainability
- Principle of efficiency
- Principle of spatial resilience
- Principle of good administration

The principles are aligned with and support Section 7 of the Spatial Planning and Land Use Management Act principles.

The following Development Principles are applicable to spatial planning, land development and land use management and have been addressed accordingly :

▣ **The Principle of Spatial Justice**

- The development is outside an urban area. The closest settlements are Murraysburg and Richmond, approximately 21km to the south and 60 km to the north, respectively.
- The development will ensure significant financial investment in the area.
- The development will help to address unemployment in the area and drive economic development.
- Investment will ensure social upliftment and improve rural livelihood.
- The development of REF's and renewable energy is supported through various National, Provincial and Local policy frameworks.
- The development is consistent with the applicable Spatial Development Frameworks (Western Cape, Central Karoo DM and Beaufort West LM).

▣ **The Principle of Spatial Sustainability**

- The REF will contribute towards the prevention of pollution and unsustainable ecological degradation through the use of non-renewable energy resources.
- It promotes sustainable development and use of renewable energy with a much smaller carbon footprint than coal, which is currently the dominant form of electricity generated in South Africa.
- Wind energy can be considered as an alternative of meeting the need for increased electricity demand over other sources of generation such as fossil fuels. These reasons include:
 - Positive impact on climate change;
 - Overcoming the country's energy constraints;
 - Diversification and decentralisation of supply;
 - Reduced costs of energy; and
 - Positive economic development including job creation.
- With a view to reducing the effects of climate change, South Africa has committed to decreasing its dependence on fossil fuels, and increasing its utilization of renewable energy. The additional power produced by REFs would supplement the national grid with a sustainable form of renewable energy, thus driving regional and national economic development, as well as providing local business opportunities, skills development and employment opportunities.
- Conventional coal fired power stations use large quantities of water during their cooling processes. REFs require limited amounts of water during construction and a minimal amount of water during operation.
- Throughout the EIA process, Critical Biodiversity Areas (CBAs), sensitive areas and no-go areas on the proposed development sites were identified through specialist input. The presented final layout avoids these areas where possible, and if not possible due to wind farm viability, mitigation measures are to be implemented to assist in reducing negative impacts and enhancing positive impacts.
- The employment opportunities associated with the Khangela Emoyeni REF is approximately :
 - 300 during construction and
 - 75 during the operational phases
- It is anticipated that there will be full time security, maintenance and control room staff required on site.
- The spatial principles and strategies of the Western Cape Provincial Spatial Development Framework are supported.

▣ **The Principle of Efficiency**

- The proposed development will contribute towards lower carbon emission goals to combat climate change and provide cleaner energy than coal which currently makes up the large majority of the national energy mix.
- This project would make use of the area's wind resources to provide cost-effective electricity to the national grid.
- The footprint of the proposed infrastructure would equate to a small percentage of the total land area.

▣ **The Principle of Spatial Resilience**

- The REF has a lifespan of more than 20 years and will contribute significantly to the local economy.
- Extensive research and numerous specialist studies provided input in the design and optimisation of the REF.
- Specialist studies included, but not limited to, noise, agriculture, bat, ecological, avifauna, social and visual impact were conducted.
- The impact assessment process confirmed that negative impacts can be mitigated.
- The Environmental Management Programme will ensure strict implemental guidelines during construction and operation.

▣ **The Principle of Good Administration**

- Prior to implementation, all relevant legislative approval will be obtained to ensure legislative compliance.
- The application for consent use supports the principles of the relevant policies, guidelines and Spatial Development Frameworks.
- The development obtained a positive Environmental Authorisation and CAA Approval.
- The development will obtain approval from Department of Agriculture, Land Reform & Rural Development.

▣ **LUPA Section 53 (Agricultural Land)**

Section 53 of the Act requires Provincial approval if land development is proposed on agricultural land that has been cultivated or irrigated during the 10 years immediately preceding the application.

As part of the environmental impact assessment process, a detailed Soil, Land Use, Land Capability and Agricultural Potential Survey was conducted by Terra Soil Science.

Refer to Annexure 16 : Soil, Land Use, Land Capability and Agricultural Potential Survey

The survey concluded that "the proposed development of a wind energy facility on the site will have a small impact on agricultural activities as the soils are of very low potential and only suited to extensive grazing. The turbine footprints are limited to rocky and shallow soil areas with very limited grazing potential".

It is confirmed that the Khangela Emoyeni REF development will not take place on cultivated or irrigated land as contemplated in Section 53 of the Act and Regulations.

3.6 National Policy

3.6.1 National Energy Act, 2008 (Act 34 of 2008)

The National Energy Act was promulgated in 2008 (Act No 34 of 2008). One of the objectives of the Act was to promote diversity of supply of energy and its sources. In this regard, the preamble makes direct reference to renewable resources, including wind :

"To ensure that diverse energy resources are available, in sustainable quantities, and at affordable prices, to the South African economy, in support of economic growth and poverty alleviation, taking into account environmental management requirements (...); to provide for (...) increased generation and consumption of renewable energies..."

3.6.2 White Paper on the Energy Policy of the Republic of South Africa, 1998

Investment in renewable energy initiatives, such as the proposed REF, is supported by the White Paper on Energy Policy for South Africa (December 1998). In this regard the document notes :

"Government policy is based on an understanding that renewables are energy sources in their own right, are not limited to small-scale and remote applications, and have significant medium and long-term commercial potential".

"Renewable resources generally operate from an unlimited resource base and, as such, can increasingly contribute towards a long-term sustainable energy future".

The support for renewable energy policy is guided by a rationale that South Africa has a very attractive range of renewable resources, particularly solar and **wind** and that renewable applications are in fact the least cost energy service in many cases; more so when social and environmental costs are taken into account.

Government policy on renewable energy is thus concerned with meeting the following challenges :

- Ensuring that economically feasible technologies and applications are implemented
- Ensuring that an equitable level of national resources is invested in renewable technologies, given their potential and compared to investments in other energy supply options
- Addressing constraints on the development of the renewable industry

The White Paper also acknowledges that South Africa has neglected the development and implementation of renewable energy applications, despite the fact that the country's renewable energy resource base is extensive and many appropriate applications exist.

The White Paper also notes that renewable energy applications have specific characteristics that need to be considered. Advantages include :

- Minimal environmental impacts in operation in comparison with traditional supply technologies
- Generally lower running costs, and high labour intensities

3.6.3 White Paper on Renewable Energy

The White Paper on Renewable Energy (November, 2003) supplements the *White Paper on Energy Policy*, which recognizes that the medium and long-term potential of renewable energy is significant. This Paper sets out Government's vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa.

The White Paper notes that while South Africa is well endowed with renewable energy resources that have the potential to become sustainable alternatives to fossil fuels, these have thus far remained largely untapped.

Government's long-term goal is the establishment of a renewable energy industry producing modern energy carriers that will offer in future years a sustainable, fully non-subsidised alternative to fossil fuels.

3.6.4 Department of Energy Process for Independent Power Producers (IPP)

Globally there is increasing pressure on countries to increase their share of renewable energy generation due to concerns such as exploitation of non-renewable resources. In order to meet the long-term goal of a sustainable renewable energy industry and to diversify the energy-generation mix in South Africa, a goal of 17.8GW of renewables by 2030 has been set by the Department of Energy (DoE) within the Integrated Resource Plan (IRP) 2010. This energy will be produced mainly from wind, solar, biomass, and small-scale hydro (with wind and solar comprising the bulk of the power generation capacity). This amounts to $\pm 42\%$ of all new power generation being derived from renewable energy forms by 2030.

In responding to the growing electricity demand within South Africa, as well as the country's targets for renewable energy, Emoyeni Wind Farm Project (Pty) Ltd, an Independent Power Producer (IPP), proposes the establishment of a renewable energy facility and associated infrastructure in the Western Cape Province to add new capacity to the national electricity grid.

It is anticipated that this project will form part of the 5th round of the Renewable Independent Power Producer Program (REIPPP).

3.7 Spatial Development Frameworks

Section 42 (1) (b) of SPLUMA requires Municipalities and Planning Tribunals (MPT) to take decisions that are consistent with :

"make a decision which is consistent with norms and standards, measures designed to protect and promote the sustainable use of agricultural land, national and provincial government policies and the municipal spatial development framework".

The following sections specifically relate to the applicable Spatial Development Frameworks and confirm that the application is consistent with the SDF's as contemplated in Section 42 (1) (b) of SPLUMA.

3.7.1 National Spatial Development Framework (NSDF)

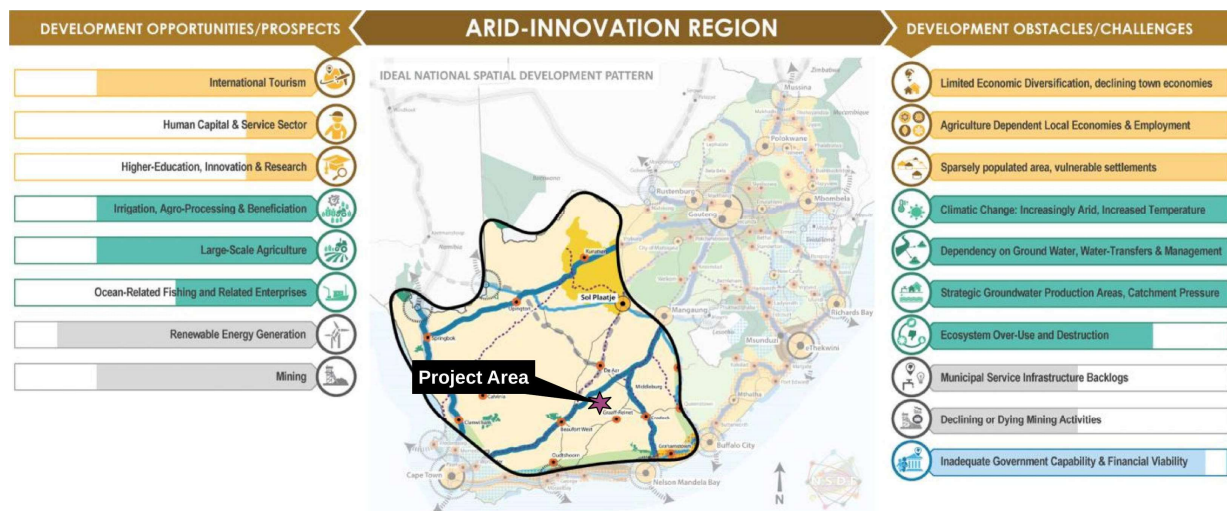
The recently completed National Spatial Development Framework (NSDF) identified, amongst others, National spatial action areas.

In order to create such a “*shared, smaller, better connected and more sustainable South Africa*”, the NSDF identifies the most urgent short-term, strategic spatial development catalysts to bring about radical spatial transformation at scale, manage and mitigate rising national risks, and move our country at speed towards the Ideal National Spatial Development Pattern. These are called National Spatial Action Areas (NSAAs).

Concerted, focused and sustained intergovernmental collaboration is required in these NSAAs in the short term to :

- Target national spatial development actions and interventions; and
- Kickstart the process of aligning plans, budgets and departmental plans in and between spheres of government around national spatial development priorities.

The Khangela Emoyeni REF falls within the Arid-Innovation Region (NSAA).



The NSDF proposals relevant to this application are :

- Strengthening and expanding alternative energy generation
- Managing land development and economic activities, to ensure the protection of critical natural resources
- Utilised existing regional planning/Regional Spatial Development Framework processes to focus on green energy generation

Renewable energy is therefore one of the catalyst interventions proposed for the area through the NSDF. The Khangela Emoyeni REF project support the principles of the NSDF.

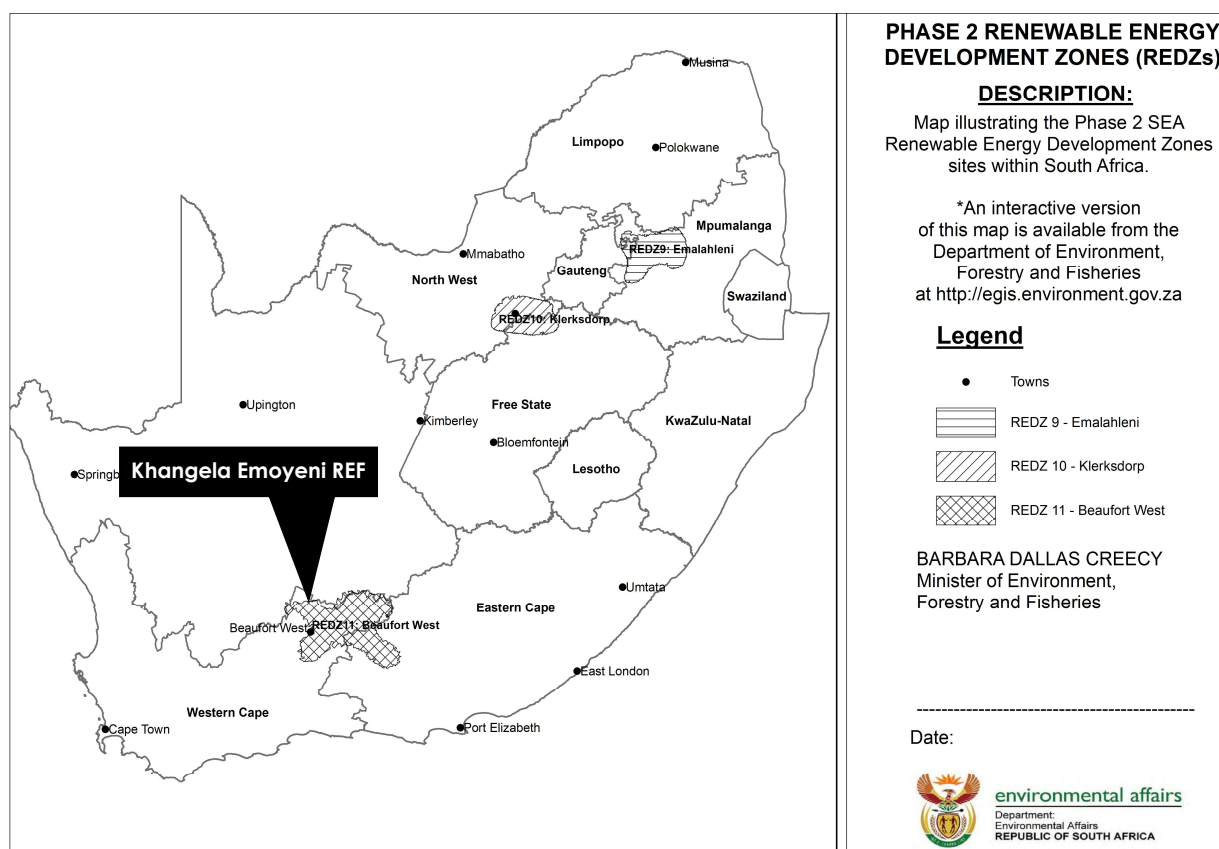
3.7.2 Renewable Energy Development Zones (REDZs)

On 16 February 2018, Minister Edna Molewa published Government Notice No. 114 in Government Gazette No. 41445 which identified 8 Renewable Energy Development Zones important for the development of large-scale wind and solar photovoltaic facilities.

On 26 February 2021, Minister Barbara Dallas Creecy, published Government Notice No. 142, 144 and 145 in Government Gazette No. 44191 which identified 3 additional REDZs for electricity transmission or distribution infrastructure or large-scale wind and solar photovoltaic energy facilities.

The Beaufort West area is identified for large scale wind and solar photovoltaic energy facilities and earmarked as Renewable Energy Development Zone 11.

The proposed Khangela Emoyeni REF is situated within Renewable Energy Development Zone 11.



Phase 2 REDZ zones

3.7.3 Western Cape Provincial Spatial Development Framework (2014) (WCPSPDF)

The WCPSPDF implemented 3 interrelated themes, i.e. :

- Sustainable use of spatial assets
- Opening opportunities in the space economy
- Develop implemented and sustainable settlements

As part of these themes, spatial policies support sustainable implementation of renewable energy solutions, i.e. :

- *Support emergent Independent Power Producers (IPPs) and sustainable energy producers (wind, solar, biomass and waste conversion initiative) in suitable rural locations (as per recommendations of the Strategic Environmental Assessments for wind energy (DEADP) and renewable energy (DEA)).*
- *Encourage and support renewable energy generation at scale.*

In support of these policies, the Western Cape Infrastructure Framework (2013) promotes the development of renewable energy plants in the Province.

3.7.4 Central Karoo District Municipality Spatial Development Framework (2020)

The Beaufort West Local Municipality is situated in the Central Karoo District Municipal area. The SDFs for these areas present the spatial vision and objectives for development implementation, specifically in relation to the Khangela Emoyeni REF.

The spatial vision for Central Karoo DM :

*Working Together in Development and Growth
in order to ensure that the Central Karoo becomes a place where economic growth, social development and sustainability is achieved whilst maintaining the rural character, as well as embracing and developing the diversity of the communities.*

❑ District wide spatial concept :

The **spatial concept for the district municipality** focusses on sustainable development, resilience and partnerships.

The four strategies of the municipal wide spatial concept are:

1. A region that **protects the environment, enhances resilience and capitalises** on and honour's the Karoo charm in support of a vibrant people and economy.
2. **Improve regional and rural accessibility and mobility** for people and goods in support of a resilient economy.
3. **Allocate government resources, infrastructure and facilities** in a manner that uplifts and skills people and focusses on maximising impact on the most possible people, while providing a basic level of service for all.
4. **Partnership-driven governance** and administration towards improved financial and non-financial sustainability and resilience.

Municipal strategy 1 (applicable to this application) :

A resilient region is one that can adapt to and mitigate against the negative effects of climate change, increasing temperatures, reduced rainfall and the host of downstream impacts on the economy and society at large. The future vibrancy of the economy and social advances will invariably be rooted in the resilience of the natural environment to a host of negative impacts.

- **Policies in support of this strategy (applicable to this application) :**

Support and promote the renewable energy :

The Karoo region is blessed with significant solar and wind energy – the prerequisites for successful renewable energy projects. The Central Karoo should leverage these assets to encourage Independent Power Producers to locate in the region, by making and keeping the Central Karoo a well-managed and desirable place to locate.

National government has identified preferred areas or Renewable Energy Development Zones (REDZ's), as well as identified areas for electricity generation. Notwithstanding this, there are vast areas of the Central Karoo outside of these REDZ's that hold potential to generate renewable energy. These areas should not be completely ignored in supporting the future energy resilience of the province and country.

Policy Guidelines:

- Actively seek out green energy projects to be located in the region.
- Put in place incentives to encourage green energy operators to locate in the Central Karoo.
- Lobby the National Department of Mineral Resources and Energy to expand the Renewable Energy Development Zones extensively within the Central Karoo, in order to promote renewable energy opportunities.

The Khangela Emoyeni REF project supports the principles as contained in the Central Karoo DM Spatial Development Framework.

3.8 Beaufort West Municipality

3.8.1 Beaufort West Municipality Integrated Development Plan (2017-2022)

The mission statement for the Beaufort West Municipality, as contained in the IDP is :

To reflect the will of the South African people as reflected in the Constitution and by Parliament:	
Service Delivery:	To provide excellent services to the residents of Beaufort West Municipality
Growing the economy:	To implement infrastructure to grow the economy and create jobs;
Staff:	To have an equipped, skilled and motivated staff establishment;
Well-run administration:	establish a sound, efficient and effective administration for the Municipality;
Financial Sustainability:	Collecting all debtors and paying creditors in time;
Sport centre:	To become the sport and recreational mecca of the Karoo, creating harmony and unity
Safe place:	To create a crime-free, safe and healthy environment
Reduce Poverty:	To reduce poverty and promote the empowerment of women, youth and people living with disabilities

The municipal strategic focus areas are the priority areas of the municipality with the following priorities:

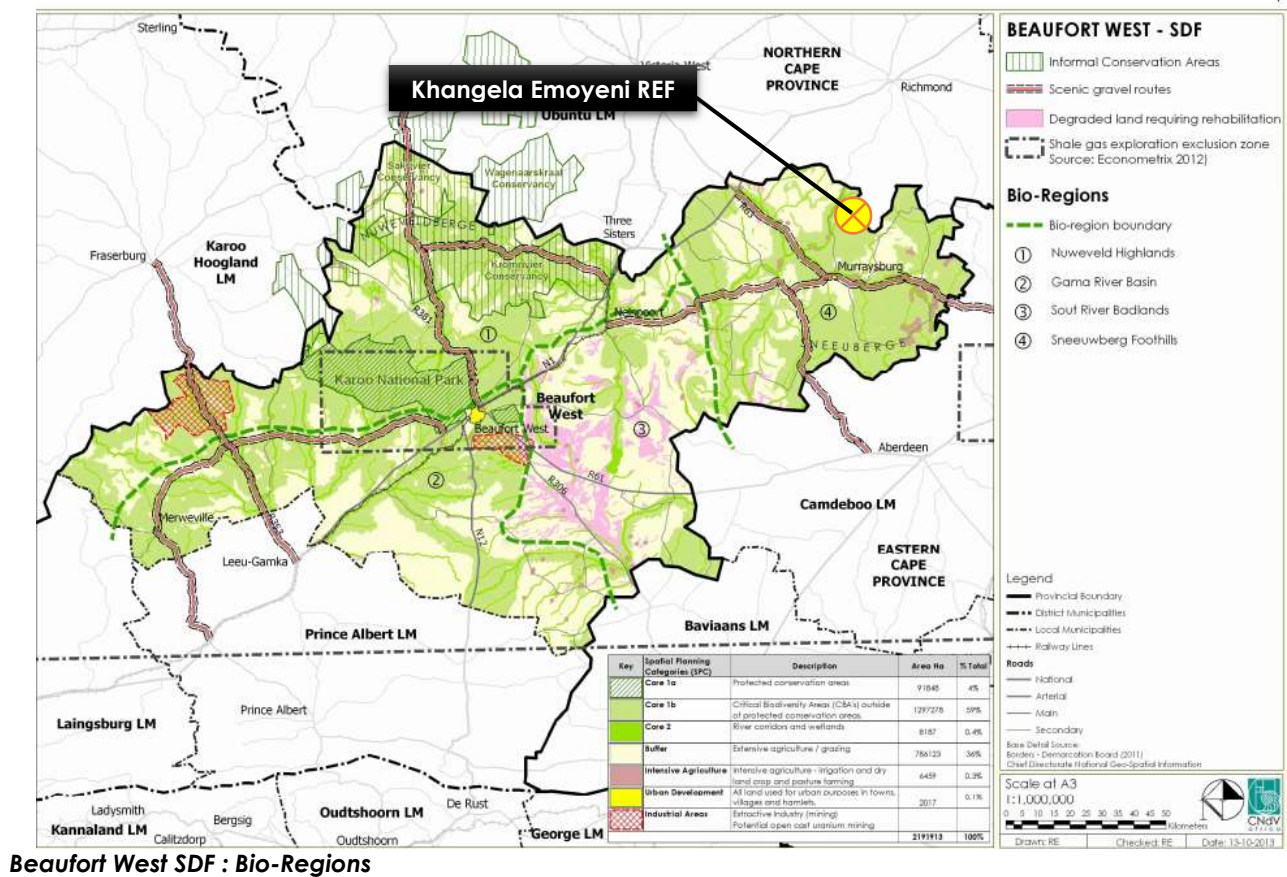
- Basic Service Delivery and Infrastructure Development
- Economic Development
- Institutional Development and Municipal Transformation
- Financial Viability and Management
- Good Governance and Community participation

The proposed Khangela Emoyeni REF supports the Municipality's strategic focus areas, insofar as job creation, economic development, sustainability and support for National and Provincial programmes of concern.

3.8.2 Beaufort West Municipality Spatial Development Framework (2013)

The spatial development framework for the municipality comprises the following elements:

- Bio-regions
- Spatial Planning Categories (SPCs)
- Sustaining the Economy
- Major Infrastructure Projects
- Major Tourism Destinations
- Land Reform
- Urban Related Development
- Urban Design Guidelines
- Potential Rural Nodes and Periodic Rural Markets; and,
- Settlement Hierarchy



■ Bio-Regions

The SDF identified four bio-regions that can be distinguished in terms of the natural environment and economy. The bio- regions are:

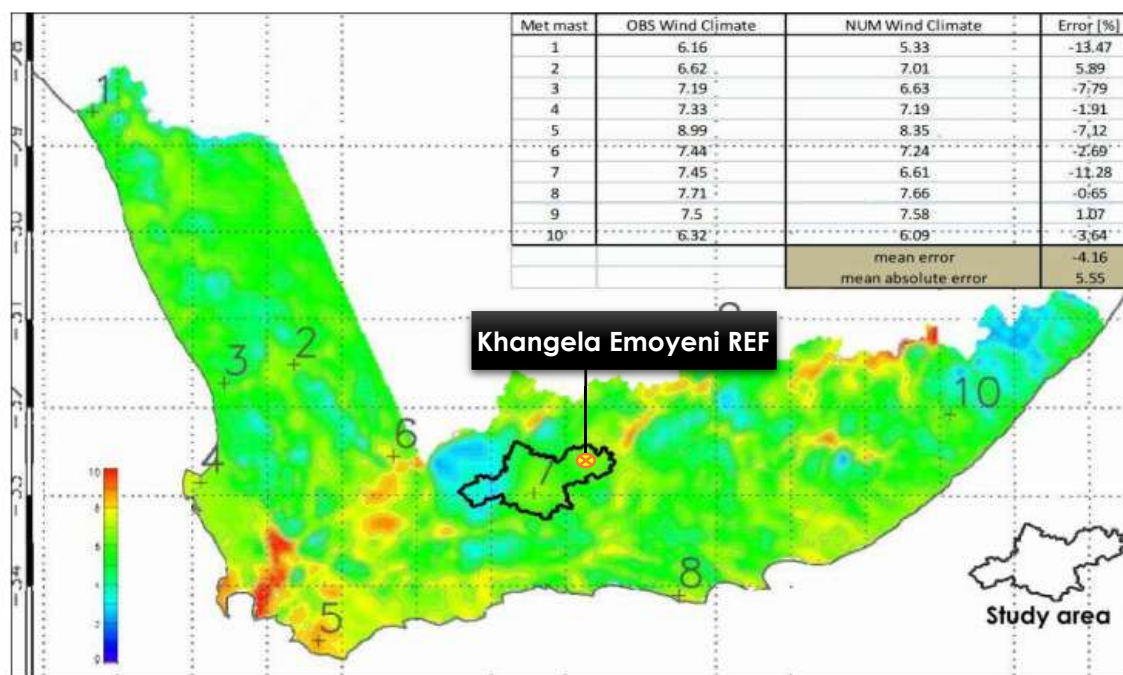
- Nuweveld Highlands
- Gamka River Basin
- Sout River Badlands
- Sneeuwberg Foothills

The Khangela Emoyeni REF is situated in the Sneeuwberg Foothills bio-region and the **SDF acknowledge the fairly good potential for renewable energy in this region.**

■ Wind and Solar Farm Siting Principles

The figure below indicates the estimated wind speeds for South Africa and provides an indication of the potential for generation of wind energy. The central and eastern parts of the Beaufort West Municipality have the highest wind speeds (6 – 8m/s).

This indicates that potential for wind energy generation exists in this area of the Beaufort West municipality.



Estimated wind speeds for South Africa

CNdV Africa prepared a Strategic Initiative to introduce Commercial Land based Wind Energy Development to the Western Cape in May 2006. The purpose of this study was to develop a regional methodology for wind energy site selection. The study provided a number of site factors for locating wind energy projects. Even though no specific reference was made to solar farm siting some of the factors could be applied to solar farms.

The report highlighted the site factors as being important: Slope, Geology, Soils, Rainfall, Surface Hydrology and Groundwater, Vegetation and Terrain Stability.

The Khangela Emoyeni REF support the wind farm siting principles as contained in the Beaufort West Municipality SDF and will be a major contributor to a sustainable economy.

The Environmental Impact Assessment process, as required by the National Environmental Management Act, is comprehensive in addressing various impacts, mitigating measures, alternatives and options prior to final approval, implementation and operation of a wind energy facility. Argus Consultancy Services Ltd co-ordinated the Environmental Impact Assessment process and this included various specialist studies.

The following Specialist Studies supported the EIA :

- Land Use, Soil and Agricultural Potential Impact Assessment
- Avifaunal Impact Assessment
- Bat Impact Assessment
- Noise Impact Assessment
- Visual Impact Assessment
- Archaeology Impact Assessment
- Terrestrial Ecology Impact Assessment
- Palaeontology Impact Assessment
- Freshwater Ecology Impact Assessment
- Socio-Economic Impact Assessment

The Environmental Impact Assessment process for the Khangela Emoyeni Wind Energy Facility and the Eskom Grid Infrastructure was conducted in 2014 and received an Environmental Authorisation (EA) for the construction of the Khangela Emoyeni REF and the grid connection infrastructure on 6 September 2018.

There have been advancements to wind turbine technology since the issuing of the EA, and the turbines authorised in the EA will no longer be viable for the project in terms of production and economic viability of the project. Amendment to the authorised turbine specifications have been approved (14/12/16/3/3/2/687AM1, dated 30.03.2021) and this amended technology will increase the efficiency of the facility consequently the economic feasibility of the project.

The following Environmental authorisations were issued, relevant to the Khangela Emoyeni REF :

- Environmental Authorisation 14/12/16/3/3/2/687 (dated 06.09.2018)
- Environmental Authorisation Eskom Distribution Grid Connection Infrastructure 14/12/16/3/3/2/685 (dated 06.09.2018)
- Amendments of the Environmental Authorisation 14/12/16/3/3/2/687AM1 (dated 30.03.2021)
- Environmental Authorisation Eskom Distribution Grid Connection Infrastructure (substation) 14/12/16/3/3/2/411 (dated 02.07.2015)

The Environmental Impact Report should be consulted for detailed assessments.

Refer to Annexure 11 : Revised Final Environmental Impact Assessment Report for the Proposed Umsinde Emoyeni Wind Energy Facility Phase Two : Summary (February 2018)

Refer to Annexure 12 : Final Amendment Report (2020)

Refer to Annexure 13 : Environmental Authorisation & Amendments

4.1 Revised Final Environmental Impact Assessment Report for Umsinde Emoyeni Wind Energy Facility – Phase Two (2018)

The following sections from the Revised Final Environmental Impact Assessment Report for Umsinde Emoyeni Wind Energy Facility – Phase Two (2018) outline a brief summary of the various specialist studies and impact outcomes.

4.1.1 Project Layout Evolution

The original layout consisted of 98 turbines. The applicant, after taking into account the findings and recommendations of the additional avifauna information, agreed to revise the turbine and reduce the number of turbine placements to 55 turbines. This 55 turbine layout was provided to all specialists to review and provide updated impact assessments on. The specialists updated their assessments where necessary and provided revised buffer areas and no go areas of high sensitivity.

Through an iterative process that took into account all the recommendations and conclusions put forward by the specialists (including additional constraints, sensitive areas and no go areas) a Revised Final layout was produced, which consists of 35 turbines for Phase 2 of the development.

4.1.2 Alternative Assessment

Alternatives are different means of meeting the general purpose and need of a proposed development and may include alternative sites, alternative layouts/designs, alternative technologies and/or the no development alternative.

▣ No Development Scenario

The 'No Development' scenario assumes that the proposed development does not proceed.

This result will include the following:

- The land-use remains agricultural with no further benefits derived from the implementation of a complementary land use.
- There is no change in the current landscape or environmental baseline.
- Whilst no REF development will occur on site, other wind energy projects go ahead as planned in the surrounding area.
- No additional electricity will be generated onsite or supplied through means of renewable energy resources. This would have implications for the South African Government in achieving its proposed renewable energy target.
- There is no opportunity for additional employment (albeit temporary) in the local area where job creation is identified as a key priority.
- The local Economic Development benefits associated with the REF development's REIPPPP commitments will not be realised.

The No Development alternative was not considered feasible in the context of the proposed development and the needed power that will be generated from this renewable resource.

■ Site Selection Process and Criteria

The proposed development, Umsinde Emoyeni Phase Two (now referred to as the Khangela Emoyeni REF), was selected out of WDSA's portfolio based on anticipated wind resource (high wind speeds), proximity to existing grid infrastructure, land availability, minimum technical constraints from a construction perspective and absence of high level environmental issues. Numerous alternative sites were discounted at the site selection process on both technical and environmental considerations.

4.1.3 Summary of Impact Assessment

Potential environmental impacts were evaluated according to their extent, duration, intensity and magnitude. Negative impacts of the proposed project on the biophysical environment include clearing of vegetation that leads to habitat fragmentation, potential loss of species of concern, soil erosion, surface water pollution; while social-economic impacts being minimal loss of agricultural land, disruption of social relations within the proposed area by the introduction of contractor workers from different areas, spread of diseases, loss of potential heritage resources and impact on sense of place.

All impacts have been identified and assessed at different stages (design/planning, construction, operation and decommission) and possible mitigation measures assigned to ensure low significance (for negative impacts) or high significance (for positive impacts).

4.1.4 Summary of Findings

From the assessment, it is evident that the construction and the operation of the REF and grid connections will have negative impacts both socially and environmentally but when appropriate mitigation measures applied negative impacts are outweighed by positive impacts.

Overall the project has a positive economic impact regionally and for South Africa through the generation of clean power, the creation of job opportunities in a extremely rural and economically depressed area, and contribute to the local and regional economy. All identified negative impacts can be successfully mitigated and there are no impacts with an assigned significance rating of "High" after mitigation has been implemented.

Throughout the process for Khangela Emoyeni REF sensitive areas and constraints within the REF site boundary were identified by the specialists. This included results from 24 month bird and 12 month bat monitoring programmes. Constraints maps were delivered to the applicant and these were taken into consideration in the development of the proposed turbine layout and grid connections. Therefore the proposed location of Phase One within the REF site boundary takes into consideration these identified constraints and is outside of highly sensitive areas. The applicant has optimised the development layout and produced a layout, which takes into consideration, all environmental and social factors, including potential cumulative impacts.

Through this process, the layout has evolved from 98 turbines to 55 turbines to the now proposed 35 turbines. Based on this assessment and the finding of the updated specialist's assessments, it is the opinion of the Environmental Assessment Practitioner (EAP) that the majority of negative impacts associated with the implementation of the proposed project have been mitigated to acceptable levels and the extent of the benefits associated with the implementation of the projects will benefit a much larger group of people, in terms of a positive local and regional economic impact, job creation, community upliftment and by definition the generation of power for the country.

4.1.5 Impact Statement

The proposed Umsinde Emoyeni REF Phase 2 has the potential to provide much needed renewable energy to the country's grid.

The potential positive impacts associated with the proposed project is further recognised through the creation of jobs for the local community, and the positive contributions to the socio-economic development of the surrounding areas and local communities.

Should the Khangela Emoyeni REF be developed, the actual physical footprint of the wind turbines and associated onsite infrastructure will occupy an area of land equivalent to less than 1% of the total project area. Small livestock grazing and other agricultural activities can continue in parallel with the operation of the turbines. The project will have no significant impact in terms of loss of agricultural productivity. Should the mitigation measures identified by specialists and the recommendations of the EMPr be effectively implemented the negative impacts associated with the proposed project will be significantly reduced.

Overall the development will have a moderate to low impact after mitigation and with the implementation of the recommended mitigation measures, impacts will be reduced to acceptable level, from an ecological perspective. As the impacts on broad-scale processes in particular have been reduced, the need for some sort of on-site conservation management action as originally recommended is seen as no longer necessary.

The overall conclusion reached with regards to the Umsinde Emoyeni Phase 2 is that *"The ecological impacts associated with the development of the Umsinde Emoyeni Phase 2 will generally be low after mitigation. There are no fatal flaws or high impacts associated with the development that cannot be reduced to a low level. As such, the development of the Umsinde Emoyeni Phase 2 is considered to be ecologically acceptable and there are no ecological considerations that should prevent the projects from being approved."*

Taking into consideration the findings of the EIA process for the proposed development and the fact that recommended mitigation measures have been used to inform the project design, and the layout of the facility has significantly reduced from 98 turbines to 35, it is the opinion of the Environmental Assessment Practitioner (EAP) that the majority of negative impacts associated with the implementation of the proposed project have been mitigated to acceptable levels. While the residual visual impact and the loss of "sense of place" of the project will have an impact on local receptors, the extent of the benefits associated with the implementation of the projects will benefit a much larger group of people, in terms of renewable energy supply and positive local and regional economic impact.

4.2 Final Amendment Report for Khangela Emoyeni Wind Energy Facility (2020)

The following sections from the Final Amendment Report for Khangela Emoyeni Wind Energy Facility (2020) outline a brief summary of the various specialist studies and impact outcomes.

4.2.1 Proposed Amendments

Emoyeni Wind Farm Project (Pty) Ltd received an Environmental Authorisation (EA) for the construction of the Umsinde Emoyeni Wind Energy Facility Phase Two in the Western Cape Province (DEA ref: 14/12/16/3/3/2/685) on 6 September 2018.

Advances in technology and refinement of the design has resulted in a change in scope. The scope changes are namely based on the new, bigger turbines which are more efficient, resulting in a slight change to the environmental footprint. Windlab aims to complete the project in order to supply electricity to the National Government and in turn local and nation-wide communities at the least economical cost per kWh, whilst limiting the impact on the receiving environment as far as possible.

The following amendments to the Environmental Authorisation have been approved :

- Project name and affected properties.
- The turbine specifications ; the upper limit for hub height, blade length and rotor diameter have increased, and each turbine requires a larger permanent hardstand area.
- Reduction in the total number of turbines due to the increased generation capacity per turbine; with associated changes to the layout.
- The road alignments have changed in respect to turbine placement changes, along with the underground cables which follow these. Roads will also be temporarily widened further for construction access roads due to the larger turbine components and vehicles.
- An extension of the validity of the EA.
- Correcting the project location to reflect only the properties associated Umsinde Emoyeni Phase 2 (i.e. currently the authorisation also includes the Umsinde Emoyeni Phase 1 properties).

4.2.2 Summary of changes from the amendments

The amendments are in respect to the turbine specifications being larger, the hub height, blade length and rotor diameter have increased, and each turbine requires a larger permanent hardstand area. There is a reduction in the total number of turbines due to the increased generational capacity per turbine, with associated changes to the layout. In addition, the road alignments have changed in respect to turbine placement changes, along with the underground cables which follow these. Roads will also be temporarily widened further for construction access roads due to the larger turbine components and vehicles.

In summary, the main implications of this are as follows:

- **Terrestrial ecology :**

The overall footprint in natural areas increases slightly from 54.7 ha to 59.4 ha (due to increased temporary and permanent turbine hardstand areas, and wider construction roads). However, in reality it would likely not exceed 54 ha based on the generation capacity. Permanent infrastructure footprints will also be reduced. The reduced number of turbines means fewer areas of disturbance during construction, the change in which is not significant. Overall, none of the impacts are significant enough to warrant a change in original impact significance ratings.

- **Wetlands and freshwater ecology :**

The amended layout and footprint have little consequence as the most sensitive areas of the delineated aquatic zones are avoided, with the exception of watercourse crossings which remain similar in number. None of the changes are significant enough to warrant a change in original impact significance ratings.

- **Avifauna:**

The Rotor Swept Area (RSA) would increase in the worst-case scenario of 33 large turbines (by 35.8%) and this moderate increase would normally be considered to be significant at this location due to the presence of Verreux's Eagles in the area. It is however highly unlikely that the proposed amendment would translate into a significantly increased RSA without exceeding the maximum generation capacity as authorised and these scenarios have been demonstrated. The no-go areas have also been revised and expanded based on additional fieldwork, the results of the Verreux's Eagle Risk Assessment Tool (VERA) model as well as further rocky ridge buffers based on the Verreux's Eagle guidelines. In summary, the proposed amendment would likely significantly reduce the potential risk of the Verreux's Eagles and other avifauna compared to the original authorisation post-mitigation, through a vastly improved layout and a potential reduction in the number of turbines.

All significance ratings remain the same except for the cumulative impact rating which is lower post-mitigation for the amendment, and new mitigation has been proposed based on the more recent field work and additional best practice guidelines.

- **Bats:**

As with avifauna, the RSA increases by 35.8% for the amendment and represents a worst case and unlikely scenario given the maximum generation capacity. In terms of bat fatalities from collisions or barotrauma, there is likely to be a reduced fatality as there is zero encroachment of turbines into high sensitive areas (with only seven turbines in medium sensitive habitats / buffers), and the higher reach of the lowest blade tip is expected to outweigh the probable increased fatality of bats from the greater total rotor swept area under the worst-case scenario of 33 turbines with a 180 m rotor diameter. Under the same worst-case scenario, there will be a slightly greater impact on the fragmentation of, and displacement of bats from, suitable foraging habitats as demonstrated by the increase in construction footprint. The only impact rating to change is that of operational fatalities and this reduces from very-high to high negative significance without mitigation, remaining low negative significance with mitigation. Revised mitigation relating to design, construction and operational phases is provided which includes monitoring and curtailment.

- **Heritage:**

The potential negative changes from the increased hardstand footprints and construction road widths are offset by the decrease in the number of turbines and the fact that the maximum authorised length of internal roads will reduce. There is a relatively low archaeological potential within the site therefore the slightly increased footprint is not of significance. Furthermore, the infrastructure remains outside the identified areas of heritage sensitivity. The siting of the REF on the more remote and desolate high dolerite hills also goes some way to addressing the issue of landscape and setting.

In terms of palaeontology, the infrastructure will now be situated within paleontologically insensitive areas underlain by Karoo dolerite (compared to the 2015 study). These changes, together with the slightly reduced number of turbines compared to the 2018 authorised layout, tend to reduce the palaeontological impact significance of the REF but are at least partially offset by the anticipated larger volume of bedrock excavations for the turbine footings as well as a slight increase in total area of surface clearance in the case of the 4.5 MW scenario (as demonstrated in Table 4). The impact rating for palaeontology has reduced both with and without mitigation, whilst cumulative palaeontology impacts which were unrated before are rated as very low negative significance with mitigation.

Cumulative impacts on the cultural landscape remain significant.

- **Visual:**

The increased hub height, rotor diameter and blade tip height would have a limited effect on the zone of visual influence and the change in turbine size may only be noticeable within a range of 5 km. Therefore there are no changes to the impact ratings and no additional mitigation proposed.

- **Noise:**

The proposed project will have a noise impact of a low significance on all identified NSDs in the area during both construction and operational phase as the proposed layout locates the turbines further than 1,000 m from any identified NSD. The change in wind turbine specifications such as wind turbine hub height and rotor diameter does not relate to sound power emission levels which depends on model and make of a turbine. Therefore, selecting a turbine model with a lower sound power emission will reduce noise emissions. There are no changes to the impact ratings and no additional mitigation proposed.

4.2.3 Cumulative impact

The following cumulative impacts have resulted in a change when compare to what was assessed in 2018:

- Avifauna collisions: very high negative significance with mitigation, reduced to high negative significance with mitigation.
- Bat fatalities due to collision or barotrauma: very high negative significance without mitigation, reduced to high negative significance with mitigation; remaining at low negative significance with mitigation.
- Impact on local paleontological resources: previously unrated, rated as low negative significance with mitigation, to very low negative significance with mitigation.

4.2.4 Advantages and disadvantages

Summary of the advantages and disadvantages of the changes associated with the amendment :

Change :	Advantage :	Disadvantage :
Terrestrial ecology	None identified	None identified
Wetlands and freshwater ecology	None identified	None identified
Heritage	None identified	In terms of archaeological sites and materials, particularly for rock engravings, an expanded physical footprint of development-related ground disturbance (in a worst-case scenario) is a disadvantage but is not deemed to be significant.
Avifauna	The advantages of the proposed amendment relate to the significantly improved layout and increase in the individual generating capacity of the turbines considered allowing for a reduction in the total number of turbines required to achieve the maximum generation capacity of the facility. The layout associated with the proposed amendment has been informed through the use of the latest available information such as the Verreux's Eagle Risk Assessment Tool (VERA, which was not previously available), resulting in updated expanded buffers, revised turbines positions and an expected reduction in the risk of negative impacts of the facility on avifauna compared to the original authorisation.	The disadvantages of the proposed amendment relate to the increase in the RSA should the maximum number of turbines (33) be constructed. This scenario is unlikely however as the maximum generation capacity of the facility would be exceeded if the maximum number of turbines with the maximum rotor diameter were to be constructed.
Bats	There are a fewer number of turbines. The higher reach of the lowest blade tip is also expected to reduce the fatality risk of clutter and clutter-edge foraging's bat species; and there is a smaller footprint required for the operational road surface area. All of these factors reduce the impacts on bats.	Factors likely to increase the impact on bats include the potentially wider rotor diameter and greater rotor swept area of individual turbines, and potentially for all turbines combined in a worst-case scenario; the potentially larger permanent handstand area of individual turbines and potentially for all turbines combined in a worst-case scenario; the larger temporary construction handstand area of individual turbines and potentially for all turbines combined in a worst-case scenario; and the greater widening of internal roads at certain places during construction.
Visual	None identified	None identified
Noise	None identified	None identified

4.2.5 Conclusion

In conclusion, there are both advantages and disadvantages to the proposed amendments and these appear to be balanced. Developing all 33 turbines at the maximum turbine specification is not possible since the total capacity (in MW), as authorised, would be exceeded. This worst-case scenario has been considered by the specialists, but they have also considered several more realistic scenarios relating to turbine size and number that demonstrate less significant impacts.

The amended layout avoids all the no-go areas, which includes additional sensitive areas as a result of the amendment studies. Therefore, risks have been further avoided through the application of the mitigation hierarchy.

As a whole the environmental impacts due to the amendments are not considered to differ significantly from the project as originally assessed and authorised. In some cases, impact ratings have been reduced to be of lesser significance.

A number of additional mitigation measures, many of which have come to light through new information, guidelines and field work have been recommended to further ensure unavoidable impacts are at least mitigated. These have been updated in the EMPr.

It is clear from the unique nature and scale of the proposed Khangela Emoyeni Renewable Energy Facility, that it will have significant benefits to the communities of the greater Beaufort West and Central Karoo Districts and will contribute significantly to the provision of renewable energy in South Africa. The importance of renewable energy, as part of the electricity generating mix in South Africa, cannot be over emphasized. The construction of the Khangela Emoyeni Renewable Energy Facility in the vicinity of Murraysburg in the Western Cape demonstrates this commitment towards renewable energy and green efficiencies.

The development of Khangela Emoyeni Renewable Energy Facility has been assessed by a team of professionals and based on the outcome of the Environmental Assessment Report and specialist studies, it was recommended for approval and implementation.

The importance of development of renewable energy projects on a global basis is undisputed. Globally, the renewable energy industry is investing billions of dollars and the role of this industry to be driver of economic growth within South Africa is seen as significant. In South Africa, the ancillary benefits of grazing and prevention of agricultural loss are essential to the success of the wind farm. The development of the proposed Khangela Emoyeni Renewable Energy Facility will significantly contribute to the electricity supply and economic development of the district. The following are key aspects to be highlighted from this submission :

- Renewable energy and the contribution of Independent Power Producers have been identified as Strategic Important Developments (SID) in South Africa.
- The Environmental Impact Assessment process and Environmental Impact Assessment Report confirms low impacts associated with the proposed development.
- The various specialist studies conducted confirmed minimal impact or impact with mitigating factors.
- The Department of Environmental Affairs issued positive Environmental Authorisations.
- Implementation of the wind generating facility will significantly contribute to local economic development and job creation possibilities.
- The principles of the Spatial Planning and Land Use Management Act are supported.
- Central Karoo and Beaufort West SDFs acknowledged the potential for Renewable Energy generation in the area and promotes renewable energy implementation.
- The development proposal is consistent with the applicable policy and National, Provincial, District and Local Spatial Development Frameworks.
- The development proposal is consistent with the relevant SDFs as contemplated in Section 42 of SPLUMA.
- The Agricultural Assessment concluded that the overall impact of the Renewable Energy Facility on the agricultural potential of the area would be small.
- The development obtained Civil Aviation Authority Approval.
- The development is approved by the Department of Mineral Resources and Energy.
- The construction of the project will not result in the unacceptable clearing of threatened or protected plant species (the proposed development is acceptable from an ecological perspective).

- Implementation of the project will support National Governments targets for renewable energy, including targets identified in the White Paper and supporting policy and legislation.

It is therefore recommended from a planning point of view that the application for the Consent Use: Renewable Energy Structure and Consent Use : Utility Service (Substation) on the farm portions as outlined in the application, be supported and approved.