PROPOSED TERRA POWER SOLUTIONS RIEBEECK EAST WIND ENERGY PROJECT
MAKANA LOCAL MUNICIPALITY
EASTERN CAPE PROVINCE OF SOUTH AFRICA

(Please Note: In all future reports, this project will be referred to as MAKANAOONE WIND ENERGY PROJECT
An amended application has been submitted to the DEA)

DEA Reference Number: 14/12/16/3/3/2/369/
NEAS Reference Number: DEAT/EIA/0001282/2012
AgriLand Reference Number: 2012_06_0122

DRAFT ENVIRONMENTAL SCOPING REPORT

Prepared for: Terra Power Solutions (Pty) Limited
Prepared by: Coastal & Environmental Services

1 Stirk Street, Grahamstown, 6139
P.O. Box 934
Grahamstown, 6140

South Africa
South Africa

September 2012
# CES Report Revision and Tracking Schedule

<table>
<thead>
<tr>
<th><strong>Document Title</strong></th>
<th>Proposed Terra Power Solutions Riebeeck East Wind Energy Project - Draft Environmental Scoping Report</th>
</tr>
</thead>
</table>
| **Client Name & Address** | Terra Power Solutions (Pty) Limited  
1 Stirk Street,  
Grahamstown, 6139 |
| **Document Reference** | 14/12/16/3/3/2/369/ |
| **Status** | Draft |
| **Issue Date** | September 2012 |
| **Lead Author** | Jadon Schmidt  
j.schmidt@cesnet.co.za  
Justin Green  
j.green@cesnet.co.za  
Thomas King  
t.king@cesnet.co.za  
Tarryn Martin  
t.martin@cesnet.co.za |
| **Reviewer** | Chantel Bezuidenhout  
c.bezuidenhout@cesnet.co.za |
| **Study Leader or Registered Environmental Assessment Practitioner Approval** | Chantel Bezuidenhout  
c.bezuidenhout@cesnet.co.za |
| **Report Distribution** | **Circulated to** | **No. of hard copies** | **No. of electronic copies** |
| | DEA | 1 | 1 |
| | DEDEAT | 1 | 1 |
| | Department of Agriculture, Forestry and Fisheries | 1 | 1 |
| | WESSA | 1 | 1 |

This document has been prepared in accordance with the scope of Coastal & Environmental Services (CES) appointment and contains intellectual property and proprietary information that is protected by copyright in favour of CES. The document may therefore not be reproduced, used or distributed to any third party without the prior written consent of Coastal & Environmental Services. This document is prepared exclusively for use by CES’s client. CES accepts no liability for any use of this document other than by its client and only for the purposes for which it was prepared. No person other than the client may copy (in whole or in part) use or rely on the contents of this document, without the prior written permission of CES. The document is subject to all confidentiality, copyright and trade secrets rules, intellectual property law and practices of South Africa.
EXECUTIVE SUMMARY

Background

Terra Power Solutions (Pty) Limited (the applicant) is a company based in Grahamstown which is involved in the development of numerous wind and solar energy projects throughout South Africa.

The proposed wind farm is located in the Makana Local Municipality, Cacadu District Municipality, Eastern Cape Province, South Africa. According to Terra Power Solutions (Pty) Ltd, available wind data in South Africa shows the Riebeeck East farms to have favourable wind conditions sufficient to support a wind farm. This has been confirmed by on site wind monitoring that has been on-going since early 2011. The facility will be located on seven properties, namely: Hilton Farm, Table Hill North, Kruisfontein, Brack Kloof, Table Hill, Slaaikraal Farm and Hounslo. It is situated approximately 22km east of Riebeeck East and 15km west of Grahamstown.

The erection of 77 wind turbines is proposed. The model and size of the turbine selected will depend on on-going wind measurement, the outcome of the EIA process and long term monitoring, and on other technical and financial considerations. The final turbine type selected will be between 100 and 140 metres high, and have a power output of between 2 and 3 MW. The facility will have a generating output ranging between 120 and 140 MW. A wind turbine consists of a vertical tower, hub and three blades. Additional infrastructure required to support the wind farm includes: 6 metre wide access roads, underground cabling running adjacent to the roads, a substation and an on-site storage shed. From the substation, the power generated will be fed into the Eskom grid via the 132 kV line traversing the site.

Project motivation

Most of South Africa’s energy comes from non-renewable sources like coal, petroleum, natural gas, propane, and uranium; however the proponents of renewable energy sources like biomass, geothermal energy, hydropower, solar energy, and wind energy is a major factor that the South African sector need to consider greatly. It is estimated that approximately 1% only of the country’s electricity is currently generated from renewable energy sources. The energy sector in South Africa alone emits approximately 380 988.41 Green House Gases (GHGs) (Eastern Cape Climate Change Conference, 2011).

South Africa’s total emissions was estimated to be 461 million tonnes CO₂ equivalent in the year 2000. Approximately 83% of these emissions were associated with energy supply and consumption (380 988.41 GHGs), 7% from industrial processes, 8% from agriculture, and 2% from waste. This poses great threat to the environment and livelihoods of citizens.

Eskom currently generates 95% of the electricity used in South Africa with a 40.87 GW net maximum installed capacity. By the year 2020 an additional 20 GW generation capacity would be required and up to 40 GW by 2030 to sustain the energy demands in the country. There is however a political will to change the energy mix to reduce the dependency of the economy on fossil fuels and facilitate the uptake of renewable energy resources.

The first step towards a solution in terms of climate change came in the form of the United Nations Convention on Climate Change 1994 (UNFCCC) and its associated Kyoto protocol 1997, adopted at the third session of COP 3, where countries agreed to reduce their greenhouse gas emissions to the levels they were at in 1990 by the year 2012. The protocol was first opened for signature from 16 March 1998 to 15 March 1999 at United Nations Headquarters, New York and by that date the Protocol had received 84 signatures. For the protocol to be ratified at least 55 of the 176 UN countries had to sign the protocol and these had to represent more than 55% of 1990 global carbon dioxide emissions.
So far, there are 141 nations, including South Africa, that have ratified the protocol (Borchert, 2007). The Kyoto Protocol is very similar in principles to the UNFCCC, but places a heavier burden on developed nations under the principle of “common but differentiated responsibilities” as well asserting binding targets for 37 industrialized countries and the European community for reducing emissions. The Kyoto Protocol also offers supplementary means of meeting targets via the use of three market-based mechanisms, namely emissions trading, clean development mechanisms and joint implementation.

Unfortunately it is quite unlikely that signing a treaty will stop global warming. Even if all the nations that have signed do achieve their targets it will mean a reduction of only 5.2% below 1990 levels. To stabilize global warming below the 2ºC level this figure would have to be between 50 and 90% (Borchert, 2007). South Africa has put in place a long term mitigation scenario (LTMS) by which the country aims to develop a plan of action which is economically viable and internationally aligned to the world effort on climate change. The scenario period (2003-2050) South Africa will aim to take action to mitigate GHG emissions by 30% to 40% by the year 2050.

This is a reduction of between 9000 tons and 17 500 tons of CO\textsubscript{2} by 2050. In January 2010, South Africa pledged to the UNFCCC, a 34% and 42% reduction against business as usual emissions growth trajectory by the year 2020 and 2025 respectively. Renewable energies need to be pursued vigorously not only to aid in reducing greenhouse gas concentrations but also because coal and other fossil fuels will not always be around, since they are non-renewable. The White Paper on Renewable Energy (2003) lays the foundation for prioritizing the implementation of renewable energy and sets a target, as a policy objective, of ten thousand gigawatt-hours (GWh) of renewable energy contribution to the final energy demand in South Africa by 2013.

According to Terra Power Solutions, this project is desirable as it will contribute to government and private sector energy generation targets. Under the IPP Producer Procurement Programme, South Africa will seek to procure the first 3725 MW of renewable capacity by 2016 (1850 MW of on-shore wind) to meet the renewable energy target of 4000 MW by 2014 and 9000 MW by 2030. Fossil fuels supply 90% of South Africa’s energy needs with demands on energy supply expected to increase by 3.5% in the next 20 years.
Legal Requirements

The EIA process is guided by regulations made in terms of Chapter 5 of the National Environmental Management Act No. 107 of 1998 (NEMA). The regulations (GNR. 543) set out the procedures and criteria for the submission, processing and consideration of and decisions on applications for the environmental authorisation of activities. Three lists of activities, published on 02 August 2010, as Government Notice Numbers R.544 to 546, define the activities that require, either a Basic Assessment (applies to activities with limited environmental impacts (GN.R. 544) or within a prescribed geographical area – province (GN.R. 546)), or a Scoping and Environmental Impact Assessment (applies to activities which are significant in extent and duration (GN.R. 545). The activities triggered by the proposed wind farm development are listed in Table 1 below.

Table 1: Listed activities potentially triggered by the proposed Terra Power Solutions Riebeeck East Wind Energy Project

<table>
<thead>
<tr>
<th>Activity No (s)</th>
<th>Description each listed activity as per project description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The construction or facilities or infrastructure for the generation of electricity where: (i) the electricity is more than 10 megawatts but less than 20 megawatts; or (ii) the output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare. Establishment of a wind farm for the generation of electricity</td>
</tr>
<tr>
<td>10</td>
<td>The construction of facilities or infrastructure for the transmission and distribution of electricity - (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more. Establishment of a substation</td>
</tr>
<tr>
<td>18</td>
<td>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock or more than 5 cubic metres from: (i) a watercourse; A 33kV underground cable will connect the turbines and the electrical substation. This cable is likely to cross one or more of the watercourses occurring on the farm portions.</td>
</tr>
<tr>
<td>23</td>
<td>The transformation of undeveloped, vacant or derelict land to – (i) residential, retail, commercial, recreational, industrial or institutional use, inside an urban area, and where the total area to be transformed is 5 hectares or more, but less than 20 hectares, or (ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the</td>
</tr>
</tbody>
</table>

1 Please note that this description should not be a verbatim repetition of the listed activity as contained in the relevant Government Notice, but should be a brief description of activities to be undertaken as per the project description.
<table>
<thead>
<tr>
<th>Listing Notice 1 of R544 EIA Regulations dated 18 June 2010</th>
<th>(38)</th>
<th>The expansion of facilities for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Expansion of electrical substation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Listing Notice 2 of R545 EIA Regulations dated 18 June 2010</th>
<th>(1)</th>
<th>The construction of facilities or infrastructure for the generation of electricity where the electricity output is 20 megawatts or more.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Establishment of a wind farm for the generation of electricity where the maximum output of the facility will be 140MW.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Listing Notice 2 of R545 EIA Regulations dated 18 June 2010</th>
<th>(8)</th>
<th>The construction of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Development of a substation</td>
</tr>
</tbody>
</table>

| Listing Notice 2 of R545 EIA Regulations dated 18 June 2010 | (15) | Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; except where such physical alteration takes place for:  
(i) linear development activities; or  
(ii) agriculture or afforestation where activity 16 in this Schedule will apply. |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Development of land.</td>
</tr>
</tbody>
</table>

| Listing Notice 3 of R546 EIA Regulations dated 18 June 2010 | (4) | The construction of a road wider than 4 metres with a reserve less than 13.5 metres  
(a) In Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga and Northern Cape provinces:  
(ii) Outside urban areas, in:  
(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Access Roads within the site during operation will be 6 meters wide. During the construction phase, these will be larger due to the size of the trucks required to transport the turbines</td>
</tr>
</tbody>
</table>

| Listing Notice 3 of R546 EIA Regulations dated 18 June 2010 | (10) | The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.  
(see GNR 546 for specific thresholds) |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Storage</td>
</tr>
<tr>
<td>Listing Notice 3 of R546 EIA Regulations dated 18 June 2010</td>
<td>(12)</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
</tbody>
</table>
| The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetation cover constitutes indigenous vegetation:  
(a) Within an critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;  
(b) Within critical biodiversity areas identified in bioregional plans;  
(c) Within the littoral active zone or 100 metres inland from high water mark of the sea or estuary, whichever distance is greater, excluding where such removal will occur behind the development setback line on even in urban areas. |

Clearing of land for development

<table>
<thead>
<tr>
<th>Listing Notice 3 of R546 EIA Regulations dated 18 June 2010</th>
<th>(13)</th>
</tr>
</thead>
</table>
| The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetation cover constitutes indigenous vegetation, except where such vegetation is required for:  
(1) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management : Waste Act, 2008 (Act No. 59 of 2008), in which case the activity is regarded to be excluded from this list  
(2) the undertaking of a linear activity falling below the thresholds mentioned in Listing Notice 1 in terms of GN No. 544 of 2010. (see GNR 546 for specific thresholds) |

Clearing of land for development

<table>
<thead>
<tr>
<th>Listing Notice 3 of R546 EIA Regulations dated 18 June 2010</th>
<th>(14)</th>
</tr>
</thead>
</table>
| The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetation cover constitutes indigenous vegetation, except where such vegetation is required for:  
(1) purposes of agriculture or afforestation inside areas identified in spatial instruments adopted by the competent authority for agriculture or afforestation purposes  
(2) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management : Waste Act, 2008 (Act No. 59 of 2008), in which case the activity is regarded to be excluded from this list  
(3) the undertaking of a linear activity falling below the thresholds in Notice 544 of 2010. (see GNR 546 for specific thresholds) |

An ecological specialist study will establish for certain how much of the existing vegetation is indigenous. Our assumption based on previous experience is that this activity is applicable.

<table>
<thead>
<tr>
<th>Listing Notice 3 of R546 EIA Regulations dated 18 June 2010</th>
<th>(19)</th>
</tr>
</thead>
</table>
| The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.  
(a) In Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga and Northern Cape provinces:  
(ii) **Outside urban areas, in:**  
(bb) National Protected Area Expansion Strategy Focus areas;  
(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act |

---

Coastal & Environmental Services

TPS Riebeeck East Wind Energy Project
and as adopted by the competent authority;
(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;
(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;
(ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined.

New roads will be constructed to allow installation and servicing of the facility

Because the proposed development triggers listed activities from GNR.545, it will require a full Scoping and EIA. This process is regulated by Part 3 of Chapter 3 of the 2010 EIA Regulations and described in detail further on in this report. It is important to note that, in addition to the requirements for an authorisation in terms of the NEMA, there may be additional legislative requirements that need to be considered prior to commencing with the activity, for example: the National Heritage Resources Act (Act No 25 of 1999), the National Water Act (Act No 36 of 1998), Aviation Act (Act No 74 of 1962) as amended, White Paper on Energy Policy for South Africa (Energy White Paper), White Paper on Renewable Energy Policy (Renewable Energy White Paper), the Integrated Energy Plan for the Republic of South Africa (March, 2003), and others.

The Environmental Impact Assessment

Coastal & Environmental Services (CES), a well-established specialist environmental consulting firm with offices in Grahamstown, East London, and Port Elizabeth have been appointed by Terra Power Solutions (Pty) Ltd as Environmental Assessment Practitioner (EAP) to conduct the Environmental Impact Assessment (EIA).

The competent authority that must consider and decide on the application for authorisation in respect of the activities listed in Table 1 is the Department of Environmental Affairs (DEA), formerly the Department of Environmental Affairs and Tourism (DEAT), as the Department has recently reached agreement with all Provinces that all electricity-related projects, including generation, transmission and distribution, are to be submitted to DEA, irrespective of the nature of the applicant. This decision has been made in terms of Section 24(C)(3) of the NEMA (Act No 107 of 1998). The decision is effective for all projects initiated before, and up until, approximately 2015.

The EIA process is divided into two key phases - Scoping and Environmental Impact Assessment. This Environmental Scoping Report (ESR) presents the outcomes of the first phase of the environmental impact assessment process. The Scoping Process has been undertaken to identify and describe:

- The nature of the proposed project;
- The legal, policy and planning context for the proposed project;
- Important biophysical and socio-economic characteristics of the affected environment;
- Potential environmental issues or impacts, so they may be addressed in the EIA phase;
- Feasible alternatives that must be assessed in the EIA phase;
- The Plan of Study (POS) for the EIA phase.

Provision was made in the Scoping Phase for the involvement of Interested and Affected Parties (I&APs) in the forthcoming EIA process.
Project Description

The term wind energy describes the process by which wind turbines convert the kinetic energy in the wind into mechanical power and a generator can then be used to convert this mechanical power into electricity. Typical turbine subsystems include:

- A rotor or blades – the portion of the wind turbine that collects energy from the wind and converts this wind energy into rotational shaft energy to turn the generator.
- A nacelle (enclosure) containing a drive train, usually including a gearbox (some turbines do not require a gearbox) and a generator which converts the turning motion of a wind turbine’s blades (mechanical energy) into electricity.
- A tower, to support the rotor and drive train - the tower on which a wind turbine is mounted is not only a support structure, but it also raises the wind turbine so that its blades safely clear the ground and so can reach the stronger winds at higher elevations.
- Electronic equipment such as controls, electrical cables, ground support equipment, and interconnection equipment.
- Turbine step-up transformer which can be indoor or outdoor, depending on the turbine model.

The ultimate size of the wind turbines will depend on further technical assessments but will typically consist of rotor turbines (3 x 60m blades) with rotor diameters of 120 meters mounted atop a 100 - 140 meter high steel or hybrid steel/concrete tower. As with all projects of this nature being developed by Independent Power Producers (IPP’s) the electricity will be fed into the national Eskom grid.

Typically, the development of the wind farm is divided into various phases:

- **Pre-feasibility**: Terra Power Solutions (Pty) Ltd conduct surveys to ensure obvious issues surrounding the project should not impact on the progress and the final acceptance of the project. This includes visits to local authorities, civil aviation authorities, identifying local communities, wind resource evaluation from existing data, grid connectivity, environmental impact assessment, logistical and project phasing requirements.

- **Feasibility**: Terra Power Solutions (Pty) Ltd will firm up and carry out thorough investigations to establish the actual costs, and economic viability of the project by designing the financial model with financial institutions, verifying wind resources by on-site measurement, ensuring grid connection is economical and feasible in the timeframes of the project, identifying possible off-takers for the electricity.

- **Wind Measurement**: Prior to the establishment of the full facility, it will be necessary to erect, a number of wind measurement masts to gather wind speed data and correlate these measurements with other meteorological data in order to produce a final wind model of the proposed project site. The measurement campaign will last not less than 12 months in order to ensure verifiable data is used for the economics of the project.

- **Implementation**: Building of a wind farm comprises:

  **Civil works**:

  1. Roads: An internal road network will be constructed for access to each turbine and to the substation during the construction phase by construction vehicles and equipment (bulldozers, trucks, cranes, etc.).
  2. Platforms: A temporary area of 40 m x 25 m will be established for each turbine to allow the turbine erection and enough spacing for the cranes. At the end of construction, the platforms will be reduced and the permanently occupied area will be about 20 m x 20 m.
  3. Turbine foundations: These will be of approximately 15 m x 15 m x 2.5 m.
  4. Cabling: Underground 22kV electrical cables will be entrenched adjacent to the access roads (about 1m in depth) to connect the turbines to the electrical substation to be
constructed on site.
5. Civil works for the 22/66 kV electrical substation, including relevant buildings.

**Erection/commissioning:**

1. Wind turbine erection: Each turbine will be erected by utilising suitable cranes.
2. Electrical equipment: Step-up transformer, switchgears, busbars and ancillary equipment will be installed in the electrical substation.
3. Commissioning and startup: Once connected to the Eskom distribution grid, the commissioning of the wind farm with all relevant functional tests will be carried out up until the final start-up of the wind farm.

**Commercial operation**

During the period when the turbines are operational, there are only a few crews who carry out routine maintenance requiring only light vehicles to access the site. Only major breakdowns would necessitate the use of cranes and trucks.

➢ **Timing Estimation:**

The overall wind farm construction schedule will be about 12-18 months. This is dependant on the delivery times of the turbine components and main equipment. Described below is a typical schedule:

- Platforms/Roads/cables laydown = 20 weeks;
- Turbines foundations = 10 weeks for each foundation (including 8 weeks to let the foundation concrete dry);
- Civil works for the substation = 12 weeks;
- Wind turbines/electrical substation erection = 2 turbines/week (in good low wind weather conditions);
- Substation erection: 8 weeks; and
- Commissioning and electrical connection = 4 weeks.

➢ **Refurbishment and rehabilitation of the site after operation:** Current wind turbines are designed to last for over 25 years and this is the figure that has been used to plan the life span of a modern wind farm. If refurbishment is economical, the facility life span could be expanded by another 25 years. Decommissioning of the wind energy facility at the end of its lifespan will be undertaken in agreement with the landowners and according to the land use agreement.

**The Affected Environment**

**Climate**

Due to the location of the study area at the confluence of several climatic regimes, namely temperate and subtropical, the Eastern Cape Province of South Africa has a complex climate. There are wide variations in temperature, rainfall and wind patterns, mainly as a result of movements of air masses, altitude, mountain orientation and the proximity of the Indian Ocean.

There is data available for climatic conditions in Grahamstown, which is close to the study site. The mean annual temperature is 16.4°C with an average maximum temperature of 20°C and an average minimum temperature of 9°C (Stone et al. 1998). The average annual rainfall for Grahamstown is 681mm and falls in a bimodal pattern with the most rain falling in Autumn and Spring (Stone et al. 1998). Rainfall reliability is poor and long lasting droughts are common (Palmer 2004).

**Geology and Topography**
The Eastern Cape Province contains a wide variety of landscapes, from the stark Karoo (the semi-desert region of the central interior) to mountain ranges and gentle hills rolling down to the sea. The climate and topography give rise to the great diversity of vegetation types and habitats found in the region. The mountainous area on the northern border of the Eastern Cape forms part of the Great Escarpment.

Vegetation and floristic

The vegetation of the Eastern Cape is complex and is transitional between the Cape and subtropical floras, and many taxa of diverse phyto-geographical affinities reach the limits of their distribution in this region. The region is best described as a tension zone where four major biomes converge and overlap.

Vegetation

The vegetation of the Eastern Cape is complex and is transitional between the Cape and subtropical floras and many taxa of diverse phytogeographical affinities reach the limits of their distribution in this region. The region is best described as a tension zone where four major biomes converge and overlap (Lubke et al. 1988). The dominant vegetation is Succulent Thicket (Spekboomveld or Valley Bushveld), a dense spiny vegetation type unique to this region. While species in the canopy are of subtropical affinities, and generally widespread species, the succulents and geophytes that comprise the understorey are of karroid affinities and are often localised endemics.

There are two vegetation classifications pertinent to the area. These are the National vegetation map developed by Mucina and Rutherford and the Subtropical Ecosystem Planning (STEP) Project. Each of these projects and descriptions of the relevant vegetation types are described below.

National Vegetation Map: Mucina and Rutherford

Mucina and Rutherford (2006) have developed the National Vegetation map as part of a South African National Biodiversity Institute (SANBI) funded project: “It was compiled in order to provide floristically based vegetation units of South Africa, Lesotho and Swaziland at a greater level of detail than had been available before." The map was developed using a wealth of data from several contributors and has allowed for the best national vegetation map to date, the last being that of Acocks developed over 50 years ago. This map forms the base of finer scale bioregional plans such as STEP. This SANBI Vegmap project has two main aims:

- “to determine the variation in and units of southern African vegetation based on the analysis and synthesis of data from vegetation studies throughout the region, and
- to compile a vegetation map. The map was to accurately reflect the distribution and variation on the vegetation and indicate the relationship of the vegetation with the environment. For this reason the collective expertise of vegetation scientists from universities and state departments were harnessed to make this project as comprehensive as possible."

The map and accompanying book describe each vegetation type in detail, along with the most important species including endemic species and those that are biogeographically important. This is the most comprehensive data for vegetation types in South Africa.

Mucina and Rutherford (2006) define the following vegetation types from which source these descriptions are derived: Bhisho Thornveld, Kowie thicket, Suurberg Quartzite Fynbos, Suurberg Shale Fynbos, Albany Broken Veld, Great Fish Norsveld
Subtropical Ecosystem Planning (STEP) Project

The Subtropical Ecosystem Planning (STEP) Project aims to identify priority areas that would ensure the long-term conservation of the subtropical thicket biome and to ensure that the conservation of this biome is considered in the policies and practices of the private and public sector that are responsible for land-use planning and the management of natural resources in the region (Pierce et al. 2005). STEP identifies five vegetation types in this region. Pierce and Mader (2006) define the following vegetation types from which source these descriptions are derived:

Zuurberg Grassy Fynbos, Grahamstown Grassland Thicket, Eastern Lower Karoo, Saltaire Karroid Thicket, Fish Noorsveld, Albany Valley Thicket and Inland Thornveld.

**Fauna**

**Amphibians and Reptiles**

The Eastern Cape is home to 133 reptile species including 21 snakes, 27 lizards and eight chelonians (tortoises and turtles). The majority of these are found in Mesic Succulent Thicket and riverine habitats.

**Birds**

Nine bird species are endemic to South Africa, but there are no Eastern Cape endemics. However, there are 62 threatened species within the Eastern Cape Province (Barnes, 2000). Most of these species occur in grasslands or are associated with wetlands, indicating a need to conserve what is left of these ecosystems (Barnes, 2000).

**Socio-economic profile: Makana Local Municipality**

The proposed Grahamstown Wind Energy Project is to be developed within the Makana Local Municipality (MLM). The proposed facility will be situated approximately 22km east of Riebeeck East and 15km west of Grahamstown, and be located on seven properties, namely: Hilton Farm, Table Hill North, Kruisfontein, Brack Kloof, Table Hill, Slaaikraal Farm and Hounslo. The surrounding area is not densely populated. However, it is still highly likely that the development of the project will have direct socio-economic impacts on the municipal area and its population.

The Makana municipal area extends over 4 379 km² and is bounded by the cities of Port Elizabeth to the west, and East London to the east. According to the South African Community Survey of 2007 (StatsSA, 2007), the municipality’s population declined from an estimation of 75 302 in 2001 to about 70 059 in 2007. The MLM IDP 2010 cites Quantec’s numeration of the population in 2007 as 70 706. The area primarily consists of three nodal points namely Grahamstown, Riebeeck East and Alicedale. Grahamstown is the largest of the nodes both economically and in terms of population size (the greater Grahamstown area accounts for approximately 81% of the municipality’s population), and serves as the administrative hub. Rhodes University (RU) is a dominant feature in the economic social landscape of the city, and therefore the MLM at large. By contrast, Alicedale is a small town that used to serve as an important national railway juncture in the past, but current economic activity is restricted to tourism primarily in the form of the Bushman Sands Hotel. Lastly, Riebeeck East has traditionally been an agrarian economy, which is still reflected in the current status quo.

---


Makana has a population density of 16.1 people per square kilometre, which is high when compared to the district population density of 6.6 people per square kilometre. This indicates a high level of urbanization in the local municipality. Despite the overall plateau in population growth, informal settlement populations increased. This may indicate migration from farms and areas in the Grahamstown periphery to the core, in the search for economic opportunities and improved service provision (MLM IDP 2010:15).

Public Participation Process

At the inception of the project a public participation process (PPP) was undertaken to allow Interested and Affected Parties (I&APs) to voice their concerns and raise issues regarding the proposed project. The key elements of the process included:-

- Development and distribution of a Background Information Document (BID) to all neighbouring landowners and other relevant stakeholders such as DWA, SAHRA, WESSA, etc.;
- Informing potential I&APs and neighbours of the proposed development through newspaper advertisements and site notice boards, and
- A public meeting will be held during this reports review period. All parties will be informed of the date, venue and time.

During the Scoping Phase the public participation process (PPP) continues. All I&APs will be notified in regards to the availability of the Draft Scoping Report for review. Furthermore the DSR will be made available in easily accessible locations prior to the start of the review period.

A public meeting will be held, where the EAP will present the details of this report to all I&APs. Time will then be available for questions. If the reader is unaware of the details of the public meeting, please contact Justin Green: j.green@cesnet.co.za.

Issues and Concerns

An extensive list of the issues identified and raised during the public consultation process, and responses thereto by the EAP, is provided in Appendix C of this report.

Identification of Alternatives

Since the core business area of the project proponent is wind farm development for the generation of electricity, the fundamental alternative of a development other than to construct and operate a wind farm is therefore not viable in this case, and will not be considered further in the EIA. Modifications or variations to the design of the wind farm that will facilitate the reduction or minimisation of environmental impacts i.e. incremental alternatives will be investigated, including modifications to the design or layout, technology and operational aspects of the proposed project.

The EIA Phase will also examine the impact of no development (i.e. the “No Go” option). The no-go alternative will be used as a baseline throughout the environmental assessment process against which potential impacts will be compared in an objective manner and will be fully assessed in the EIR.

The Way Forward – EIA Phase

This Draft Scoping Report (DSR) includes the outline of a Plan of Study (PoS) for the EIA phase, which includes Terms of Reference (ToR) for specialist studies as they are currently envisaged and the methodology that will be used to assess impacts and rate their significance. After taking into account the comments received from all stakeholders during the review period, the Scoping
Report will be finalised and submitted to DEA, who will then approve or recommend amendments to the PoS. Consultation with DEA will be ongoing throughout this EIA. However, it is anticipated that DEA will provide relevant comment with respect to the adequacy of this Plan of Study for the EIA, as it informs the content of the Environmental Impact Report (EIR) and sufficiency thereof. The following specialist studies are proposed for the EIA Phase of the assessment:

- Agricultural Impact Assessment
- Avifauna (Bird) Impact Assessment
- Bat Impact Assessment
- Ecological Impact Assessment (incorporating flora and fauna)
- Heritage, Archaeological Impact Assessment
- Noise Impact Assessment
- Palaeontological Impact Assessment
- Visual Impact Assessment

The significance of impacts will be assessed based on specialist input using a standardised rating methodology. “Significance” includes the spatial and temporal scales of impacts, the likelihood of impacts occurring, and the severity of impacts or potential benefits.

An EIR will be prepared that will describe the nature of the proposed project and its environmental setting, summarise the results of the specialist studies, and recommend practical and reasonable mitigation measures to avoid, minimise or offset any negative impacts from the development. In this regard the EIA Phase will actively engage and contribute to the planning process so as to mitigate environmental impacts through improved design and layout. The overall objective of the EIR is to provide DEA with sufficient information about the proposed project and its associated environmental and social impacts on which to make an informed decision.

An Environmental Management Programme (EMP) will be prepared that provide practical and actionable management, monitoring and institutional measures to be undertaken during the construction, operation and decommissioning of the proposed wind energy facility. Such measures are designed to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The public participation process initiated in the Scoping Phase will continue throughout the EIA Phase.

In this regard a critical outcome of the EIA phase will be the Draft EIR and Draft EMP. These reports will be released for public review and comment, and will also be presented to I&APs during public meetings, before they are finalised and presented to DEA. An environmental authorisation may be granted or rejected by the authority based on the review of these reports. The decision will be advertised, and registered I&APs will also be informed in writing and given the opportunity to appeal the decision.
# TABLE OF CONTENTS

1. INTRODUCTION .................................................................................................................. 1
   1.1. Background to the study ................................................................................................. 1
   1.2. The environmental impact assessment process ............................................................ 1
   1.3. Motivation for the activity ............................................................................................ 7
   1.4. Scoping phase ............................................................................................................... 8
   1.5. The scoping report ....................................................................................................... 9
   1.6. Details and expertise of the environmental assessment practitioner ....................... 10

2. PROJECT DESCRIPTION .................................................................................................... 13
   2.1. Location and site description of the proposed development ........................................ 13
   2.2. Detailed description of the Terra Power Solutions Riebeeck East wind energy project 16
       2.2.1. Production of electricity from wind ....................................................................... 16
       2.2.2. Stages of wind farm development ....................................................................... 16
       2.2.3. Timing estimate .................................................................................................. 22
       2.2.4. Refurbishment and rehabilitation of the site after operation ............................... 22

3. RELEVANT LEGISLATION ................................................................................................. 24
   3.1. International ............................................................................................................... 24
       3.1.1. The 1992 United Nations Framework Convention on Climate Change (FCCC) 24
       3.1.2. The Kyoto Protocol (2002) ................................................................................ 24
   3.2. National ...................................................................................................................... 24
       3.2.1. The Constitution Act (108 of 1996) .................................................................... 24
       3.2.2. The National Environmental Management Act (NEMA) (107 of 1998) ............ 25
       3.2.3. The National Environmental Management: Biodiversity Act (10 of 2004) ......... 26
       3.2.4. The National Forests Act (84 of 1998) ............................................................... 27
       3.2.5. National Heritage Resources Act (25 of 1999) .................................................... 27
       3.2.6. Atmospheric Pollution Prevention Act 45 of 1965 ................................................ 27
       3.2.10. Electricity Regulation Act (Act No. 4 of 2006) ...................................................... 29
       3.2.11. Electricity Regulation on New Generation Capacity (Government Gazette No 32378 of 5 August 2009) ................................................................. 30
       3.2.12. Aviation Act (Act No. 74 of 1962): 13th Amendment of the Civil Aviation Regulations 1997 ................................................................. 31
       3.2.13. Occupational Health and Safety Act (85 of 1993) ............................................ 33
   3.3. Municipal by-laws ...................................................................................................... 35

4. DESCRIPTION OF THE AFFECTED ENVIRONMENT .................................................. 37
   4.1. The bio-physical environment ..................................................................................... 37

5. PUBLIC PARTICIPATION PROCESS .................................................................................. 60
   5.1. Notifying interested and affected parties of the eia ...................................................... 60
   5.2. Public review period of draft esr and meetings ............................................................ 61

6. ISSUES IDENTIFIED DURING SCOPING .................................................................... 62
   6.1. Possible environmental issues & impacts .................................................................... 62

7. ALTERNATIVES ............................................................................................................... 73
   7.1. Fundamental alternatives ............................................................................................ 73
   7.2. Incremental alternatives ............................................................................................. 74

8. PLAN OF STUDY FOR EIA ............................................................................................ 75
   8.1. EIA phase .................................................................................................................... 75
   8.2. Specialist studies ........................................................................................................ 76
   8.3. Methodology for assessing the significance of impacts ............................................... 80
   8.4. Environmental impact report ..................................................................................... 83
   8.5. Ppp for the eia phase .................................................................................................. 84
   8.6. Consideration by the competent authority for environmental authorisation and appeals process ....................................................................................................................... 86

9. REFERENCES .................................................................................................................... 87

APPENDIX A: THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS ......................... 89
APPENDIX B: DEA ACKNOWLEDGEMENT OF RECEIPT .................................................. 93
APPENDIX C: PUBLIC PARTICIPATION ............................................................................... 97
APPENDIX D: THE COEGA WIND TURBINE (FOR ILLUSTRATION PURPOSES) ............. 119
APPENDIX E: SPECIES LIST OF POTENTIAL SPECIES OF SPECIAL CONCERN THAT COULD POSSIBLY OCCUR AT THE STUDY SITE (SIBIS, 2012)......................................................................................121

LIST OF FIGURES

Figure 1-1: The EIA process under current legislation (NEMA 1998) .................................................................6
Figure 2-1: Location of the proposed Terra Power Solutions Riebeeck East Wind Energy facility ......................14
Figure 2-2: Layout of the facility indicating the preliminary position of all infrastructure components ...........15
Figure 2-3: Illustration of the main components of a typical wind turbine ............................................................17
Figure 2-4: The main dimensions for the foundation of a 3MW/100m high wind turbine .................................20
Figure 4-1: Mucina and Rutherford vegetation map of the study area .................................................................43
Figure 4-2: STEP vegetation map of the study area ...............................................................................................44
Figure 4-3: The Albany Centre of Endemism, also known as the ‘Albany Hotspot’, has long been recognised as an important centre of plant species diversity and endemism (From van Wyk and Smith 2001) .........................................................................................................................45
Figure 4-4: Important Bird Areas (IBAs), Protected areas and Protected Area Expansion Focus Areas surrounding the project site ...........................................................................................................51
Figure 4-5: Wetlands surrounding the proposed project site ..................................................................................52
Figure 4-6: Critical Biodiversity Areas (CBA) for the proposed project site .............................................................52
Figure 4-7: STEP Biodiversity status of study site ...............................................................................................53
Figure 4-8: An indication of the locality of Makana Local Municipality ..............................................................54

LIST OF TABLES

Table 1-1: Listed activities potentially triggered by the proposed Wind Energy Project .................................................2
Table 4-1: Summary of the status of the Possible Species of Special Concern occurring in the Proposed Riebeeck East Wind Energy Facility area .........................................................................................46
Table 4-2: Plant species likely to occur in the Riebeeck East area that are critically Endangered (CR) on the South African Red Data List (Source: SIBIS 2012) .................................................................46
Table 4-3: Threatened and endemic reptiles likely to occur in the Grahamstown and Riebeeck East region (Source: Branch, 1998) ....................................................................................................................47
Table 4-4: Threatened and endemic frogs likely to occur in the Grahamstown/Riebeeck East area (Source: CSIR, 2004) ........................................................................................................................................48
Table 4-5: Threatened bird species likely to be encountered in Grahamstown/Riebeeck East Area and surrounds (Source: SABIF, 2012) ...........................................................................................................48
Table 4-6: Threatened large to medium-sized mammals in the Eastern Cape Province (Source: Smithers, 1986) ........................................................................................................................................49
Table 4-7: Bat species that occur in the Grahamstown and Riebeeck East area which are likely to be affected by the wind turbines (Apps, 2000) ......................................................................................49
Table 4-8: Conservation and planning tools considered for the proposed project ...................................................50
Table 4-9: Sectoral production and employment in the Eastern Cape economy .......................................................55
Table 4-10: Educational status of the MLM ............................................................................................................57
Table 4-11: Access to basic services .......................................................................................................................58
Table 4-12: Employment Sectors of the MLM ...........................................................................................................58
Table 4-13: Synthesis of socio-economic profile of Makana Local Municipality ..................................................59
Table 6-1: Issues and impacts that can be identified in the planning and design phase of the proposed project .................................................................................................................................................63
Table 6-2: Issues and impacts potentially relevant to the construction phase of the proposed project ..............65
Table 6-3: Issues and impacts potentially relevant to the operational phase of the proposed project ..............68
Table 6-4: Issues and impacts potentially relevant to the decommissioning phase of the proposed project 71
Table 7-1: Matrix indicating land uses contemplated to occur in conjunction with development of a wind farm ............................................................................................................................................74
Table 8-1: Criterion used to rate the significance of an impact ..............................................................................81
Table 8-2: The matrix that will be used for the impacts and their likelihood of occurrence ..................................82
Table 8-3: The significance rating scale ................................................................................................................82
Table 8-4: Volumes that will be generated in the EIA phase for the proposed project ........................................83
Volume 1: Environmental Scoping Report – Introduction

LIST OF PLATES

Plate 2-1: Concrete pouring of a turbine foundation – note the tower base collar in the foreground.........21
Plate 2-3: Assembly and erection of the tower sections using cranes ..................................................22
Plate 4-1: An Angulate tortoise (Chersina angulata) found in the Grahamstown and Riebeeck East area. .47

LIST OF ABBREVIATIONS

BID: Background Information Document
CES: Coastal and Environmental Services
CITES: Convention on International Trade in Endangered Species
DEA: Department of Environmental Affairs
DWA: Department of Water Affairs
EAP: Environmental Assessment Practitioner
EIA: Environmental Impact Assessment
EIR: Environmental Impact Report
EMPr: Environmental Management Programme
ESR: Environmental Scoping Report
GNR: Government Notice Regulation
ha: Hectare
I&APs: Interested and Affected Parties
IPP: Independent Power Producer
kV: Kilovolt
Ltd: Limited
MW: Mega Watts
NERSA: National Energy Regulator of South Africa
PNCO: Provincial Nature Conservation Ordinance
PoS: Plan of Study
PPA: Power Purchase Agreement
PPP: Public Participation Process
RDB: Red Data Book
REFIT: Renewable Energy Feed In Tariff
SSC: Species of Special Concern
ToR: Terms of Reference
WT: Wind Turbine
1. **INTRODUCTION**

1.1. **BACKGROUND TO THE STUDY**

Terra Power Solutions (Pty) Limited (the applicant) is a company based in Grahamstown which is involved in the development of numerous wind and solar energy projects throughout South Africa.

The proposed wind farm is located in the Makana Local Municipality, Cacadu District Municipality, Eastern Cape Province, South Africa. According to Terra Power Solutions (Pty) Ltd available wind data in South Africa shows the Riebeeck East farms to have favourable wind conditions sufficient to support a wind farm. This has been confirmed by on site wind monitoring that has been on-going since early 2011. The facility will be located on seven properties, namely: Hilton Farm, Table Hill North, Kruisfontein, Brack Kloof, Table Hill, Slaaikraal Farm and Hounslow. It is situated approximately 22km east of Riebeeck East and 15km west of Grahamstown.

The erection of 77 wind turbines is proposed. The model and size of the turbine selected will depend on ongoing wind measurement, the outcome of the EIA process and long term monitoring, and on other technical and financial considerations. The final turbine type selected will be between 100 and 140 metres high, and have a power output of between 2 and 3 MW. The facility will have a generating output ranging between 120 and 140 MW. A wind turbine consists of a vertical tower, hub and three blades. Additional infrastructure required to support the wind farm includes: 6 metre wide access roads, underground cabling running adjacent to the roads, a substation and an on-site storage shed. From the substation, the power generated will be fed into the Eskom grid via the 132 kV line traversing the site.

The ultimate size of the wind turbines will depend on further technical assessments but will typically consist of rotor turbines with rotor diameters up to a maximum of 120 meters. The towers will have a nacelle or transformer hub between 100 and 140 meters above ground with a blade tip height of between 160 and 200 meters above ground.

Improvement of the existing road infrastructure and study area access routes will be required for the construction phase.

In accordance with the requirements of the National Environmental Management Act No. 107 of 1998, and relevant Environmental Impact Assessment (EIA) regulations made in terms of this Act (Government Notice No R.543) promulgated in 2010, the proposed project requires a full Scoping and EIA process to be conducted.

Coastal & Environmental Services (CES) have been appointed by Terra Power Solutions (Pty) Limited as Environmental Assessment Practitioner (EAP) to conduct the EIA process.

1.2. **THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS**

The EIA process is guided by regulations made in terms of Chapter 5 of the National Environmental Management Act No. 107 of 1998 (NEMA), published as Government Notice No R.543 in Government Gazette No 33306 of 2 August 2010. The regulations set out the procedures and criteria for the submission, processing and consideration of and decisions on applications for the environmental authorisation of activities.

Three lists of activities, published on 2 August 2010, as Government Notice Numbers R.544, R.545 and R.546, define the activities that require, respectively, a Basic Assessment (applies to activities with limited environmental impacts), or a Scoping and Environmental Impact Assessment (applies to activities which are significant in extent and duration).

The activities triggered by the proposed wind energy project are listed in Table 1-1 below.
Table 1-1: Listed activities potentially triggered by the proposed Wind Energy Project
Indicate the number and date of the relevant notice: Activity No(s) (in terms of the relevant notice)

<table>
<thead>
<tr>
<th>Activity No(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Listing Notice 1 of R544 EIA Regulations dated 18 June 2010</td>
</tr>
<tr>
<td></td>
<td>The construction or facilities or infrastructure for the generation of electricity where:</td>
</tr>
<tr>
<td></td>
<td>(iii) the electricity is more than 10 megawatts but less than 20 megawatts; or</td>
</tr>
<tr>
<td></td>
<td>(iv) the output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare.</td>
</tr>
<tr>
<td></td>
<td>Establishment of a wind farm for the generation of electricity</td>
</tr>
<tr>
<td>(10)</td>
<td>Listing Notice 1 of R544 EIA Regulations dated 18 June 2010</td>
</tr>
<tr>
<td></td>
<td>The construction of facilities or infrastructure for the transmission and distribution of electricity</td>
</tr>
<tr>
<td></td>
<td>(iii) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;</td>
</tr>
<tr>
<td></td>
<td>(iv) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.</td>
</tr>
<tr>
<td></td>
<td>Establishment of a substation</td>
</tr>
<tr>
<td>(18)</td>
<td>Listing Notice 1 of R544 EIA Regulations dated 18 June 2010</td>
</tr>
<tr>
<td></td>
<td>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand,</td>
</tr>
<tr>
<td></td>
<td>shells, shell grit, pebbles or rock or more than 5 cubic metres from:</td>
</tr>
<tr>
<td></td>
<td>(iii) a watercourse;</td>
</tr>
<tr>
<td></td>
<td>A 33kV underground cable will connect the turbines and the electrical substation. This cable is likely to cross one or more of the</td>
</tr>
<tr>
<td></td>
<td>watercourses occurring on the farm portions.</td>
</tr>
<tr>
<td>(23)</td>
<td>Listing Notice 1 of R544 EIA Regulations dated 18 June 2010</td>
</tr>
<tr>
<td></td>
<td>The transformation of undeveloped, vacant or derelict land to –</td>
</tr>
<tr>
<td></td>
<td>(iii) residential, retail, commercial, recreational, industrial or institutional use, inside an urban area, and where the total area to</td>
</tr>
<tr>
<td></td>
<td>be transformed is 5 hectares or more, but less than 20 hectares, or</td>
</tr>
<tr>
<td></td>
<td>(iv) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to</td>
</tr>
<tr>
<td></td>
<td>be transformed is bigger than 1 hectare but less than 20 hectares; -</td>
</tr>
<tr>
<td></td>
<td>Except where such transformation takes place for linear activities</td>
</tr>
<tr>
<td></td>
<td>Development of land</td>
</tr>
<tr>
<td>(38)</td>
<td>Listing Notice 1 of R544 EIA Regulations dated 18 June 2010</td>
</tr>
<tr>
<td></td>
<td>The expansion of facilities for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the</td>
</tr>
<tr>
<td></td>
<td>development footprint will increase</td>
</tr>
<tr>
<td></td>
<td>Expansion of electrical substation</td>
</tr>
<tr>
<td>(1)</td>
<td>Listing Notice 2 of R545 EIA Regulations dated 18 June 2010</td>
</tr>
<tr>
<td></td>
<td>The construction of facilities or infrastructure for the generation of electricity where the electricity output is 20 megawatts or more.</td>
</tr>
</tbody>
</table>

*Please note that this description should not be a verbatim repetition of the listed activity as contained in the relevant Government Notice, but should be a brief description of activities to be undertaken as per the project description.*
<table>
<thead>
<tr>
<th>Listing Notice 2 of R545 EIA Regulations dated 18 June 2010</th>
<th>Establishment of a wind farm for the generation of electricity where the maximum output of the facility will be 140MW.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listing Notice 2 of R545 EIA Regulations dated 18 June 2010</td>
<td>The construction of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.</td>
</tr>
<tr>
<td>----------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Listing Notice 2 of R545 EIA Regulations dated 18 June 2010 | Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; except where such physical alteration takes place for:  
(iii) linear development activities; or  
(iv) agriculture or afforestation where activity 16 in this Schedule will apply. |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Listing Notice 3 of R546 EIA Regulations dated 18 June 2010 | The construction of a road wider than 4 metres with a reserve less than 13.5 metres  
(b) In Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga and Northern Cape provinces:  
(iv) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Listing Notice 3 of R546 EIA Regulations dated 18 June 2010 | The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.  
(see GNR 546 for specific thresholds) |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Listing Notice 3 of R546 EIA Regulations dated 18 June 2010 | The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetation cover constitutes indigenous vegetation:  
(a) Within an critically endangered or endangered ecosystem listed in terms of section 52 of the NEMA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;  
(b) Within critical biodiversity areas identified in bioregional plans;  
(c) Within the littoral active zone or 100 metres inland from high water mark of the sea or estuary, whichever distance is greater, excluding where such removal will occur behind the development setback line on even in urban areas. |

Access Roads within the site during operation will be 6 meters wide. During the construction phase, these will be larger due to the size of the trucks required to transport the turbines.

Clearing of land for development.
| Listing Notice 3 of R546 EIA Regulations dated 18 June 2010 | (13) | The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetation cover constitutes indigenous vegetation, except where such vegetation is required for:
(1) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management : Waste Act, 2008 (Act No. 59 of 2008), in which case the activity is regarded to be excluded from this list
(2) the undertaking of a linear activity falling below the thresholds mentioned in Listing Notice 1 in terms of GN No. 544 of 2010. (see GNR 546 for specific thresholds)

Clearing of land for development |
| Listing Notice 3 of R546 EIA Regulations dated 18 June 2010 | (14) | The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetation cover constitutes indigenous vegetation, except where such vegetation is required for:
(1) purposes of agriculture or afforestation inside areas identified in spatial instruments adopted by the competent authority for agriculture or afforestation purposes
(2) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management : Waste Act, 2008 (Act No. 59 of 2008), in which case the activity is regarded to be excluded from this list
(3) the undertaking of a linear activity falling below the thresholds in Notice 544 of 2010. (see GNR 546 for specific thresholds)

An ecological specialist study will establish for certain how much of the existing vegetation is indigenous. Our assumption based on previous experience is that this activity is applicable. |
| Listing Notice 3 of R546 EIA Regulations dated 18 June 2010 | (19) | The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.

(a) In Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga and Northern Cape provinces:
(ii) **Outside urban areas, in:**
(bb) National Protected Area Expansion Strategy Focus areas;
(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;
(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;
(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;
(ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined.

New roads will be constructed to allow installation and servicing of the facility |
Because the proposed development triggers a number of listed activities from GNR.545, it will require a full Scoping and EIA. This process (Figure 1-1) is regulated by Chapter 3 of Part 3 of the EIA regulations and described in detail in Appendix A of this report.

The competent authority that must consider and decide on the application for authorisation in respect of the activities listed in Table 1-1 is the Department of Environmental Affairs (DEA), as the Department has recently reached agreement with all Provinces that all electricity-related projects, including generation, transmission and distribution, are to be submitted to DEA, irrespective of the nature of the applicant. This decision has been made in terms of Section 24(C)(3) of the National Environmental Management Act (Act No 107 of 1998). The decision is effective for all projects initiated before, and up until, approximately 2015.

It is important to note that in addition to the requirements for an authorisation in terms of the NEMA, there may be additional legislative requirements which need to be considered prior to commencing with the activity, for example: the National Heritage Resources Act (Act No 25 of 1999), the National Water Act (Act No 36 of 1998), Aviation Act (Act No 74 of 1962) as amended, White Paper on Energy Policy for South Africa (Energy White Paper), White Paper on Renewable Energy Policy (Renewable Energy White Paper), the Integrated Energy Plan for the Republic of South Africa (March, 2003) etc. These are discussed in detail in Chapter 3 of this report.
Figure 1-1: The EIA process under current legislation (NEMA 1998)
1.3. MOTIVATION FOR THE ACTIVITY

According to regulation 28 (1) of the EIA regulations (2010), A scoping report must include –
li) a description of the need and desirability of the proposed activity

Electricity supply

Most of South Africa’s energy comes from non-renewable sources like coal, petroleum, natural gas, propane, and uranium; however the proponents of renewable energy sources like biomass, geothermal energy, hydropower, solar energy, and wind energy is a major factor that the South African sector need to consider greatly. It is estimated that approximately 1% only of the country’s electricity is currently generated from renewable energy sources. The energy sector in South Africa alone emits approximately 380 988.41 Green House Gases (GHGs) (Eastern Cape Climate Change Conference, 2011).

South Africa’s total emissions was estimated to be 461 million tonnes CO₂ equivalent in the year 2000. Approximately 83% of these emissions were associated with energy supply and consumption (380 988.41 GHGs), 7% from industrial processes, 8% from agriculture, and 2% from waste. This poses great threat to the environment and livelihoods of citizens.

Eskom currently generates 95% of the electricity used in South Africa with a 40.87 GW net maximum installed capacity. By the year 2020 an additional 20 GW generation capacity would be required and up to 40 GW by 2030 to sustain the energy demands in the country. There is however a political will to change the energy mix to reduce the dependency of the economy on fossil fuels and facilitate the uptake of renewable energy resources.

The first step towards a solution in terms of climate change came in the form of the United Nations Convention on Climate Change 1994 (UNFCCC) and its associated Kyoto protocol 1997, adopted at the third session of COP 3, where countries agreed to reduce their greenhouse gas emissions to the levels they were at in 1990 by the year 2012. The protocol was first opened for signature from 16 March 1998 to 15 March 1999 at United Nations Headquarters, New York and by that date the Protocol had received 84 signatures. For the protocol to be ratified at least 55 of the 176 UN countries had to sign the protocol and these had to represent more than 55% of 1990 global carbon dioxide emissions.

So far, there are 141 nations, including South Africa, that have ratified the protocol (Borchert, 2007). The Kyoto Protocol is very similar in principles to the UNFCCC, but places a heavier burden on developed nations under the principle of “common but differentiated responsibilities” as well asserting binding targets for 37 industrialized countries and the European community for reducing emissions. The Kyoto Protocol also offers supplementary means of meeting targets via the use of three market-based mechanisms, namely emissions trading, clean development mechanisms and joint implementation.

Unfortunately it is quite unlikely that signing a treaty will stop global warming. Even if all the nations that have signed do achieve their targets it will mean a reduction of only 5.2% below 1990 levels. To stabilize global warming below the 2°C level this figure would have to be between 50 and 90% (Borchert, 2007). South Africa has put in place a long term mitigation scenario (LTMS) by which the country aims to develop a plan of action which is economically viable and internationally aligned to the world effort on climate change. The scenario period (2003-2050) South Africa will aim to take action to mitigate GHG emissions by 30% to 40% by the year 2050.

This is a reduction of between 9000 tons and 17 500 tons of CO₂ by 2050. In January 2010, South Africa pledged to the UNFCCC, a 34% and 42% reduction against business as usual emissions growth trajectory by the year 2020 and 2025 respectively. Renewable energies need to be pursued vigorously not only to aid in reducing greenhouse gas concentrations but also because coal and other fossil fuels will not always be around, since they are non-renewable. The White Paper on Renewable Energy (2003) lays the foundation for prioritizing the implementation of
renewable energy and sets a target, as a policy objective, of ten thousand gigawatt-hours (GWh) of renewable energy contribution to the final energy demand in South Africa by 2013.

There is a need to generate additional local power in the province. According to the applicant this project is desirable as it will contribute to the government and private sector energy generation target. Under the IPP Producer Procurement Programme, South Africa will seek to procure the first 3725 MW of renewable capacity by 2016 (1850 MW of on-shore wind) to meet the renewable energy target of 4000 MW by 2014 and 9000 MW by 2030. The establishment of the proposed wind farm will contribute to strengthening the existing electricity grid for the area and will aid the government in achieving its goal of a 30% share of all new power generation being derived from Independent Power Producers (IPPs).

Climate change

South Africa’s use of renewable resources is currently limited and highly fossil fuel dependent. The benefits of “green” electricity such as wind turbines, as opposed to traditional coal powered stations, is the reduction of Carbon Dioxide (CO₂) and Sulphur Dioxide (SO₂) emissions and the lack of water required for the operation thereof. Localised electricity production can also compensate for voltage losses resulting from transmitting this power over long distances from Mpumalanga Province where most coal fired power stations are located (and the bulk of South Africa’s energy generation capacity resides).

In addition to the above-mentioned potential benefits (e.g. electricity supply and climate change), the proposed project site was selected due to:

- Good wind resources suitable for the installation of a large wind energy facility.
- Proximity to connectivity opportunities such as the 132 kV Eskom overhead line traversing the proposed development site
- The site is easily accessible from gravel roads off the R400 and R344 (which is in close proximity to the N2 Highway) which will facilitate in the transportation of wind turbines and construction to the site.
- The immediate surrounding area is not densely populated.

Social development

The long term presence in the Riebeeck East area (minimum 25 years) will allow for the identification and implementation of a socially responsible scheme during the operation phase of the facility. The implementation of such a scheme is a requirement of the Department of Energy for all IPPs under its procurement programme. IPPs bidding to the Department of Energy are required to submit detailed plans for social upliftment. This process follows the EIA process. A limited number of jobs will be created during the construction phase, as the erection of these structures is a rather specialised process.

1.4. SCOPING PHASE

The proposed project is currently in the Scoping Phase. The aim of this phase is to determine, in detail, the scope of the EIA required for the proposed activities. The principal objectives of the Scoping Phase in accordance with the regulatory requirements are to:

- Describe the nature of the proposed project;
- Enable preliminary identification and assessment of potential environmental issues or impacts to be addressed in the subsequent EIA phase;
- Define the legal, policy and planning context for the proposed project;
- Describe important biophysical and socio-economic characteristics of the affected environment;
- Undertake a public participation process that provides opportunities for all Interested and
Affected Parties (I&APs) to be involved;
- Identify feasible alternatives that must be assessed in the EIA phase; and
- Define the Plan of Study (PoS) for the EIA phase.

1.5. THE SCOPING REPORT

This report is the first of a number of reports that will be produced in the EIA process (see Figure 1-1 above). The scoping report has been produced in accordance with the requirements as stipulated in Section 28 of the EIA regulations (GNR 543), which clearly outlines the content of a scoping report, and Sections 54-57 which cover the activities necessary for a successful Public Participation Process (PPP). Section 1.5.1 below provides the detailed structure of this scoping report and section 1.5.2 that follows outlines the limitations and assumptions under which this report was compiled.

Structure

The structure of the report is as follows:

Chapter 1 - Introduction: Provides background information on the proposed project, a brief description of the EIA process required by NEMA and its associated regulations, and describes the key steps in the EIA process that have been undertaken thus far, and those that will be undertaken in the future. The details and expertise of the Environmental Assessment Practitioner (EAP) who prepared this report are also provided in this Chapter.

Chapter 2 – Project description: Provides a description of the proposed development, the property on which the development is to be undertaken and the location of the development on the property. The technical details of the process to be undertaken are also provided in this Chapter.

Chapter 3 – Relevant Legislation: Identifies all the legislation and guidelines that have been considered in the preparation of this scoping report.

Chapter 4 – Description of the affected environment: Provides a brief overview of the biophysical and socio-economic characteristics of the site and its environs that may be affected by the proposed development compiled largely from published information, but supplemented by information from a site visit.

Chapter 5 – Public Participation Process: Provides details of the public participation process conducted in terms of Regulation 28(a) including:
- The measures undertaken thus far to notify I&APs of the application;
- Proof that notice boards, advertisements and notices notifying potential I&APs of the application have been displayed, placed or given;
- A list of all persons and organisations that were identified and registered in terms of Regulation 57 as I&APs in relation to the application.

Chapter 6 – Issues identified during Scoping: Provides a description of the key issues that have been identified by the project team and through discussions with I&APs thus far in the Scoping Phase, and that will be assessed in the EIA phase.

Chapter 7 - Alternatives: Provides a brief discussion of feasible and reasonable alternatives to the proposed project that have been identified and considered, some of which will be investigated further in the EIA Phase.

Chapter 8 - Plan of Study: Sets out the proposed approach to the environmental impact assessment of the proposed project including:
- A description of the scope of work that will be undertaken as part of the EIA phase, including any specialist reports or specialised processes, and the manner in which the
described scope of work will be undertaken;
• An indication of the stages at which the competent authority will be consulted;
• A description of the proposed methodology for assessing the environmental issues and alternatives, including the option of not proceeding with the proposed development;
• Particulars of the public participation process that will be conducted during the EIA phase; and
• Any specific information required by the authority.

References: Cites any texts referred to during preparation of this report.

Appendices: Containing all supporting information

Assumptions and Limitations

This report is based on currently available information and, as a result, the following limitations and assumptions are implicit in it:

• Descriptions of the natural and social environments are based on limited fieldwork and available literature. More information will be provided in the EIA phase based on the outcomes of the specialist studies.
• The report is based on a project description taken from preliminary design specifications and site layouts for the proposed wind energy facility that have not yet been finalised and are likely to undergo a number of iterations and refinements before they can be regarded as definitive. All potential turbine array alternatives will, however, be contained within the property boundaries of the study area.
• The preliminary turbine site layout and associated infrastructure will be presented in the EIA phase and subject to the necessary specialist assessments. It is anticipated that this preliminary layout will be further refined as per the outcomes of these studies and overall EIA findings.

1.6. DETAILS AND EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

According to regulation 17 of the EIA regulations (2010), An EAP must –
(a) be independent; and
(b) have expertise in conducting environmental impact assessments, including knowledge of the Act, these Regulations and any guidelines that have relevance to the proposed activity

In fulfillment of the above-mentioned legislative requirement, provided below are the details of the Environmental Assessment Practitioner (EAP) that prepared this draft scoping report as well as the expertise of the individual members of the study team.

Details of the EAP

Coastal and Environmental Services (CES)
Physical Address: 67 African Street, Grahamstown 6139
Postal Address: P.O. Box 934, Grahamstown 6140
Telephone: +27 46 622 2364
Fax: +27 46 622 6564
Website: www.cesnet.co.za
Email: info@cesnet.co.za
Expertise of the EAP

CES is one of the largest specialist environmental consulting firms in southern Africa. Established in 1990, and with offices in Grahamstown and East London, we primarily specialise in assessing the impacts of development on the natural, social and economic environments. CES’s core
expertise lies in the fields of strategic environmental assessment, environmental management plans, environmental management systems, ecological/environmental water requirements, environmental risk assessment, environmental auditing and monitoring, integrated coastal zone management, social impact assessment and state of environment reporting.

In addition to adhering to all relevant national legislative requirements, CES is often required to review and summarise for specific projects, acquisition of equity funding from the majority of financial institutions demands that developments must meet certain minimum standards that are generally benchmarked against the Policy and Performance Standards of the International Finance Corporation and the World Bank Operational Directives and Policies. CES has worked on large projects in South Africa, Mozambique, Malawi, Kenya, Madagascar and Egypt and has been acknowledged by international lenders such as the World Bank and the International Finance Corporation, and the large mining companies continue to approach us as their preferred environmental consultant for this type of project.

The Project Team

Provided below are short *curriculum vitae* (CVs) of each of the team members involved in the proposed project EIA to date.

**Mr Marc Hardy**

*(Role: Report Leader)*

Marc holds a M.Phil in Environmental Management from Stellenbosch University’s School of Public Management and Planning. His professional interests include environmental impact reporting for linear, energy and bulk infrastructure projects, strategic environmental policy development and reporting – mostly relating to Environmental Management Framework’s (EMF’s) - compliance monitoring and environmental auditing. Marc has, amongst others, been project manager for the Dinokeng EMF (Gauteng), the Milnerton Refinery to Ankerlig Power Station Liquid Fuels Transportation Infrastructure Project, numerous Eskom Transmission and Distribution power line and substation EIA's countrywide, mining EMPR compliance audits, compliance audits for Camden, Grootvlei and Komati Power Stations and the hazardous waste management facility for the Coega Development Corporation (Coega IDZ). Before entering the consulting field he gained extensive experience in the EIA regulatory field whilst in the employ of the Gauteng Department of Agriculture, Conservation and Environment - being responsible for the review of infrastructure projects like the Gautrain Rapid Rail system and representing the Department on various EMF project steering committees. He is currently managing numerous EIA processes for wind energy developments countrywide, as well as renewable energy and mining projects throughout Africa.

**Mr Jadon Schmidt**

*(Role: Project Manager)*

Jadon holds a BSc degree in Geology and Botany, a BSc Honours degree in Botany (both from NMMU) and an MBA from Rhodes University with a core environmental management & sustainability focus. His MBA thesis addressed resource economic issues of marine protected areas. He is currently completing an MSc in estuarine ecology dealing specifically with sea level rise impacts on sediment and vegetation dynamics. Climate change, wetland ecology, renewable energy and resource economics are among his professional interests. Jadon is currently project leader/project manager for several EIAs in the large infrastructure & renewable energy sectors.

**Dr Chantel Bezuidenhout**

*(Role: Report Review)*
Chantel holds MSc and PhD degrees in Botany (estuarine ecology) and a BSc degree in Botany and Geography from NMMU. Chantel’s main focus is estuarine ecology and she has done extensive work on 13 systems from the Orange River Mouth in the Northern Cape to the Mngazi Estuary in the Transkei. As a result she has been involved in a number of ecological reserve determination studies including the Kromme, Seekoei and Olifants systems. Chantel has been an Environmental Consultant for approximately 5 years and as such has been focused on environmental management and impact assessment. Chantel is well versed in environmental legislation and has been involved in number of environmental impact assessments and management plans in South Africa, Zambia and Madagascar. She is currently employed in the Grahamstown office of CES.

**Ms Leigh-Ann DeWet**  
(*Role: Ecological Report Review*)  
Environmental Consultant/Botanical Specialist. Leigh-Ann holds a BSc (Botany and Entomology) as well as a BSc (Hons) and MSc in Botany from Rhodes University. She conducts vegetation sensitivity assessments, in turn to aid and guide developments and thereby minimizing their impacts on sensitive vegetation.

**Ms Tarryn Martin**  
(*Role: Ecological Report Production*)  
Tarryn holds a BSc (Botany and Zoology), a BSc (Hons) in African Vertebrate Biodiversity and a MSc with distinction in Botany from Rhodes University. Tarryn’s Master’s thesis examined the impact of fire on the recovery of C_3 and C_4 Panicoid and non-Panicoid grasses within the context of climate change. She has spent time at Rhodes University working as a research assistant and has spent many years working within the corporate tourism industry as a project manager. Her research interests include biodiversity conservation, ecotourism and climate change.

**Mr Justin Green**  
(*Role: Report Production*)  
Justin has a BSc. degree in Zoology and Entomology as well as a Post Graduate Diploma in Enterprise Management from Rhodes University. Justin’s research interests include a broad range of environmental conservation focussing on African mammology and estuarine ecology with the main focus on invertebrate faunal community structure.

**Mr Thomas King**  
(*Role: Report Production and mapping*)  
Thomas holds a BSc degree with specialisation in Zoology from the University of Pretoria and an Honours degree in Biodiversity and Conservation from Rhodes University. As part of his Honours degree, Thomas was trained in Geographical Information Systems (GIS) and Community Based Natural Resource Management (CBNRM) in addition to the required biological sciences courses. His honours thesis investigated the rate at which Subtropical Thicket recovers naturally after heavy grazing by ostriches (*Struthio camelus*).