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## EXECUTIVE SUMMARY

### Introduction

Mulilo Renewable Energy (Pty) Ltd, the applicant, intends to develop a 100 mega watt wind farm in De Aar. The context within which this development is proposed is the global concern around climate change and fossil fuel based energy supply. As a result and in response to this concern, the renewable energy industry is experiencing an explosive growth worldwide due to the accelerating global warming phenomena. Renewable energy resources are anticipated to replace coal fired power stations, thus reducing the carbon emissions that contribute to an increase in global warming.

During the past year, Mulilo Renewable Energy (Pty) Ltd identified wind power generation potential near De Aar. The site has been evaluated, and can accommodate at least 100 MW installed wind power generation capacity.

The site has been secured, with Mulilo Renewable Energy (Pty) Ltd entering into long term agreements with the land owners. Grid connectivity has been discussed with ESKOM, who are supportive of this project. Eskom is in a position to enter into a power purchase agreement as soon as the mechanism is made available.

Wind farms are considered to be of national importance in anticipation of its contribution to electricity supply and reduced reliance on non-renewable energy sources. This application has therefore been made directly to the National Department of Environmental Affairs (DEA).

### Location of the project

The site is located on the Swartkoppies and Maanhaarberge mountains to the south west of De Aar. These mountain ranges are located 20km south west of the town of De Aar in the Northern Cape. The site falls under the jurisdiction of the Emthanjeni Local Municipality. All properties are being leased by Mulilo Renewable Energy (Pty) Ltd.

The areas to be examined have a maximum elevation difference of 250m from the surrounding terrain at the foot of the mountains. The site is located in proximity to the major ESKOM substation, Hydra, which potentially provides very good grid connectivity.

The following technical factors were taken into consideration when alternatives were being considered

### Availability of wind resources:

Due to the characteristics of the wind resource profile of the specific site, wind turbine generators need to be placed at exactly the right location, to utilise the energy potential of the

wind resource that is available. Wind profiling of the area demonstrates that there are no other suitable sites in the vicinity.

**Proximity to a substation:**

Proximity to a substation is another key determinant for the locating of wind farms. The site identified is located close to a substation which among other factors makes it the ideal location. The closest substation is the Hydra substation, which is located within the bounds of the general study area.

**Road requirements:**

Road and transmission line alignments were chosen based on the following criteria:

1. Length of route: Where possible, the shortest routes were chosen.
2. Existing roads: Existing roads and tracks can be found on most of the areas that were investigated. Existing tracks and roads were favoured since it constitutes previously impacted areas. Existing access roads are also normally constructed along the most accessible routes.
3. Topography: In the absence of existing access routes, the topography determines the position of the access route.

The preferred routes are those that combine shortest distances with existing access routes.

**Generation capacity alternatives**

Alternatives that will be considered in this EIA relate to the generation capacity of the wind farm.

Two layout alternatives which as well as the no-go option have been identified for this development, are described below.

**Alternative 1: 67 Wind Turbine Generators**

Alternative 1 proposes 67 Wind Turbine Generators (WTG) with a generation capacity of 1.5MW per turbine results in an optimal generation capacity of 100 MW per annum. This is considered to be the preferred alternative.

**Alternative 2: Alternative Layout 2 (75 Wind Turbine Generators)**

Alternative 2 proposes 75 WTG with a generation capacity of 1.5MW per turbine results in an optimal generation capacity of 112.5 MW per annum.

### **Alternative 3: No-Go option**

The no-go alternative entails that the status of the properties remain as it currently is and existing rights and zoning will remain in place.

### **Specialist Findings**

#### **Botanical**

The primary natural vegetation type on site is not regarded as threatened on a national basis, and is very widespread within the Nama Karoo. Over 98% of the site supports vegetation in medium to pristine condition, and was mapped as being of Medium or High sensitivity in the baseline study of Helme (2009). Ideally no development should occur within identified High sensitivity areas (pans and drainage lines), and all infrastructure should be located at least 30m from the edge of any High sensitivity areas. The proposed 13km power line would run through an area of relatively low botanical sensitivity.

Overall the preferred development alternative (Alternative 1) of the proposed Wind Energy Facility (WEF) is likely to have a Medium negative local (site scale; 25000ha site) and Low - Medium regional (eastern Nama Karoo; 1000 000ha) negative impact on the vegetation on site, after mitigation.

#### **Avifaunal**

The proposed WEF is likely to have a significant, long-term impact on the avifauna of the area, although the negative effects on key rare, red-listed and/or endemic species may be minimal. The main negative impact is likely to be on the resident and breeding population of Verreaux's Eagle. These birds are likely to be disturbed by construction of the WEF, will lose foraging habitat (in terms of areas covered by the construction footprint and by displacement from areas with operating turbines), and may suffer mortalities in collisions with the turbine blades. These effects may be mitigated to some extent, but are likely to have some detrimental impact even post-mitigation.

Overall the development impact is considered to be low after mitigation.

#### **Bats**

The construction and operation of the wind energy facilities is likely to cause bat fatalities through roost abandonment, collisions with rotating blades and barotrauma. However, the structure of the vegetation in the area and bat distribution records (Taylor 2000) together with the echolocation surveys undertaken supports the conclusion that bat activity on the proposed sites is low.

## Visual

Preferred Layout: It is noted therefore that from a visual perspective, the development may become an iconic feature in the wide-open Karoo landscape. The main source of receptors is in the town, but the town centre is 7.5km away from the nearest turbine group on Swartkoppies and their view is well broken up by trees and buildings.

Swartkoppies is a low hill but its length in relation to the number of proposed turbines, (13), ensures that they are not likely to dominate. The remainder of the development at Kasarmberge/Maanhaarberge is less contentious visually due to its greater distance from receptors and due to the smaller number of local receptors. Its visual impact is moderate-high but at a better scale in the landscape.

## Socio-economic

Although the socio-economic impacts is relatively low for this wind farm development, other potential spin-offs related to the development of the wind farm outside of the town of De Aar include aspects such as a potential increase in tourism activities for people wanting to come see the wind farm. The increase in tourism will include associated tourism and economic benefits such as the increase for overnight accommodation, restaurants and entertainment

## Traffic

It is expected that the construction phase of the proposed development could generate approximately 100 vehicular trips during the average weekday of which approximately 20 percent will be heavy truck traffic.

In essence the difference in Alternative 2 is 8 additional wind turbines on the site and in terms of the traffic impact it is not expected that the traffic impact associated with Alternative 2 will differ much from that of Alternative 1. With the increase in the number of wind turbines the construction traffic will also increase and the traffic impact during the construction phase will be slightly higher than that of the preferred Alternative 1.

### Alternative 1 (Preferred)

- The operational phase of this project is not expected to generate significant traffic volumes. The typical day-to-day activities will probably only be service vehicles undertaking general maintenance at the site. The number of permanent staff on site is not expected to be more than 20 people and therefore no additional upgrades are required to accommodate the operational site traffic.

## **Heritage**

The key issue is the visual impact on the farming settlements and werfs together with other historical remnants such as the stone wall and the well pit on the landscape character. To some extent this can be mitigated through placement of turbines in legible groups away from the homesteads. However with the scale and the dominance of the turbines it needs to be accepted that visual impact on landscape character will be high to medium and should be measured against positive socio-economic and environmental factors.

That Alternate 1 is the most appropriate option as it has the lesser visual impact on the character of the environment and the settlements in which the heritage resources are located.

## **Archaeological**

With regard to the proposed De Aar Wind Energy Facility on the Farms Zwartkoppies and Smouspoort, indications are that in terms of historical and archaeological heritage, the proposed activity is viable, and impacts are expected to be limited and manageable.

In archaeological terms, no fatal flaws have been identified

## **Palaeontology**

Given the limited effective paleontological potential of rocks in the region, the comparatively small footprint of the proposed wind farm and the shallow excavations envisaged here, no further paleontological mitigation is recommended for this development as impacts are non-existent or low.

The cumulative impacts will fall mainly in the spheres of land use change and visual impact.

Based on the findings of all the credible specialists who undertook their respective specialist studies (based on the approved terms of references), it is concluded that the overall impact of this development is low. This development has been reviewed by using the triple bottom line approach, which clearly shows that this is a sustainable development with a balance between the biodiversity, social and economic elements. Global dependence on fossil fuels and the impacts of climate change is of concern globally. South Africa whose energy is largely fossil fuel based must aim to meet targets which have been set to incorporate more renewable energy into the energy mix and reduce carbon dioxide emission. The proposed wind farm is a step in this direction as this form of energy is considered to be a clean fuel which has not only local but also global benefits. The benefits that this proposed development contain in these crucial three spheres outweigh the negative impacts.

All measures and recommendations proposed by the various specialists are considered achievable and should be included as conditions of approval.

### **National Environmental Management Act (NEMA)**

The approach to the Environmental Impact Assessment has been guided by applicable legislation and by the principles of Integrated Environmental Management (IEM). The underlying principle of IEM is that environmental factors should be integrated into development proposals to ensure that critical environmental concerns are addressed upfront. The principles laid out in NEMA (Act No. 107 of 1998) are similar in intention to those of IEM.

The study has also been guided by the requirements of the Environmental Impact Assessment Regulations set out in terms of the National Environmental Management Act, 107 of 1998. The EIA Regulations, which are more specific in their focus, define the EIA process in detail. As indicated, the EIA process consists of two phases, i.e. Scoping and EIA. This application is currently at the EIA Phase.

**This application was undertaken in accordance to the EIA Regulations of 2006 but is also compliant to the current EIA Regulations of 2010, Listing Notice 544, 545 and 546 of the National Environmental Management Amendment Act.**

### **Way Forward**

This report is being made to the Department for a decision. Once an Environmental Authorization (previously called a Record of Decision) is issued all registered Interested and Affected Parties will be notified of the decision and details of the appeal procedure will be provided.