DOCUMENT DESCRIPTION

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Project name:	Proposed Wind Farm, De Aar
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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.

TABLE OF CONTENTS

GLOSSARY

Agricultural zoning*: Means the property is zoned for agricultural use irrespective of whether it has actually been used for farming practices*

Anemometer: *Measures the wind speed and transmits wind speed data to the controller.*

Applicant*: A person who has submitted or intends to submit an application*

Biodiversity*: The variety of organisms considered at all levels, from genetic variants belonging to the same species through species, genera, families to higher taxonomic echelons. Also includes the variety of natural communities and ecosystems*

Blades: *Most turbines have either two or three blades. Wind blowing over the blades causes the blades to "lift" and rotate.*

Brake: *A disc brake, which can be applied mechanically, electrically, or hydraulically to stop the rotor in emergencies.*

Cape Floristic Kingdom*: A floral province defined on the basis of the number of plant species, genera and families which grow there and nowhere else, i.e. are endemic to the area (also known as the Cape Floral Region or Flora Capensis)*

Controller: *The controller starts up the machine at wind speeds of about 8 to 16 miles per hour (mph) and shuts off the machine at about 65 mph. Turbines cannot operate at wind speeds above about 65 mph because their generators could overheat.*

Economy: *An economy is a system in which goods are made, distributed and used. Every country, province, district, local area and individual community has its own economic system.*

Endemic*: Restricted to a given region; usually used to denote a species, genus or family which is confined to a specific area.*

Environment*: The external circumstances, conditions and objects that affect the existence and development of an individual, organism or group. These circumstances include biophysical, social, economic, historical and cultural aspects*

Environmental Consultant*: Means the independent consultant who has expertise in the area of environmental concern being dealt with in the specific application and who must on behalf of the applicant, comply with the requirements of the EIA regulations (GN No R1183 of 5 September 1997, as amended) and who must have no financial or other interest in the undertaking of the proposed activity, except with regard to the compliance with these regulations*

Environmental Impact Assessment*: A study of the environmental consequences of a proposed course of action.*

***Ephemeral**: An organism that has a short life cycle*

***Evaluation:** The process that "uses the information from monitoring to analyse the process, programmes and projects to determine if there are opportunities for changes to the strategy, programmes and projects. Evaluation, like monitoring, should promote learning. In the implementation stage of a LED strategy, evaluation is used to determine if the actions are meeting the strategic objectives, efficiently, effectively and/or at all."*

***Footprint**: Means the total surface area of the proposed project/development*

***Foreign Direct Investment (FDI):** FDI is investment that is attracted from abroad.*

***Gear box:** Gears connect the low-speed shaft to the high-speed shaft and increase the rotational speeds from about 30 to 60 rotations per minute (rpm) to about 1200 to 1500 rpm, the rotational speed required by most generators to produce electricity. The gear box is a costly (and heavy) part of the wind turbine and engineers are exploring "direct-drive" generators that operate at lower rotational speeds and don't need gear boxes.*

***Generator:** Usually an off-the-shelf induction generator that produces 60-cycle AC electricity.*

***Geo-hydrology**: The study of groundwater*

***Gross Geographic Product (GGP):** comprises the value of all final goods and services, produced during a year, within the boundaries of a specific region and is commonly used to measure the level of economic activity in a specific area. For analytical purposes, GGP is utilised as an important indicator of economic activity.*

***Heritage Resources**: Historically important features such as graves, trees and the fossil beds and culturally significant symbols, spaces and landscapes, archaeological, paleontological and cultural materials*

***High-speed shaft:** Drives the generator.*

***Hydrology:** The study of rivers, lakes and wetlands*

***Impact on employment numbers**: the number of additional jobs created or jobs lost as a result of the change in the economic growth of the local economy. This is the most popular measure of economic impact because it is easier to comprehend than large, abstract Rand figures.*

***Indicators:** Proxy measures to provide operational definitions to the multidimensional components of LED. Indicators are expected to serve the function of defining policy problems and informing policy formulation. They should provide a basis for policy discussion and planning.*

Informal Sector*: Informal Sector activity is a dynamic process which includes many aspects of economic and social theory including exchange, regulation, and enforcement. By its nature, it is necessarily difficult to observe study, define, and measure. No single source readily or authoritatively defines informal economy as a unit of study. It refers to economic activities that fall outside the formal economy regulated by economic and legal institutions*

Key Performance Indicators (KPI): *KPIs are quantifiable measurements of the progress towards the achievement of the objectives of a project or organisation.*

Labour Market Information: *The body of data available on a particular labour market, including employment and unemployment statistics, occupational statistics, and average hours and earnings data.*

Listed Activity*: Means any activity as identified by the Minister of Environmental Affairs and Tourism has in terms of sections 24 and 24D of the National Environmental Management Act (Act No. 107of 1998), as amended, listed under GNR 386 and 387*

Local Economic Development (LED): *is an approach to sustainable economic development that encourages residents of local communities to work together to stimulate local economic activity that will result in, inter alia, an improvement in the quality of life for all in the local community.*

Low-speed shaft: *The rotor turns the low-speed shaft at about 30 to 60 rotations per minute.*

Nacelle: *The rotor attaches to the nacelle, which sits atop the tower and includes the gear box, low- and high-speed shafts, generator, controller, and brake. A cover protects the components inside the nacelle. Some nacelles are large enough for a technician to stand inside while working.*

New Business Sales: *is the impact on Business Output (also referred to as revenue or sales volume) and is the broadest measure of economic activity, as it generates the largest numbers. It includes the gross level of business revenue, which pays for cost of materials and cost of labour, as well as generating net business income profits.*

Pitch: *Blades are turned, or pitched, out of the wind to keep the rotor from turning in winds that are too high or too low to produce electricity.*

Primary Sector: *This sector is involved with gathering the raw materials (natural resources) from which everything else is made. Both mining and agriculture work directly on the products of nature found on, or under, our soil. (Example: Agriculture & Mining sectors)*

Projects: *A set of ideas, aims or activities that serve to implement specific program components. They must be prioritised and all costs must be established. They are time bound and measurable.*

Public Participation Process*: A process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters*

Red Data Species*: Species of plants and animals that because of their rarity and/or level of endemism are listed in a Red Data Book which provides an indication of their threat of extinction and recommendations for their protection*

Rotor: *The blades and the hub together are called the rotor.*

Scoping Report*: A written report describing the issues identified to date for inclusion in an EIA*

Scoping*: A procedure to consult with Interested and Affected Parties to determine issues and concerns and for determining the extent of and approach to an EIA, used to the focus the EIA*

Secondary Sector*: The secondary sector processes the raw materials from the primary sector. The secondary sector is thus a step away from the primary sector and consists of activities that process raw materials into manufactured products or material goods that are used by consumers. (Example: Construction, Water & Electricity and Manufacturing sectors)*

Secondary source: *Information sources that describe other (primary) information, using existing information sources, e.g. data bases, reports and publications.*

SMMEs: *Small, Micro and Medium Enterprises*

Stakeholders: *Interested, affected and influential individuals, organisations, governments or agencies with stakes in, or influence on, the planning outcome.*

Tower: *Towers are made from tubular steel (shown here) or steel lattice. Because wind speed increases with height, taller towers enable turbines to capture more energy and generate more electricity.*

Visual Absorption Capacity*: The potential for the area to conceal an object or proposed development*

Visual Impact Assessment*: A study of the visual consequences of a proposed development or course of action.*

Wind direction: *This is an "upwind" turbine, so-called because it operates facing into the wind. Other turbines are designed to run "downwind", facing away from the wind.*

Wind vane: *Measures wind direction and communicates with the yaw drive to orient the turbine properly with respect to the wind.*

Yaw drive: *Upwind turbines face into the wind; the yaw drive is used to keep the rotor facing into the wind as the wind direction changes. Downwind turbines don't require a yaw drive; the wind blows the rotor downwind.*

Yaw motor: *Powers the yaw drive.*

ABBREVIATIONS

BID	Background Information Document
CBD	Central Business District
CMA	Cape Metropolitan Area
DEAT	Department of Environmental Affairs and Tourism
DJEC	DJ Environmental Consultants
DoE	Department of Energy
DSR	Draft Scoping Report
DWAF	Department of Water Affairs and Forestry
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMP	Environmental Management Plan
FSR	Final Scoping Report
GDP	Gross Domestic Product
GGP	Gross Geographic Profit
HIA	Heritage Impact Assessment
HWC	Heritage Western Cape
I&AP	Interested and Affected Party
IDF	Integrated Development Framework
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IPPs	Independent power producers
LUPO	Land Use Planning Ordinance (Ordinance 15 of 1985)
MSDF	Metropolitan Spatial Development Framework
NEMA	The National Environmental Management Act, 107 of 1998
NERSA	National Energy Regulator of South Africa
NSBA	National Spatial Biodiversity Assessment

PPP	Public Participation Process
PUEG	Provincial Urban Edge Guidelines (2005)
REFIT	Renewable Energy Feed-In-Tariff
RoD	Record of Decision
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework WEF, NERSA,
UNCBD	United Nations Convention on Biological Diversity
UNFCC	United Nations Framework Convention on Climate Change
WEF	Wind Energy Facility

CHAPTER 1: INTRODUCTION

1.1 Background and Introduction

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.

South Africa is on the verge of adding renewable energy power generation to existing coal fired and nuclear power stations thus creating the framework that will lead to clean energy. In March 2009 National Energy Regulator of South Africa (NERSA) published a favourable feed-in tariff structure for renewable energy, with a tariff of R1.25 per kWhr for wind. This tariff is linked to inflation, with the terms and conditions to be finalised in the power purchase agreement. The mechanism for the independent power producers to enter into contracts with the single buyer office of ESKOM is expected to be made available by the third quarter of 2010.

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).

A number of specialists have been engaged to provide specialist input in terms of potential impacts which may occur as a result of the proposed development. A list of the specialists engaged is presented later in the report. In terms of planning requirements, a departure or rezoning application in terms of the Land Use Planning Ordinance (15 of 1985) will have to be applied for to allow a wind generation facility on land that is zoned for Agricultural use.

Mulilo Renewable Energy (Pty) Ltd (the applicant) proposes to placed wind turbines on RE 130, RE 138, 131/2, 131/1, 130/4, RE 131, 131/7 (3) - 15/180, 31/0 (Remaining Extent), Zwartekopjes Rem 131/3, Bosjesmans Fountain REM/136/1, Hartebeesplaat 135, RE 180, De Aar, in order to establish a 100 MW wind farm in De Aar.The relevant properties are currently zoned as Agriculture Zone and cover an area of approximately **27 652.81** ha in extent (see Table 1.1).

Farm	Erf	Title ref	Size	Zoning
Smouspoort, Britstown RD	RE 130	T4827/1975	9 039.27	Agriculture
Damfountain 0, Britstown RD 138	RE 138	T65558/2002	6 518.80	Agriculture
Zwartekpjes 2, Britstown RD 131	131/2	T3960/1983	2 727.33	Agriculture
Zwartekopjes 1, Britstown RD 131	131/1	T9422/1984	918.37	Agriculture
Smauspoort 4, 130 Britstown RD	130/4	T9422/1984	309.51	Agriculture
Zwartekopjes, 0, Britstown RD 131	RE 131	T9422/1984	4 512.34	Agriculture
Zwartekopjes - West Hill	131/7 (3) - 15/180	T50812	300.8138ha	Agriculture
Hartebeest Hoek	31/0 (Remaining Extent)	T19018/2007	3627.19	Agriculture
Zwartekopjes	Zwartekopjes Rem 131/3	T16882/1998	5696m2	Agriculture
Britstown RD	Bosjesmans Fountain REM/136/1	T16882/1998	2465.2ha	Agriculture
Britstown	Hartebeesplaat 135	T16882/1998	2539.8ha	Agriculture
Philipstown RD	RE 180	T2197/1921	1040.4083ha	Agriculture

Table 1.1: Properties, Size and Zoning

This report serves as the documentation in support of an Environmental Impact Assessment (EIA) undertaken for the proposed development of Farm RE 130, RE 138, 131/2, 131/1, 130/4, RE 131, 131/7 (3) - 15/180, 31/0 (Remaining Extent), Zwartekopjes Rem 131/3, Bosjesmans Fountain REM/136/1, Hartebeesplaat 135, RE 180, De Aar.

1.2 Location of 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. Refer to Figure 1.1 for a location map.

Figure 1.1: Context: Maanhaarberge and Kombuisfonteinberge Mountain ranges

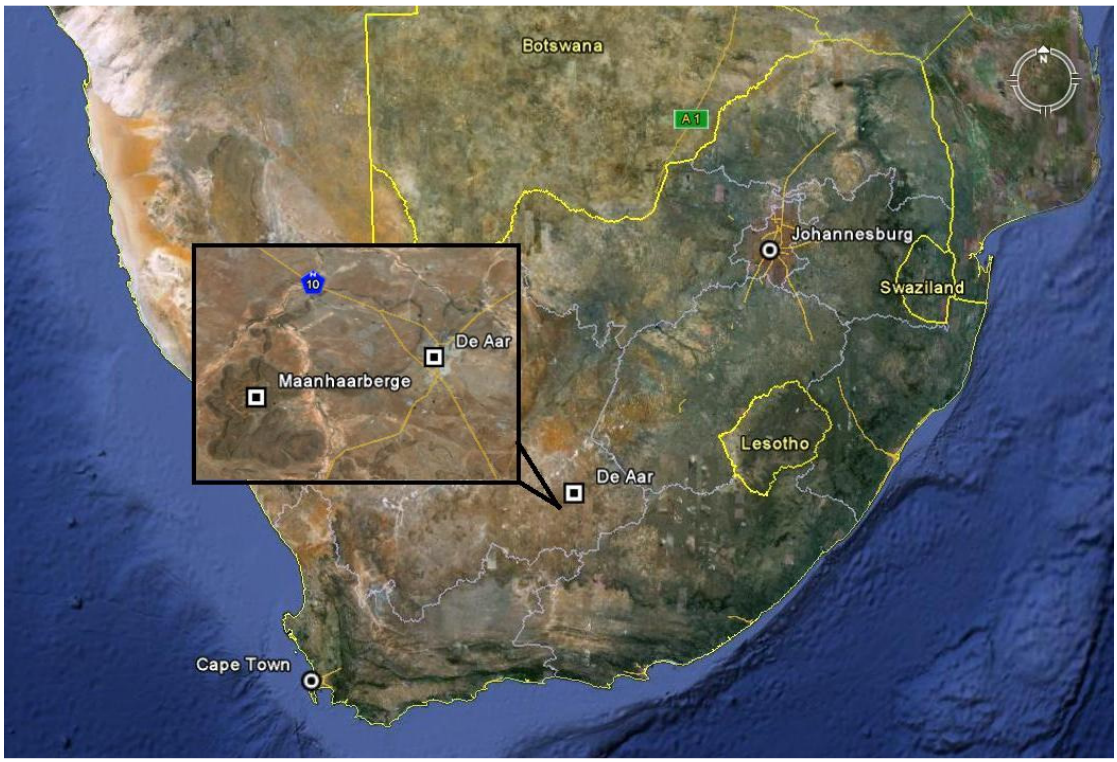
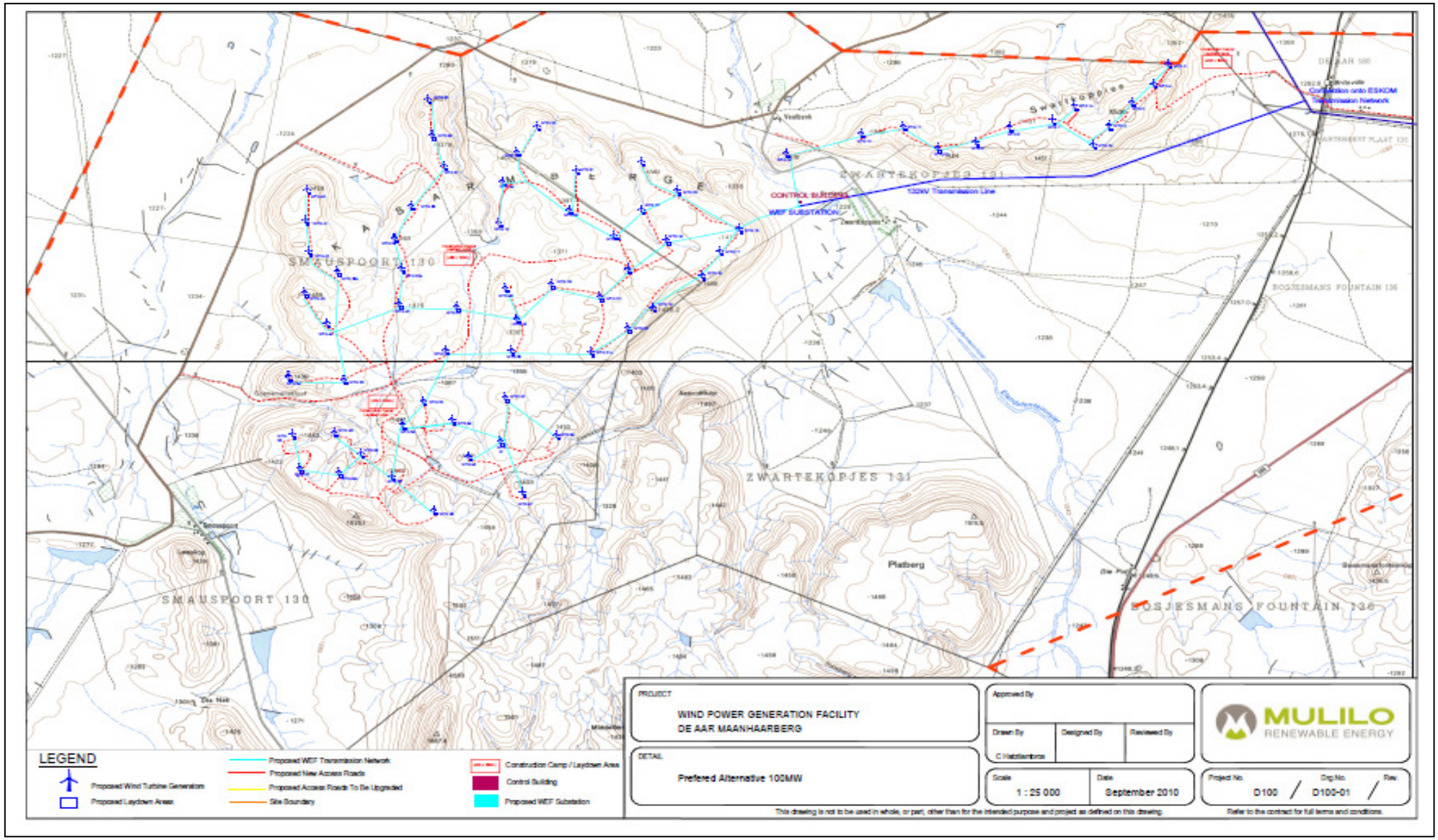


Figure 1.2: Location of Development Proposal (see Annexure C)



1.3 Qualifications of the EAP and Specialists

Name:	DJ Environmental Consultants	
Function	Dudley Janeke	Project Head
	Junaid Moosajee	Project Manager
	Quinton Terhoven	Project Coordination
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Dudley Janeke has a BSc (Ed) and BSc Honours in Botany from the University of the Western Cape. He has been involved in the Integrated Environmental Management field since 1998 and has been a principal of three environmental practices since 1999. His areas of expertise include environmental impact assessments, environmental site management and public participation programmes. He thus has considerable multi-disciplinary experience across the range of environmental sciences which he accrued over the past 11 years.

Junaid Moosajee has a Bachelor of Science (Honours) in Environmental Management from the University of Cape Town (UCT) and a certificate in Energy and Climate Change from the Energy Research Centre (UCT). Junaid has worked on a vast range of large, multidisciplinary projects including infrastructural, housing, waste and 'green' building EIAs and associated public participation processes.

The CVs of the relevant specialists are attached as part of the various specialists' reports.

1.4 Assumptions, limitations and gaps in knowledge

Limitations/assumptions to this EIA study are:

- All information received from sources contributing to this project is believed to be accurate and authentic.
- The proposal is limited to the development site, and no alternative site could be considered. Alternatives considered mainly relate to the output capacity of the wind farm.…
- The National Environmental Management Act (107 of 1998) Section 24(7) requires the consideration of cumulative impacts in the assessment process. It should be noted that cumulative impacts are considered as far as possible in the assessment of each impact.

1.5 Approach and Methodology

The approach to the Scoping and EIA Process 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. In accordance with the principles of IEM and NEMA, an open, transparent approach which encourages decision making that is accountable, has been adopted.

The underpinning principles of IEM require:

- Informed decision making and accountability for information on which decisions are made;
- A broad meaning to the term ‘environment’;
- An open participatory approach in the planning of proposals and consultation with I&APs;
- Due consideration of alternative options;
- An attempt to mitigate negative impacts and enhance positive impacts of proposals;
- An attempt to ensure that the social costs of development proposals are outweighed by the social benefits;

- Democratic regard for individual rights and obligations;
- Compliance with these principles during all stages of the planning, implementation and decommissioning of proposals; and
- The opportunity for public and specialist input in the decision-making process.

1.6 The Environmental Impact Assessment Process

In accordance with the requirements of NEMA (Act No. 107 of 1998), and relevant EIA regulations made in terms of this Act, the proposed project requires a full Scoping and Environmental Impact Assessment (EIA). The EIA process is guided by regulations made in terms of Chapter 5 of the National Environmental Management Act (Act No 107 of 1998), published as Government Notice No R.385 of 21 April 2006. The regulations set out the procedures and criteria for the submission, processing, consideration of and making decisions on applications for the environmental authorisation of activities. Two lists of activities, published on 21 April 2006, as Government Notices No R.386 and R.387, define the activities that require a Basic Assessment or a full Scoping and Environmental Impact Assessment respectively.

The activities triggered by the proposed De Aar Wind farm Project are listed in Table 1.3 below.

Table 1.3: ***Listed activities triggered by the development***

Government Notice R386 Activity No(s):	**Activity Description**
7	*The above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30m³ but less than 1000m³ an any one location or site.*
12*:*	*The transformation or removal of indigenous vegetation of 3ha or more or of any size where the transformation or removal would occur within a critically endangered or an endangered ecosystem listed in terms of section 52 of the National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004). (A precautionary approach has been adopted , the verification of this listed activity is not yet confirmed)*
14*:*	*The construction of masts of any material or type and of any height, including those used for telecommunications broadcasting and radio transmission, but excluding* *a) masts of 15m and lower exclusively used by* *(i) radio amateurs; or* *(ii)for lighting purposes* *b) flagpoles; and* *c) lightning conductor poles.*
15*:*	*The construction of a road that is wider than 4m or that has a reserve wider than 6m, excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30m long.*
16(a):	*The transformation of undeveloped, vacant or derelict land to residential mixed, retail, commercial, industrial or institutional use where* such development does not constitute infill and where the total area to be transformed is bigger than 1ha.
Government Notice R387 Activity	**Activity Description**

No(s):	
1 (a):	*the construction of facilities or infrastructure, including associated structures or infrastructure, for the generation of electricity where (i) the electricity output is 20 megawatts or more; or (ii) The elements of the facility cover a combined area in excess of 1 ha.*
1 (l):	*The construction of facilities or infrastructure, including associated structures or infrastructure for the transmission and distribution of above ground electricity with a capacity of 120kv or more.*
2	*Any development activity, including associated structures and infrastructure, where the total area of the developed area is, or is intended to be, 20 hectares or more.*

On 18 June 2010 the National Minister of Water and Environmental Affairs, promulgated regulations in terms of Sections 24(5), 24M and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA"), viz, the Environmental Impact Assessment ("EIA") Regulations 2010 (Government Notice No. R. 543, R. 544, R. 545, R. 546 and R. 547 in Government Gazette No. 33306 of 18 June 2010):

These regulations came into effect on 02 August 2010 (Government Notice No. R. 660, R. 661, R. 662, R. 663, R. 664 and R. 665 in Government Gazette No. 33411 of 02 August 2010). The EIA regulations 2010 replace the EIA regulations that were promulgated in 2006 and also introduce new provisions regarding environmental impact assessments as well as regulations regarding environmental management frameworks.

The proposed development is also in compliance with the recently approved government regulations, Government Notice No. R.543 of 2 August 2010, under the National Environmental Management Amendment Act, 2008 (Act No. 62 of 2008) (NEMAA). The issues and environmental impacts associated with the listed activities under NEMAA have been addressed by this Final EIA report as no new listed activities have been triggered.

The listed activities that trigger the Scoping and EIA process under the NEMAA are listed in Listing Notices 1 and 2 published in Government Notices No. R.544 and R.546 respectively. The NEMAA listed activities triggered by the proposed development are shown in Table 1.4 below.

Table 1.4 NEMAA Listed activities

Government Notice R.544 (Listing Notice 1) Activity No(s):	Activity Description
1	*The construction of facilities or infrastructure for the generation of electricity where:* *(ii) the output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare.*

10	*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.*
23	*The transformation of undeveloped, vacant or derelict land to –* *(ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares;*
Government Notice R.545 (Listing Notice 2) Activity No(s):	**Activity Description**
1	*The construction of facilities or infrastructure for the generation of electricity where the electricity output is 20 megawatts or more.*
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 afforrestation where activity 16 in this Schedule will apply.*

The EIA process takes place in three broad phases, namely Submission of an application form, Scoping and the Environmental Impact Assessment. This application is currently at the Environmental Impact Assessment (EIA) Phase.

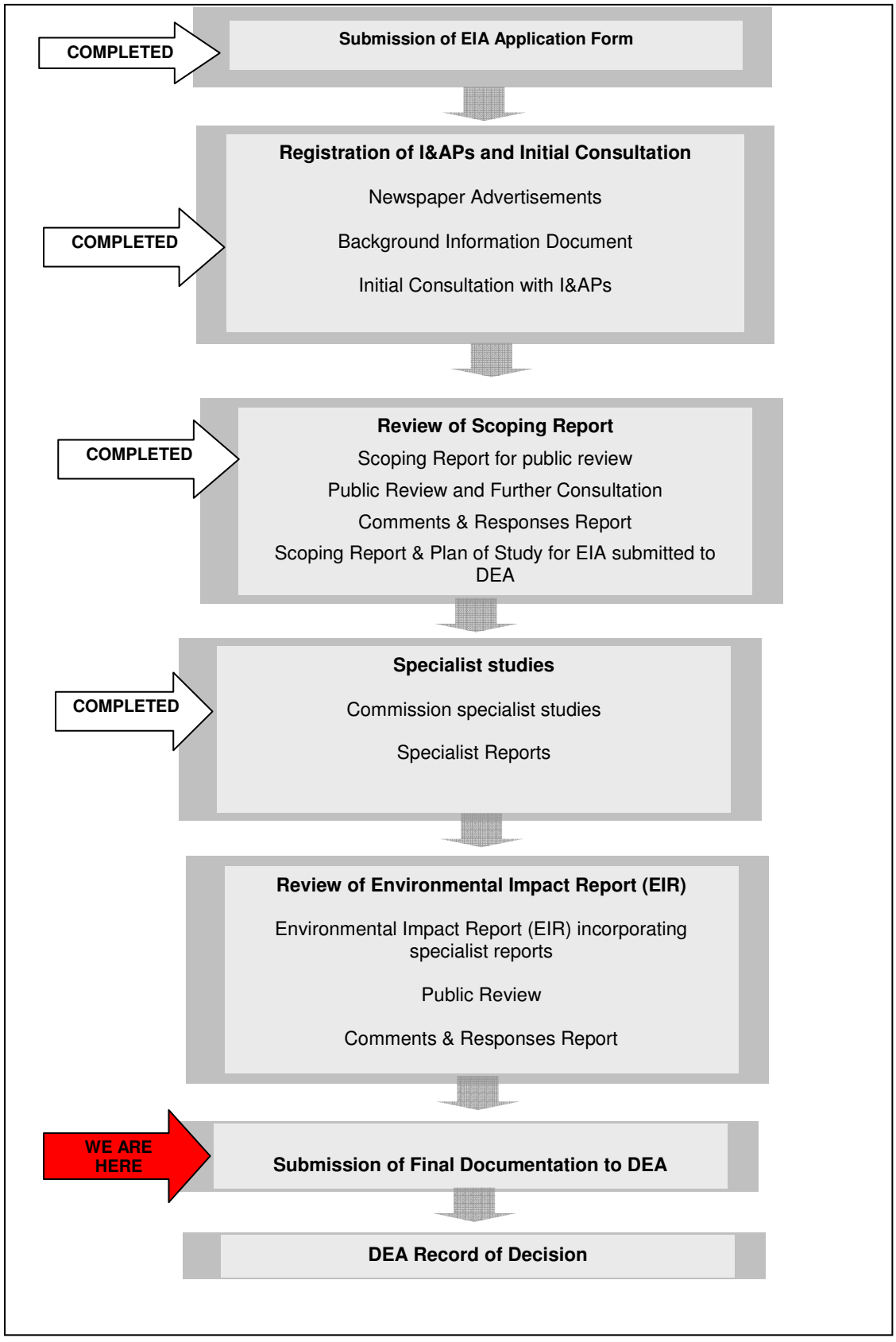
The purpose of the EIA is to:

- address issues that have been raised during the scoping phase;
- assess alternatives to the proposed activity in a comparative manner;
- assess all identified impacts and determine the significance of each impact; and
- formulate mitigation measures.

The study has also been guided by the requirements of the EIA 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 primarily two phases i.e. the Scoping and EIA phase. This application is currently at the EIA Phase.

The EIA process that has been followed is depicted in Figure 1.3 and a description of the process followed.

Figure 1.3: EIA Process Flowchart



Public participation to date

A full Scoping and EIA process consists of a number of phases, as illustrated in the figure above. The initial phase was the submission of an Application Form, which was submitted to DEA on **28 August 2009**. DEA issued a letter of acceptance on **31 August 2010**. The second phase in the full Scoping and EIA process is the Registration of Interested and Affected Parties (I&APs) and Initial Public Consultation. To inform I&APs of the proposed development and invite their registration on the project database, a notification advert was placed in **The Echo** and **Die Volksblad** newspapers on **08 October 2009** (See attached letter Annexure 4B, list of residents who received letters Annexure 4D). All registered I&AP were sent a copy of the Background Information Document. During this phase of the full EIA process key stakeholders (e.g. the Local Authority and CapeNature) were also consulted.

The **Scoping Report** was released for public review and comment from the **19 May 2010 till 02 July 2010**. I&APs were provided with 40 days to review the Scoping Report and submit their comments. The report was placed at the **De Aar Public Library** in De Aar and at **Damfontein Farm**. Copies of the report were also circulated to I&AP who requested it for review and comment. The Scoping Report and Plan of Study for EIA were also forwarded to the local authority Emthanjeni Local Municipality as well as other Organs of State for review and comment.

DJEC summarised all I&AP comments received throughout the process and provided responses to these comments in a **Comments & Responses Report** which was included in the Scoping Report that was forwarded to DEA. DEA reviewed the Scoping Report and Plan of Study for the EIA phase and gave permission to commence with the assessment phase

The EIA phase involved the appointment of the various specialists and execution of these specialist studies according to the approved terms of reference. The findings of the specialists' studies were reviewed and captured in the EIA Report which was made available for public review and comment by all registered I&APs as well as the relevant statutory bodies. I&APs were afforded with 40 days to review and comment on the document.

This **EIA Report** along with the Comments & Responses Report and other relevant information (e.g. Environmental Management Programme) have been submitted to DEA

for a decision. DEA will take 60 days to reach a decision which may be to authorize or to reject the application.

Registered I&APs will be notified within 10 days of the record of decision from the authorities

CHAPTER 2: PROJECT DESCRIPTION

2.1 Nature/type of development

The applicant intends to establish a 100 MW wind farm in De Aar. The site is located within an existing farm which is zoned for Agricultural purposes. The site was selected based on wind data from the National Aeronautics and Space Administration (NASA) Surface meteorology and Solar Energy website, at 50m, and the data set which is the most detailed, obtained from a located in De Aar. Wind farms become viable where acceptable wind speeds are measured at least 30% of the time, and can typically be found in elevated (mountainous) areas or in the coastal regions.

The proposed De Aar wind farm consists of 67 turbines, each with a generation capacity of 1,5 MW. The turbines are mounted on cylindrical steel towers 80 meters high and 4 meters in diameter at the base. Each turbine rotor has three blades, each 42 meters long and manufactured from a composite material.

The wind farm is situated 22 kilometres from the Hydra substation, where the electricity will be fed into the national grid. The wind turbines will generate electricity at a voltage of 22 kV which will stepped up with a transformer to 132kV which will lead over a 10km distance to the national grid.

The wind farm will be built in one phase, with a total construction period of an estimated 12 months.

The turbines will be painted white and provided with red flashing night lights according to the SA Civil Aviation Authority's requirements.

Each turbine, with the underground base and the crane lifting pad, occupies an area of 15 by 15 metres. The total wind farm is spread over an area of 350 hectares, with the required spacing between turbines of 200 to 600 metres, depending on terrain topography and main wind direction.

2.1.1 Transmission Towers

There is some uncertainty at the time of writing as to which design of transmission pylon will be selected by Eskom. There are a number of factors to be taken into account and a decision has not yet been taken. A double circuit (i.e. two conductors on the same towers).or two 132kV poles could be used. Eskom is yet to decide which option they prefer.

The type being considered is a monopole, 10m high, spaced approximately 250m apart, depending on terrain.

An illustration of two types of monopoles is given below:

Photo 1: Monopole design

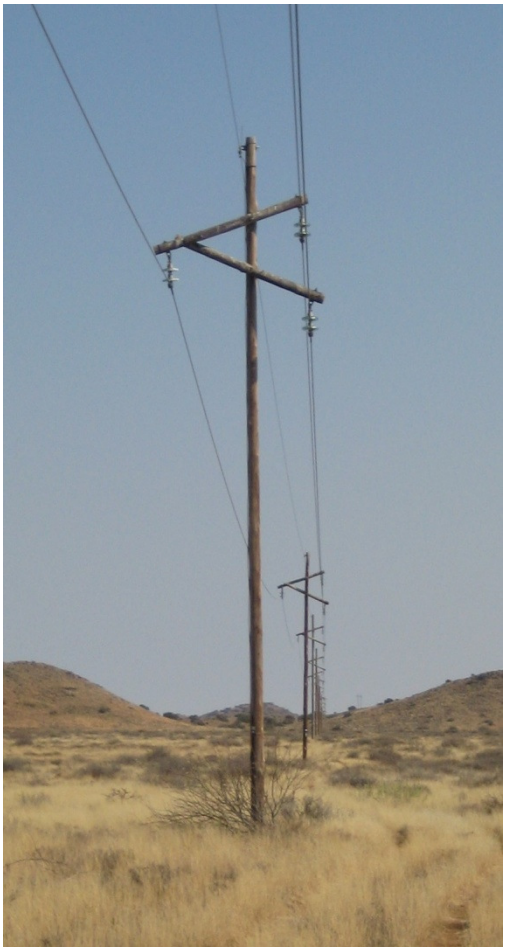
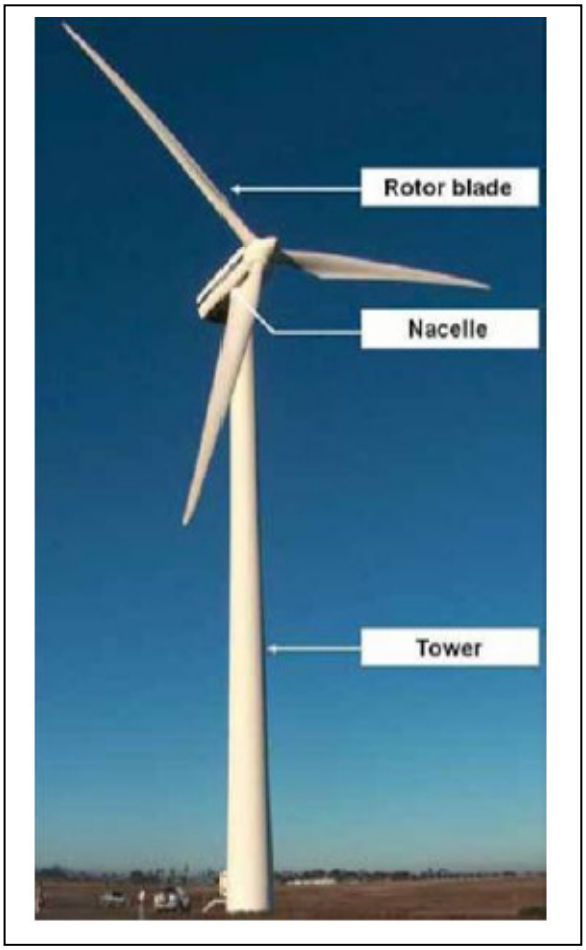


Photo 2: Monopole design

The turbine components are shown in the Photo 3 below:

Photo 3: Wind turbine components



2.2 Proposed construction methodology

Delivery of turbine components:

The turbine components will be delivered on a low bed abnormal load truck. To provide access to the site, existing gravel roads will be upgraded and will have a minimum width of four metres. Turning circles of 15 metres will be required for the trucks. The three access roads are shown in the Figure 2.1 below:

Figure 2.1a: Access road and transmission line alignment (***dark blue lines -access roads, light blue lines –22 kV transmission lines, green lines- 134kV transmission lines***)

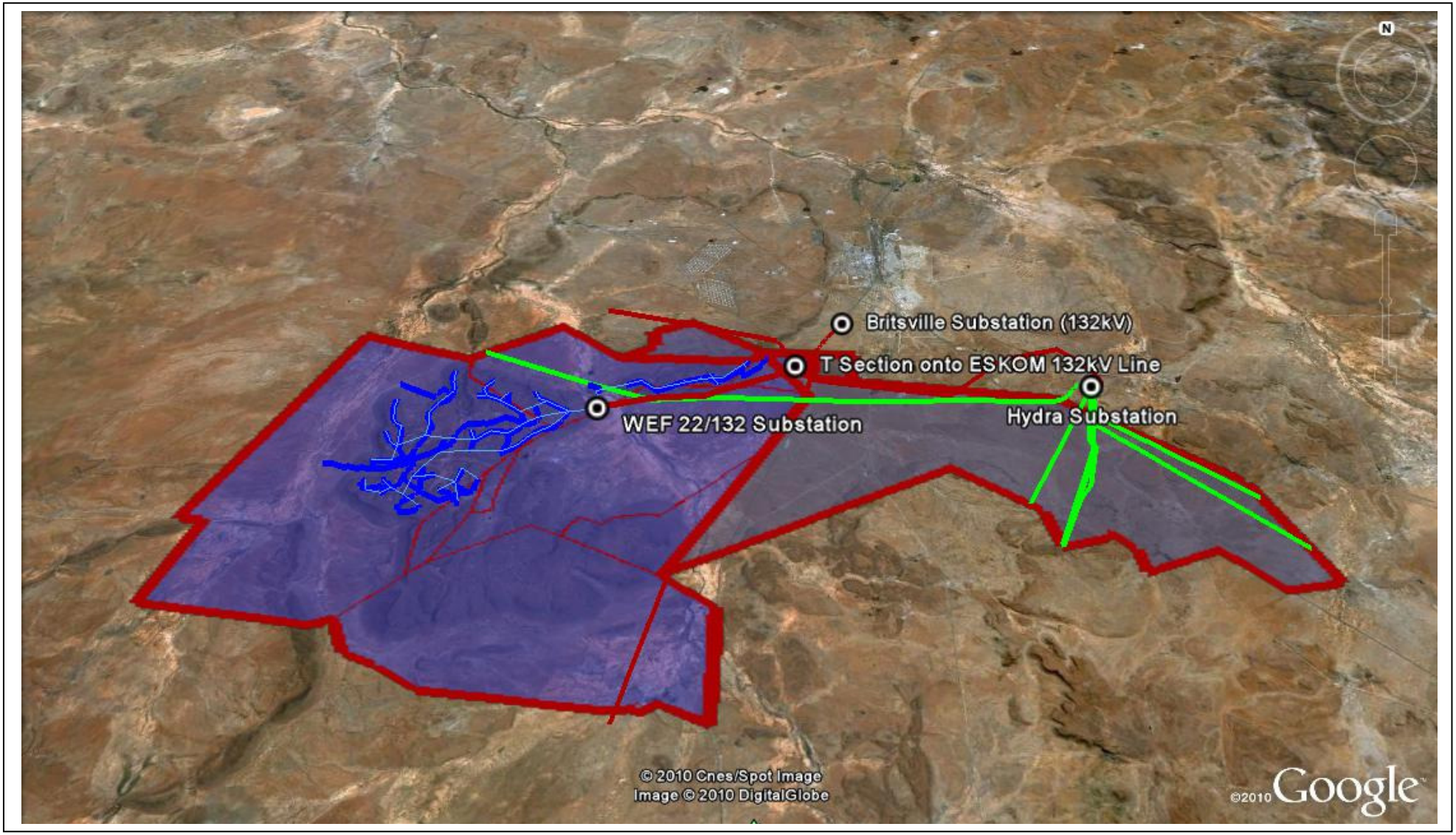


Figure 2.1b: Close up of road and transmission line alignment

The turbine erection:

A 120m crane will be used to erect the turbines. An image of a similar type crane is shown below:

The tower consists of three sections, with the first section being fitted onto the foundation by the crane. The other sections are then fitted onto the bottom section, on top of each other. The Nacelle is then fitted, followed by the hub and the rotor blades. An area of 40 by 20 meters will be required for the turbine components, crane and other equipment.

Foundation and materials:

In terms of the foundations a 16 by 16 metre wide and two metre deep foundation would be required for the turbine. Cement and reinforcing steel will be used in the foundation as illustrated in the photographs below:

Construction equipment and timing:

Construction equipment that would be present on site include: A 30 ton excavator and a 120m crane. The area required for construction is 40 by 20 meters. All excavated material will be for road works and no material will be stored on site.

A site camp for the construction phase will not be established with the construction period expected to last four weeks, of which 3 weeks would consist of laying the foundation, and another week to erect the turbine.

Main dimensions:

The turbine components will have the following dimensions and specifications

Weight and Dimensions

Component		Weight (unit: ton)	Dimensions(unit: m) length×width×height
Blade*	UP40.25	6.2	40.25×1.9×3.2
	UP37.5	6.0	37.5×1.9×3.2
Nacelle		61	10.2×3.8×3.8
Hub		15.1	3.75×3.75×3

Tower	Refer to following table

Tower weight and dimension

	65mHH 2A+		65mHH 2A		80m 3A+		65mHH 3A	
section	weight	Dimension (unit:mm) Length ×bottom outer diameter	weight	Dimension (unit:mm) Length ×bottom outer diameter	weight	Dimension (unit:mm) Length ×bottom outer diameter	weight	Dimension (unit:mm) Length ×bottom outer diameter
upper	25500	23178×3210	34101	30247×3475	30580	28629×3282	28800	30300×3475
middle	39891	21757×3654	39028	21486×4000	47161	26564×3787	32552	21453×4000
bottom	49025	16938×4000	27742	10140×4000	58111	21680×4200	24939	10115×4000

- Explanation: "HH" means hub height, 2A and 3A mean wind class according to IEC61400-1, "+" mean wind turbine can resist the ultimate wind speed of higher level wind class according to IEC61400-1

2.3 Proposed service infrastructure

Apart from a 4 m wide gravel access road, no services are required for the operation of the wind turbines. The turbines operate automatically and no on-site personnel are required.

2.4 Transport of the wind turbines

Materials to be imported will be shipped to Cape Town harbour and then transported by road over a distance of approximately 800 km to the site. Specialised high lifting and heavy load capacity cranes will be utilised to erect the turbine. A 4,5 meter gravel road will provide access to the turbine sites.

For this purpose two concept development plans have been prepared and tested in terms of its engineering efficiency, marketing potential and conservation. The development options were subjected to the scoping process. Subsequently, the required specialists' studies were undertaken as part of the assessment phase. The two development options (Alternative 1(Preferred) and Alternative 2) are now presented as the most feasible and reasonable for the proposed site. As part of the legislative

requirements, the no development or no-go option was also assessed as part of the process.

Preferred Development Option Layout

The preferred option for the proposed De Aar wind farm includes the construction of 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.

CHAPTER 3: ALTERNATIVES

Description of feasible and reasonable alternatives that have been identified

3.1 Alternatives

The NEMA Regulations require that alternatives to a proposed activity be considered. Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, process or technology alternatives, temporal alternatives or the no-go alternative.

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 as is described below

3.1.1 Alternative Layout 1

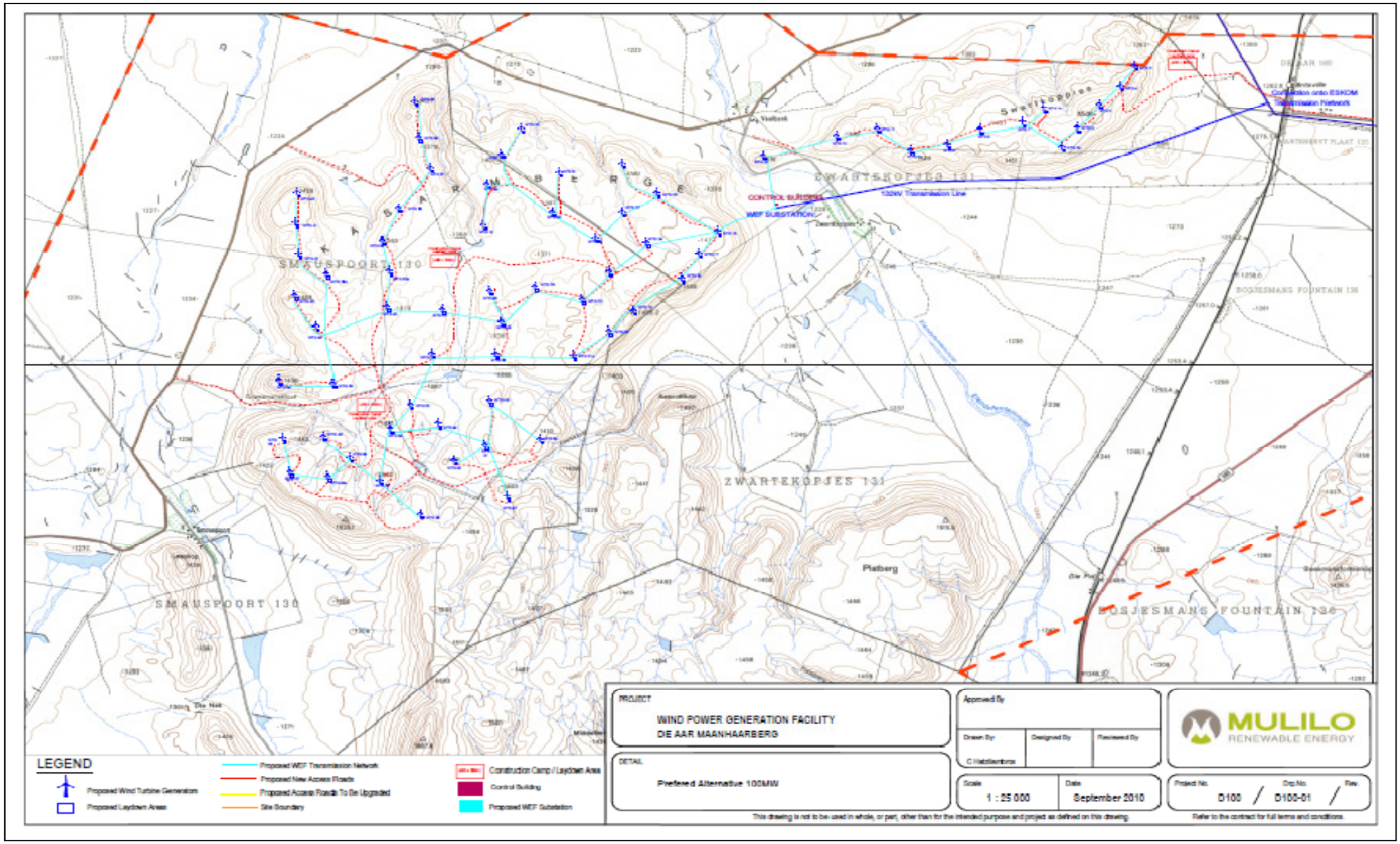
Alternative 1 proposes 67 Wind Turbine Generators (WTG) with a generation capacity of 1.5MW per turbine results in an optimal generation capacity of 100 MW per annum. This is considered to be the preferred alternative.

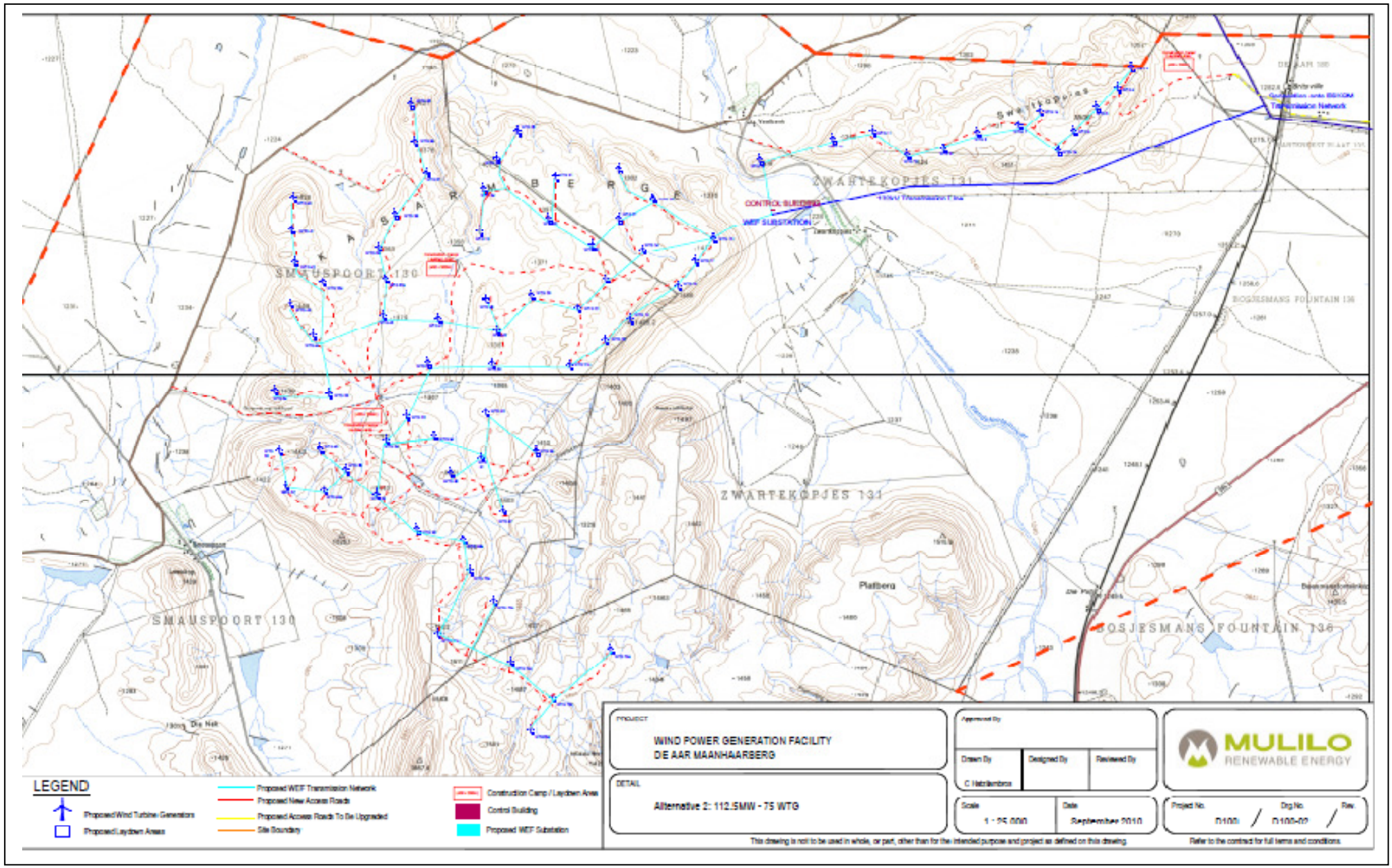
3.1.2 Alternative Layout 2

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.

See Figure 3.1 below for layout plan for both Alternative 1 and 2

Figure 3.1: Alternative 1 & Alternative 2 - Development Plan (A3 pull-outs are contained in Annexure C and D respectively)




SMAUSPOORT 130
ZWARTEKOPJES 131
BOSJESMANS FOUNTAIN 136
Platberg
CONTROL BUILDING
WEF SUBSTATION
LEGEND
Proposed Wind Turbine Generators
Proposed Laydown Areas
Proposed WEF Transmission Network
Proposed New Access Roads
Proposed Access Roads To Be Upgraded
Site Boundary
Construction Camp / Laydown Area
Control Building
Proposed WEF Substation
PROJECT
WIND POWER GENERATION FACILITY
DIE AAR MAANHAARBERG
DETAIL
Alternative 2: 112.5MW - 75 WTG
Drawn By
C Hattingh
Designed By
Reviewed By
Scale
1 : 25 000
Date
September 2010
Project No.
D100
Drg No.
D100-02
Rev.
MULILO
RENEWABLE ENERGY
This drawing is not to be used in whole, or part, other than for the intended purpose and project as defined on this drawing.
Refer to the contract for full terms and conditions.

3.1.3 No-Go option

Should the proposed development not proceed, i.e. the No Go or no development scenario occurs, then the subject properties is likely to continue to exist in its current state as underutilised agricultural land.

Mulilo Renewable Energy Pty (Ltd) considers this to be in conflict with policy frameworks which allow for renewable energy development as well as initiatives to reduce dependence of fossil fuel based energy sources and consequent contribution to climate change impacts.

CHAPTER 4: PUBLIC PARTICIPATION

4.1 Introduction

DJ Environmental Consultants ("DJEC") were appointed by the proponent to undertake the Scoping and Environmental Impact Assessment and associated Public Participation Process (PPP) in terms of the NEMA EIA Regulations for the proposed Residential Development on Mulilo Property, Farm Re/130, Farm Re/138, Farm 131/2 Re, Farm 131/1, Farm 130/4 and Farm Re/131, De Aar.

The Public Participation for the initial phase commenced on receipt of the project reference number from the Department of Environmental Affairs (DEA).

The purpose of this chapter is to provide an overview of the Public Participation activities undertaken as part of the initial phase of the assessment for the proposed development.

4.2 Objectives of the PPP

The overall aim of the consultation process is to ensure that all stakeholders have adequate opportunity to provide input into the process. More specifically the objectives of public consultation are to:

- Provide stakeholders with the opportunity to identify issues and concerns associated with the proposed project; and
- Identify mitigation and management options to address potential environmental issues.

4.3 Approach

The PPP was undertaken in accordance with the requirements of the DEA NEMA EIA Regulations.

The activities undertaken to canvass public opinion regarding the proposed project are summarised in Table 4.1.

Table 4.1: Summary of activities undertaken and proposed during public consultation

Activity	Date

PHASE 1: PROJECT INITIATION	
Submission of Application to DEA	**Application** submitted to DEA: **28 August 2009**
DEA Acknowledgement of Application	**31 August 2009**
Identification of I&APs	**October 2009**
Advertisement of the process	The application was advertised in **The Echo** and **Die Volksblad on 08 October 2009**
Placement of posters on site.	Posters indicating the proposed project were placed on the sites on **02 October 2009.**
PHASE 2: INITIAL PUBLIC CONSULTATION PROCESS	
Preparation and circulation of Background Information Document to I&APs	From **23 November 2009**
End of comment period on BID and registration for I&AP	**17 December 2009**
PHASE 3: SCOPING	
Circulation of Scoping Report to registered I&APs for comment	The release of the Scoping Report for public review **on 08 October 2009**
End of period for comment on Draft Scoping Report	**02 July 2010**
Collation of comments and submission of Scoping Report to DEA.	**05 July 2010**
PHASE 4: EIA	
DEA review Scoping Report and Plan of Study for EIA and issued a letter of acceptance and to proceed with the EIA phase.	**25 August 2010**
Appointment of Specialists to undertake studies according to the approved terms of reference.	From **October 2009**
EIA Report drafted and released in public domain for review and comment.	**08 October 2010** to **16 November 2010**
Collation of comments and submission of EIA Report and draft EMP to DEA.	**22 November 2010**
DEA review and issue a decision	**60 days** from submission to the

	Department

4.3.1 Identification of I&APs

I&APs, including local, provincial and national authorities, conservation bodies, NGO groups, immediate adjoining land owners etc, were identified. A list of I&APs involved in the process is provided in Annexure 4A.

4.3.2 Advertisements, Notices and Letters

An advertisement announcing the EIA Process and inviting I&APs to register on the project database was placed in **The Echo** and in **Die Volksblad** in Afrikaans. Copies of the advertisements are provided in Annexure 4B.

All I&APs who registered were sent a copy of the Background Information Document.

Two notices were placed on site (Afrikaans and English) advertising the proposed development and inviting I&APs to register on the project database. The size of the on-site notices was 60X84cm (see Annexure 4C).

The Scoping Report was placed for public review and comment at the De Aar Public Library and Damfontein Farm. E-mails (preferred means of communication) were also sent to all registered I&APs informing them of the release of the Scoping Report for public review and comment (see Annexure 4D).

The Environmental Impact Assessment Report was released in the public domain for review and comment. Copies of the EIA Report are placed at the De Aar Public Library and at Damfontein Farm. The EIA Report was made available for public review and comment for 40 days from **08 October 2010** until **16 November 2010**.

In addition letters were also sent out to all registered I&AP, notifying them on the availability of the EIA Report for review and comment (see Annexure E).

4.3.3 Background Information Document

A BID, announcing the commencement of the EIA process and containing information on the proposed development, the NEMA EIA Regulations, and an overview of the EIA process was compiled (Annexure 4F). The BID was circulated from November 2009 to all registered I&APs.

4.4 Comments by I&APs

I&APs were afforded and an opportunity to raise their issues and concerns regarding the proposed development during the public consultation process of the Scoping Phase and now had another opportunity to raise any issues or concerns during the assessment phase of the EIA. To date, we have not received any comments from the registered I&AP's. The Organs of State did not provide any comments during the provided comment period, despite having sent follow-up emails (Annexure 4G) during the Scoping phase and the Assessment Phase (Annexure 4H).

I&APs were invited to comment on the proposed development. All comments received were included in the EIA Report that was forwarded to the DEA. The final report has been submitted to the authority for review and final decision making.

On receipt of the decision from the DEA, the I&APs will be notified of the outcome of the decision.

ANNEXURE 4A: LIST OF REGISTERED INTERESTED AND AFFECTED PARTIES TO DATE.

NEW PROPOSED WIND POWER GENERATION FACILITY: DE AAR
I&AP DATABASE

No.	Name	Erf number	Organisation	Postal Address	Telephone		Cellular	Email Address
					code	number		
1	Frederick Jacobus van Zyl / Jurie Johannes van Zyl	RE 130	Smouspoort Boerdery Pty Ltd	P O Box 1 De Aar 7000	0.53	631 0501		fjwz@webmail.co.za
2	Roelof Erasmus Venter	RE 138		P O Box 41 De Aar 7000			082 415 2321	reventer@adsactive.com
3	Johannes Wilhelm van Zyl	131/2 RE		P O Box 12 De Aar 700	0.53	631 0471		
4	Johannes Wilhelm van Zyl	131/1		P O Box 12 De Aar 700	0.53	631 0471		
5	Johannes Wilhelm van Zyl	130/4		P O Box 12 De Aar 700	0.53	631 0471		
6	Johannes Wilhelm van Zyl	RE 131		P O Box 12 De Aar 700	0.53	631 0471		
7	Barend Van Der Merwe			Wag-'n-Bietjie Posbus 177 De Aar 700				bennie11@webmail.co.za
8	Frank Bailey			Jakkalskuilen Posbus 401 De Aar 7000				
9	Dr Jan Van Zyl			Mynfontein Posbus 477 Onrusrivier 7201				
10	W.S.O. Marais (Sterrie)			Nuwejaarsfontein Posbus 94 De Aar 7000				
11	De Put Trust (Hendrik De Jager)			Posbus 227 De Aar 7000				
12	Tersius Marais			Blaauwkrantz Boedery Posbus 282 De Aar 7000				
13	Pieter Stefanus Du Toit			Rietfontein Posbus 557 De Aar 7000				
14	Zwiegers Jan Hendrik			Baardmanskoppie Posbus 393 De Aar 7000				
15	G. Sieberhagen			Posbus 24 De Aar 7000				

16	Willem Jacobus Van Der Merwe			PO. Box 612 De Aar 7000				
17	N van Der Merwe			PO. Box 240 De Aar 7000				
18	DP. Van den Heever			PO. Box 70 De Aar 7000				
19	PJ. Van der Merwe			PO. Box 56 Britstowm 8782				
20	FC. Battenhuassen			PO. Box 67 Phillipstown 8795				
21	M van der Merwe			PO. Box 345 De Aar 7000				
22	PJ. Van der Watl			PO. Box 102 Philipstown				
23	CA Theron			PO. Box 117 De Aar 2007				
24	EG. Battenhuassen			PO. Box 11 Philipstown 8795				
25			De Aar Stone Crushers bk	PO. Box 340 De Aar 7000				
26	E.M Vermeulen			PO. Box 429 De Aar 7000				
27	JP. Theron			PO. Box 683 De Aar 7000				
28	Suzanne Erasmus			PO. Box 316 Kimberley 8300				
29	Willie Lubbe			PO. Box 42 De Aar 7000				
30	Luke Strugnell		EWT-Wildlife Energy Interaction Group (WEIG	Private Bag X11, Parkview, 2122	0.11	4861102	079 878 3741	www.ewt.org.za
31	Mr Sibonelo Mbanjwa		Department of Tourism, Environment and Conservation Head Office – Kimberley	224 Du Toit Span Road, Kimberly		(053) 807 4800	053) 8313530	dmoleko@half.ncape.gov.za
32	Mrs J. Maisela		Northern Cape Department of Agriculture, Land Reform and Rural Development	162 George Street / 7-9 Elliot Street, Kimberley, Northern Cape, 8300		(053) 838-9100 / 839 7800	(053) 832-4328 / 839 7827	

ANNEXURE 4B: COPY OF ADVERTISEMENTS

OPENBARE DEELNAMEPROSES

KENNISGEWING VAN OMVANGS BEPALING- EN OMGEWINGSIMPAKSTUDIEPROSES VOORGESTELDE WINDKRAGOPWEKKINGFASILITEIT IN DE AAR

Plaas Re/130, Plaas Re/138, Plaas 131/2 Re, Plaas 131/1,Plaas 130/4, Plaas RE/131

Projekverwysing: E12/2/20/1651 – 26/08/09

Kennis geskied hiermee ingevolge Artikel 56 (2) (c) (i) van die regulasies gepubliseer in Regeringskennisgewing Nr. R. 385, 21 April 2006, gepubliseer ingevolge Artikel 24(5), saamgelees met Artikel 44 van Hoofstuk 5 van die **Wet op Nasionale Omgewingsbestuur**, (Wet nr. 107 van 1998), van voornemens om 'n Omvangsbepalingsproses te onderneem en alle belanghebbende en geaffekteerde partye (I&APs) te nooi om op die projekdatabasis te registreer. Daar is by die Departement van Omgewingsake en Toerisme (DEAT) aansoek gedoen en toestemming is verleen om met die omvangstudieproses voort te gaan.

Die bedrywighede wat tot die Omvangsbepalingstudie en OIB aanleiding gee, word soos volg gelys:

Regeringskennisgewing R386-aktiwiteit Nr(s):	**Beskrywing van Aktiwiteit**
7	Die bogrondse berging van 'n gevaarlike goederesoort, insluitende petrol, diesel, vloeibare petroleumgas of paraffien in houers met 'n gekombineerde kapasiteit van meer as 30 kubieke meter, maar minder as 1 000 kubieke meter op enige plek of perseel.
12	Die omvorming of verwydering van inheemse plantegroei van drie hektaar of meer, of elke grootte waar die omvorming of verwydering sal plaasvind binne 'n kritiies bedreigde of 'n bedreigde ekosisteem wat gelys is ingevolge artikel 52 van die Wet op Nasionale Omgewingsbestuur: Biodiversiteit, 2004 (Wet nr 10 van 2004).
14	Die bou van maste van enige materiaal of soort, en van enige hoogte, met inbegrip van die gebruik vir telekommunikasieuitsending en radiouitsending, maar uitsluitende- (a) maste van 15 meter en laer wat uitsluitlike gebruik word (i) deur radio-amateurs; of (ii) vir beligtingdoeleindes (b) vlagpale en (c) weerligafleierpale.
15	Die bou van 'n pad wat breër is as vier meter, of wat 'n reserwe het wat breër is as ses meter, uitsluitend paaie wat binne die strekking val van 'n ander gelyste bedrywigheid, of wat toegangspaaie van minder as 30meter in lengte is.
16	Die omvorming van onontwikkelde, onbeboude of verlate grond om – (a) gapingsvernouingsontwikkeling daar te stel wat 'n area van 5 hektaar of meer dek, maar minder as 20 hektaar is of (b) residensiële, gemengde, kleinhandel -, kommersiële, nywerheids - of institusionele gebruik waar sodanige ontwikkeling nie gapingvernouing is nie, en waar die totale area wat omvorm word, groter as 1 hektaar is.
Regeringskennisgewing R387-aktiwiteit Nr(s):	**Beskrywing van Aktiwiteit**
1 (a)	Die bou van fasiliteite of infrastruktuur, insluitende verwante strukture of infrastruktuur, vir- (a) die opwekking van krag waar- (i) die kragopbrengs 20 megawatt of meer is of (ii) die elemente van die fasiliteit 'n gekombineerde gebied groter as 1 hektaar dek.
1 (l)	Die bou van fasiliteite of infrastruktuur, insluitend verwante strukture of-infrastruktuur, vir- die leiding en verspreiding van bogrondse krag met 'n kapasiteit van 120 kilovolts of meer.
2	Elke ontwikkelingbedrywigheid, insluitende verwante strukture en infrastruktuur, waar die totale gebied van die ontwikkelde gebied 20 hektaar of meer is, of so beplan word.

Ligging:
Die voorgestelde windkragopwekkingfasiliteit in De Aar is binne die Emthanjeni Plaaslike munisipaliteit geleë. Die area is op die bergreeks om die stad van De Aar, 22 km van die Hydra-substasie geleë.

Projekbeskrywing:
Die voorstel is om 'n windplaas wat 300MW krag opwek, te skep. Die Vestas V90 2MW turbines **(90 m deursnee turbiene 2MW opwekkingsvermoë)** was gekies vir die simulasie. Die presiese posisies van die turbienes sal later in die proses vasgestel word.

Geleentheid vir deelname:
Indien u as belanghebbende en geaffekteerde party wil **registreer**, of op omgewingsaspekte kommentaar wil lewer, stuur asseblief u besonderhede na die onderstaande adres voor of op **8 November 2009** . Maak asseblief seker dat alle korrespondensie die **DEAT-verwysingsnommer. E12/2/20/1653 – 26/08/09** bevat, asook 'n aanduiding van u belang in die voorgestelde projek. 'n **Agtergrondinligtingsdokument** sal aan alle partye wat registreer gestuur word.

Vir verdere inligting, skakel **Junaid Moosajee** by:

DJ Environmental Consultants
Postnet Suite 66, Privaatsak X 15, Somerset-Wes 7130
Tel. 021 851 0900 **Faks:** 021 851 0933 **E-pos:** junaid@djec.co.za

OPENBARE DEELNAME PROSES

KENNISGEWING VAN OMVANGSBEPALING- EN OMGEWINGS-IMPAKSTUDIEPROSES VOORGESTELDE WINDKRAG OPWEKKINGFASILITEIT IN DE AAR

Plaas Re/130, Plaas Re/138, Plaas 131/2 Re, Plaas 131/1,Plaas 130/4, Plaas RE/131

Projekverwysing: E12/2/20/1651 – 26/08/09

Kennis geskied hiermee ingevolge artikel 56 (2) (c) (i) van die regulasies gepubliseer in Regeringskennisgewing Nr. R. 385 21, April 2006, gepubliseer ingevolge Artikel 24(5), saamgelees met artikel 44 van hoofstuk 5 van die Wet op Nasionale Omgewingsbestuur, 1998 (Wet nr. 107 van 1998), van die voorneme om 'n omvangsproses te onderneem en alle belanghebbende en geaffekteerde partye (I&APs) te nooi om op die projekdatabasis te registreer. Daar is by die Departement van Omgewingsake en Toerisme (DEAT) aansoek gedoen en toestemming is verleen om met die omvangstudieproses voort te gaan.

Die bedrywighede wat tot die Omvangstudie en OIB aanleiding gee, word soos volg gelys:

Regeringskennisgewing R386-aktiwiteit Nr (s):	**Beskrywing van Aktiwiteit**
7	Die bogrondse berging van 'n gevaarlike goederesoort, insluitende petrol, diesel, vloeibare petroleumgas of paraffien in houers met 'n gekombineerde kapasiteit van meer as 30 kubieke meter, maar minder as 1000 kubieke meter te enige plek of perseel.
12	Die omvorming of verwydering van inheemse plantegroei van drie hektaar of meer, of elke grootte waar die omvorming of verwydering sal plaasvind binne 'n krities bedreigde of 'n bedreigde ekosisteem wat gelys is ingevolge artikel 52 van die Wet op Nasionale Omgewingsbestuur: Biodiversiteit, 2004 (Wet nr 10 van 2004).
14	Die bou van maste van enige materiaal of soort, en van enige hoogte, met inbegrip van die gebruik vir telekommunikasieuitsending en radiouitsending, maar uitsluitend- (a) maste van 15 meter en laer wat uitsluitlik gebruik word (i) deur radio-amateurs; of (ii) vir beligtingdoeleindes (b) vlagpale; en (c) weerligafleierpale.
15	Die bou van 'n pad wat breër is as vier meter, of wat 'n reserwe het wat breër is as ses meter, uitsluitend paaie wat binne die strekking val van 'n ander gelyste bedrywigheid, of wat toegangspaaie van minder as 30 meter in lengte is.
16	Die omvorming van onontwikkelde, onbeboude of verlate grond om – (a) gapingsvernouingsontwikkeling daar te stel wat 'n area van 5 hektaar of meer dek, maar minder as 20 hektaar is; of (b) residensiële, gemengde, kleinhandel-, kommersiële, nywerheids- of institusionele gebruik waar sodanige ontwikkeling nie gapingvernou ing is nie, en waar die totale area wat omvorm word, groter as 1 hektaar is.
Regeringskennisgewing R387-aktiwiteit Nr (s):	**Beskrywing van Aktiwiteit**
1(a)	Die bou van fasiliteite of infrastruktuur, insluitende verwante strukture of-infrastruktuur, vir- (a) die opwekking van krag waar- (i) die kragopbrengs 20 megawatts of meer is; of (ii) die elemente van die fasiliteit 'n gekombineerde gebied groter as 1 hektaar dek.
1(1)	Die bou van fasiliteite of infrastruktuur, insluitende verwante strukture of-infrastruktuur, vir- die leiding en verspreiding van bogrondse krag met 'n kapasiteit van 120 kilovolts of meer.
2	Elke ontwikkelingbedrywigheid insluitende verwante strukture en infrastruktuur, waar die totale gebied van die ontwikkelde gebied 20 hektaar of meer is, of so beplan word.

Ligging:
Die voorgestelde windkrag opwekkingfasiliteit in De Aar is binne die Emthanjeni plaaslike munisipaliteit geleë. Die area is op die bergreeks om die stad van De Aar. Die area is geleë 22km van die Hydra substasie.

Projekbeskrywing:
Die voorstel is om 'n windplaas wat 300MW te skep. Die Vestas V90 2MW turbienes (90m diameter turbiene 2MW opwekkingsvermoë) was gekies vir die simulasie. Die presiese posisies van die turbienes sal later in die proses vasgestel word

Geleentheid vir deelname:
Indien u as belanghebbende en geaffekteerde party wil **registreer,** of op omgewings-aspekte kommentaar wil lewer, stuur asseblief u besonderhede na die onderstaande adres voor of op **8 November 2009.** Maak asseblief seker dat alle korrespondensie die **DEAT-verwysingsnommer.** E12/2/20/1653 – 26/08/09 bevat, asook 'n aanduiding van u belang in die voorgestelde projek. 'n Agtergondinligtingsdokument sal aan alle partye wat registreer gestuur word.

Vir verdere inligting, kontak **Junaid Moosajee** by:

DJ Environmental Consultants
Postnet Suite 66, Privaatsak X15 Somerset-Wes 7130
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OPENBARE DEELNAME-PROSES

KENNISGEWING VAN OMVANGSBEPALING- EN OMGEWINGSIMPAKSTUDIEPROSES

VOORGESTELDE WINDKRAG OPWEKKINGFASILITEIT IN DE AAR

Plaas Re/130, Plaas Re/138, Plaas 131/2 Re, Plaas 131/1,Plaas 130/4, Plaas RE/131

Projekverwysing: E12/2/20/1651 – 26/08/09

Kennis geskied hiermee ingevolge Artikel 56 (2) (c) (i) van die regulasies gepubliseer in Regeringskennisgewing Nr. R. 385, 21 April 2006, gepubliseer ingevolge Artikel 24(5), saamgelees met Artikel 44 van Hoofstuk 5 van die **Wet op Nasionale Omgewginsbestuur**, (Wet nr. 107 van 1998), van voornemens om 'n Omvangsbepalingsproses te onderneem en alle belanghebbende en geaffekteerde partye (I&APs) te nooi om op die projekdatabasis te registreer. Daar is by die Departement van Omgewingsake en Toerisme (DEAT) aansoek gedoen en toestemming is verleen om met die omvangstudieproses voort te gaan.

Die bedrywighede wat tot die Omvangsbepalingstudie en OIB aanleiding gee, word soos volg gelys:

Regeringskennisgewing R386-aktiwiteit Nr(s):	**Beskrywing van Aktiwiteit**
7	Die bogrondse berging van 'n gevaarlike goederesoort, insluitende petrol, diesel, vloeibare petroleumgas of paraffien in houers met 'n gekombineerde kapasitiet van meer as 30 kubieke meter, maar minder as 1 000 kubieke meter te enige plek of perseel.
12	Die omvorming of verwydering van inheemse plantegroei van drie hektaar of meer, of elke grootte waar die omvorming of verwydering sal plaasvind binne 'n krities.bedreigde of 'n bedreigde ekosisteem wat gelys is ingevolge artikel 52 van die Wet op Nasionale Omgewingsbestuur: Biodiversiteit, 2004 (Wet nr 10 van 2004).
14	Die bou van maste van enige materiaal of soort, en van enige hoogte, met inbegrip van die gebruik vir telekommunikasieuitsending en radiouitsending, maar uitsluitende- (a) maste van 15 meter en laer wat uitsluitlike gebruik word (i) deur radio amateurs; of (ii) vir beligtingdoeleindes (b) vlagpale; en (c) weerligafleierpale.
15	Die bou van 'n pad wat breër is as vier meter, of wat 'n reserwe het wat breër is as ses meter, uitsluitend paaie wat binne die strekking val van 'n ander gelyste bedrywigheid, of wat toegangspaaie van minder as 30meter in lengte is.
16	Die omvorming van onontwikkelde, onbeboude of verlate grond om – (a) gapingsvernouingsontwikkeling daar te stel wat 'n area van 5 hektaar of meer dek, maar minder as 20 hektaar is; of (b) residensiële, gemengde, kleinhandel-, kommersiële, nywerheids- of institusionele gebruik waar sodanige ontwikkeling nie gapingvernouing is nie, en waar die totale area wat omvorm word, groter as 1 hektaar is.
Regeringskennisgewing R387-aktiwiteit Nr(s):	**Beskrywing van Aktiwiteit**
1 (a)	Die bou van fasiliteite of infrastruktuur, insluitende verwante strukture of-infrastruktuur, vir- (a) die opwekking van krag waar- (i) die kragopbrengs 20 megawatts of meer is; of (ii) die elemente van die fasiliteit 'n gekombineerde gebied groter as 1 hektaar dek.
1 (l)	Die bou van fasiliteite of infrastruktuur, insluitende verwante strukture of-infrastruktuur, vir- die leiding en verspreiding van bogrondse krag met 'n kapasiteit van 120 kilovolts of meer.
2	Elke ontwikkelingbedrywigheid, insluitende verwante strukture en infrastruktuur, waar die totale gebied van die ontwikkelde gebied 20 hektaar of meer is, of so beplan word.

Ligging:

Die voorgestelde windkrag opwekkingfasiliteit in De Aar is binne die Emthanjeni Plaaslike munisipaliteit geleë. Die area is op die bergreeks om die stad van De Aar, 22km van die Hydra substasie geleë.

Projekbeskrywing:

Die voorstel is om 'n windplaas wat 300MW krag opwek, te skep. Die Vestas V90 2MW turbienes **(90m diameter turbiene 2MW opwekkingsvermoë)** was gekies vir die simulasie. Die presiese posisies van die turbienes sal later in die proses vasgestel word

Geleentheid vir deelname:

Indien u as belanghebbende en geaffekteerde party wil **registreer**, of op omgewingsaspekte kommentaar wil lewer, stuur asseblief u besonderhede na die onderstaande adres voor of op **8 November 2009**. Maak asseblief seker dat alle korrespondensie die **DEAT-verwysingsnommer. E12/2/20/1653 – 26/08/09** bevat, asook 'n aanduiding van u belang in die voorgestelde projek. 'n **Agtergondinligtingsdokument** sal aan alle partye wat registreer gestuur word.

Vir verdere inligting, kontak **Junaid Moosajee** by:

DJ Environmental Consultants
Postnet Suite 66, Privaatsak X 15, Somerset-Wes 7130
Tel. 021 851 0900 **Faks:** 021 851 0933 **E-pos:** junaid@djec.co.za

OPENBARE DEELNAME-PROSES

KENNISGEWING VAN OMVANGSBEPALING- EN OMGEWINGSIMPAKSTUDIEPROSES

VOORGESTELDE WINDKRAG OPWEKKINGFASILITEIT IN DE AAR

Plaas Re/130, Plaas Re/138, Plaas 131/2 Re, Plaas 131/1,Plaas 130/4, Plaas RE/131

Projekverwysing: E12/2/20/1651 – 26/08/09

Kennis geskied hiermee ingevolge Artikel 56 (2) (c) (i) van die regulasies gepubliseer in Regeringskennisgewing Nr. R. 385, 21 April 2006, gepubliseer ingevolge Artikel 24(5), saamgelees met Artikel 44 van Hoofstuk 5 van die **Wet op Nasionale Omgewginsbestuur**, (Wet nr. 107 van 1998), van voornemens om 'n Omvangsbepalingsproses te onderneem en alle belanghebbende en geaffekteerde partye (I&APs) te nooi om op die projekdatabasis te registreer. Daar is by die Departement van Omgewingsake en Toerisme (DEAT) aansoek gedoen en toestemming is verleen om met die omvangstudieproses voort te gaan.

Die bedrywighede wat tot die Omvangsbepalingstudie en OIB aanleiding gee, word soos volg gelys:

Regeringskennisgewing R386-aktiwiteit Nr(s):	**Beskrywing van Aktiwiteit**
7	Die bogrondse berging van 'n gevaarlike goederesoort, insluitende petrol, diesel, vloeibare petroleumgas of paraffien in houers met 'n gekombineerde kapasitiet van meer as 30 kubieke meter, maar minder as 1 000 kubieke meter te enige plek of perseel.
12	Die omvorming of verwydering van inheemse plantegroei van drie hektaar of meer, of elke grootte waar die omvorming of verwydering sal plaasvind binne 'n krities.bedreigde of 'n bedreigde ekosisteem wat gelys is ingevolge artikel 52 van die Wet op Nasionale Omgewingsbestuur: Biodiversiteit, 2004 (Wet nr 10 van 2004).
14	Die bou van maste van enige materiaal of soort, en van enige hoogte, met inbegrip van die gebruik vir telekommunikasieuitsending en radiouitsending, maar uitsluitende- (d) maste van 15 meter en laer wat uitsluitlike gebruik word (iii) deur radio amateurs; of (iv) vir beligtingdoeleindes (e) vlagpale; en (f) weerligafleierpale.
15	Die bou van 'n pad wat breër is as vier meter, of wat 'n reserwe het wat breër is as ses meter, uitsluitend paaie wat binne die strekking val van 'n ander gelyste bedrywigheid, of wat toegangspaaie van minder as 30meter in lengte is.
16	Die omvorming van onontwikkelde, onbeboude of verlate grond om – (b) gapingsvernouingsontwikkeling daar te stel wat 'n area van 5 hektaar of meer dek, maar minder as 20 hektaar is; of (b) residensiële, gemengde, kleinhandel-, kommersiële, nywerheids- of institusionele gebruik waar sodanige ontwikkeling nie gapingvernouing is nie, en waar die totale area wat omvorm word, groter as 1 hektaar is.
Regeringskennisgewing R387-aktiwiteit Nr(s):	**Beskrywing van Aktiwiteit**
1 (a)	Die bou van fasiliteite of infrastruktuur, insluitende verwante strukture of-infrastruktuur, vir- (a) die opwekking van krag waar- (i) die kragopbrengs 20 megawatts of meer is; of (ii) die elemente van die fasiliteit 'n gekombineerde gebied groter as 1 hektaar dek.
1 (l)	Die bou van fasiliteite of infrastruktuur, insluitende verwante strukture of-infrastruktuur, vir- die leiding en verspreiding van bogrondse krag met 'n kapasiteit van 120 kilovolts of meer.
2	Elke ontwikkelingbedrywigheid, insluitende verwante strukture en infrastruktuur, waar die totale gebied van die ontwikkelde gebied 20 hektaar of meer is, of so beplan word.

Ligging:

Die voorgestelde windkrag opwekkingfasiliteit in De Aar is binne die Emthanjeni Plaaslike munisipaliteit geleë. Die area is op die bergreeks om die stad van De Aar, 22km van die Hydra substasie geleë.

Projekbeskrywing:

Die voorstel is om 'n windplaas wat 300MW krag opwek, te skep. Die Vestas V90 2MW turbienes **(90m diameter turbiene 2MW opwekkingsvermoë)** was gekies vir die simulasie. Die presiese posisies van die turbienes sal later in die proses vasgestel word

Geleentheid vir deelname:

Indien u as belanghebbende en geaffekteerde party wil **registreer**, of op omgewingsaspekte kommentaar wil lewer, stuur asseblief u besonderhede na die onderstaande adres voor of op **8 November 2009**. Maak asseblief seker dat alle korrespondensie die **DEAT-verwysingsnommer. E12/2/20/1653 – 26/08/09** bevat, asook 'n aanduiding van u belang in die voorgestelde projek. 'n **Agtergondinligtingsdokument** sal aan alle partye wat registreer gestuur word.

Vir verdere inligting, kontak **Junaid Moosajee** by:

DJ Environmental Consultants
Postnet Suite 66, Privaatsak X 15, Somerset-Wes 7130
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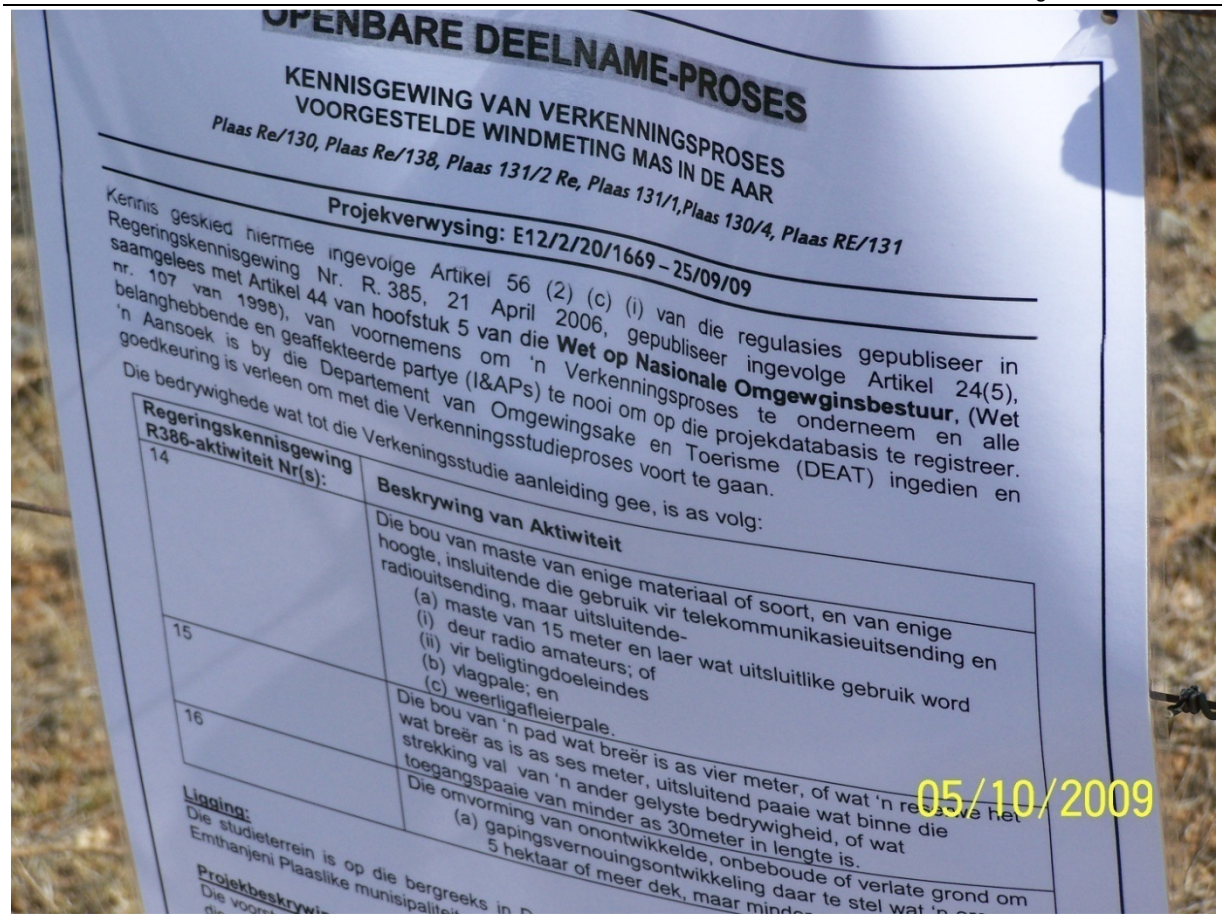
OPENBARE DEELNAME-PROSES
05/10/2009


OPENBARE DEELNAME-PROSES
KENNISGEWING VAN OMVANGSBEPALING- EN OMGEWINGSIMPAKSTUDIEPROSES
VOORGESTELDE WINDKRAG OPWEKKINGFASILITEIT IN DE AAR
Plaas Re/130, Plaas Re/138, Plaas 131/2 Re, Plaas 131/1,Plaas 130/4, Plaas RE/131
Projekverwysing: E12/2/20/1651 – 26/08/09
Kennis geskied hiermee ingevolge artikel 56 (2) (c) (i) van die regulasies gepubliseer in Regeringskennisgewing Nr. R. 385 21, April 2006, gepubliseer ingevolge Artikel 24(5), saamgelees met artikel 44 van hoofstuk 5 van die Wet op Nasionale Omgewginsbestuur, 1998 (Wet nr. 107 van 1998), van die voorneme om 'n omvangsproses te onderneem on alle belanghebbende en geaffekteerde partye (I&APs) te nooi om op die projekdatabasis te registreer. Daar is by die Departement van Omgewingsake en Toerisme (DEAT) aansoek gedoen en toestemming is verleen om met die omvangstudieproses voort te gaan.
Die bedrywighede wat tot die Omvangstudie en OIB aanleiding gee, word soos volg gelys:
Regeringskennisgewing R386-aktiwiteit Nr(s): | Beskrywing van Aktiwiteit
7 | Die bogrondse berging van 'n gevaarlike goederesoort, insluitende petrol, diesel, vloeibare petroleumgas of paraffien in houers met 'n gekombineerde kapasitiet van meer as 30 kubieke meter, maar minder as 1 000 kubieke meter te enige plek of perseel.
12 | Die omvorming of verwydering van inheemse plantegroei van drie hektaar of meer, of elke grootte waar die omvorming of verwydering sal plaasvind binne 'n krities.bedreigde of 'n bedreigde ekosisteem wat gelys is ingevolge artikel 52 van die Wet op Nasionale Omgewingsbestuur: Biodiversiteit, 2004 (Wet nr 10 van 2004).
14 | Die bou van maste van enige materiaal of soort, en van enige hoogte, met inbegrip van die gebruik vir telekommunikasieuitsending en radiouitsending, maar uitsluitende-
(a) (i) maste van 15 meter en laer wat uitsluitlike gebruik word deur radio amateurs; of
(ii) vir beligtingdoeleindes
(b) vlagpale; en
(c) weerligafleierpale.
15 | Die bou van 'n pad wat breër is as vier meter, of wat 'n reserwe het wat breër is as ses meter, uitsluitend paale wat binne die strekking val van 'n ander gelyste bedrywigheid, of wat toegangspaaie van minder as 30meter in lengte is.
16 | Die omvorming van onontwikkelde, onbeboude of verlate grond om –
(a) gapingsvernouingsontwikkeling daar te stel wat 'n area van 5 hektaar of meer dek, maar minder as 20 hektaar is; of
(b) residensiële, gemengde, kleinhandel-, kommersiële, nywerheids- of institusionele ontwikkeling nie gapingvernouing
Regeringskennisgewing R387-aktiwiteit Nr(s): | Beskrywing van Aktiwiteit
1 (a) | waar sodanige ontwikkeling omvorm word, groter as 1 hektaar
05/10/2009


05/10/2009


OPENBARE DEELNAME-PROSES
05/10/2009


OPENBARE DEELNAME-PROSES
KENNISGEWING VAN VERKENNINGSPROSES
VOORGESTELDE WINDMETING MAS IN DE AAR
Plaas Re/130, Plaas Re/138, Plaas 131/2 Re, Plaas 131/1,Plaas 130/4, Plaas RE/131
Projekverwysing: E12/2/20/1669 – 25/09/09
Kennis geskied hiermee ingevolge Artikel 56 (2) (c) (i) van die regulasies gepubliseer in Regeringskennisgewing Nr. R. 385, 21 April 2006, gepubliseer ingevolge Artikel 24(5), saamgelees met Artikel 44 van hoofstuk 5 van die Wet op Nasionale Omgewginsbestuur, (Wet nr. 107 van 1998), van voornemens om 'n Verkenningsproses te onderneem en alle belanghebbende en geaffekteerde partye (I&APs) te nooi om op die projekdatabasis te registreer. 'n Aansoek is by die Departement van Omgewingsake en Toerisme (DEAT) ingedien en goedkeuring is verleen om met die Verkenningsstudieproses voort te gaan.
Die bedrywighede wat tot die Verkeningsstudie aanleiding gee, is as volg:
Regeringskennisgewing R386-aktiwiteit Nr(s):
Beskrywing van Aktiwiteit
14
Die bou van maste van enige materiaal of soort, en van enige hoogte, insluitende die gebruik vir telekommunikasieuitsending en radiouitsending, maar uitsluitende-
(a) maste van 15 meter en laer wat uitsluitlike gebruik word
(i) deur radio amateurs; of
(ii) vir beligtingdoeleindes
(b) vlagpale; en
(c) weerligafleierpale.
15
Die bou van 'n pad wat breër is as vier meter, of wat 'n re... wat binne die
16
wat breër as is as ses meter, uitsluitend paaie wat binne die strekking val van 'n ander gelyste bedrywigheid, of wat toegangspaaie van minder as 30meter in lengte is.
Die omvorming van onontwikkelde, onbeboude of verlate grond om
(a) gapingsvernouingsontwikkeling daar te stel wat 'n
5 hektaar of meer dek, maar
Ligging:
Die studieterrein is op die bergreeks in
Emthanjeni Plaaslike munisipaliteit
Projekbeskrywi
Die voor
05/10/2009


TOP
05/10/2009

ANNEXURE 4D

19 May 2010

AVAILABILITY OF DRAFT SCOPING REPORT FOR PUBLIC REVIEW AND COMMENT

PROPOSAL: WIND POWER GENERATING FACILITY IN DE AAR

ERVEN: FARM RE/130, FARM RE/138, FARM 131/2 RE, FARM 131/1 FARM 130/4 FARM RE/131

PROJECT REFERENCE: 12/12/20/1651-25/09/09

Dear Stakeholder

Notice is hereby given in terms of Section 56 (2) (c) (i) of the regulations published in Government Notice No. R. 385 21 April 2006 published in terms of Section 24(5) read with Section 44 of Chapter 5 of The **National Environmental Management Act**, (Act no 107 of 1998), of the intent to carry out a Scoping process and invite all interested and affected parties to register on the project database.

Application to the Department of Environmental Affairs and Tourism (DEAT) has been made and permission was granted to proceed with the scoping process.

The wind power generation facility in De Aar is situated within the Emthanjeni Local Municipality. The site is located on the mountain ranges around the town of De Aar which is approximately 22km from the Hydra substation

DJ Environmental Consultants have been appointed as the independent Environmental Assessment Practitioners to undertake the Environmental Impact Assessment (EIA) Process required in terms of the National Environmental Management Act 107 of 1998 (NEMA), as amended, and the EIA Regulations, 2006.

Opportunity to Participate:

The **Draft Scoping Report** will be made available from **19 May 2010 until 21 June 2010** at the De Aar Public Library and Damfontain farm. You are hereby invited to review the Draft Scoping Report and to forward your comments by **21 June 2010** to DJ Environmental Consultants at the contact details above. Please ensure that all correspondence contains the DEAT reference no**: 12/12/20/1651-25/09/09**.

Yours Sincerely

Junaid Moosajee

19 Mei 2010

BESKIKBAARSTELLING VAN DIE OMVANGSEPALING- EN OMGEWINGSIMPAKSTUDIEPROSES VIR PUBLIEKE OORSIG EN KOMMENTAAR

VOORSTEL: WIND OPWEKKINGSKRAG FASILITEIT IN DE AAR

ERF NOMMERS: PLAAS RE/130, PLAAS RE/138, PLAAS 131/2 RE, PLAAS 131/1, PLAAS 130/4, PLAAS RE/131

PROJEK VERWYSINGSNOMMER: 12/12/20/1651-25/09/09

Geagte Belanghebende

'Kennis geskied hiermee in terme van Artikel 56(2) (c) (i) van die regulasies gepubliseer in die Staatskennisgewing Nr. R.385, 21 April 2006 gepubliseer ingevolge Artikel 24(5) gelees met Artikel 44 van Hoofstuk 5 van die Wet op Nasionale Omgewingsbestuur (NEMA),1998 (Wet nr 107 van 1998), van voornemens om 'n Omvagsbepalingproses uit te voer en alle belanghebbende en geaffekteerde partye te nooi om op die projek databasis te registreer.

'n Aansoek is by die Departement van Omgewingsake en Toerisme ingedien en goedkeuring is verleen om met die Omvangsbepalingsproses voort te gaan.

Die voorgestelde windkrag opwekkingfasiliteit in De Aar is binne die Emthanjeni Plaaslike munisipaliteit geleë. Die area is op die bergreeks om die stad van De Aar, 22km van die Hydra substasie geleë.

DJ Environmental Consultants is as onafhanklike Omgewingskonsultante aangestel om die Omgewingsimpakstudieproses uit te voer volgens die Wet op Nasionale Omgewingsbestuur, 1998 (Wet Nr. 107 van 1998), soos aangepas, en die Omgewingsimpakstudie Regulasies, 2006.

Geleentheid om deel te neem:

Die Verkenningsverslag sal vanaf **19 Mei 2010 tot 21 Junie 2010** by die De Aar Openbare Biblioteek en Damfontain plaas beskikbaar wees. U word hiermee verwittig om die Verkenningsverslag te hersien en u kommentaar aan DJ Environmental Consultants (kontakbesonderhede hierbo) teen **21 Junie 2010** te stuur. Maak seker dat alle korrespondensie die Departement van Omgewingsake se verwysingsnommer: **12/12/20/1651-25/09/09** bevat**.**

Die Uwe

Junaid Moosajee

17 May 2010

TO WHOM IT MAY CONCERN

This serves to confirm that the letters informing the I&APS that the Draft Scoping Assessment Report for the Wind Generating Facility: De Aar development is in the Public Domain and it has been posted to the names and addresses listed below.

SIGNED **DATE**

FOR AND ON BEHALF OF SOUTH AFRICAN POST OFFICE

R.E. Venter (Oom Oelf)
Posbus 41
De Aar
7000

Helm van Zyl (J.W.)
Posbus 12
De Aar
7000

Frikkie van Zyl
Smouspoort Boerdery
Posbus 1
De Aar
7000

Frank Bailey
Jakkalskuilen
Posbus 401
De Aar
7000

Dr Jan van Zyl
Mynfontein
Posbus 477
Onrusrivier
7201

W.S.O. Marais (Sterrie)
Nuwejaarsfontein
Posbus 94
De Aar
7000

De Put Trust (Hendrik de Jager)
Posbus 227
De Aar
7000

Tersius Marais
Blaauwkrantz Boerdery
Posbus 282
De Aar
7000

Pieter Stefanus Du Toit
Rietfontein
Posbus 557
De Aar
7000

Zwiegers Jan Hendrik
Baardmanskoppie
Posbus 393
De Aar
7000

G. Sieberhagen
Posbus 24
De Aar
7000

Willem Jacobus van der Merwe
P O Box 612
De Aar
7000

N van der Merwe
P O Box 240
De Aar
7000

DP van den Heever
P O Box 70
De Aar
7000

PJ van der Merwe
P O Box 56
Britstown
8782

FC Battenhaussen
P O Box 67
Philipstown
8795

M van der Merwe
P O Box 345
De Aar
7000

PJ van der Walt
P O Box 102
Philipstown
8795

CA Theron
P O Box 117
De Aar
7000

EG Battenhaussen
P O Box 11
Philipstown
8795

De Aar Stone Crushers bk
P O Box 340
De Aar
7000

EM Vermeulen
P O Box 429
De Aar
7000

JP Theron
P O Box 683
De Aar
7000

Suzanne Erasmus
PO Box 316
Kimberley
8300
Northern Cape
South Africa

Willie Lubbe
PO Box 42
De Aar
7000
Northern Cape
South Africa

Barend Jacobus van der Merwe
Wag-'n-Bietjie
Posbus 177
De Aar
7000

Luke Strugnell
EWT-Wildlife Energy Interaction Group
(WEIG)
Private Bag X11,
Parkview,
2122

ANNEXURE 4E

05 Oktober 2010

VOORGESTELDE WIND OPWEKKINGSKRAG FASILITEIT IN DE AAR

PLASE: RE/130, RE/138, 131/2 RE, 131/1, 130/4, RE/131, De Aar

DEPARTEMENT VAN OMGEWINGSAKE - VERWYSINGSNOMMER: **12/12/20/1651**

BESKIKBAARSTELLING VAN DIE KONSEP OMGEWINGSIMPAKSTUDIE-VERSLAG VIR PUBLIEKE OORSIG EN KOMMENTAAR

Geagte Belanghebbende Party

U word hiermee verwittig van die beskikbaarstelling van die konsep Omgewingsimpakstudie(OIS)- verslag vir die bogenoemde voorgestelde ontwikkeling.

Hierdie OIS-verslag is beskikbaar vir publieke oorsig en kommentaar vanaf 08 Oktober **2010** tot **16 November 2010** by die De Aar Openbare Biblioteek en Damfontein plaas.:

U word uitgenooi om die konsep OIS-verslag te hersien en u kommentaar na DJEC (kontakbesonderhede hieronder) voor of op **16 November 2010** te stuur.

Junaid Moosagee *DJ Environmental Consultants* *Postnet Suite 66* *Privaatsak X15* *Somerset Wes* *7130*	*junaid@djec.co.za* *Faks: +27 21 851 0933* *Tel: +27 21 851 0900*

Maak asseblief seker dat alle korrespondensie die Departement van Omgewingsake se verwysingsnommer: **12/12/20/1651** bevat.

Na afloop van die publieke kommentaarperiode, sal 'n Kommentaar- en Antwoordverslag opgestel word wat alle kommentaar gemaak deur die I&APs sal bevat. Die Kommentaar- en Antwoordverslag sal in die finale OIS-verslag ingesluit word wat by die Departement van Omgewingsake ingehandig sal word vir hersiening en besluitneming. Alle geregistreerde I&APs sal van die besluit in kennis gestel word.

Neem ook kennis dat die volgende geaktiveerde bedrywighede ingevolge Artikel 24 van die Wet op Nasionale Omgewingsbestuur (NEMA), 1998 (Wet nr. 107 van 1998), onder Regulasie R386 en R387 geïdentifiseer was:

- Staatskennisgewing 386: 7; 12; 14; 15; 16(a)
- Staatskennisgewing 387: 1(a); 1(l); 2

Op 18 Junie 2010 het die Nasionale Minister van Water- en Omgewingsake, regulasies uitgevaardig ingevolge Artikel 24(5), 24M en 44 van die Wet op Nasionale Omgewingsbestuur, 1998 (Wet nr 107 van 1998) nl. die Omgewingsimpakstudie(OIS)-Regulasies, 2010 (Staatskennisgewing nr. R.543, R.544, R545, R546 en R547 in Staatskoerant Nr 33306 van 18 Junie 2010). Hierdie regulasies is van krag vanaf 2 Augustus 2010. Die volgende bedrywighede is volgens die nuwe OIS Regulasies van 2010 as deel van hierdie aansoek geidentifiseer:

- Lystingskennisgewing 1 (Staatskennisgewing Nr. R. 544): 1(ii), 10(i), 23(ii)
- Lystingskennisgewing 2 (Staatskennisgewing Nr. R. 545): 1, 15

Vir verdere inligting, kontak Junaid Moosagee by kontakbesonderhede bo verskaf.

Die uwe

Junaid Moosagee
DJ Environmental Consultants

AECI Office Park
Building No 1 Office 22
De Beers Rd Ext
Somerset West 7130

Tel: 021 851 0900
Fax: 021 851 0933
Fax to email: 0866 14 7731

°Integrated Environmental Management ° Public Participation Management ° Waste Management

5 October 2010

TO WHOM IT MAY CONCERN

This serves to confirm that the letters informing the I&APS that the Environmental Impact Assessment Report for the Wind Generating Facility: De Aar development is in the Public Domain and it has been posted to the names and addresses listed below.

SIGNED **DATE**

FOR AND ON BEHALF OF SOUTH AFRICAN POST OFFICE

R.E. Venter (Oom Oelf)
Posbus 41
De Aar
7000

Helm van Zyl (J.W.)
Posbus 12
De Aar
7000

Frikkie van Zyl
Smouspoort Boerdery
Posbus 1
De Aar
7000

Frank Bailey
Jakkalskuilen
Posbus 401
De Aar
7000

Dr Jan van Zyl
Mynfontein
Posbus 477
Onrusrivier
7201

W.S.O. Marais (Sterrie)
Nuwejaarsfontein
Posbus 94
De Aar
7000

SOMERSET MALL
2010 -10- 05
COUNTER 3

De Put Trust (Hendrik de Jager)
Posbus 227
De Aar
7000

Tersius Marais
Blaauwkrantz Boerdery
Posbus 282
De Aar
7000

Pieter Stefanus Du Toit
Rietfontein
Posbus 557
De Aar
7000

Zwiegers Jan Hendrik
Baardmanskoppie
Posbus 393
De Aar
7000

G. Sieberhagen
Posbus 24
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M van der Merwe
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De Aar
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Philipstown
8795

CA Theron
P O Box 117
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7000

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De Aar Stone Crushers bk
P O Box 340
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7000

EM Vermeulen
P O Box 429
De Aar
7000

JP Theron
P O Box 683
De Aar
7000

Suzanne Erasmus
PO Box 316
Kimberley
8300
Northern Cape
South Africa

Willie Lubbe
PO Box 42
De Aar
7000
Northern Cape
South Africa

Barend Jacobus van der Merwe
Wag-'n-Bietjie
Posbus 177
De Aar
7000

Luke Strugnell
EWT-Wildlife Energy Interaction Group
(WEIG)
Private Bag X11,
Parkview,
2122

ANNEXURE 4F: BID

BACKGROUND INFORMATION DOCUMENT

Project Reference Number: E12/12/20/1651-26/08/09

PROPOSED WIND POWER GENERATION FACILITY, DE AAR

TABLE OF CONTENTS

List of Figures

List of Tables

1. THE PURPOSE OF THIS DOCUMENT

The purpose of this Background Information Document (BID) is to:

i) Provide background information on this project;

ii) Inform the public about the legal framework within which the Environmental Impact Assessment (EIA) process will be conducted;

iii) Convey information to Interested and Affected Parties (I&APs) about the project;

iv) Provide an opportunity for I&APs to comment on and/or raise any concerns regarding the project proposal.

2. INTRODUCTION AND BACKGROUND

The proposed development is situated within the Emthanjeni Local Municipality in the Northern Cape. The site is located on the mountain ranges about 20km south west of the town of De Aar. The areas that have been examined include the mountains to the east of De Aar, Plateau East; as well as the mountain ranges to the west; Maanhaarberge and Kombuisfonteinberge. The areas to be examined have a maximum elevation difference of 250m from the surrounding terrain at the foot of the mountains. The wind farm will generate an initial 300

Mega Watt of energy in total. The generated power is to be connected to the national transmission grid via Hydra substation.

A wind measuring mast will be erected to determine the most appropriate locations for the turbines. A Basic Environmental Assessment **(Project Reference: E12/12/20/1669 – 25/09/09)** will be undertaken for the erection of these masts.

Locality Map: see Figure 2

The proposed development site consists of a number of properties (see **Table 1**). The relevant properties are currently zoned as Agriculture Zone I. The development will require authorisation in terms of the Environmental Impact Assessment Regulations, 2006 promulgated in terms of the National Environmental Management Act 107 of 1998 (NEMA), as amended.

DJ Environmental Consultants (DJEC) has been appointed as the independent environmental consultants to undertake the EIA Process required in terms of the EIA Regulations, 2006

DESCRIPTION OF PROPOSED ACTIVITY

The following land uses are proposed to be developed:

(a) Wind Generating Facilities.

(b) Wind Measuring Mast

Table 1: Properties and Zoning

FARM NO.	ZONING	JURISDICTION	TITLE DEED	AREA (ha)
Farm Re/130	Agriculture	Emthanjeni Local Municipality	T4827/1975	9039.26
Farm Re/138 Farm 131/2 Re	Agriculture	Emthanjeni Local Municipality	T65558/2002 T3960/1983	6518.79 2727.32
Farm 131/1	Agriculture	Emthanjeni Local Municipality	T9422/1984	918.37
Farm 130/4	Agriculture	Emthanjeni Local Municipality	T9422/1984	309.50
Farm RE/131	Agriculture	Emthanjeni Local	T9422/1984	4512.34

		Municipality		
TOTAL EXTENT OF LANDHOLDINGS				**24025.58**

4. LEGISLATIVE FRAMEWORK

The most important Acts, Policies and Guidelines relevant to this development are listed below inter alia.

Acts:

- National Environmental Management Act (107 of 1998), as amended.
- National Environmental Management: Biodiversity Act (10 of 2004)
- National Heritage Resources Act 25 of 1999
- Aviation Act, 1962 (Act no.74 of 1962) and Civil Aviation Regulations (CAR's), 1997

Guideline documents:

- *Strategic Initiative to Introduce Commercial Land Based Wind Energy Development to the Western Cape*

5. ALTERNATIVES

Alternatives to the proposed development will be identified within the Scoping process.

EIA & PUBLIC PARTICIPATION PROCESS

The NEMA Environmental Impact Assessment (EIA) regulations promulgated in June 2006 require that a Scoping and EIA process be conducted. This process includes a thorough Public Participation Process. The public participation process will include the following basic steps:

- ✓ Identify Interested and Affected Parties and key stakeholder groups
- ✓ Advertise the project
- ✓ Distribute Background Information documents
- ✓ Host meetings with potentially affected residents and/or property owners
- ✓ Advertise & facilitate public meeting and/or open days
- ✓ Compilation of a Scoping Report for public review and comment and for submission to commenting authorities.
- ✓ Compilation of Scoping Report and Plan of Study for EIA to authorities
- ✓ Appointment of specialist consultants.
- ✓ Compilation of an Environmental Impact Report (EIR) for public review and comment.
- ✓ Finalising of EIR for submission to authorities.

The following activities have triggered the EIA process:

Table 2: Listed activities triggered by development:

Government Notice R386 Activity No(s):	**Describe the relevant Basic Assessment Activity in writing**
7	The above ground storage of a dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30m³ but less than 1000m³ on any one location or site.
12	The transformation or removal of indigenous vegetation of 3ha or more or of any size where the

	transformation or removal would occur within a critically endangered or an endangered ecosystem listed in terms of section 52 of the National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004). (A precautionary approach has been adopted , the verification of this listed activity is not yet confirmed)
14	The construction of masts of any material or type and of any height, including those used for telecommunications broadcasting and radio transmission, but excluding a) masts of 15m and lower exclusively used by (I) radio amateurs; or (ii)for lighting purposes b) flagpoles; and c) lightning conductor poles
15	The construction of a road that is wider than 4 metres or that has a reserve wider than 6 metres, excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30 metres long.
16	The transformation of undeveloped, vacant or derelict land to – (c) establish infill development covering an area of 5 hectares or more, but less than 20 hectares; or
Government Notice R387 Activity No(s):	**Describe the relevant Scoping and EIA Activity in writing**
1(I)	The construction of facilities or infrastructure, including associated structures or infrastructure for the transmission and distribution of above ground electricity with a capacity of 120kvor more.
2	Any development activity, including associated structures and infrastructure, where the total area of the developed area is, or is intended to be, 20 hectares or more.

7. WHAT IS INVOLVED IN THE SCOPING AND EIA PROCESS?

A full Scoping and EIA process consists of a number of phases, as illustrated in **Figure 1**. The initial phase was the submission of an Application Form to the DEAT on **28 August 2009**. DEAT issued a letter of acceptance on **31 August 2009**. The second phase in the full Scoping and EIA process is the Registration of I&APs and Initial Public Consultation. To inform I&APs of the proposed development and invite them to register on the project database, a notification advert was placed in the **The Echo** and **Die Volksblad** on **9 October 2009**. In addition, adjacent landowners were notified and informed by registered mail, of the proposed development and were invited to register on the project database. During this phase of the full EIA process, key stakeholders (e.g. the Local Authority and the Department of Water Affairs and Forestry) will also be consulted.

The third phase involves the preparation of a Scoping Report which will be circulated for review to registered I&APs. I&APs will have 40 days to review the Scoping Report and submit their comments.

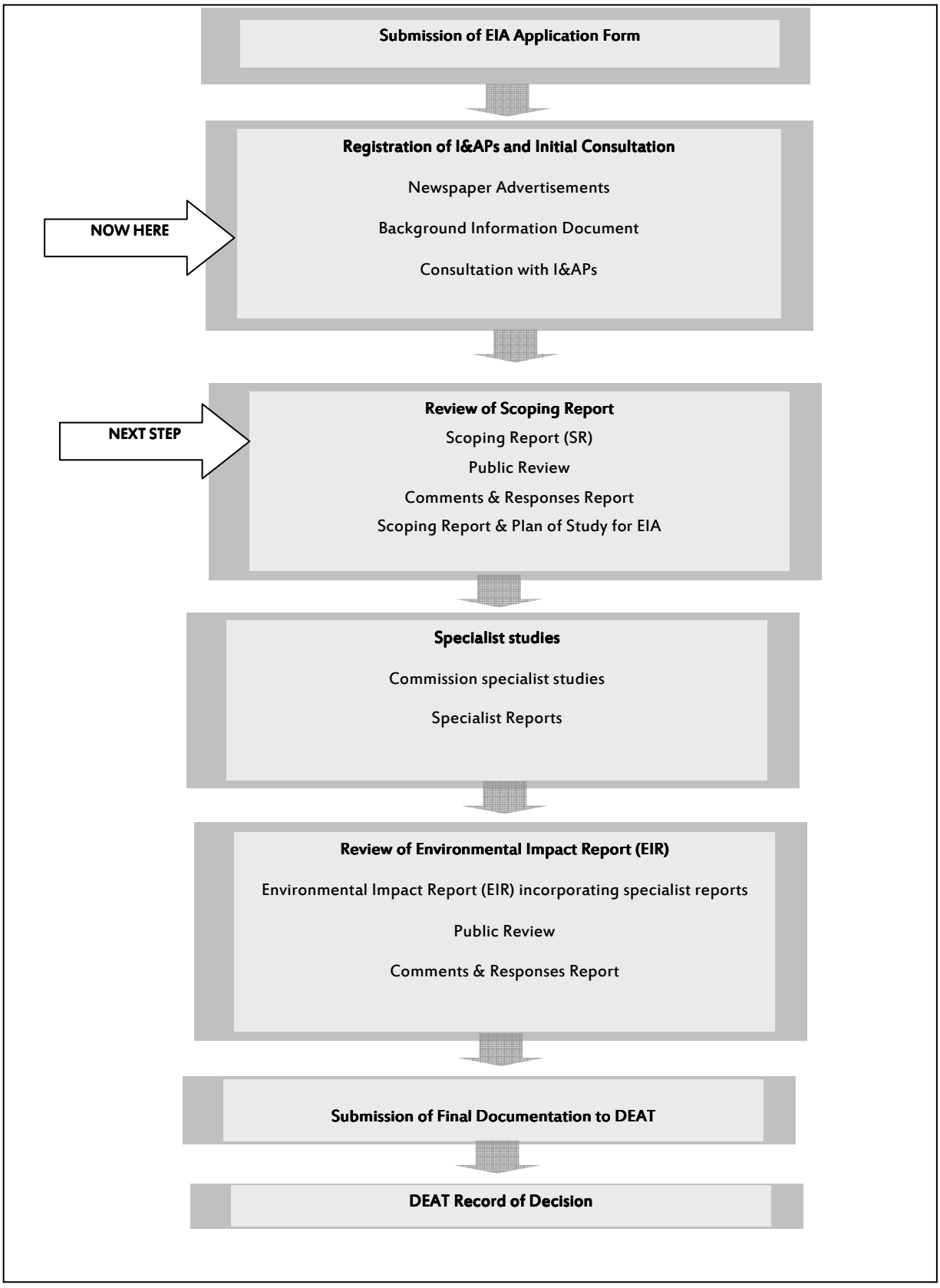
DJEC will summarise all comments received during the process in a Comments & Responses Report. The Final Scoping Report with the Comments and Responses Report will then be forwarded to (DEAT). DEAT will take 45 days to review and comment on the document.

The next phase involves the appointment of specialists and the completion of specialist studies. Thereafter the EIA Report will be available for public review and comment for a period of 40 days.

The final EIA Report together with the Comments & Responses Report and other relevant information (e.g. Environmental Management Plans) will be submitted to DEAT for a decision. DEAT will take 60 days to issue a record of decision.

I&APs will be notified within 10 days of the Record of Decision from the authorities.

Figure 1: The Scoping and EIA process


Submission of EIA Application Form
Registration of I&APs and Initial Consultation
Newspaper Advertisements
Background Information Document
Consultation with I&APs
NOW HERE
Review of Scoping Report
Scoping Report (SR)
Public Review
Comments & Responses Report
Scoping Report & Plan of Study for EIA
NEXT STEP
Specialist studies
Commission specialist studies
Specialist Reports
Review of Environmental Impact Report (EIR)
Environmental Impact Report (EIR) incorporating specialist reports
Public Review
Comments & Responses Report
Submission of Final Documentation to DEAT
DEAT Record of Decision

8. PROGRAMME ACTIVITIES

Table 3 outlines the envisaged activities for the process.

Table 3: Anticipated Programme for the Scoping study and EIA

Task
Submission of Application Form to DEAT ✓
Advertisements to announce commencement of EIA and register I&APs ✓
Distribution of Background Information Document ✓
Comment Period
Release of Scoping Report for public review
Comment Period
Submission of Scoping Report and Plan of Study for EIA
Commissioning of specialist studies
Release of Environmental Impact Report for public review
Comment Period
Submission of Final Documentation for decision
DEAT Record of Decision

9. HOW CAN YOU GET INVOLVED?

DJEC values your input in the EIA process. There are a number of ways in which you can participate in the project throughout the process. At this stage if you, or your organisation would like to be involved in the EIA process and receive further information (or know of any individual or organisation who would like to participate), please submit your contact details for **registration** on our project database.

Additionally if you have any preliminary comments, want to suggest alternatives or questions regarding the project following the review of this document, please submit your comments, **in writing**, to Junaid Moosajee of DJEC (contact details below). Please note that you will also have the opportunity to comment on the scoping report that will be placed in the public domain for a period of 40 days.

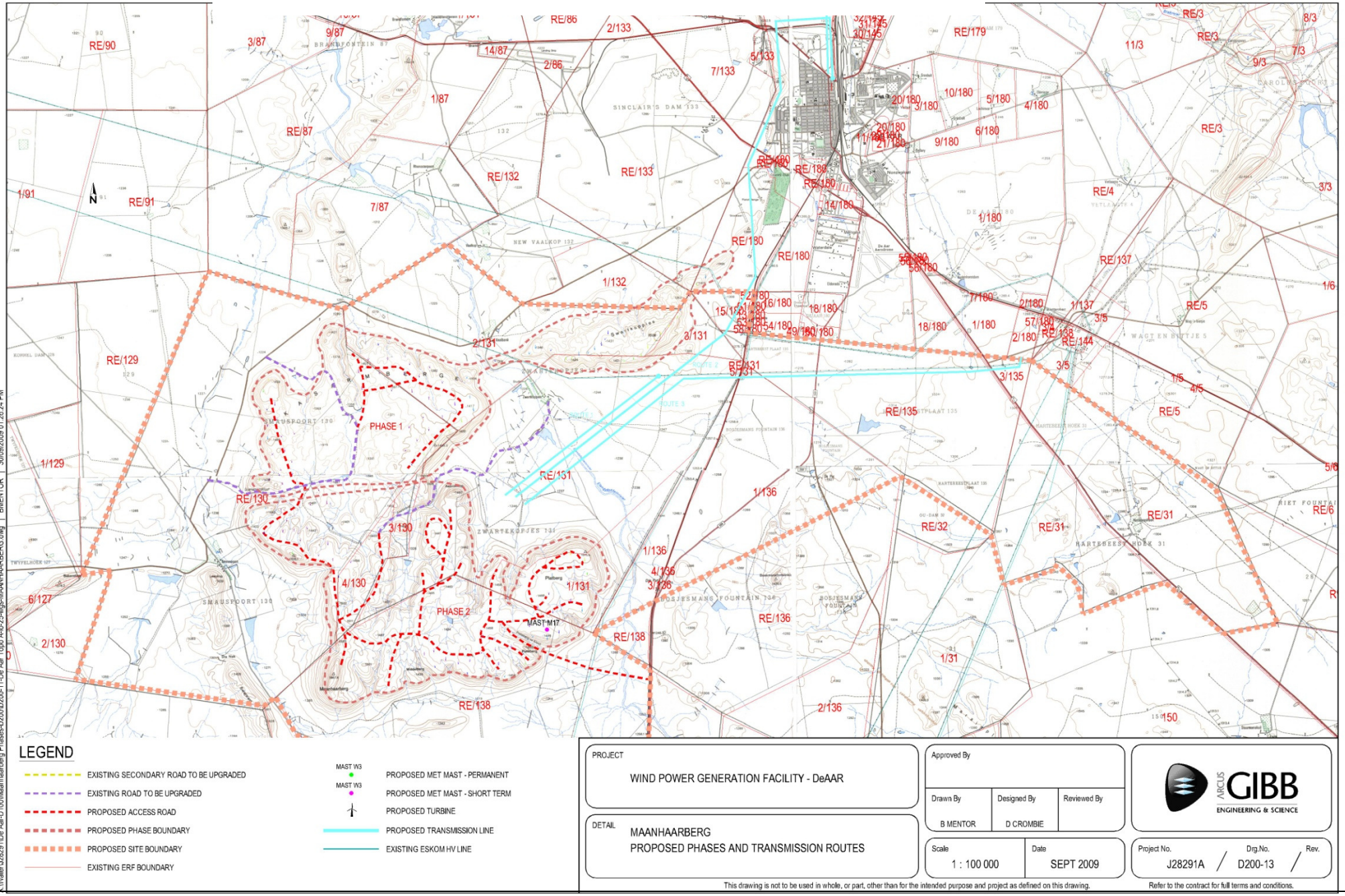
Please note that you must declare any business, financial, personal or other interest in the approval or refusal of the proposal, your preferred means of communication and the project reference number **E12/12/20/1651–26/08/09** in all correspondence related to this proposed project.

DJ ENVIRONMENTAL CONSULTANTS

Junaid Moosajee
Postnet Suite 66
Private Bag X15
Somerset West
7130

Tel: (021) 851 0900,
Fax: (021) 851 0933
Email :junaid@djec.co.za

Figure 2: Locality Plan



PROPOSED WIND POWER GENERATION FACILITY: DE AAR

Project Reference Number: E12/12/20/1652 – 26/08/09

If you have any comments, issues or concerns regarding this proposed development, it would be appreciated if you would complete this form and return it by post or fax to (*see also address and fax number on letter head*).

Attention: Junaid Moosajee **Pages:** ____ **(**including this page**)**

Fax Number: 021 851 0933 **Date:** _____

From (Please print name clearly)**:**_____

Address:_____

_____

Fax Number:_____ **Telephone Number**:_____

e-mail : _____

COMMENT:

ANNEXURE 4G: PROOF OF EMAILS TO ORGANS OF STATE

Junaid Moosajee

From: Junaid Moosajee [junaid@djec.co.za]
Sent: 01 July 2010 12:17 PM
To: 'TRMaluleke@ruraldevelopment.gov.za'
Subject: EIA: proposed wind farm in De Aar DEAT ref#E12/12/20/1651

Dear Stakeholder

This email serves as a reminder that the closing date for the aforementioned project is 2 July 2010. Should you wish to comment, please do so prior to 2 July 2010. If no comments are received, it will be assumed that the Final Scoping Report is in order and can be submitted to the Department of Environmental Affairs and Tourism. We anticipate the submission of the report to take place on 5 July 2010.

If you have submitted comments, thank you for your input thus far.

Kind regards,

"The opportunity of a lifetime should be seized within the lifetime of the opportunity."

Junaid Moosajee
Senior Environmental Consultant

D J Environmental Consultants
AECI Office Park, Building No 2, Room 10-19, Somerset West, 7130
Postnet Suite 66, Private Bag X15, Somerset West 7130
tel: 021 851 0900
fax: 021 851 0933

junaid@djec.co.za

1

Junaid Moosajee

From: Junaid Moosajee [junaid@djec.co.za]
Sent: 29 June 2010 11:28 AM
To: 'dmoleko@half.ncape.gov.za'; 'wlubbe@emthanjeni.co.za'
Subject: EIA: proposed wind farm in De Aar DEAT ref#E12/12/20/1651

Dear Stakeholders

This email serves as a reminder that the closing date for the aforementioned project is 2 July 2010. Should you wish to comment, please do so prior to 2 July 2010. If no comments are received, it will be assumed that the Final Scoping Report is in order and can be submitted to the Department of Environmental Affairs and Tourism. We anticipate the submission of the report to take place on 5 July 2010.

If you have submitted comments, thank you for your input thus far.

Kind regards,

"The opportunity of a lifetime should be seized within the lifetime of the opportunity."

Junaid Moosajee
Senior Environmental Consultant

D J Environmental Consultants
AECI Office Park, Building No 2, Room 10-19, Somerset West, 7130
Postnet Suite 66, Private Bag X15, Somerset West 7130

tel: 021 851 0900
fax: 021 851 0933

junaid@djec.co.za

1

Junaid Moosajee

From: Mail Delivery System [MAILER-DAEMON@djec.co.za]
Sent: 01 July 2010 12:12 PM
To: junaid@djec.co.za
Subject: Successful Mail Delivery Report
Attachments: details.txt; Message Headers.txt

This is the mail system at host djec.dyndns.com.

Your message was successfully delivered to the destination(s) listed below. If the message was delivered to mailbox you will receive no further notifications. Otherwise you may still receive notifications of mail delivery errors from other systems.

The mail system

<wlubbe@emthanjeni.co.za>: delivery via mail.emthanjeni.co.za[78.46.2.201]:25:
250 OK id=1OUGjG-000219-Ac

<dmoleko@half.ncape.gov.za>: delivery via
mailgatectn01.sita.co.za[196.36.153.11]:25: 250 ok: Message 37755381
accepted

1

Junaid Moosajee

From: Mail Delivery System [postmaster@half.ncape.gov.za]
Sent: 01 July 2010 12:09 PM
To: junaid@djec.co.za
Subject: Delivery Confirmation

With reference to your message with the subject:
"EIA: proposed wind farm in De Aar DEAT ref#E12/12/20/1651 "

Your message was successfully delivered to the following addresses:
<dmoleko@half.ncape.gov.za>

---------- Beginning of message follows ----------

Return-path: <junaid@djec.co.za>
Received: from half.ncape.gov.za (10.240.50.252) by half.ncape.gov.za (Mercury 1.48);
1 Jul 10 12:08:37 +0200
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for <dmoleko@half.ncape.gov.za>; Thu, 01 Jul 2010 12:25:05 +0200
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by gbr1.gov.za with esmtp (Exim 4.69)
(envelope-from <junaid@djec.co.za>)
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for dmoleko@half.ncape.gov.za; Thu, 01 Jul 2010 12:11:06 +0200
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X-IronPort-Anti-Spam-Result: ArQUABoGLEwpwIzHU2dsb2JhbACBQpBqixCCKAsBHEm+DIJ4gi0EiCuCMA
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ANNEXURE 4H: PROOF OF LETTERS TO ORGANS OF STATE

For Attention: Mr. W.V.D. Mothibi 10 November 2010

Northern Cape Department of Agriculture, Land Reform and Rural Development.
162 George Street
Kimberly
Northern Cape
8300

Wind Power Generating Facility in De Aar

RE 130, RE 138, 131/2, 131/1, 130/4, RE 131, 131/7 (3) - 15/180, 31/0 (Remaining Extent), Zwartekopjes Rem 131/3, Bosjesmans Fountain REM/136/1, Hartebeesplaat 135, RE 180
Department of Environmental Affairs reference number: E12/12/20/1651

Dear Commenting Body

Please be reminded of the aforementioned application which has been made available for comment for a 40 day comment period until **16 November 2010**. Please note that comment is required as per the Department of Environmental Affairs' requirements. Please quote the reference number **E12/12/20/1651** in all correspondence regarding the proposed development.

If comment will not be issued please indicate the reasons for this so that we may submit it to Department of Environmental Affairs.

All comments made on the report should be forwarded to DJEC either by post, e-mail or fax to the following contact details:

For Attention: Junaid Moosajee
DJ Environmental Consultants
Post Net Suite 66
Private Bag X15
Somerset West
7130
E-mail: junaid@djec.co.za
Fax: 021 - 8510933

If you have any further questions or comments please contact Junaid Moosajee or Quinton Terhoven at DJ Environmental Consultants (contact details on letterhead).

Yours sincerely

Junaid Moosajee

For Attention: The Municipal Manager 10 November 2010

Emthanjeni Local Municipality
PO Box 42
De Aar
7000

Wind Power Generating Facility in De Aar

RE 130, RE 138, 131/2, 131/1, 130/4, RE 131, 131/7 (3) - 15/180, 31/0 (Remaining Extent), Zwartekopjes Rem 131/3, Bosjesmans Fountain REM/136/1, Hartebeesplaat 135, RE 180

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7130
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Fax: 021 - 8510933

If you have any further questions or comments please contact Junaid Moosajee or Quinton Terhoven at DJ Environmental Consultants (contact details on letterhead).

Yours sincerely

Junaid Moosajee

For Attention: Sibonelo Mbanjwa 10 November 2010

Northern Cape Province Department of Tourism, Environment &Conservation
224 Du Toit Span Road
Kimberley
8300

Wind Power Generating Facility in De Aar

RE 130, RE 138, 131/2, 131/1, 130/4, RE 131, 131/7 (3) - 15/180, 31/0 (Remaining Extent), Zwartekopjes Rem 131/3, Bosjesmans Fountain REM/136/1, Hartebeesplaat 135, RE 180
Department of Environmental Affairs reference number: E12/12/20/1651

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If comment will not be issued please indicate the reasons for this so that we may submit it to Department of Environmental Affairs.

All comments made on the report should be forwarded to DJEC either by post, e-mail or fax to the following contact details:

For Attention: Junaid Moosajee
DJ Environmental Consultants
Post Net Suite 66
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Somerset West
7130
E-mail: junaid@djec.co.za
Fax: 021 - 8510933

If you have any further questions or comments please contact Junaid Moosajee or Quinton Terhoven at DJ Environmental Consultants (contact details on letterhead).

Yours sincerely

Junaid Moosajee

AECI Office Park
Building No 1 Office 22
De Beers Rd Ext
Somerset West 7130

Tel: 021 851 0900
Fax: 021 851 0933
Fax to email: 0866 14 7731

°Integrated Environmental Management ° Public Participation Management ° Waste Management

10 November 2010

RECORD OF COURIER

Report name : Draft EIA Report: Proposed Wind Generation Facility, De Aar

Total No. of Reports:

Date : 10 November 2010

Accepted by :.....(Postnet Somerset Mall Branch)

Signed.....

This serves to confirm as a reminder that the Draft EIA Report on the proposed WIND GENERATION FACILITY: De Aar development has been posted to the names and addresses listed below for comments.

Mr. W.V.D. Mothibi
Northern Cape Department of Agriculture, Land Reform and Rural Development.
162 George Street
Kimberley
Northern Cape, 8300

Sibonelo Mbanjwa
Northern Cape Province Department of Tourism, Environment & Conservation
224 Du Toit Span Road
Kimberley
8300

POSTNET
10 NOV 2010
SOMERSET MALL

Willie Lubbe
Municipal Manager
Emthanjeni Local Municipality
PO Box 42
De Aar
7000

CHAPTER 5: APPLICABLE LEGISLATION AND POLICIES

5.1 Introduction

There are a number of regulatory requirements at local, provincial and national level to which the development will have to conform. A brief summary of the legislation which require an EIA prior to authorisation being issued is outlined below, as understood by DJEC.

Note that other legislative requirements may pertain to the proposed development, but identification and interpretation of these is beyond the brief of this study. As such, the list provided below is not intended to be definitive or exhaustive, and serves to highlight key environmental legislation and obligations only.

5.2 The Constitution of South Africa Act No.108 of 1996

The Constitution is the supreme law of South Africa, against which all other laws are measured; any laws in conflict with it are therefore invalid. It protects certain fundamental rights which are, however, not absolute, and may be limited „in terms of law of general application to the extent that the limitation is reasonable and justifiable in an open and democratic society based on human dignity, equality and freedom" (Section 36).

The Environmental Clause

One such fundamental right in Section 24 provides the basic framework for all environmental policy and legislation, and it states:

—Everyone has the right –

a) To an environment that is not harmful to their health or well-being; and

b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –

i) prevent pollution and ecological degradation;

ii) promote conservation; and

iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Access to Information

Section 32 provides that everyone has the right of access to any information held by the State or another juristic person, and that is required for the exercise or protection of any rights.

Just Administrative Action

Section 33 of the Constitution entrenches the right to lawful, reasonable and procedurally fair administrative action, as well as written reasons for administrative actions that have adversely affected a person's rights.

Enforcement of Rights

In terms of Section 38, if any rights in the Bill of Rights have been infringed or threatened, a court may be approached for assistance by a person actFing individually; on behalf of another who is incapacitated; on behalf of a group or class of persons; in the public's interest, or as an association in the interests of its members.

5.3 The National Environmental Management Act, 1998 (Act No. 107 of 1998)

The National Environmental Management Act (NEMA) provides for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-coordinating environmental functions exercised by organs of the State and to provide for matters connected therewith. Section 2 of NEMA establishes a set of principles that apply to the activities of all organs of state that may significantly affect the environment. These include the following:

- Development must be sustainable;
- Pollution must be avoided or minimised and remedied;
- Waste must be avoided or minimised, reused or recycled;

- Negative impacts must be minimised; and
- Responsibility for the environmental health and safety consequences of a policy, project, product or service exists throughout its life cycle.

These principles are taken into consideration when a government department exercises its powers, for example during the granting of permits and the enforcement of existing legislation or conditions of approval.

Section 24 provides that all activities that may significantly affect the environment and require authorisation by law must be assessed prior to approval. In addition, it provides for the Minister of Environmental Affairs and Tourism or the relevant MEC to identify:

- New activities that require approval;
- Areas within which activities require approval; and
- Existing activities that should be assessed and reported on.

It also provides for the Minister to make regulations with respect to the manner in which investigations should occur. No regulations have been issued under Section 24 as yet.

Section 28(1) states that "every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring". If such pollution cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution.

These measures may include:

- Assessing the impact on the environment;

- Informing and educating employees about the environmental risks of their work and ways of minimising these risks;
- Ceasing, modifying or controlling actions which cause pollution/degradation;
- Containing pollutants or preventing movement of pollutants;

- Eliminating the source of pollution; and
- Remedying the impacts of the pollution.

The authorities may direct an industry to rectify or remedy a potential or actual pollution problem. If such a directive is not complied with, the authorities may undertake the work and recover the costs from the responsible industry.

Legal Requirements for the development

The development has a responsibility to ensure that the proposed activity and the EIA process conform to the principles of NEMA. The development is obliged, under Section 28 to take actions to prevent pollution or degradation of the environment.

5.3.1 National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2006

The Environmental Impact Assessment (EIA) Regulations were promulgated in terms of Chapter 5 of the National Environmental Management Act, 1998, as amended (NEMA). NEMA states that before certain development activities can be undertaken, an environmental impact assessment must be followed.

5.4 The National Heritage Resources Act, 1999 (Act No. 25 of 1999)

The protection and management of South Africa's heritage resources are controlled by the National Heritage Resources Act (NHRA), 1999 (Act No. 25 of 1999). The enforcing authority for this act is the South African National Heritage Resources Agency (SAHRA). In the Western Cape, SAHRA have delegated this authority to Heritage Western Cape (HWC).

In terms of Section 38 of the National Heritage Resources Act, SAHRA and/or HWC **can** call for an impact assessment where certain categories of development are proposed. The applicable category in this case is:

- *Any development or other activity which will change the character of a site exceeding 5 000 m² in extent [Section 38(1) (c)].*
- *The construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*

As such, HWC can call for an assessment of the proposed development. Initial meetings with HWC indicate that an HIA will be required. It also indicates that the EIA decision-making authority must consider the comments of the delegated heritage authority in reaching its decision.

5.5 Conservation of Agricultural Resources Act No 43 of 1983

The aim of this Act is to provide for the conservation of the natural agricultural resources of South Africa "… by the maintenance of the production potential of land, by the combating and prevention of erosion and weakening or destruction of water sources, and by the protection of the vegetation and the combating of weeds and invader plants".

CHAPTER 6: IMPACT ASSESSMENTS

Description, Assessment and Mitigation Measures for Impacts

This chapter provides a detailed description of the potential impacts which may occur as a result of the implementation of the proposed project (described in Chapter 2). These potential impacts have been subjected to detailed assessment and include potential biophysical, social and economic impacts which may arise during the operational phase of the proposed activities (i.e. long-term impacts) as well as potential construction related impacts (i.e. short-term).

6.1 Assessment Methodology

An examination of each impact in terms of its extent, duration, intensity, probability, significance and mitigatory potential has been provided below:

¨ Extent of impact being either:

- ✓ Immediate (the site and immediate surrounds)
- ✓ Local (adjacent residential areas)
- ✓ Regional (Western Cape)
- ✓ National (Country wide)
- ✓ International

¨ Duration of impact being either:

- ✓ Short term (0-5 years)
- ✓ Medium term (5-15 years)
- ✓ Long term (operational life of the development)

¨

Intensity of impact being either:

- ✓ Low (where natural, cultural and social functions and processes are not affected)
- ✓ Medium (where the affected environment is altered but natural, cultural and social functions and processes can continue)
- ✓ High (where the affected environment is altered but natural, cultural and social functions and processes are altered to the extent that it will temporarily or permanently cease)

¨ Probability of impact being either:

- ✓ Low probability (possibility of impact occurring is low)
- ✓ Probable (where there is a distinct possibility that it will occur)
- ✓ Highly probable (where the impact is most likely to occur)
- ✓ Definite (where the impact will occur)

¨ Significance of impact:

- ✓ Low (where natural, cultural and social functions and processes are not affected)
- ✓ Medium (where the affected environment is altered but natural, cultural and social functions and processes can continue)
- ✓ High (where the affected environment is altered but natural, cultural and social functions and processes are altered to the extent that it will temporarily or permanently cease)

It should be noted that impacts are discussed in terms of the operational phase in the tables below. Impacts associated with the construction phase will be discussed under the construction impacts section for all the impacts identified. The following issues have been identified by the professional team during the assessment phase.

This chapter provides a description and assessment of the key potential impacts associated with the proposed project/composite alternatives, as identified in the FSR.
Mitigation measures relevant to the further planning and design, construction and operational phases of the proposed project alternatives, as appropriate, are recommended. These measures are aimed at ameliorating negative impacts or enhancing potential benefits. The significance of potential impacts without mitigation as well as those with mitigation is provided.

6.2 Detailed studies undertaken as part of the EIA

A number of significant issues were identified during the scoping study. These issues were further investigated during the EIA phase.

The following specialist studies were undertaken:

1. Botanical Impact Assessment
2. Avifaunal Impact Assessment
3. Bat Study
4. Noise Impact Assessment
5. Archaeological Impact Assessment

6. Paleontological Impact Assessment
7. Heritage Study
8. Socio-Economic Impact Assessment.
9. Visual Impact Assessment
10. Traffic Impact Assessment

6.3 SPECIALIST ASSESSMENTS

6.3.1 Botanical Impact Assessment

The study area lies near the eastern edge of the Nama Karoo biome which may include the western most elements of the Grassland biome (Besemkaree Koppies Shrubland). From a botanical perspective the region is unremarkable as it is typical of a much wider region.

According to the SA Vegetation Map (Mucina & Rutherford 2006 cited in Helme 2010), four mapped vegetation types occur in the study area. All four of the vegetation types are still largely intact due largely to the almost total lack of intensive crop agriculture in this arid region, as a result these vegetation types are not regarded as Threatened vegetation types (Rouget *et al* 2004 cited Helme 2010).
The proposed turbines and most of the internal access roads will be located in the Upper Karoo Hardeveld vegetation type which is one of the richest vegetation types in the Nama Karoo (Mucina & Rutherford 2006, cited Helme 2010). In terms of the extent of this vegetation type it is fairly widespread and covers significant parts of the rocky hills of the Great Karoo. Mucina & Rutherford 2006, cited in Helme 2010 reports that only about 1% has been lost. Generally, veld condition is good with few invasive aliens.

Impacts
The following potentially negative ecological impacts have been identified by Helme (2010):

- Direct, permanent loss of up to 120ha of natural vegetation at the construction phase (tower installation requires special cranes on heavy tracks; crane standpads; substation; access roads; powerline footings; concrete mixing sites; turbine foundations).
- Direct, temporary loss of up to 30ha of natural vegetation at the construction phase (laydown areas; underground cabling; disturbance around towers; building material storage areas; access route along 13km powerline).
- Indirect, long term to permanent ecological impact at the operational phase (possible fragmentation of natural habitat and ecological corridors). Indirect impacts are often difficult to quantify and avoid. The indirect botanical impacts of the proposed development are fortunately likely to be relatively small.

Comparison of alternatives

According to the botanical Impact assessment (Helme 2010) Alternative 1 of the proposed Wind Energy Facility is likely to have a **Medium negative local** impact(site scale; 25000ha site) and a Low – Medium negative regional (Eastern Nama Karoo; 1000000ha) impact, both before and after mitigation. In terms of mitigation, a reduction in scale of the project (fewer turbines, less road, and shorter cable trenches) could reduce the potential botanical impacts with all other mitigation likely to have little effect. A WEF similar to the one being proposed would have a lower botanical impact i.e. Low negative regional scale and would be more favourable from a botanical perspective.

Assessment of alternatives

The No Go alternative is the preferred alternative from a botanical perspective as it is likely to have a Neutral botanical impact.

Alternative 1 is likely to have a slightly lower botanical impact than Alternative 2 and is thus the preferred development alternative.

No significant mitigation is possible and thus post-mitigation impact levels are deemed to be the same as pre-mitigation impact levels.

Assessment

Direct Impact: Permanent loss of natural vegetation

About 98% of the proposed permanent development footprints within the study area will impact on natural vegetation of Medium botanical significance. It is estimated that as much as 120ha of currently natural vegetation will be permanently lost.

In a regional context, this permanent loss of up to 120ha of vegetation of a Least Threatened type is of Low - Medium significance (Alt 1) and Medium significance (Alt 2).

Table 6.1: Impact table for permanent loss of vegetation in development footprint

Alternative	Extent of impact	Duration of impact	Intensity	Probability of occurrence	Status of the impact	Degree of confidence	Level of significance	Significance after mitigation
No Go	Local	Long term	Neutral		Neutral	Medium	**Neutral**	Not Applicable
1	Local	Long term & permanent	Low - Medium	High	Negative	High	**Low -Medium negative**	**Low -Medium negative**
2	Local	Long term & permanent	Medium	High	Negative	High	**Medium Negative**	**Medium Negative**

Direct Impact: Long term but temporary loss of natural vegetation

The existing natural vegetation will be severely disturbed in various areas, largely as a result of:

- heavy machinery movement through some sensitive areas,
- road construction,
- cable trench excavation through sensitive areas,
- power line construction through areas of natural vegetation,
- associated piling and scraping of soil for foundations where this is close to or in natural vegetation.

Soil compaction or chemical changes could result in certain species not returning for many years and therefore this impact is rated as being long term.

Primary sources of disturbance will be:

- large crane that is used to put up the machinery with 13m wide tracks, which
- laydown areas next to the turbines;
- turning circles for long trucks;
- blasting for turbine foundations;
- the construction of the new 13km long power line;
- burying of the underground cabling on site.

The botanical impact assessment reports that “in a regional context, this temporary but long term loss of vegetation of a Least Threatened type is of Low - Medium significance (Alt 1) and Medium significance (Alt 2).”

Table 6.2: Impact table for temporary but long term loss of vegetation in development footprint.

Alternative	Extent of impact	Duration of impact	Intensity	Probability of occurrence	Status of the impact	Degree of confidence	Level of significance	Significance after mitigation
No Go	Local	Long term	Neutral		Neutral	Medium	**Neutral**	Not Applicable
1	Local	Long term	Low - Medium	High	Negative	High	**Low -Medium negative**	**Low -Medium negative**
2	Local	Long term	Medium	High	Negative	High	**Medium Negative**	**Medium Negative**

Indirect impacts

Indirect impacts are likely to have only a minor impact on this site. Possible indirect negative effects on the vegetation include shading, disturbance of wind flow, etc. are likely to be minimal and are not assessed further.

The most important indirect impact is likely to be that of habitat fragmentation as a result of establishing new infrastructure into undisturbed natural habitat. The extensive network of internal access roads that will have to be built would be the main source of habitat fragmentation.

Extensive cut and fill associated with road building can disturb the soil thereby creating conditions for the establishment of invasive alien species.

Table 6.3: Impact table for indirect botanical impacts.

Alternative	Extent of impact	Duration of impact	Intensity	Probability of occurrence	Status of the impact	Degree of confidence	Level of significance	Significance after mitigation
No Go	Local	Long term	Neutral		Neutral	Medium	**Neutral**	Not Applicable
1	Local	Long term	Low	Medium	Negative	Medium	**Low negative**	**Low negative**
2	Local	Long term	Low	Medium	Negative	Medium	**Low Negative**	**Low Negative**

Impact statement

The No Go alternative is the preferred alternative from a botanical perspective as it would have no botanical impacts. Overall Alternative 1 of the proposed WEF is likely to have a Medium local (site scale; 25 000ha site) and Low to Medium regional (eastern Nama Karoo; 1000 000ha) negative impact on the vegetation on site, prior to mitigation. Without significantly altering the layout relocating it on and reducing the scale and total footprint of the project the impact cannot be reduced. Impacts before and after mitigation are likely to be similar.

Alternative 2 is likely to have a similar but slightly greater botanical impact (possibly Medium negative overall), and is therefore not the preferred development alternative assessed.

Table 7.4: Summary table for overall (combined direct & indirect) botanical impacts of the No Go and the two development alternatives assessed.

Alternative	**Extent of impact**	**Duration of impact**	**Intensity**	**Probability of occurrence**	**Status of the impact**	**Degree of confidence**	**Level of significance (before mitigation)**	**Significance after mitigation**
No Go	Local	Temporary to Permanent	Neutral	Medium	Neutral	Medium	**Neutral**	Not Applicable
1	Local	Long term to Permanent	Low - Medium	High	Negative	High	**Low - Medium negative**	**Low - Medium negative**
2	Local	Long term to Permanent	Medium	High	Negative	High	**Medium negative**	**Medium negative**

Recommended site specific mitigation

- Most of the impacts cannot be avoided or reduced, except by reducing the scale of the project (number of turbines, length of road and cable trenches, etc.), or by relocating the facility to a lower sensitivity site on the adjacent plains i.e. away from the dolerite hills.

- No positive botanical impacts associated with the project have been identified.

- Cumulative effects are in many respects regional effects, and given that there are large areas of similar habitat in the region in good condition the cumulative botanical effects of the project are of very low significance.

- The proposed 13km power line to the Eskom grid will have an acceptable overall Low negative impact overall, and the expected botanical impacts are difficult to mitigate. The proposed substation is in an acceptable location.

- The No Go alternative is likely to have a Neutral botanical impact (virtually by definition, as current impacts on site are negligible) and is thus the preferred alternative from a botanical perspective.

- Alternative 1 is likely to have a slightly lower botanical impact than Alternative 2 and is thus the preferred development alternative.

- No significant mitigation is possible (without reducing the scale of the development, or relocating to areas of lower sensitivity on the surrounding plains) and thus post-mitigation impact levels are deemed to be the same as pre-mitigation impact levels.

- It is recommended that all turbines and the substation be located at least 30m from any mapped High sensitivity areas on site (see sensitivity map in baseline study of Helme 2009).

- If the sensitive habitats on the dolerite hills and flats can be largely avoided this is the best way to reduce botanical impacts of the proposed development. This means that all depressions and pan-like areas should be avoided, and buffered from any development by at least 30m, and all seasonal drainage lines should similarly be avoided (where possible) and buffered from development by natural vegetation.

- An independent, properly qualified ECO must be permanently on site throughout the road construction, cable laying, turbine foundation excavation and blasting, and during the erection of the turbines.

- Any excavation, including those for cables, must be supervised by the ECO. No excavations may be left open for more than 1 week, and they should preferably be closed up within 1 day, using the carefully stockpiled soil that came out of the trench. In the case of turbine footings some 45m^3 of soil and rock will presumably be displaced by the concrete, and this should not be dumped on any undisturbed natural vegetation, but must rather be set aside within a portion of the turning circle of the trucks that deliver the components, and must be spread over the foundations once the turbines are erected, or used as access road fill elsewhere on the site.

- In order to minimize blasting and excavation impacts in very rocky areas cable trenches should not be excavated in these areas, and the cables should instead run above ground or on the surface.

- No dumping or temporary storage of any materials may take place outside designated and demarcated laydown areas.

- A CEMP and OEMP should be drawn up, which must outline management steps for all the areas of natural vegetation on the site.

- Alien vegetation management must be undertaken in the 13km long powerline servitude and along the edges of all on-site infrastructure on an annual basis.

6.3.2 Avifaunal Impact Assessment

According to the avifaunal impact assessment (Jenknins, 2010) at least 220 bird species, including 15 red-listed species, 69 endemics, and four red-listed endemics may occur in the broader area. The site falls within the Platberg-Karoo Conservancy Important Bird Area, which supports critical or regionally significant populations of a number of potentially collision prone or otherwise sensitive species. The birds of greatest potential relevance and importance in terms of the possible impacts of the WEF are likely to be (i) raptors resident and nesting on the cliff-lines – particularly Verreaux's Eagle *Aquila verreauxii*, Jackal Buzzard *Buteo rufofuscus* and Rock Kestrel *Falco rupicolus*, and possibly including Lanner Falcon *Falco biarmicus* and Booted Eagle *Aquila pennatus*, (ii) large terrestrial birds and raptors foraging on or commuting over the plateau – including Ludwig's Bustard *Neotis ludwigii* and Kori Bustard *Ardeotis kori*, Blue Korhaan *Eupodotis caerulescens*, Blue Crane *Anthropoides paradiseus*, Secretarybird *Sagittarius serpentarius*, Martial Eagle *Polemaetus bellicosus*, Tawny Eagle *Aquila rapax*, Black Harrier *Circus maurus*, Lesser Kestrel *Falco naumanni*, and populations of endemic passerines (including Rock Pipit *Anthus crenatus*, and Black-headed Canary *Serinus alario*).

Impacts

The expected impacts are:

- habitat destruction by the construction of the facility itself and its associated power lines or substation/s,
- disturbance by construction and maintenance activities and possibly by the operation of the facility,
- possible displacement or disturbance of sensitive species,
- mortality caused by collision with the wind turbine blades,
- collision with the power line network associated with the Wind Farm,
- electrocution on the required power line and substation infrastructure.

Jenkins (2010) reports that "the proposed Wind Farm 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."

Alternative 1 which has a smaller construction footprint and fewer turbines is the preferred alternative from an avifaunal perspective. The avifaunal impact report states that the main direct impact is likely to be on at least three pairs of Verreaux's Eagle as a result of disturbance during the wind farm construction. In addition to this, loss of foraging habitat as well as possible mortalities due to collisions with the turbine blades,. Although the Verreaux's Eagle is not threatened, "an experimental approach to development and mitigation is recommended, which will inform an understanding of how large raptors are affected by wind energy facilities, and how best to mitigate negative impacts, to the long-term benefit of this and more threatened raptor species in future. In addition, a comprehensive programme is put forward to fully monitor and research the actual impacts of the Wind Farm on the Verreaux's Eagles specifically, and on the broader avifauna of the area, from pre-construction and into the operational phase."[1]

Table 6.5. Results of recent published studies of the effects of wind farms on local avifauna.

Location	*n* wind farm/s assessed	Turbine hub height (m)	*n* turbines	Habitat	Bird groups assessed	Evidence of displacement?	Collision rate (birds/turbine/year)	Reference
Argyll, Scotland	1	?	46	Open moorland with plantations	Golden Eagle *Aquila chrysaetos*	Yes, foraging range changed as eagles avoided the wind farm	N/A	Walker *et al.* 1995
Tarifa, Southern Spain	2	18-36	66-190	Hilly woodland	Raptors	N/A	Raptors = 0.27, Griffon Vultures *Gyps fulvus* = 0.12	Barrios & Rodríguez 2004
Tarifa, Southern Spain	2	28-36	66-190	Hilly woodland	Raptors	N/A	0.04-0.07, mostly Griffon Vultures	de Lucas *et al.* 2008

[1] Jenkins, A. 2010: De Aar Wind Farm Avian Impact Assessment

East Anglia, UK	2	60	8	Croplands	Gamebirds, corvids, larks and see-eaters	Minimal, only gamebirds significantly affected	N/A	Devereaux *et al.* 2008
Altamont Pass, California	1	14-43	5400	Hilly grassland	Various	N/A	4.67 , raptors = 1.94	Smallwood & Thelander 2008
Southern Spain	1	44	16	Hilly woodland	Various	Yes, >75% reduction in raptor sightings	0.03	Farfán *et al.* 2009
Netherlands	3	67-78	7-10	Farmland	Various	N/A	27.0-39.0	Krijgsveld *et al.* 2009
Northumberland, UK	1	30	9	Coastal	Seabirds	N/A	16.5-21.5, mostly large gulls	Newton & Little 2009
N England & Scotland	12	30-70	14-42	Moorland	Gamebirds, shorebirds, raptors, passerines	Yes, 53% reduction in Hen Harrier *Circus cyaneus* sightings, other species also decreased	N/A	Pearce-Higgins *et al.* 2009
Smøla, Norway	1	70	68	Coastal moorland	White-tailed Eagle *Haliaeetus albicilla*	Yes – 40% of nest sites displaced, although wind farm area still used for foraging	0.11 (causing a 10% reduction in survival)	Nygård *et al.* 2010

Jenkins (2010) adds that effective mitigation can only be achieved with a commitment to rigorous pre- and post-construction monitoring ideally using a combination of occasional, direct observation of birds commuting or foraging through and around the wind energy facility, coupled with constant, remote tracking of avian traffic using specialised radar equipment. Such systems can be programmed to set the relevant turbines to idle as birds enter a pre-determined danger zone around the turbine array, and to re-engage those turbines once the birds have passed safely through the array.

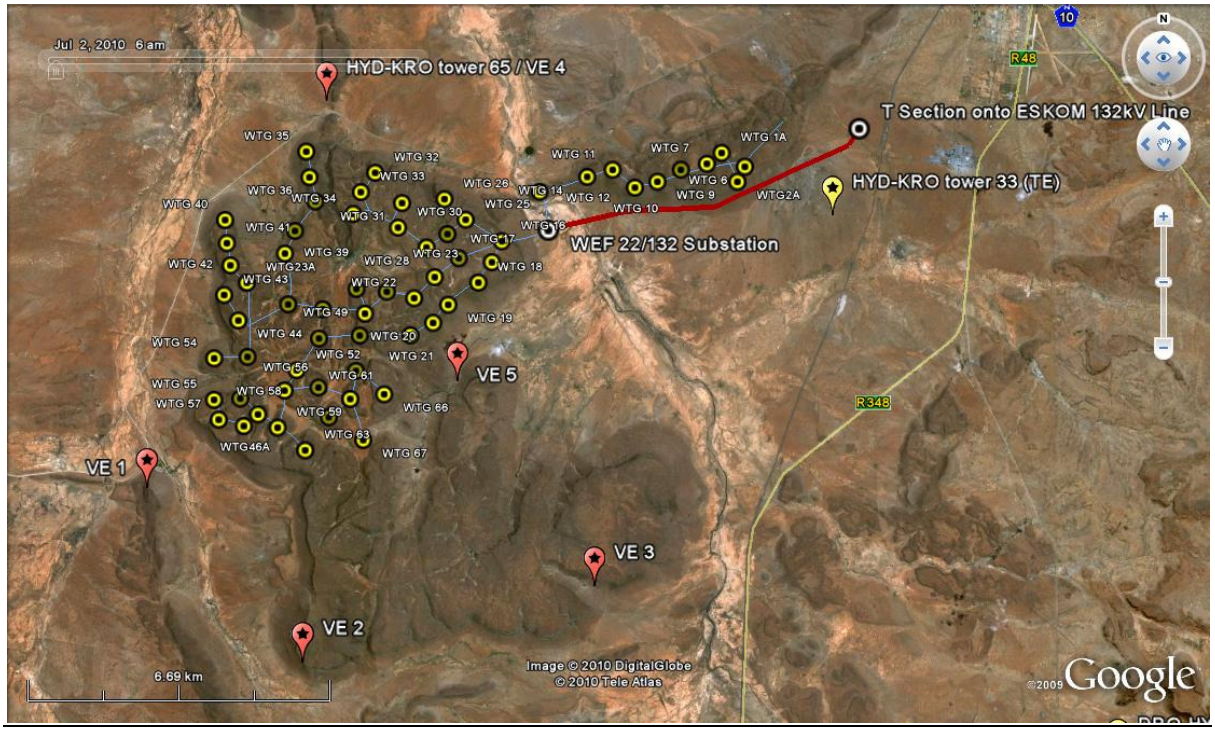

Figure 6.1. Google Earth™ images showing the distribution of known large eagle nest sites in the vicinity of the proposed Maanhaarberg Wind Energy Facility (VE = Verreaux's Eagle, TE = Tawny Eagle). The upper image includes nests located on nearby transmission lines, while the lower image shows the proximity of the proposed turbine array to the Verreaux's Eagle nest sites (VE 1-5) and single Tawny Eagle nest site (HYD-KRO 33) in and immediately adjacent to the proposed Wind Farm.

Common name	Conservation status	Regional endemicity	Relative importance of local population[1]	Susceptibility to collision	Susceptibility to electrocution	Susceptibility to disturbance
Ludwig's Bustard	Vulnerable	Near-endemic	High	High	-	Moderate
Kori Bustard	Vulnerable	-	Moderate	High	-	Moderate
Blue Korhaan	Near-threatened	Endemic	Moderate	Moderate	-	Moderate
Blue Crane	Vulnerable	Endemic	High	High	-	Moderate
Black Harrier	Near-threatened	Endemic	Low	High	-	Moderate
Tawny Eagle	Vulnerable	-	High	High	High	Moderate
Martial Eagle	Vulnerable	-	High	Moderate	High	Moderate
Secretarybird	Near-threatened	-	High	High	-	Moderate
Lesser Kestrel	Vulnerable	-	High	Moderate	-	Moderate
Lanner Falcon	Near-threatened	-	Low	High	Moderate	-
Greater Flamingo	Near-threatened	-	Low	High	-	-

[1]Relative to the national/global population

Table 6.6. Red-listed bird species considered likely to occur within the impact zone of the proposed wind energy facility, with estimates of their relative susceptibility to the environmental impacts of the construction and operational phases of the development. Red-listed endemic species are highlighted in grey.

Table 6.7. Bird impacts matrix for the De Aar Wind Farm for development Alternative 1.

Option		Nature of impact	Affected taxa	Extent	Duration	Intensity	Probability	Status	Degree of confidence	Level of significance	Mitigation measu	Significance
CONSTRUCTION PHASE												
ALTERNATIVE 1	Disturbance: Construction of road network and installation of turbines and power lines	Cliff-nesting raptors, endemic passerines on plateau		Local and surrounds	Short term	Medium	Definite	Negative	High	Medium	Minimise duration of construction activity	Medium-Low
	Habitat loss: Construction footprint	Cliff-nesting raptors, endemic passerines on plateau		Local	Long term	Medium	Definite	Negative	High	Medium	Minimise construction footprint	Medium-Low
OPERATIONAL PHASE												
ALTERNATIVE 1	Disturbance: Operation and maintenance - noise and movement	Cliff-nesting raptors, endemic passerines on plateau	Local and surrounds	Long term	Medium-High	Probable	Negative		Medium	Medium	Minimise noise output of facility	Medium-Low

Option		Nature of impact	Affected taxa	Extent	Duration	Intensity	Probability	Status	Degree of confidence	Level of significance	Mitigation measu	Significance
	Habitat loss: Displacement by operation - noise and movement	Cliff-nesting raptors, endemic passerines on plateau	Local and surrounds	Long term	Medium-High	Improbable	Negative		Medium	Medium	Construct the facility in phases to habituate local avifauna to sight and sounds of Wind Farm	Medium-Low
	Mortality: Electrocution on associated infrastructure	Raptors and storks	Local and surrounds	Long term	Medium-High	Probable	Negative		Medium	Medium	Use bird friendly hardware and power line designs	Low
	Mortality: Collision with turbine blades and associated power lines	Cliff-nesting raptors, commuting large terrestrial and wetland spp. and plains raptors	Local and surrounds	Long term	Medium-High	Probable	Negative		Medium-Low	Medium-High	Turbine and power line siting, mark turbine blades and power lines, establish radar-linked turbine shutdown system	Medium-Low

Table 6.8. Bird impacts matrix for the De Aar Wind Farm for development Alternative 2.

Option	Nature of impact	Affected taxa	Extent	Duration	Intensity	Probability	Status	Degree of confidence	Level of significance	Mitigation measure	Significance after
CONSTRUCTION PHASE											
ALTERNATIVE 2	Disturbance: Construction of road network and installation of turbines and power lines	Cliff-nesting raptors, endemic passerines on plateau	Local and surrounds	Short term	Medium	Definite	Negative	High	Medium-High	Minimise duration of construction activity	Medium
	Habitat loss: Construction footprint	Cliff-nesting raptors, endemic passerines on plateau	Local	Long term	Medium	Definite	Negative	High	Medium-High	Minimise construction footprint	Medium
OPERATIONAL PHASE											

Option	Nature of impact	Affected taxa	Extent	Duration	Intensity	Probability	Status	Degree of confidence	Level of significance	Mitigation measure	Significance after
ALTERNATIVE 2	Disturbance: Operation and maintenance- noise and movement	Cliff-nesting raptors, endemic passerines on plateau	Local and surrounds	Long term	Medium-High	Probable	Negative	Medium	Medium-High	Minimise noise output of facility	Medium
	Habitat loss: Displacement by operation - noise and movement	Cliff-nesting raptors, endemic passerines on plateau	Local and surrounds	Long term	Medium-High	Improbable	Negative	Medium	Medium-High	Construct the facility in phases to habituate local avifauna to sight and sounds of Wind Farm	Medium
	Mortality: Electrocution on associated infrastructure	Raptors and storks	Local and surrounds	Long term	Medium-High	Probable	Negative	Medium	Medium	Use bird friendly hardware and power line designs	Low
	Mortality: Collision with turbine blades and associated power lines	Cliff-nesting raptors, commuting large terrestrial and wetland spp. and plains raptors	Local and surrounds	Long term	Medium-High	Probable	Negative	Medium-Low	High	Turbine and power line siting, mark turbine blades and power lines, establish radar-linked turbine shutdown system	Medium-High

MITIGATION

Mitigation of impacts on birds should focus on:

(i) Minimizing the inclusive construction footprint of the development and abbreviating construction time (immediately favouring Alternative 1).

(ii) Selectively siting turbines, excluding them from the following areas:

- Within 500 m of the likely flight path through the natural gap in the ridge-line between Swartkoppies and Vaalbank.
- Within 500 m of the likely flight path between Swartkoppies and Smouspoort along Eselskloof.
- Within 200 m of the steep sides of cliffs or ridges likely to be favoured by slope-soaring birds (e.g. most high points around the escarpment edge).
- Within a 1000 m radius of any occupied Verreaux's or Tawny Eagle territories (Fig. 3 of Avifaunal Report).

(iii) Further reducing collision risk by marking turbine blades (one black blade per turbine).

(iv) Adjusting the layout and schedule of operational turbines according to the results of ongoing monitoring of bird numbers and movement in the area (see 'Long-term monitoring' below), and possibly by establishing a radar-linked turbine shut-down system (e.g. http://www.detect-inc.com/wind.html).

(v) Minimising the length of any new power lines installed, ensuring that all new lines are marked with bird flight diverters (Jenkins *et al.* 2010) along their entire length, and that all new power line infrastructure is adequately insulated and bird friendly in configuration (Lehman *et al.* 2007). Note that current understanding of power line collision risk in birds precludes any guarantee of successfully distinguishing high risk from medium or low risk sections of a new line (Jenkins *et al.* 2010). In situations where new lines run in parallel with existing, unmarked power lines, this approach has the added benefit of reducing the collision risk posed by the older line.

6.3.3 Bat Study

Jacobs (2010) reports that the causes of bat fatalities by wind turbines remain unclear. Although, patterns that have emerged from European and North American bat fatalities involve species that are tree-roosting, long distance latitudinal migrators (Cryan & Barclay 2009, cited Jacobs 2010). Evidence suggests that these fatalities are due to the rotating blades of the wind turbines and as a result of collision or barotrauma (Baeerwald et al. 2008, Cryan & Barclay 2009, cited Jacobs 2010) rather than as a result of collisions with the towers. According to the bat impact study (Jacobs, 2010) the following parameters of wind turbines are thought to increase bat fatalities:

- Height of the wind turbines. Turbine with 65 m high towers caused more fatalities of migratory bats than turbines of 50 m even when bat activity was lower at the high towers than at the low towers (Baerwald & Barclay 2009).

- Location of the turbines in areas of high bat activity (Arnett et al. 2008, Baerwald & Barclay 2009).

- Operational speed of the turbines during times of low winds (Arnett et al. 2008, Horn et al. 2008, Baerwald et al. 2009).

IDENTIFICATION OF KEY ISSUES AND IMPACT PATHWAYS

- Placement of towers (should be placed in areas of low bat activity)
- Operational times of turbines (avoid turbine operation during periods of peak bat activity - between dusk and 22h00)
- Operational speed of turbines (increase wind speeds at which towers are started during low wind conditions).
- Buffer zone around farm buildings (increase to 5 km radius or more)

The bat impact study also reports that “issues related to construction, operation and closure/decommissioning should not impact on bats” as bats are nocturnal. Excessive noise, however, could still disturb roosting bats but a buffer zone in excess of 5 km radius around roosts should mitigate this impact.

Although no bat activity was detected near the masts at any of the sites, bats were observed flying within 5 km of farm buildings. Schnitzler & Kalko 1998 (cited in Jacobs 2010) states that Bat habitat is more critically determined by the structure of vegetation than by the plant species comprising it. The region falls within the Nama Karoo where the natural vegetation consists largely of low shrubs and grasses, which provide very little habitat for bats. Bat activity is likely to be low and restricted to the areas immediately around farm house where introduced trees and buildings provide roosts and insect prey. Buffer zones of 5 km radius or more around farm buildings should mitigate the impact on bats near the farm house.

Table 6.9. Impact assessment of proposed wind energy facilities on bats.

	Construction	**Operation**
Nature of Impact	Indirect. The project could result in excessive noise and dust that could cause bats to desert their roosts.	Direct 1) Collisions with moving blades. 2) Barotrauma as a result of pressure differential in vortices around rotating blades
Extent	Local	Local
Duration	Short-term for duration of construction	Short-term for duration of operation
Intensity	Low	High (increased mortality of bats is likely to have a severe impact on bats because they are slow breeders – 1 pup/year)
Probability	Low (low bat activity and at only one site)	Low (low bat activity and at only one site)
Status	Negative	Negative
Confidence	Low (surveys done in season of low bat activity)	Low (survey done in season of low bat activity)
Significance	Minor	Minor
Mitigation	Buffer zone > 5 km from nearest towns.	1) Avoid erection of turbines in areas of high bat activity. 2) Avoid operation of turbines in periods of high bat activity i.e. dusk to 22h00 3) Avoid high rotation speeds of blades during periods of high bat

		activity and low winds. 4) Increase speed of wind at which blades are activated during low wind speed conditions. 5) Buffer zone > 5 km around farm buildings
Significance after mitigation	Neutral	Low negative. Mitigation driven.

8 ASSESSMENT OF ALTERNATIVES

Table 6.10. Assessment of alternative options with respect to bats.			
Option	**Option 1**	**Option 2**	**Option 3 No-go**
Extent of impact	Regional and local	Regional and local	No impact
Duration of impact	Long term	Long term	No impact
Intensity	High	High	No impact
Probability of occurrence	Low	low	No impact
Status of impact	Negative	Negative	Neutral
Degree of confidence	Low	Low	High
Level of significance	High, negative	High, negative	Neutral
Significance after mitigation	Low, negative	Low, negative	NA

In areas of high bat activity both options 1 & 2 are likely to have a severe impact on bats. Impacts associated with alternatives 1 and 2 are similar and have thus been rated the same. The study found that bat activity at the proposed sites was low or absent. Impacts on bats are determined by the height of the towers, speed of rotation of the blades, times of operation and level of bat activity. Provided the mitigation measures detailed in table above are implemented impacts should be low.

6.3.4 Noise Impact Assessment

A noise impact study was undertaken (DDA, 2010) to measure and assess the noise impact on the areas surrounding the site. The noise impact was measured by taking the difference between the existing measured or typical noise levels in that area and the predicted levels for the proposed development activities.

This difference in noise measurements was assessed in accordance with the guidelines provided in the South African National Standards (SANS) Code of Practice 10103:2008 'The measurement and rating of environmental noise with respect to annoyance and to speech communication', as well as the noise regulations applicable to the Northern Cape, i.e. the National Noise Control Regulations of the Environment Conservation Act No. 73 of 1989, promulgated by the Department of Environmental Affairs and Tourism. The latter regulations define noise as 'disturbing' if it causes the ambient noise level to increase by 7 dB(A) or more over the existing ambient level of the area.

The main sources of noise found during the measurement were:

- Vehicular traffic from nearby roads.
- Human domestic activities, such as people conversing, children playing, etc.
- Natural sounds, such as birds, insects, dogs barking, etc.

Human perception of the change in sound is subjective and does not bear a close relation to actual change, for example:

- A change in level of 3 dB(A) is just detectable;
- A change in level of 5-6 dB(A) is clearly perceptible; and
- A change in level of 10 dB(A) is perceived roughly as doubling or halving of loudness.

In terms of methodology the ambient noise levels were measured intermittently over two days, i.e. the 19th and 20th of May 2010. Four noise monitoring locations were selected, as follows:

- residential property in De Aar,
- south of the town of De Aar
- two points were placed at farms within the project site.

Table 6.11 shows the averaged values of the noise measurements at the four selected locations for representative daytime and night-time periods.

Monitoring Point	District	Noise Level (dB(A))	
		Daytime L_{eq}	Night-time L_{eq}
MP01 just outside De Aar	Suburban	45.1	41.1
MP02 close to a farm outside De Aar	Rural	27.0	-
MP03 at a farm outside De Aar	Rural	35.6	-
MP04 at a guesthouse in De Aar	Urban	-	48.4

Construction Phase

Noise modelling calculations as reported in the noise impact assessment show that noise from typical construction activities “associated with the site preparation and turbine erection, at a distance greater than 1 km from the construction area, the noise levels were estimated to be lower than 40 dB(A).” Given that De Aar is situated more than 4 km from the proposed wind turbine locations, it is anticipated that noise impacts will not be experienced by people in the town.

The closest farmhouse to the proposed turbines is located 1200km from the site. At this location, noise impacts from construction activities will be “audible but not intrusive, with the

noise level reaching around 36 dB(A)". This however is only expected to last for a four week duration before construction commences on the other turbines which are located further away.

During construction some blasting is expected to occur. Calculations, however, show that blasting vibration impacts will be well below the thresholds which are recommended for private buildings as the closest dwellings are at a distance of at least 1.2 km.

Operation Phase

In terms of noise impacts associated with each of the alternatives during the operation phase, the noise impact assessment found that both alternatives would generate similar noise levels. Although alternative 2 has an additional 7 turbines which extends the noise contours further south, the distance between the turbines and the distance of the closest receptor means that the additional turbines do not have a significant influence.

The noise impact report states that "Both alternatives produced a localised noise impact, with the 40 dB(A) noise contour."

Extending to 350 m and the 30 dB(A) to 900 m from the turbine locations". Noise levels at Zwartkoppies was found to reach 30 dB(A) during daytime and 31.5 dB(A) during night-time but this is below the SANS guidelines for a rural district, i.e. 45 dB(A).

Table 6.12 Sound Power Levels for the Vestas V90 2MW Wind Turbine

Wind Speed (m/s)	Sound Power Level (dB(A))
4	94.4
5	99.4
6	102.5
7	103.6
>8	104

6.13 World Health Organisation Guidelines for Ambient Sound Levels

Environments	Ambient Sound Level L_{Aeq} (dB(A))			
	Daytime		Night-time	
	Indoor	Outdoor	Indoor	Outdoor
Dwellings	50	55	-	-
Bedrooms	-	-	30	45
Schools	35	55	-	-

Table 6.14 Typical Rating Levels for Ambient Noise

Type of District	Outdoors Rating Level $L_{Req,T}$ [1,2] (dB(A))	
	Day-time	Night-time
Rural districts	45	35
Suburban districts with little road traffic	50	40
Urban districts	55	45
Urban districts with workshops, business premises and main roads	60	50
Central business districts	65	55
Industrial districts	70	60

[1] A-weighted equivalent continuous rating levels, which include corrections for total character and impulsiveness of the noise.

[2] Day-time: 06:00 – 22:00, Night-time: 22:00 – 06:00

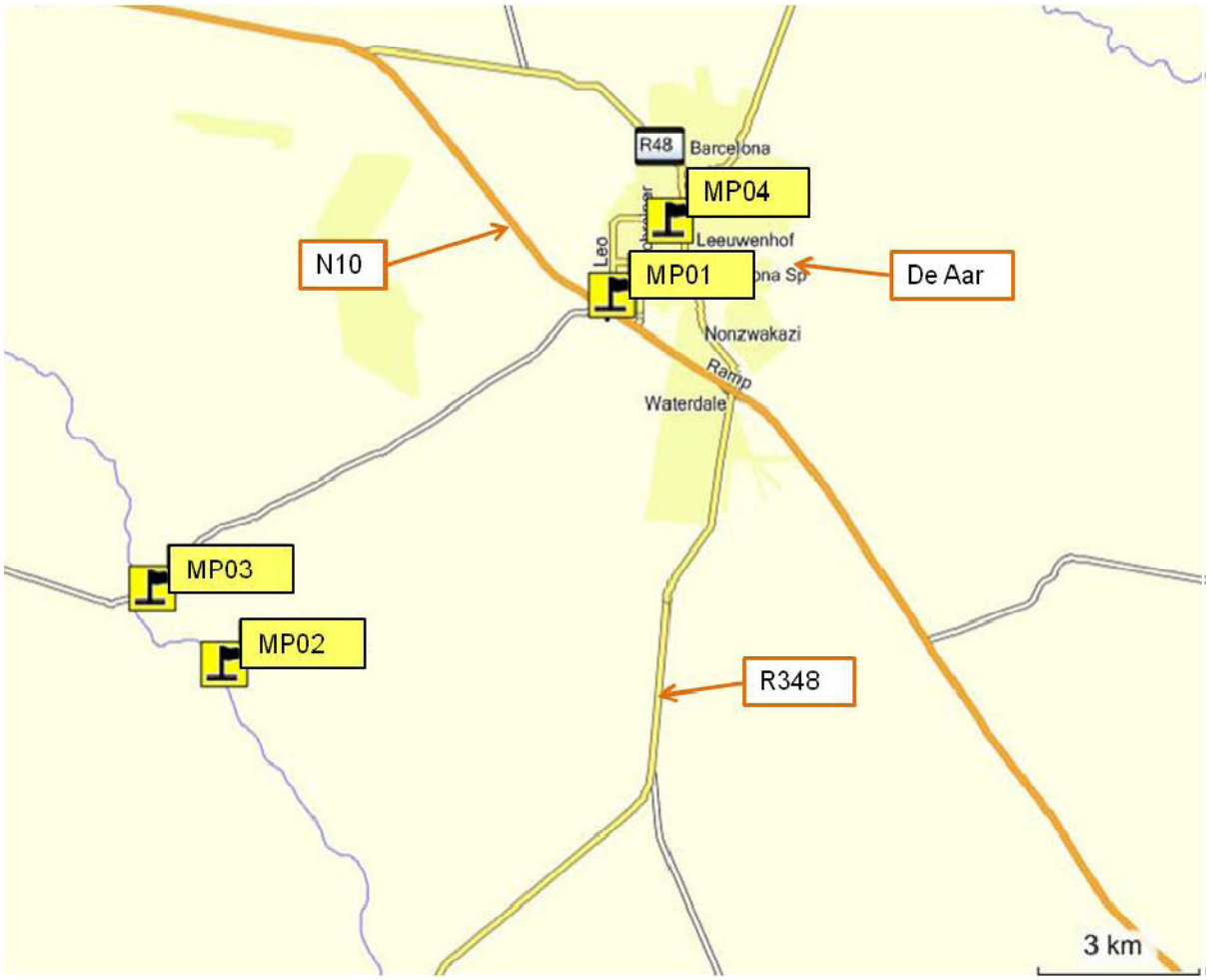

Figure 6.3 De Aar Wind Farm Noise Measurement Locations

Table 6.15 Measured Noise Levels

Monitoring Point	District	Noise Level (dB(A))			
		Daytime		Night-time	
		L_{eq}	L_{90}	L_{eq}	L_{90}
MP01 just outside De Aar	Urban	45.1	28.7	41.1	31.1
MP02 close to a farm outside De Aar	Rural	27.0	19.2	-	-
MP03 at a farm outside De Aar	Rural	35.6	24.9	-	-
MP04 at a guesthouse in De Aar	Urban	-	-	48.4	31.4

Table 6.16 Wind Turbine Construction Noise at Various Distances

Receptor Distance (m)	Modelled Noise Level dB(A)
50	68.7
100	62.4
200	49.5
400	43.6
1000	38.1
1500	33.6
2000	28.2

Wind Farm Operation Phase: Alternative 1

Predicted Noise Levels

At a distance of 350m from the actual turbine noise levels were measured to be 40 dB(A) and at 900m levels dropped to below 30 dB(A).

The figure below shows that the noise contours are within the site boundary for the most part. However, WTG3 close to the northern boundary is the only exception but this is not of concern as there are no noise receptors in this area.

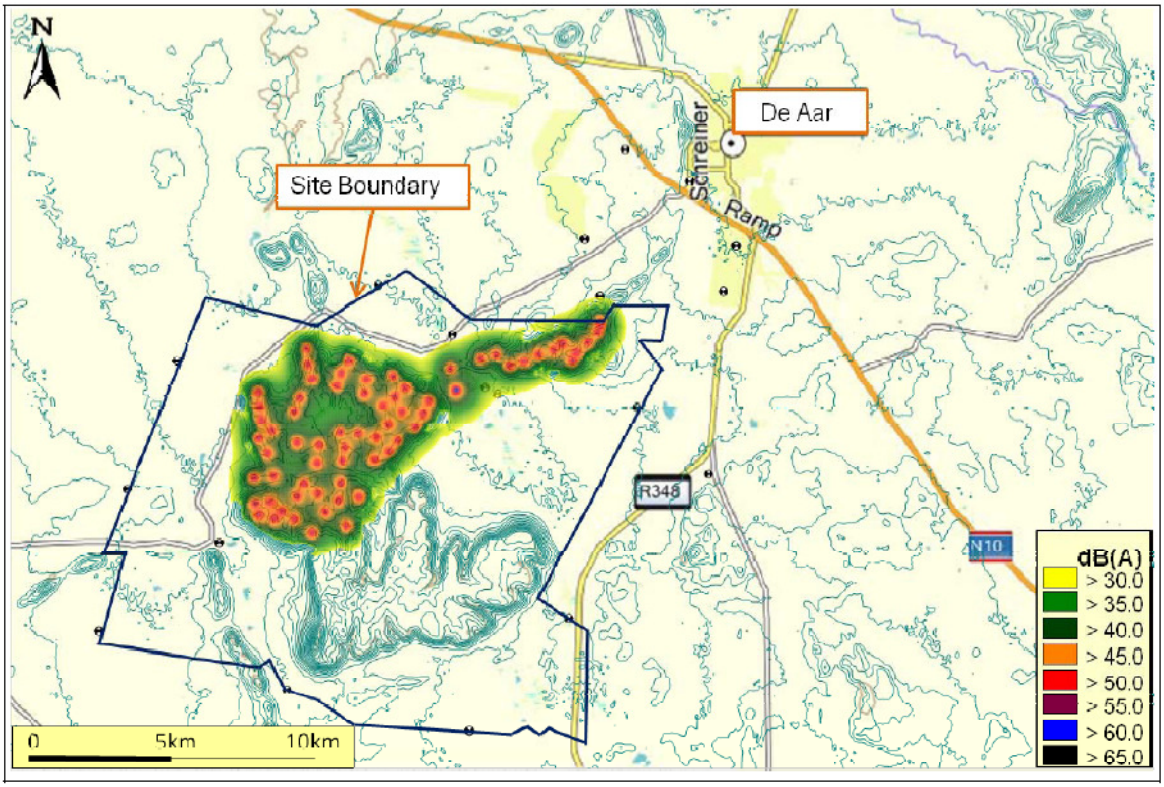

Figure 4 Alternative 1: Daytime Modelling Results

Wind Farm Operation Phase: Alternative 2

Predicted Noise Levels

As with Alternative 1, Alternative 2 wind turbines and transformer substation produced a localised noise impact. At a distance of 350m from the actual turbine noise levels were measured to be 40 dB(A) and at 900m levels dropped to below 30 dB(A). Noise contours show that the only difference between Alternative 2 and Alternative 1 is the extension of the noise contours towards the south, as a result of the additional 7 wind turbines. The distance between the wind turbine positions means that there is no significant cumulative effect of the additional noise sources with the noise level at the closest farmhouse increasing by a negligible amount i.e. 0.2 dB(A).

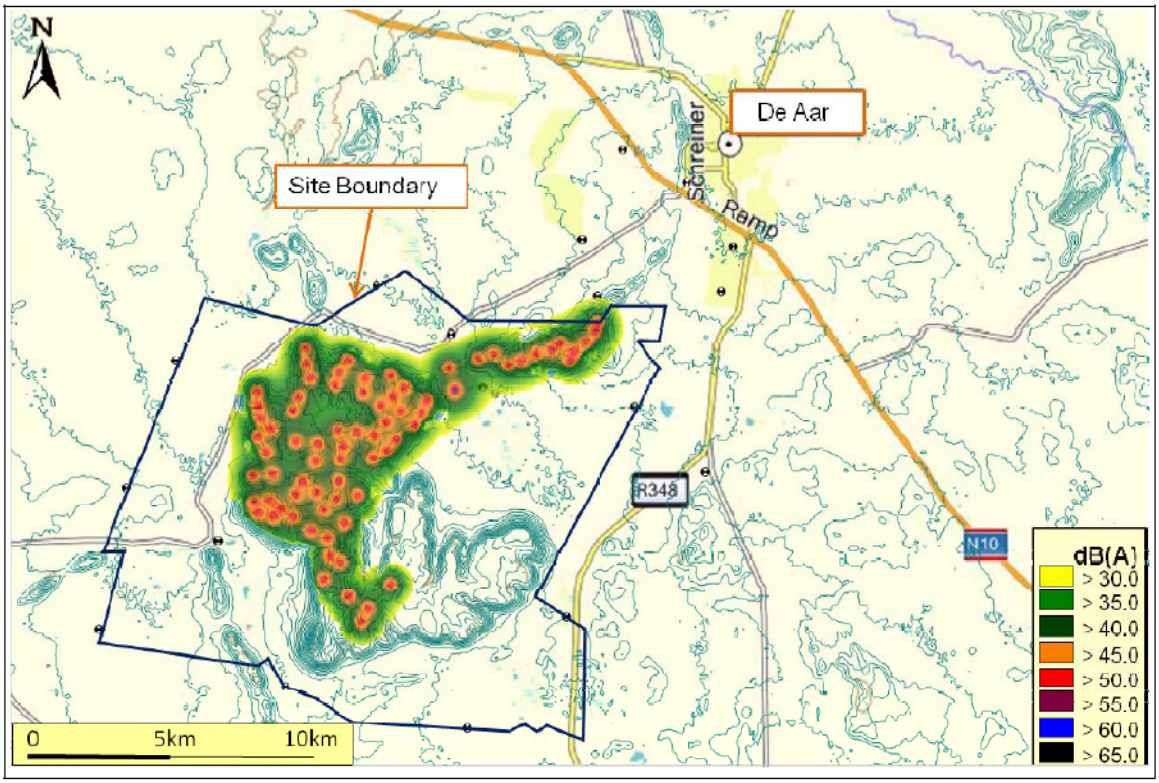

Figure 5 Alternative 2: Daytime Modelling Results

Recommendations

The main recommendations during construction are:

 Diesel-powered and other equipment should be maintained regularly and have appropriately fitted silencers.

 Personnel should be specifically trained, in order to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events.

 Noise measurements should be performed during construction. The monitoring locations should include the south-western border of De Aar and the farmhouses within the site boundary.

 Blasting should not take place more than once a day and should only be permitted between the hours of 09h00 to 17h00 Monday to Saturday. No blasting should take place on Sundays or public holidays.

The main recommendation during operation is:

Noise levels should be measured at the various receptors when operation of the wind farm commences. Following initial measurements the monitoring frequency should be biannually. Monitoring locations should include:

- the south-western border of De Aar, the
- farmhouses within and around the site boundary,
- the transformer location.

Table 6.17 Assessment of noise impacts

Option	Nature of impact	Extent of impact	Duration of impact	Intensity	Probability of occurrence	Status of the impact	Degree of confidence	Level of significance	Mitigation measure	Significance after mitigation
CONSTRUCTION PHASE										
Alternative 1	Noise	Local	Short-term	Low	Probable	Negative	High	Low	N/A	N/A
Alternative 2	Noise	Local	Short-term	Low	Probable	Negative	High	Low	N/A	N/A

Option	Nature of impact	Extent of impact	Duration of impact	Intensity	Probability of occurrence	Status of the impact	Degree of confidence	Level of significance	Mitigation measure	Significance after mitigation
OPERATIONAL PHASE										
Alternative 1	Noise	Local	Long-term	Low	Probable	Negative	High	Low	N/A	N/A
Alternative 2	Noise	Local	Long - term	Low	Probable	Negative	High	Low	N/A	N/A

6.3.5 Archaeological Impact Assessment

The baseline archaeological input reports that relatively large numbers of Stone Age tools were located which can be assigned to the Middle Stone Age and Later Stone Ages. The tools are considered to be isolated finds and are sparsely scattered over the surrounding environment. A small scatter of tools that appear to be associated with the possible remains of a stone circle was also found above the Eskom access road on the Farm Zwartkoppies. Cultural remains such as pottery or ostrich eggshells were not found or any evidence of any factory or workshop.

The distribution patterns of the finds were non-specific and of the finds, but a few, small, dispersed scatters of tools were found. No rock engravings or any rocky art sites were documented.

Issues

The reports states the “the main cause of impacts to archaeological sites is physical disturbance of the material itself and its context. The heritage and scientific potential of an archaeological site is highly dependent on its geological and spatial context. This means that even though, for example a deep excavation may expose archaeological artefacts, the artefacts are relatively meaningless once removed from the area in which they were found. “

Two colonial or historic period `sites’ were documented by the archaeologist and these include a pit dug into the mountain side on the Smouspoort Farm, alongside a gravel road.

A more enigmatic feature includes the remains of about 100 m of dry stone packed walling that occur quite close to a small earth dam situated on the high plateau, on the Farm Smouspoort. The oldest building on Smouspoort dates to 1861. With regard to the water pit it is anticipated that upgrading of the gravel access road will not impact this historic feature.

No physical impact is anticipated or expected on the stone walling as the wind turbines will not be located in this area.
Historic structures and features are sensitive to:

- physical damage such as demolition
- neglect and
- Deterioration over time.

The South African Heritage Resources Agency (SAHRA) issued a Review Comment on the Archaeological Impact Scoping Study (SAHRA file no. 9/2/025/0001), dated 24 August, 2010, which supported the findings and recommendations of the archaeological study.

In order to comply with the above findings, the Agency for Cultural Resource Management undertook another visit to De Aar in September, 2010, order to fulfil the recommendations contained in the SAHRA Review Comment.

The following findings and observations were made:

Proposed Transmission Line: A number Middle and Later Stone Age (LSA) tools were found during the 13.5 km, overhead transmission line site inspection by the archaeological specialist. Tools found include:

“Highly weathered hornfels/lydianite, and comprise mainly thicker flakes, chunks and blade tools, while the LSA tools are in un-weathered hornfels, comprising mostly thin unmodified, utilized and some retouched flakes, chunks and a few cores.”
The ruined remains of a modern veewagterhuis (or shepherds) hut was also documented in the proposed powerline servitude.

Proposed Construction Camp Site: Although a few tools were found close to the proposed construction camp site, the finds have been rated as low local significance and mitigation will not be required.

Proposed Access Roads: A number of access roads are proposed however, in terms of archaeological impact this would not be an issue as the landscape is not sensitive from an archaeological perspective.

However, the preferred access road to the wind turbine location sites on the Smouspoort Farm Smousport will have a high local significance impacts as at least one grave, a number

Later Stone Age tools and other remnants such as shell and bone has been found. This is considered to be a rare find.

Indications are that:

- Overall archaeological remains are rated as having low significance given their wide scatter for the construction camp and transmission line.
- An archaeological site on the Smouspoort Farm which is of high significance will be impacted by the proposed upgrading of the (preferred) access.

The following recommendations are made:

1. No archaeological mitigation in the proposed transmission line is required.

2. No archaeological mitigation in the proposed construction camp site is required.

3. The access road should not traverse the site known as zwk95 as it contains a number of are archeologically finds and the affected section of the road should be moved 10-15m from the site. The site should be fenced under the supervision of an archaeologist and access should be controlled by means of a gate to avoid disturbance of the site. The site should be managed in the long term and a fund should be made available by the applicant for this management.

Comment from the South African heritage resources Agency is included in the Archaeological Impact Report.

The Archaeological Impact assessment concludes by stating that “in terms of historical and archaeological heritage, the proposed project is viable”.

SUMMARY OF ARCHAEOLOGICAL IMPACTS

Nature of impact: The potential impact of the construction of the overhead transmission line on above and below ground pre-colonial archaeology		
	Without Mitigation	**With Mitigation**
Extent of impact	Local	Local
Duration of impact	Permanent	Permanent
Intensity	High	Low
Probability	Definite	Improbable
Significance	Low	Low
Degree of confidence	High	High
Mitigation: No mitigation is proposed as the heritage resources are of low significance. Mitigation will not materially contribute to our understanding of the MSA and LSA in the Northern Cape. The AIA has captured most of the archaeological heritage present in the proposed transmission line.		

Nature of impact: The potential impact of the construction of the construction camp site on above and below ground pre-colonial archaeology

	Without Mitigation	With Mitigation
Extent of impact	Local	Local
Duration of impact	Short term	Short term
Intensity	Low	Low
Probability	Probable	Improbable
Significance	Low	Low
Degree of confidence	High	High
Mitigation: No mitigation is proposed as the heritage resources are of low significance. Mitigation will not materially contribute to our understanding of the MSA and LSA in the Northern Cape.		

Nature of impact: The potential impact of the construction of the proposed Swartkoppies access road on above and below ground pre-colonial archaeology		
	Without Mitigation	**With Mitigation**
Extent of impact	Local	Local
Duration of impact	Short term	Short term
Intensity	Low	Low
Probability	Improbable	Improbable
Significance	Low	Low
Degree of confidence	High	High
Mitigation: No mitigation required		

Nature of impact: The potential impact of the construction of the proposed Goenmanskloof access road on above and below ground pre-colonial archaeology		
	Without Mitigation	**With Mitigation**
Extent of impact	Local	Local
Duration of impact	Short term	Short term
Intensity	Low	Low
Probability	Improbable	Improbable
Significance	Low	Low
Degree of confidence	High	High
Mitigation: No mitigation required. The proposed access road is no longer an alternative.		

Nature of impact: The potential impact of the construction of the proposed Kasarmberge access road on above and below ground pre-colonial archaeology		
	Without Mitigation	**With Mitigation**
Extent of impact	Local	Local
Duration of impact	Permanent	Permanent
Intensity	High	Low
Probability	Definite	Highly probable
Significance	High	Low
Degree of confidence	High	High
Mitigation: zwk95 is a site of very high local significance. The affected section of the road must be moved at least 10-15 m away from the archaeological site. If this cannot be achieved, the site will have to be mitigated. The site must also be permanently fenced off during the proposed upgrading of the road. The site must not be disturbed in any way.		

6.3.6 Paleontological Impact Assessment

The proposed two-phase wind farm development is situated on the plateaux of the Maanhaarberg and Swartkoppies, about 20km southwest of De Aar in the Northern Cape Province. The majority of the development footprint, including wind turbines as well as ancillary gravel road construction, is underlain by unfossiliferous Karoo dolerite. Non-marine sediments of the Mid Permian Ecca and Lower Beaufort Groups (Karoo Supergroup) crop out on the slopes of the Karoo koppies. The Tierberg, Waterford and Abrahamskraal Formations represented here have a moderate to high paleontological sensitivity. However, they are largely obscured by Neogene (Late Tertiary) to Recent drift deposits – notably dolerite scree and alluvium - and their fossil potential has been compromised through baking (thermal metamorphosis) by the adjacent major dolerite intrusions. 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, no further paleontological mitigation is recommended for this development. However, should substantial fossil remains be exposed during construction (*e.g.* in borrow pits excavated for new or upgraded gravel roads), the ECO should alert SAHRA so that appropriate action (*e.g.* recording, sampling or collection) can be undertaken by a professional palaeontologist.

Paleontological mitigation generally concerns the construction phase rather than the operational phase of a development, unless this development involves ongoing excavation of bedrock (e.g. mining). The inferred paleontological sensitivity of fossil heritage within each of the six rock units represented in the Maanhaarberg study area near De Aar is summarized in Table 6.18 below (See also Almond & Pether 2008).

TABLE 6.18: FOSSIL HERITAGE IN THE DE AAR AREA

GEOLOGICAL UNIT	ROCK TYPES & AGE	FOSSIL HERITAGE	PALEONTOLOGICAL SENSITIVITY	RECOMMENDED MITIGATION
Superficial deposits ("drift")	alluvium, colluvium (scree), pan sediments *etc* QUATERNARY TO RECENT	sparse remains of mammals (bones, teeth), reptiles, ostrich egg shells, molluscs shells, trace fossils, plant remains, palynomorphs, diatoms stone artefacts	LOW	any substantial fossil finds to be reported by ECO to SAHRA
Calcretes (T-Qc)	pedogenic limestones NEOGENE TO QUATERNARY	calcretised trace fossils (termitaria, rhizoliths *etc*) possible vertebrate bones, teeth, mollusc shells	LOW	any substantial fossil finds to be reported by ECO to SAHRA
Karoo Dolerite Suite	intrusive dolerite sills & dykes	NONE	ZERO	none

(Jd)	EARLY JURASSIC			
Abrahams-kraal Formation (Pa) BEAUFORT GROUP	floodplain mudrocks with lenticular channel sandstones, minor playa lake sediments MIDDLE PERMIAN	rich terrestrial vertebrate fauna (esp. therapsids), petrified wood, plant remains, freshwater molluscs, trace fossils (trackways, burrows, coprolites)	HIGH	any substantial fossil finds to be reported by ECO to SAHRA
Waterford (= Carnarvon) Formation (Pc) ECCA GROUP	storm-deposited shallow shelf sandstones with interbedded mudrocks MIDDLE PERMIAN	abundant trace fossils, petrified wood, rare fish & amphibian remains, possible stromatolitic limestones, palynomorphs	MEDIUM	any substantial fossil finds to be reported by ECO to SAHRA
Tierberg Formation (Pt) ECCA GROUP	dark basinal, prodelta and submarine fan mudrocks with minor sandstones EARLY TO MIDDLE PERMIAN	locally abundant trace fossils, petrified wood, plant debris, microvertebrates, palynomorphs	MEDIUM	any substantial fossil finds to be reported by ECO to SAHRA

The Ecca and Beaufort Group sediments here generally have a moderate to high paleontological sensitivity. However, with the exception of some ancillary road construction, the greater part of the proposed wind farm development is situated on the dolerite plateaux of the Maanhaarberg and Swartkoppies that are not paleontological sensitive at all. Furthermore, Karoo Supergroup sediments beneath and adjacent to these major dolerite intrusions will have been extensively baked, considerably reducing their original fossil potential.

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.

6.3.6 Heritage Study

The heritage impact assessment (Attwell, 2010) describes the landscape character as one which comprises grassland and bushes which graduates to grassy uplands and mountainous areas. The landscape itself shows little evidence of human settlement. The assessment was undertaken according to the requirements of the National Heritage Resources Act.

The National Heritage Resources Act requires a heritage assessment (HIA) in certain categories of development1. These include the following:

- *The construction of a road, wall, powerline, pipeline, canal or any other similar form of linear development or barrier exceeding 300 m*

- *The construction of a bridge of similar structure exceeding 50 min length*
- *Any development or other activity which will change the character of a site*

(i) *Exceeding 5000 sq m in extent*
(ii) Involving three or more existing erven or subdivisions thereof
(iii) Involving three or more erven or divisions thereof which have been consolidated within the past five years; …

Other than a few farmland nodes along the Elandsfontein River at Zwartkoppies and Vaalbank, and also at Smouspoort. The landscape is "not settled or cultivated and is empty and mountainous with few structures of any kind". The heritage confirmed that the two farmsteads are not older than 60 years old.

Figure 6 Early farm: Zwartkoppies Showing historic building.

Due to the fact that homesteads are not of local or provincial heritage significance they are not subject to the grading system of the National Heritage Resources Act. The link between Smouspoort and the Anglo Boer War and the historic elements in the werf makes the site important from a historical and cultural perspective.

Affected Heritage Resources

Although he following resources will not be physical impacted, the visual impact of the proposed WEF will impact these resources:
These are:

- Structure (old barn) on Farm Zwartkoppies
- Significant natural site associated with Anglo-Boer War 1899-1902, on Farm Smouspoort
- Dry stone walling (possibly early stock control measures) near farm Smouspoort

It should however be noted that the resources identified above are not of outstanding significance.

Attwell (2010) reports that "historic portions of the farm werf at Zwartkoppies including the early structure are likely be graded as 3c in terms of the criteria of conservation-worthiness, i.e. of some local cultural significance in that the building was associated with early agricultural settlement".

Other elements in the cultural landscape that are of local and provincial significance are:

- The barn at Zwartkoppies Grade 3c
- The werf at Smouspoort including farmhouse – ungraded
- The farmhouse at Vaalbank. Older than 60 years but ungraded
- The farm and werf at Zwartkoppies - ungraded
- The Boer meeting place –Currently unsupported by documentary research 3b
- Stone walling Smouspoort 3c

Findings:
Landscape character is likely to be affected by the proposed wind farm facilities. In particular the following:

- The placement of facilities on the visually dominant Maanhaarberge
- The low extensive views leasing to the Maanhaarberge
- Visual impact on skylines and ridges where skylines have been identified as a significant landscape element (this is mitigated by the general remoteness of the side with few receptors, mostly travellers along the and the farming community in the area)
- Specific impact on the farms of Zwartkoppies and Smouspoort will be high because of their geographical location in relation to mountain ridges
- Contrast between the rural wilderness quality and the "industrial" nature of the proposal

The significance of the impact on heritage resources
The significance of the impact may affect the site in:

- Physical and material aspects
- Visual spatial qualities
- Associational impacts

Conclusions and Recommendations

There are minor heritage resources in the vicinity of the site. The area is not considered a cultural landscape in terms of the internationally accepted definitions.

The following are the conclusions

- Impact are likely to be visual/spatial
- Impact on farm settlements was high to medium and because of the contrast in scales and character of installation, the impact was negative.
- In terms of applicable legislation, the report found that Section 27 of the National Heritage Resources Act did not apply. Section 34 of the Act however did apply as there were farm structures on the farms Smouspoort, Vaalbank and Zwartkoppies that contained structures or historical elements older than 60 years. Not all were graded however.
- The site on the farm Smouspoort associated by oral tradition with the Anglo Boer War could not be verified through documentary sources. However the continued presence of small Boer parties in the area could be verified through documentary sources. It is assumed that the historical associations with the site have significance.
- Impacts in the vicinity of the farm settlements are likely to be high negative. With mitigation this can be reduced to medium.
- Impact is likely to affect the character of the site. Such cumulative impact is difficult to mitigate
- Impact on heritage resources is medium negative. This is overset by the fact that heritage resources are not of provincial or national significance
- Impact on the site linked by oral tradition to the Boer War and the stone wall is low by virtue of its geographical position. Impact on the barn at Zwartkoppies is high negative but the heritage significance of the site is low.
- A separate archaeological study found Stone Age Scatters
- No additional Khoi or remnants of Koranna history were found
- No known oral traditions or intangible heritage other than those associated with the Anglo Boer War 1899-1902 were found.
- In terms of lesser visual impact and impact on the character of the landscape, the preferred option is the most appropriate alternative
- The No go option has the least impact on the landscape but contributes nothing to the economy of the area or to the development of clean and sustainable energy resources

The following are the recommendations:

- That Option 1 (Alternate One) 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
- That this report be submitted to Heritage Northern Cape for endorsement
- That the conclusions be endorsed
- That the proposal be endorsed subject to the understanding that as impacts are largely visual/spatial and that as the character of the landscape is affected, the recommendations of the VIA of 2010 be endorsed.

SECTION		
IMPACT	Options 1 and 2 consisting of 67-75 turbines and related infrastructure grouped around the Maanahaarberg.	
Nature of impact	Visual impact on landscape Visual impact on identified heritage resources	
STAGE	**CONSTRUCTION PHASE**	**OPERATION PHASE**
Extent of impact	Local	Local
Duration of impact	Temporary	Long-term
Intensity	Medium to low on archaeological sites.	Medium to low on heritage structures(Smouspoort, Medium on heritage structures (Zwaartkoppies) Medium to high on landscape character (site not identified as a noteworthy cultural landscape)
Probability of occurrence	Highly probable	Highly Probable
Status of the impact Cost benefit	(Visual) Moderate negative Positive in terms of provision of economic opportunities	(Visual) Low Negative Positive in terms of pioneering clean energy facilities
Accumulative Impact	On Visual Cultural landscape medium to low with mitigation during construction	Medium with mitigation including appropriate placement of turbines
Degree of confidence	High	Moderate to high in light of general suitability of site
Level of significance	Low to medium heritage significance	Low to medium heritage significance. With mitigation to ensure protection of site contexts Medium
Mitigation measures	▪ Construction environmental management plan (EMP) to be drawn up prior to construction, with details affecting archaeological watching brief ▪ No other heritage related requirements	▪ Placement of turbines and infrastructure to reduce visual impact on heritage resources particularly in the Zwaartkoppies vicinity
Level of significance after mitigation	Low	Medium to Low
EMP requirements	Archaeological watching brief as part of EMP	Potential mechanisms for screening of impact of facility on agricultural landscape.
Discussion 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 measures against positive socio-economic and environmental factors .		

Table 6.18 Assessment of Impacts

6.3.7 Socio-Economic Impact Assessment[2]

The aim of this impact assessment is to investigate and describe the socio-economic environment surrounding the proposed project site, and the potential impacts of the proposed wind farm development on the existing environment. The existing environment consists of all socio-economic networks and systems that are potentially impacted on by the proposed wind farm project located outside of De Aar.

The local area has a diverse economy, while the main sectors contributing to the Gross Geographic Product (GGP) in 2008 included the financial and business services sector (21.6%), the general government sector (21.1%) and the trade sector (15.5%). The sectors experiencing the strongest growth between 2001 and 2008 include the financial and business services sector as well as the agricultural sector.

The largest share of total labour in the Emthanjeni LM is distributed between three main sectors. The general government sector employs more than 24% of the share of total labour, while the agricultural sector employs 21.5% of the labour and a total of 19% of the labour is employed in the trade sector.

These three sectors' employment contribution remained high since 2001, the percentage employment in the agricultural sector increased significantly (4.9%). Another increase in employment during 2001 and 2008 was recorded in the financial and business services sector (5.1%). The largest economic contributor (financial and business services sector) also experienced the highest employment growth rate during 2001 and 2008. Only three of the economic sectors (agriculture, mining and financial and business services) however recorded growth in employment since 2001. A very low number of persons are employed by the mining sector (1.1%) and the electricity sector (0.6%).

To summarise from a socio-economic perspective, the Emthanjeni LM has a total population of 38,612 in 2010 and an average annual population growth rate of -0.7% (1996-2008). Although the unemployment rate is only 26%, the not economically active population amounts to 46.9%. The low skills levels (32% of labour force is unskilled workers) together with the low annual household income (79.8% of households earn low-income annual salaries) creates an urgent need to increase economic growth through the absorption of the current labour force. This will however be challenging due to the lack of required skills in the municipal region. The annual economic growth rate was approximately 3.1% between 1998 and 2008 therefore a concerted effort will be required to attain the National 6% growth objective. Active economic sectors are mainly in the form of the government services sector and the trade sector.

Issues

The construction and operational phase of the proposed development will have direct and indirect impact on employment respectively.

[2] Urban-Econ, 2010: De Aar wind Power Generation Facility- Socio-Economic Impact Assessment

The baseline data draws attention to a few key socio-economic development issues. These issues require “external interventions and investments to create the enabling conditions needed to realise the latent economic potential of the area”.

The salient issues can be summarised as follows:

- The unemployment gap.
- Underemployment (elementary occupations and low skills levels)
- The need for facilities and services to meet the needs of a growing and changing population.
- Dependency on the agricultural and manufacturing sectors in terms of GGP growth

Potential impacts during construction would include:

- Employment opportunities for the duration of the construction period;
- Both on-site construction jobs (direct) as well as downstream and upstream (indirect and induced) opportunities would be stimulated;
- Direct jobs would become available to the local labour force (depending on procurement schedules), while indirect and induced jobs would be created on a regional scale;
- Businesses related to the construction industry would benefit from increased demand for their products and/or services, thus resulting in increased new business sales;
- An increase in GGP;
- Increased in business productivity will result in an increase in GGP during the duration of construction.

During operation, similar impacts would be felt, but these impacts will be sustainable in the long-term.

- Employment opportunities
- In addition to these on-site job opportunities, which should be targeted at locals, especially those who may be residing in proximity to the proposed wind farm, spin-off employment opportunities will be generated.
- New Business Sales
- Businesses directly and indirectly related to any of the proposed components would benefit from the development, with increased local demand for their products and/or services.
- Impact on infrastructure and resources in the region
- Impact on income based on increased business sales and jobs created
- Improved competitiveness of the region in terms of energy generation

Potential Negative impacts could include:

- Potential increased crime and violence in the area
- Potential health risks
- Potential for local road congestion
- Noise due to construction and traffic

- Implications to local agriculture.

CAPEX expenditure

Alternative One will amount to about **R 765,210,000 (R 765 million)**

Alternative Two will be **about R 856,578,358 (R 857 million).**

Table 6.19: Annualised Impacts during the Construction Phase (CAPEX, 2010)

	Impact Variable	New Business Sales R Million	Gross Geographic Product R Million	Employment
Alternative 2 Alternative 1	Direct (i.e. buildings & infrastructure)	R 230.63	R 60.03	90
	Indirect	R 29.34	R 7.56	87
	Induced	R 9.50	R 2.47	60
	Total	**R 269.47**	**R 70.06**	**237**
Alternative 1	**Impact Variable**	**New Business Sales R Million**	**Gross Geographic Product R Million**	**Employment**
	Direct (i.e. buildings & infrastructure)	R 258.16	R 67.19	101
	Indirect	R 32.85	R 8.47	97
	Induced	R 10.63	R 2.77	67
	Total	**R 301.64**	**R 78.43**	**265**

Source: Urban-Econ Economic Model, 2010

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The capital investment of between R765 million and R 857 million could thus lead to an increase of total new annual business sales, of between R 270 million and R 302 million (including direct and indirect impacts).

It should however be noticed that the impact in terms of new business sales varies for every project, as it is up to the developers/client (Mulilo) to source building materials, suppliers and services from the local area. The percentage of local support is also influenced by the availability of resources and credible building suppliers and service providers.

The net effect of the construction of the proposed wind farm in De Aar on increased GGP is illustrated in Table 6.19. The capital investment of between R 765 million (Alternative One) and R 857 million (Alternative Two) could thus lead to an annual increase of total GGP, of R 70 million, while Alternative 2 will lead to a GGP increase of approximately R 78 million

Mulilo indicated that a total of 180 workers are expected to be directly employed during the construction phase of the proposed wind farm. Indirectly, jobs are also created in industries that provide goods, materials and services. For example, an additional amount of goods used in construction will be required from business and industries related to the construction sector. This could lead to an increased number of jobs being created in these businesses, i.e. in order to increase output. The total number of new jobs created (direct, indirect and induced) as a result of the capital investment of the proposed wind farm development's Alternative One, amounts to 237 annual jobs, while Alternative Two will directly employ 101 workers, resulting in a total of 265 annual jobs.

The impact of OPEX on business sales, GGP and employment will be smaller than that of CAPEX, but sustained over the long term. The multiplier effect of the estimated turnover by business on the proposed site is illustrated in subsequent table and paragraphs. Results are reflective of benefits that will most likely occur during one operational year, once the project has reached maturity, i.e. breakeven point. The operational phase, or commercialisation phase, includes all operational expenditure.

Table 6.20: Annualised Impacts during the Operational Phase (OPEX, 2010)

	Impact Variable	New Business Sales R Million	Gross Geographic Product R Million	Employment
Alternative 2 Alternative 1	Direct (i.e. buildings & infrastructure)	R 2.14	R 1.04	3
	Indirect	R 0.13	R 0.04	0
	Induced	R 0.01	R 0.00	0
	Total	**R 2.27**	**R 1.08**	**3**
Alternative 1	**Impact Variable**	**New Business Sales R Million**	**Gross Geographic Product R Million**	**Employment**
	Direct (i.e. buildings & infrastructure)	R 28.65	R 13.88	33
	Indirect	R 1.71	R 0.57	2
	Induced	R 0.10	R 0.05	0
	Total	**R 30.46**	**R 14.51**	**35**

Source: Urban-Econ Economic Model, 2010

If the proposed De Aar wind farm development occurs, goods and services bought in the local economy will result in additional turnover, which could result in the need to hire more people, which in turn could create additional household income and thus additional spending power.

Thus, as injection of growth occurs within the local economy, this injection can in turn create further growth (new business sales) within the economy, as indicated per Table 6.20;

- The total number of new business sales (direct and indirect) during the operational phase of the proposed wind farm development, amounts to between R 2.3 million and R 30.5 million (Alternative One and Alternate Two).

The generation of additional business sales and employment opportunities will initiate an ongoing ripple effect through the sub-region, resulting in an increase in product and service value (measured in GGP). The potential impact of the additional GGP for the local economy, as shown in Table 7.20, is as follows:

- The total increase in GGP (direct, indirect and induced) during the operational phase of the proposed wind farm development, amounts to R 1.08 million (Alternative One) and R 14.51 million (Alternative Two).

As a result of the businesses which operated in the study area after the construction phase, and the indicated increases in annual turnover, it is estimated that the economy will be able to, once the project has reached maturity, sustain the following employment opportunities, as per Table 6.20:

- A total increase of 3 employment opportunities (Alternative One) and 35 employment opportunities (Alternative Two). Of this total amount of employment opportunities generated and sustained, 15 (Alternative One) and 31 (Alternative Two) jobs would be created as a direct result of the wind farm development.

As evident from the macro economic analysis, the economic impacts on increased business sales, GGP and employment opportunities for both Alternative One and Alternative Two are very similar. It is thus difficult to base the final decision on which alternative to follow solely on the economic impacts. It is thus recommended that other specialist studies together with the economic impact are consulted for a final decision on the preferred alternative Table 6.20a-b indicates the social impact in terms of *Alternative One and Alternative Two,* while Tables 6.20c and 6.20d illustrate the socio-economic impact should the no-go Alternative be chosen.

Table 6.20a: Summary of Impact Assessment, Economic Stimulation, Construction Phase

Potential Impact	Stimulation of Local Economy
Extent of Impact	Regional
Duration of Impact	Short
Intensity of Impact	Medium (Positive)
Probability of Impact	Definite/High
Significance Rating	Medium (Positive)

Table 6.20b: Summary of Impact Assessment, Economic Stimulation, Operational Phase

Potential Impact	Stimulation of Local Economy
Extent of Impact	Regional
Duration of Impact	Permanent
Intensity of Impact	Low (Positive)
Probability of Impact	Likely/medium

Significance Rating	Low (Positive)

Table 6.20c: Summary of Impact Assessment, Economic Stimulation, Construction Phase (No-Go Option)

Potential Impact	Stimulation of Local Economy
Extent of Impact	None
Duration of Impact	None
Intensity of Impact	None
Probability of Impact	None
Significance Rating	None

Table 6.20d: Summary of Impact Assessment, Economic Stimulation, Operational Phase (No-Go Option)

Potential Impact	Stimulation of Local Economy
Extent of Impact	None
Duration of Impact	None
Intensity of Impact	None
Probability of Impact	None
Significance Rating	None

Table 6.21a-b indicates the socio-economic impact in terms of the *Alternative One* and *Alternative Two,* while Tables 6.21c and 6.21d illustrate the impact should the no-go Alternative be chosen.

Table 6.21a: Summary of Impact Assessment, Government Income, Construction Phase

Potential Impact	Increased Government Income
Extent of Impact	Regional
Duration of Impact	Short
Intensity of Impact	Low (Positive)
Probability of Impact	Definite/High
Significance Rating	Low (Positive)

Table 6.21b: Summary of Impact Assessment, Government Income, Operational Phase

Potential Impact	Increased Government Income
Extent of Impact	Regional
Duration of Impact	Permanent
Intensity of Impact	Low (Positive)
Probability of Impact	Likely/medium
Significance Rating	Low (Positive)

Table 6.21c: Summary of Impact Assessment, Government Income, Construction Phase (No-Go Option)

Potential Impact	Increased Government Income
Extent of Impact	None
Duration of Impact	None
Intensity of Impact	None
Probability of Impact	None
Significance Rating	None

Table 6.21d: Summary of Impact Assessment, Government Income, Operational Phase (No-Go Option)

Potential Impact	Increased Government Income
Extent of Impact	None
Duration of Impact	None

Intensity of Impact	None
Probability of Impact	None
Significance Rating	None

Table 6.22a-b indicates the socio-economic impact in terms of the *Alternative One* and *Alternative Two,* while Tables 6.22c and 6.22d illustrate the impact should the no-go Alternative be chosen.

Table 6.22a: Summary of Impact Assessment, Local Economy, Construction Phase

Potential Impact	Diversification of Local Economy
Extent of Impact	Regional
Duration of Impact	Short
Intensity of Impact	Low (Positive)
Probability of Impact	Definite/High
Significance Rating	Low (Positive)

Table 6.22b: Summary of Impact Assessment, Local Economy, Operational Phase

Potential Impact	Diversification of Local Economy
Extent of Impact	Regional
Duration of Impact	Permanent
Intensity of Impact	Low (Positive)
Probability of Impact	Definite/High
Significance Rating	Low (Positive)

Table 6.22c: Summary of Impact Assessment, Local Economy, Construction Phase (No-Go Option)

Potential Impact	Diversification of Local Economy
Extent of Impact	None
Duration of Impact	None
Intensity of Impact	None
Probability of Impact	None
Significance Rating	None

Table 6.22d: Summary of Impact Assessment, Local Economy, Operational Phase (No-Go Option)

Potential Impact	Diversification of Local Economy
Extent of Impact	None
Duration of Impact	None
Intensity of Impact	None
Probability of Impact	None
Significance Rating	None

Table 6.23a-b indicates the socio-economic impact in terms of the *Alternative One* and *Alternative Two,* while Tables 6.23c and 6.23d illustrate the impact should the no-go Alternative be chosen.

Table 6.23a: Summary of Impact Assessment, Employment, Construction Phase

Potential Impact	Employment and Skills Transfer
Extent of Impact	Regional
Duration of Impact	Short
Intensity of Impact	Low (Positive)
Probability of Impact	Definite/High
Significance Rating	Low (Positive)

Table 6.23b: Summary of Impact Assessment, Employment, Operational Phase

Potential Impact	Employment and Skills Transfer
Extent of Impact	Regional
Duration of Impact	Permanent
Intensity of Impact	Low (Positive)
Probability of Impact	Definite/High
Significance Rating	Low (Positive)

Table 6.23c: Summary of Impact Assessment, Employment, Construction Phase (No-Go Option)

Potential Impact	Employment and Skills Transfer
Extent of Impact	None
Duration of Impact	None
Intensity of Impact	None
Probability of Impact	None
Significance Rating	None

Table 6.23d: Summary of Impact Assessment, Employment, Operational Phase (No-Go Option)

Potential Impact	Employment and Skills Transfer
Extent of Impact	None
Duration of Impact	None
Intensity of Impact	None
Probability of Impact	None
Significance Rating	None

Table 6.24a-b indicates the socio-economic impact in terms of the *Alternative One* and *Alternative Two,* while Tables 6.24c and 6.24d illustrate the impact should the no-go Alternative be chosen.

Table 6.24a: Summary of Impact Assessment, Infrastructure Pressure, Construction Phase

Potential Impact	Increased Pressure on Infrastructure
Extent of Impact	Regional
Duration of Impact	Short
Intensity of Impact	Low (Positive)
Probability of Impact	Definite/High
Significance Rating	Low (Positive)

Table 6.24b: Summary of Impact Assessment, Infrastructure Pressure, Operational Phase

Potential Impact	Increased Pressure on Infrastructure
Extent of Impact	Regional
Duration of Impact	Permanent
Intensity of Impact	Low (Positive)
Probability of Impact	Likely/medium
Significance Rating	Low (Positive)

Table 6.24c: Summary of Impact Assessment, Infrastructure Pressure, Construction Phase (No-Go Option)

Potential Impact	Increased Pressure on Infrastructure
Extent of Impact	None
Duration of Impact	None
Intensity of Impact	None
Probability of Impact	None
Significance Rating	None

Table 6.24d: Summary of Impact Assessment, Infrastructure Pressure, Operational Phase (No-Go Option)

Potential Impact	Increased Pressure on Infrastructure
Extent of Impact	None
Duration of Impact	None
Intensity of Impact	None
Probability of Impact	None
Significance Rating	None

Table 6.24e Summary of Impact Assessment, Land-Use Patterns, Operational Phase

Potential Impact	Altering Land Use Patterns
Extent of Impact	Regional
Duration of Impact	Permanent
Intensity of Impact	High (Positive)
Probability of Impact	Definite/high
Significance Rating	High (Positive)

Table 6.24f: Summary of Impact Assessment, Land-Use Patterns, Operational Phase (No-Go Option)

Potential Impact	Altering Land Use Patterns
Extent of Impact	None
Duration of Impact	None
Intensity of Impact	None
Probability of Impact	None
Significance Rating	None

Table 6.25a: Summary of Impact Assessment, Safety, Construction Phase

Potential Impact	Safety and Security
Extent of Impact	Regional
Duration of Impact	Short
Intensity of Impact	Low (Negative)
Probability of Impact	Likely/medium
Significance Rating	Low (Negative)

Table 6.25b: Summary of Impact Assessment, Safety, Construction Phase (No-Go Option)

Potential Impact	Safety and Security
Extent of Impact	None
Duration of Impact	None
Intensity of Impact	None
Probability of Impact	None
Significance Rating	None

Table 6.26a: Summary of Impact Assessment, Planning, Operational Phase

Potential Impact	Degree of Correspondence with Development Planning
Extent of Impact	Regional
Duration of Impact	Permanent
Intensity of Impact	Low (Positive)
Probability of Impact	Likely/medium
Significance Rating	Low (Positive)

Table 6.26b: Summary of Impact Assessment, Planning, Operational Phase (No-Go Option)

Potential Impact	Degree of Correspondence with Development Planning
Extent of Impact	None
Duration of Impact	None

Intensity of Impact	None
Probability of Impact	None
Significance Rating	None

6.27 SUMMARY TABLE OF SOCIO-ECONOMIC IMPACTS

CONSTRUCTION PHASE (Alternative One and Two)					
Nature of Socio-Economic Impact	**Extend of Impact**	**Duration of Impact**	**Intensity of Impact**	**Probability of Impact**	**Significance Rating**
Stimulation of the local economy	Regional	Short	Medium (Positive)	Definite/High	Medium (Positive)
Increase in government income	Regional	Short	Low (Positive)	Definite/High	Low (Positive)
Diversification of the local economy	Regional	Short	Low (Positive)	Definite/High	Low (Positive)
Employment creation and associated transfer of skills	Regional	Short	Low (Positive)	Definite/High	Low (Positive)
Increase pressure on infrastructure	Regional	Short	Low (Positive)	Definite/High	Low (Positive)
Altering land use patterns	n/a	n/a	n/a	n/a	n/a
Increased traffic and congestion	Regional	Medium	Low (Negative)	Definite/High	Low (Negative)
Safety and security	Regional	Short	Low (Negative)	Likely/Medium	Low (Negative)
Degree of correspondence with development planning	n/a	n/a	n/a	n/a	n/a
Loss of visual value	n/a	n/a	n/a	n/a	n/a
Noise pollution and loss of tranquillity	Local	Short	Low (Negative)	Likely/Medium	Low (Negative)

OPERATIONAL PHASE (Alternative One and Two)					
Nature of Socio-Economic Impact	**Extend of Impact**	**Duration of Impact**	**Intensity of Impact**	**Probability of Impact**	**Significance Rating**
Stimulation of the local economy	Regional	Permanent	Low (Positive)	Likely/Medium	Low (Positive)
Increase in government income	Regional	Permanent	Low (Positive)	Likely/Medium	Low (Positive)
Diversification of the local economy	Regional	Permanent	Low (Positive)	Definite/High	Low (Positive)
Employment creation and associated transfer of skills	Regional	Permanent	Low (Positive)	Definite/High	Low (Positive)
Increase pressure on infrastructure	Regional	Permanent	Low (Positive)	Likely/Medium	Low (Positive)
Altering land use patterns	Regional	Permanent	High (Positive)	Definite/High	High(Positive)

Increased traffic and congestion	Local	Long	Low (Negative)	Low	Low (Negative)
Safety and security	n/a	n/a	n/a	n/a	n/a
Degree of correspondence with development planning	Regional	Permanent	Low (Positive)	Likely/Medium	Low (Positive)
Loss of visual value	Regional	Permanent	High (Negative)	Definite/High	High (Negative)
Noise pollution and loss of tranquillity	Local	Long	Low (Negative)	Low	Low (Negative)

6.3.8 Visual Impact Assessment

The visual impact assessment undertaken by Viridian Consulting found that the key issues are:

- The potential visibility of the development from the surrounding terrain, residential areas, and transport corridors
- The ability of the landscape to absorb the development
- The technical specifications of all the infrastructure elements
- The potential negative visual impact during the construction phase
- The potential visual impacts at night, in a rural area
- The potential visual impacts during the life of the project
- The consideration of the alternative layouts and the no development alternative
- Mitigation measures to reduce the impacts

Key Impacts

"Visual effects: does it make a difference visually if the wind farm is in an area of existing visual clutter or in an area where it creates new patterns or better clutter?"

The turbines will add visual clutter

"Visual order: specific arrangements of objects recognisable as a pattern. Visual disorder – where it is not possible to perceive a pattern."

The turbines will create visual disorder and the turbines will appear to be haphazardly scattered from any direction they are seen.

"Visual composition: which is a deliberate arrangement of objects in a view in order to achieve a particular visual relationship, (e.g. grouping turbines only where they will be back grounded)."

The turbines do not present a visual composition.

Visual receptor sites are as follows:

- The built up area of De Aar, the smallholdings, and the townships.
- The South African Armed Services
- The N10
- The railway lines.
- Roads to the southeast and west of the development site and farmsteads
- Roads to the north of De Aar and farmsteads

Results of the assessment of the Visual Significance of the Impacts associated with the Construction and Operation of De Aar Wind Farm.

Note: 'Long term' means the whole life of the project which could be up to 15 years

	Nature of impact	Extent of impact	Duration of impact	Intensity	Probability of occurrence	Status of impact	Degree of confidence	Level of significance	Mitigation Measures	Significance after mitigation
CONSTRUCTION PHASE										
Preferred Option										
1	Location of the construction roads, off existing roads	Local and surrounds	Short-term	Medium-high	Definite	Negative	High	Moderate-high	Upgrade road junctions as required	Moderate
2	Upgrading existing local gravel roads on west and east flanks of hills	Local and surrounds	Short-term	Medium-high	Definite	Negative	High	Moderate-high	Careful alignment of road for least visibility, revegetating disturbed slopes	Moderate
3	Provision of new roads on top of hills to connect infrastructure for construction and maintenance	Local and surrounds	Short-term	Medium-high	Definite	Negative	High	Moderate	Careful alignment of road for least visibility, revegetating disturbed slopes	Moderate
4	Movement of construction vehicles around the site, with lights	Local and surrounds	Short-term	High	Definite	Negative	High	Moderate-High	None	Moderate-High
5	Dust generation, movement of construction vehicles	Local and surrounds	Short-term	Medium	Definite	Negative	High	Moderate	None	Moderate
6	Construction of trenches for underground cables	Local and surrounds	Short-term	Medium	Probable	Negative	Moderate	Moderate	Return ground to original state	Low
7	Construction of buildings. (small, garage sized)	Local and surrounds	Short-term	Medium	Definite	Negative	High	Moderate	Locate out of view of centres of population	Low
8	Construction of small sub station on site	Local and surrounds	Short-term	Medium	Definite	Negative	High	Moderate	Locate out of view of centres of population	Low
9	Construction of the concrete footings, 40x20m for each turbine	Local and surrounds	Short-term	High	Definite	Negative	High	High	Methodology set out in report	Moderate-low
10	Impact on local roads used for low loader bringing very large, heavy components from the N10, R48, around De Aar	Local and surrounds	Short-term	High	Definite	Negative	High	High	Good traffic management and keeping local people informed	Moderate-High

Table 6.27 Assessment of Visual Significance-Construction Phase

	Nature of impact	Extent of impact	Duration of impact	Intensity	Probability of occurrence	Status of impact	Degree of confidence	Level of significance	Mitigation Measures	Significance after mitigation
11	The impact of the construction of the transmission lines from the site to Eskom lines	Local and surrounds	Short-term	Medium to high	Definite	Negative	High	Moderate	None	Moderate
12	The grouping of the turbines on site	Local and surrounds	Long-term	Moderate	Probable	Neutral	High	Moderate	None	Low
13	The colour finish of the turbines	Local and surrounds	Long-term	High	Definite	Negative	Moderate	High	Use a neutral colour, preferably white, non reflecting; no stripes, decals or logos	Low
OPERATIONAL PHASE										
Preferred Option										
1	Maintenance visits by maintenance crew, using the existing gravel roads, the upgraded gravel roads and the gravel roads connecting the infrastructure	Local and surrounds	Permanent	Low	Definite	Neutral	High	Low	None	Low
2	Site buildings (small garage sized)	Local and surrounds	Long-term	Medium	Definite	Negative	High	Moderate	Locate out of view of centres of population	Low
3	Small sub station on site	Local and surrounds	Long-term	Medium	Definite	Negative	High	Moderate	Locate out of view of centres of population	Low
4	Concrete footings for each turbine	Local and surrounds	Long-term	High	Definite	Negative	High	High	The disturbed areas should be re-vegetated	Low
5	The impact of the transmission line from the site to Eskom line	Local and surrounds	Long-term	Medium	Definite	Negative	High	Moderate	None	Moderate-low
6	The grouping of the turbines on site	Local and surrounds	Long-term	Moderate	Probable	Neutral	High	Moderate	None	Moderate
7	The colour finish of the turbines	Local and surrounds	Long-term	High	Definite	Negative	Moderate	High	Use a neutral colour, preferably white, non reflecting; no stripes, decals or logos	Low
8	The visual impact of seeing the turbines rotating	Local and surrounds	Long-term	Will range depending on location of receptor	Definite	Neutral	Moderate	Will vary for receptors	Local consultations	Moderate-low

Table 6.28 Assessment of Visual Significance-Operation Phase

	Nature of impact	Extent of impact	Duration of impact	Intensity	Probability of occurrence	Status of impact	Degree of confidence	Level of significance	Mitigation Measures	Significance after mitigation
Alternative Option										
1	Assessment of Impacts during Construction and Operational Phases	Local and surrounds	Long-term	High	Definite	Negative	High	High	As for the Preferred Option	Greater than the Preferred Option due to the increase in Turbine numbers and consequent infrastructure increase
NO GO OPTION										
1	Retention of status quo	Local and surrounds	Permanent	Medium	Probable	Status quo	Moderate	Moderate	N/a	N/a

Table 6.29 Assessment of Visual Significance-No Go Alternative

Preferred Layout: In terms of the wind farm development the visual impact assessments noted that the development could become an "icon feature" in the landscape. The turbines will not dominate the landscape in Alternative 1. Alternative 2, given that it proposes more turbines is therefore more visually intrusive and therefore Alternative 1 is proposed.

Mitigation (as presented in the Visual impact assessment report):
Mitigation of the visual issues can be provided by keeping the contract time to the minimum, and by ensuring that road junctions have good sightlines, traffic control measures when needed, and signage.

Construction camps locations are shown on the drawings as lay down areas. These must be screened from receptors locally.

Dust generation, movement of machinery and vehicles:
Access roads to be kept clean and storage of materials to be screened. Storage of builders' rubble to be controlled.

Visibility of site offices:
Site offices should be limited to single storey and they should be sited carefully using temporary screen fencing to screen from the wider landscape.

Fires and litter:
All site operatives to receive training in awareness of these issues; no fires to be allowed, litter to be regarded as a serious offence and no contaminants to be allowed to enter the environment by any means.

Roadways should be low-key in appearance; gravel is the most appropriate surface material as there are many gravel roads locally. Roadways should fit onto the land as closely as possible with the minimum of cut and fill. Too much disturbance will result in wide scarring of the landscape.

The largest would be the sub-station and the control building. It is proposed that these are placed where they are least visible to the greatest numbers of people, be finished in materials and colours which fit in with the landscape, and in places where topography can offer shielding.

Visual clarity can be affected as the horizontal power lines are above ground and contradicts the strong vertical element of the turbine structures. Therefore pylons are preferred rather than the commonly used monopoles which have a weaker visual form.

Aircraft warning lights will be present on the turbines however, mitigation in this regard will not be required as it is a necessary requirement of the South African Civil Aviation Authority. Shields to project lights downward could be considered as a mitigation measure.

6.3.9 Traffic Impact Assessment[3]

The report identify the preferred access route to the site, comment on the condition of the existing roads in the site vicinity, identify possible access points to the site and recommend road improvements to the surrounding road network.

The report is based on existing available information on the road network, road condition information obtained during site visits and an assessment of the expected traffic volumes generated.

Existing conditions

Roads included in this study are the N10, the R348 and Smouspoort Road. The existing roadway characteristics are summarised in Table 6.30.

Table 6.30: Existing Roadway Facilities

Roadway	Type of Road	Posted Speed (km/h)	Sidewalks?	On-Street Parking?
N10	National Road	120	Shoulder	No
R348	Provincial Main Road	Not posted	No	No
Smauspoort Road	Provincial Divisional Road	Not posted	No	No

Transport route

Based on the abnormal load requirements, a preliminary route as outlined in Figure 7 is proposed for transporting the large equipment from the Cape Town harbour to the site. This route involves avoiding tunnels and mountain passes and goes via the Nuwekloof Pass near Gouda to Worcester, through Beaufort West, Three Sisters to Victoria West and via Britstown to De Aar. The final route will have to be checked for compliance during the final design stages of the project. Crossing the electrified rail line is a serious concern and an alternative route will have to be identified. It is unlikely that access via the R348 will be possible. All bridges along the proposed transport route were checked for vertical clearance and all measured more than 5 000mm, which is sufficient. The load bearing capacity of some of the bridges still have to be confirmed with the different roads authorities.

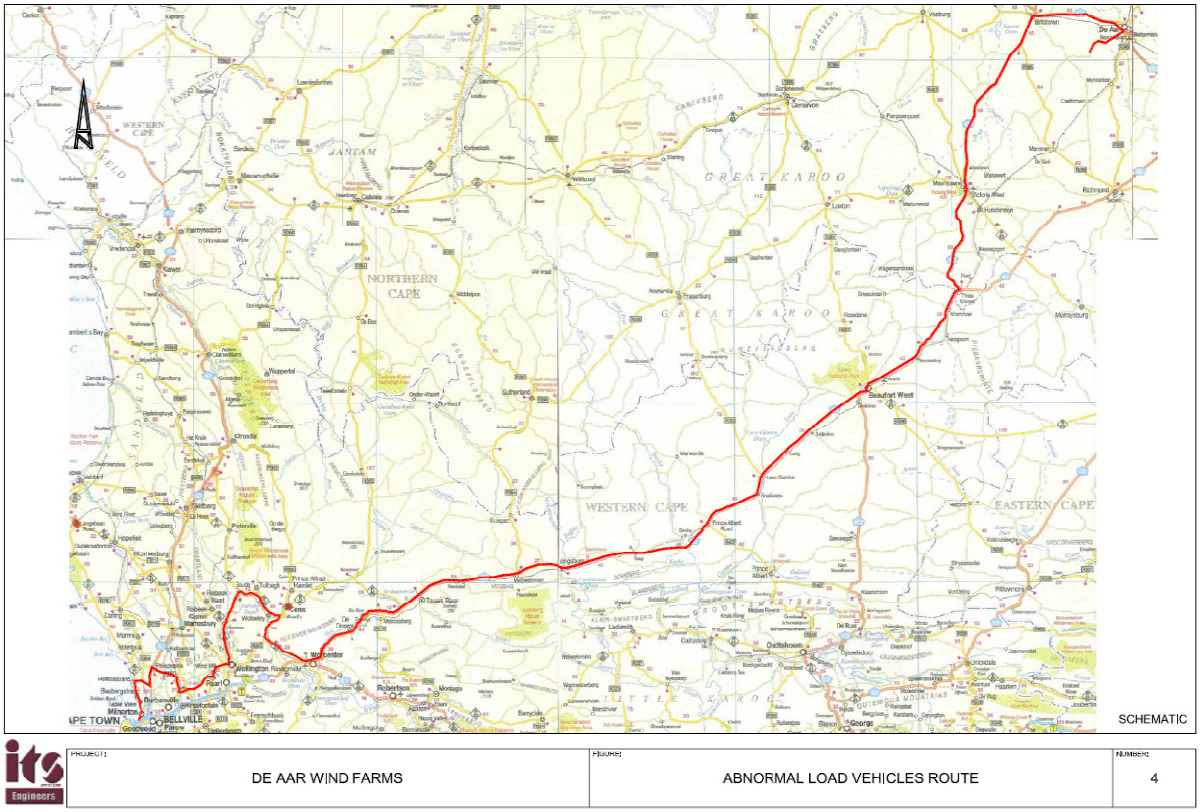
Site accesses

Access to the eastern section of the proposed development (Swartkoppies) is proposed off the R348 via the existing De Aar Stone Crushers access road. This access road crosses the

[3] Extracted and edited from ITSE, 2010 De Aar wind farm: Traffic Impact assessment

electrified rail line at a level rail crossing just south of the Britsville siding. This rail crossing at the Britsville siding is problematic, specifically for the abnormal load vehicles. The vertical alignment through the level rail crossing is not ideal for these vehicles and some major upgrades will be required at this crossing. The horizontal alignment through this rail crossing is also problematic due to the section of the access road before the rail crossing being parallel and adjacent to the rail line. Some of the abnormal delivery vehicles can be as long as 52 metres and it will be a challenge to negotiate this rail crossing with these vehicles. The vertical clearance between the road surface at the level crossing and the power cable is 5 150mm, which is sufficient. Typically a vertical clearance of at least 5 000mm is required.

Figure 7 Proposed transport route for the delivery of turbine components



PROJECT:	FIGURE:	NUMBER:
DE AAR WIND FARMS	ABNORMAL LOAD VEHICLES ROUTE	4

Year 2012 Background Traffic Conditions (No go alternative)

The year 2012s background traffic volumes were developed by applying a 3.0 *percent annual traffic growth rate* to the existing traffic volumes on the major links. This estimated growth rate was assumed to allow for the additional traffic volumes that will be generated by other in-process and future developments in the vicinity of the proposed development.

Due to the low traffic volumes the current road network will continue to operate at acceptable levels-of-service during the background conditions. The surface conditions of the gravel roads and some tarred sections in the site vicinity are poor and will deteriorate with the growth in background traffic volumes without proper maintenance. To maintain the roads will require re-gravelling of some sections and rehabilitation/pot-hole fixing of the tarred sections

Construction Phase

A large amount of traffic will be generated during the construction phase. The following activities will probably occur during the construction phase:

• Construction of the internal access roads,
• Stripping and stockpiling of topsoil,
• Excavation and construction of the foundations for the wind turbines,
• Construction of the operations building,
• Erection/Assembly and disassembly of the cranes
• Assembly of the towers, nacelles and blades,
• Trenching for cabling and
• Reinstatement of the site.

Trip Generation

Estimates of the peak hour vehicle trips for new developments are typically based on empirical observations at similar land uses. The estimates summarised in Table 6.31 are based on information sourced from other similar projects and it is also based on the assumption that the proposed 67 wind turbines will be constructed over a 12 month period. These assumptions are considered the worst case scenario.

Table 6.31: Expected Generated Truck Trips during the Construction Phase

Material	Approximate Number of Trucks required
Sand & Aggregate	1 300
Cement	170
Water Tankers	250
Construction Cranes	40
Tower Sections	270
Nacelles	70
Blades	200
TOTAL	**2 300**

It is expected that approximately 2 300 trucks will be required during the 12 month construction period. This means that on average approximately 8 trucks will visit the site per day which equates to approximately 16 truck trips spread over an eight hour day.

Alternative Development Proposals

Construction Phase

Alternative 1 (Preferred): 67 Wind turbines with a capacity of 100MW

• 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.

• The proposed access off the R348 via the De Aar Stone Crushers access road will be problematic. Not only will it require major upgrades of the at-grade rail crossing south of the

Britsville siding, but it will probably also require a permit from Transnet for the upgrade.

Option	Nature of impact	Extent of impact	Duration of impact	Intensity	Probability of occurrence	Status of the impact	Degree of confidence	Level of significance	Mitigation measure	Significance after mitigation

Transnet has placed a moratorium on the development of all at-grade rail crossings.

• Instead of using the proposed access off the R348 it is recommended that access to the Swartkoppies section of the development should be pursued off the Smouspoort Road in the vicinity of the De Aar Dumping Site. With the bulk of the construction traffic anyway on the Smouspoort Road, access to the Swartkoppies site could also be via the Smouspoort Road. This contains the construction traffic and the long-term traffic to one access road and simplifies mitigation and maintenance.

• To mitigate the possible impacts of the construction traffic and to reduce long-term maintenance costs it is recommended that the Smouspoort Road be surfaced. The surfacing should be constructed with a base coarse and permanent seal to reduce maintenance not only during the construction period but also in the long-term. The sealed surface should be 6.8 metres wide to accommodate two 3.4 metre lanes.

Alternative 2: 75 Wind turbines with a capacity of 112.5MW

In terms of traffic impact both alternatives will be similar. However, during the construction phase alternative 2 which has additional turbines will result in additional traffic impacts with trucks entering and leaving the site. The construction period is also expected to be slightly longer but not significantly so.

Operational Phase

Alternative 1 (Preferred)

It is expected that traffic impacts during the operation phase will be similar for both alternatives. Minimal traffic is anticipated as few or no workers will be on site at any given time.

Traffic impacts summary table

CONSTRUCTION PHASE										
Option	Nature of impact	Extent of impact	Duration of impact	Intensity	Probability of occurrence	Status of the impact	Degree of confidence	Level of significance	Mitigation measure	Significance after mitigation
PREFERRED OPTION	Heavy truck traffic will damage the road surface of the Smauspoort Road.	Region	Short-term	High	Highly probable	Negative	High	Medium	The Smauspoort Road should be surfaced	Low
	Network and intersection operations	Region	Short-term	Medium	Highly probable	Neutral	High	Low	None	Low
	Abnormal load trucks will have an impact on the regional road network.	Region	Short-term	Medium	Probable	Neutral	High	Low	Rehabilitation/Road repairs when and where required	Low
OPERATIONAL PHASE										
PREFERRED OPTION	Additional vehicular trips as a result of the day to day operations will impact on the existing road network and intersection operations.	Site and immediate surroundings	Short-term	Low	Probable	Neutral	High	Low	None	Low

OVERALL SUMMARY TABLE OF IMPACTS

Alternative	Nature of impact	Extent of impact	Duration of impact	Intensity	Probability of occurrence	Status of the impact	Degree of confidence	Level of significance (before mitigation)	Significance after mitigation
CONSTRUCTION PHASE									
Alternative 1	Impact on botany	Local	Long term to Permanent	Low - Medium	High	Negative	High	Low - Medium negative	Low - Medium negative
	Avifaunal	Local and surrounds	Short term	Medium	Definite	Negative	High	Medium	Medium-Low
	Bats	Regional and local	Long term	High	Low	Negative	Low	High, negative	Low, negative
	Noise	Local	Short term	Low	Probable	Negative	High	Not applicable	Not applicable
	Heritage	Local	Temporary	Medium to low on archaeological sites.	Highly probable	(Visual) Moderate negative Positive in terms of provision of economic opportunities	High	Low to medium heritage significance	Low
	Socio economic	Regional	Short term	Low	Probable	Positive	High	Medium	High
	Visual	Local and surrounds	Short term	Med-high	Definite	Negative	High	High	Moderate
	Traffic	Region	Short-term	Medium	Probable	Neutral	High	Low	Low
	Archaeology								
Alternative 2	Impact on botany	Local	Long term to Permanent	Medium	High	Negative	High	Medium negative	Medium negative
	Avifaunal	Local and surrounds	Short term	Medium	Definite	Negative	High	Medium	Medium-Low
	Bats	Regional and local	Long term	High	Low	Negative	Low	High, negative	Low, negative
	Noise	Local	Short term	Low	Probable	Negative	High	Not applicable	Not applicable
	Heritage	Local	Temporary	Medium to low on archaeological sites.	Highly probable	(Visual) Moderate negative Positive in terms of provision of economic opportunities	High	Low to medium heritage significance	Low

	Socio economic	Regional	Short term	Low	Probable	Positive	High	Medium	High
	Visual	Local	Medium	Moderate	Probable	Negative	High	Moderate high	Moderate
	Traffic	Region	Short-term	Medium	Probable	Neutral	High	Low	Low
	Archaeology	Local	Short term	Low	Improbable	Negative	High	Low	Low
OPERATION PHASE									
Alternative 1&2	Nature of impact	Extent of impact	Duration of impact	Intensity	Probability of occurrence	Status of the impact	Degree of confidence	Level of significance (before mitigation)	Significance after mitigation
	Impact on botany	Local	Long term to Permanent	Medium	High	Negative	High	Medium negative	Medium negative
	Avifaunal	Local and surrounds	Long term	Medium-High	Probable	Negative	Medium	Medium	Medium-Low
	Bats	Regional and local	Long term	High	Low	Negative	Low	High, negative	Low, negative
	Noise	Local	Short term	Low	Probable	Negative	High	Not applicable	Not applicable
	Heritage	Local	Long-term	Medium to low on heritage structures(Smous poort, Medium on heritage structures (Zwaartkoppies) Medium to high on landscape character (site not identified as a noteworthy cultural landscape)	Highly Probable	(Visual) Low Negative Positive in terms of pioneering clean energy facilities	Moderate to high in light of general suitability of site	Low to medium heritage significance. With mitigation to ensure protection of site contexts Medium	Medium to Low
	Socio	Regional	Long term	Low	Probable	Positive	Low	Low	Low

	economic								
	Visual	Local and surrounds	Long term	Medium	Definite	Negative	High	Moderate	Low
	Traffic	Site and immediate surroundings	Short-term	Low	Probable	Neutral	High	Low	Low
	Archaeology	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

Discussion

As evident from the significance ratings of Alternative 1 and 2 for both the operation and construction phase impacts are generally similar. However, it is the opinion of the specialists that a smaller wind farm (as proposed under Alternative 1) would be more preferable. It can therefore be concluded that the applicant‘s preferred alternative is the most suitable option in terms of the extent, intensity and significance of impacts.

CHAPTER 7: NEED AND DESIRABILITY

Section 28 (1) (i) of the EIA regulations under GNR.543 requires that a description of the need and desirability of a proposed activity or project be undertaken at the scoping phase. As such, this section of the report outlines the importance of renewable energy in South Africa and in particular, the importance that the proposed wind farm project by Mulilo Renewable Energy Pty (Ltd) will have at the local, national, regional and international level.

South Africa generates most of its required electricity from coal of which there is a ready supply of at the local level. However, national government is on the verge of augmenting the existing generation capacity of thermal and nuclear power plants with renewable energy power generation, thus creating the framework that will lead to an increase in the supply of clean energy for the nation. Targets for the promotion of renewable energy now exist in more than 58 countries, of which 13 are developing countries. The South African Government has recognised the country's high level of renewable energy potential and presently has in place targets of 10 000 GWh of renewable energy by 2013 (to be produced mainly from biomass, wind, solar and small-scale hydro). This is amounts to ~4% (1 667 MW) of the total estimated electricity demand (41 539 MW) by 2013.

On October 29, 2009 the National Energy Regulator of South Africa (NERSA) published a favourable feed-in tariff structure for renewable energy, with a tariff of 1.25 per kWhr for wind systems with an output greater than 1 megawatt (MW). The basic economic principle underpinning the feed-in tariff was the establishment of a tariff (price) that covers the cost of generation plus a "reasonable profit" to induce developers to invest. The terms and conditions of the tariff are specified in the power purchase agreement (PPA) which together with Renewable Energy Feed-In-Tariff (REFIT) guidelines, will be revised in six months time to be in line with Government Notice No. R.721 in *Government Gazette* 32378 Electricity Regulation Act No. 4 of 2006 of 5 August 2009: Electricity Regulations on New Generation Capacity.

The proposed wind farm is considered to be of national importance in anticipation of its contribution to electricity supply and reduced reliance on fossil energy sources. The proposed project by Mulilo is expected to have the following benefits:

- **Climate Change**

  Due to concerns such as climate change, and the ongoing exploitation of non-renewable resources, there is increasing international pressure on countries to increase their share of renewable energy generation. The project is expected to contribute positively towards climate change mitigation due to the following:

  - For every 1 MWh of "green" electricity used instead of traditional coal powered stations, one can:-

- Save 1290 liters of water
- Avoid 8.22 kg of Sulphur Dioxide (SO_2)emissions
- Avoid 1000 kg of Carbon Dioxide (CO_2) emissions including transmission losses, and;
- Avoid 142 kg of ash production

- **Social Upliftment**

  The Northern Cape area has large tracts of land which are very dry and the farmers do their best to earn a living from the land. The towns are small and operate on a survival socio-economic level. The need to improve the quality of life for all, and especially for the poor, is critical in South Africa. It is expected that the proposed project will contribute directly to the upliftment of the individuals and the societies in which they live. During project development by Renewable Energy Pty (Ltd), skills development and transfer will be one of the top priorities and local community involvement will be enhanced as far as possible.

- **Electricity Supply**

  The establishment of the proposed power generation facility will strengthen the existing electricity grid for the area. Moreover, the project will contribute towards meeting the national energy target as set by the Department of Energy (DoE), of a 30% share of all new power generation being derived from independent power producers (IPPs).

Renewable energy is recognised internationally as a major contributor in protecting the climate, nature and the environment, as well as providing a wide range of environmental, economic and social benefits that can contribute towards long-term global sustainability. Should the proposed site and development identified by Mulilo be acceptable, it is considered viable that long term benefits for the community and society in De Aar will be realized as highlighted above.

The proposed project will also have international significance as it contributes to South Africa being able to meet some of its international obligations by aligning domestic policy with internationally agreed strategies and standards as set by the United Nations Framework Convention on Climate Change (UNFCCC), Kyoto Protocol and United Nations Convention on Biological Diversity (UNCBD) all of which South Africa is a signatory to.

CHAPTER 8: ENVIRONMENTAL IMPACT STATEMENT

Introduction:

This chapter is written based on the findings of the specialist studies (undertaken by credible specialists) which were commissioned as part of the EIA phase of the environmental legislative process as well as the professional opinion of the environmental assessment practitioner. The terms of reference for the various specialist studies undertaken, was reflected in the final scoping report which was submitted to the environmental regulatory authority. Approval for the scoping report was granted and the specialist studies were commissioned on this basis. Each specialist's curriculum vitae are available on request.

For ease of reference the chapter is structured in such a manner to provide a summary of the specialists' findings and concluded by the recommendation of the environmental assessment practitioner. More detail on the findings of the specialist studies are reflected in the previous chapters. All specialists' reports are attached (see Annexure B)

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 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 the 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 measures against positive socio-economic and environmental factors.

That Option 1 (Alternate One) 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 as the negative impacts can be mitigated. 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.

CHAPTER 9: RECOMMENDATION AND WAY FORWARD

9.1 Recommendation

Based on the findings of the specialists it is recommended that the proposed development (the preferred alternative) be approved provided the mitigation measures that have been proposed are implemented.

9.2 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. The decision made by the DEA will be made known within 10 days after receipt to all registered I&APs. A person affected by the decision who wishes to appeal against the decision, must lodge a written notice of intention to appeal with the MEC within 10 days of being notified of the decision taken by the Department. Following the lodging of the Notice of Intent to Appeal, the appeal submission must be submitted to the Department within the 30 days after the Notice of Intention to Appeal was lodged with the Office of the MEC.

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