

**PROPOSED WAAIHOEK WIND ENERGY FACILITY POWERLINE,
UTRECHT, KWA-ZULU NATAL**

DEA Reference: **14/12/16/3/3/2/654**

SCOPING REPORT

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June 2014

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1 INTRODUCTION

1.1 Background to the study

South Africa Mainstream Renewable Power Developments (Pty) Ltd. (Mainstream) is proposing to construct a Wind Energy Facility (WEF) to be developed south-east of Utrecht in the Emadlangeni Local Municipality, KwaZulu-Natal Province. The WEF will host a maximum of 93 wind turbines, each generating between 1.5 – 4 megawatts (MW) of power, with total combined potential power output of approximately 160MW. In conjunction with the development of the WEF, Mainstream is proposing to construct Powerlines to link the WEF to the Substation.

Coastal & Environmental Services (CES) has been appointed by Mainstream as Environmental Assessment Practitioner (EAP) to secure the necessary environmental authorisations for the project.

1.2 Environmental authorisation in South Africa

The regulation and protection of the environment within South Africa, occurs mainly through the application of various items of legislation, within the regulatory framework of the Constitution (Act 108 of 1996).

The primary legislation regulating Environmental Impact Assessment (EIA) within South Africa is the National Environmental Management Act (“NEMA” Act 107 of 1998). NEMA makes provision for the Minister of Water & Environmental Affairs to identify activities which may not commence prior to authorisation from either the Minister or the provincial Member of the Executive Council (“the MEC”). In addition to this, NEMA also provided for the formulation of regulations in respect of such authorisations.

The EIA Regulations (2010) allow for a basic assessment process for activities with limited environmental impact (listed in GN R.544 & 546, 2010) and a more rigorous two tiered approach to activities with potentially greater environmental impact (listed in GN R.545, 2010). This two-tiered approach includes both a Scoping and EIA process.

1.3 Environmental Impact Assessment Process

The proposed Waaihoek WEF Powerline activities trigger the need for an EIA under the Regulations of 2010 in Listing Notices 1, 2 and 3 and published in Government Notices No. R.544, R.545 and R.546, respectively. The listed activities that have been applied for are provided in Table 1-1 below.

Table 1-1: Listed activities triggered by the proposed Waaihoek WEF Powerline

Government Notice	Activity Number	Activity Description
GN R No.544 BASIC ASSESSMENT	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
	11	The construction of: (vi) infrastructure or structures covering 50 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.

Government Notice	Activity Number	Activity Description
GN R No.545 FULL SCOPING AND EIR	8	The construction of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.
GN R No.546 BASIC ASSESSMENT	13	The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetation cover constitutes indigenous vegetation. (a) Critical biodiversity areas and ecological support areas as identified in systematic biodiversity plans adopted by the competent authority

Applications for activities listed within GN R544 and GN R546 require a Basic Assessment, while applications for activities listed within GN R545 require a Scoping and EIR process. However, in terms of Section 20(2) (c) of the EIA Regulations (2010), a Scoping and EIR process must be applied to an application if the application is for two or more activities that are part of the same development and one of the two activities requires Scoping and EIA. Because the proposed Waaihoek WEF triggers at least one listed activity from GNR.545, it will require a full Scoping and EIA. This process, shown in Figure 1-1, is regulated by Chapter 3, Part 3 of the EIA Regulations.

The facility proponent is initially required to submit a report detailing the scoping phase (Scoping Report), and set out the terms of reference for the EIA process (Plan of Study for EIA). This is then followed by a report detailing the EIA phase (EIR). The competent authority will issue a final decision subsequent to their review of the EIR.

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

It is important to note that in addition to the requirements for an authorisation in terms of the NEMA, there may be additional legislative requirements which need to be considered prior to commencing with the activity, for example:

- National Heritage Resources Act (Act No 25 of 1999)
- Aviation Act (Act No 74 of 1962): 13th Amendment of the Civil Aviation Regulations (1997)
- NEM: Biodiversity Act (Act 10 of 2004)
- National Water Act (Act 36 of 1998).

Three applications forms have been submitted for the three components of the proposed Waaihoek WEF and associated infrastructure, namely:

1. Transmission powerline between the Waaihoek WEF and the Bloedrivier substation
2. Waaihoek WEF, internal access roads and connecting cables
3. Expansion (potential increase in footprint) of the Bloedrivier substation

The listed activity for the expansion of the Bloedrivier substation is described below and will follow a Basic Assessment process:

Project activity	Listed activity
Substation	GN R No. 544 (38) The expansion of facilities for the transmission and distribution of electricity

	<p>where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.</p> <p>This listed activity will only be required if Eskom do not have the connection capacity and will not necessitate an upgrade of power capacity (kV), but rather an extension of the footprint of the Bloedrivier substation to accommodate the feed-in connection from the Waaihoek WEF.</p>
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Project component	Reference number
Transmission powerline between Waaihoek WEF and Bloedrivier substation (88-275kV)	14/12/16/3/3/2/654
Waaihoek WEF (and internal infrastructure)	14/12/16/3/3/2/655
Expansion of Bloedrivier substation	14/12/16/3/3/1/1125

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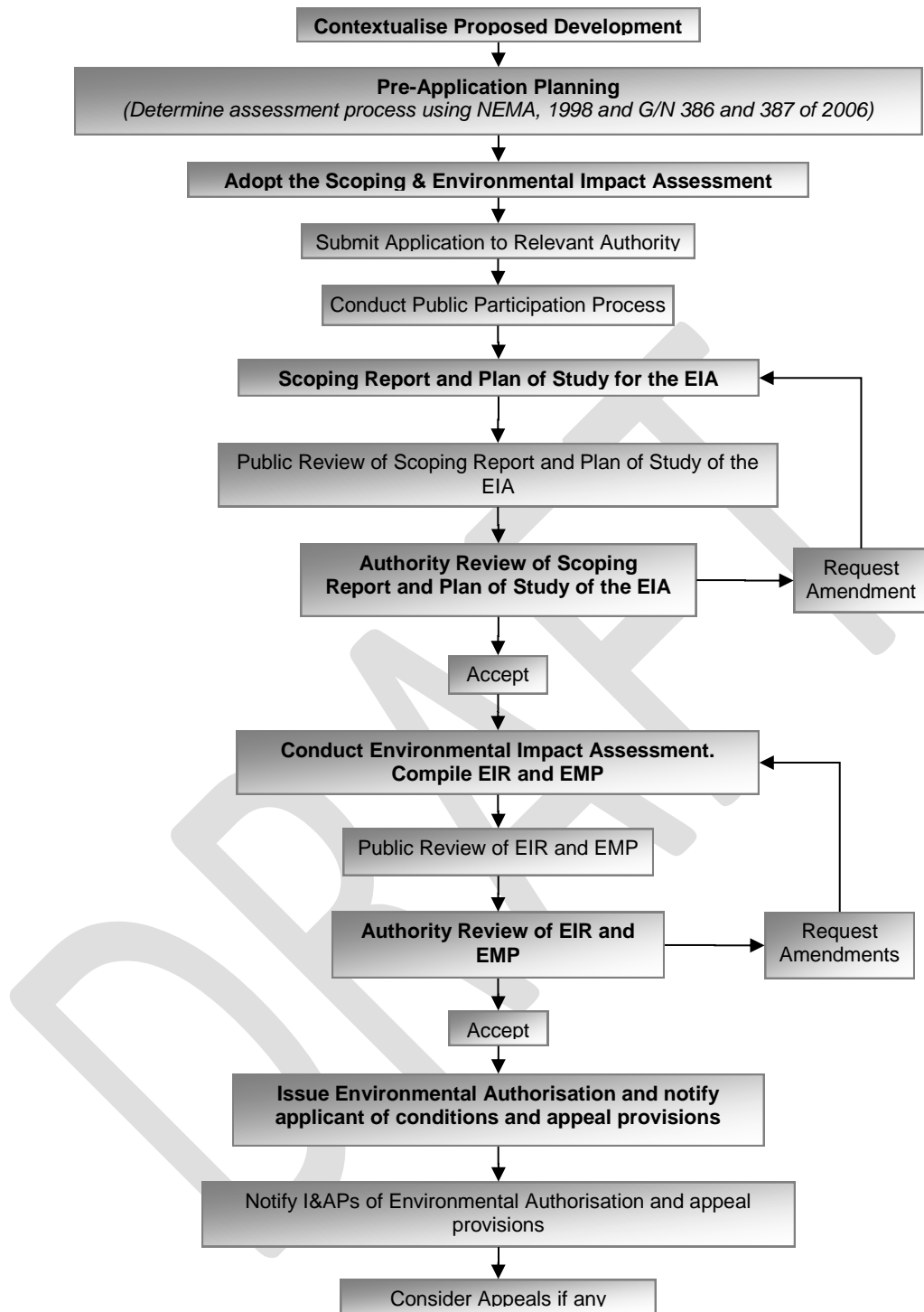


Figure 1-1. The EIA process flow chart

1.4 Scoping Phase

The Scoping Phase is designed to determine the “scope” of the subsequent Environmental Impact Assessment (EIA), conducted in fulfilment of the application for authorisation. The overall aim of the Scoping Phase is to determine those environmental issues and impacts associated with the proposed WEF that require further investigation in an EIA. The purpose of scoping is therefore to identify:

- Issues
- Impacts
- Alternatives

An integral part of the Scoping Phase is the initial public participation process (PPP). This process ensures that all possible interested and affected parties (I&APs) are informed of the proposed activity and are provided with an opportunity to comment and identify issues.

1.5 Nature and Structure of this Report

This report fulfils the requirement of the EIA Regulations (2010) for the documentation of the Scoping Phase.

The structure of this report is based on Section 28 of GN No.543, of the Environmental Impact Assessment Regulations (2010), which clearly specifies the required content of a Scoping Report.

1.6 Assumptions and Limitations

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

- The report is based on a project description taken from design specifications for the proposed wind farm that have not yet been finalised, and which are likely to undergo a number of iterations and refinements before they can be regarded as definitive. A project description based on the final design will be provided in the EIA Phase.
- Descriptions of the natural and social environments are based on limited fieldwork and available literature. More information will be provided in the EIA phase based on the outcomes of the specialist studies.

1.7 Details and Expertise of the Environmental Assessment Practitioner

In terms of Section 28(1) of the EIA Regulations (2010), a Scoping Report must contain all the information necessary for a proper understanding of the nature of issues identified during scoping, and must include–

(a) Details of–

- (i) The EAP who prepared the report; and**
- (ii) The expertise of the EAP to carry out scoping procedures.**

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

Coastal & Environmental Services (CES), established in 1990, is a specialist environmental consulting company based in Grahamstown, with a branch in East London (Eastern Cape Province). We believe that a balance between development and environmental protection can be achieved by skilful, considerate and careful planning.

CES has considerable experience in terrestrial, marine and freshwater ecology, the Social Impact Assessment (SIA) process, and state of environment reporting (SOER), Integrated Waste Management Plans (IWMP), Spatial Development Frameworks (SDF), public participation, as well as the management and co-ordination of all aspects of the Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) processes. CES has been active in all of the above fields, and in so doing have made a positive contribution to towards environmental management and sustainable development in the Eastern Cape, South Africa and many other African countries.

Dr Alan Carter holds a PhD in Plant Sciences and is a Certified Public Accountant, with extensive training and experience in both financial accounting and environmental science disciplines with international accounting firms in South Africa and the USA. He has over 20 years of experience in environmental management and has specialist skills in sanitation, coastal environments and industrial waste. Dr Carter is registered as a Professional Natural Scientist under the South African Council for Natural Scientific Professions and is a certified ISO14001 Environmental Management Systems Auditor.





Dr Greer Hawley, Principal Environmental Consultant, has a BSc degree in Botany and Zoology and a BSc Honours in Botany from the University of Cape Town. She completed her PhD thesis (Microbiology) at Rhodes University. The core academic focus has been directed in the field of taxonomy both in the plant and fungal kingdom, but she has been involved in a diverse range of research activities. Her research ranges from studying fresh and marine algae, estuarine diatoms, species classification in the fynbos and forest vegetation and fungal species identification and ecology. Greer's study of fungi have also contributed towards an understanding of soil and "below ground" ecology. She is currently working on numerous impact assessments at the East London branch.

Mr Roy de Kock, Senior Environmental Consultant, holds a BSc Honours in Geology and an MSc in Botany from the Nelson Mandela Metropolitan University in Port Elizabeth. His thesis was on Rehabilitation Ecology with the focus on Mine Rehabilitation. His Master's thesis titled; Bushclump Rehabilitation Within Couga Bontveld After Strip Mining focused on rehabilitation of mined Bontveld vegetation on limestones of the Nanaga Formation where he attempts to recognise the evolutionary path of the present landscape, as well as focussing on primary ecological processes such as hydrology, energy capture and nutrient cycling and the impact of mining on change in diversity and ecosystem health. Currently he is working on numerous impact assessments at the East London branch. Roy is registered as a Candidate Natural Scientist under SACNASP.

Dr Cherie-Lynn Mack, holds a PhD and MSc (with distinction) degrees in Environmental Biotechnology, with a BSc degree in Microbiology and Biochemistry. She has postgraduate research experience in industrial and domestic wastewater treatment technologies, with particular emphasis on the coal and platinum mining industries. Her interests lie in the water sector, with experience in ecological reserve determination and water quality monitoring and analysis. She has experience in water quality analysis and industrial wastewater treatment research. She is currently employed in the East London office of CES as a senior environmental consultant.

Ms Louise Bryson holds a BSc in Zoology and Ecology from the University of the Witwatersrand and BSc honours degree in Environmental Science from Rhodes University. Currently she is writing up an MSc from the Institute for Water Research (IWR) at Rhodes University. Her thesis outlines the development of an erosion and sediment delivery model that will have application for the water resource management of semi-arid catchments in South Africa. She has a background in both fluvial geomorphology and Civil Engineering. She is currently employed in the East London office of CES as an environmental consultant.

Ms Caroline Evans, Environmental Consultant. Caroline holds a BSc with majors in Environmental Science (distinction) and Zoology, as well as a BSc (Hons) in Environmental Science (distinction) both from Rhodes University. Her undergraduate degree included both commerce and natural sciences. Caroline's honours dissertation evaluated the economic impacts of degradation of the xeric subtropical thicket through farming practices, focussing on the rehabilitation potential of the affected areas in terms of carbon tax. She is currently writing up her MSc (Environmental Science and Ichthyology) thesis on the effects of alien fish species on local rural livelihoods. This thesis focuses on the social implications of alien fish species and the impact that the cultural customs of the Xhosa people have on the success of social development projects in the aquaculture industry. She has a broad academic background including statistics, economics, management, climate change, wetland ecology, GIS, rehabilitation ecology, ecological modelling and zoology.

2 PROJECT DESCRIPTION

In terms of Section 28(1) of the EIA Regulations (2010), a Scoping Report must contain all the information necessary for a proper understanding of the nature of issues identified during scoping, and must include–

- (b) A description of the proposed activity;
- (d) A description of the property on which the activity is to be undertaken and the location of the activity on the property, or if it is–
 - (i) A linear activity, a description of the route of the activity; or
 - (ii) An ocean-based activity, the coordinates where the activity is to be undertaken.

2.1 Project Locality

The proposed Waaihoek WEF development is situated approximately 20km east of the town of Utrecht, north of the R34 between Utrecht and Vryheid (Figure 2-2 and 2-3). Various powerline corridor alternatives, connecting the WEF to the Eskom Bloedrivier substation, will be considered (Figure 2-1).

2.1.1 Powerline - Ref. No.: 14/12/16/3/3/2/654

Mainstream proposes to construct a new powerline between the existing Bloedrivier substation and the proposed Waaihoek Wind Energy Facility internal substation, both located outside Utrecht in the Emadlangeni Local Municipality, Kwa-Zulu Natal Province. This proposed powerline will transmit electricity generated by the proposed Waaihoek Wind Energy Facility to the existing Eskom electricity grid through the existing Bloedrivier substation.

The Eskom Bloedrivier substation is located within the proposed WEF area, and will be the site where the energy generated by the WEF is fed into the Eskom grid. Three overhead powerline corridor alternatives are proposed to transmit the electricity from the WEF to the Eskom Bloedrivier substation. In addition, the option of utilising an abandoned 88kV powerline servitude to the south of the site and connecting directly into the existing 88kV line running parallel to the R34 is also being considered (Figure 2-1).

Farm properties included in the powerline alternatives are:

Farm name	Farm no.	21 Digit SG code
Grootvlei	RE/66	NOHT00000000006600000
	6/66	NOHT00000000006600006
	10/66	NOHT00000000006600010
	12/66	NOHT00000000006600012
	13/66	NOHT00000000006600013
	16/66	NOHT00000000006600016
Vlakplaats	3/83	NOHT00000000008300003
	5/83	NOHT00000000008300005
	8/83	NOHT00000000008300008
	10/83	NOHT00000000008300010
Roodekoppe	2/119	NOHT00000000011900002
	4/119	NOHT00000000011900004
	5/119	NOHT00000000011900005
	7/119	NOHT00000000011900007

	16/119	NOHT00000000011900016
Spartelspruit	3/150	NOHT00000000015000003
	RE/150	NOHT00000000015000000
Groothoek	9/152	NOHT00000000015200009
Waihoek	4/173	NOHT00000000017300004
	9/173	NOHT00000000017300009
	11/173	NOHT00000000017300011
Goedehoop	3/177	NOHT00000000017700003
Goedgeloof	RE/180	NOHT00000000018000000
Oldeani	RE/435	NOHT00000000043500000
	RE/435	NOHT00000000043500000
HT	RE/460	NOHT00000000046000000
Vlakplaats	9/83	NOHT00000000083000009
	6/83	NOHT00000000083000006
Rusthof	434	NOHT00000000043400000
Goedgeloof	4/180	NOHT00000000018000004
	3/180	NOHT00000000018000003
	2/180	NOHT00000000018000002
	1/180	NOHT00000000018000001
Groothoek	13/152	NOHT00000000015200013

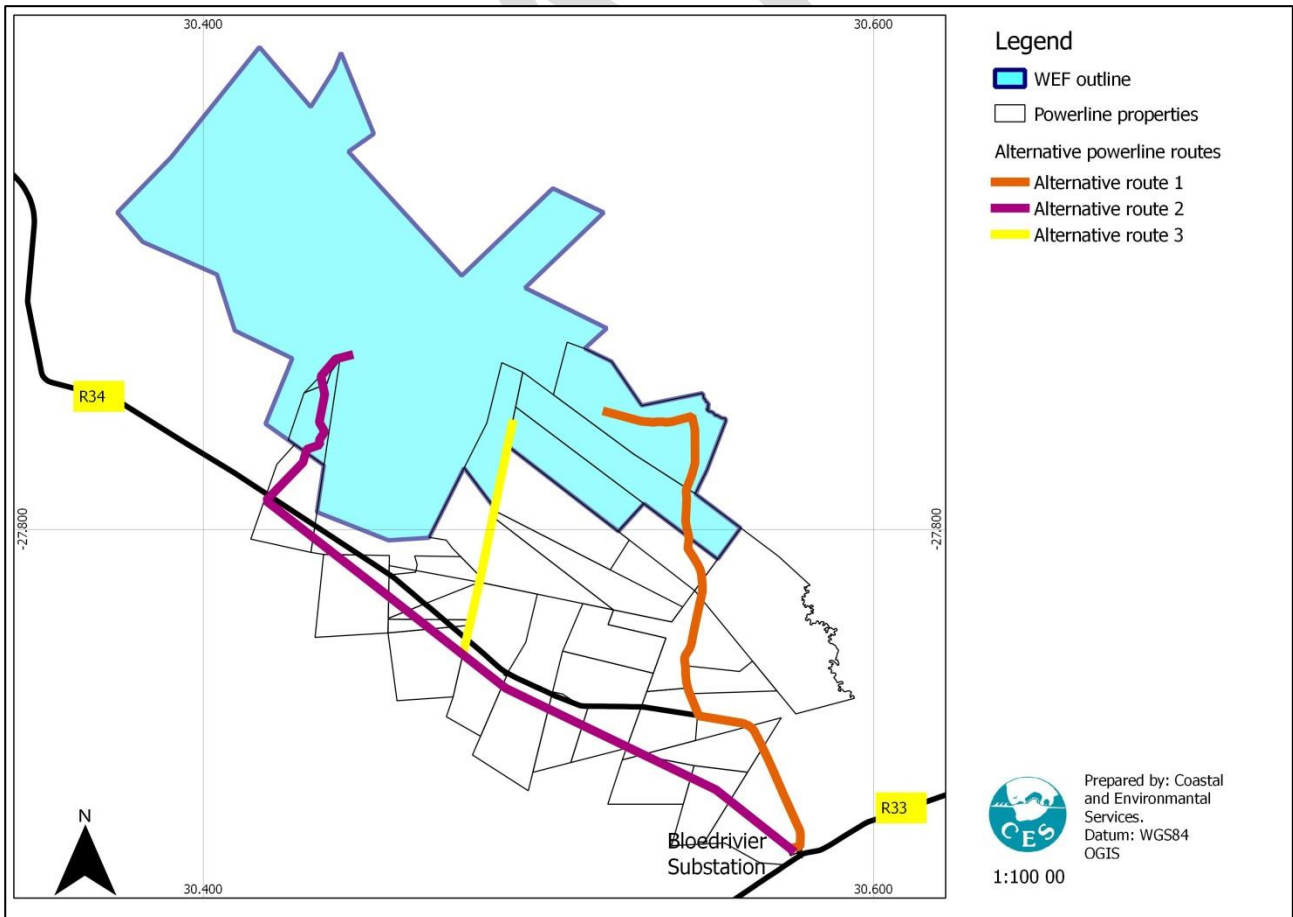


Figure 2-1. Proposed Waihoek Powerline alternatives locality

2.1.2 Wind energy facility (WEF) – Ref. No.: 14/12/16/3/3/2/655

The Waaihoek WEF powerline development is proposed in association with the Waaihoek Wind Energy Facility. Figure 2-2 illustrates the properties involved in the WEF development.

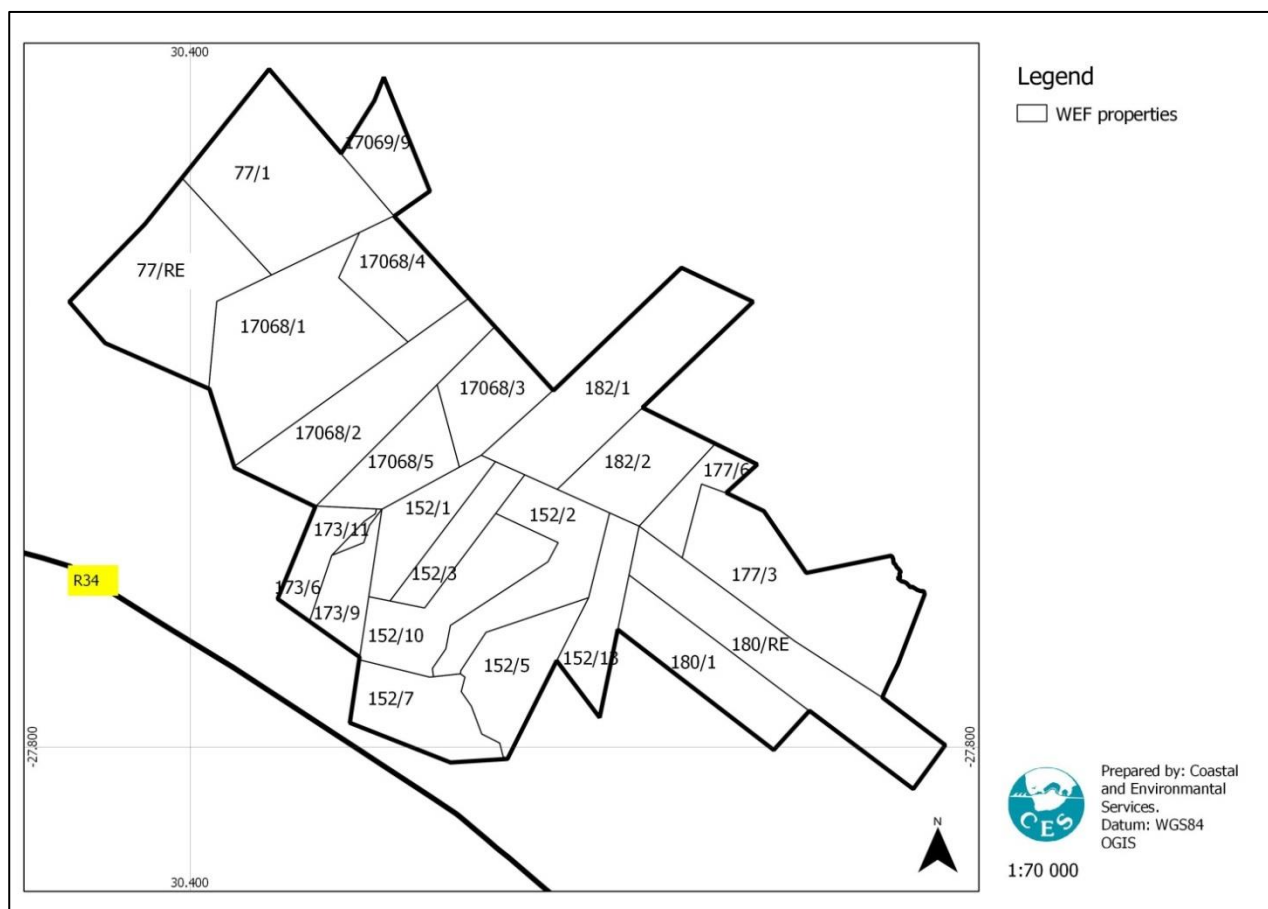


Figure 2-2. Proposed Waaihoek WEF project affected farms.

2.2 Proposed Activity

The Waaihoek WEF has three project elements namely the:

- Powerline alternatives.
- Waaihoek WEF.
- Bloedrivier Substation expansion.

2.2.1 Powerline

A new powerline, either with 88kV or 275kV capacity, will be constructed between the existing Bloedrivier Substation and the Waaihoek WEF internal substation. The 88kV line might be a double-circuit line (i.e. each tower supports six conductors). The proposed powerline will transmit electricity generated by the Waaihoek WEF to the existing Eskom Bloedrivier Substation. Two overhead powerline corridor alternatives are proposed to transmit the electricity from the Waaihoek WEF to the Eskom Bloedrivier Substation.

A third option of breaking directly into the existing 88kV line to the south of the site will also be considered.

Prior to the construction of a new powerline, a number of issues such as servitude acquisition, powerline and tower specifications, access roads and construction camps must be considered. Some of this preliminary work has already been completed.

Generally, 275 kV powerlines require a servitude width of between 50m and 70m. The exact width would depend on the type of tower used. Access to the transmission line will be required for the construction and occasional maintenance activities. Access roads at agreed points within the servitude will be established in order to determine whether the existing road network is sufficient for this purpose. All areas marked as no-go areas, identified by means of the EIA process, located inside the servitude shall be treated with the utmost care and responsibility.

The potentially affected communities and landowners have been notified of the proposed transmission powerline in the study area through newspaper advertisements in the relevant local newspapers, the distribution of BID documents, and via public meetings, where the project was presented to them and their questions and concerns captured and collated in an issues and responses table.

The typical steps involved in the construction and operation of a powerline are as follows:

- Conduct a survey of the alignment;
- Select the best-suited structures and foundations;
- Design the line and placement of towers;
- Clear vegetation and erect gates if necessary;
- Establish construction camps and access roads;
- Construct foundations;
- Assemble and erect towers
- String conductors;
- Rehabilitate working areas and protect erosion susceptible areas;
- Test and commission powerline; and
- Conduct ongoing maintenance.

All post-construction activities include the operation and maintenance of the proposed development. Such activities will require routine maintenance work using access roads that will be built along the servitude of the powerline. Access roads to the existing powerlines will be used as far as possible to avoid constructing new roads. Post-construction activities are as follows:

- The servitude will need to be cleared from time to time to ensure that vegetation does not interfere with the operation of the line. Access roads will be monitored for erosion and the necessary corrective measures undertaken. Servitude maintenance therefore goes hand in hand with the use of and maintenance of access roads.
- There should be a program in place to ensure the control of vegetation around pylons to minimize the risk of fires.
- The installation of anti-climb wires serves as a deterrent to unauthorized climbing of the pylons. It will not, however, prevent a determined individual from climbing over and up the pylon. Eskom has programs in place where the broken wires are replaced as part of the maintenance on the powerline.
- Corrosion on structures is frequently found where the protective system, either galvanizing or a protective organic coating, has weathered, exposing the steel substrate. With routine maintenance, this form of corrosion can be avoided.

2.2.2 Substation

A substation is an important element of an electricity generation, transmission and distribution system. Its function is to transform voltages from high to low or visa-versa, using transformers and other heavy-duty switchgear. A substation in a transmission network allows Eskom to de-energise a transmission line or other electrical switchgear for maintenance or for new construction or installation. Eskom is therefore able to maintain reliability of supply as maintenance work is performed while still keeping the whole system running.

Mainstream proposes to expand the existing Bloedrivier Substation, if required by Eskom, situated at the intersection of the R34 and R33 to the south of the proposed Waaihoek WEF. In the EIA Regulations (2010), expansion refers to the increased capacity or increased footprint associated with a project activity. This will allow electricity generated by the Waaihoek WEF to be transmitted through the Bloedrivier Substation to the national Eskom electricity grid. The substation will act as a step-up of electricity from 88 to 275kV. Consultation with Eskom will confirm if the additional 88/275kV transformer bay can be accommodated inside the existing substation, or if the footprint of the substation will need to be expanded to accommodate the new bay.

DRAFT

3 PROJECT NEED & DESIRABILITY

In terms of Section 28(1) of the EIA Regulations (2010), a Scoping Report must contain all the information necessary for a proper understanding of the nature of issues identified during scoping, and must include–

(i) **A description of the need and desirability of the proposed activity**

The need and desirability of the proposed powerlines in association with the Waaihoek WEF project can be demonstrated in the following main areas:

- Move to green energy due to growing concerns associated with climate change and the on-going exploitation of non-renewable resources.
- Security of electricity supply, where over the last few years, South Africa has been adversely impacted by interruptions in the supply of electricity.
- Stimulation of the green economy where there is a high potential for new business opportunities and job creation.

The above main drivers for renewable energy projects are supported by the following recent International, National and KZN Provincial policy documents.

3.1 International

3.1.1 The 1992 United Nations Framework Convention on Climate Change (UNFCCC)

The UNFCCC is a framework convention which was adopted at the 1992 Rio Earth Summit. South Africa signed the UNFCCC in 1993 and ratified it in August 1997. The stated purpose of the UNFCCC is to, “achieve....stabilisation of greenhouse gas concentrations in the atmosphere at concentrations at a level that would prevent dangerous anthropogenic interference with the climate system”, and to thereby prevent human-induced climate change by reducing the production of greenhouse gases defined as, “those gaseous constituents of the atmosphere both natural and anthropogenic, that absorb and re-emit infrared radiation”.

The UNFCCC is relevant in that the proposed Waaihoek WEF project will contribute to a reduction in the production of greenhouse gases by providing an alternative to fossil fuel-derived electricity. South Africa has committed to reducing emissions to demonstrate its commitment to meeting international obligations.

3.1.2 The Kyoto Protocol (2002)

The Kyoto Protocol is a protocol to the UNFCCC which was initially adopted for use on 11 December 1997 in Kyoto, Japan, and which entered into force on 16 February 2005 (UNFCCC, 2009). The Kyoto Protocol is the chief instrument for tackling climate change. The major feature of the Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing greenhouse gas (GHG) emissions. This amounts to an average of 5% against 1990 levels over the five-year period 2008-2011. The major distinction between the Protocol and the Convention is that, “while the Convention encouraged industrialised countries to stabilize GHG emissions, the Protocol commits them to do so”.

The Kyoto Protocol is relevant in that the proposed Waaihoek WEF project will contribute to a reduction in the production of greenhouse gases by providing an alternative to fossil fuel-derived electricity, and will assist South Africa to begin demonstrating its commitment to meeting international obligations in terms of reducing its emissions.

3.2 National

3.2.1 National Development Plan (2011)

The National Development Plan (NDP) (also referred to as Vision 2030) is a detailed plan produced by the National Planning Commission in 2011 that is aimed at reducing and eliminating poverty in South Africa by 2030. The NDP represents a new approach by Government to promote sustainable and inclusive development in South Africa, promoting a decent standard of living for all, and includes 12 key focus areas, those relevant to the current proposed WEF being:

- An economy that will create more jobs.
- Improving infrastructure.
- Transition to a low carbon economy.

Sector	Target
Electrical infrastructure	<ul style="list-style-type: none"> • We need an additional 29,000 MW of electricity by 2030. About 10,900 MW of existing capacity will be retired, implying new build of about 40,000 MW. • About 20,000 MW of this capacity should come from renewable sources.
Transition to a low carbon economy	<ul style="list-style-type: none"> • Achieve the peak, plateau and decline greenhouse gas emissions trajectory by 2025. • About 20,000 MW of renewable energy capacity should be constructed by 2030.

3.2.2 National Climate Change Response White Paper (2012)

The White Paper indicates that Government regards climate change as one of the greatest threats to sustainable development in South Africa and commits the country to making a fair contribution to the global effort to achieve the stabilisation of greenhouse gas concentrations in the atmosphere at a level that prevents dangerous anthropogenic interference with the climate system.

The White Paper also identifies various strategies in order to achieve its climate change response objectives, including:

- The prioritisation of mitigation interventions that significantly contribute to an eventual decline emission trajectory from 2036 onwards, in particular, interventions within the energy, transport and industrial sectors.
- The prioritisation of mitigation interventions that have potential positive job creation, poverty alleviation and/or general economic impacts. In particular, interventions that stimulate new industrial activities and those that improve the efficiency and competitive advantage of existing business and industry.

The White Paper provides numerous specific actions for various Key Mitigation Sectors including renewable energy. The following selected strategies (amongst others) must be implemented by South Africa in order to achieve its climate change response objectives:

- The prioritisation of mitigation interventions that significantly contribute to a peak, plateau and decline emission trajectory where greenhouse gas emissions peak in 2020 to 2025 at 34% and 42% respectively below a business as usual baseline, plateau to 2035 and begin declining in absolute terms from 2036 onwards, in particular, interventions within the energy, transport and industrial sectors.
- The prioritisation of mitigation interventions that have potential positive job creation, poverty alleviation and/or general economic impacts. In particular, interventions that stimulate new industrial activities and those that improve the efficiency and competitive advantage of existing business and industry.

The proposed Waaihoek WEF project will provide an alternative to fossil fuel-derived electricity, and will contribute to climate change mitigation.

3.2.3 White Paper on Renewable Energy Policy (2003)

The White Paper on the Renewable Energy Policy (2003) commits SA Government support for the development, demonstration and implementation of renewable energy sources for both small and large scale applications. It sets out the policy principles, goals and objectives to achieve, “An energy economy in which modern renewable energy increases its share of energy consumed and provides affordable access to energy throughout South Africa, thus contributing to sustainable development and environmental conservation”. In terms of the White Paper, the Government sets a target of 10 000 GWh (0.8Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro.

The proposed Waaihoek WEF is consistent with the White Paper and the objectives therein to develop an economy in which renewable energy has a significant market share and provides affordable access to energy throughout South Africa, thus contributing to sustainable development and environmental conservation.

3.2.4 Integrated Energy Plan for the Republic of South Africa (2003)

The former Department of Minerals and Energy (DME) commissioned the Integrated Energy Plan (IEP) in response to the requirements of the National Energy Policy in order to provide a framework by which specific energy policies, development decisions and energy supply trade-offs could be made on a project-by-project basis. The framework is intended to create a balance between energy demand and resource availability so as to provide low cost electricity for social and economic development, while taking into account health, safety and environmental parameters.

In addition to the above, the IEP recognised the following:-

- South Africa is likely to be reliant on coal for at least the next 20 years as the predominant source of energy.
- New electricity generation will remain predominantly coal based but with the potential for hydro, natural gas, renewables and nuclear capacity.
- Need to diversify energy supply through increased use of natural gas and new and renewable energies.
- The promotion of the use of energy efficiency management and technologies.
- The need to ensure environmental considerations in energy supply, transformation and end use.
- The promotion of universal access to clean and affordable energy, with the emphasis on household energy supply being coordinated with provincial and local integrated development programme.
- The need to introduce policy, legislation and regulations for the promotion of renewable energy and energy efficiency measures and mandatory provision of energy data.
- The need to undertake integrated energy planning on an on-going basis.

The Waaihoek WEF is in line with the IEP with regards to diversification of energy supply and the promotion of universal access to clean energy.

3.2.5 Integrated Resource Plan for Electricity 2010-2030

The Integrated Resource Plan (IRP2010) for South Africa was initiated by the Department of Energy (DoE) and lays the foundation for the country's energy mix up to 2030, and seeks to find an appropriate balance between the expectations of different stakeholders considering a number of key constraints and risks, including:

- Reducing carbon emissions.
- New technology uncertainties such as costs, operability and lead time to build.
- Water usage.
- Localisation and job creation.
- Southern African regional development and integration.
- Security of supply.

The Policy-Adjusted IRP includes recent developments with respect to prices and allocates 17.8GW for renewables of the total 42.6GW new-build up to 2030 allocated as follows:

- Wind at 8.4GW.
- Concentrated solar power at 1.0GW.
- Photovoltaic at 8.4GW.

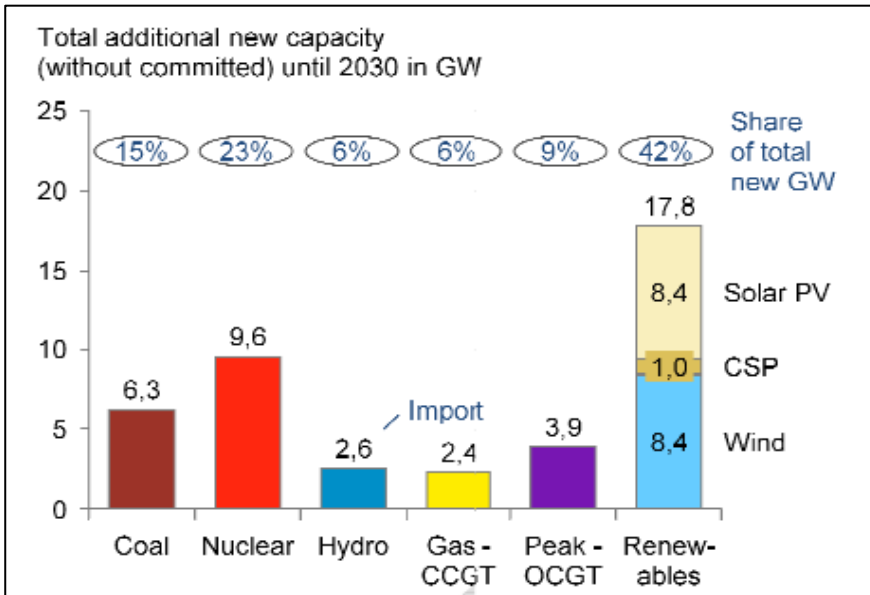


Figure 3-1. After consultation process – Policy Adjusted IRP [IRP 2010 final report rev2].

3.2.6 Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)

South Africa has a high level of renewable energy potential and presently has in place a target of 10 000GWh of renewable energy. The Minister has determined that 3 725MW to be generated from renewable energy sources is required to ensure the continued uninterrupted supply of electricity. This 3 725MW is broadly in accordance with the capacity allocated to Renewable Energy generation in IRP 2010-2030.

The REIPPPP Programme has been designed so as to contribute towards the target of 3 725MW and towards socio-economic and environmentally sustainable growth, and to start and stimulate the renewable industry in South Africa.

In terms of this REIPPPP Programme, bidders will be required to bid on tariff and the identified socio-economic development objectives of the DoE. The tariff will be payable by the Buyer (currently Eskom) pursuant to the Power Purchase Agreement (PPA) to be entered into between the Buyer and the Project Company of a Preferred Bidder.

The generation capacity allocated to each technology is in accordance with the table below and the maximum tariff that a Bidder may bid for purposes of the IPP Procurement Programme is as set out in the RFP.

Technology	MW
Onshore wind	1 850 MW
Concentrated solar thermal	200 MW
Solar photovoltaic	1 450 MW
Biomass	12,5 MW
Biogas	12,5 MW
Landfill Gas	25 MW
Small hydro	75 MW
Small Projects	100 MW
Renewable energy target per the REIPPP Programme	

In December 2012, the Minister announced that a further 3 200MW of renewable energy should be procured with the following combined total installed capacity open for bidding:

Technology	2011	2012	TOTAL
	Installed Capacity	Installed Capacity	
Onshore wind	1 850MW	1 450MW	3 300MW
Concentrated solar power	200MW	400MW	600MW
Solar photovoltaics	1 450MW	1 075MW	2 525MW
Biomass	12.5MW	1.5MW	14MW
Biogas	12.5MW	1.5MW	14MW
Landfill gas	25MW		25MW
Small hydro	75MW		75MW
SMALL PROJECTS	100MW	100MW	200MW
TOTAL	3 725MW	3 200MW	6 925MW

In terms of REIPPPP, bids would be awarded for renewable energy supply to ESKOM through up to 5 bidding phases. The 1st, 2nd and 3rd round bidding processes have been completed where projects are currently reaching financial close in order to implement the projects. REIPPPP is entering the fourth bidding window in August 2014.

3.2.7 Long Term Mitigation Scenarios (2007)

The aim of the Long Term Mitigation Scenarios (LTMS) was to set the pathway for South Africa’s long-term climate policy and will eventually inform a legislative, regulatory and fiscal package that will give effect to the policy package at a mandatory level. The overall goal is to “develop a plan of action which is economically risk-averse and internationally aligned to the world effort on climate change.”

The strategy assesses various response scenarios but concludes that the only sustainable option (“the preferred option”) for South Africa is the “Required by Science” scenario where the emissions reduction targets should target a band of between -30% to -40% emission reductions from 2003 levels by 2050 which includes increasing renewable energy in the energy mix by 50% by 2050.

3.2.8 Industrial Policy Action Plan 2011/12 – 2013/14

The South African Industrial Policy Action Plan (IPAP 2) 2011/12 – 2013/14 represents a further step in the evolution of this work and serves as an integral component of government's New Growth Path and notes that there are significant opportunities to develop new 'green' and energy-efficient industries and related services and indicates that in 2007/2008, the global market value of the 'Low-Carbon Green Sector' was estimated at £3 046 billion (or nearly US\$5 trillion), a figure that is expected to rise significantly in the light of climate-change imperatives, energy and water security imperatives.

Based on economic, social and ecological criteria, IPAP identifies a number of sub-sectors and an initial round of concrete measures proposed for development of the renewable energy sector with key action programmes.

Key Action Programmes:

- Solar and Wind Energy - Stimulate demand to create significant investment in renewable energy supply and the manufacturing of local content for this supply.
- Development of an industrial energy-efficiency programme - Develop an industrial energy-efficiency programme to counteract higher energy prices, lower emissions and create new goods and services.
- Demonstrate viability of Concentrated Solar Thermal (CST) power as a major renewable energy generation source - To co-ordinate the establishment of a CST demonstration plant;
- Biomass Energy - Add economic value to waste biomass, waste streams and much-needed infrastructure by converting it into electricity or useful heat.
- Water and Energy Efficient Appliances - Use a combination of appliance and building standards, contracting for energy savings in a manner similar to contracting for renewable energy and public procurement to stimulate the wholesale uptake of water- and energy-efficient appliances.
- Efficient Motors, Variable-Speed Drives, Energy Metering and Control and Electricity Storage (Batteries and Fuel Cells) - Pursue the adoption and manufacture of a collection of technologies within the electric products cluster that relate to the emergence of smart grids, buildings and processes, as well as motive power and the electrification of transport.
- Green Industries special focus: The South African Renewables Initiative (SARi) - SARi is an intra-governmental initiative set to catalyse industrial and economic benefits from an ambitious program of renewables development; including financing and associated institutional arrangements that would not impose an unacceptable burden on South Africa's economy, public finances or citizens.

3.2.9 Strategic Infrastructure Projects (2012)

The National Infrastructure Plan that was adopted in 2012 together with the New Growth Path, which sets a goal of five million new jobs by 2020, identifies structural problems in the economy and points to opportunities in specific sectors and markets or "jobs drivers" resulted in the establishment of the Presidential Infrastructure Coordinating Committee (PICC) which in turn resulted in the development of 18 Strategic Infrastructure Projects (SIPS).

The following SIP projects are relevant to the proposed Waaihoek WEF:

SIP 8: Green energy in support of the South African economy

- Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP2010).

SIP 9: Electricity generation to support socio-economic development

- Accelerate the construction of new electricity generation capacity in accordance with the IRP2010 to meet the needs of the economy and address historical imbalances.

3.3 Provincial

3.3.1 Feasibility of a Renewable/Alternate Energy Cluster in KwaZulu-Natal (2007)

In 2006/2007 the KwaZulu-Natal (KZN) Department of Economic Development & Tourism (DEDT), commissioned a study to analyse the global and national trends and potential for Renewable Energy (RE) and Alternate Energy (AE) projects in KZN. The analysis showed that KZN is well endowed with, amongst other natural resources, wind resources that could be harnessed to produce energy. The initiative to develop a RE/AE cluster in KZN was taken due to the observation that many RE and AE projects had little or no collaboration between them or strategic input from the KZN government. The objective of the cluster would therefore be to co-ordinate and share knowledge and experiences in this sector.

3.3.2 Overview and Analysis of Alternative and Renewable Energy Sources as Applicable to KwaZulu-Natal (2007)

Following the feasibility study mentioned above, the KZN DEDT saw the need to follow a strategic direction on two sustainable energy initiatives namely the more efficient utilisation of electricity and the use of locally available renewable energy resources.

KZN consumes in excess of 6 700MW of electricity or almost two Eskom ‘six-pack’ power stations in its peak demand period. With average growth in electricity demand being between 6-7% it implies that KZN requires between 400MW and 470MW more electricity generation capacity to achieve and sustain growth targets. There is an obvious need for more electricity generation capacity in the province but care must be taken when considering where this increased electricity will come from. There are various environmental and economic benefits derived when economies become less dependent on non-renewable fossil fuels and instead replace them with cleaner renewable energy sources.

Although KZN does not have a reputation for being a very windy province, the presence of a long coastline and high lying areas do provide some opportunities for wind energy generation. The Waaihoek site is in one of the areas with better wind as well as accessible grid with available capacity.

4 ALTERNATIVES

In terms of Section 28(1) of the EIA Regulations (2010), a Scoping Report must contain all the information necessary for a proper understanding of the nature of issues identified during scoping, and must include—

- (c) A description of any feasible and reasonable alternatives that have been identified;
- (j) A description of identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity.

One of the requirements of an EIA is to investigate alternatives associated with a proposed project activity.

4.1 Reasonable and feasible alternatives

Alternatives should include consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. The no-go alternative must also in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment.

“**alternatives**”, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- (a) the property on which or location where it is proposed to undertake the activity.
- (b) the type of activity to be undertaken.
- (c) the design or layout of the activity.
- (d) the technology to be used in the activity.
- (e) the operational aspects of the activity.
- (f) the option of not implementing the activity.

4.2 Fundamental, incremental and no-go alternatives

4.2.1 Fundamental alternatives

Fundamental alternatives are developments that are totally different from the proposed project description and usually include the following:

- Alternative property or location where it is proposed to undertake the activity.
- Alternative type of activity to be undertaken.
- Alternative technology to be used in the activity.

4.2.2 Incremental alternatives

Incremental alternatives relate to modifications or variations to the design of a project that provide different options to reduce or minimise environmental impacts. There are several incremental alternatives that can be considered with respect to the current wind farm project, including:

- Alternative design or layout of the activity.
- Alternative operational aspects of the activity.

4.2.3 No-go alternative

It is mandatory to consider the “no-go” option in the EIA process. The “no-go” alternative refers to the current status quo and the risks and impacts associated to it. Some existing activities may carry risks and may be undesirable (e.g. an existing contaminated site earmarked for a development). In the case of the current proposed wind energy facility, the main “no-go” activity is:

- No construction of a wind energy facility and associated infrastructure in the proposed project area.

Table 4-1. The alternatives for the proposed Waaihoek WEF powerline

Alternative level	Alternatives	Advantages	Disadvantages	Reasonable and feasible	Further assessment	Comment
Location alternative For the power line.	Alternative location 1(A1)	Shorter route. 86% of grid follows R34.	New access roads will need to be developed. The first 7.9km has an average slope of -9.5%.	YES	YES	1.9km new access roads 0.7km grid aligned parallel to existing farm roads 16.1km grid aligned parallel to R34
	Alternative location 2 (A2)	76% of grid follows existing R34	Longest route	YES	YES	25.4km grid aligned parallel to existing farm roads. 19.4km of grid aligned to existing 88kV grid line.
Location alternative For the on-site WEF substation.	Alternative Substation for A1	The area is level and no drainage problems are envisaged. The proposed position will allow for a shorter connection to the power line corridor, connecting the WEF to the Bloedrivier substation.	Not centrally located within the WEF development.	YES	YES	The proposed location for the substation is in the South Eastern part of the development.
	Alternative Substation for A2	Connects the longest power line alternative.	Longest route	YES	YES	The proposed location for the substation is in the central part of the development.
Design alternative	Underground	Not visually intrusive.	Maintenance	NO	NO	Cables are placed in

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Alternative level	Alternatives	Advantages	Disadvantages	Reasonable and feasible	Further assessment	Comment
	cabling.	Not an impact for birds. Not exposed to extreme weather. Not exposed to theft.	issues. High voltage cables not suitable. Installation costs are high.			dug trenches.
	Above ground power line.	Cheaper to install. Easier to maintain. Easier to route on land. Can be located near roads.	Visually intrusive. An impact for birds. Exposed to extreme weather and theft. Difficult to install in steep areas.	YES	YES	Above ground power lines were considered a feasible alternative.
No-go option This refers to the current status quo and the risks and impacts associated to it.	Existing activities on site include:					
	Farm grassland with earmarked grazing and agriculture	Will remain relatively undisturbed		YES	YES	Assessed in the impact assessment process

5 RELEVANT LEGISLATION

In terms of Section 28(1) of the EIA Regulations (2010), a Scoping Report must contain all the information necessary for a proper understanding of the nature of issues identified during scoping, and must include–

- (f) **An identification of all legislation and guidelines that have been considered in the preparation of the scoping report.**

The development of the proposed Waaihoek WEF, which includes the construction of powerlines, will be subject to the requirements of various items of South African legislation. These are described below.

5.1 The Constitution Act (No. 108 of 1996)

This is the supreme law of the land. As a result, all laws, including those pertaining to the proposed development, must conform to the Constitution. The Bill of Rights - Chapter 2 of the Constitution, includes an environmental right (Section 24) according to which, everyone has the right:

- (a). To an environment that is not harmful to their health or well-being.
- (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.
 - (iii). Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Relevance to the proposed Waaihoek WEF Powerline:

- The WEF developer has an obligation to ensure that the proposed activity will not result in pollution and ecological degradation.
- The WEF developer has an obligation to ensure that the proposed activity is ecologically sustainable, while demonstrating economic and social development.

5.2 National Environmental Management Act (No.107 of 1998)

The National Environmental Management Act (No.107 of 1998) (NEMA) provides for basis for environmental governance in South Africa by establishing principles and institutions for decision-making on matters affecting the environment.

A key aspect of NEMA is that it provides a set of environmental management principles that apply throughout the Republic to the actions of all organs of state that may significantly affect the environment. Section 2 of NEMA contains principles (see Table 5-1) relevant to the proposed WEF project, and likely to be utilised in the process of decision making by DEA.

Table 5-1. NEMA Environmental Management Principles

(2)	Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
(3)	Development must be socially, environmentally and economically sustainable.
(4)(a)	Sustainable development requires the consideration of all relevant factors including the following: <ul style="list-style-type: none"> i. That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;

	<ul style="list-style-type: none"> ii. That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied; iii. That waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner.
(4)(e)	Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.
(4)(i)	The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.
(4)(j)	The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.
(4)(p)	The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.
(4)(r)	Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

As these principles are utilised as a guideline by the competent authority in ensuring the protection of the environment, the proposed development should, where possible, be in accordance with these principles. Where this is not possible, deviation from these principles would have to be very strongly motivated.

NEMA introduces the duty of care concept, which is based on the policy of strict liability. This duty of care extends to the prevention, control and rehabilitation of significant pollution and environmental degradation. It also dictates a duty of care to address emergency incidents of pollution. A failure to perform this duty of care may lead to criminal prosecution, and may lead to the prosecution of managers or directors of companies for the conduct of the legal persons.

Employees who refuse to perform environmentally hazardous work, or whistle blowers, are protected in terms of NEMA.

In addition NEMA introduces a new framework for environmental impact assessments, the EIA Regulations (2010) discussed previously.

Relevance to the proposed Waaihoek WEF Powerline:

- The WEF developer must be mindful of the principles, broad liability and implications associated with NEMA and must eliminate or mitigate any potential impacts.
- The WEF developer must be mindful of the principles, broad liability and implications of causing damage to the environment.

5.3 National Environmental Management: Protected Areas Act (No. 57 of 2003)

The National Environmental Management: Protected Areas Act (No. 57 of 2003) (NEMPAA) mainly provides for the following:

- Declaration of nature reserves and determination of the type of reserve declared.
- Cooperative governance in the declaration and management of nature reserves.
- A system of protected areas in order to manage and conserve biodiversity.
- Utilization and participation of local communities in the management of protected areas.

Relevance to the proposed Waaihoek WEF Powerline:

- The Act will be relevant to the WEF developer if the WEF is located close to any areas proclaimed in terms of the Act.

5.4 National Environment Management: Biodiversity Act (No. 10 of 2004)

The National Environment Management: Biodiversity Act (No. 10 of 2004) (NEMBA) provides for the management and conservation of South Africa's biodiversity and the protection of species and ecosystems that warrant national protection.

The objectives of this Act are to:

- Provide, within the framework of the National Environmental Management Act.
- Manage and conserve of biological diversity within the Republic.
- Promote the use of indigenous biological resources in a sustainable manner.

The Act provides for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act 107 of 1998. In terms of the Biodiversity Act, the developer has a responsibility for:

1. The conservation of endangered ecosystems and restriction of activities according to the categorisation of the area (not just by listed activity as specified in the EIA regulations).
2. Application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all developments within the area are in line with ecological sustainable development and protection of biodiversity.
3. Limit further loss of biodiversity and conserve endangered ecosystems.

The Act's permit system is further regulated in the Act's Threatened or Protected Species Regulations, which were promulgated in February 2007.

Relevance to the proposed Waaihoek WEF Powerline:

- The WEF developer must not cause a threat to any endangered ecosystems and must protect and promote biodiversity;
- The WEF developer must assess the impacts of the proposed development on endangered ecosystems;
- The WEF developer may not remove or damage any protected species without a permit; and
- The WEF developer must ensure that the site is cleared of alien vegetation using appropriate means.

5.5 National Environmental Management: Waste Management Act (No. 59 of 2008)

The National Environmental Management: Waste Management Act (No. 59 of 2008) (NEMWMA) gives legal effect to the Government's policies and principles relating to waste management in South Africa, as reflected in the National Waste Management Strategy (NWMS).

The objects of the Act are (amongst others) to:

Protect health, well-being and the environment by providing reasonable measures for:

- minimising the consumption of natural resources.
- avoiding and minimising the generation of waste.
- reducing, re-using, recycling and recovering waste.
- treating and safely disposing of waste as a last resort.
- preventing pollution and ecological degradation.
- securing ecologically sustainable development while promoting justifiable economic and social development.

Relevance to the proposed Waaihoek WEF Powerline:

- The WEF developer must ensure that all activities associated with the project address waste related matters in compliance with the requirements of the Act.

5.6 National Forests Act (No. 84 of 1998)

The objective of this Act is to monitor and manage the sustainable use of forests. In terms of Section 12 (1) (d) of this Act and GN No. 1012 (promulgated under the National Forests Act), no person may, except under licence:

- Cut, disturb, damage or destroy a protected tree.
- Possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree.

Relevance to the proposed Waaihoek WEF Powerline:

- If any protected trees or indigenous forest in terms of this Act occur on site, the WEF developer will require a licence from the Department of Forestry (DAFF) to perform any of the above-listed activities.

5.7 National Heritage Resources Act (No. 25 of 1999) and KwaZulu-Natal Heritage Act (No. 4 of 2008)

The protection of archaeological and paleontological resources is the responsibility of a provincial heritage resources authority and all archaeological objects, paleontological material and meteorites are the property of the State. “Any person who discovers archaeological or paleontological objects or material or a meteorite in the course of development must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority”.

The KwaZulu-Natal Heritage Act (No. 4 of 2008) provides for the “General protection of:

1. Structures where no structure which is, or which may reasonably be expected to be older than 60 years, may be demolished, altered or added to without the prior written approval of the Council having been obtained on written application to the Council.
2. Graves of victims of conflict where no person may damage, alter, exhume, or remove from its original position without the prior written approval:
 - the grave of a victim of conflict.
 - a cemetery made up of such graves.
 - any part of a cemetery containing such graves.
3. Traditional burial places without the prior written approval of the Council having been obtained on written application to the Council.
4. Battlefield sites, archaeological sites, rock art sites, paleontological sites, historic fortifications, meteorite or meteorite impact sites. No person may destroy, damage, excavate, alter, write or draw upon, or otherwise disturb any battlefield site, archaeological site, rock art site, paleontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Council having been obtained on written application to the Council.

Relevance to the proposed Waaihoek WEF Powerline:

SAHRA needs to be informed of the project and EIA process.

- A heritage impact assessment (HIA) must be undertaken.
- No person may alter or demolish any structure or part of a structure, which is older than 60 years or disturb any archaeological or paleontological site or grave older than 60 years without a permit issued by the relevant provincial heritage resources authority.
- No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter or deface archaeological or historically significant sites.

5.8 Electricity Regulation Act (No. 4 of 2006)

The Electricity Regulation Act (Act No. 4 of 2006) came into effect on 1 August 2006 and the objectives of this Act are to:

- Facilitate universal access to electricity.
- Promote the use of diverse energy sources and energy efficiencies.
- Promote competitiveness and customer and end user choice.

Relevance to the proposed Waaihoek WEF Powerline:

- The proposed WEF is in line with the call of the Electricity Regulation Act No. 4 of 2006 as it is has the potential to improve energy security of supply through diversification.

5.9 Occupational Health and Safety Act (No. 85 of 1993)

The objective of this Act is to provide for the health and safety of persons at work. In addition, the Act requires that, “as far as reasonably practicable, employers must ensure that their activities do not expose non-employees to health hazards”. The importance of the Act lies in its numerous regulations, many of which will be relevant to the proposed Waaihoek WEF. These cover, among other issues, noise and lighting.

Relevance to the proposed Waaihoek WEF Powerline:

- The WEF developer must be mindful of the principles and broad liability and implications contained in the OHSA and mitigate any potential impacts.

5.10 Aviation Act (No. 74 of 1962): 13th Amendment of the Civil Aviation Regulations 1997

The Aviation Act relates, in particular, to the greater associated WEF development.

Section 14 of obstacle limitations and marking outside aerodrome or heliport (CAR Part 139.01.33) under this Act specifically deals with wind turbine generators (wind farms). According to this section, “A wind turbine generator is a special type of aviation obstruction due to the fact that at least the top third of the generator is continuously variable and offers a peculiar problem in as much marking by night is concerned. The Act emphasizes that, when wind turbine generators are grouped in numbers of three or more they will be referred to as “wind farms”.

Of particular importance to the proposed Waaihoek WEF project are the following:-

- Wind farm placement: Due to the potential of wind turbine generators to interfere on radio navigation equipment, no wind farm should be built closer than 35km from an aerodrome. In addition, much care should be taken to consider visual flight rules routes, proximity of known recreational flight activity such as hang gliders, en route navigational facilities etc.
- Wind farm markings: Wind turbines shall be painted bright white to provide the maximum daytime conspicuousness. The colours grey, blue and darker shades of white should be avoided altogether. If such colours have been used, the wind turbines shall be supplemented with daytime lighting, as required.
- Wind farm lighting: Wind farm (3 or more units) lighting: In determining the required lighting of a wind farm, it is important to identify the layout of the wind farm first. This will allow the proper approach to be taken when identifying which turbines need to be lit. Any special consideration to the site’s location in proximity to aerodromes or known corridors, as well as any special terrain considerations, must be identified and addressed at this time.
- Turbine Lighting Assignment: The following guidelines should be followed to determine which turbines, need to be equipped with lighting fixtures. Again, the placement of the lights is contingent upon which type of configuration is being used.

Relevance to the proposed Waaihoek WEF Powerline:

- Due to requirements of the Act to ensure the safety of aircrafts, the WEF developer must engage directly with the Civil Aviation Authority regarding the structural details of the facility.

5.11 National Environmental Management: Air Quality Act (No. 39 of 2004)

The National Environmental Management: Air Quality Act (No. 39 of 2004)(NEMAQA) is the principal legislation regulating air quality in South Africa. The objects of the Act are to:

- Give effect to section 24(b) of the Constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of people, and
- Protect the environment by providing reasonable measures for:
 - Protection and enhancement of the quality of air in the Republic.
 - Prevention of air pollution and ecological degradation.
- Securing ecologically sustainable development while promoting justifiable economic and social development.

The Air Quality Act empowers the Minister to establish a national framework for achieving the objects of this Act. The said national framework will bind all organs of state. The said national framework will inter alia have to establish national standards for municipalities to monitor ambient air quality and point, non-point and mobile emissions.

Relevance to the proposed Waaihoek WEF Powerline:

- Although no major air quality issues are expected, the WEF developer needs to be mindful of the Act as it also relates to potential dust generation during construction, etc.

5.12 National Water Act (No. 36 of 1998)

The National Water Act (No. 36 of 1998) (NWA) provides for fundamental reform of the law relating to water resources in South Africa.

The purpose of the Act amongst other things is to:

- Ensure that the national water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors:
 - Promoting equitable access to water.
 - Promoting the efficient, sustainable and beneficial use of water in the public interest.
 - Facilitating social and economic development.
 - Protecting aquatic and associated ecosystems and their biological diversity.
 - Reducing and preventing pollution and degradation of water resources.

The NWA is concerned with the overall management, equitable allocation and conservation of water resources in South Africa. To this end, it requires registration of water users and licenses to be obtained for water use except for certain limited instances set out in the Act. These instances include domestic use, certain recreational use, where the use occurs in terms of an existing lawful use or where the Department of Water Affairs (DWA) has issued a general authorisation that obviates the need for a permit.

Water use for which a permit is required

For the purposes of this Act, water uses for which a permit is required (amongst other), are defined in Section 21 as follows:

- Taking water from a water resource.
- Storing water.
- Impeding or diverting the flow of water in a watercourse.
- Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.
- Disposing of waste in a manner which may detrimentally impact on a water resource.
- Altering the bed, banks, course or characteristics of a watercourse.

Relevance to the proposed Waaihoek WEF Powerline:

- There may be certain instances where the WEF developer may need to obtain approval in

terms of the Water Act.

5.13 Conservation of Agricultural Resources Act (No. 43 of 1983)

The Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA) is the main statute that deals with agricultural resource conservation.

The objects of the Act are to provide for the conservation of the natural agricultural resources of South Africa by the maintenance of the production potential of land. In order to maintain production potential of land, CARA provides for the following mechanisms; namely:

- Combating and prevention of erosion and weakening and destruction of water sources.
- Protection of vegetation.
- Combating of weeds and invader plants.

5.13.1 CARA Regulations

In order to give meaning to mechanisms aimed maintaining production potential of land provided for in CARA, Minister of Agriculture published regulations under CARA (CARA Regulations) which prescribes control measures which all land users have to comply, in respect of a number of matters, including the:

- Cultivation of virgin soil.
- Protection of cultivated land.
- Utilisation and protection of the veld.
- Control of weed and invader plants.
- Prevention and control of veld fires and the restoration and reclamation of eroded land.

Relevance to the proposed Waaihoek WEF Powerline:

- An agricultural potential assessment may need to be conducted to determine how the proposed development may impact on the agricultural production potential of the WEF site.

5.14 Subdivision of Agricultural Land Act (No. 70 of 1970)

The Subdivision of Agricultural Land Act (No. 70 of 1970) controls the subdivision of all agricultural land in South Africa and prohibits certain actions relating to agricultural land. In terms of the Act, the owner of agricultural land is required to obtain consent from the Minister of Agriculture in order to subdivide agricultural land.

The purpose of the Act is to prevent uneconomic farming units from being created and degradation of prime agricultural land. The Act also regulates leasing and selling of agricultural land as well as registration of servitudes.

Relevance to the proposed Waaihoek WEF Powerline:

- Approval will be required from the Department of Agriculture (DAFF) for any activities on the land zoned for agriculture and any proposed rezoning or sub-divisions of agricultural land.

5.15 Mineral and Petroleum Resources Development Act (No. 28 of 2002)

Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA) makes provision for equitable access to and sustainable development of the South Africa's mineral and petroleum resources and to provide for matters connected therewith.

The objects of this Act are (amongst others) to:

- Give effect to the principle of the State's custodianship of the nation's mineral and petroleum resources.
- Promote equitable access to the nation's mineral and petroleum resources to all the people of South Africa.
- Give effect to section 24 of the Constitution by ensuring that the nation's mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development.

Application for a mining right

As per Section 27 (1) of the Act, the Department of Minerals and Energy (DME) must grant permission for all mining operations. Both the removal of sand and/or stone from a borrow pit or quarry requires an application for a mining right.

There are two categories of permission relevant to borrow pits and hard rock quarries, namely; “Mining Permits” and secondly “Mining Rights or Licence.” As is reflected in the table below, these categories are linked to the size of the proposed operation and the proposed operational period.

Table 5-2. Categories of permission required for a borrow pit

Category	Size	Period of operation	DME Requirement
Mining Permit	< 1.5ha	< 2 years	Environmental Management Plan (EMP)
Mining Right (Licence)	Not specified	Not specified	Scoping and EIA Environmental Management Programme Report

In addition, Section 53 of the Act requires that Ministerial approval is attained for “any person who intends to use the surface of any land in any way which may be contrary to any object of this Act or is likely to impede any such object”.

Relevance to the proposed Waaihoek WEF Powerline:

- Any activities associated with the WEF requiring extraction of sand or hard rock for construction purposes will require the submission of an application to DME for either a mining permit or mining licence.
- The Waaihoek WEF must apply to the Minister of Mineral Resources for approval to use the land for the purposes of the WEF

5.16 National Road Traffic Act (No. 93 of 1996)

The National Road Traffic Act (No. 93 of 1996) (NRTA) provides for all road traffic matters and is applied uniformly throughout South Africa. The Act enforces the necessity of registering and licensing motor vehicles. It also stipulates requirements regarding fitness of drivers and vehicles as well as making provision for the transportation of dangerous goods.

Relevance to the proposed Waaihoek WEF Powerline:

- All the requirements stipulated in the NRTA will need to be complied with during the construction and operational phases of the proposed WEF and WEF powerline development.

5.17 National Veld and Forest Fire Act (No. 101 of 1998)

The aim of the Act is to “prevent and combat veld, forest and mountain fires” in South Africa. Of particular relevant to the proposed Waaihoek WEF development the following requirements of the Act need to be considered:

Relevant Section of the Act	Relevant to the proposed Waaihoek WEF Powerline:
Section 3: Fire Protection Associations.	The proposed Waaihoek WEF must register as a member of the fire protection association in the area.
Chapter 4 Section 12-14: Veld fire prevention: duty to prepare and maintain firebreaks	The proposed Waaihoek WEF will be required to take all practicable measures to ensure that fire breaks are prepared and maintained according to the specifications contained in Section 12 - 14
Section 17: Fire fighting: readiness	The proposed Waaihoek WEF must have the appropriate equipment, protective clothing and trained

5.18 Other relevant national legislation

In addition to the above, aside from the environmental authorisation, there are other permits, contracts and licenses that will need to be obtained by the project proponent for the proposed project some of which fall outside the scope of the EIA. However, for the purposes of completeness, these include:-

- KwaZulu-Natal Planning and Development Act (No. 6 of 2008).
- National Energy Regulator of South Africa (NERSA): Generation License.
- Eskom: Connection agreement and Power Purchase Agreement (PPA).

5.19 Municipal Policy

Emadlangeni Municipal by-laws

Certain activities related to the proposed development may, in addition to National legislation, be subject to control by municipal by-laws. These will need to be confirmed with the Emadlangeni Local Municipality prior to construction.

Spatial Development Frameworks (SDF)

Amajuba District Municipality (ADM) SDF identifies land use categories. The proposed Waaihoek WEF fall within an area designated for agricultural land use (Figure 5-1). Since the WEF activities are not mutually exclusive from farming activities, the proposed Waaihoek WEF is not in conflict with the future spatial planning in the ADM.

The Emadlangeni Local Municipality (ELM) Spatial Development Framework (SDF) incorporates the objectives of the Provincial Growth and Development Strategy (2011) to respond to the effects of climate change by advancing alternative energy generation, whilst managing the current pressure on biodiversity.

Although no areas have been “set aside” for alternative energy, biodiversity, environmental and agricultural areas have been mapped (Figure 5-2 and 5-3 below). The proposed Waaihoek WEF project area contains a few patches of Biodiversity Priority Area 3, according to the ELM SDF, and falls between areas earmarked for future environmental and agricultural use. The proposed Waaihoek WEF is not in conflict with future spatial planning according to the ELM SDF.

Integrated Development Plan (IDP)

The ADM IDP (2012-2013) discusses alternative energy as a response to a disaster risk management category involving infrastructure failure with regards to electrical service delivery. The focus is to implement a program for the development of alternative energy sources as an alternative route to achieve the objectives of service delivery. The IDP speaks mainly to self-sustaining sources of energy for example solar water heating, but does not investigate options for large-scale energy generation from any other alternative sources.

ELM IDP also investigates options for including solar energy, but considers alternative energy sources in the context of climate change mitigation in accordance with the KZN Provincial Development and Growth Strategy (2011) and objectives of COP 17, whilst addressing electrical service delivery. Small scale solar energy is the main focus, with no consideration of larger generation facilities.

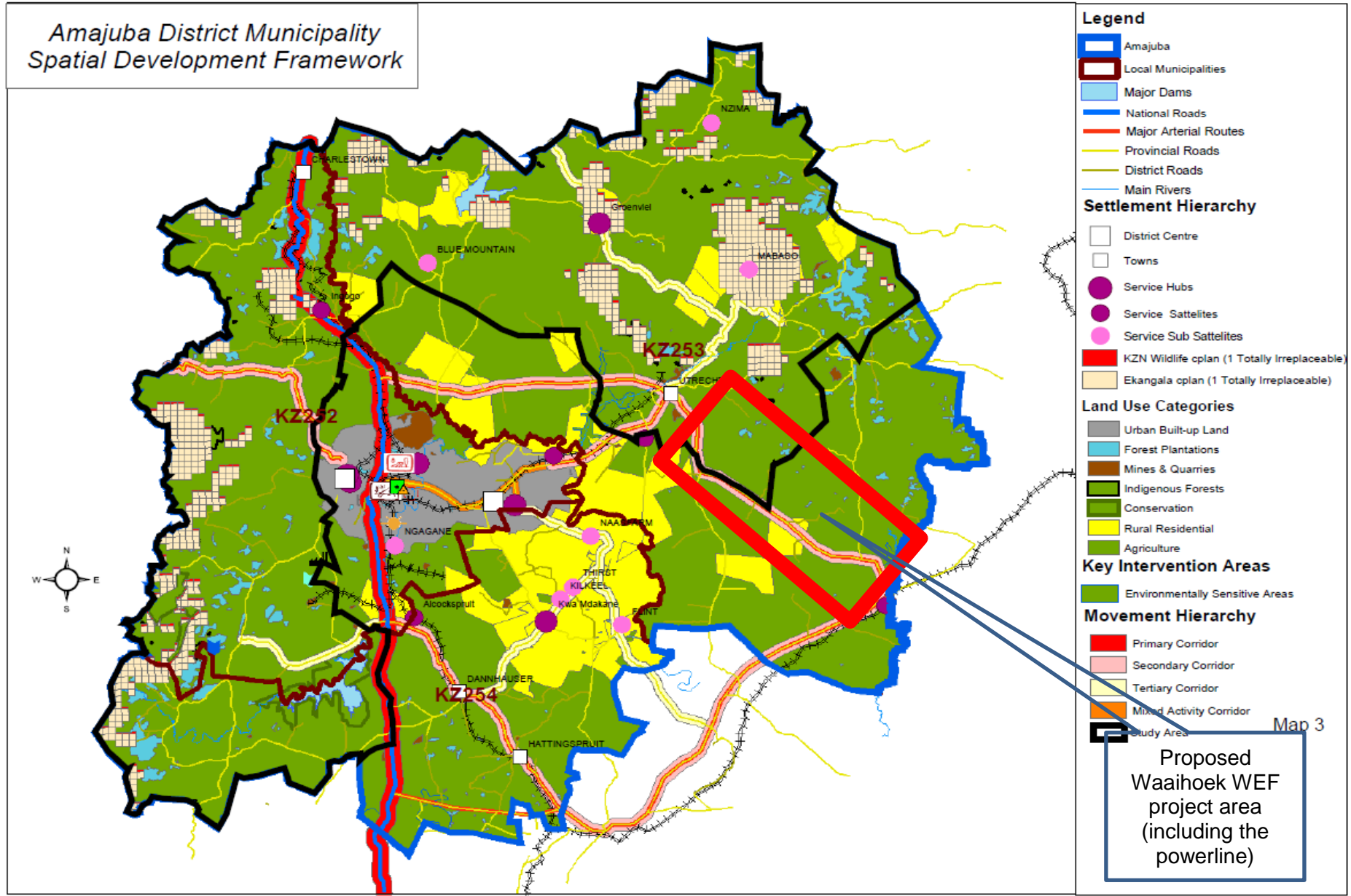


Figure 5-1. ADM SDF landuse categories relevant to the proposed Waihoek WEF Powerline.

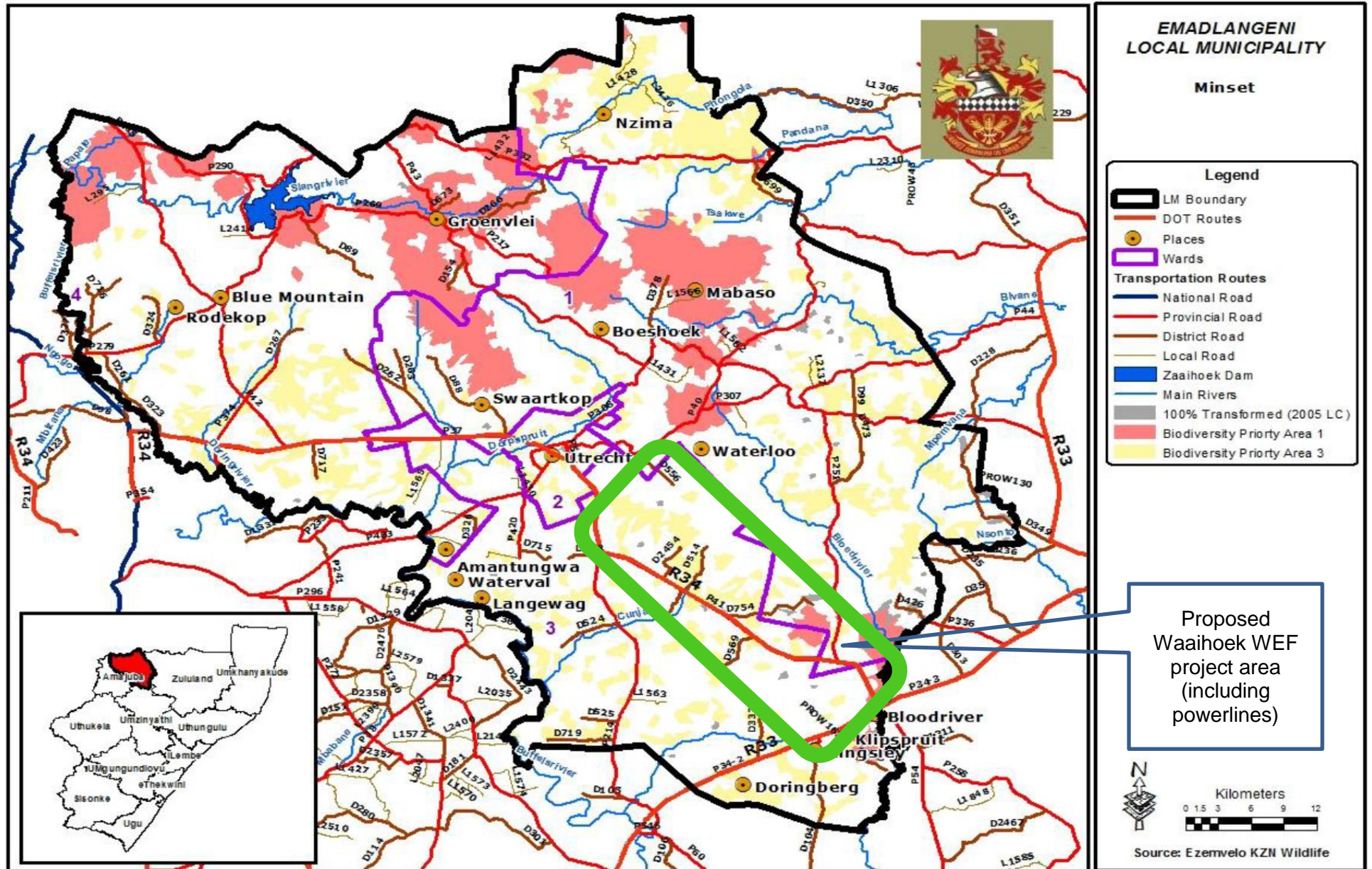


Figure 5-2. ELM SDF – Minset Biodiversity Priority Areas. The proposed Waihoek WEF project area outlined in green.

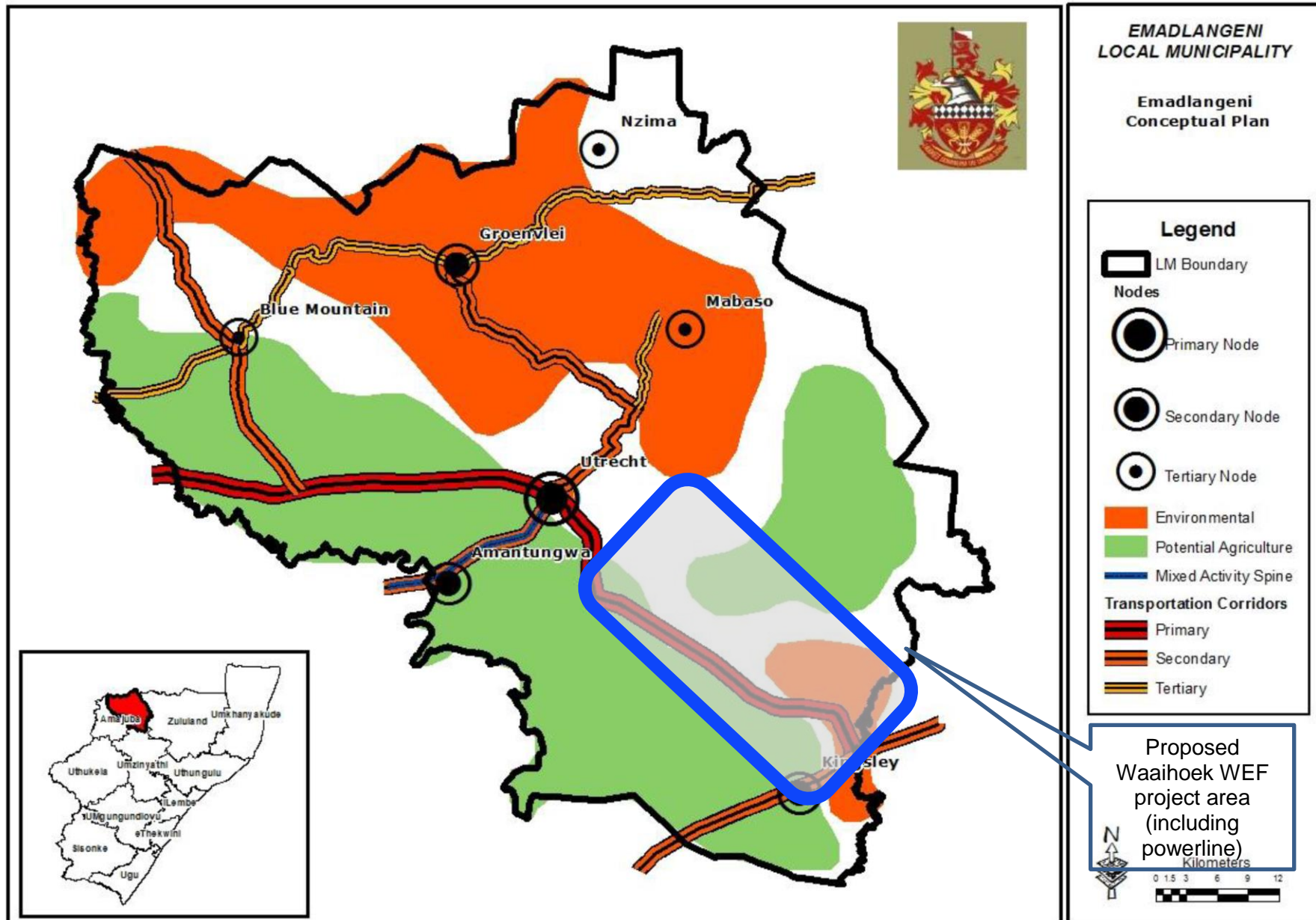


Figure 5-3. ELM SDF conceptual plan for future development proposals. The proposed Waihoek WEF project area is outlined in blue.

6 DESCRIPTION OF THE ENVIRONMENT

In terms of Section 28(1) of the EIA Regulations (2010), a Scoping Report must contain all the information necessary for a proper understanding of the nature of issues identified during scoping, and must include–

- (e) **A description of the environment that may be affected by the activity and the manner in which activity may be affected by the environment.**

6.1 Bio-physical environment

6.1.1 Current land use activities

Emadlangeni Local Municipality covers an area of approximately 353 931ha, with 85.2% of the area remaining in a natural state and 14.8% of the area having no natural habitat remaining. The ELM is an administrative area in the Amajuba District Municipality of KwaZulu-Natal and is located 52km east of Newcastle and 68km west of Vryheid on the R34.

The region concerned with the greater Waaihoek WEF project area is mountainous with open grassland and sparse vegetation. A large proportion of the project area is used for agriculture as a mixture of subsistence, commercial livestock and game farming (Figure 6-1). Along the length of the proposed powerline alternatives and surrounding the Bloedrivier Substation, the land-use can be described as cultivation agriculture, supported by the Brakwater Irrigation Dam. A number of homesteads and a rural school are located within the project area.

Land-uses in the landscape adjacent to the proposed development include:

- A provincial road (R34) to the south of the project area.
- Protected area currently operated as a conservancy to the west (Utrecht Balele Community Game Park).
- Eskom powerline servitude to the south of the project area and south of the R34.

6.1.2 Climate

Utrecht usually receives about 615mm of rain per year, with most rainfall occurring during mid-summer. Utrecht receives the lowest rainfall (3 mm) in July and the highest (114mm) in January. Average midday temperatures range from 18.7 °C in June to 26.1 °C in January. The region is the coldest during July with average temperatures of 2.9 °C during the night.

6.1.3 Topography

The powerline alternatives for the proposed Waaihoek WEF occur on low, gently sloped terrain. The Waaihoek WEF extends from approximately 1700 metres above sea level (masl) to 1265masl and 1220masl. The relief of the properties in this area are mainly upland high lying areas. These upland areas are part of a plateau forming the upper catchment for the Bloedrivier.

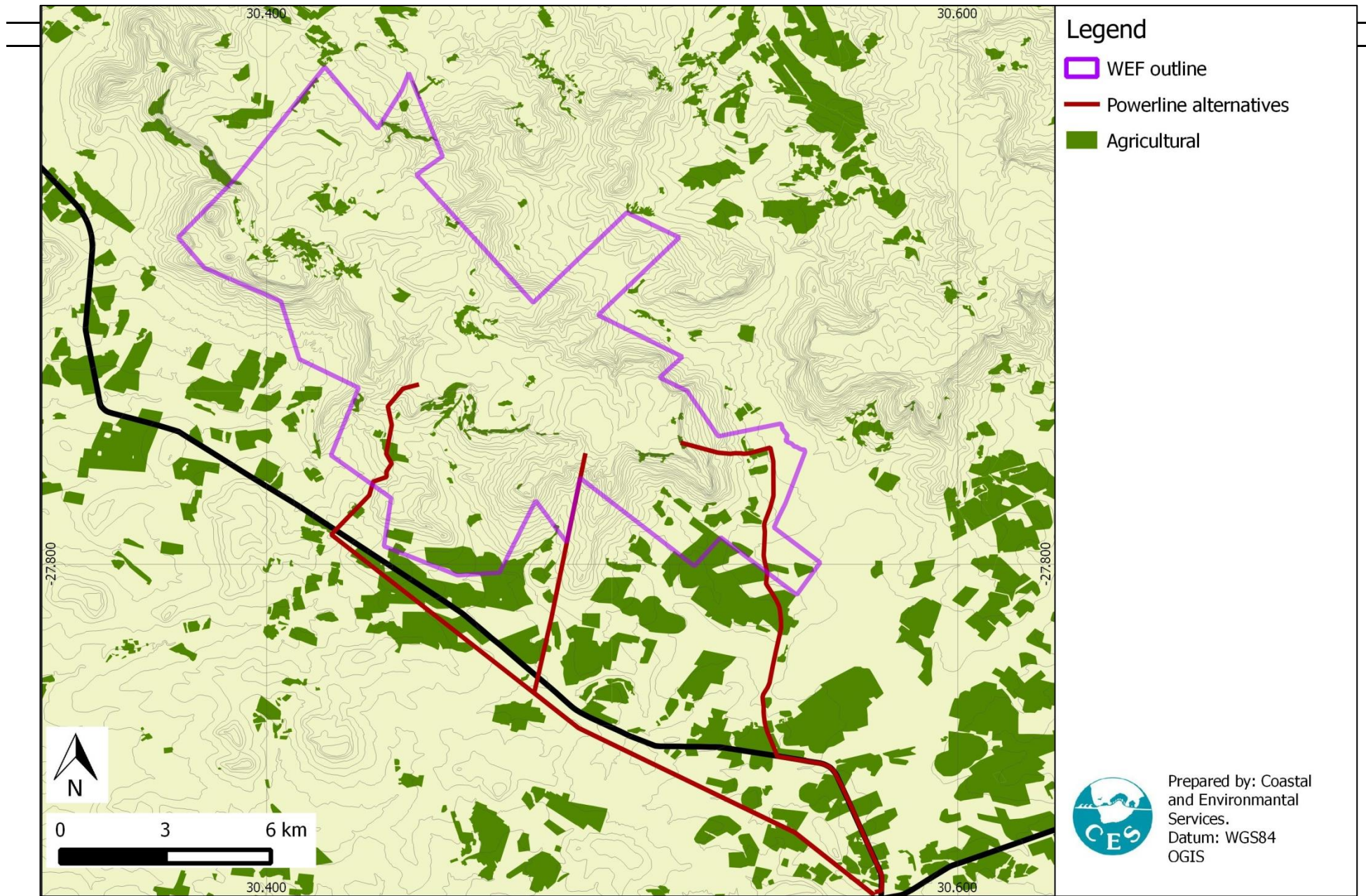


Figure 6-1. The current land use of the affected farms where the proposed Waaihoek WEF and alternative powerlines will be located.

6.1.4 Geology

About two thirds of South Africa is covered by sedimentary and volcanic rocks of the Karoo Supergroup which is made up of Volcanics (basalt and rhyolite); Sediments (sandstone, shale, siltstone); and dolerite. According to Figure 6-3 the geology underlying the proposed Waaihoek WEF consists of the Dwyka Group, Karoo Dolerite, Pietermaritzburg Formation, Volksrust Formation and Vryheid Formation. The latter three Formations form a part of the Ecca Group with Volksrust consisting of shale, Vryheid of sandstone and Pietermaritzburg of shale. Karoo Dolerite is apparent in the form of dykes and sills intruding into the surrounding rock. The Dwyka Group forms the base of the sequence and consists of diamictite.

Sandstone and shales are common sedimentary rocks. Sandstones are generally medium-grained clastic rocks composed of rounded or angular fragments of quartz in a cementing matrix. Shales consist of clay minerals and tiny fragments of quartz and/or other rock forming minerals. Dwyka tillite is compacted boulder clay of glacial origin.

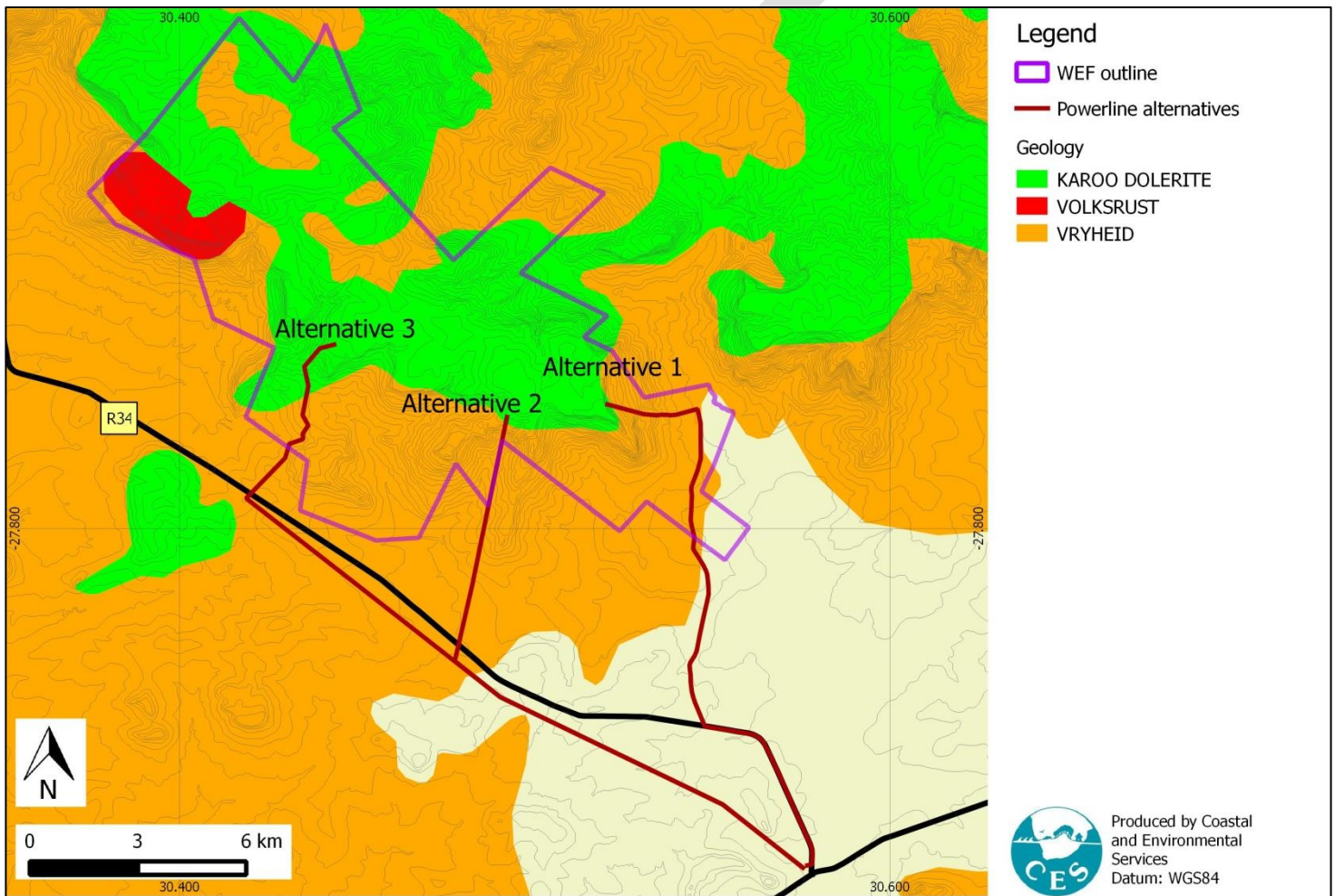


Figure 6-2. The geology of the proposed Waaihoek WEF Powerlines.

6.1.5 Soils and agricultural potential

The desktop information on soils and agricultural potential has been obtained from the AGIS online database, produced by the institute of Soil, Climate and Water. The information from this database will need to be verified as initial site information appears to contradict this assessment.

The Waaihoek WEF powerline project area has three dominant soil patterns:

Acrisols: the plateau on which the proposed Waaihoek WEF is located is dominated by Acrisols

(Table 6-1; Figure 6-3), a soil pattern which is fertile, well drained and has a high potential arability (Figure 6-4).

Leptosols: Leptosols (Table 6-1; Figure 6-3). Leptosols are located on the lower lying areas at the foot of the plateau and is characterised by minimal development and are generally shallow on weathering rock. This soil pattern is not considered to be very arable in terms of agricultural potential, however significant areas are currently being cultivated (Figure 6-4).

Plinthosols: Plinthosol soils are located in the lowest areas, in the south-west portion of the project area (Figure 6-3; Table 6-1). Plinthosols are considered to be moderately arable and have a medium to high base status (water saturation).

Table 6-1. Generalised soil patterns which occur in the Waaihoek WEF project area.

Code	Group	Description	Agricultural Potential
AC: Acrisols (depicted in orange in Figure 6-3)	Red-yellow well drained soils generally lacking a strong texture contrast	Red and yellow, massive or weakly structured soils with low to medium base status	HIGH (Figure 6-4)
LP1: Leptosols 1 (depicted in blue in Figure 6-3)	Soils with limited pedological development	Soils with minimal development, usually shallow on hard or weathering rock, with or without intermittent diverse soils. Lime rare or absent in the landscape	LOW (Figure 6-4)
LP2: Leptosols 2 (depicted in grey in Figure 6-3)		Soils with minimal development, usually shallow on hard or weathering rock, with or without intermittent diverse soils. Lime generally present in part or most of the landscape	
PT1: Plinthosols 1 (depicted in light pink in Figure 6-3)	Soils with a plinthic horizon	Red, yellow and greyish soils with low to medium base status	MODERATE (Figure 6-4)
PT2: Plinthosols (depicted in pink in Figure 6-3)		Red, yellow and greyish soils with high base status	

Agricultural potential refers to the soil characteristics only and does not take prevailing local climatic conditions/restrictions into account. Soils are classified as high, moderate or low potential and are characterised as follows:

- “High” potential soils refer to those soils generally more than 900-1200 mm deep, with medium texture, lacking significant structure and without any drainage restrictions.
 - Waaihoek WEF project area is dominated by large expanses of land with high agricultural potential (Figure 6-3 and Figure 6-4).

- “Moderate” potential soils refer to those soils either between approximately 500 mm and 900 mm deep, or with significant restrictions such as soil structure, lack of fertility caused by sandy texture or the like.
 - The project area has large areas which are considered to have a moderate agricultural potential (Figure 6-3 and Figure 6-4).
- “Low” potential soils are generally shallow to very shallow, often with rock, or have severely restricting soil structure or occur in wetland areas.
 - There are a few hectares located in the southeast corner of the Waaihoek WEF project area which are considered to have low agricultural potential (Figure 6-3 and Figure 6-4).

None of the Waaihoek WEF project area (including both powerline alternatives) occurs within the nationally demarcated arable agricultural land according to Section 70 of the Agricultural Act.

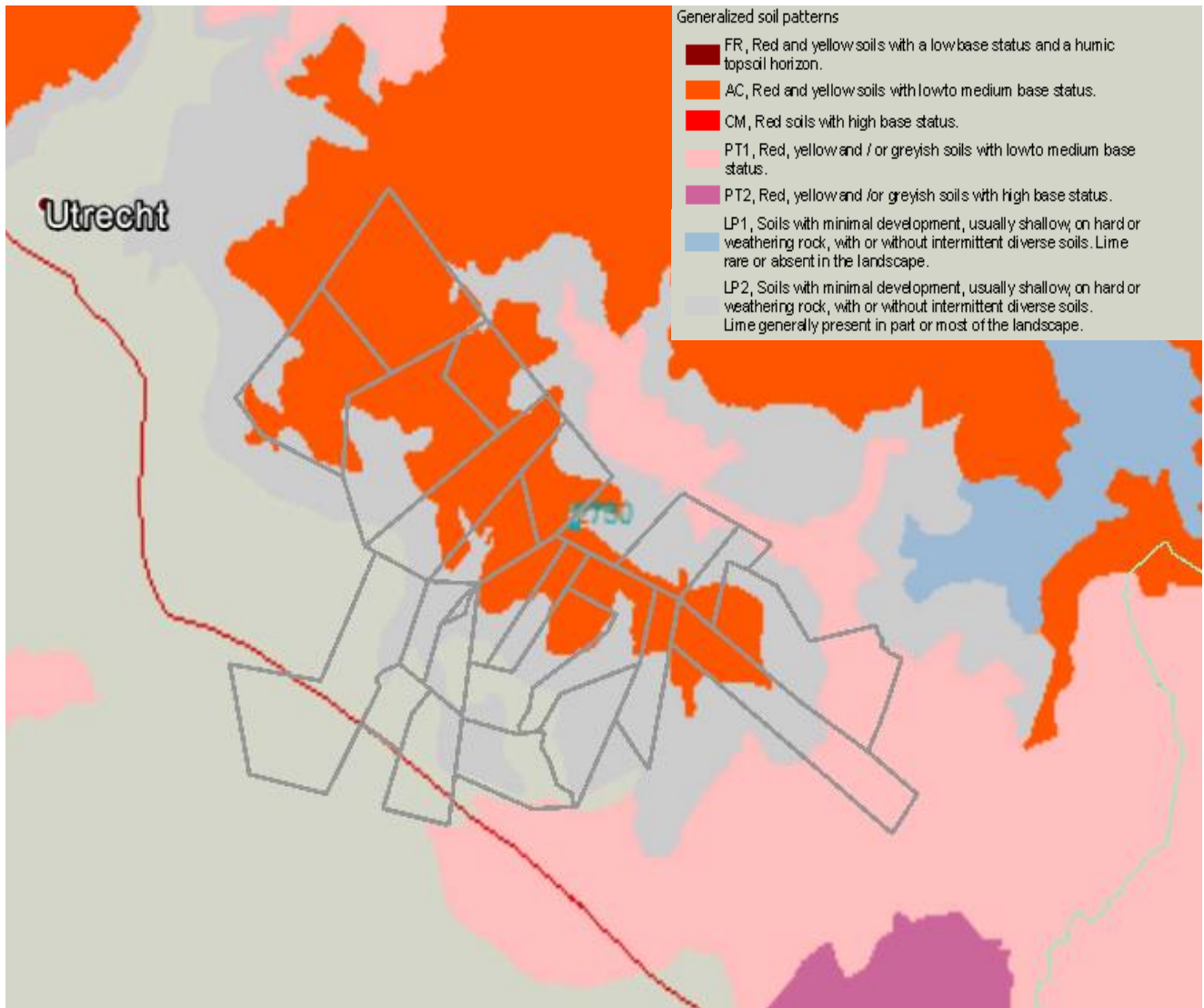


Figure 6-3. Generalised soil patterns of the Waaihoek WEF project area and surrounding areas (www.agis.agric.za)

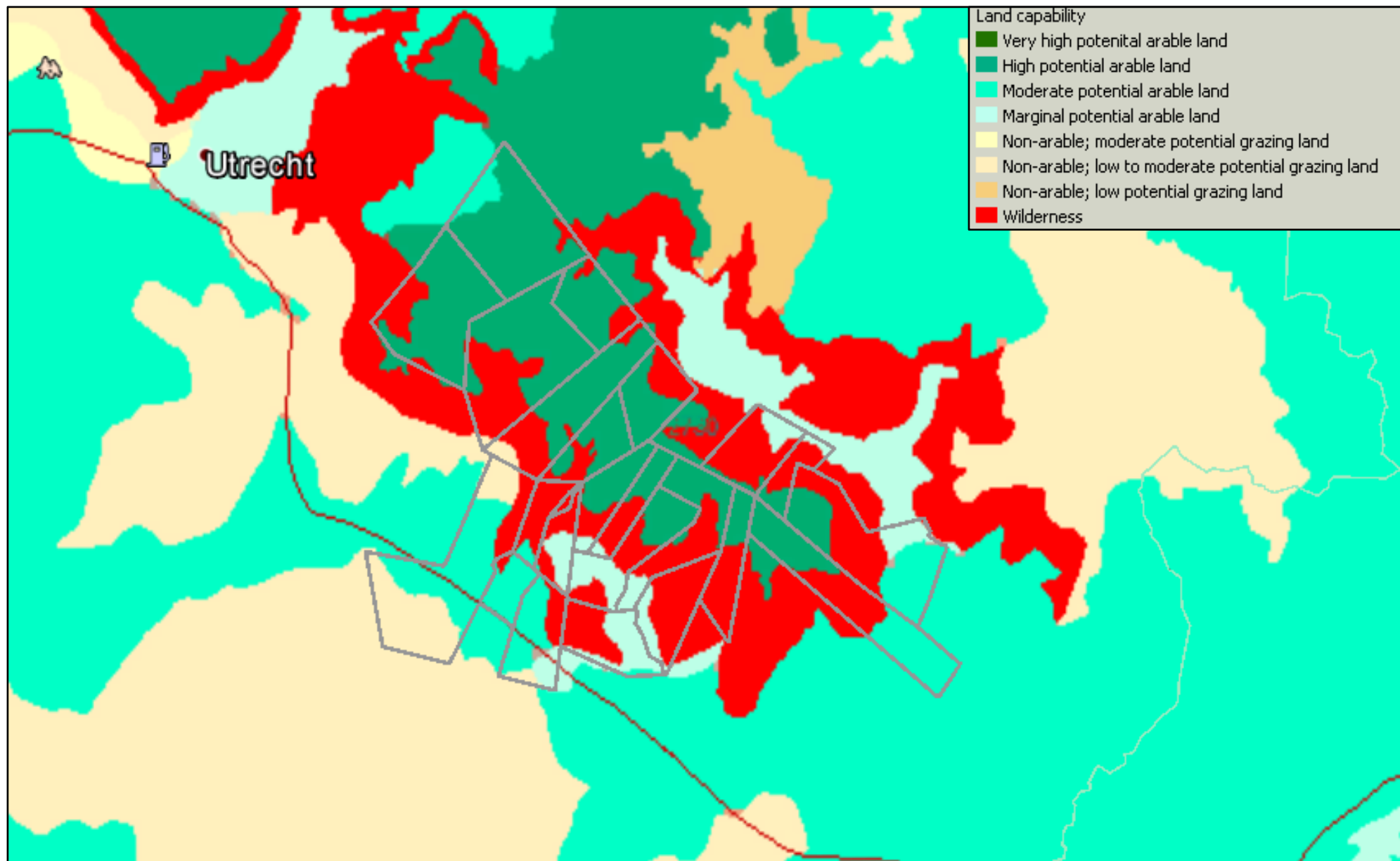


Figure 6-4. Agricultural land capability of the Waaihoek WEF project area and surrounding areas (www.agis.agric.za)

6.1.6 Vegetation and Floristics

South African National Biodiversity Institute (SANBI) (Mucina and Rutherford, 2006)

The proposed Waaihoek WEF project area is located in three vegetation types of the grassland biome (Figure 6-5), namely, Wakkerstroom Montane Grassland (Gm14), Kwazulu-Natal Highland Thornveld (Gs 6) and Income Sandy grassland (Gs 7).

A significant portion of the proposed Waaihoek WEF will be located within Wakkerstroom Montane Grassland (Gm14), which is located along the top of the plateau in the project area. This vegetation unit is associated with the Escarpment that links the southern and northern Drakensburg escarpments. The vegetation comprises of short montane grasslands on the relatively flat plateaus, with short forest and *Leucosidea* thickets occurring along steep, east-facing slopes and drainage areas. *L. sericea* is the dominant woody pioneer species that invades areas as a result of grazing mismanagement. Wakkerstroom Montane Grassland (Gm14) is classified as LEAST THREATENED by Mucina and Rutherford (2006).

Kwazulu-Natal Highland Thornveld (Gs 6), which is located on the lower slopes around the higher-lying plateau, consists of hilly, undulating landscapes and broad valleys supporting tall tussock grassland usually dominated by *Hyparrhenia hirta*, with occasional savannoid woodlands with scattered *Acacia sieberiana* var. *woodii* and in small pockets also with *A. karroo* and *A. nilotica*. Kwazulu-Natal Highland Thornveld is classified by Mucina and Rutherford (2006) as LEAST THREATENED.

Income Sandy grassland (Gs 7), through which the proposed powerline is routed, is described as very flat extensive areas with generally shallow, poorly drained, sandy soils supporting low, tussock-dominated sourveld forming a mosaic with wooded grasslands (with *Acacia sieberiana* var. *woodii*) and on well-drained sites with the *A. karroo*, *A. nilotica*, *A. caffra* and *Diospyros lyciodes*. On disturbed sites *A. sieberiana* var. *woodii* can form sparse woodlands. *Aristida congesta*, *Cynodon dactylon* and *Microchloa caffra* are common on shallow soils. This vegetation type is classified as VULNERABLE according to Mucina and Rutherford (2006).

In addition, wetland areas within the project area have also been mapped and classified as Eastern Temperate Freshwater Wetlands (Azf 3). These wetlands usually occur in flat landscapes or shallow depressions filled with temporary water bodies supporting zoned systems of aquatic and hygrophilous vegetation of temporary flooded grasslands and ephemeral herblands. This vegetation type is sensitive. The potential impact of the WEF and associated infrastructure on these and other wetlands in the project area will be assessed.

Kwazulu-Natal Systematic Conservation Plan

Systematic conservation assessment is the technical, often computer-based, identification of priority areas for conservation. This assessment informs conservation planning and decision-making. Two fundamental inputs for the KZNSCP are landcover and vegetation type. The KwaZulu-Natal Systematic Conservation Plan (KZNSCP) addresses:

- Land cover.
- The need to identify and map Critical Biodiversity Areas (CBA).
- Priorities for conservation in KwaZulu-Natal.

The KZNSCP identifies Critical Biodiversity Areas (CBAs) according to irreplaceability criteria and describes three area classifications:

- CBA 1 (Mandatory) has an irreplaceability index of 1, which means that there are no other locations identified as alternatives for achieving the conservation targets for one or more biodiversity feature. Special mitigation measures would need to be considered to safeguard this feature. Once these measures are implemented then development could be permitted in the area.

- CBA 2 (Mandatory) are areas that support high biodiversity, with irreplaceability values between 0.1 - 0.8 which means that there are other locations identified as alternatives for achieving the conservation targets for one or more biodiversity feature, but not many.
- CBA3 is indicative of one or more feature(s) with a high irreplaceability index of 2. This means that there are more alternative sites within which the targets of conservation can be met.

Areas that have not been classified according the analysis, called Biodiversity Areas, are not open for wholesale development as important species are still located within them and should be accounted for in the EIA process.

The proposed Waaihoek WEF is located in predominantly in CBA 3 and Biodiversity areas (EKZNW, 2010) (Figure 6-6). Areas of CBA 1 are located in the south-western portion of the project area which may be affected the powerline routes only.

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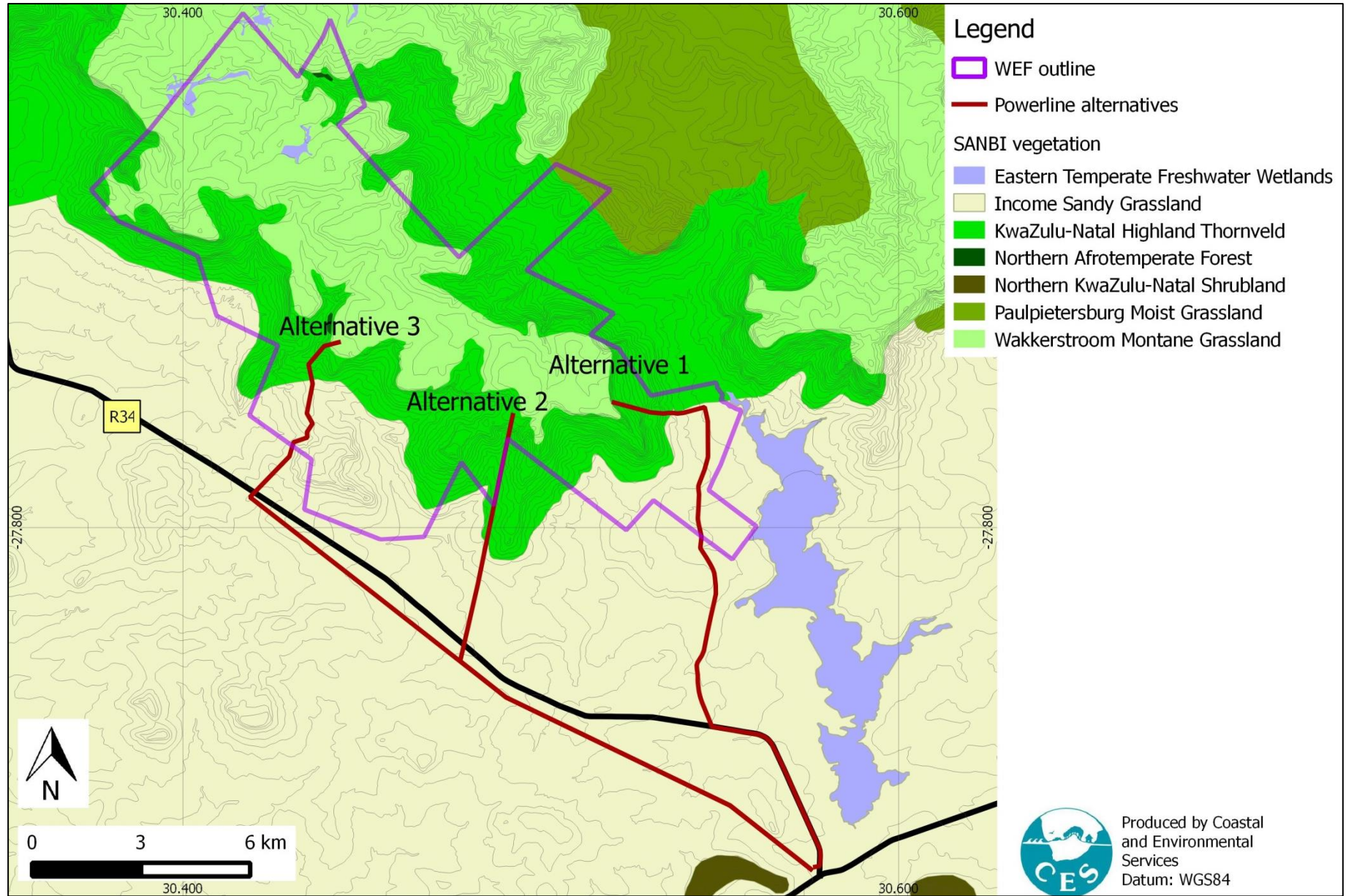


Figure 6-5. Vegetation map showing the National Biodiversity Index (NBI) vegetation type of the proposed Waaihoek WEF Powerline.

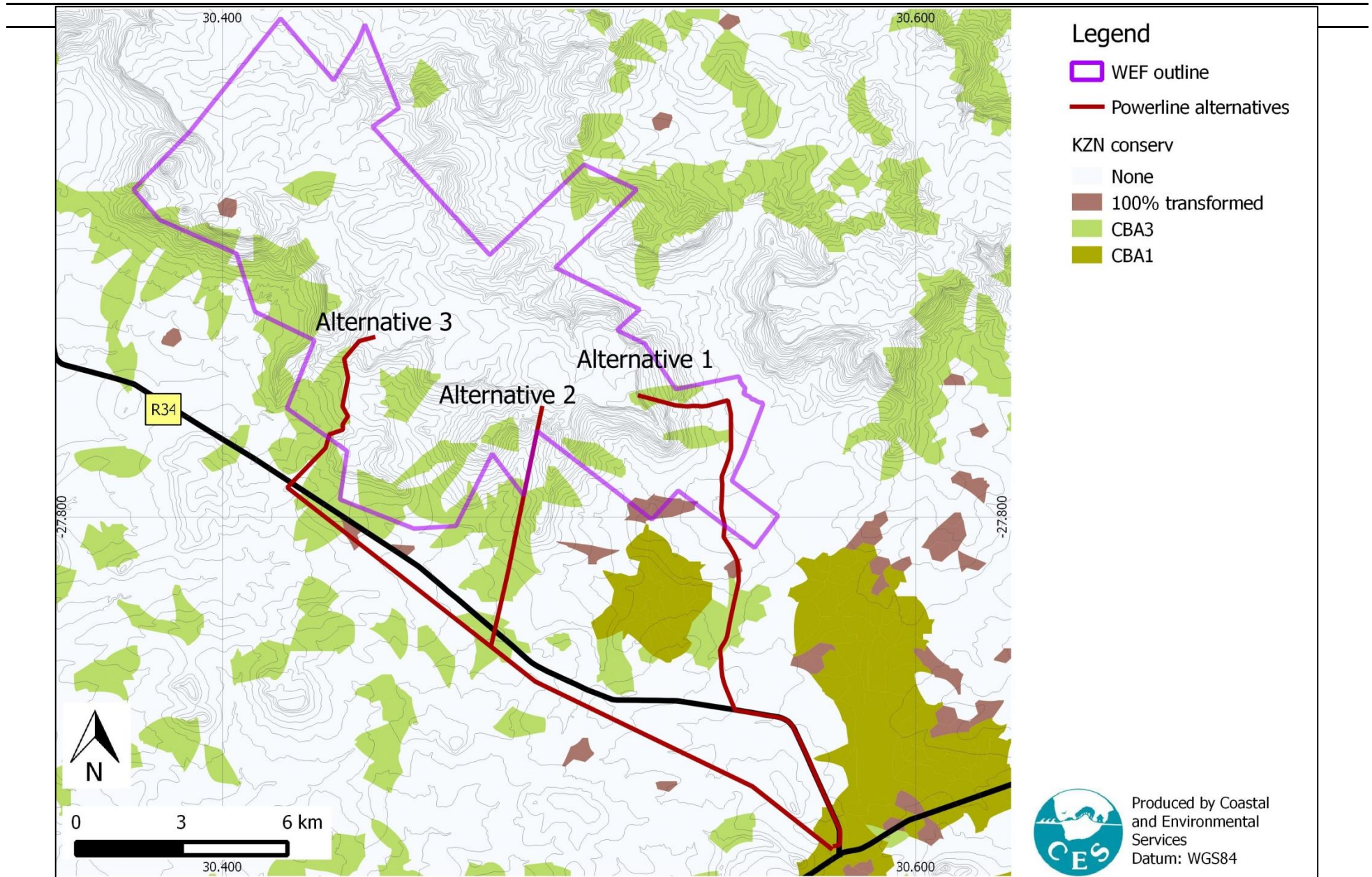


Figure 6-6. The KwaZulu-Natal Systematic Conservation Plan of the proposed Waihoek WEF Powerlines.

6.1.7 Fauna (excluding birds and bats)

Although the Waaihoek WEF project area is currently used for commercial agriculture and is devoid of the large game species, the nature of the agricultural activities is such that ecosystems that support faunal assemblages are still functional. The project area is largely natural grassland, which could support natural populations of various faunal groups. Faunal movement is not restricted, except where farm owners have erected game fences. It is likely that hunting is practiced by local communities, which may have depleted population numbers. Expanding populations of fauna from the Utrecht Balele Community Game Park may move and re-established depleted areas within the project area.

Mammals

Although historically present, large mammals (e.g. elephants) are now locally extinct. Small antelope still occur naturally, while some farms that have been restocked their farms with game e.g. Waterloo Farm and Paardepoort. Antelope that are currently present in the area include: Eland, Blesbuck, Springbok, Wildebeest, Common Duiker and Grey Rhebok.

Table 6-2. Mammals likely to naturally occur within the project area and surrounds according to geographical distribution (Stuart and Stuart (2007))

Common Name	Scientific Name	Red Data Book species (Friedman and Daly, 2004)
Rough-haired Golden mole	<i>Chrysospalax villosus</i>	Critically endangered
Elephant Shrew (Eastern Rock Sengi)	<i>Elephantulus myurus</i>	Least concern
Sclaters Forest Shrew Forest Shrew	<i>Mysorex sclateri</i> <i>Mysorex varius</i>	Endangered Data deficient
Musk Shrews	<i>Crocidura species (at least 3)</i>	Data deficient
Savanna (Chacma) Baboon	<i>Papio cynocephalus ursinus</i>	Least concern
Vervet Monkey	<i>Cercopithecus pygerythrus</i>	Least concern
Scrub Hare	<i>Lepus saxatilis</i>	Least concern
Natal Red Rock Rabbit Smith's Red Rock Rabbit	<i>Pronolagus crassicaudatus</i> <i>Pronolagus rupestris</i>	Least concern Least concern
Woodland Dormouse	<i>Graphiurus murinus</i>	Least concern
Common (African) Mole-rat	<i>Cryptomys hottentotus</i>	Least concern
Porcupine	<i>Hystrix africaeausstralis</i>	Least concern
Greater Cane-rat	<i>Thryonomys swinderianus</i>	Least concern
White-tailed Mouse	<i>Mystromys albicaudatus</i>	Endangered
Fat Mouse	<i>Steatomys pratensis</i>	Least concern
Brants Climbing Mouse Chestnut Climbing Mouse	<i>Dendromus mesomelas</i> <i>Dendromus mystacalis</i>	Least concern Least concern
Highveld Gerbil	<i>Tatera brantsii</i>	Least concern
Namaqua Rock Mouse Red Veld Rat	<i>Micaelamys namaquensis</i> <i>Aethomys chrysophilus</i>	Least concern Least concern
Four-striped Grass Mouse	<i>Rhabdomys pumilio</i>	Least concern
House Mouse	<i>Mus musculus</i>	Introduced
Natal Multimammate Mouse	<i>Mastomys natalensis</i>	Least concern
House Rat	<i>Rattus rattus</i>	Introduced
Angoni Vlei Rat Vlei Rat	<i>Otomys angoniensis</i> <i>Otomys irroratus</i>	Least concern Least concern
Cape Fox	<i>Vulpes chama</i>	Least concern
Black-backed Jackal	<i>Canis mesomelas</i>	Least concern
Cape Clawless Otter	<i>Aonyx capensis</i>	Least concern
Spotted-necked Otter	<i>Lutra maculicolis</i>	Near threatened
Honey Badger	<i>Mellivora capensis</i>	Near threatened
African Striped Weasel	<i>Poecilogale albinucha</i>	Data deficient

Striped Polecat	<i>Ictonyx striatus</i>	Least concern
Slender Mongoose	<i>Galerella sanguinea</i>	Least concern
Water Mongoose	<i>Atilax paludinosus</i>	Least concern
White-tailed Mongoose	<i>Ichneumia albicauda</i>	Least concern
Yellow Mongoose	<i>Cynictis penicillata</i>	Least concern
South African Large-spotted Genet	<i>Genetta tigrina</i>	Least concern
Aardwolf	<i>Proteles cristatus</i>	Least concern
African Wild Cat	<i>Felis silvestris lybica</i>	Least concern
Serval	<i>Leptailurus serval</i>	Data deficient
Leopard	<i>Panthera pardus</i>	Least concern
Aardvark	<i>Orycteropus afer</i>	Least concern
Rock Dassie	<i>Procavia capensis</i>	Least concern
Bushbuck	<i>Tragelaphus scriptus</i>	Least concern
Mountain Reedbuck	<i>Redunca fulvorufula</i>	Least concern
Grey Rhebok	<i>Pelea capreolus</i>	Least concern
Steenbok	<i>Raphicerus campestris</i>	Least concern
Oribi	<i>Ourebia ourebi</i>	Endangered
Common Duiker	<i>Sylvicapra grimmia</i>	Least concern

The proposed Waaihoek WEF Powerline may impact on fauna in several direct or indirect ways including:

- Direct loss of habitat for niche specific species.
- Interruption of communication due to noise generated by pylons.

Reptiles

Three main orders of Reptile are present in southern African namely: Crocodylia, Chelonia (tortoises, terrapins and turtles) and Squamata (snakes, lizards, worm lizards). No Chelonia are reported within the project area by Branch (2001). Most reptiles have limited mobility and have specific habitat requirements. Lizards are commonly habitat specific (small ranges), while snakes are food-specific (wider ranges).

Table 6-3. The project area of the proposed Waaihoek WEF falls within the geographical ranges of the following reptilian fauna

Common name	Scientific name	Red Data
<i>Snakes</i>		
Bibron's Blind Snake	<i>Typhlops bibronii</i>	
Peter's Thread Snake	<i>Leptotyphlops scutifrons</i>	
Common Brown Water Snake	<i>Lycodonomorphous rufulus</i>	
Dusky bellied Water Snake	<i>Lycodonomorphous laevisissimus</i>	
Southern Brown House Snake	<i>Lamprophis capensis</i>	
Olive House Snake	<i>Lamprophis inornatus</i>	
Aurora House Snake	<i>Lamprophis aurora</i>	
Spotted House Snake	<i>Lamprophis guttatus</i>	
Cape Wolf Snake	<i>Lycophidion capense</i>	
Common Slug Eater	<i>Duberria lutrix</i>	
Mole Snake	<i>Pseudaspis cana</i>	
Many-spotted Snake	<i>Amplorhinus multimaculatus</i>	
Rhombic Skaapsteker	<i>Psammophylax rhombeatus</i>	
Cross-marked Grass Snake	<i>Psammophis crucifer</i>	
Cape Centipede Eater	<i>Aparallactus capensis</i>	
Spotted Harlequin Snake	<i>Homoroselaps lacteus</i>	
Striped Harlequin Snake	<i>Homoroselaps dorsalis</i>	
Common Egg Eater	<i>Dasypeltis scabra</i>	
Southern Brown Egg Eater	<i>Dasypeltis inornata</i>	

Spotted Bush Snake	<i>Philothamnus semivariatus</i>	
Green Water Snake	<i>Philothamnus hoplogaster</i>	
Red-lipped Snake	<i>Crotaphopeltis hotamboeia</i>	
Boomslang	<i>Dispholidus typus</i>	
Sundevall's Garter Snake	<i>Elapsoidea sundevallii</i>	
Rinkhals	<i>Hemachatus haemachatus</i>	
Rhombic Night Adder	<i>Causus rhombeatus</i>	
Puff Adder	<i>Bitis arietans</i>	
<i>Lizards</i>		
Cape Skink	<i>Trachylepis capensis</i>	
Variable Skink	<i>Trachylepis varia</i>	
Striped Skink	<i>Trachylepis striata</i>	
Delalande's Sandveld Lizard	<i>Nucras lalandii</i>	
Yellow-throated Plated Lizard	<i>Gerrhosaurus flavigularis</i>	
Highveld Girdled Lizard	<i>Cordylus vittifer</i>	
Drakensberg Crag Lizard	<i>Cordylus melanotus</i>	
<i>Monitors</i>		
Water Monitor	<i>Varanus niloticus</i>	
Rock Monitor	<i>Varanus albigularis</i>	
<i>Geckos</i>		
Van Son's Thick-toed Gecko	<i>Pachydactylus vansonii</i>	

The main impact of the proposed Waaihoek Powerline on reptile fauna within the project area is through habitat loss, especially in rocky outcrop areas.

Amphibians

Wetlands within the project area are likely to support a number of amphibian species. The most species likely to occur in the project area according to distribution ranges are provided in Table 6-4 below. No species has been classified as a Red Data List species (Carruthers and du Preez, 2011).

Table 6-4. Potential amphibian fauna within the proposed Waaihoek WEF project area

Common name	Scientific name
Common Platanna	<i>Xenopus laevis</i>
Natal Cascade Frog	<i>Hadromophryne natalensis</i>
Spotted Shovel-nosed Frog	<i>Hemisus guttatus</i>
Bubbling Kassina	<i>Kassina senegalensis</i>
Rattling Frog	<i>Semnodactylus wealii</i>
Bushveld Rain Frog	<i>Breviceps adspersus</i>
Mozambique Rain Frog	<i>Breviceps mossambicus</i>
Giant Bullfrog	<i>Pyxicephalus adspersus</i>
Tremolo Sand Frog	<i>Tomopterna cryptotis</i>
Tandy's Sand Frog	<i>Tomopterna tandyi</i>
Natal Sand Frog	<i>Tomopterna natalensis</i>
Guttural Toad	<i>Amietophrynus gutturalis</i>
Raucous Toad	<i>Amietophrynus rangeri</i>
Red Toad	<i>Schismaderma carens</i>
Sharp-nosed Grass Frog	<i>Ptychadena oxyrynchus</i>
Striped Grass Frog	<i>Ptychadena porosissima</i>
Common River Frog	<i>Amietia angolensis</i>
Cape River Frog	<i>Amietia fuscigula</i>
Striped Stream Frog	<i>Strongylopus fasciatus</i>
Clicking Stream Frog	<i>Strongylopus grayii</i>
Boettger's Caco	<i>Cacosternum boettgeri</i>

Bronze Caco	<i>Cacosternum namaquense</i>
Snoring Puddle Frog	<i>Phrynobatrachus natalensis</i>

Potential impacts of the proposed Waaihoek Powerline on the amphibian population may include habitat disturbance, especially in the prolific wetlands within the broader project area.

Invertebrates

Generally species, invertebrates are a group of faunal assemblages with no vertebral column. This includes the large range of fauna including, but not limited to: Arthropoda (insects, spiders and crabs), Nematoda and Annelida (worms) and Mollusca (snails, clams and squids).

Representative species from all these phyla will be present within the project area. No detailed assessment of invertebrates has been included in this study. The impacts on invertebrate communities may be associated with direct loss of habitat.

6.1.8 Wetlands

Wetland definition

“Wetland” is a name given to a variety of ecosystems ranging from rivers, springs, seeps and mires in upper catchments, to midland marshes, pans and floodplains, coastal lakes, mangrove swamps and estuaries at the bottom of a catchment. These ecosystems all share the common primary driver of water and its prolonged presence is a fundamental determinant of soil characteristics, vegetation and animal life (DWAF, 2005).

The National Water Act (No. 36 of 1998) defines wetlands as:

“Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.”

Thus wetlands must have one or more of the following characteristics:

- Hydromorphic soils: characteristic soils of prolonged saturation.
- Hydrophytes, at least occasionally: highly saturated plants.
- High water table: A high water table that results in saturation at or near the surface, leading to anaerobic conditions developing in the top 50cm of the soil.

The importance of wetlands

South Africa is a Contracting Party to the Ramsar Convention on Wetlands and has committed itself to the intergovernmental treaty, which provides the framework for the national protection of wetlands and the resources they could provide. The Ramsar Convention is the only global environmental treaty that deals with a particular ecosystem. The treaty was adopted in the Iranian city of Ramsar in 1971 and the Convention's member countries cover all geographic regions of the planet. Wetland conservation in South Africa is now driven by the South African National Biodiversity Institute (SANBI) under the requirements of the National Environmental Management Biodiversity Act (NEMA, 10, 2004).

In natural capital terms wetlands may be seen as a significant economic investment due to their associated ecosystems services. This monetary value is rooted to the fact that the primary tasks of a wetland are to process water and regulate runoff. This is important as the South African economy is heavily dependent on water and yet the climatic variability of the country has meant that for the most part rainfall occurs as intermittent, high intensity storms. The inherent value of wetlands is that they protect and regulate this water source by acting like sponges, soaking up water during flood events and releasing it during dry periods (DWAF, 2005). By regulating water flows during floods, wetlands may reduce flood damage and help prevent soil erosion. As natural filters wetlands help to purify water by trapping pollutants, heavy metals and disease causing organisms.

The most common ecosystem services provided by wetlands are:

- Improved water quality.
- Flood attenuation.
- Sediment trapping.
- Reduce number of water borne diseases.
- Herbal medicine.
- Water storage.

These ecosystem services are provided at very little cost but with significant payback for the South African economy.

Despite being classified as the third most significant life support system on earth (IUCN, 1980), wetlands are some of the most threatened habitats in the world today. Breen & Begg (1989) reported that more than 50% of the wetland inventory in South Africa had disappeared. The main issues have been draining wetlands for crops and pastures, poorly managed burning and grazing resulting in headcut and donga erosion, planting alien invasive vegetation, mining, pollution and urban development. These have been significant as they alter the natural flow of water in wetlands and as water is the driver of wetland formation it follows that any changes would be damaging.

Wetland Legislation and Policy

The South African legislation and international treaties facilitate and enforce the protection of wetlands and rivers. The relevant legislation to the proposed Waaihoek WEF are as follows:

- Section 24 of the Constitution of the Republic of South Africa.
- The Ramsar convention, 1971.
- National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998) inclusive of all amendments.
- NEM: Biodiversity Act, (Act No. 10 of 2004).
- National Water Act, 1998 (Act No. 36 of 1998).
- Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983).
- Nature and Environmental Conservation Ordinance (No. 19 of 1974).
- National Forest Act (No. 84 of 1998).
- National Heritage Resources Act (No. 25 of 1999).

Figure 6-7 indicates the wetlands present in the Waaihoek WEF Powerline area.

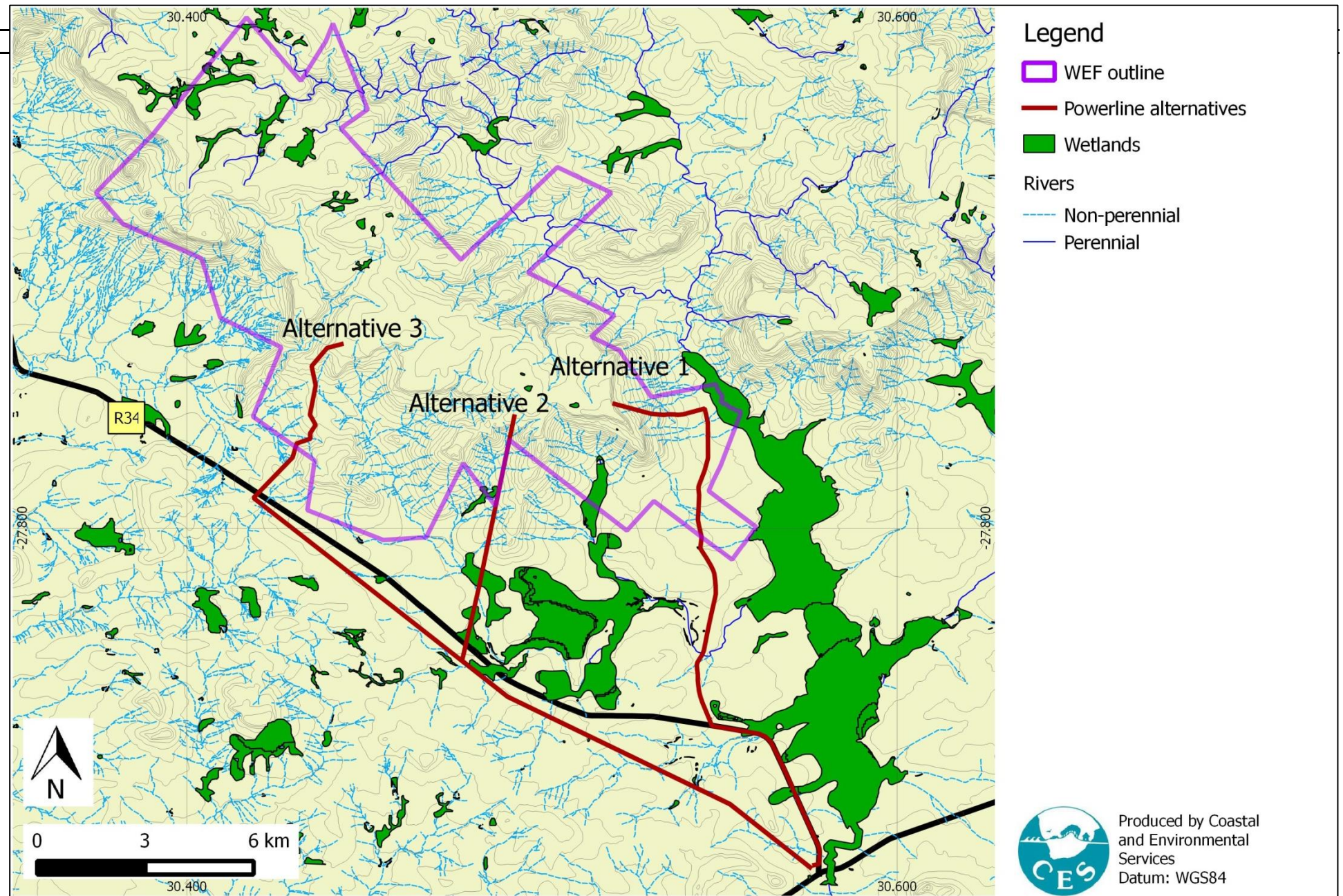


Figure 6-7. Wetland areas in the Waaihoek WEF Powerline project area.

6.1.9 Avifaunal

Important Bird Areas (IBA's) – Birdlife International

The selection of Important Bird Areas (IBAs) is achieved through the application of quantitative ornithological criteria, grounded in up-to-date knowledge of the sizes and trends of bird populations. The criteria ensure that the sites selected as IBAs have true significance for the international conservation of bird populations, and provide a common currency that all IBAs adhere to, thus creating consistency among, and enabling comparability between, sites at national, continental and global levels.

It is crucial to understand why a site is important, and to do this it is necessary to examine its international significance in terms of the presence and abundance of species that occur there, year round or seasonally. At the global level, a set of four categories and criteria are used to assess the significance of the site.

The global IBA criteria are as follows:

A1. Globally threatened species

- *Criterion: The site is known or thought to hold significant numbers of a globally threatened species, or other species of global conservation concern.*
- The site qualifies if it is known, estimated or thought to hold a population of a species categorized by the IUCN Red List as Critically Endangered, Endangered or Vulnerable. In general, the regular presence of a Critical or Endangered species, irrespective of population size, at a site may be sufficient for a site to qualify as an IBA. For Vulnerable species, the presence of more than threshold numbers at a site is necessary to trigger selection.

A2. Restricted-range species

- *Criterion: The site is known or thought to hold a significant component of a group of species whose breeding distributions define an Endemic Bird Area (EBA) or Secondary Area (SA).*
- This category is for species of Endemic Bird Areas (EBAs). EBAs are defined as places where two or more species of restricted range, i.e. with world distributions of less than 50 000 km², occur together. More than 70% of such species are also globally threatened. Also included here are species of Secondary Areas.

A3. Biome-restricted species

- *Criterion: The site is known or thought to hold a significant component of the group of species whose distributions are largely or wholly confined to one biome.*
- This category applies to groups of species with largely shared distributions of greater than 50 000km², which occur mostly or wholly within all or part of a particular biome and are, therefore, of global importance.

A4. Congregations

- *Criteria: A site may qualify on any one or more of the four criteria listed below:*
 - i. The site is known or thought to hold, on a regular basis, $\geq 1\%$ of a biogeographic population of a congregatory waterbird species.
 - ii. The site is known or thought to hold, on a regular basis, $\geq 1\%$ of the global population of a congregatory seabird or terrestrial species.
 - iii. The site is known or thought to hold, on a regular basis, $\geq 20\ 000$ waterbirds or $\geq 10\ 000$ pairs of seabirds of one or more species.
 - iv. The site is known or thought to exceed thresholds set for migratory species at bottleneck sites.

IBA's in relation to the proposed Waaihoek WEF

1. Grassland Biosphere Reserve

The Grassland Biosphere Reserve covers a vast area which is centred on the towns of Volksrust and Wakkerstroom. The proposed Waaihoek WEF project area falls within the southern portions of the reserve (Figure 6-8). The Grassland Biosphere Reserve comprises some 800 private farms, several municipalities and conservancies and a considerable amount of state-owned land. The area covers several catchments and holds many perennial rivers and wetlands.

Location	South Africa, Free State, KwaZulu-Natal, Mpumalanga
Central coordinates	30° 1.00' East 27° 15.00' South
IBA criteria	A1, A2, A3, A4i, A4ii, A4iii
Area	1,050,000 ha
Altitude	1,700 - 2,291m
Year of IBA assessment	2001

The IBA trigger species include:

Species	IBA criteria	IUCN category
Maccoa Duck (<i>Oxyura maccoa</i>)	A4i	Near Threatened
White-backed Duck (<i>Thalassornis leuconotus</i>)	A4i	Least Concern
African Black Duck (<i>Anas sparsa</i>)	A4i	Least Concern
Yellow-billed Duck (<i>Anas undulate</i>)	A4i	Least Concern
Cape Shoveler (<i>Anas smithii</i>)	A4i	Least Concern
Southern Pochard (<i>Netta erythrophthalma</i>)	A4i	Least Concern
Little Grebe (<i>Tachybaptus ruficollis</i>)	A4i	Least Concern
Great Crested Grebe (<i>Podiceps cristatus</i>)	A4i	Least Concern
Black-necked Grebe (<i>Podiceps nigricollis</i>)	A4i	Least Concern
Black Stork (<i>Ciconia nigra</i>)	A4i	Least Concern
Southern Bald Ibis (<i>Geronticus calvus</i>)	A1, A3, A4i	Vulnerable
Hadada Ibis (<i>Bostrychia hagedash</i>)	A4i	Least Concern
Lesser Kestrel (<i>Falco naumanni</i>)	A1, A4ii	Least Concern
Mountain Buzzard (<i>Buteo oreophilus</i>)	A3	Least Concern
White-winged Flufftail (<i>Sarothrura ayresii</i>)	A1, A4i	Critically Endangered
Striped Flufftail (<i>Sarothrura affinis</i>)	A3	Least Concern
Corncrake (<i>Crex crex</i>)	A1	Least Concern
Red-knobbed Coot (<i>Fulica cristata</i>)	A4i	Least Concern
Wattled Crane (<i>Bugeranus carunculatus</i>)	A1	Vulnerable
Blue Crane (<i>Anthropoides paradiseus</i>)	A1, A4i	Vulnerable
Wattled Lapwing (<i>Vanellus senegallus</i>)	A4i	Least Concern
Black-winged Lapwing (<i>Vanellus melanopterus</i>)	A4i	Least Concern
African Snipe (<i>Gallinago nigripennis</i>)	A4i	Least Concern
Black-winged Pratincole (<i>Glareola nordmanni</i>)	A1, A4i	Near Threatened
White-winged Tern (<i>Chlidonias leucopterus</i>)	A4i	Least Concern
Knysna Turaco (<i>Tauraco corythaix</i>)	A3	Least Concern
Ground Woodpecker (<i>Geocolaptes olivaceus</i>)	A1	Least Concern
Olive Bush-shrike (<i>Telophorus olivaceus</i>)	A3	Least Concern
Grey Cuckooshrike (<i>Coracina caesia</i>)	A3	Least Concern
Rudd's Lark (<i>Heteromira ruddi</i>)	A1, A2, A3	Vulnerable
Botha's Lark (<i>Spizocorys fringillaris</i>)	A1, A2, A3	Endangered
African Scrub-warbler (<i>Bradypterus barratti</i>)	A3	Least Concern

Yellow-throated Woodland-warbler (<i>Phylloscopus ruficapilla</i>)	A3	Least Concern
Bush Blackcap (<i>Lioptilus nigricapillus</i>)	A1, A3	Near Threatened
Orange Ground-thrush (<i>Zoothera gurneyi</i>)	A3	Least Concern
White-starred Robin (<i>Pogonocichla stellate</i>)	A3	Least Concern
Chorister Robin-chat (<i>Cossypha dichroa</i>)	A3	Least Concern
Buff-streaked Chat (<i>Oenanthe bifasciata</i>)	A1, A3	Least Concern
Gurney's Sugarbird (<i>Promerops gurneyi</i>)	A3	Least Concern
Sweet Waxbill (<i>Estrilda melanotis</i>)	A3	Least Concern
Yellow-breasted Pipit (<i>Anthus chloris</i>)	A1, A2, A3	Vulnerable
Forest Canary (<i>Serinus scotops</i>)	A3	Least Concern

2. Chelmsford Nature Reserve

Located approximately 45km southwest of the Waaihoek WEF project area (Figure 6-8), Chelmsford Nature Reserve features a gently undulating landscape with lightly wooded hills and flat-bottomed valleys. The Chelmsford Dam, a large, man-made impoundment, and the Ngagane River, are the dominant features in the area.

Location	South Africa, KwaZulu-Natal
Central coordinates	29° 57.00' East 27° 57.00' South
IBA criteria	A1, A4i
Area	5,984 ha
Altitude	1,240 - 1,290m
Year of IBA assessment	2001

The IBA trigger species include:

Species	IBA criteria	IUCN category
Southern Bald Ibis (<i>Geronticus calvus</i>)	A1, A4i	Vulnerable
Black Harrier (<i>Circus maurus</i>)	A1	Vulnerable
Blue Bustard (<i>Eupodotis caerulescens</i>)	A1	Near Threatened
Corncrake (<i>Crex crex</i>)	A1	Least Concern
Blue Crane (<i>Anthropoides paradiseus</i>)	A1	Vulnerable
Ground Woodpecker (<i>Geocolaptes olivaceus</i>)	A1	Least Concern

3. Itala Game Reserve

Itala Game Reserve is located approximately 70km east of the Waaihoek WEF project area in the rolling hills south of the Pongola River (Figure 6-8). Drainage lines and deep valleys, extending predominantly north–south, and opening mostly into the Pongola river basin, cleave the area. This results in an extremely varied topography and rugged terrain, with steep rocky cliff-faces and deep gorges dissected by numerous streams with a network of pools.

Location	South Africa, KwaZulu-Natal
Central coordinates	31° 25.00' East 27° 30.00' South
IBA criteria	A1, A3, A4i
Area	29,653 ha
Altitude	350 - 1,550m
Year of IBA assessment	2001

The IBA trigger species include:

Species	IBA criteria	IUCN category
Southern Bald Ibis (<i>Geronticus calvus</i>)	A1, A4i	Vulnerable
Brown-headed Parrot (<i>Poicephalus cryptoxanthus</i>)	A3	Least Concern
Four-coloured Bush-shrike (<i>Telophorus quadricolor</i>)	A3	Least Concern
Black-bellied Glossy-starling (<i>Lamprotornis corruscus</i>)	A3	Least Concern
Blue Crane (<i>Anthropoides paradiseus</i>)	A1	Vulnerable

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WAAIHOEK WIND ENERGY FACILITY

Important Bird Areas

IBA	Protection Status
Grassland Biosphere Reserve	Partially Protected
Chelmsford Nature Reserve	Fully Protected
Itala Game Reserve	Fully Protected

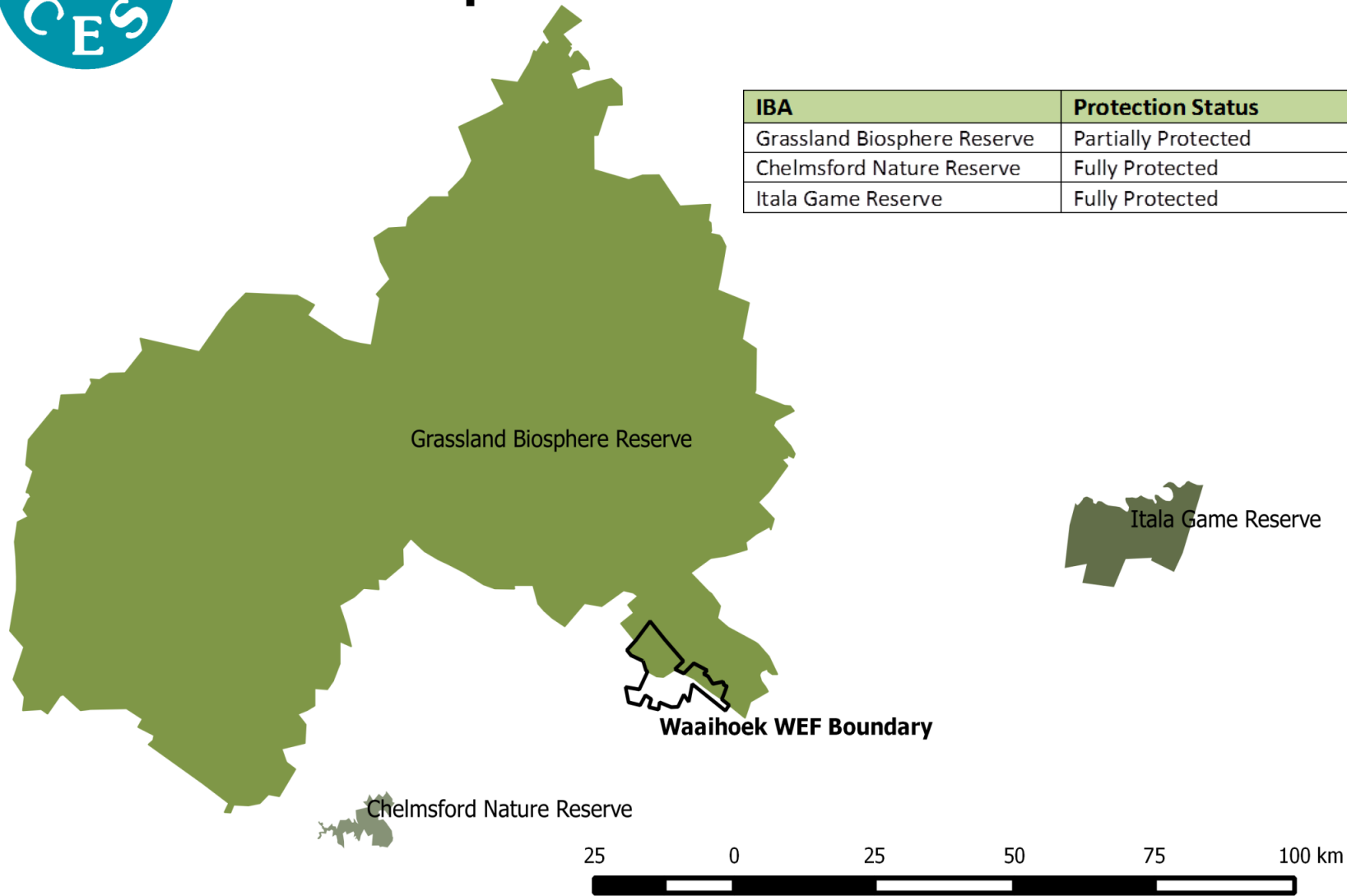


Figure 6-8. Important Bird Areas (IBA's) surrounding the Waihoek WEF development

Waihoek WEF Bird Monitoring Preliminary Report Summary

The 12 month pre-construction Bird Monitoring Programme is currently being undertaken by Chris van Rooyen and Albert Froneman who are Avifaunal Specialist Consultants. The programme was initiated in October 2013 (spring survey). Four site visits will be made during the programme, in order to adequately collect season data. While on site, a number of data collection methods will be used in order to maximise the quantity and improve the quality of the data collection.

Monitoring is conducted in the following manner:

- Drive transects: primarily to record large priority species (i.e. raptors and large terrestrial species).
- Walk transects: primarily to record small passerines.
- Transect monitoring: to gather baseline data on the use of the site by birds in order to measure potential displacement by the wind farm activities.
- Vantage point counts: to measure the potential collision risk with the turbines.
- Priority species were identified using the January 2012 BLSA list of priority species for wind farms.

To date, a total of 44 bird species have been recorded in the proposed Waihoek WEF area, and 30 at the control site during transect counts. The total number of birds recorded during transect counts within the proposed Waihoek WEF area to date is 631 and 317 at the control site (Figure 6-9, 6-10 and 6-11).

Of the transect-recorded species at the turbine site, 8 species (18% of recorded species) are priority species. At the control site, 6 species (20% of recorded species) are priority species.

Four potential focal points of bird activity were identified, two within the proposed Waihoek WEF project area and two at the control focal points. The focal points within the proposed Waihoek WEF area are a wetland, and the cliff face below the escarpment. The control focal points are an active Southern Bald Ibis breeding colony approximately 5km east of the site, and a wetland approximately 5km east of the control drive transect.

More in depth analysis of the data and the observed behaviour will be conducted at the end of the data collection period. Of the priority bird species recorded to date, White-bellied Korhaan, Denham's Bustard, Blue Crane, Southern Bald Ibis and Secretarybird are the most likely candidates for displacement. To date very little flight activity of priority bird species has been recorded.

The results presented thus far are preliminary. Final analysis and recommendations will be done when the pre-construction monitoring is completed and statistical analyses are performed.

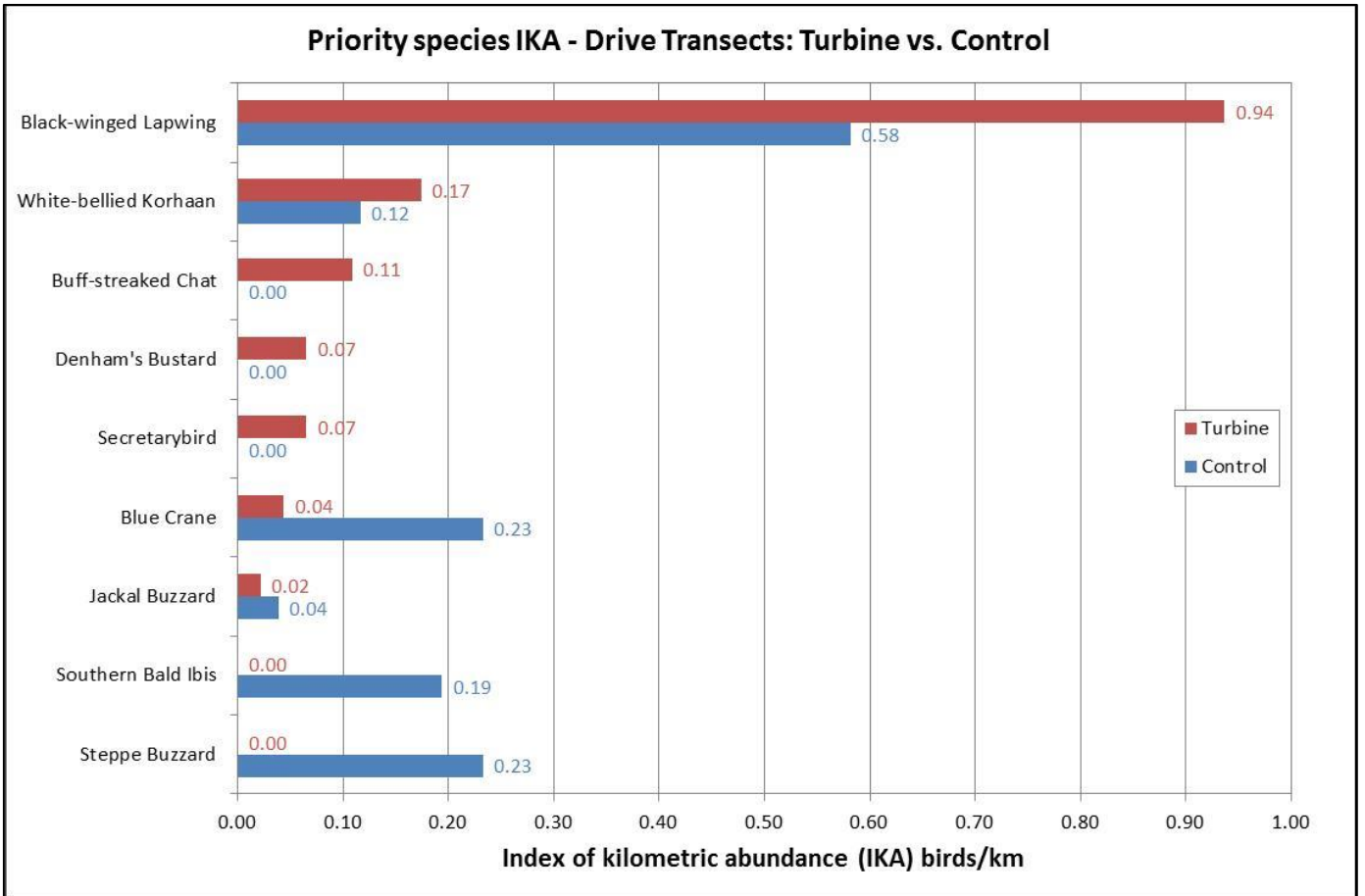


Figure 6-9. IKA for drive transect priority species at the turbine vs. control site

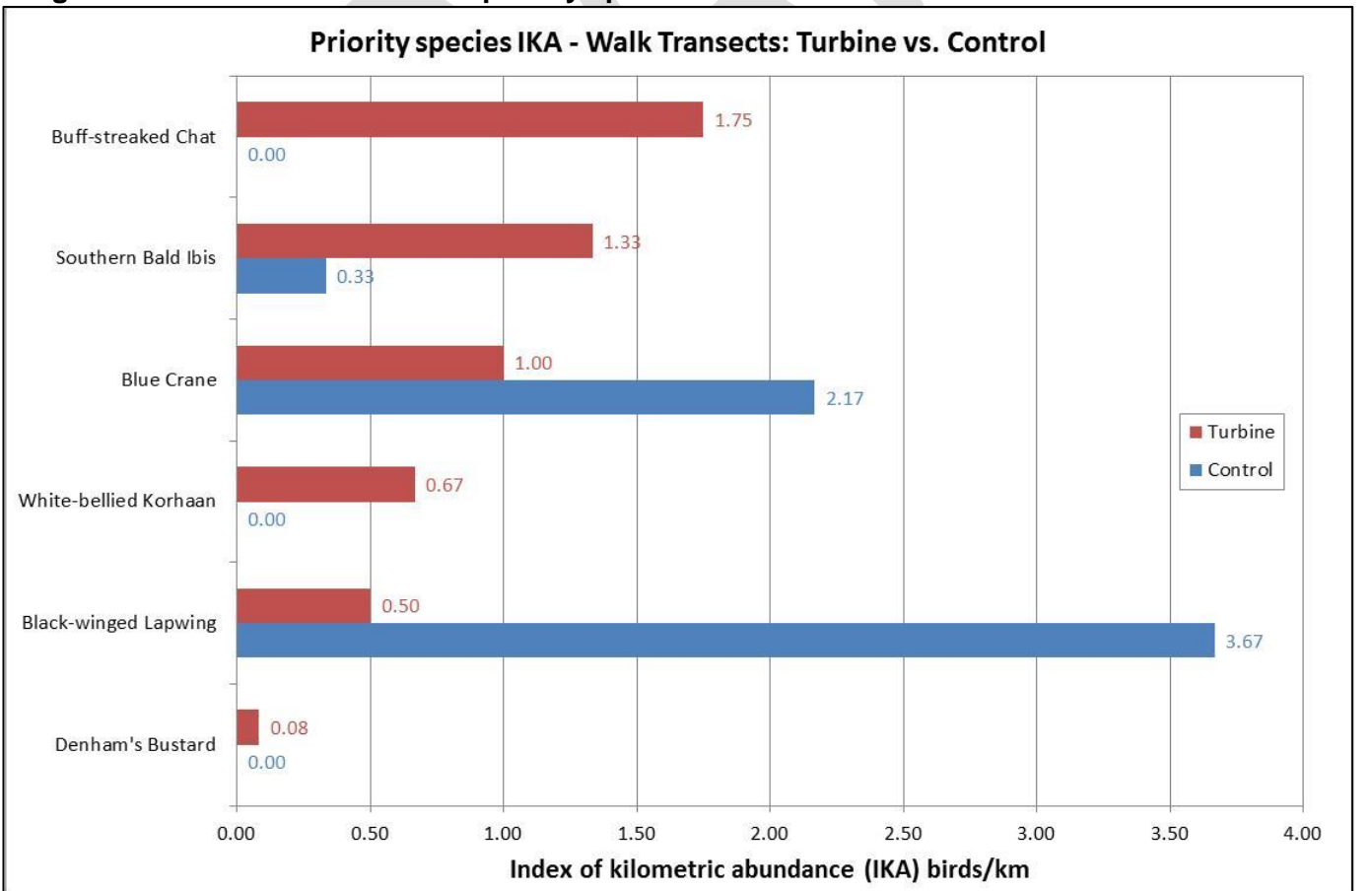


Figure 6-10. IKA for walk transects priority species at the turbine vs. control site

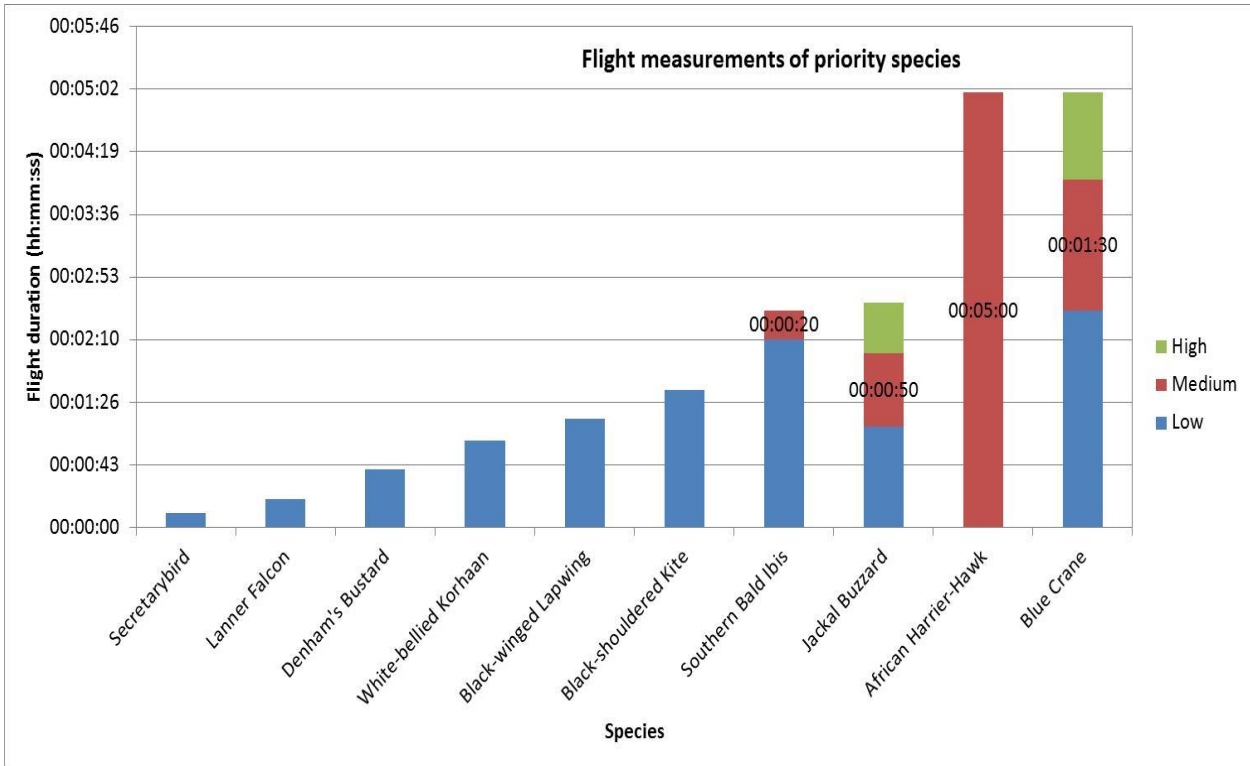


Figure 6-11. Flight time and height recorded for all individuals of priority species to date. Time is indicated in hours: minutes: seconds. Flight height is indicated as low (green/below rotor height = 0-40m) and medium (red/within rotor height = 40-190m) and high (blue/above rotor height = >190m).

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6.1.10 Chiroptera (Bats)

Bats form part of the Order Chiroptera and are the second largest group of mammals after rodents. Most South African bats are insectivorous and are capable of consuming vast quantities of insects on a nightly basis (Taylor 2000, Tuttle and Hensley 2001) however, they have also been found to feed on amphibians, fruit, nectar and other invertebrates. As a result, insectivorous bats are the predominant predators of nocturnal flying insects in South Africa and contribute greatly to the suppression of these numbers. Their prey also includes agricultural pests such as moths and vectors for diseases such as mosquitoes (Rautenbach 1982, Taylor 2000).

Urban development and agricultural practices have contributed to the deterioration of bat populations on a global scale. A mostly negative public perception of bats has detracted from the acknowledgement of their importance as an essential component of ecological systems and their value as natural pest control agents, which actually serves as an advantage to humans.

Many bat species roost in large communities and congregate in small areas. Therefore, any major disturbances within and around the roosting areas may adversely impact individuals of different communities, within the same population, concurrently (Hester and Grenier 2005). In addition, nativity rates of bats are much lower than those of most other small mammals. Therefore, bat populations are not able to recover rapidly after mass mortalities and major roost disturbances.

Table 6-5. Table of species that may be roosting or foraging on the study area, the possible site specific roosts, and their probability of occurrence based on literature (Monadjem et al., 2010).

Species name	Common name	Conservation Status	Likely Risk of Impact (Sowler & Stoffberg, 2014)
<i>Epomophorus wahlbergi</i>	Wahlberg's Epauletted Fruit bat	Least Concern	Medium-High
<i>Epomophorus crypturus</i>	Peters's epauletted fruit bat	Least Concern	Medium-High
<i>Rousettus aegyptiacus</i>	Egyptian rousette	Least Concern	Medium-High
<i>Clootis percivali</i>	Percival's short-eared trident bat	Vulnerable	Low
<i>Hipposideros caffer</i>	Sundevall's leaf-nosed bat	Least Concern	Low
<i>Rhinolophus blasii</i>	Blasius's horseshoe bat	Near Threatened	Low
<i>Rhinolophus clivosus</i>	Geoffroy's horseshoe bat	Least Concern	Low
<i>Rhinolophus darlingi</i>	Darling's horseshoe bat	Least Concern	Low
<i>Rhinolophus simulator</i>	Bushveld horseshoe bat	Least Concern	Low
<i>Taphozous mauritanus</i>	Mauritian tomb bat	Least Concern	High
<i>Miniopterus natalensis</i>	Natal long-fingered bat	Near Threatened	Medium - High
<i>Miniopterus fraterculus</i>	Lesser long-fingered bat	Least Concern	Medium - High
<i>Nycteris thebaica</i>	Egyptian slit-faced bat	Least Concern	Low
<i>Eptesicus hottentotus</i>	Long-tailed serotine	Least Concern	Medium
<i>Myotis tricolor</i>	Temmink's myotis	Least Concern	Medium - High
<i>Neoromicia capensis</i>	Cape Serotine	Least Concern	Medium - High
<i>Scotophilus dinganii</i>	Yellow-bellied house bat	Least Concern	Medium-High
<i>Pipistrellus hesperidus</i>	Dusky pipistrelle	Least Concern	Medium
<i>Chaerephon pumilus</i>	Little free-tailed bat	Least concern	High
<i>Mops condylurus</i>	Angolan free-tailed bat	Least concern	High
<i>Tadarida aegyptiaca</i>	Egyptian free-tailed bat	Least concern	High

Although most bats are highly capable of advanced navigation through the use of echolocation and excellent sight, they are still at risk of physical impact with the blades of wind turbines. Despite the high incidence of deaths caused by direct impact with the blades, most bat mortalities have been found to be caused by barotrauma (Baerwald *et al.* 2008). This is a condition where low air pressure found around the moving blades of wind turbines, causes the lungs of a bat to collapse, resulting in fatal internal haemorrhaging (Kunz *et al.* 2007). Baerwald *et al.* (2008) found that 90% of bat fatalities around wind turbines involved internal haemorrhaging consistent with barotrauma. While there are few documented cases of bats colliding with powerlines, the potential impact will be assessed as part of the greater Waaihoek WEF development.

Waaihoek WEF Bat Monitoring Preliminary Report Summary

To date, three bat species that may be impacted by the proposed Waaihoek WEF have been observed namely; *Miniopterus natalensis*, *Neoromicia capensis* and *Tadarida aegyptiaca*. On-going monitoring will provide more complete information on species that may be present. More detail will be available in the second monitoring report; data from the passive recording devices will provide preliminary indications of high-traffic bat areas, etc.

6.2 Socio-economic profile

6.2.1 Emadlangeni Local Municipality and Amajuba District Municipality

Waaihoek WEF project area falls within the ambit of Emadlangeni Local Municipality (ELM) within the Amajuba District Municipality (ADM) (Figure 6-14). ADM is considered one of the most fertile regions in KZN. The local agricultural sector plays a critical role in the district's and province's economies, especially in terms of production value and employment. Agricultural activities include subsistence farming, forestry, game, cattle, sheep, wheat, soya and, maize. The district is the most important wool producing area in KwaZulu-Natal. ADM offers significant opportunities for tourism investment, including several joint ventures with surrounding districts. The region is close to the majestic Drakensberg Mountains and is an integral part of the internationally renowned Battlefields Route, which focuses on the battles that have sculptured the history of South Africa.

ELM, previously known as Utrecht Local Municipality, is located some 52 km east of Newcastle and 68 km west of Vryheid on the R34. The Local Municipality has through demarcation inherited a large rural area, 3 235km² in extent. It is however the smallest in terms of people in the ADM, with just 6% of the population. Only 10% of people live in urban areas. Established in 1854, Utrecht is one of the oldest towns in KwaZulu-Natal. The land was bought from the Zulu chief, Panda. At the foot of the northern end of the Drakensberg, known as the Balele Mountains, this small valley, with the Encuba River (Schoonstroom), running through it, was chosen by the then settlers for its beauty, peace and tranquillity.

There is a dire need for economic development in the ELM. Limited mining occurs while sectors making a notable contribution to the economy of the area include trade, finance and government services, while agriculture is considered to be the most important economic sector. The ADM as a whole has been well developed, with emphasis on commercial stock farming and the region is the most important wool producing area in KwaZulu-Natal. Dry land crop production occurs on a small scale, and just 1 000ha is under irrigation.

6.2.2 Demographics

According to StatsSA 2011 census ELM has a total population of approximately 34 442 people with 6 252 households and a population growth rate of 0.65% per year. The average household size is 5.2 people and 38.8% of households are female headed. There has been a population growth of 6% (2 165 people) over the last ten years. This low growth could be attributed to a high mortality rate as well as work migration as the area does not offer much in terms of employment and economic activity.

Within the proposed Waaihoek WEF project area the population is characterised by a low density, rural farming community consisting of private farmers and farm managers and the Waaihoek Community Trust. The Waaihoek Community Trust occupies the land through a Regional land Claims Commission that was registered in 1998. In total, 261 households and 400 beneficiaries are currently associated with the Waaihoek Community Trust.

6.2.3 Employment

According to StatsSA, only 29% of the labour force is employed in the ELM. This represents a 24% decrease in employment from 2001 which was 53%. Of those who are employed, over 99% earn less than R1600. This indicates that almost the entire population falls within the indigent bracket and there is a dire need for economic and infrastructure development which have the capacity to create jobs and enrich the area economically. Currently, the largest industry where males are employed is the agriculture sector followed by manufacturing, and wholesale and retail (Figure 6-12). Females are mainly employed in community sectors followed by transport, storage and communication; and wholesale and retail (Figure 6-13).

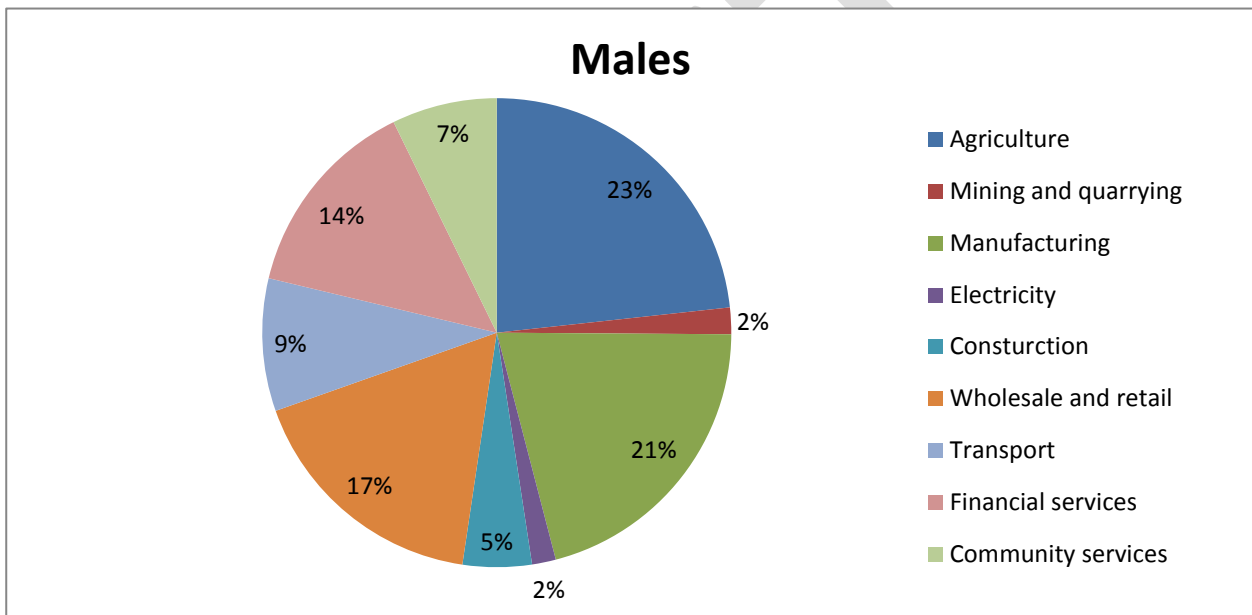


Figure 6-12. The industries within which males are employed in Emadlangeni Local Municipality (StatsSA 2011 census)

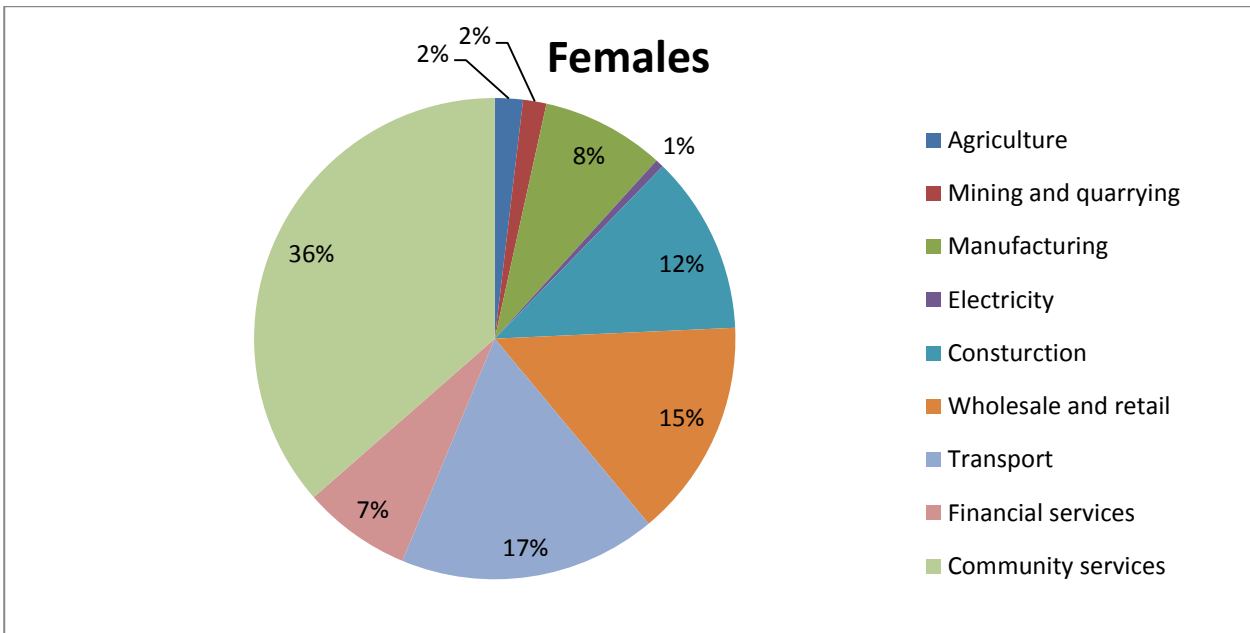


Figure 6-13. The industries within which females are employed in Emadlangeni Local Municipality (StatsSA 2011 census)

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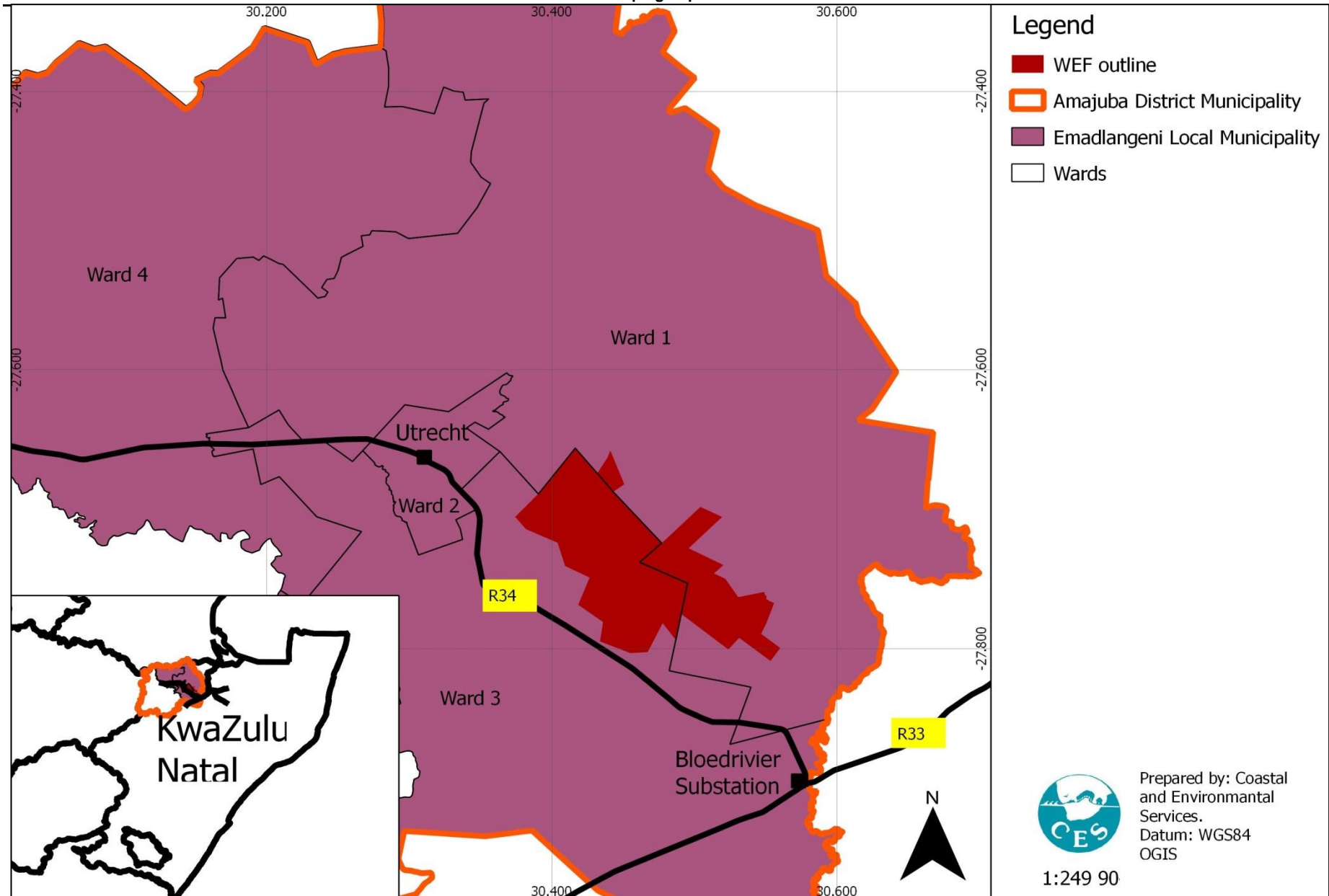


Figure 6-14. The Waaihoek WEF project area in relation to the District and Local Municipality.

6.2.4 Heritage: Culture, History and Archaeology

History and Culture

A desktop assessment of potential historical and cultural sites in the general area has been conducted based on a number of considerations, which are listed below.

Cultural heritage sites are categorised as:

- Sites within the last 60 years.
 - Settlements that are currently inhabited and may or may not have human graves.
 - Settlements that are recently abandoned and may or may not have human graves.
 - Older human settlements (between 10 and 60 years) that are abandoned and probably all have human graves.
- Historical.
 - Human settlements with graves (older than 60 years).
 - Colonial farm buildings and their rubbish middens.
 - Colonial farm walling and cattle byres.
 - Battle Fields relating to the Anglo-Boer wars or Anglo-Zulu War.
 - Towns and their buildings.
 - Features related to the Groot Trek, in this area.
 - Farm boundaries.
 - Cemeteries: farm and battlefields.
- Cultural landscape: How people have modified the landscape and/or have special meaning to specific places on the landscape. This will include historical farm walls that occur in the study area, gardens of old houses.
- Oral History: Sites that have significance to local people but have not been recorded. These are normally associated with historical events. No known sites occur in the data base.
- Living Heritage sites are those areas that have (historical) meaning and reference to an individual and/or group of people. These can be tangible and non-tangible areas. No known sites have been recorded.

Archaeology

Archaeological studies typically include the historical sites in the general area (as described above) and can be further divided into the various time categories:

- Historical Period (1820 – 1900) mainly related to non-written/recorded history.
- Late Iron Age: Human settlements dating from 1100 ACE – 1820 ACE characterised by circular stone wall features in the settlements. Engravings can be associated with these settlements.
- Late Iron Age and Historical Period sites can occur in overhangs and shelters.
- Early Iron Age: 200 ACE – 1100 ACE does not exist in this area.
- Late Stone Age: Dating from c. 30 000 – 1100 years ago (in this area. Includes rock art sites, and people associated with San gatherer-hunters. The sites will occur in overhangs and open fields.
- Middle Stone Age: 250 000 – 30 000 years ago. The sites are mostly found in open fields and consist of stone tools.
- Early Stone Age: 1 million – 250 000 years ago – no sites so far recorded in the area.

Sites of importance identified from desktop assessment

A number of sites of interest in terms of historical or archaeological interest have been identified in and surrounding the proposed Waaihoek WEF project area. These include:

- The Battle of Bloed Rivier Poort is a Provincial Monument with human graves – September 1901. Need to consider the visual impact.
- Historical farms such as Paardepoort, Waaihoek, Goedehoop, Slagveld all have original buildings in various stages of preservation. All built structures over 60 years are automatically protected as are their rubbish middens. Farm buildings will need a permit for any damage and destruction, and this will unlikely be given. Paardepoort is a sensitive area.

- Rock art sites: Four known rock art sites have been recorded.
- Monuments: The grave site at Bloed Rivier Poort is a monument.

6.2.5 Tourism

The Waaihoek WEF project area forms part of the internationally renowned KwaZulu-Natal Battlefields area of South Africa. The area is rich in history, with names such as Shaka, Winston Churchill, Mahatma Gandhi and General Louis Botha associated with historical records and museums. The legacy of the Zulu Kingdom's critical, blood-soaked conflicts is reconciled in this fascinating region's myriad Battlefield sites, historic towns, national monuments and museums.

The area is also rich in natural biodiversity areas, including activities such as white- water rafting down the rapids of the Thukela River, sailing on the Chelmsford Dam, and hunting in the designated hunting reserves. The town of Utrecht lies within the confines of the Balele Game Park and the Utrecht Community Game Farm, with a total Game Park area of 2500 ha. All the mountains that surround the town are part of the Game Park and have been stocked with no fewer than 11 species of game including Impala, Blesbuck, Bushbuck, Waterbuck, Nyala, Red Hartebeest, Blue Wildebeest, Kudu, Burchell's Zebra, Warthog and Giraffe. Utrecht's game reserve association has, in the last 5 years, brought about a greater awareness of the natural surroundings of the town and has shifted the focus of the town from industry to tourism.

The Utrecht Community Game Farm is seen as the core of tourism development in the area. It creates many opportunities for rural tourism and for the manufacturing of arts and crafts in the more remote areas. The conservancy and district offers a variety of experiences that include hiking and horse trails, trout fishing in dams of the pristine Bivane River, birding as well as water sport at the recreation resort.

The Chelmsford Nature Reserve has white rhino, wildebeest, zebra, blesbok, springbok and numerous bird species. Within the reserve, Ntshingwayo Dam, the third largest dam in KwaZulu-Natal is an excellent venue for a variety of water sports. The dam is renowned for carp and bass fishing.

6.2.6 Visual Impacts

Due to the size of both the powerlines pylons (and the sheer size of the associated wind turbines), issues relating to visual impacts are prominent concerns that require addressing when assessing any proposed WEF Powerline. The approach for the assessment of the significance of visual impacts should be aligned with the guidelines for visual assessment specialist studies as set out by South Africa's Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) (Oberholzer 2005). The DEA&DP guideline recommends that a visual impact assessment consider the following specific concepts (from Oberholzer 2005):

- An awareness that 'visual' implies the full range of visual, aesthetic, cultural and spiritual aspects of the environment that contribute to the area's sense of place.
- The considerations of both the natural and cultural landscape, and their interrelatedness.
- The identification of all scenic resources, protected areas and sites of special interest, together with their relative importance in the region.
- An understanding of the landscape processes, including geological, vegetation and settlement patterns, which give the landscape its particular character or scenic attributes.
- The need to include both quantitative criteria, such as 'visibility', and qualitative criteria, such as aesthetic value or sense of place.
- The need to include visual input as an integral part of the project planning and design process, so that the findings and recommended mitigation measures can inform the final design, and hopefully the quality of the project.
- The need to determine the value of visual/aesthetic resources through public involvement.

Criteria applied to assessment:

1. Visual sensitivity: e.g. heritage and protected areas are highly sensitive.

2. Visibility of Development: i.e. what is the geographical extent of visibility?
3. Visual Exposure: extent and duration of visibility.
4. Visual Intrusion: the WEF development is assessed in term of other man-made structure in the surrounding landscape.

Although visual impact assessment criteria attempt to objectify potential impacts, a significant aspect of visual impact depends on the perception and feelings of individuals. The geographical extent of visibility will be mapped once a final WEF layout and WEF powerline have been assessed.

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7 MANNER IN WHICH THE ENVIRONMENT MAY BE AFFECTED

In terms of Section 28(1) of the EIA Regulations (2010), a Scoping Report must contain all the information necessary for a proper understanding of the nature of issues identified during scoping, and must include–

- (g) A description of environmental issues and potential impacts, including cumulative impacts, that have been identified.

7.1 Issues identification

The Table below describes the issues identified during the Scoping Phase. The identification of these issues has resulted in the recommendation for various specialist assessments to be undertaken during the EIA Phase.

Table 7-1. Issue identified during the Scoping Phase.

Biophysical Issues	
Environmental legal and policy compliance	Various items of environmental legislation and policy must be adhered to in order to ensure that the environment is adequately managed for conservation and development.
Terrestrial Fauna	This would include potential impacts on large and small mammals, reptiles, amphibians, invertebrates, etc.
Terrestrial Flora	This issue includes impacts on indigenous and/or protected vegetation, encroachment of alien or invasive vegetation onto disturbed areas, etc.
Wetlands, surface and groundwater	Numerous wetlands and streams have been identified on-site which may be affected by layout and construction of the WEF and associated powerline.
Avifauna	The potential avifaunal impacts include mortality or injury through collision with turbines, habitat loss or alternation, disturbance and displacement. The proposed site is in the vicinity of an identified Important Bird Area. A twelve month bird monitoring programme is required by DEA to be completed prior to the completion of an impact assessment, which will determine the significance of potential impact of the WEF on avifauna. Powerlines also pose a significant threat to birdlife.
Chiroptera (Bats)	A wide variety of bat habitats are present on site, including cliffs and overhangs. A twelve month bat monitoring programme is required by DEA to be completed prior to the completion of an impact assessment, which will determine the significance of potential impact of the WEF and associated infrastructure on bat populations.
Construction waste management	Construction waste will be generated, which may have a detrimental impact on the environment unless correctly disposed of.
Geotechnical	This covers aspects such as soil erodibility, geological formations, etc.
Climate change mitigation	Replacement of fossil fuel-generated electricity with renewable energy-generated electricity is considered to be highly beneficial.
Palaeontology	If deep foundations are required for individual turbines, there is a possibility that remains of paleontological significance may be exposed. These should be documented and conserved wherever possible.

Agricultural Potential	The site proposed is currently zoned for agricultural use. The placement of turbines in areas of high agricultural potential should be avoided wherever possible.
Socio-economic Issues	
Noise	The effect of noise from the operation of turbines can negatively impact on the surrounding land inhabitants. While the powerlines do not pose a significant issue in terms of noise, the associated WEF does require a specialist study.
Landscape & visual	The powerlines routed along roads will contribute towards cluttering of the skyline by the associated turbines.
Social development	Positive impacts may be felt in the surrounding communities as a result of the financial injection and employment opportunities into the area.
Cultural heritage & archaeology	The WEF project area is in proximity to the site of the Battle of Bloedrivier (discussed earlier). There are also identified cave paintings in the area. Impacts on these sites must be minimised.
Tourism	It is difficult to predict the impact of the WEF on tourism. It may be that the construction and operation of the WEF could become a tourist attraction in its own right, but there is no definitive evidence supporting this view.
Existing Infrastructure/services	Existing infrastructure, particularly roads, can be heavily impacted on by the movement of heavy vehicles to and from the site.

7.2 Issue rating

The above identified issues have been preliminarily rated according to an environmental significance scale, **using a precautionary approach** (Table 7-2). This scale is an attempt to evaluate the importance of a particular issue.

Issues that are ranked as being of “VERY HIGH” and “HIGH” significance (Table 7-3) will be investigated further to determine how the impact can be minimised or what alternative activities or mitigation measures can be implemented. These issues may also assist decision makers i.e. numerous HIGH negative impacts may result in a negative decision. These issues will be assessed by specialists qualified to identify, assess the significance of and propose mitigation measures to minimise impacts related to their respective specialised fields.

For issues identified as having “MODERATE” significance (Table 7-3), the most effective and practical mitigations measures will be proposed as part of the general EIA impact assessment.

For issues ranked as “LOW” significance (Table 7-3), management measures will be identified to ensure that the impacts relating to these issues remain of low significance.

Table 7-2. Significance rating table

No Significance
There are no primary or secondary effects at all that are important.
Low Significance
These issues will usually result in medium to short term effects on the social and/or natural environment. Impacts rated as LOW will need to be considered by the public and/or the specialist as constituting a fairly unimportant and usually short term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect.
Moderate Significance
These issues will usually result in medium to long term effects on the social and/or natural environment. Impacts rated as MODERATE will need to be considered by society as constituting a fairly important and usually medium term change to the (natural and/or social) environment. These impacts are real but not substantial.

High Significance
These issues will usually result in long term effects on the social and/or natural environment. Impacts rated as HIGH will need to be considered by society as constituting an important and usually long term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light.
Very High Significance
These issues would be considered by society as constituting a major and usually permanent change to the (natural and/or social) environment, and usually result in severe or very severe effects, or beneficial or very beneficial effects.

Table 7-3. Significance of identified issues pre-mitigation.

Issue	Planning and Design	Construction	Operation	Decommissioning	Assessment Type
Biophysical Issues					
Environmental Legal and Policy compliance	Moderate	No	No	No	General EIR
Terrestrial Fauna	Low	Low	Low	Low	General EIR
Flora	High	High	High	High	Specialist
Wetlands, Surface and Groundwater	High	High	No	No	Specialist
Avifauna	High	Low	High	Low	Specialist
Chiroptera	Moderate	Low	Moderate	Low	Specialist
Waste Management	No	Moderate	No	Moderate	General EIR
Geotechnical	No	Moderate	No	Moderate	Specialist
Air Quality and Climate Change	No	No	High Positive	No	General EIR
Palaeontology	No	High	No	No	Specialist
Agricultural Potential	No	Low	Moderate	Low	Specialist
Socio-economic Issues					
Landscape & visual	High	Low	High	Low	Specialist
Social development	No	Moderate	High Positive	Low	Specialist
Traffic & transport	Moderate	Moderate	No	Moderate	General EIR
Cultural heritage & archaeology	Very High	Very High	No	No	Specialist
Tourism	No	Low	High	Low	General EIR
Existing infrastructure/services	No	Moderate	No	Moderate	General EIR
Land Use	No	Low	Low	Low	General EIR

Based on the above rating of impacts, specialist studies will be conducted on the aspects listed below. The terms of reference for these studies can be found in Section 9 of this report; the Plan of Study for the EIR.

- Visual Impact Assessment (9.2.1)
- Ecological Impact Assessment (9.2.2)
- Wetland Delineation and Hydrology Assessment (9.2.3)
- Avifaunal Impact Assessment (9.2.4)
 - This assessment is currently in the second season of the 12 month monitoring programme.
- Chiroptera (Bat) Impact Assessment (9.2.5)
 - This assessment is currently in the second season of the 12 month monitoring programme.
- Archaeological Impact Assessment (9.2.6)
- Paleontological Impact Assessment (9.2.7)
- Agricultural Impact Assessment (9.2.8)
- Socio-economic Impact Assessment (9.2.9)

8 PUBLIC PARTICIPATION

In terms of Section 28(1) of the EIA Regulations (2010), a Scoping Report must contain all the information necessary for a proper understanding of the nature of issues identified during scoping, and must include–

- (h) Details of the public participation process conducted in terms of regulation 27(a), including-**
 - (i) The steps that were taken to notify potentially interested and affected parties of the application**
 - (ii) Proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the application have been displayed, placed or given;**
 - (iii) A list of all person or organisations that were identified and registered in terms of regulation 55 as interested and affected parties in relation to the application; and**
 - (iv) A summary of the issues raised by interested and affected parties, the date of receipt of and the response of the EAP to those issues.**
- (k) Copies of any representations, and comments received in connection with the application or the scoping report from interested and affected parties;**
- (l) Copies of the minutes of any meetings held by the EAP with interested and affected parties and other role players which record the views of the participants; and**
- (m) Any responses by the EAP to those representations and comments and views.**

8.1 Notification of interested and affected parties

Please note that all proof of Public notification (images and photographs) are attached in Appendix A.

1. Newspaper advertisement

The proposed activity was advertised in the Natal Witness and Vryheid Herald on 25th October 2013. This advertisement detailed the proposed development and provided Interested & Affected Parties (I&APs) with 30 days to register. See Appendix A.

2. Onsite notice

A notice board, measuring 1x1.2 m was placed at three sites within the proposed Waaihoek WEF project area (See Figure 8-1 below). The onsite notices are clearly visible from the road and are strategically placed at all the alternative access points, as well as at the Bloedrivier Substation, and will remain in situ for the duration of the EIA process (See Appendix A for photographic evidence). In addition to these A3 posters were also put up in Utrecht at the Municipal Offices. See Appendix A.

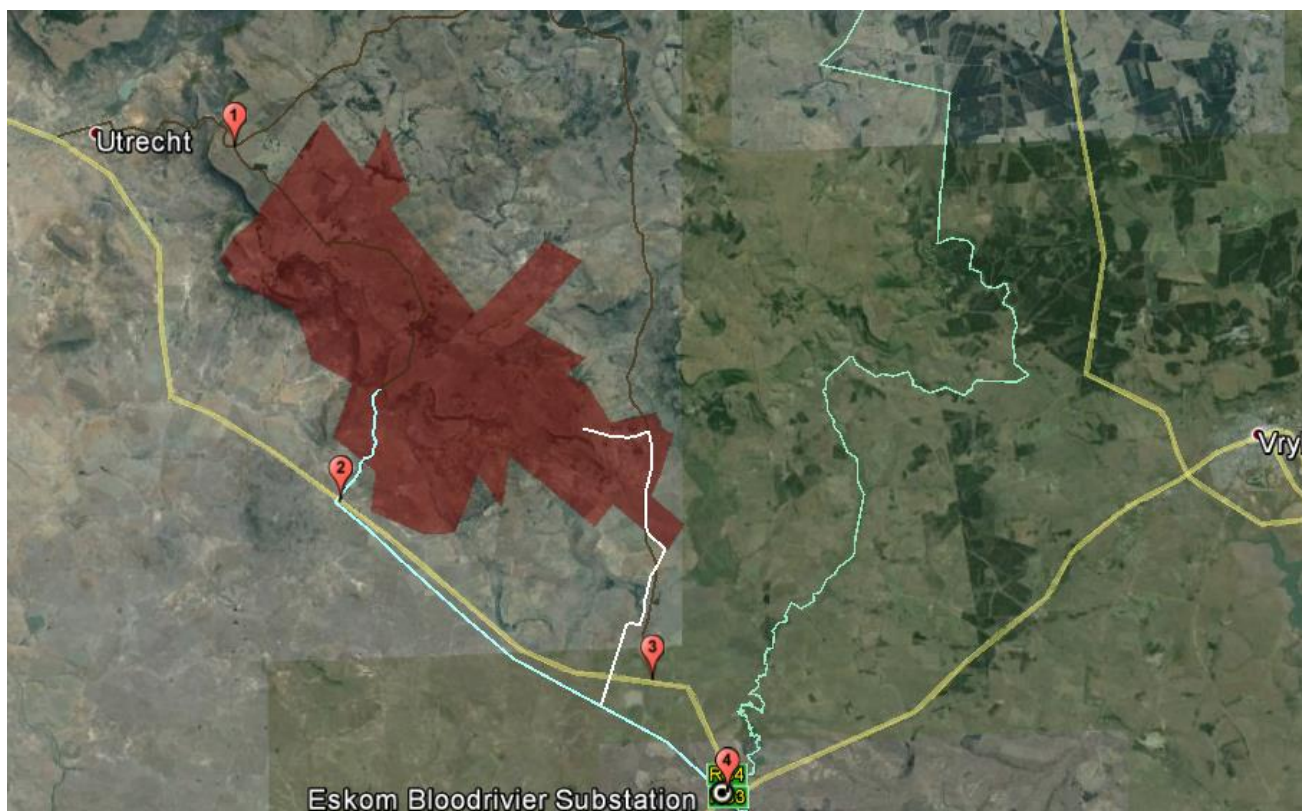


Figure 8-1. Location of onsite notices.

3. Interested and Affected Parties (IAPs) identification and notification

In addition to the above notification, certain IAPs were identified based on their potential interest in the project. In Table 8.1, relevant organisations were contacted either via e-mail or directly for comment and were sent a Letter of Notification and a Background Information Document (BID). In addition, surrounding landowners and additional IAPs were identified and notified, the details of which can be found in Appendix B.

Table 8-1. The identified stakeholders for the proposed Waaihoek WEF.

Identified stakeholders	
Organisation	Contact Name
SANRAL	Ms Nanna Gouws
Department of Agriculture, Forestry & Fisheries: Land Use & Soil Management	Ms Anneliza Collett
Eskom: Renewable Energy	Mr Kevin Leask
Eskom	Ms Tshililo Nekhalali
Eskom: Land & Rights Section	Ms Michelle Nicol
Department of Water Affairs	Ms Zethu Makwabasa
Department of Energy	Ms Mokgadi Mathekgana
Department of Environmental Affairs: General Enquiries	Mr Albi Modise
Department of Environmental Affairs: Project Enquiries	Ms Mmatlala Rabothata
Department of Agriculture & Environment (DAE) KZN: Senior Manager Environmental Affairs North Region	Dr LW Mngoma
Department of Agriculture & Environment (DAE) KZN: Environmental Services District Manager	Mr Zama Mathenjwa
Department of Agriculture & Environment (DAE) KZN: Amajuba District Agriculture District Manager	Mr John Nhleko
Department of Agriculture & Environment (DAE) KZN: HOD EIA	Mr Poovey Moodley
Amajuba DM Manager	Mr Linda Africa
Emadlangeni LM Manager	Ms GP Ntshangase
Emadlangeni Technical Services	Mr Khumbulani Gwala

Identified stakeholders	
Organisation	Contact Name
Emadlangeni Ward 1 councillor	Cllr V. Ndlovu
Emadlangeni Ward 3 councillor	Cllr B.M Phenyane
Renewable energy forum in KZN: Chairperson	Ms Abigail Knox
Telkom	Mr Raymond Couch
Sentech	Ms Alishea Viljoen
Vodacom	Mr Andre Barnard
Civil Aviation Authority	Ms Lizelle Stroh
Air Traffic and Navigation Services (ATNS): Vryheid and Newcastle airports	Mr Dylan Fryer
Ezemvelo KZN Wildlife	Ms Dinesree Thambu
Ezemvelo KZN Wildlife	Ms Felicity Elliott
Ezemvelo KZN Wildlife: Integrated Environmental Management	Mr Andy Blackmore
Ezemvelo KZN Wildlife: District Conservation Officer, Underberg Region	Mr Richard Schutte
Ezemvelo KZN Wildlife: Regional Ecologist	Ms Sonja Kruger
Ezemvelo KZN Wildlife: Ecological Advice Division	Mr Ian Rushworth
Ezemvelo KZN Wildlife: KZN Biodiversity Stewardship Programme	Mr Greg Martindale
Ezemvelo KZN Wildlife: Avifaunal unit	Mr Athol Marchant
Ezemvelo KZN Wildlife: District Ecologist	Mr Petros Ngwenya
AMAFA / Heritage KwaZulu Natal	Ms Annie van der Venter
AMAFA / Heritage KwaZulu Natal	Mr James van Vuuren
Birdlife South Africa	Mr Daniel Marnewick
Birdlife South Africa	Dr Hanneline Smit-Robinson
Birdlife South Africa: Birds and Renewable Energy Manager	Ms Samantha Ralson
Endangered Wildlife Trust: CEO	Ms Yolán Friedman
Endangered Wildlife Trust: Head of Conservation Science	Dr Harriet Davies-Mostert
Endangered Wildlife Trust: African Crane Conservation Programme Manager	Ms Kerryn Morrison
Endangered Wildlife Trust: African Crane Conservation Programme Field Officer	Ms Glenn Ramke
Endangered Wildlife Trust: Senior Field Officer KZN	Ms Tanya Smith
Endangered Wildlife Trust: Wildlife & Energy Programme	Mr Lourens Leeuwner
WESSA KZN Region	Ms Jenny Duvenage
WESSA KZN Region: Conservation Project Manager	Mr Chris Galliers
WESSA KZN Region: Conservation Director	Mr Garth Barnes
WWF: Enkangala Grasslands Project South Africa	Mr Angus Burns
The Bat Interest Group of KwaZulu-Natal	Ms Wendy White
Utrecht Farmers Association	Ms Michelle van Staden
Ingogo Farmers Association	Mr Jan Smit
Groenvlei Farmers Association	Mr Christoff Joubert
Dejagersdrift Farmers Association	Mrs Patricia Strauss
Vryheid Farmers Association	Ms Lurien Jacobsz
Battlefields Route Association KZN	Mr Dave Sutcliff

8.1.1 Surrounding and Affected Landowners

The residents of the surrounding areas will be provided with an initial letter of introduction to the project and a BID during the site meetings. These documents included the contact details of the EAP in order for the landowners to register themselves and/or submit their comments on the proposed development.

8.1.2 Registered I&APS

Other than I&APs initially identified, any person requesting to be registered as an I&AP was included into the I&AP database (Appendix B).

8.1.3 The Public Participation Process to be followed going forward include:
Release of the Draft Scoping Report for Authority, Stakeholder and Public review.

The WEF Draft Scoping Report was available for public review from the 14th April 2014 – 2nd June 2014 (authority comment period) and 17th April – 6th June 2014 (remaining I&AP comment):
Hard copies of the Draft Scoping Report were made available at:

1. Utrecht Public Library.
2. Electronic copies were emailed to all stakeholders.
3. Electronic copies were made available on the CES website (www.cesnet.co.za)

This document, which is a condensed powerline specific version of the original WEF document, will be available for public review from the 27th June 2014.

8.1.4 Issues and Response Trail

A number of initial focus group meetings were held (Appendix A, 13.1.3), where key issues were raised. The table (Table 8.2) below summarises the main issues raised through group meetings and during the public review period, and includes the EAP responses to these issues.

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Table 8-2. Issues Raised by I&APs and Response:

Issues	Stakeholder	Response
Biophysical Issues		
<p>There is a large wetland that exists between the Bloedrivier and Groenvlei.</p>	<p>Emadlangeni Municipality</p>	<p>A wetland and hydrology specialist study is being conducted to assess the impacts of the WEF on wetland areas, the statement has been noted and will be addressed in the specialist study.</p>
<p>Will agriculture and specifically cattle farming be able to proceed as normal? What effects will the windfarm have on cattle farming? What will be the spin-off to the owners, and will Mainstream buy the land or lease it from the landowner?</p>	<p>Boshoff Davel (Farm owner)</p>	<p>Studies have found that the impact on agriculture is low. There is disturbance during the construction phase as the building of roads and digging of foundations results in a high level of activity. Farmers have had to temporarily cordon off certain areas of their farms during the year and a half to two years of construction, so there will be some inconveniences, but once the turbines are completed and rehabilitation is done and the contractors are gone, the farmer can proceed as before. According to calculations only between 1% and 5% of the farm land will be taken up by the turbine footprints and the roads. An agricultural specialist study is currently underway to assess the impact of the WEF on the surrounding agriculture</p>
<p>There are about 200 Blue Cranes as well as Wattled Cranes on a farm (which is not on the site but on the way to Dundee) stop over during the winter months to breed. Will monitoring of these sites be short or long term?</p>	<p>Lourens Greyling (Farm owner)</p>	<p>An avifauna specialist study is being conducted to assess the impacts of the WEF on birdlife in the area. Long term monitoring is currently underway.</p>
<p>Chris Van Rooyen (the bird specialist) was saying that it has been found that in certain studies overseas, individual turbines on a farm can actually cause major impacts on bird populations, no matter how good your mitigation is. He said that for example there may be 1 or 2 turbines, or a line of turbines that cause more impacts than the others. The concern therefore is what happens when turbines in a specific area cause serious impacts. How is that written into the Scoping Report and the impact statement and what arrangements are made in the management program in the long term?</p>	<p>Robert Stannard (Farm owner)</p>	<p>The EIA is done and specialists are appointed to identify impacts beforehand. If 1 or 2 turbines or a certain part of the site have a bigger impact, it is likely that the wind farm operator would be required to shut down those turbines if necessary. An avifauna specialist study is being conducted to assess the impacts of the WEF on birdlife in the area. Long term monitoring is currently underway.</p>

<p>There is limited bat data available and a further concern is the fact that the appointed specialist is not based in KZN.</p>		<p>The bat specialist study has already conducted two site visits, including initial surveys and determining where the best positions are to erect their masts with detectors. Various other factors are also considered when installing bat detectors, like safety and security as the detectors must be erected at height and in areas where they might be stolen or vandalised. All the appointed specialists are accredited scientists in their respected fields with sufficient experience in assessing the impact of a new windfarm on the natural environment.</p>
<p>There is an affected property that falls in a demarcated private nature reserve as gazetted under the Protected Areas Act. Ezemvelu database names it the Remainder of Farm 77 Paardepoort. Mainstream would not be able to construct wind turbines on a protected area, as per legislation, and that Ezemvelu would oppose it. There are buffers in terms of certain types of land uses in protected areas but those are state protected areas. She did not know if this would apply to private protected areas. The buffer is an EIA trigger so it is dependent on the land use being proposed. 5km is the first trigger. CES should probably contact the Ekangala Grassland programme because the proposed wind farm is located just outside their hotspot area.</p>	<p>Ezemvelu Wildlife</p>	<p>The statement has been noted and will be investigated during the specialist studies.</p>
<p>An immediate concern is the fact that the proposed wind farm is situated on a plateau. This is going to have a big implication on birds, but will wait for the outcome of the bird specialist assessment. Ezemvelu will follow up with Ian Rushworth as he might have specific site data ready for that area. The dissemination data given to CES will help in the assessment as that is what their specialists would use. Ezemvelu could not provide CES with a sector plan as it is still being worked on, but they might have one ready in January.</p>		<p>The statement has been noted and CES will follow up with Ezemvelu on getting a copy of the Sector Plan. Bird specialist to follow up with Ian Rushworth on bird data for the area.</p>

<p>What are KZNSCP basing their CBA's on. It is based on both vegetation types and species and habitat requirements.</p>		<p>The statement has been noted and will be investigated during the specialist studies.</p>
<p>The proposed wind farm is located in an altitudinal corridor as well as a macro corridor.</p>		<p>CES to investigate impacts on the altitude corridor.</p>
<p>Will cattle grazing be negatively affected?</p>	<p>Waihoek Community</p>	<p>The statement will be addressed during the agricultural specialist study.</p>
<p>Very little additional information has been provided with regards to the potential impacts on birds</p>		<p>The potential impacts with regards to birds has been raised on pages 87-88 of the DSR, additionally we have added the following to the table: "the potential avifaunal impacts include mortality or injury through collision with turbines, habitat loss or alternation, disturbance and displacement. As per the best practice guidelines, the specific avifaunal impacts can only be determined after a 12 month monitoring period. Please note that bird monitoring only commenced in October 2013. We have however, as previously stated, included the results of the first two bird monitoring reports (pages 71-73).</p>
<p>The scoping report should be based on a desktop review of available information, as well as a short site visit</p>	<p>BirdLife South Africa</p>	<p>Please refer to pages 66-70 with regard to the desktop review. This section describes and refers to specific IBA's as well as lists of potentially vulnerable birds specific to these areas. This section also includes a map indicating the proximity of the IBA's to the proposed Waihoek Wind Energy Facility. This information was obtained from the information available on the BirdLife South Africa website. Please refer to pages 71-73 with regard to the site visit. This section details the data obtained, by Mr Chris van Rooyen, during the first and second bird monitoring site visits. This section of the report explains how the monitoring is conducted and site specific information relating to priority species, control focus points, etc. has been listed.</p>
<p>By outlining the proposed approach to monitoring any concerns or omissions in the proposed approach to impact assessment can be highlighted at an early stage of the process, rather than after a full years study, when it is much more challenging to address any shortcomings</p>		<p>Please refer to pages 103 which refers to the Terms of Reference, which Mr Chris van Rooyen has detailed, making specific reference to "BirdLife South Africa/Endangered Wildlife Trust best practice guidelines for avian monitoring and impact mitigation at proposed wind energy development sites in southern Africa</p>

<p>We do urge you to discuss any proposed deviations from the Best Practice Guidelines with us, should any be contemplated</p>		<p>BirdLife South Africa's comments have been forwarded to Mr Chris van Rooyen. However, as stipulated in his Terms of Reference, we do not anticipate any deviations from the BirdLife South Africa / Endangered Wildlife Trust's best practice guidelines</p>
<p>The proposed site overlaps with the migratory range of the Straw Coloured Fruit Bat (Rare Migrant) as well as the distribution range of the Wahlberg's Epauletted Fruit bat. These bats do not use echolocation to navigate and may be affected by the development</p>		<p>Efforts are made to determine whether the proposed development would significantly affect any fruit bats. The turbine placement area is not deemed typical fruit bat habitat, however very little data of fruit bat activity and commuting (if any) in such terrain exist and must be determined</p>
<p>Will there be a specific monitoring effort to determine the presence of fruit bats in the area, as passive recording devices will not detect these</p>	<p>Endangered Wildlife Trust</p>	<p>Manual surveys are done during each site visit and specific efforts for determining the presence of fruit bats have been incorporated into the methodology from here onwards. Such efforts include netting at areas most likely to support fruit bats on site, investigating possible feeding areas for spit outs, listening for male mating calls (specifically E. wahlbergi) and visual observations for commuting fruit bats by means of spot lights. Locals will also be questioned. Areas with a probability of providing fruit bat roosts, foraging areas as well as predictions of probable commuting paths have been assigned sensitivities in the preliminary bat sensitivity map</p>
<p>A faunal species description from discussion with locals and literature is totally inadequate when there is the possibility of endangered mammals on the site. That part of KwaZulu-Natal is very poorly surveyed for mammals and the literature available cannot give an accurate portrait of the situation on the ground.</p>	<p>Richardson & Peplow Environmental</p>	<p>Please note that the objectives of a Scoping Report in an EIA process is to undertake a literature review in order to determine the Scope of work to be undertaken and inform the Environmental Impact Assessment and is not intended to provide comprehensive site specific detail. Discussion and engagement with "locals" can be critical. National and International guidelines agree that local content can provide be extremely informative, especially at local scales, and must be undertaken. This is particularly relevant for the current project, where one of the "locals" who have been engaged, also happens to be an environmental consultant and game warden for the local Utrecht Game Reserve.</p>

<p>All mole species are highly dependent on ground vibrations for communication and predator avoidance. Wind turbines produce a large amount of vibration which could impact extremely negatively on all the species of moles in the area, especially <i>Chrysospalax villosus</i> (Critically Endangered). Either a full monitoring programme needs to be undertaken or all turbines set back 500 m from any soils which might contain these moles</p>		<p>Careful note of this issue has been made. The following needs to be taken into account: a) The soils (or lack thereof) in the project area are not a likely habitat for <i>Chrysospalax villosus</i>, which prefer sandy soils and dense vegetation. The distribution of <i>Chrysospalax villosus</i> has been researched to some degree (see IUCN) and surveyed within the project area. The only population recorded in proximity of the project area is approximately 50 km north around the area of Volksrust and Wakkerstroom. Unlike birds and bats that will be fatally affected by turbines, ground vibrations may only deter moles from the region. Considering the above, it is our opinion that a full monitoring programme during the EIA is not necessary. Nor is a 500 metre buffer or set back line, which has no scientific basis and may not prove an effective mitigation. A general faunal monitoring programme for selected faunal species, which could include <i>Chrysospalax villosus</i> would be recommended as part of the Environmental Management Programme which would commence prior to construction, in the event that this project is selected under the RE-IPPPP sometime in the future.</p>
<p>The above comments on vibrations also need to be applied to all the shrews in the area.</p>		<p>For reasons similar to those given in Response 2, general faunal monitoring programme for selected faunal species, which could include shrews would be recommended as part of the Environmental Management Programme which would commence prior to construction, in the event that this project is selected under the RE-IPPPP sometime in the future</p>
<p>The Department of the Environment requires that all pre-construction monitoring is carried out in accordance with The South African Good Practice Guidelines for Surveying Bats at Wind Energy Facility Developments - Pre-construction.</p>	<p>KZN Bat Interest Group</p>	<p>The preconstruction monitoring for the proposed Waaihoek WEF is conducted in accordance with these guidelines, where scientifically and practically sensible, by Mr Werner Marais, Bat Specialist.</p>
<p>Any deviations from the guidelines must be scientifically or practically (not economically or logistically) justified. Financial, security or capacity constraints are not acceptable reasons for deviating from the minimum requirements.</p>		<p>The minimum requirements are always followed, where scientifically and practically sensible, however security issues on this particular site are of high concern and conscious efforts are made to minimise its effects.</p>

<p>The methodology takes no account of the fact that this is an area known for frequent and intense electrical storms. Bat monitoring equipment is highly susceptible to lightning damage and we consider 5 site visits totally inadequate unless the equipment is being remotely monitored so damaged equipment can be replaced immediately. Bats KZN consider it imperative that the pre-construction monitoring be continued until data representing a minimum of 75% of the time at each recording station for each season can be presented.</p>		<p>All passive monitoring systems on site is thoroughly earthed and precautions taken against general low level static discharge as well, such discharge occurs at microphones damaging them even without direct lightning strikes. The earthing is set up isolated from the passive systems with an extra 1 meter of earthing extending vertically above the microphones in an effort to mitigate static discharge and minimise damage in the event of a lightning strike.</p>
<p>Manual surveys are not optional. The Guidelines require a minimum of 8 nights of manual surveys spread evenly across all 4 seasons.</p>		<p>Manual surveys are in no way considered "optional" in our methodology and manual surveys are conducted for as many nights as the weather permits during the week of each seasonal site visit. However, the data gathered from the passive systems can inform mitigation at a much more thorough level and contribute extensively to the conservation of local bat populations that may be at risk. The correct functioning and attention to these systems is therefore prioritised over manual surveys when needed.</p>
<p>Four trips are insufficient to search for all the bat roosts, especially fruit bat roosts, in the area.</p>		<p>All bat roosts will never be discovered in the timeframe of a preconstruction survey, considering the large geographical scales of WEF proposals in SA. Rather, the safer and precautionary approach is taken whereby habitats capable of providing bat roosts (including fruit bat roosts) are identified and demarcated as having high bat sensitivity and thereby buffered. However large roosts such as bat caves will receive special attention.</p>
<p>At least one bat detector station should be set up for each unique combination of vegetation and topography, and land-use and topography. In addition to the minimum number of detectors for all unique combinations of vegetation, land-use and topography, one detector should be assigned for every additional 35km² (3,500ha) comprising the site.</p>		<p>Six passive systems are set up over the site with the second met mast being installed in June 2014, which will amount to a total of 7 passive systems on site. The terrain on the plateau where turbines are proposed is fairly homogenous with shallow water drainage systems and clumps of invader Black Wattle trees. The placement of systems cover the critical combinations of habitat and terrain relevant to bats and applicable to areas of turbine placement.</p>

<p>A site of this size should include at least 2 bat detector microphones at different points within the site at a height within the rotor sweep height of +/- 80m, the remainder should be at least 10m above ground.</p>	<p>The 2nd met mast has been erected on site recently and the 2nd microphone at height is being installed this month (June 2014), both these met masts have microphones at 50m and 10m heights. The remainder of microphones are mounted at 10m on short temporary masts.</p>
<p>Special attention must be given to placing bat detectors above cliffs and on ridges where several Molossid bat species and Rousettus aegyptiaca are most likely to congregate.</p>	<p>Areas close to cliffs and ledges are demarcated as having high bat sensitivity and are have a precautionary buffer, therefore no turbines will be placed in such terrain.</p>
<p>The methodology is almost completely concerned with insect-eating bats. Fruit bats are a vital part of the environment in KwaZulu-Natal and the three species of fruit bats potentially in the area must be given equal prominence in the bat survey.</p>	<p>Specific efforts for determining the presence of fruit bats have been incorporated into the methodology from here onwards. Such efforts include netting at areas most likely to support fruit bats on site, investigating possible feeding areas for spit outs, listening for male mating calls (specifically <i>E. wahlbergi</i>) and visual observations for commuting fruit bats by means of spot lights. Locals will also be questioned. Areas with a probability of providing fruit bat roosts, foraging areas as well as predictions of probable commuting paths have been assigned sensitivities in the preliminary bat sensitivity map. The turbine placement area is not deemed typical fruit bat habitat, however very little data of fruit bat activity and commuting (if any) in such terrain exist and must be determined.</p>
<p>In addition to the above, section 7 - Manner in which the environment may be affected, should include a report on the pest control services being provided by bats to the agricultural crops and other activities being carried out in the WEF and surrounding areas.</p>	<p>Mention of this have been made in the most recent preconstruction monitoring progress report and will also be in the final preconstruction report, which also serves as the EIA phase bat impact assessment report.</p>

<p>Bats KZN believes that the precautionary principle should apply to any wind farm in KZN: unless it can be proved that they will not affect bat populations and the ecosystem services they supply they should not be allowed.</p>		<p>Any development anywhere in the world will affect the natural ecosystems to some degree; similarly any WEF anywhere in SA will affect bat populations to some degree. The preconstruction monitoring aims to determine the level of the effects on bats at the Waaihoek site. These monitoring programmes will determine whether the degree of impact will be detrimental to local bat populations and the services that they provide in the broader area. Once these, possible, impacts have been identified, proposed measures to mitigate such impacts will be listed. The precautionary approach informed by the quantitative data gathered is used on all sites.</p>
Socio-economic Issues		
<p>What job opportunities will there be for the community. What skills and qualifications will people need?</p>	<p>Waaihoek Community</p>	<p>A certain portion of jobs will need to be filled by qualified people with current job experience. But there will definitely be opportunities for unskilled and semi-skilled workers during construction. Most of the required skills will be construction related. More detail to follow during social assessment.</p>
<p>Is it possible for members of the community to get bursaries? Will Mainstream aid in children's education?</p>		<p>Statement has been noted and will be addressed by the Client.</p>
<p>There is the mobile library Mainstream donated, but is there any more aid to follow.</p>		<p>There are various aid projects that can be used to aid the local communities, but it will depend on certain factors. Currently, the development might not even happen, or may be scaled down. The finer details of the project will only become clearer as the project progresses. If the project commences to construction and operation, there will be benefits for the community throughout the 20 year life cycle as per client.</p>
<p>What kind of assistance will Mainstream bring to the elders?</p>		<p>The rules of WEF development state that a certain percentage of the profit goes to community projects to help the community start businesses, projects, etc. This money will be given to the community and the elders should benefit too.</p>
<p>Will Mainstream be engaging with Emadlangeni on rezoning, technical and town planning issues?</p>		<p>Emadlangeni Municipality</p>
<p>Is the application for rezoning through the local municipality office?</p>	<p>Confirmed that it does take place through the local municipality office.</p>	

<p>Socio-economic issues and the opportunities that may rise from this project play an important role in the development process. Mainstream would like to initiate talks with the relative municipality representative about this.</p>		<p>Talks have been initiated.</p>
General Project Issues		
<p>How much energy will be generated from the windfarm?</p>	<p>Emadlangeni Municipality</p>	<p>The question has been noted and will be addressed once the final layout and turbine specifications have been determined.</p>
<p>Electricity is regularly cut during thunder storms. How does Mainstream plan to deal with power cuts?</p>		<p>According to the agreement Mainstream will have with the Department of Energy, the wind farm cannot go down for extended periods, so there will have to be a back-up plan for when the electricity does go out. Mainstream will need to ensure that power comes back online within an hour or two before they get penalised. The substation is relatively old and may require an upgrade to accommodate the extra power input.</p>
<p>Will the power cables will be situated above or below ground?</p>		<p>The cables connecting the turbines to the switching station will be situated underground while the lines from the switching station to the substation will be overhead.</p>
<p>How will long term maintenance of the turbines and hardstand areas be managed? What will happen 5 years down the line if something happens to the turbine high up? How does the crane access the area? Will the hardstand areas be rehabilitated?</p>	<p>Robert Stannard (Farm owner)</p>	<p>The hardstand area must be accessible for maintenance and will therefore be well maintained for the 20 years operations phase, however short grass will be maintained for grazing. Long term maintenance will be required and thus maintenance crews will come in every 5 to 7 years to inspect the turbines using cranes. Cutting fire breaks and having fire fighting systems in place are important.</p>

<p>The construction of various access roads will affect farm properties. How will access be mitigated through these farms, will new fences and gates be erected? What will be the quality of these new roads as they will be there for the next 20 years at least.</p>	<p>Petrus Fourie (Farm owner)</p>	<p>Meetings will be held beforehand between the construction contractors and the farmers on how construction will take place on their farms. Farmers will specify where their existing gates are, where their cattle walk, and where they drive, and the new access points will be planned around this where possible. Any fences and gates that had to be removed during construction will be rebuilt, but the farm owner will get opportunity to voice his opinions before construction. In addition, wind farm developers usually use existing road footprints during layout planning where possible. All new roads will be properly constructed with storm water structures, etc. The engineers in consultation with the landowners will play a role in designing these roads.</p>
<p>Unclear how Mainstream is planning to transport 200 ton turbines up the existing gravel pass as it is very steep.</p>	<p>Robert Stannard (Farm owner)</p>	<p>The statement has been noted and will be addressed in the specialist engineering study.</p>
<p>There are properties located along Knights Pass that are gazetted by KZN Wildlife as protected. The existing borrow pit on top of the mountain is pretty much worked out, and Mainstream will probably have to identify an alternative borrow pit site. The best way forward will be to consult with the landowners to identify new sites.</p>	<p>Robert Stannard (Farm owner)</p>	<p>Mainstream does not want to start up a new borrow pit, if possible, especially up on the plateau. The wind farm will not require a huge amount of material, so various options will be investigated.</p>
<p>Will the new road be tarred or gravel?</p>	<p>Waihoek Community</p>	<p>New access road will be gravel roads that are layered and surfaced with storm water structures and erosion prevention mechanisms as per the Standard guidelines for roads.</p>

9 PLAN OF STUDY FOR THE EIA

In terms of Section 28(1) of the EIA Regulations (2010), a Scoping Report must contain all the information necessary for a proper understanding of the nature of issues identified during scoping, and must include–

- (n) **A plan of study for environmental impact assessment which sets out the proposed approach to the environmental impact assessment of the application, which must include–**
- (i) **A description of the tasks that will be undertaken as part of the environmental impact assessment process, including any specialist reports or specialised processes, and the manner in which such tasks will be undertaken;**
 - (ii) **An indication of the stages at which the competent authority will be consulted;**
 - (iii) **A description of the proposed method of assessing the environmental issues and alternatives, including the option of not proceeding with the activity; and**
 - (iv) **Particulars of the public participation process that will be conducted during the environmental impact assessment process.**

In line with the above-mentioned legislative requirement, this Chapter therefore sets out the Plan of Study (PoS) for the EIA phase of the assessment. Consultation with DEA will be on-going throughout this EIA. However, it is anticipated that DEA will provide relevant comment with respect to the adequacy of this Plan of Study for the EIA, as it informs the content of the EIR and sufficiency thereof.

9.1 EIA phase

The EIA phase has four key elements, namely:-

- **Specialist Studies:** Specialist studies identified as being necessary during the Scoping Phase, plus any additional studies that may be required by the authorities, will be undertaken during the initial phase of the EIA. Appropriately qualified and experienced specialists will be appointed to undertake the various assessments. Specialists will gather baseline information relevant to the study being undertaken and will assess impacts associated with the development. Specialists will also make recommendations to mitigate negative impacts and enhance benefits. The resulting information will be synthesised into the Environmental Impact Report (EIR), whilst the full specialist reports will be attached to the EIR as a Specialist Volume.
- **Environmental Impact Report (EIR):** The main purpose of this report is to gather and synthesise environmental information and evaluate the overall environmental impacts associated with the development, to consider mitigation measures and alternative options, and make recommendations in choosing the best development alternative. The EIR also identifies mitigation measures and management recommendations to minimise negative impacts and enhance benefits. The EIR and associated specialist reports are made available for public and authority review and comment. The availability of the report will be advertised in one Provincial and one local newspaper and the report will also be made available for public scrutiny in easily accessible locations.
- **Comments Report:** The comments report provides a detailed record of comments, issues and concerns raised by I&APs and the authorities during the review period, and also provides relevant responses to these comments.

- Environmental Management Programme (EMPr): The EMPr provides guidelines to the project proponent and the technical team on how best to implement the mitigation measures and management recommendations outlined in the EIR during the construction and operational phase.
- In addition to the above, the Public Participation Process commenced during the Scoping Phase will be continued, during which I&APs are afforded further opportunities to raise their issues, concerns and comments regarding the proposed project. It is possible that some of the project details may have changed in response to the preliminary findings of the Scoping Report, and as a result of design changes made by the project proponent. I&APs and key stakeholders are given the opportunity to review the Draft EIR before it is submitted to the authorities for consideration. Comments on the Draft EIR received from I&APs are included and addressed in the submitted EIR.

9.2 Specialist Studies

The following Specialist Studies are proposed for the EIA Phase–

- **Visual and Landscape Impact Assessment:** R.de Kock from CES
- **Ecological Impact Assessment (Flora and Fauna):** Dr G Hawley from CES
- **Wetland Delineation and Hydrology Assessment:** L. Bryson from CES
- **Avifauna Impact Assessment:** C van Rooyen from Chris van Rooyen Consulting
- **Chiroptera (Bat) Impact Assessment:** W.Marais from Animalia
- **Archaeological Impact Assessment:** G. Anderson from Umlandu
- **Palaeontological Impact Assessment:** Dr G.Groenewald
- **Agricultural Impact Assessment:** R.de Kock from CES
- **Socio-economic Impact Assessment:** A. Hough from CES

The Terms of Reference for the above-mentioned studies, which outline the information required from the specialists, are provided in Sections 9.2.1 – 9.2.10 below and the methodology for assessing the significance of impacts and alternatives is described in Section 9.3 that follows. Specialists will also be required to address issues raised by I&APs in their reports. The specialists CV's can be located in Appendix C.

9.2.1 Visual and Landscape Impact Assessment

The following Terms of Reference will be used to guide the Visual Impact Assessment:

1. Conduct a site reconnaissance visit and photographic survey of the proposed project site.
2. Conduct a desk top mapping exercise to establish the visual sensitivity of the affected area:-
 - Describe and rate the scenic character and sense of place of the area and site.
 - Establish extent of visibility by mapping the view-sheds and zones of visual influence
 - Establish visual exposure to viewpoints
 - Establish the inherent visual sensitivity of the site by mapping slope grades, landforms, vegetation, special features and land use and overlaying all relevant above map layers to assimilate a visual sensitivity map.
3. Review relevant legislation, policies, guidelines and standards.
4. Prepare of a draft Visual Baseline/Sensitivity report
 - Assess visual sensitivity criteria such as extent of visibility, the sites inherent sensitivity, visual sensitivity of the receptor's, visual absorption capacity of the area and visual intrusion on the character of the area
 - Prepare photomontages of the proposed development
 - Conduct shadow flickering modelling if deemed necessary
 - Assess the proposed project against the visual impact criteria (visibility, visual exposure, sensitivity of site and receptor, visual absorption capacity and visual intrusion) for the site.
 - Assess impacts based on a synthesis of criteria for each site (criteria = nature of impact, extent, duration, intensity, probability and significance)
 - Assess the No-go alternative
 - Describe practicable mitigation measures to be implemented to minimise negative impacts

9.2.2 Ecological Impact Assessment

A detailed survey of the site will be undertaken to determine the possibility of there being listed threatened or protected ecosystems and species on the proposed project site. If any of these are found, the Environmental Management Programme will include recommended measures to remove or otherwise protect plant species found on the site that are afforded protection under the National Environmental Management: Biodiversity Act during construction.

The Terms of reference for Ecological Impact Assessment include:

1. Conduct baseline survey of the vegetation and associated habitats by undertaking field surveys (February 2014, during growing season).
2. Provide a detailed description and indicate locations of populations of “species of special concern”, both faunal (excluding birds and bats) and floral.
3. Provide description of the extent and nature of vegetation structure (e.g. pristine vs degraded) in the project area.
4. Describe the vegetation types in terms of plant species richness (species composition), habitat preference of plants and animals.
5. Classify vegetation. i.e. pristine/degraded, in terms of bio-physical criteria, structure and composition.
6. Describe the project area in terms of faunal species present, as observed, through discussion with landowners and through literature review.
7. Identify sensitive areas/habitats that would need special consideration in terms of plant and animal populations (excluding birds and bats)
8. Ensure that all issues, concerns and potential impacts raised by IAPs are addressed
9. Provide assumptions and sources of information
10. Indicate constraints/limitations applicable to the report
11. Identify the potential sources of risk to the affected environment on a species, habitat, population and ecosystem level during the Planning & Design, Construction and Operation phases
12. Identify relevant legislative and permit requirements applicable to the proposed project
13. Assess potential impacts in terms of conservation/ecosystem/biodiversity value
14. Assess direct, indirect and potential cumulative impacts during the Planning & Design, Construction and Operation phases
15. Assess the No-Go alternative
16. Determine significance of impacts utilising the CES impact rating method
17. Recommend mitigation measures to minimise or eliminate negative impacts, enhance potential project benefits and indicate how these can be implemented
18. Recommend appropriate monitoring required during the construction and operation phase in order to audit mitigation success and residual impacts

9.2.3 Wetland Delineation and Hydrology Assessment

Although the primary driver of a wetland is water, due to its dynamic nature water is not a very useful parameter for identifying the outer boundary of a wetland. What is needed is a method of identifying the indirect indicators of prolonged saturation by water. This includes wetland plants and wetland soils. Their presence or absence implies the frequency and duration of saturation and is a satisfactory indicator to classify the area as a wetland. In wetland delineation there are three zones which are distinguished according to a changing frequency of saturation. These are the permanent, seasonal and temporary zone. The objective is to identify the outer edge of the temporary zone as this marks the boundary between the wetland and the adjacent terrestrial habitats.

The terms of reference for Wetland Delineation and Hydrology Assessment include the following:

1. Conduct a desktop biodiversity assessment of the study area.
2. Map of the zone of influence of the wetlands:
 - A map demarcating the relevant local drainage area of the respective wetland.

- This would involve mapping the wetland, its respective catchment and other wetland areas within a 500m radius of the study area.
 - This will demonstrate the connectivity between the site and the surrounding regions.
3. Classify the wetland:
 - Provide maps depicting demarcated wetland areas delineated to a scale of 1:10 000, following the methodology described by DWAF (2005), together with a classification of delineated wetland areas.
 4. The determination of the Present Ecological State (functionality) of any wetland areas:
 - Estimate the wetland areas biodiversity, conservation and ecosystem functional importance.
 - Possible habitat for species of special concern will be commented on.
 5. Recommended buffer zones and No-go areas around any delineated wetland areas based on the relevant legislation (KwaZulu-Natal Systematic Conservation Plan guidelines) or best practice.
 6. Assess the significance of the potential impacts and benefits of the WEF (for design/ planning, construction and operational phases) using the methodology prescribed by CES.
 7. Provide mitigation measures to reduce the significance of negative impacts and improve the significance of positive impacts, if appropriate.

9.2.4 Avifaunal Impact Assessment

According to the adopted “Best practice Guidelines” for avi-faunal impact assessment for renewable energy projects, a minimum of 12 months monitoring is required prior to the generation of an impact assessment. In accordance with these guidelines the following Terms of Reference will be undertaken:

- The existing environment must be described and the bird communities most likely to be impacted will be identified. Different bird micro-habitats must be described as well as the species associated with those habitats.
- Typical impacts that could be expected from the developments must be listed as well as the expected impact on the bird communities. Impacts must be quantified (if possible) and a full description of predicted impacts (direct and indirect) must be provided.
- Gaps in baseline data must be highlighted and discussed. An indication of the confidence levels must be given. The best available data sources must be used to predict the impacts including the results of the pre-construction monitoring and specialist studies that have been completed for previous EIA studies (if any) conducted at the site (or similar sites), and extensive use must be made of local knowledge, if available.
- The potential impact on the birds must be assessed and evaluated according to the requirements prescribed by the Environmental Assessment Practitioner.
- Practical mitigation measures must be recommended and discussed, including a post-construction monitoring programme.
- Bird sensitive areas must be mapped in a sensitivity map for easy reference. Any no-go areas must be clearly indicated.

The following approach must be used to conduct this study:

1. Obtain Bird distribution data of the Southern African Bird Atlas Project 2 to ascertain which species occur within the study area. A data set will be obtained for the quarter degree grid cells within which the development will take place.
2. Conduct an extensive review of relevant ornithological literature, including the bird specialist studies (if any) that have already been conducted at the site.
3. Classify the vegetation types relating to bird communities in the quarter degree grid cells and from physically inspecting the site.

4. Conduct an extensive review of international literature on bird impacts at wind energy facilities will be conducted.
5. The results of the pre-construction monitoring programme must be used to inform the findings of bird specialist study (see point 3 below).
6. Technical details of the planned infrastructure will be obtained from the client through the Environmental Assessment Practitioner.

The methodology for data gathering is guided by the latest version of the “Best practice guidelines for avian monitoring and impact mitigation at proposed wind energy development sites in southern Africa”. This document is endorsed by the Endangered Wildlife Trust (EWT) and Birdlife South Africa (BLSA), and based on international best practice.

Priority avifauna species are to be identified from the following data sources:

- The latest BLSA list of priority species for wind farms.
- Existing avifaunal data sources, e.g. the South African Bird Atlas 2 (SABAP2) and the Co-ordinated Avifaunal Road Count (CAR).
- Local knowledge.
- Professional judgment and experience, including experienced gained at sites currently being monitored.

The bird impact assessment report must contains an analysis of the results of the pre-construction monitoring, and management recommendations to minimise the envisaged impacts. The report will cover the following:

- Description of data capture methodology (e.g. survey method, delineation of study area and identification of priority avifauna).
- Estimated abundance of avifauna, which serves as the baseline for comparing potential displacement of birds during and after construction.
- Quantification of flight movement.
- Statistical analysis of results to test for representativeness of the data (i.e. whether the data is representative of general flight behaviour).
- Maps of recorded flights to indicate potential high risk areas.
- A site specific collision risk rating for each priority species.
- An assessment of the envisaged impacts.
- Recommendations for minimising the envisaged impacts e.g. turbine placement and buffer zones around priority species nests.

9.2.5 Bat Impact Assessment

The methodology for the pre-construction monitoring will include 5 site visits (including 1st installation visit) evenly spaced throughout a 12 month period (thus every 3 months), allowing for the discrimination of seasonal differences.

The following will be included:

1. Passive bat activity monitoring systems (bat detectors) will be deployed on site to measure nightly bat activity levels. The microphones of these systems will be mounted at 2 heights, 10m and minimum 55m (80m preferable) on the met mast/s to record activity at applicable heights. Additional monitoring systems on temporary 9-10 mast/s will also be set up on site to increase coverage of comparative terrain. Animalia will install the monitoring equipment. Werner Marais is in possession of a Level 2 Working at Heights Qualification and can install the systems on met masts.
2. The site may be surveyed for nocturnal bat activity by transecting it with a bat detector mounted on a vehicle and/or on foot (where allowed by terrain).
3. The different habitat types must be recorded.
4. Confirm bat roosts or features capable of offering bat roosts or attracting bats.

5. All data collected during the transects and passive monitoring periods will be analysed and presented in the quarterly reports.

The results for the above mentioned methodologies will be delivered as such:

- Graphic indication of bat activity over a time period; correlated with environmental data
- Represented on a map of bat species occurrence.
- Map the different habitat types that are applicable to bats and assess their significance to bat ecology.

9.2.6 Archaeological Impact Assessment

The National Heritage Resources Act (No. 25 of 1999) requires that “...any development or other activity which will change the character of a site exceeding 5 000m², or the rezoning or change of land use of a site exceeding 10 000 m², requires an archaeological impact assessment”

An archaeological impact assessment will therefore be conducted, the primary objective of which is to determine whether there are any indications that the proposed site is of archaeological significance. This will be a phase 1 assessment and will be largely desk-top although a site visit will be required to enable the specialist the opportunity to look for significant artefacts on the surface of the site. It is not expected that a more detailed Phase 2 assessment will be required but this remains to be confirmed.

The terms of reference for the Phase 1 archaeological study will be to:

1. Determine the likelihood of archaeological remains of significance in the proposed site.
2. Identify and map (where applicable) the location of any significant archaeological remains.
3. Assess the sensitivity and significance of archaeological remains in the site.
4. Identify mitigation measures to protect and maintain any valuable archaeological sites and remains that may exist within the proposed site.

9.2.7 Palaeontological Impact Assessment

Following the “SAHRA APM Guidelines: Minimum Standards for the Archaeological & Palaeontological Components of Impact Assessment Reports” the aims of the PIA are to:

1. Identify exposed and subsurface rock formations that are considered to be palaeontologically significant.
2. Assess the level of palaeontological significance of these formations.
3. Conduct fieldwork to assess the immediate risk to exposed fossils as well as to document and sample these localities.
4. Comment on the impact of the development on these exposed and/or potential fossil resources.
5. Make recommendations as to how the developer should conserve or mitigate damage to these resources.

9.2.8 Agricultural Impact Assessment

The study site and surrounding areas will be described using a two-phased approach. Firstly, a desktop assessment of the site will be conducted in terms of current agricultural classifications. The assessment will be based on existing soil and agricultural potential data for the site.

Further to the above, a site visit will be conducted to assess soils onsite. Soil samples will be collected at random points and sent to a Soil Laboratory for comparative analysis.

The following terms of reference is used as a guideline for the study:

1. Identify and assess all potential impacts (direct, indirect and cumulative) and economic consequences of the proposed development on soils and agricultural potential.
2. Describe and map soil types (soil forms) and characteristics (soil depth, soil colour, limiting factors, and clay content of the top and sub soil layers).

3. Describe the slope of the site.
4. Determine the agricultural potential of the site.
5. Describe current land use as well as possible alternative land use options.
6. Provide recommended mitigation measures, monitoring requirements, and rehabilitation guidelines.

9.2.9 Socio-economic Impact Assessment

The major function of a Socio-economic Impact Assessment (SIA) is to alert the developer to the most critical impacts of a project and to provide suggestions for mitigation and management planning. This issues-based approach will ensure that proposed activity impacts will be socially acceptable. The SIA aims to ascertain the nature, extent, duration, probability, significance and status of the identified impacts that may result during the planning, construction and operational phases of a development.

Based upon these criteria, the various social impacts will be identified and assessed on two levels. The first of these levels refers to the construction phase, while the second concerns the operational phase of the project. Impacts associated with the no-go alternatives are also assessed.

The major process through which the impacts will be identified includes the following:

- Impacts as identified during the scoping phase.
- Impacts identified during interviews and public meeting.
- Impacts identified by the authors as part of their professional judgement and using desktop studies.

The Terms of Reference for this study must include the following:

1. Examine the impacts of the project, to contextualise these impacts and then to assess them.
2. Provide recommendations for mitigating the assessed impacts.
3. Investigate the legal and institutional opportunities and constraints relevant to the establishment of the trust.
4. Review the comments made by Interested and Affected Parties (I&APs) to ensure that all issues and concerns raised by them have been addressed and, if some issues cannot be addressed at this stage, indicate these in the report and discuss the implications or when can they be addressed.

In order to fulfil the brief, the study must examine the macro socio-economic environment, the PACs and municipality context and consider how households will be directly affected by the project. The report must assess impacts, rate them against a standard template, and provide recommendations for mitigation and management strategies that might be applied to deal with the impacts.

9.3 Methodology for assessing the significance of impacts

Although specialists will be given relatively free rein on how they conduct their research and obtain information, they will be required to provide their reports to the EAP in a specific layout and structure, so that a uniform specialist report volume can be produced.

To ensure a direct comparison between various specialist studies, a standard rating scale has been defined and will be used to assess and quantify the identified impacts. This is necessary since impacts have a number of parameters that need to be assessed. Five factors need to be considered when assessing the significance of impacts, namely:

1. Relationship of the impact to **temporal** scales - the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.
2. Relationship of the impact to **spatial** scales - the spatial scale defines the physical extent of the impact.

- The severity of the impact - the **severity/beneficial** scale is used in order to scientifically evaluate how severe negative impacts would be, or how beneficial positive impacts would be on a particular affected system (for ecological impacts) or a particular affected party.

The severity of impacts can be evaluated with and without mitigation in order to demonstrate how serious the impact is when nothing is done about it. The word ‘mitigation’ means not just ‘compensation’, but also the ideas of containment and remedy. For beneficial impacts, optimization means anything that can enhance the benefits. However, mitigation or optimization must be practical, technically feasible and economically viable.

- The **likelihood/probability** of the impacts occurring - the likelihood of impacts taking place as a result of project actions differs between potential impacts. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident), and may or may not result from the proposed development. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.

The **environmental significance** scale is an attempt to evaluate the importance of a particular impact. This evaluation needs to be undertaken in the relevant context, as an impact can either be ecological or social, or both. The evaluation of the significance of an impact relies heavily on the values of the person making the judgment. For this reason, impacts of especially a social nature need to reflect the values of the affected society.

Negative impacts that are ranked as being of “**VERY HIGH**” and “**HIGH**” significance will be investigated further to determine how the impact can be minimised or what alternative activities or mitigation measures can be implemented. These impacts may also assist decision makers i.e. lots of **HIGH** negative impacts may bring about a negative decision.

For impacts identified as having a negative impact of “**MODERATE**” significance, it is standard practice to investigate alternate activities and/or mitigation measures. The most effective and practical mitigations measures will then be proposed.

For impacts ranked as “**LOW**” significance, no investigations or alternatives will be considered. Possible management measures will be investigated to ensure that the impacts remain of low significance.

Table 9-1. Criterion used to rate the significance of an impact.

Significance Rating Table	
Temporal Scale (The duration of the impact)	
<u>Short term</u>	Less than 5 years (Many construction phase impacts are of a short duration).
<u>Medium term</u>	Between 5 and 20 years.
<u>Long term</u>	Between 20 and 40 years (From a human perspective almost permanent).
<u>Permanent</u>	Over 40 years or resulting in a permanent and lasting change that will always be there.
Spatial Scale (The area in which any impact will have an affect)	
Individual	Impacts affect an individual.

Localised	Impacts affect a small area of a few hectares in extent. Often only a portion of the project area.
Project Level	Impacts affect the entire project area.
Surrounding Areas	Impacts that affect the area surrounding the development
Municipal	Impacts affect either the Local Municipality, or any towns within them.
Regional	Impacts affect the wider district municipality or the province as a whole.
National	Impacts affect the entire country.
International/Global	Impacts affect other countries or have a global influence.
Will definitely occur	Impacts will definitely occur.
Degree of Confidence or Certainty (The confidence with which one has predicted the significance of an impact)	
<i>Definite</i>	More than 90% sure of a particular fact. Should have substantial supportive data.
<i>Probable</i>	Over 70% sure of a particular fact, or of the likelihood of that impact occurring.
<i>Possible</i>	Only over 40% sure of a particular fact, or of the likelihood of an impact occurring.
<i>Unsure</i>	Less than 40% sure of a particular fact, or of the likelihood of an impact occurring.

Table 9-2. The severity rating scale.

Impact severity (The severity of negative impacts, or how beneficial positive impacts would be on a particular affected system or affected party)	
Very severe	Very beneficial
An irreversible and permanent change to the affected system(s) or parties which cannot be mitigated. For example the permanent loss of land.	A permanent and very substantial benefit to the affected system(s) or parties, with no real alternative to achieving this benefit. For example the vast improvement of sewage effluent quality.
Severe	Beneficial
Long term impacts on the affected system(s) or parties that could be mitigated. However, this mitigation would be difficult, expensive or time consuming, or some combination of these. For example, the clearing of forest vegetation.	A long term impact and substantial benefit to the affected system(s) or parties. Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these. For example an increase in the local economy.
Moderately severe	Moderately beneficial
Medium to long term impacts on the affected system(s) or parties, which could be mitigated. For example constructing the sewage treatment facility where there was vegetation with a low conservation value.	A medium to long term impact of real benefit to the affected system(s) or parties. Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way. For example a 'slight' improvement in sewage

	effluent quality.
Slight	Slightly beneficial
Medium or short term impacts on the affected system(s) or parties. Mitigation is very easy, cheap, less time consuming or not necessary. For example a temporary fluctuation in the water table due to water abstraction.	A short to medium term impact and negligible benefit to the affected system(s) or parties. Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.
No effect	Don't know/Can't know
The system(s) or parties are not affected by the proposed development.	In certain cases it may not be possible to determine the severity of an impact.

Table 9-3. The rating of overall significance.

Overall Significance (The combination of all the above criteria as an overall significance)	
VERY HIGH NEGATIVE	VERY BENEFICIAL
<p>These impacts would be considered by society as constituting a major and usually permanent change to the (natural and/or social) environment, and usually result in severe or very severe effects, or beneficial or very beneficial effects.</p> <p>Example: The loss of a species would be viewed by informed society as being of VERY HIGH significance.</p> <p>Example: The establishment of a large amount of infrastructure in a rural area, which previously had very few services, would be regarded by the affected parties as resulting in benefits with VERY HIGH significance.</p>	
HIGH NEGATIVE	BENEFICIAL
<p>These impacts will usually result in long term effects on the social and/or natural environment. Impacts rated as HIGH will need to be considered by society as constituting an important and usually long term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light.</p> <p>Example: The loss of a diverse vegetation type, which is fairly common elsewhere, would have a significance rating of HIGH over the long term, as the area could be rehabilitated.</p> <p>Example: The change to soil conditions will impact the natural system, and the impact on affected parties (such as people growing crops in the soil) would be HIGH.</p>	
MODERATE NEGATIVE	SOME BENEFITS
<p>These impacts will usually result in medium to long term effects on the social and/or natural environment. Impacts rated as MODERATE will need to be considered by society as constituting a fairly important and usually medium term change to the (natural and/or social) environment. These impacts are real but not substantial.</p> <p>Example: The loss of a sparse, open vegetation type of low diversity may be regarded as MODERATELY significant.</p>	
LOW NEGATIVE	FEW BENEFITS
<p>These impacts will usually result in medium to short term effects on the social and/or natural environment. Impacts rated as LOW will need to be considered by the public and/or the specialist as constituting a fairly unimportant and usually short term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect.</p> <p>Example: The temporary change in the water table of a wetland habitat, as these systems is adapted to fluctuating water levels.</p> <p>Example: The increased earning potential of people employed as a result of a development would only result in benefits of LOW significance to people who live some distance away.</p>	
NO SIGNIFICANCE	
<p>There are no primary or secondary effects at all that are important to scientists or the public.</p> <p>Example: A change to the geology of a particular formation may be regarded as severe from a geological perspective, but is of NO significance in the overall context.</p>	
DON'T KNOW	
<p>In certain cases it may not be possible to determine the significance of an impact. For example, the primary or secondary impacts on the social or natural environment given the</p>	

available information.

Example: The effect of a particular development on people’s psychological perspective of the environment.

9.4 Environmental Impact Report

The results of the Specialist Studies given above will inform the preparation of the EIR. In addition, the EIR will gather any comments received from I&APs and determine whether it is necessary to increase the scope of work or amend the Terms of Reference.

The EIR will also examine the option of not proceeding with the proposed development – the “No Go” option.

Public participation during the EIA phase will continue and include:

- Stakeholder meetings, public meetings or focus group meetings to present the findings of the specialist impacts assessments.
- Public review of the Draft and Final EIR and Environmental Management Programme (EMPr).

Proposed structure of EIR:

To avoid the EIR being excessively long and cumbersome, whilst meeting the content requirements specified in the NEMA EIA regulations, the final report will be divided into a number of volumes indicated in Table 9-4.

9.5 Consideration by the competent authority for Environmental Authorisation and appeals process

Once the EIR has been finalised it will be submitted to the competent authority for review and consideration for authorisation. The authority will grant authorisation, refuse authorisation or request further detail or information to clarify areas of concern. Should authorisation be granted, the decision will be subject to Conditions of Approval, to which the proponent is obliged to adhere.

The competent authority’s decision will be advertised in the newspapers mentioned in Chapter 7 (Public Participation) above and registered I&APs will be informed within 12 days of the date of the Decision. Once the public have been notified of the Environmental Authorisation, anyone wishing to appeal the decision must lodge a notice of intention to appeal with the Minister, MEC or delegated person within 20 days of the date of decision on the application, and the appeal must be submitted, on a form prescribed by the competent authority, within 30 days after the lapsing of the 20 days of notice for the intention to appeal.

Table 9-4. Reports that will be generated in the EIA phase for the proposed Waaihoek Wind Energy Project.

Report	Contents
Environmental Impact Report (EIR)	This report will contain the following; <ol style="list-style-type: none"> 1. Introduction <ul style="list-style-type: none"> • Detail of the environmental assessment practitioner who compiled the report • Expertise of the EAP to carry out an environmental impact assessment 2. Description of the Project <ul style="list-style-type: none"> • A description of the property on which the activity is to be undertaken • The location of the activity on the property • A description of the types of activities that are proposed for the development. 3. Description of the Affected Environment <ul style="list-style-type: none"> • The natural environment

	<ul style="list-style-type: none"> • The socio-economic environment • The legal, policy and planning setting <p>4. The Public Participation Process</p> <ul style="list-style-type: none"> • Steps undertaken in order to notify and involve I&APs • Advertisements and media • Meetings held in the PPP • Issues and Comment Trail management <p>5. Summary of Comments and Response Trail</p> <ul style="list-style-type: none"> • Summary of comments and issues raised by I&APs and responses to the issues <p>6. Summary of Specialist Reports</p> <ul style="list-style-type: none"> • Summary of the findings and recommendations of all specialist studies <p>7. Alternatives Considered</p> <ul style="list-style-type: none"> • Description of all alternatives considered in the EIA • Initial screening of alternatives • Description and comparative assessment of all alternatives identified during the EIA <p>8. The Significance of Potential Environmental Impacts</p> <ul style="list-style-type: none"> • The methodology used to determine the significance of environmental impacts • Impacts on the natural environment • Impacts on the socio-economic environment • Impacts on the legal, policy and planning setting <p>9. Environmental Impact Statement</p> <ul style="list-style-type: none"> • A summary of the key findings of the EIA • Comparative assessment of the positive and negative implications of the proposed activity and identified alternatives <p>10. Conclusions</p> <ul style="list-style-type: none"> • Mitigation measures for identified adverse environmental impacts • Opinion as to whether the activity should or should not be authorised • Any conditions that should be made in respect to any form of authorisation <p><i>It should be noted that the above is not the exact Table of Contents for the EIA, but is intended to indicate the major topics that will be covered in the report.</i></p>
<p>Specialist Studies</p>	<p>This will be a compilation of all the specialist studies undertaken in the EIA, and will include detailed assessments of -</p> <ul style="list-style-type: none"> • Visual impacts • Heritage impacts • Paleontological impacts • Noise impacts • Ecological impacts • Avifauna impacts • Bat impacts • Agricultural impacts • Socio-economic impacts • Wetland delineation and hydrology impacts
<p>Comments and Response Trail</p>	<p>This will include -</p> <ol style="list-style-type: none"> 1. Lists of persons, organisations and organs of state that were registered as I&APs 2. Comments and Response trail for the Scoping and EIA phases 3. Copies of any representations, objections and comments received from I&APs

<p>Environmental Management Programme (EMP)</p>	<p>Environmental management programme for key activities at the proposed renewable energy facility, which will contain the following -</p> <ol style="list-style-type: none"> 1. Introduction <ul style="list-style-type: none"> • The details of the EAP who prepared the EMPr • The expertise of the EAP to prepare an EMPr 2. Detailed description of the aspects of the activity covered by the EMPr 3. Mitigation Measures and Actions <ul style="list-style-type: none"> • Planning and Design • Pre-construction and construction activities • Operation and undertaking of the activity • Rehabilitation of the environment 4. Responsibilities <ul style="list-style-type: none"> • Persons responsible • Time periods for implementation 5. Monitoring Programme
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10 CONCLUSIONS

10.1 Activity and Possible Impacts

The proposed activity involves the establishment of the powerlines and associated Waaihoek WEF infrastructure in the Emadlangeni Local Municipality, to be located approximately 8km east and south-east of Utrecht.

The details of the proposed facility include:

- Two overhead powerline corridor alternatives are proposed to transmit the electricity from the WEF to the Eskom Bloedrivier Substation.
- Construction and operation a maximum of 93 turbines to produce up to 160 MW of electricity.
- Construction of access roads within the wind farm locality.
- Construction of underground power cables to link to a WEF substation.
- Construction of a WEF substation - two alternative sites are proposed.
- The possible expansion of the existing Bloedrivier Substation.

The nature of the proposed site for the establishment of the powerline and associated WEF development is suitably-placed on land currently used for livestock grazing. However, the establishment of the proposed development raises various issues pertaining to:

- Visual intrusion on the landscape.
- Sensitive Wetland and hydrological features.
- Ecological sensitivity (flora and fauna).
- Agricultural potential and utilisation.
- Avi-faunal and bat sensitivity.
- Heritage sites and resources.
- Paleontological sites in terms of potential fossil deposits.
- Socio-economic impacts and benefits.

These key issues are to be comprehensively addressed and assessed according to the Terms of Reference developed for each specialist during the EIA phase.

10.2 Fatal flaws

At this stage, no fatal flaws have been identified and there is no reason why the proposed development should not proceed to EIA phase for further assessment.

10.3 EIA phase

The following activities will form part of the EIA phase:

- Public Participation: public meetings, focus group meetings, public review of documentation
- Specialist studies as described in the Plan of Study
- Consultation with I&APs regarding possible significance of impacts and suitable mitigation measures.
- Evaluation of impacts prior to mitigation.
- Compilation of practicable and effective mitigation measures.
- Evaluation of impacts after mitigation.
- Provision of an opinion as to whether or not the activity should be authorised.
- Compilation of an environmental impact statement.
- Compilation of a draft Environmental Management Programme (EMPr).

11 REFERENCES

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National Environmental Management: Protected Areas Act (No. 57 of 2003)

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12 APPENDICES

12.1 Appendix A: Public Participation Documents

12.1.1 Newspaper advert:



Proposed Waaihoek Wind Energy Facility
(Emadlangeni Local Municipality, Amajuba District Municipality, KwaZulu-Natal)

**NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT
AND INVITATION TO REGISTER AS AN I&AP**

Notice is hereby given in terms of Regulation 54(2) published in Government Notice No. R543 under Chapter 5 of the National Environmental Management Act (No. 107 of 1998), of the intent to submit an Environmental Impact Assessment application to the National Department of Environmental Affairs (DEA).

Proponent and Location:
South Africa Mainstream Renewable Power Developments (Pty) Ltd. is proposing to construct a Wind Energy Facility with a maximum capacity of 160MW, to be developed approximately 8km east and south-east of Utrecht in the Emadlangeni Local Municipality, KwaZulu Natal Province.

Project Activities:
The proposed project will entail the construction and operation of up to 90 wind turbines each generating between 1.5 – 4 M.W of power. Two overhead powerline corridor alternatives are proposed to transmit the electricity from the WEF to the Eskom Bloedrivier substation. In addition, the option of utilising an abandoned 88kV powerline servitude to the south of the site is also being considered.

Listed Activities:
The proposed project is a listed activity in terms of GN R 545, activity (1): "The construction of facilities or infrastructure for the generation of electricity where the electricity output is 20 megawatts or more" and GN R 545, activity (8) "The construction of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex" which require a full Scoping and EIR.

Other listed activities in terms of GN R 544 include activities (10), (11), (18); GN R 545 activity (15) and GN R546 activities (4) and (13).

Coastal & Environmental Services has been commissioned by South Africa Mainstream Renewable Power Developments (Pty) Ltd. to undertake the Environmental Impact Assessment. You are hereby invited to register as an Interested & Affected Party (I&AP). Please submit your name, contact information and any comments to the contact person below.

**For more information, registration as an I&AP or submission of written comments contact by post,
phone, fax or e-mail:**

Contact details: Mr Roy de Kock, PO Box 8145, East London, 5210, Tel: 043 726 7809/8313, Fax: 043 726 8352, e-mail: r.dekock@cesnet.co.za


Advert from newspaper (Published on the 25th October 2013 in the Vryheid Herald and 18th October in the Natal Witness.

NATAL WITNESS

The Witness

October 18, 2013

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Proposed Waaihoek Wind Energy Facility
 (Emadlangeni Local Municipality, Amajuba District Municipality,
 KwaZulu-Natal)

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Project Activities:
 The proposed project will entail the construction and operation of up to 90 wind
 turbines each generating between 1,5 - 4 MW of power. Two overhead powerline
 corridor alternatives are proposed to transmit the electricity from the WEF to the
 Eskom Bloedrivier substation. In addition, the option of utilising an abandoned
 88 kV powerline servitude to the south of the site is also being considered.

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 construction of facilities or infrastructure for the transmission and distribution
 of electricity with a capacity of 275 kilovolts or more outside an urban area or
 industrial complex" which require a full Scoping and EIR.

Other listed activities in terms of GN R 544 include activities (10), (11), (18); GN
 R 545 activity (15) and GN R546 activities (4) and (13).

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 the Environmental Impact Assessment. You are hereby invited to register as
 an Interested and Affected Party (I&AP). Please submit your name, contact
 information and any comments to the contact person below.

**For more information, registration as an I&AP or submission of written
 comments contact by post, phone, fax or e-mail:**
**Contact details: Mr Roy de Kock, PO Box 8145, East London, 5210,
 Tel: 043 726 7809/8313, Fax: 043 726
 8352, e-mail: r.dekock@cesnet.co.za**

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VRYHEID HERALD

Vryheid Herald, 25 October 2013

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Mr J H de Klerk - Municipal Manager

ZULULAND DISTRICT MUNICIPALITY 0302013



**Proposed Waaihoek Wind Energy Facility
(Emadlangeni Local Municipality, Amajuba District
Municipality, KwaZulu-Natal)**

**NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT
AND INVITATION TO REGISTER AS AN I&AP**

Notice is hereby given in terms of Regulation 54(2) published in Govern-
ment Notice No. R543 under Chapter 5 of the National Environmental Man-
agement Act (No. 107 of 1998), of the intent to submit an Environmental
Impact Assessment application of the National Department of Environmen-
tal Affairs (DEA).

Proponent and Location:

South Africa Mainstream Renewable Power Developments (Pty) Ltd is pro-
posing to construct a Wind Energy Facility with a maximum capacity of
160MW, to be developed approximately 8km east and south-east of Utre-
cht in the Emadlangeni Local Municipality, KwaZulu-Natal Province.

Project Activities:

The proposed project will entail the construction and operation of up to 90
wind turbines each generating between 1.5 - 4 MW of power. Two over-
head powerline corridor alternatives are proposed to transmit the electricity
from the WEF to the Eskom Bloedrivier substation. In addition, the option
of utilising an abandoned 88kV powerline servitude to the south of the site
is also being considered.

Listed Activities:

The proposed project is a listed activity in terms of GN R 545, activity (1):
"The construction of facilities or infrastructure for the generation of electri-
city where the electricity output is 20 megawatts or more" and GN R 545,
activity (8) "The construction of facilities or infrastructure for the transmis-
sion and distribution of electricity with a capacity of 275 kilovolts or more,
outside an urban area or industrial complex" which require a full Scoping
and EIR.

Other listed activities in terms of GN R 544 include activities (10), (11), (18),
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Costal & Environmental Services has been commissioned by South Africa
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**For more information, registration as an I&AP or submission of
written comments contact by post, phone, fax or e-mail:**

Contact details: Mr Roy de Kock, PO Box 8145, East London, 5210,
Tel: 043 726 7809/8313, Fax: 043 726 8352,
e-mail: r.dekock@cesnet.co.za

12.1.2 On-site notice boards

NOTICE

ENVIRONMENTAL IMPACT ASSESSMENT



Notice is hereby given in terms of Regulation 54 of the regulations published in Government Notice No. R 543 under Chapter 5 of the National Environmental Management Act (No. 107 of 1998) of the intent to submit an application for an Environmental Impact Assessment to the Department of Environmental Affairs (National).

Proponent and Location:
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 In addition, the option of utilising an abandoned 88kV powerline servitude to the south of the site is also being considered.

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Coastal & Environmental Services has been commissioned by South Africa Mainstream Renewable Power Developments (Pty) Ltd to do undertake the Environmental Impact Assessment. You are hereby invited to register as an interested & Affected Party (I&AP).

For more information, registration as an I&AP or submission of written comments contact by post, phone, fax or e-mail:
 Mr Roy de Kock, PO Box 8145, East London 6110, Tel: 043 726 7809/8313, Fax: 043 726 8352, e-mail: r.dekock@cesnet.co.za







12.1.3 Focus Group Meeting Register

Stakeholder:	Meeting Venue:	Meeting Date:
Ezemvelu Wildlife	Ezemvelu Wildlife office, Pietermaritzburg	18/11/2013
Affected landowners	Utrecht Country Club	18/11/2013
Emadlangeni Local Municipality	Emadlangeni Local Municipality office, Utrecht	19/11/2013
Waihoek Community Trust	Waihoek Community Hall	19/11/2013

Attendance Register
Emadlangeni Local Municipality
19th November 2013

Name	Organisation	Email	Tel no.
Khumtani Gwelo	Emadlangeni municipality	gwelo.khum@gmail	078 1209155 034 331 7041
Mike Mangrae	Mainstream	mike.mangrae@mainstream.co.za	0837851492
Jordan Schmidt	CES	j.schmidt@cesnet.co.za	082 468 2392
Ry de Kock	CES	r.dekock@cesnet.co.za	076 2819660

Attendance Register
Meeting with Ezemvelu Wildlife in Pietermaritzburg
18th November 2013

Name	Organisation	Email	Tel no.
Dussese Thangoh	Ezemvelu KZN Wildlife	Dussese.Thangoh@kznlw.gov.za	033-8451425
Felicity Elliott	..	f.elliott@kznlw.gov.za	033 845 1427
Jordan Schwartz	CES	j.schwartz@cesnet.co.za	082 46 82392
Roy de Kock	CES	r.de.kock@cesnet.co.za	011 585 1715
Mike Mangrall	Mainstream	mike.mangrall@mainstream.co.za	07622819660
			0837851492

Attendance Register
 Utrecht Country Club
 18th November 2013

Name	Organisation	Email	Tel no.
C.B. Abudi	Farmer	boodoffdavid@gmail.com	0829335368
P.S. Fouaze	Farmer	pith.fouze@gmail.com	0832902939
V.A. Sitoria	Waaiohoek Trustee	-	076 5505853
J.M. Dube	Waaiohoek Trustee	j.dube@waaiohoek.co.za	083422 8314
A.M. Ndlovu	Waaiohoek Trustee	-	0791144382
N.E. Mhosi	Waaiohoek Trustee	-	072 500 6100
Z.K. Mtambo	Waaiohoek Trustee	-	0745226362
G.M. Muzungu	Waaiohoek Trustee	-	076 1915 968

Name	Organisation	Email	Tel no.
J. P. THEBON	GOEDHOOP CC	j.thebon@goedhoop.com	082 7791427
S. THEBON	GOEDHOOP 177cc	sthebon@goedhoop.com	0121436935
S. THEBON	GOEDHOOP	S@QUESTIONS7@YIMM.COM	0832285069
R. SUNDHO	BUSINESSUNIT 17076	INFO@WINDENERGYM1024	082 873 5575
L. P. GREYLING	GROOTVLEI + VLAARPLAAS	lourens@crazyweather.co.za	0826238379

WAIHŌEK COMMUNITY TRUST.

(Committee Meeting Held on 19/1/2013).

ATTENDANCE REGISTER

No.	Name and Surname	Email/address or contacts no:	Organization/ Company	Signature
1	Mukehi Khumalo	079 2585 253	WCT	
2	MABU NOUNALO	0720549254	WCT	
3	Shalle Sani	0728523091	WCT	
4	V. MANDI	-	WCT	
5	Mesika Sebata	079 3152 967	WCT	
6	DORRA Sibi	055 4286 19	WCT	
7	J. L. Ndumande	0720958289	WCT	
8	Rubee Mphahane	0720627510	WCT	
9	Stanele Zava	076 982 9492	WCT	
10	Melique Mshali	0726072739	WCT	
11	THAKAZANE SANGANYI	079 2826 781	WCT	
12	ZANELE MALUMBA	0720954969	WCT	
13	MOKUPHATHE MANDI	0761016354	WCT	
14	ELLIOT MANDI	-	WCT	
15	Sandile Sangoeni	0721393212	WCT	
16	MAGNABA AYOKHAKAZI	0720304735	WCT	
17	Mphahane Ndehane	0550917119	WCT	
18	THAKAZANE Dlamini	0728343718	WCT	
19	MANDI MANDI	0723624345	WCT	

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WAIHIOEK COMMUNITY TRUST.
 (Committee Meeting Held on 19/1/2013).

ATTENDANCE REGISTER

No.	Name and Surname	Email/address or contacts no:	Organization/ Company	Signature
20	Manda Marama	083 943 6683	WCI	[Signature]
21	Membelike Sogaeweni	072 888 809	WCI	[Signature]
22	Moyeni Sibhe	073 856 0601	WCI	[Signature]
23	Moses Mosa	071 039 0114	WCI	[Signature]
24	JFKIM SAPOLETHI	07340402919	WCI	[Signature]
25	P. NINA NINA	0840960603	WCI	[Signature]
26	M. Mhlangu	0712024333	WCI	[Signature]
27	SE. ESOBO	07446618	WCI	[Signature]
28	SPR. Marama	076 195 968	WCI	[Signature]
29	M. Mante	072924089	WCI	[Signature]
30	MANYANA NATHU		WCI	[Signature]
31	MIE D. MASHA	013 0202 981	WCI	[Signature]
32	MIE V. SIBISI	079 8605 847	WCI	[Signature]
33	M. P. Sibisi	0722608119	WCI	[Signature]
34	M. A. Sibisi		WCI	[Signature]
35	MIE B. ZULU	082 5114138	WCI	[Signature]
36	MIE B. Malinga	073 890 8927	WCI	[Signature]
37	MIE H. Malinga		WCI	[Signature]
38	MIE B. Nyatso		WCI	[Signature]

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WAIHIOEK COMMUNITY TRUST.


(Committee Meeting Held on 19/11/2013).

ATTENDANCE REGISTER

No.	Name and Surname	Email/address or contacts no:	Organization/ Company	Signature
39	Sunguani Mubiani	0725596207		
40	Makini Sika	076231636		
41	Bopparaoi Tawane	0298605976		
42	Nekumaa Nwan	072880840		
43	Makuzi S. Sibi	0720935100		
44	MALINSE SPANANANA	0769080943		
45	Mwambi Akatao	0762256992		
46	MABUZA Dibaba	0768377811		
47	KABA Sydney	0725633374		
48	Mwambi Akatao	079706346		
49	Wibe Kwamale	0768505863	Institute of Agriculture W.C.T.	
50	Sibho Sibisi	0765482490		
51	Mame Makenisi	0849230164		
52	Mike Mangwale	0877851192	Mainteam CES	
53	Jabon Shaniat	0826682394		
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Focus Group Meeting Minutes

Coastal & Environmental Services

 <p>Coastal & Environmental Services East London P. O. Box 8145, Nahoon, East London, 5210 Tel: +27 (43) 726 7809 Fax: +27 (43) 726 8352 Email: info@cesnet.co.za Also in Grahamstown, Cape Town and Port Elizabeth www.cesnet.co.za</p>	MEETING MINUTES	
	CLIENT	Mainstream Renewable Power (South Africa)
	DATE	18-11-2013
	VENUE	Ezemvelu Wildlife office, Pietermaritzburg
	TIME OF MEETING	11:00
	MINUTES BY	Roy de Kock
	CIRCULATION DATE	4 February 2014

ATTENDED BY		
NAME	ASSOCIATION	EMAIL ADDRESS
Dinesree Thambu	Ezemvelu Wildlife	dinesree.thambu@kznwildlife.com
Felicity Elliott	Ezemvelu Wildlife	felicity.elliott@kznwildlife.com
Jadon Schmidt	CES	j.schmidt@cesnet.co.za
Roy de Kock	CES	r.dekock@cesnet.co.za
Mike Mangnall	Mainstream	Mike.Mangnall@mainstreamrp.com
APOLOGIES		
Ian Rushworth	Ezemvelu Wildlife	ianr@kznwildlife.com

Issues raised by:	Response:
<p>Introduction:</p> <ul style="list-style-type: none"> Roy de Kock (Roy) welcomed everybody and introduced himself and Jadon Schmidt from CES and Mike Mangnall from Mainstream Renewable Power. Denesree and Felicity introduced themselves as representatives from Ezemvelu KZN Wildlife. Roy then explained the purpose of the focus group meeting and commenced with a presentation on the proposed activity and the EIA process. Mike explained that BVi Consulting Engineers will be providing preliminary inputs in terms of borrow pits, access roads, etc. that will be covered in the EIR. Roy mentioned that a turbine layout was not yet available as negotiations with the farmers were still underway, Roy did indicate a turbine focus area on a locality map indicating where most of the turbines will be concentrated on the various farm portions. Roy further explained that most of the turbines will be located on the ridges. Roy explained that the wind farm will be connected to the Eskom power grid at the Bloedrivier Substation. There are three alternative powerline corridors that will be proposed to Environmental Affairs with Powerline Corridor A1 being the preferred alternative. 	
<p>Mike asked if Ezemvelu will engage with other conservation bodies such as BirdlifeSA on the proposed development</p>	<p>Denesree responded that yes, they will but encouraged both Mainstream and CES to do the same. Roy: All conservation bodies have been identified as stakeholders and have been sent notifications and BIDs.</p>
<p>Denesree asked if Mainstream has already determined whether there is sufficient wind in the area. She explained that she's asked this because she is not aware of any wind</p>	<p>Mike responded that yes Mainstream has done the investigations. He stated that they have to be certain that there is sufficient</p>

Coastal & Environmental Services

Issues raised by:	Response:
<p>data that says there is wind in the area. She further asked if this is being investigated in addition to the physical alternatives in terms of feasibility.</p>	<p>wind in the area prior to engaging and appointing the EIA consultants and engineers. He mentioned that they have good maps and models of the area indicating that there is indeed wind and therefore started signing up the farmers in the middle of last year (2012) while at the same time erecting a 70m tall mast. This means that Mainstream has site data for more than a year, which is a decent period on which to base decisions to move forward. From a wind perspective Mainstream definitely knows there is wind. Mike further stated that they have been looking at sites in KZN for a few years now and although there are other places that have wind, these are limited by the fact that there are scattered settlements around those areas. The Utrecht site is large enough and has limited settlements nearby.</p>
<p>Felicity asked if the existing powerline is a 132kV line.</p>	<p>Mike responded that it is an 88kV line. He further stated that the powerlines in that area are either 88kV or 275 kV. Mike stated that Mainstream would like to build an 88kV line with a transformer bay at the Bloedrivier substation to step the electricity up to 275kV, but it depends on how many turbines end up being approved during the EIA. He stated that there are various options currently on the table. At this stage Mainstream is assessing the impacts of using the existing corridors as well as of a new line breaking into the Eskom substation. Roy added that in terms of the EIA process CES is assessing the entire windfarm site including various powerline alternatives as well as the upgrade of the Eskom Bloedrivier power station and its cumulative impacts on the natural environment in its entirety.</p>
<p>Denesree asked if all the aspects will be addressed in one EIA.</p>	<p>Roy responded that Eskom has requested that the project be split into its 3 components namely the windfarm, the powerline and the substation upgrade. Roy explained that therefore there will be 3 applications submitted, but all the individual and cumulative impacts will be assessed in a single EIA report submitted to the DEA with 3 reference numbers. Roy confirmed that Ezemvelu are registered stakeholders on all three applications.</p>
<p>Denesree asked if Ezemvelu will be given opportunity to review the reports.</p>	<p>Roy confirmed that all reports will be given to the registered Stakeholders & I&APs for review and comment prior to submission to the DEA.</p>
<p>Felicity stated that it is sometimes frustrating when EIAs get broken up into various parts as they get done out of order and is not always practical.</p>	<p>Roy reminded all that the 3 different components will be assessed cumulatively within one EIA process and one report. He further said that the specialists will also assess them cumulatively, as a single</p>


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Issues raised by:	Response:
<p>Denesree: stated they will not comment on one of the sections until the full EIA is completed. She explained that this is because any alternative that might be chosen in one section could affect an alternative in any of the following ones.</p>	<p>specialist report. Roy noted their concern and added that CES understands Ezemvelu's concern that certain impacts might get diluted in the process. He said that CES is avoiding this by conducting a cumulative assessment.</p>
<p>Felicity asked if Mainstream has decided what model (of wind turbines) they will use.</p>	<p>Mike: responded that they have not finalised turbine model types as that only happens right at the end of the process when all the required approvals are in place. Mike explained that it is very difficult to sign suppliers when you have not measured wind properly and if you have not finalised turbine positions. Certain turbines work better in different wind regimes and different strengths of wind. He mentioned that Mainstream is currently using Siemens 2.3 MW turbines with a hub height of 80m but the Waaihoek turbines are likely to be larger.</p>
<p>Felicity asked that if Mainstream and CES have not got final heights and diameters for the turbines, how they are planning to conduct their investigations on the birds and bats.</p>	<p>Mike responded that in previous EIAs Mainstream assessed the worst case scenario (or the biggest turbine proposed), e.g. 120m turbine height.</p>
<p>Felicity asked how many measuring masts there currently are onsite and their heights.</p>	<p>Mike responded that there is currently only one mast onsite that is 70m tall. He further explained that each mast cost around R800 000 and that a developer needs at least 1 mast onsite for proper verifiable data and to be able to tender on the projects, but it depends on the nature of the site. Mike mentioned that as the Waaihoek site is a long narrow site running along a plateau, they may need multiple masts. He said that he was unsure about the exact number, but Mainstream may erect 3 to 4 masts over the next year or two (2014-2015).</p>
<p>Felicity noted that one of the problems that they have with the North Coast wind project is getting decent bat data. She further stated that they have only one mast up, which at 70m is slightly lower than the potential turbine height. She then asked what Mainstream is proposing to do to get accurate bat data at height.</p>	<p>Mike responded that Mainstream appointed Animalia as bat specialists. He stated that they are from Johannesburg and have done numerous wind farm assessments to date. Mike further mentioned that they already conducted a site visit last month (October 2013) to do initial surveys and to determine where the best positions are to erect their masts with detectors. Mike then explained that various other factors are also considered when installing bat detectors, like safety and security as the detectors must be erected at height and in areas where they might be stolen or vandalised. He mentioned that Mainstream has implemented a pulley system to install one of their detectors at height on another site. The bat guidelines designed by <i>Stofberg and Sowler</i> (Refer to Animalia for full reference) says a minimum of one detector at a height of 50m is required per site. Previously detectors were put on the ground but data was not accurate enough so Mainstream will be probably be placing</p>

Issues raised by:	Response:
	<p>another detector at height next year (2014) when the second tall mast goes up. Mike said that Animalia suggested 8 locations and have already installed 4 detectors. Animalia were encountering problems as some of the detectors were tampered with or had been stolen.</p>
<p>Felicity mentioned that she observed from the proposed timelines that the scoping report will only be completed in February 2014. She said that this is a problem as it is then too late to comment on the methodology for the bird and bat monitoring processes. She asked if it was possible for CES to supply Ezemvelu with a methodology for the Bird and Bat assessments as well at the Ecological assessment before then.</p>	<p>Roy responded that this will not be a problem.</p> <p>ACTION: CES to forward the Bird, Bat & Ecological specialist methodologies to Ezemvelu for comment.</p>
<p>Felicity asked whether Mainstream and CES are also meeting with the Department of Agriculture as stakeholder. She mentioned that the KZN Department of Agriculture has developed an Agricultural Potential Map that may be beneficial.</p>	<p>Roy responded that the Department has been identified and registered as a stakeholder and that they have been notified of the proposed development. He further confirmed that they are aware of the agricultural potential map.</p>
<p>Felicity raised her concern about the availability of bat data. She mentioned that there is limited bat data available and raised a further concern about the fact that the appointed specialist is not based in KZN.</p>	<p>Roy responded that he will liaise with all specialists to provide their findings to all the relevant associations (like bat associations, BirdlifeSA, EWT, etc.). He further stated that all the appointed specialists are accredited scientists in their respected fields with sufficient experience in assessing the impact of a new windfarm on the natural environment.</p> <p>Mike added that Mainstream has worked with the bird and bat specialists before and that they are reputable.</p>
<p>Jadon mentioned that as he has not managed a windfarm EIA in KZN before, he would appreciate clearance on the link between Ezemvelu and the provincial DEA.</p>	<p>Denesree responded that Ezemvelu and provincial DEA are 'sister departments'. They both fall under the same minister, but Ezemvelu is the conservation authority for the province. She further explained that when provincial DEA get an EIA or BAR application, Ezemvelu will act as the specialist advisers in terms of biodiversity for the province. She then concluded that with national DEA both sections are housed together, so that you have the EIA unit and the biodiversity unit, while they are broken up into separate departments at provincial level.</p>
<p>Roy mentioned that he has already identified a contact person from provincial DEA. He further stated that National DEA always requires comment from the provincial department of Environmental Affairs. He then asked whether DEA will accept comment from Ezemvelu only or will they want comment from provincial DEA as well.</p>	<p>Denesree responded that CES will have to get comments from both departments. She then requested CES to forward the contact details of the provincial DEA contact person to Ezemvelu as Ezemvelu will then include them into all their correspondence.</p> <p>ACTION: CES to forward the contact name from provincial DEA to Ezemvelu</p>
<p>Felicity wanted to know if CES has any KZN specific data or files like the KZN dissemination disc. She explained that the disc has a lot of detailed shapefile layers on it, like vegetation, protected areas, corridors etc.</p>	<p>Mike responded that Mainstream has the most recent wetland data from KZN only.</p> <p>Roy added that most of the information CES has obtained are from BGIS website.</p>

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Issues raised by:	Response:
<u>Felicity</u> then responded that she will give CES a copy of the disc.	
<u>Felicity</u> noticed that there is an affected property that falls in a demarcated private nature reserve as gazetted under the Protected Areas Act. She further mentioned that the Ezemvelu database names it the Remainder of Farm 77 Paardepoort.	<u>Roy</u> confirmed that he is aware of this property and will investigate further. ACTION: CES to investigate the protection status on Farm RE/77, Paardepoort.
<u>Mike</u> wanted to know the description of the term 'reserve' or 'conservancy', and what it mean in terms of requirements for the development.	<u>Denesree</u> responded that it mean that Mainstream would not be able to construct wind turbines on a protected area, as per legislation, and that Ezemvelu would oppose it. <u>Felicity</u> added that there are buffers in terms of certain types of land uses in protected areas but those are state protected areas. She did not know if this would apply to private protected areas.
<u>Roy</u> wanted to know what the buffer is on state owned land in KZN.	<u>Felicity</u> responded that the buffer is an EIA trigger so it is dependent on the land use being proposed. She also mentioned that 5km is the first trigger. She further noted that CES should probably contact the Ekangala Grassland programme because the proposed wind farm is located just outside their hotspot area. ACTION: CES to contact Ekangala Grassland programme to add an I&AP. Botanical specialist to investigate impacts on the Ekangala Grassland programme
<u>Denesree</u> stated that their immediate concern is that fact that the proposed wind farm is situated on a plateau. She said that this is going to have a big implication on birds, but will wait for the outcome of the bird specialist assessment. She mentioned that they will follow up with Ian Rushworth as he might have specific site data ready for that area. She then stated that the dissemination data she gave CES will help in the assessment as that is what their specialists would use. She the concluded that they could not provide CES with a sector plan as it is still being worked on, but they might have one ready in January.	<u>Roy</u> noted this. ACTION: CES to follow up with Ezemvelu on getting a copy of the Sector Plan. Bird specialist to follow up with Ian Rushworth on bird data for the area.
<u>Roy</u> asked what are KZNSCP basing their CBA's on.	<u>Felicity</u> responded that it is based on both vegetation types and species and habitat requirements.
<u>Felicity</u> noted that the proposed wind farm is located in an altitudinal corridor as well as a macro corridor.	<u>Roy</u> noted this and confirmed that he will investigate. ACTION: CES to investigate impacts on the altitude corridor.
<u>Roy</u> thanked everyone and closed the meeting.	

 <p>Coastal & Environmental Services East London P. O. Box 8145, Nahoon, East London, 5210 Tel: +27 (43) 726 7809 Fax: +27 (43) 726 8352 Email: info@cesnet.co.za Also in Grahamstown, Cape Town and Port Elizabeth www.cesnet.co.za</p>	MEETING MINUTES	
	CLIENT	Mainstream Renewable Power (South Africa)
	DATE	19-11-2013
	VENUE	Utrecht Country Club
	TIME OF MEETING	17:30
	MINUTES BY	Roy de Kock
	CIRCULATION DATE	4 February 2014

ATTENDED BY		
NAME	ASSOCIATION	EMAIL ADDRESS
See attendance register		

Issues raised	Response
<ul style="list-style-type: none"> Roy de Kock (Roy) welcomed everyone present and introduced himself and Jadon Schmidt as consultants from Coastal and Environmental Services and Mike Mangnall (Mike) from Mainstream Renewable Power. Roy then explained the purpose of the focus group meeting and commenced with a presentation on the proposed activity and the EIA process. Mike explained that BVi Consulting Engineers will be providing preliminary inputs in terms of borrow pits (if required), access roads, etc. that will be covered in the EIR. Roy mentioned that a turbine layout was not yet available as negotiations with the farmers were still underway, Roy did indicate a turbine focus area on a locality map indicating where most of the turbines will be concentrated on the various farm portions. Roy further explained that most of the turbines will be located on top of the ridges. Roy explained that the wind farm will be connected to the Eskom power grid at the Bloedrivier Substation. There are three alternative powerline corridors that will be proposed to Environmental Affairs with Powerline Corridor A1 being the preferred alternative. 	
<p>Boshoff Dave introduced himself as the previous owner of one of the affected properties which he now leases from the community trust. He asked whether agriculture and specifically cattle farming will be able to proceed as normal. He also asked what effect the windfarm will have on cattle farming. He then asked what the spin-off to the owners is going to be, and whether Mainstream is going to buy the land or lease it from the landowner.</p>	<p>Mike responded that with wind farms that have done EIAs already and specifically the ones that Mainstream are building currently, studies have found that the impact on agriculture is low. He stated that there is disturbance during the construction phase as the building of roads and digging of foundations results in a high level of activity. He further stated that farmers have had to temporarily cordon off certain areas of their farms during the year and a half to two years of construction, so there will be some inconveniences, but once the turbines are completed and rehabilitation is done and the contractors are gone, the farmer can proceed as before. Mike mentioned that according to their calculations only between</p>


	<p>1% and 5% of the farm land will be taken up by the turbine footprints and the roads.</p> <p>Mike then responded that Mainstream leases parts of the land from the landowner. They do not purchase any land. He mentioned that Mainstream will have a license to feed power into the Eskom grid for 20 years, with the hope that it will run over for a further 20 years. Mike explained that Mainstream pay the farmers a percentage of what they make, or a minimum amount for each megawatt of power that the wind farm produces, so regardless of what happens with the developer, the farmer is guaranteed a minimum rental fee for the turbines on his or her property.</p> <p>Roy added that the turbines will not be fenced off after construction so cattle can graze underneath the turbines. He then warned that long grasses will not be allowed to grow around the hardstands of the turbines though.</p>
<p>Robert Stannard asked how long term maintenance of the turbines and hardstand areas will be managed. He asked what will happen 5 years down the line if something happens to the turbine high up. How does the crane access the area? He further asked if the hardstand areas will be rehabilitated.</p>	<p>Mike responded that the hardstand area must be accessible for maintenance and will therefore be well maintained for the 20 years operations phase, however short grass will be maintained for grazing. He further explained that as the turbines are mostly automated during operations, few staff will be required. He said that there may be a farm manager appointed who will live somewhere close by, like Utrecht or Vryheid. Mike further explained that long term maintenance will be required and thus maintenance crews will come in every 5 to 7 years to inspect the turbines using cranes. Furthermore, Mike explained that cutting fire breaks and having fire fighting systems in place are important. He said that the wind farm operator will belong to the local fire fighting association.</p>
<p>Lourens Greyling mentioned that there are about 200 Blue Cranes as well as Wattled Cranes on his farm (which on the way to Dundee) during the winter months to breed. He asked whether monitoring of these will be short or long term.</p>	<p>Roy thanked Lourens for the information and said that the info will be forwarded to the bird specialist to assess. He confirmed that bird monitoring is long term in order to obtain seasonal information.</p> <p>Mike added that this is the type of information that Mainstream and CES are trying to pick up as early as possible in the process. He said that this will allow Mainstream to adjust the layout accordingly to minimise impacts.</p> <p>Roy concluded that the bird specialists do a 12 month pre-construction monitoring, as well as monitoring during the construction and operational phase of the wind farm.</p>

<p>Robert Stannard mentioned that he has already spent some time with the bird specialists when they were up here for 3 weeks during initial site monitoring. He said that Chris Van Rooyen (the bird specialist) was saying that it has been found that in certain studies overseas, individual turbines on a farm can actually cause major impacts on bird populations, no matter how good your mitigation is. He said that for example there may be 1 or 2 turbines, or a line of turbines that cause more impacts than the others. Robert's concern therefore is what happens when turbines in a specific area cause serious impacts. He wanted to know how is that written into the scoping report and the impact statement and what arrangements are made in the management program in the long term?</p>	<p>Mike responded that the EIA is done and specialists are appointed to identify impacts beforehand. He further said that if 1 or 2 turbines or a certain part of the site has a bigger impact, it is likely that the wind farm operator would be required to shut down those turbines if necessary. He said that they would first conduct further monitoring and appoint specialists to focus on the problem and try and identify the specific turbines and period if required. Mike explained that if only two turbines caused problems over a short period in the year, the operator would probably need to curtail those turbines for that part of the year. He said that the operator can either shut them down completely or start the turbines at a certain wind speed for example. He further mentioned that a lot of lessons have been learnt from countries that have been doing this for a long time. He concluded that Mainstream will try and do as much work upfront as possible in order to mitigate those impacts prior to construction and operation.</p> <p>Roy concluded that this is why we have an environmental process, so that we can identify these issues before the turbines are constructed, and mitigate them accordingly.</p>
<p>Petrus Fourie mentioned that the construction of various access roads will affect farm properties. He asked how access will be mitigated through these farms. He wanted to know if new fences and gates will be erected. He then asked what the quality of these new roads will be as they will be there for the next 20 years at least.</p>	<p>Mike responded that there would be meetings held beforehand between the construction contractors and the farmers on how construction will take place on their farms. He said that a farmer will specify where his existing gates are, where his cattle walk, and where he drives, and the new access points will be planned around this where possible. He then said that any fences and gates that had to be removed during construction will be rebuilt, but the farm owner will get opportunity to voice his opinions before construction.</p> <p>Roy added that wind farm developers usually use existing road footprints during layout planning where possible. He also confirmed that all new roads will be properly constructed with storm water structures, etc. He further confirmed that the developer will not build roads that may get washed away or eroded within a few months as the EIA process will mitigate this. He then concluded that the engineers in consultation with the landowners will play a role in designing these roads.</p>
<p>Robert Stannard said that he is unclear on how Mainstream is planning to transport 200 ton turbines up the existing gravel pass as it is very steep. He asked how Mainstream is planning for this.</p>	<p>Mike responded that this will have to be planned between the engineers in consultation with the landowners. He mentioned that the engineers will be onsite within a day or 2 to determine any fatal flaws with the routes and also to see how equipment will be transported up the</p>

<p>Robert Stannard mentioned that there are properties located along Knights Pass that are gazetted by KZN Wildlife as protected. He added that the existing borrow pit on top of the mountain is pretty much worked out, and that Mainstream will probably have to identify an alternative borrow pit site. He recommended the best way forward will be to consult with the landowners to identify new sites.</p>	<p>plateau.</p> <p>Mike responded that Mainstream does not want to start up a new borrow pit, if possible, especially up on the plateau. He confirmed that the wind farm will not require a huge amount of material, so various options will be investigated.</p> <p>Job Dube: mentioned that there is a working borrow pit up on the plateau that could be enlarged if necessary.</p> <p>Roy responded that both the borrow pit issue and access roads up the mountain pass will be assessed in the EIA process.</p>
<p>Roy concluded the meeting by thanking everyone that attended the meeting and reminded everyone to forward any future issues identified or questions that required response to either him or Mike at Mainstream via either post, email or telephone.</p>	

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 <p>Coastal & Environmental Services East London P. O. Box 8145, Nahoon, East London, 5210 Tel: +27 (43) 726 7809 Fax: +27 (43) 726 8352 Email: info@cesnet.co.za Also in Grahamstown, Cape Town and Port Elizabeth www.cesnet.co.za</p>	MEETING MINUTES	
	CLIENT	Mainstream Renewable Power (South Africa)
	DATE	19-11-2013
	VENUE	Emadlangeni Local Municipality office, Utrecht
	TIME OF MEETING	09:30
	MINUTES BY	Roy de Kock
	CIRCULATION DATE	4 February 2014

ATTENDED BY		
NAME	ASSOCIATION	EMAIL ADDRESS
Khumbulani Gwele	Emadlangeni Municipality	gwele.khu@gmail.com
Jadon Schmidt	CES	j.schmidt@cesnet.co.za
Roy de Kock	CES	r.dekock@cesnet.co.za
Mike Mangnall	Mainstream	Mike.Mangnall@mainstreamrp.com

Issues raised:	Response:
<ul style="list-style-type: none"> Roy de Kock (Roy) thanked Khumbulani for his time and introduced himself and Jadon Schmidt as consultants from Coastal and Environmental Services and Mike Mangnall (Mike) from Mainstream Renewable Power. Roy then explained the purpose of the focus group meeting. Roy mentioned that a turbine layout was not yet available as negotiations with the farmers were still underway, Roy did indicate a turbine focus area on a locality map indicating where most of the turbines will be concentrated on the various farm portions. Roy further explained that most of the turbines will be located on top of the ridges. Roy explained that the wind farm will be connected to the Eskom power grid at the Bloedrivier Substation. There are three alternative powerline corridors that will be proposed to Environmental Affairs with Powerline Corridor A1 being the preferred alternative currently. 	
Khumbulani: asked if CES and Mainstream were aware of the fact that a large wetland exists between the Bloedrivier and Groenvlei .	Roy confirmed this and responded that this wetland should not be affected by the proposed powerline development.
Khumbulani asked how much energy will be generated from the windfarm?	Roy responded that the maximum planned number of turbines is 90. He explained that they will each generate between 1.5 and 3 megawatts depending on the type of turbines used with a maximum potential capacity of around 140 megawatts. He further explained that this number might be reduced depending on the outcome of the environmental process.
Khumbulani commented that electricity is regularly cut during thunder storms. He asked how Mainstream is planning to deal with power cuts	Mike responded that according to the agreement they will have with the Department of Energy, the wind farm cannot go down for extended periods, so there will have to be a back up plan for when the electricity does go out. He further explained that Mainstream will need to ensure that

	power comes back online within an hour or two before they get penalised. Mike concluded that the substation is relatively old and may require an upgrade to accommodate the extra power input.
Khumbulani asked whether the power cables will be situated above or below ground.	Roy responded that the cables connecting the turbines to the switching station will be situated underground while the lines from the switching station to the substation will be overhead.
Mike asked whether Mainstream will be engaging with Khumbulani himself on rezoning, technical and town planning issues.	Khumbulani responded that the site may require rezoning as the affected land is currently zoned for agricultural. He confirmed that the affected land parcels are mostly private land and therefore will require meeting with the landowners to submit a proposal on rezoning.
Mike asked if the application for rezoning is through the local municipality office.	Khumbulani confirmed that it does.
Mike asked if Khumbalani himself is the correct contact person for any future queries.	Khumbulani confirmed that he is the correct contact person.
Khumbulani asked if CES and/or Mainstream would be available to present their project to the full Council the following Monday	Mike responded that the project is only at its beginning phases and requests that some more planning is done before presenting to the Council. He confirmed that Mainstream would like to present to the Council in due course, possibly later during the year (2014)
Mike stated that socio-economic issues and the opportunities that may rise from this project play an important role in the development process. He mentioned that he would like to initiate talks with the relative municipality representative about this. He asked for the relevant contact person's details.	Khumbulani answered that he will provide the contact details. He mentioned the contact person's name as Mbali.
Khumbulani asked if this project will provide electricity to the local communities. He also asked if Mainstream will provide opportunities to the community for skills development.	Mike responded that unfortunately according to government rules, wind farm developers cannot feed electricity straight to the community. He added that Mainstream will initiate various projects to try and improve the lives of the community. He explained that if this process is successful and Mainstream reaches construction and operation phase, they will form a trust in the name of various stakeholders ranging from the municipality and community. He further added that a percentage of the revenue generated will go to the community. However, he said, the building contractors building the wind farm will bring in their own skilled workers but there will definitely be jobs available for local unskilled workers.
Roy thanked everyone for their time and closed the meeting.	

 <p>Coastal & Environmental Services East London P. O. Box 8145, Nahoon, East London, 5210 Tel: +27 (43) 726 7809 Fax: +27 (43) 726 8352 Email: r.dekock@cesnet.co.za Also in Grahamstown, Cape Town and Port Elizabeth www.cesnet.co.za</p>	MEETING MINUTES	
	CLIENT	Mainstream Renewable Power (South Africa)
	DATE	18-11-2013
	VENUE	Waihoek Community Hall
	TIME OF MEETING	17:00
	MINUTES BY	Roy de Kock
	CIRCULATION DATE	4 February 2014

ATTENDED BY		
NAME	ASSOCIATION	EMAIL ADDRESS
See attendance register attached		

Issues raised by:	Response:
<p>Introduction</p> <ul style="list-style-type: none"> • Mike and Roy explained the purpose of the focus group meeting and commenced with a presentation on the proposed activity and the EIA process. • Mike explained that BVI Consulting Engineers will be providing preliminary inputs in terms of borrow pits (if required), access roads and so on, which will be in the EIR as well. • Roy mentioned that a turbine layout was not yet available as negotiations with the farmers were still underway. Roy did indicate a turbine focus area on the locality map showing where most of the turbines will be concentrated on the various farm portions. • Roy explained that almost all the turbines will be located on top of the ridges. • The turbines will be connected to the Eskom power grid through the Bloodrivier Substation. • There are three alternative powerline corridors that will be proposed to Environmental Affairs with Powerline Corridor A1 being the preferred alternative. • The presentation was translated into Zulu by Mr. Job Dube 	
<p>Job asked how the community will benefit in terms of electricity provision.</p>	<p>Mike explained that the windfarm will not be able to provide electricity directly to the community but there might be other ways to help the community.</p>
<p>Job asked if cattle grazing will be negatively affected.</p>	<p>Mike responded that there will be some disturbance during construction but that cattle will be able to carry on grazing as before after construction was completed.</p>
<p>Job asked what job opportunities there will be for the community. He further asked what skills and qualifications will people need.</p>	<p>Mike explained that a certain portion of jobs will need to be filled by qualified people with current job experience. But there will definitely be opportunities for unskilled and semi-skilled workers during construction. Most of the required skills will be construction related.</p>
<p>Job asked if it is possible for members of the community to get bursaries. He further asked if Mainstream will aid in children's education.</p>	<p>Mike responded Mainstream can assist in some way through the benefits that come from building the windfarm over time.</p>

Issues raised by:	Response:
<p>Petros stated that he understands the fact that Mainstream will be building a new road. He wanted to know if this road will be tarred or gravel.</p>	<p>Roy corrected Petros on the fact that Mainstream will not only construct a single road but various access roads. He further explained that each of these turbines - however many get approved - will need an access road. The result will therefore be a network of roads. Roy confirmed that all new access roads will be gravel roads that are layered and surfaced with storm water structures and erosion prevention mechanisms as per the Standard guidelines for roads. He further confirmed that these roads may be used by the community after construction.</p>
<p>Mr Khumalo acknowledged that he is aware of the mobile library Mainstream donated. He asked if there is any more aid to follow.</p>	<p>Mike responded that development of this project is only starting now. There are various aid projects that can be used to aid the local communities, but it will depend on certain factors. Mike explained that the development might not even happen, or may be scaled down. The finer details of the project will only become clearer as the project progresses. Mike concluded that if the project commences to construction and operation, there will definitely be benefits for the community throughout the 20 year life cycle.</p>
<p>Petros asked what kind of assistance Mainstream are going to bring to the elders.</p>	<p>Mike responded that there will be different income streams coming into the community through the land contract that Mainstream have with the community trust. He stated that everyone, including elders will share in the profit that the developer makes and the community can decide how to use that money. Mike further explained that the rules also state that a certain percentage of the profit goes to community projects to help the community start businesses, projects, etc.</p>
<p>Roy and Mike thanked everyone for attending and the meeting was concluded with a prayer.</p>	



12.1.4 Correspondence with Stakeholders

See attached documentation

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12.1.5 Correspondence with Landowners and Neighbouring Landowners

See attached documentation

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12.1.6 Correspondence with Registered I&APs

Please find the following attached

- a) Comment and Response from **BirdLife South Africa**
- b) Comment and Response from **Endangered Wildlife Trust**
- c) Comment and Response from **Richardson & Peplow Environmental**
- d) Comment and Response from **KZN Bat Interest Group**

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12.2 Appendix B: Interested and Affected Parties Database

12.2.1 I&AP Database for the Waaihoek WEF Powerline

STAKEHOLDERS	
Stakeholder	Contact Person
SANRAL	Ms Nanna Gouws
Department of Agriculture, Forestry & Fisheries: Land Use & Soil Management	Ms Anneliza Collett
Eskom: Renewable Energy	Mr Kevin Leask
Eskom	Ms Tshililo Nekhalali
Eskom: Land & Rights Section	Ms Michelle Nicol
Department of Water Affairs	Ms Zethu Makwabasa
Department of Energy	Ms Mokgadi Mathekgana
Department of Environmental Affairs: General Enquiries	Mr Albi Modise
Department of Environmental Affairs: Project Enquiries	Ms Mmatlala Rabothata
Department of Agriculture & Environment (DAE) KZN: Senior Manager Environmental Affairs North Region	Dr LW Mngoma
Department of Agriculture & Environment (DAE) KZN: Environmental Services District Manager	Mr Zama Mathenjwa
Department of Agriculture & Environment (DAE) KZN: Amajuba District Agriculture District Manager	Mr John Nhleko
Department of Agriculture & Environment (DAE) KZN: HOD EIA	Mr Poovey Moodley
Amajuba DM Manager	Mr Linda Africa
Emadlangeni LM Manager	Ms GP Ntshangase
Emadlangeni Technical Services	Mr Khumbulani Gwala
Emadlangeni Ward 1 councillor	ClIr V. Ndlovu
Emadlangeni Ward 3 councillor	ClIr B.M Phenyane
Renewable energy forum in KZN: Chairperson	Ms Abigail Knox
Telkom	Mr Raymond Couch
Sentech	Ms Alishea Viljoen
Vodacom	Mr Andre Barnard
Civil Aviation Authority	Ms Lizelle Stroh
Air Traffic and Navigation Services (ATNS): Vryheid and Newcastle airports	Mr Dylan Fryer
Ezemvelo KZN Wildlife	Ms Dinesree Thambu
Ezemvelo KZN Wildlife	Ms Felicity Elliott
Ezemvelo KZN Wildlife: Integrated Environmental Management	Mr Andy Blackmore
Ezemvelo KZN Wildlife: District Conservation Officer, Underberg Region	Mr Richard Schutte
Ezemvelo KZN Wildlife: Regional Ecologist	Ms Sonja Kruger
Ezemvelo KZN Wildlife: Ecological Advice Division	Mr Ian Rushworth
Ezemvelo KZN Wildlife: KZN Biodiversity Stewardship Programme	Mr Greg Martindale
Ezemvelo KZN Wildlife: Avifaunal unit	Mr Athol Marchant
Ezemvelo KZN Wildlife: District Ecologist	Mr Petros Ngwenya
AMAFA / Heritage KwaZulu Natal	Ms Annie van der Venter
AMAFA / Heritage KwaZulu Natal	Mr James van Vuuren
Birdlife South Africa	Mr Daniel Marnewick
Birdlife South Africa	Dr Hanneline Smit-Robinson

Birdlife South Africa: Birds and Renewable Energy Manager	Ms Samantha Ralson
Endangered Wildlife Trust: CEO	Ms Yolán Friedman
Endangered Wildlife Trust: Head of Conservation Science	Dr Harriet Davies-Mostert
Endangered Wildlife Trust: African Crane Conservation Programme Manager	Ms Kerry Morrison
Endangered Wildlife Trust: African Crane Conservation Programme Field Officer	Ms Glenn Ramke
Endangered Wildlife Trust: Senior Field Officer KZN	Ms Tanya Smith
Endangered Wildlife Trust: Wildlife & Energy Programme	Mr Lourens Leeuwner
WESSA KZN Region	Ms Jenny Duvenage
WESSA KZN Region: Conservation Project Manager	Mr Chris Galliers
WESSA KZN Region: Conservation Director	Mr Garth Barnes
WWF: Enkangala Grasslands Project South Africa	Mr Angus Burns
The Bat Interest Group of KwaZulu-Natal	Ms Wendy White
Utrecht Farmers Association	Ms Michelle van Staden
Ingogo Farmers Association	Mr Jan Smit
Groenvlei Farmers Association	Mr Christoff Joubert
Dejagersdrift Farmers Association	Mrs Patricia Strauss
Vryheid Farmers Association	Ms Lurien Jacobsz
Battlefields Route Association KZN	Mr Dave Sutcliff

LANDOWNERS AND NEIGHBOURING LANDOWNERS

Farm Number/Portion	Farm Name	Name
177/3	Goede Hoop	Ms Marina Theron (Goedehoop Number 177 Farming)
180/RE	Goedeloof	Mr Petrus Stephanus Fourie
435/RE	Oldeani	Mr Dieter Louis Muhl
435/1	Oldeani	Transnet
150/RE	Spartelspruit	Mr Koot Smit (Spartelspruit Trust)
460		Mr Gunther August Wolters Muhl
150/1	Spartelspruit	
150/3	Spartelspruit	Mr TL Mnguni (Siyanqobaazwelethu Community Trust)
119/4	Roodekoppe	
150/2	Spartelspruit	Mr Lourens Greyling (Baltus Spruit Eiendomme Cc)
150/5	Spartelspruit	
119/16	Roodekoppe	Eskom Finance Co Pty Ltd
173/4	Waaioek	Waaioek Community Trust
173/6	Waaioek	
173/9	Waaioek	Mr Job Dube
173/11	Waaioek	Mr Greyling
152/1	Groothoek	
17068/5	Wijdgelegen	Mr Karel Landman (Fanie Landman Family Trust)
152/9	Groothoek	Ms Nelisiwe Elsie Dhlamini
83/3	Vlakplaats	Mr Hennie Boshoff (LAM Boerdery Trust)
83/10	Vlakplaats	
66/0	Grootvlei	Mr Moshamedi Hendry Motloug
66/12	Grootvlei	Mr Gert Willem Hanekom

66/13	Grootvlei	Mr Christopher Subonelo Sibisi
119/2	Roodekoppe	Ulrich Gevers
119/7	Roodekoppe	
119/16	Roodekoppe	Eskom Finance Co Pty Ltd
152/13	Grootvlei	Waihoek Community Trust
180/0	Goedgeloof	Mr Petrus Stephanus Fourie
180/1	Goedgeloof	Mr Charles Johan de Villiers
180/2	Goedgeloof	Mr Nhlhla Nhleko (Masibambani Communal Land)
434	Rusthof	Mr Andries De Villiers
83/6	Vlakplaats	
180/4	Goedgeloof	Mr Gunther August Wolters Muhl
180/3	Goedgeloof	
83/9	Vlakplaats	Mr Lourens Greyling (Baltus Spruit Eiendomme Cc)
66/7	Grootvlei	
83/5	Vlakplaats	
119/5	Roodekoppe	Mr TL Mnguni (Siyanqobaazwelethu Community Trust)
66/6	Grootvlei	
83/8	Vlakplaats	

12.2.2 I&AP Database for the associated Waihoek WEF

STAKEHOLDERS	
Stakeholder	Contact Person
SANRAL	Ms Nanna Gouws
Department of Agriculture, Forestry & Fisheries: Land Use & Soil Management	Ms Anneliza Collett
Eskom: Renewable Energy	Mr Kevin Leask
Eskom	Ms Tshililo Nekhalali
Eskom: Land & Rights Section	Ms Michelle Nicol
Department of Water Affairs	Ms Zethu Makwabasa
Department of Energy	Ms Mokgadi Mathekgana
Department of Environmental Affairs: General Enquiries	Mr Albi Modise
Department of Environmental Affairs: Project Enquiries	Ms Mmatlala Rabothata
Department of Agriculture & Environment (DAE) KZN: Senior Manager Environmental Affairs North Region	Dr LW Mngoma
Department of Agriculture & Environment (DAE) KZN: Environmental Services District Manager	Mr Zama Mathenjwa
Department of Agriculture & Environment (DAE) KZN: Amajuba District Agriculture District Manager	Mr John Nhleko
Department of Agriculture & Environment (DAE) KZN: HOD EIA	Mr Poovey Moodley
Amajuba DM Manager	Mr Linda Africa
Emadlangeni LM Manager	Ms GP Ntshangase
Emadlangeni Technical Services	Mr Khumbulani Gwala
Emadlangeni Ward 1 councillor	Clr V. Ndlovu
Emadlangeni Ward 3 councillor	Clr B.M Phenyane
Renewable energy forum in KZN: Chairperson	Ms Abigail Knox
Telkom	Mr Raymond Couch

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Sentech	Ms Alishea Viljoen
Vodacom	Mr Andre Barnard
Civil Aviation Authority	Ms Lizelle Stroh
Air Traffic and Navigation Services (ATNS): Vryheid and Newcastle airports	Mr Dylan Fryer
Ezemvelo KZN Wildlife	Ms Dinesree Thambu
Ezemvelo KZN Wildlife	Ms Felicity Elliott
Ezemvelo KZN Wildlife: Integrated Environmental Management	Mr Andy Blackmore
Ezemvelo KZN Wildlife: District Conservation Officer, Underberg Region	Mr Richard Schutte
Ezemvelo KZN Wildlife: Regional Ecologist	Ms Sonja Kruger
Ezemvelo KZN Wildlife: Ecological Advice Division	Mr Ian Rushworth
Ezemvelo KZN Wildlife: KZN Biodiversity Stewardship Programme	Mr Greg Martindale
Ezemvelo KZN Wildlife: Avifaunal unit	Mr Athol Marchant
Ezemvelo KZN Wildlife: District Ecologist	Mr Petros Ngwenya
AMAFA / Heritage KwaZulu Natal	Ms Annie van der Venter
AMAFA / Heritage KwaZulu Natal	Mr James van Vuuren
Birdlife South Africa	Mr Daniel Marnewick
Birdlife South Africa	Dr Hanneline Smit-Robinson
Birdlife South Africa: Birds and Renewable Energy Manager	Ms Samantha Ralson
Endangered Wildlife Trust: CEO	Ms Yolán Friedman
Endangered Wildlife Trust: Head of Conservation Science	Dr Harriet Davies-Mostert
Endangered Wildlife Trust: African Crane Conservation Programme Manager	Ms Kerry Morrison
Endangered Wildlife Trust: African Crane Conservation Programme Field Officer	Ms Glenn Ramke
Endangered Wildlife Trust: Senior Field Officer KZN	Ms Tanya Smith
Endangered Wildlife Trust: Wildlife & Energy Programme	Mr Lourens Leeuwener
WESSA KZN Region	Ms Jenny Duvenage
WESSA KZN Region: Conservation Project Manager	Mr Chris Galliers
WESSA KZN Region: Conservation Director	Mr Garth Barnes
WWF: Enkangala Grasslands Project South Africa	Mr Angus Burns
The Bat Interest Group of KwaZulu-Natal	Ms Wendy White
Utrecht Farmers Association	Ms Michelle van Staden
Ingogo Farmers Association	Mr Jan Smit
Groenvlei Farmers Association	Mr Christoff Joubert
Dejagersdrift Farmers Association	Mrs Patricia Strauss
Vryheid Farmers Association	Ms Lurien Jacobsz
Battlefields Route Association KZN	Mr Dave Sutcliff

WEF LANDOWNERS

Farm Number/Portion	Farm Name	Contact Person
180/1	Goedgeloof	Mr Charles Johan de Villiers
180/RE	Goedgeloof	Mr Petrus Stephanus Fourie
173/9	Waaihoek	
173/11	Waaihoek	
173/3	Waaihoek	Waaihoek Community Trust

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173/4	Waaihoek	Mr Job Dube Mr Greyling
173/5	Waaihoek	
173/6	Waaihoek	
152/1	Groothoek	
152/3	Groothoek	
152/2	Groothoek	
152/5	Groothoek	
152/7	Groothoek	
152/10	Groothoek	
152/13	Groothoek	
177/3	Goede Hoop	
177/6	Goede Hoop	Mr Craig de Oliviera (Counterpoint Trading 402 BK)
182/2	Weltevreden	Mr Koos Uys (Jurust EDMS BPK Pty Ltd.)
182/1	Weltevreden	
17068/1	Wijdgelegen	Mr Karel Landman (Fanie Landman Family Trust)
17068/2	Wijdgelegen	
17068/5	Wijdgelegen	
17068/3	Wijdgelegen	Mr David Stock; Mr Kobus vd Bank (Knights Farm Pty Ltd)
17068/4	Wijdgelegen	Mr Lafras Uys (Jutein EDMS BPK)
77/RE	Paardepoort	Mr Inus Davel (Davelhoek Trust)
77/1	Paardepoort	
17069/9	Bloedrivier	Mr Robert Stannard

ADJACENT LANDOWNERS

Farm Number/Portion	Farm Name	Contact Person
17064	Stuurmanskraal	Mr Inus Davel (Davelshoek Trust)
160/3	Twijfontein	Mr Graystock Rudolf Naude
17071/4	Tigerfontein	
17069/3	Bloedrivier	Mr Robert Stannard
17069/2	Bloedrivier	
17069/4	Bloedrivier	
17069/10	Bloedrivier	
78/2	Blaauwstroom	Blaauwstroom Trust
78/3	Blaauwstroom	
159/1	Vryheid	
107/2	Vergenoegd	Mr Johannes Davel
107/3	Vergenoegd	
122/RE	Weltevreden	Ms Susanna Margaretha Hunter
122/2	Weltevreden	Government of South Africa
123/7	Holdkrans	
152/12	Groothoek	Mr Hennie Boshoff (LAM Boerdery Trust)
173/3	Waaihoek	Waaihoek Community Trust
173/4	Waaihoek	
173/5	Waaihoek	
173/12	Waaihoek	
173/13	Waaihoek	Mr Job Dube

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160/1	Twijelfontein	Mr Greyling
160/2	Twijelfontein	
17274/RE	Gumtree Grove	
122/1	Weltevreden	Mr Willem Adriaan Human
177/RE	Goede Hoop	
177/1	Goede Hoop	
177/2	Goede Hoop	Mr Moses Mahlinza
177/7	Goede Hoop	
177/5	Goede Hoop	Mr Craig de Oliviera (Counterpoint Trading 402 BK)
177/8	Goede Hoop	Mr William Peter Fogarty
180/2	Goedeloof	Mr Nhlanhla Nhleko (Masibambani Communal Land)
150/RE	Spartelspruit	Mr Koot Smit (Spartelspruit Trust)
182/RE	Weltevreden	Mr Koos Uys (Jurust EDMS BPK Pty Ltd)
424/1	Gumstreespruit	Mr Jan Harm Steenkamp
177/4	Goede Hoop	Mr Andries de Villiers
434	Rusthof	
152/6	Groothoek	
435/RE	Oldeani	Mr Dieter Louis Muhl

SURROUNDING LANDOWNERS

Farm Number/Portion	Farm Name	Contact Person
83/4	Vlakplaats	Mr Andries De Villiers
83/6	Vlakplaats	
124/11	Klipspruit	
152/4	Groothoek	
152/6	Groothoek	
83/2	Vlakplaats	Ms Annie Jacoba Mans
66/2	Grootvlei	Mr Lourens Greyling (Baltus Spruit Eiendomme Cc)
66/7	Grootvlei	
83/5	Vlakplaats	
83/9	Vlakplaats	
123/2	Holdkrans	Blaauwstroom Trust
159/RE	Vryheid	
159/2	Vryheid	
159/3	Vryheid	
159/5	Vryheid	
107/1	Vergenoegd	Mr Christoffel Boshoff Davel
107/4	Vergenoegd	
107/7	Vergenoegd	
107/8	Vergenoegd	
61/2	Waterhoek	Mr Cornelis Moll
152/9	Groothoek	Ms Nelisiwe Elsie Dhlamini
104/5	Suikerhoek	Mr Robert Tobias Oosthuizen (Gleimius Trading Cc)
104/6	Suikerhoek	
150/1	Spartelspruit	Mr Gunther August Wolters Muhl

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180/3	Goedeloof	
180/4	Goedeloof	
61/3	Waterhoek	Ms Jacoba Alberta Johanna Taljard
124/6	Klipspruit	Mr Jan Harm Steenkamp
53/4	Wydgelegen	Mr Johannes Adam Wilken
107/5	Vergenoegd	Mr Johannes Davel
107/6	Vergenoegd	
6/1	Hammar	
6/2	Hammar	
83/3	Vlakplaats	Mr Hennie Boshoff (Lam Boerdery Trust)
83/10	Vlakplaats	
83/11	Vlakplaats	
53/2	Wydgelegen	Mr Willy Leeuw (Leeuw Mining & Exploration Pty Ltd)
66/RE	Grootvlei	Mr Moshamedi Hendry Motloun
124/8	Klipspruit	Mr Levy Mpheni Ngcobo (Brothers Property Holdings KZN CC)
124/9	Klipspruit	
173/10	Waaihoek	
66/10	Grootvlei	Mr Nicolaas Smuts
66/16	Grootvlei	
124/12	Klipspruit	Mr Pieter Breytenbach
86/1	Zoetmelksrivier	Ms Senta Klingenberg
83/8	Vlakplaats	Mr TL Mnguni (Siyanqobaazwelethu Community Trust)
124/RE	Klipspruit	Mr Thomas Frederick Klopper
61/1	Waterhoek	Vidroforte Africa Pty Ltd
61/8	Waterhoek	N&H Boerdery Trust
123/RE	Holdkrans	Mr Willem Adriaan Human
123/4	Holdkrans	
78/1	Blaauwstroom	Mr Petrus Jacobus Claassen (Winlake Trading 22 Pty Ltd)
123/1	Oudehoutdraai	
17069/5		Mr Josef Johannes Benjamin Greyling
159/4	Vryheid	Steftraco BK
160/3	Twijelfontein	Mr Graystock Rudolf Naude
17071/3	Tigerfontein	
173/8	Waaihoek	Mr Inus Davel (Davelshoek Trust)
173/14	Waaihoek	Pinelands Stud Pty Ltd
180/5	Goedeloof	Mr Pieter Carel Hanekom
181/RE	Lijnspruit	Mr Erasmus Jacobus Petrus Smit
181/4	Lijnspruit	
181/8	Lijnspruit	
17069/1	Bloedrivier	Mr Robert Stannard
17069/6	Bloedrivier	
17069/7	Bloedrivier	
17069/8	Bloedrivier	
17071/RE	Tigerfontein	Mr Leonhard Daniel Malan

17071/1	Tigerfontein	Ms Cornelia Albertha Johanna Hatting
17071/2	Tigerfontein	

REGISTERED I&APs	
Stakeholder	Name
Endangered Wildlife Trust	Mr Bradley Gibbons
Leads 2 Business	Ms Bianca Torr�
Ngcobo Bros. Property Holdings C.C	Mr G Usher
Ngcobo Bros. Property Holdings C.C	Mr LM Ngcobo
Independent	Mrs AJ Mans
McCarthy Cruywagen Attorneys	Mr Dennis McCarthy
Naud� Boerdery	Mr GR Naud�
Richardson & Peplow Environmental	Ms Kate Richardson

DRAFT

12.3 Appendix C: Project Team CV's

ALAN CARTER - PHD, CPA (USA)

Date and place of birth: 7th July 1959, East London, Eastern Cape, South Africa

QUALIFICATIONS

Academic

- Ph.D. Plant Science (Rhodes University, 1987)
- B. Compt. Hons. Accounting Science (University of South Africa, 1997)
- B. Com. Financial Accounting (Rhodes University, 1995)
- B.Sc. Hons. Plant Science (Rhodes University, 1983)
- B.Sc. Plant Science & Zoology (Rhodes University, 1982)

Other

- Completed American National Standards Institute and British Standards Institute “Environmental Management Systems Lead Auditor Training Course”.

CERTIFICATIONS & MEMBERSHIPS

Environmental

- Certified Environmental Assessment Practitioner of South Africa (CEAPSA)(since 2012)
- Registered as a professional environmental scientist with the South African Council for Natural Scientific Professions (SACNASP) (since 2004).
- Certified ISO14001 Environmental Auditor with the Registrar Accreditation Board (RAB) (American National Standards Institute, USA), Quality Systems Association (Australia) (RABQSA) (since 2002).
- Professional Member of the South African Institute of Ecologists and Environmental Scientists, South Africa (SAIE&ES) (since 1987).
- Member of the South African Bureau of Standards (SABS) Technical Committee TC 207: Environmental Management Systems (since 2002)
- Member of the Sustainable Energy Society of South Africa (SESSA) (since 2007)

Financial Accounting

- Texas State Board of Public Accountancy (TSBPA), USA - Certified Public Accountant (since 1999)
- American Institute of Certified Public Accountants (AICPA), USA - Professional Member (since 1999).
- South African Institute of Chartered Accountants (SAICA) - Completed three year training certification requirements (completed 1996).

PROFESSIONAL EXPERIENCE

- January 2002 – Present: Director (Coastal & Environmental Services, East London, South Africa)
- January 1999 – December 2001: Manager (Arthur Andersen LLP, Public Accounting Firm, Chicago, Illinois USA)
- December 1996 – December 1998: Senior Accountant/Auditor (Ernst & Young LLP, Public Accounting Firm, Austin, Texas, USA.)

- January 1994 – December 1996: Senior Accountant/Auditor (Ernst & Young, Charteris & Barnes, Chartered Accountants, East London, South Africa)
- July 1991 – December 1994: Associate Consultant (Coastal & Environmental Services, East London, South Africa)
- March 1989 – June 1990: Data Investigator (London Stock Exchange, London, England, United Kingdom)

CONSULTING EXPERIENCE

Environmental consulting experience as project manager or team member is broad and covers a number of key areas. Specific experience includes the following:

Environmental Impact Assessment, Feasibility and Pre-feasibility Assessments

- Managed numerous projects and prepared environmental impact assessment (EIA) reports in terms of relevant EIA legislation and regulations for development proposals including golf estates and resorts, industrial activities, housing developments, infrastructure projects (bulk water and waste water, roads, electrical, etc.), mining, aquaculture, renewable energy (solar and wind), etc. (2002 – present). Projects have also included preparation of applications in terms of other statutory requirements, such as water-use and mining licence /permit applications.
- Managed projects to develop pre-feasibility and feasibility assessments for various projects, including various tourism developments, infrastructure projects, etc.
- Managed project for the East London Industrial Development Zone (ELIDZ) to develop a Conceptual Framework for a Mariculture Zone within the ELIDZ (2009).
- Managed pre-feasibility study to establish a Mariculture Zone within the Coega Industrial Development Zone (2014).

Strategic Environmental Assessment

- Managed Strategic Environmental Assessment (SEA) projects for two South African ports (2006 – 2007).
- Managed Strategic Environmental Assessment (SEA) projects for five (5) local municipalities in the Eastern Cape as part of the municipal Spatial Development Framework plans (2004 – 2005).
- Involved in the financial assessment of various land-use options and carbon credit potential as part of a larger Strategic Environmental Assessment (SEA) for assessing forestry potential in Water Catchment Area 12 in the Eastern Cape of South Africa (2006).

Climate change, emissions trading and renewable energy

- Managed project to develop a Climate Change Strategy for Buffalo City Metro Municipality (2013).
- Managed projects to develop climate change strategies for two district municipalities in the Eastern Cape Province (2011).
- Conducted specialist carbon stock and greenhouse gas emissions impact and life cycle assessment as part of the Environmental, Social and Health Impact Assessment for a proposed sugarcane to ethanol project in Sierra Leone (2009 - 2010) and a proposed Jatropha bio-diesel project in Mozambique (2009 - 2010).
- Managed project to develop the Eastern Cape Province Climate Change Strategy (2010).
- Managed project to develop a Transnet National Ports Authority Climate Change Risk Strategy (2009)
- Participated in a project to develop a Renewable Energy roadmap for the East London Industrial Development Zone (ELIDZ) (2013).
- Participated in a project for the East London Industrial Development Zone (ELIDZ) and Eastern Cape Government to prepare a Renewable Energy Strategy (2009).

- Contributed to the development of Arthur Andersen LLP's International Climate Change and Emissions Trading Services (2001).
- Conducted carbon credit (Clean Development Mechanism - CDM) feasibility assessment for a variety of renewable energy projects ranging from biogas to solar PV.
- Participated in the preparation of CDM applications for two solar PV projects in the Eastern Cape.

Waste Management

- Managed project to develop Integrated Waste Management Plans for eight local municipalities on behalf of a District Municipalities in the Eastern Cape Province (2011).
- Managed a project to develop a zero-waste strategy for a community development in the Eastern Cape Province (2010).
- Managed projects to develop Integrated Waste Management Plans for two District Municipalities in the Eastern Cape Province (2009 & 2011).
- Managed waste management status quo analysis for a District Municipality in the Eastern Cape Province (2003).
- For three consecutive years, managed elements of the evaluation of the environmental financial reserves of the three largest solid waste companies (Waste Management, Inc., Republic Services, Inc., Allied Waste, Inc.) and number of smaller waste companies in the USA as part of the annual financial audit process for SEC reporting purposes. Ensured compliance with RCRA and CERCLA environmental regulations.
- Managed elements of the evaluation of the environmental financial reserves of the largest hazardous waste company in the USA (Safety-Kleen, Inc.), as part of the audit process for SEC reporting purposes. Ensured compliance with RCRA and CERCLA environmental regulations.

Environmental Due Diligence and Business Risk

- Conducted environmental due diligence projects on behalf of the German Development Bank for a forestry pulp and paper operation in Swaziland (2010) and for a large diversified South African agricultural/agro-processing company (2011)
- Managed project for the Transnet National Ports Authority to identify the environmental risks and liabilities associated with the operations of the Port of Durban as part of a broader National initiative to assess business and financial risks relating to environmental management (2006).
- Managed project to determine the financial feasibility of various proposed tourism developments for the Kouga Development Agency in the Eastern Cape Province (2006)
- Contributed significantly to a study to determine the financial and environmental feasibility of three proposed tourism development projects at Coffee Bay on the Wild Coast (2004).
- Conducted sustainability and cost/benefit analysis of various waste water treatment options (including a marine pipeline at Hood Point) for the West Bank of East London (2004).
- Conducted analysis of permit fees and application processing costs for off-road vehicle use on the South African coastline for the Department of Environmental Affairs and Tourism, Marine & Coastal Management (2003).
- Involved in the determination of the historical cost element of environmental remediation insurance claims for a number of multinational companies, including Dow Chemicals, Inc. and International Paper, Inc.
- Evaluated the environmental budgeting process of the US Army and provided best practice guidance for improving the process.

Policy and Guidelines

- Managed project to develop a sustainability diagnostic report as part of the development of the Eastern Cape Development Plan and Vision 2030 (2013)
- Managed project for the Department of Environmental Affairs and Tourism, Marine & Coastal Management to determine the cost implications associated with the implementation of the Integrated Coastal Management Act (2007).
- Managed project to develop a Conservation Plan and Municipal Open Space System (MOSS) for Buffalo City Municipality (2007)

- Managed project to develop a Sanitation Policy and Strategy for Buffalo City Municipality, Eastern Cape (2004 – 2006).
- Managed project to develop an Integrated Environmental Management Plan and Integrated Coastal Zone Management Plan for Buffalo City Municipality, Eastern Cape (2004 – 2005).
- Managed projects to develop and implement an Environmental Management System (EMS) for the Chris Hani and Joe Gqabi (formerly Ukhahlamba) District Municipalities in the Eastern Cape generally in line with ISO14001 EMS standards (2004 – 2005).
- Managed project to develop a State of the Environment Report and Environmental Implementation Plans for Amathole, Chris Hani, OR Tambo and Joe Gqabi District Municipalities in the Eastern Cape Province (2005 – 20010).
- Conducted analysis of permit fees and application processing costs for off-road vehicle use on the South African coastline for the Department of Environmental Affairs and Tourism, Marine & Coastal Management (2003).

Environmental Auditing and compliance

- Managed project to develop an Environmental & Social Management System (ESMS) in line with IFC Performance Standards for a telecoms company in Zimbabwe on behalf of the German Development Bank (2013)
- Participated in numerous ISO14001 Environmental Management System (EMS) audits for large South African corporations including SAPPI, BHP Billiton, SAB Miller, Western Platinum Refinery, Dorbyl Group and others (2002 – present).
- Reviewed the SHE data reporting system of International Paper, Inc. (IP) for three successive years as part of the verification of the IP SHE Annual Report, which included environmental assessments of 12 IP pulp and paper mills located throughout the USA.
- Conducted Environmental Management System (EMS) reviews for a number of large US corporations, including Gulfstream Aerospace Corporation

Public financial accounting

- While with Ernst & Young LLP, (USA), functioned as lead financial auditor for various public and private companies, mostly in the technology business segment of up to \$200 million in annual sales. Client experience included assistance in a \$100 million debt offering, a \$100 million IPO and SEC annual and quarterly reporting requirements.
- Completed three years of articles (training contract) in fulfilment of the certification requirements of the South African Institute of Chartered Accountants which included auditing, accounting and preparation of tax returns for many small to medium sized commercial entities.

PUBLICATIONS

Refereed Publications

- **Carter, A.R.** 1985. Reproductive morphology and phenology, and culture studies of *Gelidium pristoides* (Rhodophyta) from Port Alfred in South Africa. *Botanica Marina* 28: 303-311.
- **Carter, A.R.** 1993. Chromosome observations relating to bispore production in *Gelidium pristoides* (Gelidiales, Rhodophyta). *Botanica Marina* 36: 253-256.
- **Carter, A.R.** and R.J. Anderson. 1985. Regrowth after experimental harvesting of the agarophyte *Gelidium pristoides* (Gelidiales: Rhodophyta) in the eastern Cape Province. *South African Journal of Marine Science* 3: 111-118.
- **Carter, A.R.** and R.J. Anderson. 1986. Seasonal growth and agar contents in *Gelidium pristoides* (Gelidiales, Rhodophyta) from Port Alfred, South Africa. *Botanica Marina* 29: 117-123.
- **Carter, A.R.** and R.H. Simons. 1987. Regrowth and production capacity of *Gelidium pristoides* (Gelidiales, Rhodophyta) under various harvesting regimes at Port Alfred, South Africa. *Botanica Marina* 30: 227-231.
- **Carter, A.R.** and R.J. Anderson. 1991. Biological and physical factors controlling the spatial distribution of the intertidal alga *Gelidium pristoides* in the eastern Cape Province, South Africa. *Journal of the Marine Biological Association of the United Kingdom* 71: 555-568.

Published reports

- Water Research Commission. 2006. Profiling Estuary Management in Integrated Development Planning in South Africa with Particular Reference to the Eastern Cape. Project No. K5/1485.
- Turpie J., N. Sihlophe, **A. Carter**, T. Maswime and S. Hosking. 2006. Maximising the socio-economic benefits of estuaries through integrated planning and management: A rationale and protocol for incorporating and enhancing estuary values in planning and management. Unpublished Water Research Commission Report No. K5/1485

Conference Proceedings

- **Carter, A.R.** 2002. Climate change and emission inventories in South Africa. *Invited plenary paper at the 5th International System Auditors Convention, Pretoria. Held under the auspices of the South African Auditor & Training Certification Association Conference (SAATCA).*
- **Carter, A.R.** 2003. Accounting for environmental closure costs and remediation liabilities in the South African mining industry. *Proceedings of the Mining and Sustainable Development Conference. Chamber of Mines of South Africa, Vol. 2: 6B1-5*
- **Carter, A.R.** and S. Fergus. 2004. Sustainability analysis of wastewater treatment options on the West Bank of East London, Buffalo City. *Proceedings of the Annual National Conference of the International Association for Impact Assessment, South African Affiliate: Pages 295-301.*
- **Carter, A.,** L. Greyling, M. Parramon and K. Whittington-Jones. 2007. A methodology for assessing the risk of incurring environmental costs associated with port activities. *Proceedings of the 1st Global Conference of the Environmental Management Accounting Network.*
- Hawley, GL, McMaster AR and **Carter AR.** 2009. Carbon stock and life-cycle assessment in assessing cumulative climate change impacts in the environmental impact assessment process. *Proceedings of the Annual National Conference of the International Association for Impact Assessment, South African Affiliate.*
- Hawley, GL, McMaster AR and **Carter AR.** 2010. The Environmental and Social Impact Assessment and associated issues and challenges. *African, Caribbean and Pacific Group of States (ACP), Science and Technology Programme, Sustainable Crop Biofuels in Africa.*
- **Carter, A.R.** 2011. A case study in the use of Life Cycle Assessment (LCA) in the assessment of greenhouse gas impacts and emissions in biofuel projects. *2nd Environmental Management Accounting Network- Africa Conference on Sustainability Accounting for Emerging Economies. Abstracts: Pages 69-70.*

DR GREER LEIGH HAWLEY

Date of birth: 30 May 1978

QUALIFICATIONS

BSc (University of Cape Town)

BSc (Botany Hons) (University of Cape Town),

PhD (Rhodes University)

Training in Greenhouse Gas Accounting for Forest Inventories (Greenhouse Gas Management Institute)

ASSOCIATIONS

- South African Association of Microbiology
- International Association for Impact Assessment
- South African Association of Botany

PROFESSIONAL EXPERIENCE

1998	:	Botanical consultant: University of Cape Town Laboratory assistant: University of Cape Town
1999	:	Undergraduate Tutor: University of Cape Town
2000- 2001	:	Temporary administrative position: Robert Half International, London Assistant Office Manager: Warwick House, London Office administration: West London Magistrates Court, London
2002	:	Laboratory Assistant: Amphigro
2002- 2007	:	Undergraduate Tutor: Botany and Microbiology, Rhodes University
2006- 2007	:	Laboratory researcher: Abalone Probiotic isolation and testing, Rhodes University
2007	:	Laboratory assistant and product quality control: Mycoroot (Pty) Ltd, Grahamstown
2007- present	:	Principal Environmental Consultant - Coastal & Environmental Services <ul style="list-style-type: none"> ○ Environmental Impact Assessments ○ Ecological and Carbon Stock Specialist studies ○ Provide input, report writing and management of Spatial Development Frameworks ○ Provided input and carry out report writing of Environmental Feasibility studies

RESEARCH INTERESTS

In the last 10 years, Dr Greer Hawley has been involved in a number of diverse activities. The core academic focus has however, been directed in the field of taxonomy both in the plant and fungal kingdom. The theory of taxonomy and phylogenetic analysis has been applied to further knowledge of species identification and understanding of biodiversity in South Africa. Greer's research ranges from studying fresh and marine algae, estuarine diatoms, *Restio* species classification in the fynbos vegetation and fungal species identification and ecology in *Pinus* plantation in Mpumalanga. Greer's microbiological study of Ectomycorrhizal fungi has also contributed towards an understanding of soil ecology and "below ground" networks, including saprotrophic and mutual symbiotic micro-organisms.

POST GRADUATE STUDENT SUPERVISION

2005 – 2007: 3 Honours students in the Mycology Unit, Rhodes University

2006: MSc student in the Mycology Unit, Rhodes University.

SELECTED RECENT PUBLICATIONS

Hawley GL and Dames JF. 2004. Mycorrhizal status of indigenous tree species in a forest biome of the Eastern Cape, South Africa. *South African Journal of Science* 100, 633-637.

Hawley GL and Dames JF. (2008). Ectomycorrhizas in association with *Pinus* in South Africa. *South African Journal of Science*.

RECENT CONFERENCE PAPER/PUBLICATIONS

2010: Hawley, GL, McMaster AR and Carter AR. The Environmental and Social Impact Assessment, and associated issues and challenges associated with Biofuels. African, Caribbean and Pacific Group of States (ACP), Science and Technology Programme, Sustainable Crop Biofuels in Africa.

2009: Hawley, GL, McMaster AR and Carter AR. Carbon, carbon stock and life-cycle assessment in assessing cumulative climate change impacts in the environmental impact process. International Association of Impact Assessors.

2008: Hawley GL and Dames JF. Ectomycorrhizal species diversity above- and below ground comparison in *Pinus patula* (Schlecht et Cham) plantations, South Africa. South African Society for Microbiology (Poster presentation).

2006: Hawley, GL and Dames, JF. Morphological and molecular identification of ectomycorrhizal fungi in *Pinus* plantations. South African Society of Microbiology.

RECENT ENVIRONMENTAL MANAGEMENT EXPERIENCE

Specialist studies

- ***Addax BioEnergy (2009/2010), Biodiversity and Ecological Impact Assessment AND Carbon Stock Impact Assessment, Sierra Leone.***

The above specialist studies were submitted as separate deliverables and are described separately.

Biodiversity and Ecological Impact Assessment: This study involved the survey of a 60 000 ha site in Sierra Leone. The vegetation types were described and assessed in terms of biodiversity and overall ecological sensitivity. In addition, the area was surveyed by local experts for the presence of rare and endangered faunal species, for inclusion into the report. All vegetation types were mapped using GIS. The assessment was compiled for international review in accordance with World Bank standards.

Carbon Stock Impact Assessment: In accordance with the EU directive, Biofuel production needs to demonstrate a 30% reduction in carbon emissions compared to fossil fuels. For this reason, a Carbon Stock study was carried out to determine site specific carbon stocks. ***This study included field calculations, vegetation and soil sampling and carbon stock calculations according to internationally accepted standards and using best practice guidelines.*** Using the detailed GIS vegetation maps, total carbon stocks could be calculated. Sample collection included local academic soil scientists. This study and associated methodology was compiled according to the International Panel on Climate Change (IPCC) standards.

- ***Wild Coast Forest Survey: (2009-2010) Department of Water and Forestry / Eastern Cape Parks Board initiative***

The forest survey included substantial field work and data collection of the following: plant species identification, GPS mapping of forest boundaries, forest-typing and identifying and quantifying disturbance impacts.

- ***Mncwasa Water Scheme (2009): Ecological Sensitivity Assessment***

This assessment involved a detailed vegetation survey of forest vegetation and wetlands along anticipated and alternative pipeline routes. The survey included an assessment of the environmental sensitivity along the route and recommendations for mitigation and environmentally acceptable alternatives.

- ***Peregrine Dunes Golf Estate (2009): Vegetation Rehabilitation Plan and Ecological Impact Assessment***

The Ecological Impact Assessment and Rehabilitation Plan were represented as two reports for the same project. The work carried out on the Ecological Impact Assessment included report revision writing.

The Rehabilitation Plan was submitted as part of the Environmental Management Plan and incorporated elements of re-vegetation, alien plant removal and rehabilitation, landscape restoration, based on widely accepted concepts of soil ecology and plant succession ecology.

Feasibility studies

- ***Nkanya Lodge Feasibility Study: Eastern Cape Development Corporation (ECDC) initiative***

Aspects of this study included the consideration of the economic and financial viability of the proposed project as well as the environmental risks and alternative technologies.

Full Scoping and Environmental Impact Assessments (South African National Environmental Management: EIA regulations)

- ***Buffalo City Municipality R72 national road re-alignment (2007-2008): Sleeper site***

Responsibilities included: Project Management, budget management, written report, public participation and engagement with key stakeholders throughout the EIA process. Environmental approval obtained.

- ***Wild Coast Abalone expansion and processing plant (2008)***

Responsibilities included: Project management, budget management, written reports, public participation and stakeholder engagement with key stakeholders. Environmental approval obtained.

- ***All Saints Hospital Waste Water Treatment Works (2012)***

Responsibilities included: Project management, budget management, written reports, public participation and stakeholder engagement with key stakeholders. Environmental approval obtained.

- ***Qolora Aquaculture Development Zone (2011)***

Responsibilities included: Project management, budget management, written reports, public participation and stakeholder engagement with key stakeholders. Environmental approval obtained.

- ***Jamestown Waste Water Treatment Works (2012)***

Responsibilities included: Project management, budget management, written reports, public participation and stakeholder engagement with key stakeholders. Environmental approval obtained.

- ***Ntabankulu Waste Water Treatment Works (2012)***

Responsibilities included: Project management, budget management, written reports, public participation and stakeholder engagement with key stakeholders. Environmental approval obtained.

- ***Qamata: No-gate Waste Water Treatment Works (2012)***

Responsibilities included: Project management, budget management, written reports, public participation and stakeholder engagement with key stakeholders. Environmental approval obtained.

- **St Patricks Hospital Waste Water Treatment Works (Current)**

Responsibilities included: Project management, budget management, written reports, public participation and stakeholder engagement with key stakeholders.

State of Environment (SoER) and Environmental Management Plans (EMP) for:

- OR Tambo District Municipality, Eastern Cape Province, South Africa (2009-2010). Accepted by council.
- Ukhahlamba (Joe Gqabi) District Municipality, Eastern Cape Province, South Africa. (2011)
- Mnquma Local Municipality, Eastern Cape Province, South Africa (2012)

Activities:

- Field survey of district municipality through aerial surveying and field work reporting of whole district municipality (incorporating 4-7 local municipalities).
- Continued interaction with municipal representatives and key stakeholders
- Workshops held with key role-players and decision-makers
- Review of planning document and integrated development programs.
- Identification of key environmental issues
- Selection of priority environmental issues
- Development of Environmental Management Action Plans directly aimed at mitigated priority issues.

Responsibilities:

- Overall project manager,
- Budget management,
- Report writing,
- Team delegation and management and
- Client liaison.

Additional Specialist studies

- Sensitive Ecology Assessment: Mncwasa Water Scheme
- Vegetation Rehabilitation Plan: Peregrine Dunes Golf Estate
- Ecological Impact Assessment: Peregrine Dunes Golf Estate
- Vegetation Assessment: Atterbury Development
- Wild Coast Forest Survey: (current) DWAF/EC Parks initiative
- Biodiversity and Ecological Impact Assessment, Sierra Leone, Addax Biofuels
- Land use Impact Assessment, Sierra Leone, Addax Biofuels
- Thyspunt – Melkhout Eskom Power line, Ecological Impact Assessment
- Ecological Impact Assessment: Chaba Wind Energy Facility
- Ecological Impact Assessment: Chaba Wind Energy Facility
- Ecological Impact Assessment: Qunu Renewable Energy Facility
- Ecological Impact Assessment: Ncora Renewable Energy Facility
- Ecological Impact Assessment: Ngqamakwe Renewable Energy Facility
- Ecological Impact Assessment: Qumbu Wind Energy Facility
- Terrestrial Ecology Impact Assessment: Qolora Aquaculture Zone
- Toboshane Valley Estate: Ecological Impact Assessment
- Toboshane Valley Estate: Conservation Management Plan
- Floral Biodiversity and Impact Assessment: Niassa Green Resource, Mozambique

ROY DE KOCK (M.Sc.)

Date of Birth: 22-06-1976

QUALIFICATIONS

M.Sc. in Rehabilitation Ecology (Nelson Mandela Metropolitan University, 2010)

B.Sc Honours in Geology (Nelson Mandela Metropolitan University, 2008)

B.Sc Geology/Botany (Nelson Mandela Metropolitan University, 2007)

Diploma in Marketing (University of Witwatersrand, 2003).

EIA Course (Rhodes University, 2010)

MEMBERSHIPS***Environmental***

- Registered as a Candidate Environmental Scientist with the South African Council for Natural Scientific Professions (SACNASP).
- South African Association of Botanists (SAAB)

PROFESSIONAL EXPERIENCE

October 2012 – Current: Senior Environmental Consultant (Coastal & Environmental Services)

April 2010 – October 2012: Environmental Consultant (Coastal & Environmental Services)

June 2008 – March 2010: Laboratory Technician (Nelson Mandela Metropolitan University)

March 1995 – November 2003: Financial Advisor (ABSA Bank)

CONSULTING EXPERIENCE

Environmental consulting experience as project manager or team member is broad and covers a number of key areas. Specific experience includes the following:

Environmental Impact Assessment and pre-feasibility assessments

- Stone Vegetation Assessment, Kaizers Beach (2010)
- Eskom Vegetation Assessment, Elloit-Ugie-Sappi (2010)
- Eskom Melkhout 132kV Distribution EIA, Oyster Bay (2011)
- Bizana Mixed-use Development Scoping and full EIR, Bizana; Eastern Cape (2012)
- Toboshane Valley Estate EIA, East London (2011)
- Toboshane Valley Estate Visual Impact Assessment (2011)
- Thomas River Windfarm EIA, Cathcart (2010)
- Chaba Windfarm EIA, Komga; Eastern Cape (2010)
- Lushington Park Windfarm EIA, East London (2011)
- Lushington Park Windfarm Ecological Impact Assessment, East London (2011)
- Langa Solar Facility EIA, Berlin (2011)
- Red Cap 66kV Power line EIA, St. Francis, Eastern cape (2011)
- Red Cap 66kV Power line Ecological Impact Assessment, St. Francis, Eastern cape (2011)
- N9 road upgrade in Middelburg EIA, Eastern Cape (2012)
- Hard rock quarry licence and EMP, Middelburg, Eastern Cape (2012)
- Ecological Impact Assessment in Hombe, Eastern Cape for a new Eskom 132kV power line (2012)
- Ecological Impact Assessment in Taweni, Eastern Cape for a new Eskom 132kV power line (2011)
- Ecological Impact Assessment in Mfinizo, Eastern Cape for a new Eskom 132kV power line (2011)
- ADM Sleeper site basic Assessment Report and Soil Contamination Assessment (2012)
- Eskom Mfinizo, Taweni and Hombe Basic Assessment Reports (2011).

- Tsolwana Road upgrade EIA, Tarkastad EIA (2012)
- Centane Road road upgrade EIA, Mazeppa Bay, Eastern Cape (Current)
- Innowind Peddie Solar facility EIA, Eastern Cape (2012)
- Innowind Peddie Solar and Wind facility Agricultural Impact study, Eastern Cape (2012)
- Innowind Peddie Solar facility Visual Impact study, Eastern Cape (2012)
- Innowind Peddie Solar facility Ecological Impact study, Eastern Cape (2012)
- Innowind Qumbu Solar and Wind facility Agricultural Impact study, Eastern Cape (2012)
- Innowind Qumbu Solar facility Visual Impact study, Eastern Cape (2012)
- Kangankunde Rare Minerals mine, Malawi, Rehabilitation Management Plan and Mine Closure Plan (2011)
- Kenmare Moma Titanium mine, Mozambique, Weed Control Plan and Species of Special Concern Management Plan (2011)
- GS Cimentos limestone mine, Maputu, Mozambique, Rehabilitation Management Plan and Mine Closure Plan (2011)
- Upgrade of the R61 between Baziya and Umthatha BAR (2012)
- Upgrade of the R61 between Baziya and Umthatha Ecological Impact Assessment (2012)
- Amatola Water Bulk Water Pipeline Ecological Report – Cannon Rocks to Alexandria (2012)
- Amatola Water Bulk Water Pipeline Ecological Report – Port Alfred Borehole Extraction & Treatment (2012)
- Amatola Water Bulk Water Pipeline Ecological Report – Bushmansriver to Cannon Rocks (2013)
- Ndabakazi Mixed-use Development Ecological Report (2012)
- Ndabakazi Mixed-use Development Geotechnical Assessment (2012)
- Goba water pipeline, Katberg, Eastern Cape Vegetation Assessment (2012)
- SSI Botanical Compliance for EA (2012)
- Terra Wind Middleton Wind Energy Facility Agricultural Impact Assessment (2012)
- Innowind Grassridge WEF, Groundtruthing Report (2012)
- Innowind Waainek WEF, Management Programmes (2012)
- SANRAL R61 Mthatha to Umngazi EIA (Current)
- Berlin Beef Feedlot EIA (2013)
- SANRAL R61 Mthatha to Baziya Environmental Sensitivity Report (Current)
- SANRAL N2 road upgrade between Tetyana & Sitebe Komkulu; Eastern Cape EIA (Current)
- SANRAL N2 road upgrade between Tetyana & Sitebe Komkulu; Eastern Cape Ecological Assessment (Current)
- SANRAL N2 road upgrade between Tetyana & Sitebe Komkulu; Eastern Cape Sensitivity Assessment (Current)
- Cedarville to Mt. Frere road upgrade EIA – Inzame Engineering (Current)
- Amatola District Municipality Office building EIA – Stutterheim (Current)
- Amatola District Municipality Office building Ecological Assessment – Stutterheim (Current)

Policy and Guidelines

- Ukhahlamba District Municipality EMP, Eastern Cape (2010)
- Qamata LSDF, Eastern cape (2010)
- Water use license applications x 12 for N9 road upgrade, Middelburg, Eastern Cape (Current)
- Tsolwana Water use lisenche applications, Tarkastad EIA (2012)
- Section 24G NEMA application for an unauthorised bridge build over the Black Kei river, Tarkastad, Eastern Cape (Current).
- Centane Road Water use license application, Mazeppa Bay, Eastern Cape (Current)
- Centane Road borrow pit license applications, Mazeppa Bay, Eastern Cape (Current)
- Upgrade of the R61 between Baziya and Mthatha Water use license application (Current)
- Upgrade of the R61 between Baziya and Mthatha Mining License (Current)
- SANRAL N2 road upgrade between Tetyana & Sitebe Komkulu; Eastern Cape Mining licenses (Current)
- SANRAL N2 road upgrade between Tetyana & Sitebe Komkulu; Eastern Cape Water use license applications (Current)

- Cedarville to Mt. Frere road upgrade Mining licenses – Inzame Engineering (Current)
- Cedarville to Mt. Frere road upgrade Water use license applications – Inzame Engineering (Current)

Environmental Auditing and compliance

- TNPA Car Berth Dredging ECO, Port of East London (2010)
- Kenmare Moma Titanium mine, Mozambique. Development of Rehabilitation KPI's (2011)
- Eskom Zebra substation ECO, Cradock, Eastern Cape (2011)
- Tsolwana Road upgrade ECO, Tarkastad EIA (Current)
- Centane Road Upgrade ECO, Mazeppa Bay, Eastern Cape (Current)
- N9 road upgrade in Middelburg ECO, Eastern Cape (Current)
- Red Cap Kouga Windfarm ECO, St Francis Bay, Eastern Cape (Current)
- SANRAL R61 Mthatha to Umngazi road upgrade ECO, Eastern Cape (Current)
- Armstrong Transkei Schools Construction Environmental non-compliance & recommendations – Armstrong Engineering (Current)

RESEARCH

I assisted the Nelson Mandela Metropolitan University; Botany Department, headed by Prof. Janine Adams, in a 3 year monitoring program of Mangrove forests along the South African East Coast. We monitored growth of the different types of Mangroves as well as human impacts on the survivability of these forests.

CHERIE-LYNN MACK

Date of Birth: 05-08-1980

QUALIFICATIONS

PhD Environmental Biotechnology (Rhodes University), M.Sc Environmental Biotechnology with distinction (Rhodes University), B.Sc Hons. Biotechnology (Rhodes University), B.Sc Microbiology & Biochemistry (Rhodes University)

Completed the SASS5 aquatic macroinvertebrate monitoring course (2012) conducted by Groundtruth (Dr Mark Graham)

MEMBERSHIP

- The Water Institute of Southern Africa (WISA)
- International Association for Impact Assessment (South Africa)

PROFESSIONAL EXPERIENCE

November 2009 – Present: Principle Environmental Consultant (Coastal & Environmental Services)

October 2008 – July 2009: Water Scientist (Golder Associates Africa)

January 2008 – June 2008: Postdoctoral Research student (Department of Microbiology, Stellenbosch University)

CONSULTING EXPERIENCE

October 2009 – present Principle Environmental Consultant, Coastal & Environmental Services

As a principle consultant, my role in the company is to manage and provide input into the compilation of Environmental Impact Assessments for a wide variety of clients, and for a wide variety of developments. To date, these projects have included:

Renewable Energy Projects

- Great Kei Wind Energy Facility
- Qumbu Wind Energy Facility
- Ngqamakhwe Renewable Energy Facility EIA
- Ncora Renewable Energy Facility EIA
- Qunu Renewable Energy Facility EIA
- Thomas River Renewable Energy Facility EIA
- Chaba Wind Energy EIA
- Lushington Park Wind Energy Facility EIA

Wastewater Specialist Assessments:

- Wastewater Specialist Impact Assessment for St Patricks Hospital Wastewater Treatment Works
- Environmental Management Plan as part of the Alfred Nzo District Municipality Effluent Management Plan
- Wastewater Specialist Impact Assessment for Jamestown Wastewater Treatment Works
- Wastewater Specialist Impact Assessment for Qolora Aquaculture Zone EIA
- All Saints Wastewater Treatment Works, Wastewater Specialist Impact Assessment
- Project Manager and Waste Specialist: Scoping and Environmental Impact assessment for Sunningdale Dairy Processing Facility

Water Quality Specialist Assessments:

- Surface and Groundwater Assessment Report. EcoFarm Sugar Plantation Project, Mozambique
- Water Quality Specialist Impact Assessment for the proposed abstraction works in the Lower Fish River. Ndlambe Local Municipality
- Surface Water and Groundwater Quality Annual Report, for Kenmare Mining, Mozambique
- Project Manager and Surface Water Quality Specialist: Surface and groundwater quality monitoring program for the East London Industrial Development Zone

Aquatic Ecology Specialist Assessments:

- Aquatic Ecology Baseline Survey and Impact Assessment (Macroinvertebrates and Water quality). Syrah Resources Graphite Mine, Mozambique.
- Aquatic Ecology Baseline Survey and Impact Assessment (Macroinvertebrates and Water quality). Baobab Iron Ore Mine, Mozambique.

Other:

- Waste License for the DAS Electro-coating Facility Wastewater Treatment Works EIA
- Eastern Cape Parks and Tourism Authority Upgrade of the Water and Wastewater Treatment works at Double Mouth Camp site EIA
- Department of Water Affairs: Lusikisiki Regional Bulk Water Supply Scheme EIA
- Ndlambe Local Municipality Bulk Water Supply Scheme EIA
- TNPA Foreshore Reclamation Project EIA, Port of East London
- Eskom Distribution Power line EIAs (x4)

October 2008 – July 2009 Water Scientist, Golder Associates Africa

Surface and Groundwater Specialist Assessments:

- Surface water specialist information gap analysis for LIFEX coal mine extension project for AngloCoal.
- Water quality trainee: Comprehensive reserve determination for the Lower and Middle Vaal Water Management Areas (DWAF).
- Water quality trainee: Intermediate reserve determination of the Crocodile (West) and Marico Water Management Areas (DWAF)

Other:

- The linear flow channel reactor for oxidation of sulphide in semi-treated acid mine drainage for the Water Research Commission (WRC)
- Construction and operation of an Integrated Managed Passive (IMPI) demonstration scale acid mine drainage treatment plant for BHP Billiton
- Metal removal using sulphate reducing bacteria (SRB) from acid mine drainage for Landau Colliery (AngloCoal)

RESEARCH & TEACHING EXPERIENCE

I have had my research published in peer-reviewed journals and have presented at various international conferences. A full list of publications is available upon request. My area of research is environmental biotechnology, with emphasis on industrial wastewater treatment technologies, particularly from the mining sector.

LOUISE KAY BRYSON

Date of Birth: 11-08-1986

QUALIFICATIONS

B.Sc Hons. Environmental Sciences (Rhodes University), B.Sc Zoology and Ecology, environment and conservation (University of the Witwatersrand)

PROFESSIONAL EXPERIENCE

2013- GIS work for Conservation Services Support (CSS), Grahamstown.

2012- Environmental Compliance Officer during the establishment phase for a coal mine for Elitheni Coal at Indwe, Eastern Cape.

2011- Vacation work for UWP Consulting Engineers on the Gauteng Freeway Improvement Project (GFIP) on the Reading interchange. I assisted with road and bridge inspections and filing of site inspection requests.

2010- Vacation work for Rainbow Construction- Renovations and building the office block for Blue Platinum Telecoms on Grayston Drive. I surveyed and was in charge of a team at the basement level of the building.

2009- Vacation work for Rainbow Construction on the GFIP on the Rivonia Road off ramp. I inspected the pre-cast yard, concrete formwork and concrete testing procedures and conducted quantity surveying of excavations.

2008- Vacation work for Metago Environmental Engineers. I conducted research into indigenous flora and fauna for re-establishment on a slimes dam.

RESEARCH & TEACHING EXPERIENCE

2012-current- Masters thesis

- “An erosion and sediment delivery model for semi-arid catchments”.

2011- Honours dissertation

- “Stream variability in space and time and its relationship with erosion: an analysis of erosion and floodouts on the Camdeboo Plain”.

2012- Teaching assistant. Rhodes University

- Teaching assistant for GIS honours course in the Geography Department. Marked assignments, was available for consultations and presented a lecture on the hydrological toolset for Arc-GIS.

CAROLINE ANN EVANS (BSc Hons)

Date of Birth: 23-05-1988

QUALIFICATIONS

Academic degrees

- B.Sc. Zoology & Environmental Science (Rhodes University) with distinction
- B.Sc. Honours Environmental Science (Rhodes University) with distinction
- MSc Environmental Science (Rhodes University - ongoing)

Academic diplomas

- Tools for Wetland Assessment certification with distinction
- Urban Ecology certification with distinction
- Computer Literacy with distinction
- Entrepreneurship
- Post Graduate Statistics with distinction

Academic Accolades

- Rhodes University Deans List
- Rhodes University Academic Colours
- Golden Key Academic Honour Society
- Selected as one of 15 students in South Africa to participate in a professional scientific writing and publishing seminar.
- Selected as one of 20 students in South Africa to participate in the higher education conference with public officials from across South Africa.
- Selected as class leader and representative in my honours year.
- Group leader in various class projects including a project which assessed the energy usage of Rhodes University and a presentation made to the Vice-Chancellor, Dean of Students and Dean of Science on sustainable energy practice suggestions.
- Planned and executed various community outreach projects involving mathematics, science and sustainable livelihoods practices and education.

PROFESSIONAL EXPERIENCE

November 2013 – Present: Environmental Consultant (Coastal & Environmental Services)

January 2010 – December 2011: Graduate Assistant (Rhodes University, Department of Environmental Science)

CONSULTING EXPERIENCE

Since starting at CES in November 2013 I have been involved in the following projects:

- Semicept Loerie Mining Application
- Grey Jade Waterfall Feedlot Basic Assessment Report (BAR)
- Black Lite Solar 5MW Photovoltaic Facility Basic Assessment Report (BAR)
- DRDLR Maize Meat Feedlot (Biogas) Proposal
- Olivewood Golf Estate Environmental Impact Assessment
- Olivewood Golf Estate Visual Impact Assessment
- Waaihoek Wind Energy Facility Ecological Assessment (current)
- Coega IDZ Aquaculture Feasibility Study (current)
- ECDC Biofuels SEA (current)

RESEARCH

I hold a BSc with majors in Environmental Science (distinction) and Zoology, as well as a BSc (Hons) in Environmental Science (distinction) both from Rhodes University. My undergraduate degree included both commerce and natural sciences. During my honours dissertation I evaluated the economic impacts of degradation of the xeric subtropical thicket through farming practices, focusing on the rehabilitation potential of the affected areas in terms of carbon tax. I am currently writing up my MSc (Environmental Science and Ichthyology) thesis on the effects of alien fish species on local rural livelihoods. This thesis focuses on the social implications of alien fish species and the impact that the cultural customs of the Xhosa people have on the success of social development projects in the aquaculture industry. I have a broad academic background including statistics, economics, management, climate change, wetland ecology, GIS, rehabilitation ecology, ecological modeling and zoology.

My main research interests include renewable energy, climate change and the development of a holistic ecosystem model to improve the understand of all three sections of the environment (social, ecological and economic).

DRAFT

GAVIN ANDERSON M.PHIL

Date and place of birth: 22 February 1969, Cape Town, South Africa

ACADEMIC QUALIFICATIONS

- BA(Soc Sci), BA (Hons) M.Phil at University of Cape Town

CERTIFICATIONS

- Principle Investigator with expertise status in Stone Age, Rock Art and Iron Age
- Registered with: South African Heritage Resources Agency, KwaZulu-Natal Heritage, Eastern Cape Heritage
- Registered with Association of Southern African Professional Archaeologists, and ASAPA CRM sub-section

RELEVANT PROFESSIONAL EXPERIENCE

- 1994-2004: Head of the Natal Museum Institute for Cultural Resources Management
- 2004-2012: 50% Member of Umlando cc

PROJECT EXPERIENCE

- Heritage manager for numerous projects including:
 - wind turbines
 - photovoltaic farms
 - roads: new and upgrades, and related borrow pits and quarries
 - pipelines: water and multipurpose lines, and sewerage
 - mines
 - Ezemvelo KZN: inland and coastal
 - Harbours
 - Housing: low cost and estate
 - Living Heritage
 - Electrical transmission lines and substations
 - Hydroelectricity
 - Dams and water transfer schemes
 - San Rock Art
 - Industrial and commercial sites
 - Beachfront developments
 - Agriculture
 - Afforestation
 - Historical archaeology at the Point, Durban
 - Cellular phone masts
 - Private game reserves
 - Mariculture

GIDEON GROENEWALD - PHD

Date and place of birth: 30th September 1955, Lady Grey, Eastern Cape, South Africa

ACADEMIC QUALIFICATIONS

- BSc (Hons) PhD (NMMU), Nat Dip Nat Con (UNISA)

CERTIFICATIONS

- Earth Scientist - South African Council for Natural Scientific Professions (SACNASP).
- Member – Palaeontological Association of Southern Africa
- Member – Geological Association of Southern Africa

RELEVANT PROFESSIONAL EXPERIENCE

- *Environmental Education* - 1986-present : take school children on field trips, assist in filming of educational TV programs on interpretative geology, palaeontology and ecology, including grassveld ecology and the ecology of lichens . University of the North (Qwaqwa branch) short course in Eco- tourism at Hons level.
- *Palaeontology* - 1978-present : Environmental Impact Assessments and Fossil hunting expeditions for international and local tourist market
- *Geology and Earth Sciences*: 1999 – present: Director (Metsi Metseng Geological and Environmental Services CC)

SPECIFIC RELEVANT PROJECT EXPERIENCE

- Involved with numerous development proposals including:
- 2005-2006: Consultant to Maluti-A-Phofung Municipality to develop Tourism Sector Plan (DBSA Project)
- 2001-2010: Contractual appointment: Peace Parks Foundation: Lesotho Transfrontier Facilitator for the Maloti-Drakensberg Transfrontier Conservation Development and other related Transfrontier projects. Mainly involved in development of Responsible Tourism in Lesotho and border regions of South Africa.
- 2005-present: Ad hoc appointment as environmental consultant (geology, geohydrology and soils) to assess environmental impacts at road accidents where tanker trucks are involved in large scale spillages of dangerous goods
- 2008 – 2011: Appointed Palaeontologist on the Ingula Pumped Storage Scheme of Eskom Holdings (Pty) Ltd
- 2009 – present: Appointed Palaeontologist for the new Multi Purpose Petroleum Pipeline installation from Heidelberg (Gauteng) to Durban
- 2010 – present: Appointed Geohydrologist to supply groundwater to the town of Senekal/Matwabeng
- 2009 – present: Involved in various Palaeontological Impact Assessment for bulk services, roads, renewable energy projects and mines. Clients include Umlando Archeological and Tourism Resource Management, GIBBS, CES Aurecon, LHL and other consulting firms.

CHRIS VAN ROOYEN

30 April 1964

SPECIALIST FIELD: Avifauna

RELEVANT WORK EXPERIENCE (PLSE SEE APPENDIX A FOR A MORE COMPREHENSIVE CAREER HISTORY)

- 1991-1995: Volunteer for the Endangered Wildlife Trust's Raptor Conservation Group and Vulture Study Group.
- 1996-2007: Specialist Consultant with the Endangered Wildlife Trust. Duties entailed the overall co-ordination and management of the Endangered Wildlife Trust's national programme to eliminate negative wildlife interactions with electrical utility structures in southern Africa
- November 2007 to present: Environmental Consultant specialising in Bird Impact Assessment Studies

CLIENTS

Industry

- Eskom Distribution Division
- Eskom Transmission Division
- Eskom Research (Resources and Strategy)
- Eskom Generation Division
- Botswana Power Company
- NamPower (Namibia)
- Debswana (Botswana)
- SAPPI
- Texas Utility Company (USA)
- TransPower (New Zealand)
- South African Roads Agency
- Mainstream Renewable Power
- Windcurrent SA
- Biotherm Energy
- Vleesbaai Independent Power Producer
- Renewable Energy Systems SA
- South African General and Trust Company (SAGIT)
- Southern Cape Renewables
- Juwi Renewable Energies
- Mulilo Renewable Energy
- Renosterberg Wind Energy Company
- Industrial Development Corporation
- Electrawinds Africa and Indian Ocean Islands
- Red Cap Kouga Wind Farm

Environmental Assessment Practitioners

- Bohlweki Environmental
- Strategic Environmental Focus
- Tswelopele Environmental
- Digby Wells Associates
- Iliso Consulting
- Savannah Environmental
- PBA International
- Arcus Gibb
- Landscape Dynamics
- BKS
- Naledzi Environmental
- Eyethu Engineers
- Ninham Shand
- WSP Environmental
- Enviro Dynamics (Namibia)
- Eco Assessments
- Loci Environmental (Botswana)
- SRK
- Zitholele Consulting
- EcoPlan (Namibia)
- Groundwater Consultant Services – SA
- CSIR
- CIC International
- EnviroXcellence Services
- Naledzi Environmental Consultants
- Cymbian Enviro-social Consultants
- Envirovolution Consulting
- Nzumbululo Heritage Consultants
- Synergistics Environmental Services
- Seedcracker Environmental Consulting
- Namibia Nature Foundation
- Texture Environmental
- Environmental Evaluation Unit, University of Cape Town
- Cape EAPrac
- Aurecon
- Aecon
- Khoro 22
- DIGES
- Shumani SHE
- Wandima Environmental Consulting

PROJECTS

Bird Impact Assessment Specialist Studies:

For power lines:

1. Chobe 33kV Distribution line
2. Athene - Umfolozi 400kV
3. Beta-Delphi 400kV
4. Cape Strengthening Scheme 765kV
5. Flurian-Louis-Trichardt 132kV
6. Ghanzi 132kV (Botswana)
7. Ikaros 400kV
8. Matimba-Witkop 400kV

9. Naboomspruit 132kV
10. Tabor-Flurian 132kV
11. Windhoek - Walvisbaai 220 kV (Namibia)
12. Witkop-Overysse 132kV
13. Breyten 88kV
14. Adis-Phoebus 400kV
15. Dhuva-Janus 400kV
16. Perseus-Mercury 400kV
17. Gravelotte 132kV
18. Ikaros 400 kV
19. Khanye 132kV (Botswana)
20. Moropule – Thamaga 220 kV (Botswana)
21. Parys 132kV
22. Simplon –Everest 132kV
23. Tutuka-Alpha 400kV
24. Simplon-Der Brochen 132kV
25. Big Tree 132kV
26. Mercury-Ferrum-Garona 400kV
27. Zeus-Perseus 765kV
28. Matimba B Integration Project
29. Caprivi 350kV DC (Namibia)
30. Gerus-Mururani Gate 350kV DC (Namibia)
31. Mmamabula 220kV (Botswana)
32. Steenberg-Der Brochen 132kV
33. Venetia-Paradise T 132kV
34. Burgersfort 132kV
35. Majuba-Umfolozi 765kV
36. Delta 765kV Substation
37. Braamhoek 22kV
38. Steelpoort Merensky 400kV
39. Mmamabula Delta 400kV
40. Delta Epsilon 765kV
41. Gerus-Zambezi 350kV DC Interconnector: Review of proposed avian mitigation measures for the Okavango and Kwando River crossings
42. Giyani 22kV Distribution line
43. Lihobong-Kao 132/11kV distribution power line, Lesotho
44. 132kV Leslie – Wildebeest distribution line
45. A proposed new 50 kV Spoornet feeder line between Sishen and Saldanha
46. Cairns 132kv substation extension and associated power lines
47. Pimlico 132kv substation extension and associated power lines
48. Gyani 22kV
49. Matafin 132kV
50. Nkomazi_Fig Tree 132kV
51. Pebble Rock 132kV
52. Reddersburg 132kV
53. Thaba Combine 132kV
54. Nkomati 132kV
55. Louis Trichardt – Musina 132kV
56. Endicot 44kV
57. Apollo Lepini 400kV
58. Tarlton-Spring Farms 132kV
59. Kuschke 132kV substation
60. Bendstore 66kV Substation and associated lines
61. Kuiseb 400kV (Namibia)
62. Gyani-Malamulele 132kV
63. Watershed 132kV
64. Bakone 132kV substation

65. Eerstegoud 132kV LILO lines
66. Kumba Iron Ore: SWEP - Relocation of Infrastructure
67. Kudu Gas Power Station: Associated power lines
68. Steenberg Booyendal 132kV
69. Toulon Pumps 33kV
70. Thabatshipi 132kV
71. Witkop-Silica 132kV
72. Bakubung 132kV
73. Nelsriver 132kV
74. Rethabiseng 132kV
75. Tilburg 132kV
76. GaKgapane 66kV
77. Knobel Gilead 132kV
78. Bochum Knobel 132kV
79. Madibeng 132kV
80. Witbank Railway Line and associated infrastructure
81. Spencer NDP phase 2 (5 lines)
82. Akanani 132kV
83. Hermes-Dominion Reefs 132kV
84. Cape Pensinsula Strengthening Project 400kV
85. Magalakwena 132kV
86. Benfiosa 132kV
87. Dithabaneng 132kV
88. Taunus Diepkloof 132kV
89. Taunus Doornkop 132kV
90. Tweedracht 132kV
91. Jane Furse 132kV
92. Majeje Sub 132kV
93. Tabor Louis Trichardt 132kV
94. Riversong 88kV
95. Mamatsekele 132kV
96. Kabokweni 132kV
97. MDPP 400kV Botswana
98. Marble Hall NDP 132kV
99. Bokmakiere 132kV Substation and LILO lines
100. Styl drift 132kV
101. Taunus – Diepkloof 132kV
102. Bighorn NDP 132kV
103. Waterkloof 88kV
104. Camden – Theta 765kV
105. Dhuvu – Minerva 400kV Diversion
106. Lesedi –Grootpan 132kV
107. Waterberg NDP
108. Bulgerivier – Dorset 132kV
109. Bulgerivier – Toulon 132kV
110. Nokeng-Fluorspar 132kV
111. Mantsole 132kV
112. Tshilamba 132kV
113. Thabampoopo - Tshebela – Nhlovuko 132kV
114. Arthurseat 132kV
115. Borutho 132kV MTS
116. Grootboom 132kV
117. DWAF Steelpoort 132kV
118. Chloe – Gilead 66kV
119. Pietersburg – Chloe 66kV
120. Tshatane – Lesideng 132kV
121. Lesego – Jane Furse 132kV

122. DWAF 1 – DWAF 2 132kV
123. Pitso 132kV Substation
124. Lebowa – Dithabaneng – Boynton LILO 132kV
125. Thulamela 132kV
126. Marang 132kV
127. Thulamela 132kV
128. Merensky 132kV
129. Amandla – Makometsane - Moutse 132kV
130. Lebathlane 132kV
131. Sun City Substation and associated powerlines
132. Solar Park 400kV Integration Project
133. Mamatsekele 132kV
134. KwaMhlanga 132kV
135. Malelane – Buffelspruit 132kV
136. Gutshwa 132kV
137. Taung-Gold 88kV
138. Vaalkop Dam 88kV
139. Geluk Rural 132kV
140. Chloorkop Esselen 400kV EMP
141. Freedom Park 88kV
142. Houhoek Substation
143. Blouwater Uiekraal 66kV
144. Carmona 132kV
145. Muldersvlei – Platttekloof 132kV
146. Warden – Vrede 88kV
147. Bredasdorp – Arniston 66kV
148. Sanari – Leeuwdraai 132kV
149. Malelane -Buffelspruit 132kV
150. Legogote – Gutshwa 132kV
151. Two Rivers 132kV
152. Gamma – Kappa 765kV
153. Groblershoop – Garona 132kV
154. Winterveld 132kV
155. Roscco – Bracken 88kV
156. DWAF – Dikgalopeng 132kV
157. Ohrigstad 132kV
158. Gibson Bay 132kV Grid Connection

Bird Impact Assessment Studies for power stations:

1. Open Cycle Gas Turbine Plants & The Associated Transmission Lines & Substation At Atlantis, Western Cape
2. Kangra Power Station: Siting Report
3. Victor 132kV

Ongoing involvement in Bird Impact Assessment Studies for wind-powered generation facilities:

1. Eskom Klipheuwel Experimental Wind Power Facility, Western Cape (EIA)
2. Mainstream Wind Facility Jeffreys Bay, Eastern Cape (EIA and monitoring)
3. Biotherm, Swellendam, (Excelsior), Western Cape (EIA and monitoring)
4. Biotherm, Napier, (Matjieskloof), Western Cape (pre-feasibility)
5. Windcurrent SA, Jeffreys Bay, Eastern Cape (2 sites) (EIA and monitoring)
6. Caledon Wind, Caledon, Western Cape (EIA)
7. Innwind (4 sites), Western Cape (EIA)
8. Renewable Energy Systems (RES) Oyster Bay, Eastern Cape (EIA and monitoring)
9. Oelsner Group (Kerriefontein), Western Cape (EIA)
10. Oelsner Group (Langefontein), Western Cape (EIA)
11. InCa Energy, Vredendal Wind Energy Facility Western Cape (EIA)
12. Mainstream Loeriesfontein Wind Energy Facility Phase 1 (EIA and monitoring)

13. Mainstream Loeriesfontein Wind Energy Facility Phase 2 (monitoring)
14. Mainstream Loeriesfontein Wind Energy Facility Phase 3 (monitoring)
15. Mainstream Noupoort Wind Energy Facility (EIA and monitoring)
16. Mainstream Pofadder Wind Energy Facility (EIA and monitoring)
17. Biotherm Port Nolloth Wind Energy Facility (Monitoring)
18. Biotherm Spitskopvlakte Wind Energy Facility (EIA and monitoring)
19. Biotherm Indwe Wind Energy Facility (monitoring)
20. Langhoogte Wind Energy Facility (EIA and monitoring)
21. Vleesbaai Wind Energy Facility (EIA and monitoring)
22. Electrawind, St Helena Bay Wind Energy Facility (EIA and monitoring)
23. SAGIT, Caledon Wind Energy facility (EIA and monitoring)
24. SAGIT, Wolseley Wind Energy Facility (EIA and monitoring)
25. Southern Cape Renewables, Lunsklip Wind Energy Facility, Stilbaai (EIA and monitoring)
26. Mainstream Dwarsrug Wind Energy Facility (EIA and monitoring)
27. Mulilo De Aar 2 North Wind Energy Facility (Monitoring)
28. Mulilo De Aar 2 South Wind Energy Facility (Monitoring)
29. Rhenosterberg Wind Energy Facility (EIA and monitoring - reviewer)
30. Mainstream Amathole Wind Energy Facility (EIA and monitoring)
31. JUWI Namies Wind Energy Facility (EIA and monitoring)
32. Mainstream Waaihoek Wind Energy Facility

Bird Impact Assessment Studies for Solar Energy Plants:

1. Concentrated Solar Power Plant, Upington, Northern Cape.
2. Mainstream De Aar Solar Power Project (post-EIA monitoring)
3. Droogfontein Solar Power Project (post-EIA monitoring)

Bird Impact Assessment Studies for Desalination Plants:

1. Proposed Desalination Project at Mile 6 near Swakopmund, Namibia

Regional research and conservation initiatives:

1. The compilation of a habitat sensitivity map for Denham's Bustard, Blue Crane and Whitebellied Korhaan in the Kouga Municipal area of the Eastern Cape Province.

Risk Assessments on existing electricity infrastructure:

1. Amandel 132kV
2. Atlanta 22kV
3. Butterworth-Ncora 66kV
4. Debswana Jwaneng 66kV (Botswana)
5. Edwardsdam – Mareetsane 88kV
6. Gaborone 132kV (Botswana)
7. Lydenburg-Merensky 132kV
8. Tabor-Dendron 132kV
9. Vryheid-Bredasdorp 66kV
10. Vygeboom 132kV
11. Watershed-Mmabatho 88kV
12. Welgevonden 22kV network
13. Ferrum-Garona 275kV
14. Investigation into genet related faulting at the Perseus Substation,
15. North-West Transmission Region
16. Investigation into genet related faulting at the Helios Substation,
17. Western Transmission Region
18. Investigation into vulture electrocutions on staggered vertical reticulation structures in the Northern Cape

Bird Impact Assessment Studies for other developments (not energy related):

1. Lizard Point Golf Estate
2. Lever Creek Estates
3. Leloko Lifestyle Estates
4. Vaaloewers Residential Development
5. Clearwater Estates Grass Owl Impact Study
6. Sommerset Ext. Grass Owl Study
7. Proposed Three Diamonds Trading Mining Project (Portion 9 and 15 of the Farm Blesbokfontein)
8. N17 Section: Springs To Leandra –“Borrow Pit 12 And Access Road On (Section 9, 6 And 28 Of The Farm Winterhoek 314 Ir)
9. South African Police Services Gauteng Radio Communication System: Portion 136 Of The Farm 528 Jq, Lindley.
10. Report for the proposed upgrade and extension of the Zeekoegat Wastewater Treatment Works, Gauteng.
11. Bird Impact Assessment for Portion 265 (a portion of Portion 163) of the farm Rietfontein 189-JR, Gauteng.
12. Bird Impact Assessment Study for Portions 54 and 55 of the Farm Zwartkop 525 JQ, Gauteng.
13. Bird Impact Assessment Study Portions 8 and 36 of the Farm Nooitgedacht 534 JQ, Gauteng.
14. Shumba's Rest Bird Impact Assessment Study
15. Randfontein Golf Estate Bird Impact Assessment Study
16. Zilkaatsnek Wildlife Estate
17. Regenstein Communications Tower (Namibia)
18. Input into Richards Bay Comparative Risk Assessment Study
19. Maquasa West Open Cast Coal Mine
20. Glen Erasmia Residential Development, Kempton Park, Gauteng
21. Bird Impact Assessment Study, Weltevreden Mine, Mpumalanga
22. Bird Impact Assessment Study, Olifantsvlei Cemetery, Johannesburg
23. Camden Ash Disposal Facility, Mpumalanga
24. Kusile Ash Disposal Facility, Mpumalanga (reviewer)
25. Msobo Coal Bird Survey, Mpumalanga

Environmental Impact Assessment Reports:

- Draft Environmental Impact Report for a proposed dam in the Moseitse River in Botswana

Basic Assessments:

- Proposed temporary and permanent diversion of Lovato Road, Gauteng
- Flood Management: Rosslyn East at Frans du Toit Road, City of Tshwane

Section 24G of NEMA applications:

- Rectification application for the de-silting of the Kaalplaasspruit, Rosslyn

Papers and Conference Presentations

1. Van Rooyen, C. S. 1996. Towards an Integrated Management System for the Management of Wildlife Interactions with Electricity Structures. Abstracts of the 2nd International Conference on Raptors p.9. Raptor Research Foundation/University of Urbino.
2. Van Rooyen, C.S. & Piper, S.E. 1997. The effects of Powerlines on Vultures. *In: BOSHOF, A.F., ANDERSON, M.D.& BORELLO, W.D. (Eds). Vultures in the 21st Century: Proceedings of a workshop on vulture research and conservation in southern Africa.* Johannesburg: Vulture Study Group: 102-104.
3. Kruger, R. & Van Rooyen, C.S. 1998. Evaluating the risk existing powerlines pose to large raptors by using risk assessment methodology: The Molopo case study. Proceedings of the 5th World Conference on Birds of Prey and Owls (in press). Raptor Conservation Group/World Working Group on Birds of Prey and Owls. Midrand. South Africa.

4. Van Rooyen, C.S., Kruger, R., Nelson, P.A & Fedorsky, C.A. 1998. The Eskom/EWT Strategic Partnership: The South African Approach towards the Management of Wildlife/Utility Interactions. EEI Natural Resources/Biologist National Workshop.1998. Edison Electrical Institute, Washington, D.C.
5. Van Rooyen, C.S. 1998. Raptor mortality on powerlines in South Africa. Proceedings of the 5th World Conference on Birds of Prey and Owls (in press.). Raptor Conservation Group/World Working Group on Birds of Prey and Owls. Midrand. South Africa
6. Van Rooyen, C.S. 1998. Experiences of Partnerships in South Africa. Conference Proceedings, Second NGO Conference on the Environment, November 3-5 1998. Gaborone, Botswana.
7. Van Rooyen, C.S. 1999. An overview of the Eskom-EWT Strategic Partnership in South Africa. EPRI Workshop On Avian Interactions with Utility Structures 2-3 December 1999, Charleston, South Carolina.
8. Van Rooyen, C.S. & Taylor, P.V. 1999. Bird Streamers as probable cause of electrocutions in South Africa. EPRI Workshop on Avian Interactions with Utility Structures 2-3 December 1999. Charleston, South Carolina.
9. Van Rooyen, C.S. 2000. An overview of vulture electrocutions in South Africa. Vulture News No.43. Endangered Wildlife Trust. Johannesburg, South Africa.
10. Van Rooyen, C.S. Vosloo, H.F. & R.E. Harness. 2002. Eliminating bird streamers as a cause of faulting on transmission lines in South Africa. IEEE 46th Rural Electric Power Conference. May 2002. Colorado Springs. Colorado.
11. Van Rooyen, C. 2003. Mitigation Programme for Avian Collisions with Eskom Transmission Lines. Unpublished Progress Report. Endangered Wildlife Trust. September 2003.
12. Smallie, J. & Van Rooyen, C. 2003. Risk assessment of bird interaction on the Hydra-Droërvier 1 and 2 400kV. Unpublished report to Eskom Transmission Group. Endangered Wildlife Trust. Johannesburg. South Africa
13. Kruger, R. Van Rooyen, C.S. & Maritz, A. 2003. The electrocution risk posed to vultures by vertically configured medium voltage designs. Proceedings of the 6th World Conference on Birds of Prey and Owls, Budapest, Hungary, May 2003.
14. Van Rooyen, C. 2004. Report on vulture interactions with powerlines in southern Africa: 1996 to 2003. In: Monadjem, A., Anderson, M.D., Piper, S.E. & Boshoff, A.F. (Eds). *The vultures of Southern Africa-Quo Vadis?* Proceedings of a workshop on vulture research and conservation in southern Africa. Birds of Prey Working Group, Johannesburg.
15. Smallie, J. J & Van Rooyen, C.S. 2005. Impact of Bird Streamers on Quality of Supply on Transmission Lines: A Case Study. Proceedings of the 5th International Conference on Power and Energy Systems, Benalmadena, Spain.
16. Jenkins, A. Van Rooyen, C.S., De Goede J.A, Matshikiza M.T. 2005. Managing raptor interactions with powerlines in South Africa. Proceedings of the 5th International Conference on Power and Energy Systems, Benalmadena, Spain.
17. Van Rooyen, C.S., Froneman A, Piper S, Michael M. 2006. Assessing the power line network in the KwaZulu-Natal Province of South Africa from a vulture interaction perspective. Proceedings of International Conference on Utility Line Structures, Fort Collins, Colorado, March 2006.

Research Reports

1. Van Rooyen, C. Jenkins, A. De Goede, J. & Smallie J. 2003. Environmentally acceptable ways to minimise the incidence of power outages associated with large raptor nests on Eskom pylons in the Karoo: Lessons learnt to date. Project number 9RE-00005 / R1127 Technology Services International. Johannesburg. South Africa.
2. Jenkins, A. De Goede, J. & Van Rooyen, C. 2004. Environmentally acceptable ways to minimise the incidence of power outages associated with large raptor nests on Eskom pylons in the Karoo. Project number R99-00754. Technology Services International. Johannesburg. South Africa.
3. Jenkins, A. De Goede, J. & Van Rooyen, C. 2005. Implementation of management recommendations stemming from the Eskom Electric Eagle Project (or EEEP Phase 5). Project number R99-00754. Technology Services International. Johannesburg. South Africa.
4. Van Rooyen, C., Froneman A. & Piper S.E. 2004. The evaluation of vulture interactions with power lines in KwaZulu-Natal: Research Report RES/RR/04/24331. Eskom Resources and Strategy.
5. Van Rooyen, C. 2006. The evaluation of vulture interactions with power lines in KwaZulu-Natal: Phase Two. Research Report RES/RR/06/28111. Eskom Resources and Strategy.
6. Van Rooyen, C.S., Froneman A, Piper S. 2006. The quantification of risks that power lines pose to vultures in the greater Kimberley area. Research Report RES/RR/06/28106. Eskom Resources and Strategy.

Book Chapters

1. Van Rooyen, C.S & Ledger J. A. 1999. Birds and Utility Structures: Developments in Southern Africa. In: Birds and Power lines: Collisions, Electrocutation and Breeding. Ferrer M and Janss G F E Eds.
2. Van Rooyen, C.S. 2004. The Management of Wildlife Interactions with overhead lines. In The fundamentals and practice of Overhead Line Maintenance (132kV and above), pp217-245. Eskom Technology, Services International, Johannesburg.

Guidelines

1. Jenkins A R; Van Rooyen C S; Smallie J J; Anderson M D & Smit H A. 2011. Best practice guidelines for avian monitoring and impact mitigation at proposed wind energy development sites in southern Africa. Endangered Wildlife Trust and Birdlife South Africa.

Awards

- The Eskom-EWT Strategic Partnership won the Edison Electric Institute Common Goals Award in the USA for outstanding electric utility customer and community relations programmes in 1997, from a field of 61 international entries from 49 countries.
- The Eskom-EWT Strategic Partnership was a finalist in the 1998 and 2000 Green Trust Awards.
- Eskom Manager's Award in 1997 for the management of animal interactions.
- Eskom Manager's Award in 1999 for environmental management.
- Highly Commended Award in 2001 for Business Efficiency from Eskom Transmission Group.
- Nominated for Eskom Chairman's Award in 2001 in Environmental Category
- Runner-up: Eskom Resources and Strategy manager's award 2003
- Listed in Marqui's Who's Who in the World 2007 edition
- Northern Cape Raptor Conservationist of the Year: 2004

Other interests/activities

- I am a professional wildlife photographer and have been conducting photo safaris and courses since 2004 in my free time. My special interest is bird photography, and my photos have appeared in numerous publications both in SA and abroad. I have also received merit awards in the Agfa, Fuji and BBC Wildlife Photographic Awards competitions.
- I am an accomplished bird artist and have done several stamps designs for the South African Post Office. I am also a co-illustrator of Roberts Birds of South Africa 7th Edition and the Roberts Field Guide to the Birds of Southern Africa 2007.



Chris van Rooyen

13 December 2013

DRAFT

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Werner C. Marais

Summary of qualifications

Late 2009	<i>University of Johannesburg</i>
Started PhD (Biodiversity and Conservation) – Still in progress	
2008	<i>University of Johannesburg</i>
MSc (Biodiversity and Conservation)	
2006	<i>University of Johannesburg</i>
Hons (Biodiversity and Conservation)	
2005	<i>University of Johannesburg</i>
BSc (Zoology and Botany)	

Education

PhD (Biodiversity and Conservation)

- In-depth study of the subterranean and epiphoreal ecosystems of caves and their surrounding environments in the Gauteng province, and more specifically the Carletonville Dolomite Grassland vegetation unit.
- Special reference is paid to cave dwelling bats and their specific conservation needs inside as well as outside caves, where foraging takes place.
- A thorough understanding of grassland ecology as well as mammalian biology/behavior is essential for the study.
- The impacts of urbanisation on cave bat colonies are an essential focus of the research.
- Strong ecological focus.

MSc (Biodiversity and Conservation)

- The potential of using insectivorous bats (Microchiroptera) as a means of insect pest control in agricultural areas – Passed with distinction
- Involved a large scale in-depth survey of the bat diversity in the Tzaneen and Waterpoort areas, Limpopo.
- Understanding and observing the biology and behavior of local bat species.

- Designing and experimenting with artificial bat roosts.

Hons Biodiversity and Conservation

- Research project: Preliminary study of the terrestrial Arthropoda associated with caves of the Cradle of Humankind World Heritage Site – Passed with distinction
- Introduction to Environmental Management
- Herpetology
- Terrestrial and conservation ecology
- Resource management (incl. forestry, fire ecology, animal behavior)
- Practical fieldwork methodology (4X4, boat training and mapping)
- Mammology
- Population genetics and biosystematics
- Philosophy and research methodology: Zoology Nature conservation
- Parasitology
- Molecular evolution

BSc Zoology and Botany

- One-year course in animal diversity and identification
- Six month course in basic and marine ecology
- Limnology and terrestrial ecology
- Coastal diversity excursion (Marine ecology)
- Introduction to SASS Freshwater pollution monitoring methodology
- Applied freshwater ecotoxicology
- Waterborne diseases
- Integrated animal physiology and processes
- General parasitology
- Cytology
- Six-month course in the identification and diversity of South African flora
- Ethno and economical plants
- Biotechnology
- Plant physiology
- Plant pathology
- Cellular and molecular biology
- Introduction to organic and physical chemistry
- General chemistry
- Mineralogy and earth dynamics
- Etc.

Additional:

- ***Experienced report writing skills, sufficient computer skills.***
- ***Proficient in GIS, bioacoustics analysis.***
- ***Snake Identification and Handling Course – Presented by MHB Enviro Developments.***
- ***Multiple training courses in bat related topics - Gauteng and Northern Regions Bat Interest Group (GNoRBIG; 2005-2009).***
- ***Soil Classification and Wetland Delineation Course – Presented by Terrasoil.***
- ***Advanced Fall Arrest Level 2 qualification (for working at heights).***

Affiliations to professional bodies and societies

Pr.Sci.Nat.– SACNASP (Zoological Science; registration number 400169/10)
 Bat Conservation International (BCI)
 Serving on the research committee of the Gauteng and Northern Regions Bat Interest Group (GNoRBIG).

Experience

- i. 2008/2009/2010/2011/2012/2013 Founder of Animalia Zoological & Ecological Consultation CC. Only some of the projects that were either completed personally or supervised by Werner Marais (Animalia has completed more than **140 specialist reports** under the supervision of Werner Marais):
 - Ecological study for the proposed Coolbreeze development on the farm Spaarwater, Ekurhuleni.
 - Small mammal survey for the proposed development at Alewynspoort 145 IR, Meyerton.
 - Long term bat monitoring study for the proposed Kouga Wind Energy Facility.
 - Long term bat monitoring study for the proposed Noupoot and Loeriesfontein Wind Energy Facilities and PV plants, Northern Cape (supervised)
 - Long term bat monitoring study for the proposed Jeffrey's Bay Wind Energy Facility (supervised)
 - Long term bat monitoring study for the proposed Mossel Bay Wind Energy Facility (supervised)
 - Bat sensitivity assessment for the proposed Copperton Wind Energy Facility, Northern Cape (supervised)
 - Bat sensitivity assessment for the proposed De Aar Wind Energy Facility, Northern Cape
 - Bat sensitivity assessment for the proposed Grahamstown Wind Energy Facility, Eastern Cape
 - Fauna and bat sensitivity assessment for the proposed Walker Bay Wind Energy Facility, Western Cape
 - Long term bat monitoring study for the proposed Golden Valley Wind Energy Facility, Eastern Cape.
 - Long term bat monitoring study for the proposed Middleton Wind Energy Facility, Eastern Cape.
 - Bat sensitivity assessment for the proposed Saldanha and Vredenburg Wind Energy Facilities.
 - Bat sensitivity assessment for the proposed Lushington Park Wind Energy Facility.
 - Bat sensitivity assessment for the proposed Isivunguvungu Wind Energy Facility, Western Cape
 - Scoping phase bat sensitivity assessment for the proposed Driekop Wind Energy Facility.
 - Scoping phase faunal sensitivity assessment for the proposed Driekop Wind Energy Facility.
 - Bat sensitivity assessment for the proposed Koekenaap Wind Energy Facility, Western Cape.
 - Scoping phase bat sensitivity assessment for the proposed Aberdeen and Kleinsee wind energy facilities
 - Bat sensitivity assessment for the proposed Haverfontein Wind Energy Facility, Eastern Cape.
 - Bat sensitivity assessment for the proposed Middleton Wind Energy Facility, Eastern Cape.

- Bat specialist assessment for the feasibility phase (on site assessments) for the proposed Saldanha and Veldrift Wind Energy Facilities, Western Cape.
- Bat specialist assessment for the feasibility phase of the proposed Lady Grey, Loeriesfontein, Noupoort and Prieska wind energy facilities in the Eastern and Northern Cape.
- Bat specialist assessment for the proposed Happy Valley Wind Energy Facility, Eastern Cape.
- Bat specialist assessment for the proposed Deep River Wind Energy Facility.
- Specialist survey of Bullfrog (*Pyxicephalus adspersus*) in Rynfield, Benoni.
- Specialist reptile study for Janho Sand Quarry in Gauteng.
- Specialist bullfrog rehabilitation plan compilation for a stand in Rynfield, Benoni.
- Cave specialist study for a proposed water pipeline in Laudium, Gauteng.
- Cave specialist study for the Apies River: Fountains Access project in Pretoria.
- Bat identification and fieldwork expertise at West Driefontein Cave.
- Specialist study of Bullfrog (*Pyxicephalus adspersus*) in Withok Estates, Brakpan.
- Specialist wetland mammal assessment for the proposed development for Reiger Park Ext. 11 in Boksburg, Gauteng.
- Specialist survey of amphibians in the Sasolburg area.
- Specialist survey of reptiles in the Kibler Park area, Gauteng.
- Specialist survey of wetland mammals on Kookfontein farm, Vereeniging.
- Reptile assessment with special reference to the Striped Harlequin snake (*Homoroselaps dorsalis*) for the Founders community school site, Elandsfontein 352-JR, Gauteng.
- Ridge ecological and cave specialist studies for the Founders community school site, Elandsfontein 352-JR, Gauteng.
- Reptile (*Homoroselaps dorsalis*) specialist assessment for the proposed development on Portion 9 of the farm Rhenosterspruit 495 IQ, Gauteng.
- Cave and bat habitat survey for the proposed development on Portion 9 of the farm Rhenosterspruit 495 IQ, Gauteng.
- Ridge ecological assessment for the proposed South Hills development project on Erf 1202 South Hills, Portion 65 of the farm Klipriviersberg 106 I.R. and Holding 88 Klipriviersberg Estate, Gauteng.
- Etc.

ii. 2008 University of Johannesburg Gauteng

- Sensitivity and biodiversity surveys of five caves in the Cradle of Humankind World Heritage Site (COHWHS) and Pretoria areas.
- Preliminary survey to investigate the correlation between insectivorous bats and prey insects in the Krugersdorp Game Reserve.

iii. 2007, 2008 Limpopo

1. Bertie van Zyl (Pty) Ltd.(ZZ2 Tomato Farms)

2. University of Johannesburg Gauteng

Two year project to research the biological pest control method of utilizing insectivorous bats in agriculture. Required to conduct an in-depth study of bat (Microchiroptera) behavior and ecologically important factors.

iv. 2006 University of Johannesburg Gauteng

Six month survey of cave dwelling arthropods in the Cradle of Humankind World Heritage Site.

Additional:

Invited by the EWT (Endangered Wildlife Trust) to deliver a presentation on current ecological issues regarding bats and wind energy.

Invited to present on current ecological issues regarding bats and wind energy for ESSA (Exploration Society of Southern Africa).

As a co-author, recieved the Dow Greeff price for best annual scientific publication: "Die karst-ekologie van die Bakwenagrot (Gauteng)" published in the Suid-Afrikaanse Tydskrif vir Natuurwetenskap en Tegnologie, Vol. 31(1), 2012.

Public and educational presentations related to bats, and presented a part of a Bat Training Course at Nylsvley Nature Reserve.

Presented the following papers at conferences:

- *The potential of using insectivorous bats (Microchiroptera) as a means of insect pest control in agricultural areas. The Zoological Society of Southern Africa's 50th Anniversary Conference. July 2009.*
- *Inseketende vlermuise (Microchiroptera) en vlermuishuise in landbougebiede. Suid Afrikaanse Akademie vir Wetenskap en Kuns se 100 jaar Eufees kongres. October 2009.*

Interviewed for two popular magazine articles on ecological aspects of biological pest control utilising bats; published in two consecutive issues of Farmers Weekly.

Languages Afrikaans / English

References *Dr Francois Durand – Karst ecologist and paleontologist. Pr.Sci.Nat. (Zoology and Earth Sciences).*

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Thank You



BRETT WILLIAMS

Brett Williams has been involved in Health Safety and Environmental Management since 1987, and has been measuring noise related impacts since 1996. Brett is the owner of Safetech who have offices in Pretoria and Port Elizabeth. He has consulted too many different industries including, mining, chemical, automotive, food production etc. He is registered with the Department of Labour and Chamber of Mines to measure environmental stressors, which include chemical monitoring, noise and other physical stresses. He has also been trained by the United States Environmental Protection Agency on air pollution measurement and dispersion modelling. He has submitted a doctoral thesis through the University of Pretoria for examination on the relationship between polluting organisations and the receiving community.

TERTIARY EDUCATION

- National Diploma Health & Safety Management
- Bachelor of Arts (UPE)
- United States EPA Pollution Measurement course conducted at the University Of Cincinnati (EPA Training Centre)
- US EPA Air Dispersion Modelling Training Course
- Master of Business Administration (University of Wales) with dissertation on environmental reporting in South Africa.
- PhD - Currently registered at University of Pretoria. The thesis has been submitted for external examination and graduation is possible in 2013.
- Various Health & Safety Courses.
- Environmental Auditor (ISO 14001:2004)

KEY EXPERIENCE

The table below presents an abridged list of Brett Williams' project experience relevant to this proposal:

- Crown Chickens – The independent report review of a noise specialist report conducted as part of an EIA to establish a new broiler farm
- BMW – The evaluation of the impact of the Rosslyn production facilities on the surrounding community.
- Victory Race Track - Specialist noise report conducted as part of an EIA to establish a new stock car racing track.
- Continental Tyre - The evaluation of the impact of production facilities on the surrounding community.
- Media 24 – The measurement portion of an investigation on the impact of a printing press on a local community. The main study was conducted by the University of Stellenbosch.
- Zwarteboosh Quarry - Specialist noise report conducted as part of an EIA to establish a new quarry.
- Milo Granite - Specialist noise report conducted as part of an EIA to establish a new quarry.
- Dunlop Tyres - The evaluation of the impact of production facilities on the surrounding community.
- Sasol Secunda - Independent report review of a noise specialist report conducted to determine the impact of production facilities on the surrounding community.
- Barlow World Coatings - The evaluation of the impact of production facilities on the surrounding community.
- Western Platinum Refinery - The evaluation of the impact of production facilities on the surrounding community.
- CSIR – Noise Impact Study of Namwater Desalination Plant and Kouga Wind Turbine Project and the Nampont Walvis Bay Port Container Terminal extension
- Innowind Wind Energy Turbine Project, Grahamstown.

- CSIR - Noise Impact Study of Cookhouse and Overberg Wind Turbine Projects
 - BKS – Classified Study
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DRAFT