Environmental Impact Assessment for the proposed Ubuntu Wind Energy Project near Jeffrey's Bay, Eastern Cape: Final Environmental Impact Assessment Report

Chapter 3: Description of the Affected Environment

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CHAPTER 3. DESCRIPTION OF THE AFFECTED ENVIRONMENT

This section of the Final EIA Report provides a description of the environment that may be affected by the proposed Ubuntu wind energy project approximately 3 kilometres north-east of Jeffrey's Bay along the eastern side of the Kabeljous River in the Eastern Cape Province. This information is provided in order to assist the reader in understanding the possible effects of the proposed project on the environment. Wind energy projects can extend over a large area as the distance between each turbine is approximately 500m. However, each turbine foundation is approximately 20m by 20m and with associated access roads and electrical substation it is unlikely that the wind energy project will affect more than 1% of the area it occupies although it will be visible in the area surrounding the wind farm. Aspects of the biophysical, social and economic environment that could directly or indirectly be affected by, or could affect, the proposed development have been described. The information presented in this chapter has been drawn primarily from the specialist studies commissioned for the EIA as well as from existing information available for the area and pre-existing field data, and aims to provide the context within which this EIA is being conducted.

The main objective of this chapter is to provide an overview of the region in which the proposed wind farm will be located, key environmental features are highlighted however these will be addressed in greater detail in the specialist studies included in this report.

3.1 SITE LOCALITY

The proposed Ubuntu wind energy project would be situated on a coastal plateau approximately 120 m to 200 m above sea level, inland of the N2 national road (see site locality maps in Figure 1.1 in Chapter 1 of this report). The landscape is relatively flat, high lying agricultural lands sloping steeply to the west and south-west towards the Kabeljous River. The facility will extend over two farms, Farms Zuurbron and Vlakteplaas. The farm Zuurbron extends from approximately 6 to 15 km from the coast; and the farm Vlakteplaas extends from approximately 4 to 6 km from the coast, with the southern border of the latter farm being on the N2.

These farms have a combined area of approximately 4 200 ha. Wind turbines will be situated on the northern half of Vlakteplaas and eastern half of Zuurbron. After construction, the turbine mast footprints (including new roads, hard standing areas for cranes and turbine foundations) will cover approximately 15 ha which comprises 0.36% of the total area.

3.2 BIOPHYSICAL ENVIRONMENT

3.2.1 Climate

Rainfall in the Kouga region is bimodal where both summer and winter rainfall occurs, a feature typical of the south-east coastal region of the country. The mean annual rainfall is approximately 400 mm. The weather is mild without extreme conditions with an average summer temperature of 24°C and a winter temperature of 17°C. During winter the prevailing wind is from a westerly to

south westerly direction and during summer the wind is predominantly easterly. A high frequency of wind occurs daily in the area.

3.2.2 Landscape and Geology

Dairy and stock farming is the main land use type in the surrounding region. The Gamtoos River floodplain is under intensive irrigated cultivation. Settlements such as Hankey and Humansdorp have developed as service centres for the agricultural industry. Humansdorp lies to the west of the site. Towns and villages along the coast are holiday resorts with seasonal variations in population. Jeffrey's Bay is the largest of these and is rapidly expanding with light and medium industrial sectors. Other holiday resorts that potentially will be affected by the wind farm include Aston Bay, Paradise Beach and St Francis Bay.

There are various power line, road and railway networks covering the area. A 132 kV power line crosses the site, in an east-west direction north of the N2 highway, with the Melkhoutbosch substation (Figure 3.1) located on this power line north of the N2-R330 interchange. The electricity generated at the Ubuntu wind energy project will feed into the 132 kV line and into the Melkhoutbosch substation.

The N2 is a main freight and tourist route between Port Elizabeth and Cape Town. Other main roads are the R102 between Jeffrey's Bay and Humansdorp and the R330 between Hankey and St Francis Bay. A number of relatively large structures are visible in the wind farm area, such as communication towers and chicken broiler housing. Various quarries are also present in the area. In addition there are viewpoints in protected areas which potentially will be affected by the wind farm. Of these, the Kabeljous River Nature Reserve and the Kabeljous River Natural Heritage Site are most likely to be affected.

The topography of the region is dominated by a flat coastal plain which gradually rises to the north and west to form the Cape Fold Belt mountains. The mountains and palaeo-marine deposits of the region have been deeply incised by the Gamtoos River system. The wind farm will be located on a palaeo-marine terrace adjacent to, and above, the Gamtoos River valley.

3.2.3 Ecology

The habitat is dominated by grazed grassy fynbos, or pastures containing fynbos elements that structurally resemble natural grassland. These areas of old farmland are now overgrown with grass and used for grazing, with dams and thicket in the kloofs and drainage lines. The majority of the land consists of cultivated fields, mainly producing fodder for livestock but used historically for crop production. A number of farm dams are present on the site and seasonal/ephemeral wetlands occur in the rainy season in flat areas, especially towards the northern part of the site. Ecological barriers in the area consist of fences, gravel farm roads, culverts and power lines. Biotic interactions are concentrated around pollination, seed dispersal, herbivory and predation. Utility lines and roads form corridors for bird mediated seed dispersal as well as vehicle mediated dispersal, in the case of roads.

A few scattered alien plant species are present, although these do not occur in abundance.

Figure 3.1: Melkhoutbosch substation, near the N2-R330 interchange north of Humansdorp

3.2.4 Flora and Fauna

The present vegetation consists of:

- Gamtoos Thicket restricted to kloofs and valleys along drainage lines, of which the latter are dominated by trees.
- Humansdorp Shale Renosterveld and Loerie Conglomerate Fynbos, which includes shrubby fynbos communities and low-lying seep and wetland/pan areas dominated by grasses and herbs with scattered thicket clumps, where not cultivated or transformed. Rocky outcrop communities also present on ridges with a mix of succulent and fynbos elements.
- Dams, streams and drainage lines of natural or anthropogenic origin with typical associated aquatic and riparian flora.

The Vegetation of Southern Africa Conservation Status (Mucina and Rutherford, 2006) of the vegetation types ranges from Least Threatened (Gamtoos Thicket and Loerie Conglomerate

Fynbos) to Endangered (Humansdorp Shale Renosterveld). The site is located outside the eastern extent of the Garden Route Biodiversity Sector Plan for the Kouga Municipality.

Terrestrial animal species that may occur in the study area mostly have a conservation status of Least Concern to Vulnerable and No Endangered or Critically Endangered terrestrial fauna are expected to occur within the site. The site does not host any butterflies of special concern and does not fall within an area of any Endangered or Critically Endangered reptiles as presented in Branch (1988). Vulnerable Blue Duiker (*Philantomba monticola*) and Endangered Oribi (*Ourebia ourebi*) have distributions that overlap with the locations of the wind farm, but due to the absence of preferred habitat, are not expected to occur on the proposed site. Hewitt's Ghost Frog (*Heleophryne hewitti*), which is regarded as Critically Endangered (Branch, 1988) is known to be present within a limited number of catchments within the Elandsberg mountains and no individuals of this species are expected to be present at the proposed site. It is, however, not impossible that they might occur as the presence of the species in the area has not been determined. A number of protected and endemic plant species are likely to occur in intact areas of natural vegetation.

3.2.5 Birds

The species that are most likely to be impacted are raptors (birds of prey) that use the favourable wind conditions on the ridges to forage. The site contains highly suitable habitat for Red List species, particularly the southern African sub-species of the Denham's Bustard, the South African endemic Blue Crane, Secretarybird, the southern African sub-species of the White-bellied Korhaan, the endemic Black Harrier and the Lanner Falcon. It is also an important area for the White Stork (Palaearctic migrant).

The micro habitats recorded in this study area are described below.

- **Natural fynbos**. The remaining areas of fynbos are mostly situated on slopes which have not been cleared for cultivation in the past, due to it being too rocky or steep for agricultural activity. These remaining areas of natural fynbos in the study area are potentially important for Red listed species such as Lanner Falcon, Peregrine Falcon, Martial Eagle, Secretary bird, Denham's Bustard and Black Harrier. Other priority species that that could be encountered here are mostly raptors such as Rock Kestrel, Jackal Buzzard, and Steppe Buzzard (see Table 3.1).

- **Old lands**. The majority of the study area consists of old agricultural lands where the natural fynbos vegetation was cleared when agriculture was practiced at some stage in the past (mostly cereal crops). These areas are now used for grazing and have reverted to a form of grassland, consisting of a mixture of indigenous and exotic grasses, with clumps of fynbos. This constitutes optimal habitat for Red listed Blue Crane, Denham's Bustard, White-bellied Korhaan and Secretarybird (see Table 3.1). These old lands are also very suitable for various raptors e.g. Black Harrier, Peregrine Falcon, Lanner Falcon, Steppe Buzzard, Jackal Buzzard and Amur Falcon. White Storks are also attracted to these areas.

- **Dams**. The area contains several dams and water bodies, mostly man made but also some natural and seasonal wetlands. These dams and pans, depending on the shape, can be important for some bird species. Dams with shallow sloping sides are suitable for a wider range of species. In the context of this study, shallow dams with sloping sides potentially could be roost sites for Blue Cranes and White Storks.

Water bodies are also frequented by a variety of waders and ducks, and could attract the Red listed Black Stork (see Table 3.1).

- **Drainage lines**. The study area contains one prominent seasonal drainage line. The banks of the drainage line show evidence of infestation by alien plants. Some of the larger trees in the drainage lines may be used by Secretary Birds for breeding and/or roosting.

- **Wetlands**. The drainage line and some of the dams in the study area have associated wetland areas, which may be of importance to Blue Cranes and the Red listed African Marsh Harrier (see Table 3.1).

The priority bird species (Retief 2011b) that have been recorded on the site during the three seasons of transect monitoring are listed in Table 3.1 below.

Table 3.1: Priority bird species recorded during transect surveys

Common Name	Scientific Name	Priority rating (Retief *et al* 2011)	Summer IKA = Index of Kilometric Abundance, or birds/km	Winter IKA = Index of Kilometric Abundance, or birds/km	Spring IKA = Index of Kilometric Abundance, or birds/km	Combined seasons IKA = Index of Kilometric Abundance, or birds/km
Blue Crane	*Anthropoides paradiseus*	294	0.32	0.34	0.18	0.28
Black Harrier	*Circus maurus*	289	0.08		0.04	0.04
Denham's Bustard	*Neotis denhami*	270	0.68	4.18	0.47	1.78
African Marsh-Harrier	*Circus ranivorus*	264	0.01	0.01	0.02	0.01
Peregrine Falcon	*Falco peregrinus*	260			0.02	0.01
Secretarybird	*Sagittarius serpentarius*	228	0.04	0.62	0.08	0.25
White-bellied Korhaan	*Eupodotis senegalensis*	228	0.08	1.81	0.34	0.74
African Fish-eagle	*Haliaeetus vocifer*	220			0.02	0.01
Jackal Buzzard	*Buteo rufofuscus*	220	0.07	0.06	0.01	0.05
Lanner Falcon	*Falco biarmicus*	208			0.03	0.01
White Stork	*Ciconia ciconia*	194	0.01			0.00
Amur Falcon	*Falco amurensis*	188	0.35			0.12
Steppe Buzzard	*Buteo vulpinus*	174	0.10			0.03
Southern Pale Chanting Goshawk	*Melierax canorus*	170	0.03	0.23	0.01	0.09
Southern Tchagra	*Tchagra tchagra*	150		0.11	0.01	0.04
Rock Kestrel	*Falco rupicolus*	148	0.05	0.06	0.07	0.06

3.2.6 Bats

Thirteen bat species have a geographical distribution that includes the study area. Four of these species are listed as Near-Threatened locally and one is Near-Threatened globally (Friedmann & Daly 2004; Monadjem, *et al*. 2010), whereas all other species are listed as Least Concern (see Table 3.2).

Although the site itself does not seem to have habitat that is attractive to bats such as caves, ridges with rock crevices or dense foliage, the broader areas surrounding the site are potentially attractive to bat habitat. The open grassland situated at an elevation of more than 200m also provides good foraging habitat for insectivorous bats feeding in the open air, such as *Tadarida aegyptiaca.*

The wind turbines could pose a potential hazard to eight of the 13 species, on account of their foraging habits. Some of the species are known to disperse over long distances, e.g. *Miniopterus schreibersii*, which disperses over 250 km (*Miniopterus natalensis,* which is present on the Ubuntu site, was previously included as a subspecies of *M schreibersii (*Monadjem, *et al*. 2010*))*. Furthermore some species are known to cover large distances when foraging at night or when moving between winter and summer roosts. No migration patterns have been recorded for bats in South Africa and the wind turbines will pose a risk to all bats whose migration routes cross the potential site.

Table 3.2: Bat species that are likely to occur on the proposed Ubuntu wind farm (Friedmann & Daly 2004; Monadjem, *et al*. 2010)

Species	Common Name	SA conservation status	Global conservation status (IUCN)
Epomophorus wahlbergi	Wahlberg's epauletted fruit bat	Least Concern	Least Concern
Eptesicus hottentotus	Long-tailed serotine (endemic)	Least Concern	Least Concern
Kerivoula lanosa	Lesser woolly bat	Near Threatened	Least Concern
Miniopterus fraterculus	Lesser long-fingered bat	Least Concern	Least Concern
Miniopterus natalensis	Natal long-fingered bat	Near Threatened	Near Threatened
Myotis tricolor	Temminck's myotis	Near Threatened	Least Concern
Neoromicia capensis	Cape serotine	Least Concern	Least Concern
Nycteris thebaica	Egyptian slit-faced bat	Least Concern	Least Concern
Rousettus aegyptiacus	Egyptian Rousette (endemic)	Least Concern	Least Concern
Rhinolophus capensis	Cape horseshoe bat (endemic)	Near Threatened	Least Concern
Rhinolophus clivosus	Geoffroy's horseshoe bat (endemic)	Near Threatened	Least Concern
Taphozous mauritianus	Mauritian tomb bat	Least Concern	Least Concern
Tadarida aegyptiaca	Egyptian free-tailed bat	Least Concern	Least Concern

Archaeology and cultural

The proposed Ubuntu Wind Energy Facility site is more than 5 kilometres from the coast and falls outside the coastal sensitive zone. Most of the proposed wind energy site has been ploughed in the past and now covered by dense short grass which made it difficult to find archaeological materials. Apart from a few stone tools no significant sites/materials were found and it is highly unlikely that in situ archaeological material/sites will be exposed during development. There are also two other important cultural sites in the wider vicinity of the development, namely, Kabeljous River Shelter and the grave site of Sara Baartman. The developers should observe for any archeologically valuable features during the construction phase.

Palaeontology

The study area is largely underlain by fluvial conglomerates and minor sandstones of the Mesozoic Enon Formation (Uitenhage Group) that are locally mantled with a veneer of pebbly relictual soils of the so-called Bluewater Bay Formation (Algoa Group). Both of these rock units are very sparsely fossiliferous, so any proposed development on the coastal plateau here is likely to have very little impact on the local palaeontological heritage. Likewise, small outcrop areas of sandstone and quartzite bedrocks of the Palaeozoic Table Mountain Group (Skurweberg and Baviaanskloof Formations) on the western edge of the study area are predominantly fluvial in origin and contain a very restricted fossil record (mainly trace fossils, with occasional shell- and plant-rich horizons). Geologically recent (mainly Quaternary) alluvium associated with modern or ancient water courses such as the Kabeljousrivier may contain fossils such as silicified wood and other plant material, trace fossils, freshwater molluscs, or disarticulated vertebrate bones and teeth, but these tend to be very sparse.

3.3 SOCIO-ECONOMIC

The study area falls within the Kouga Municipal area in the Cacadu District. The Kouga Municipality has a population of 62 542 people (as indicated in the Kouga Municipality revised Integrated Development Plan (IDP) (2005/2006), with a low proportion of young people, 38 % being between the ages of 0 and 20 years (census 2001). The Municipality is a top performer in the Eastern Cape with low rates of dependency (1.29), unemployment (25 %) and poverty (31 %). Some 47 % of households in Kouga have members who receive social grants. This is the lowest percentage of households in the District (Kouga Municipality Annual Report 2005-2006).

Agriculture is one of the major contributors to Geographical Value Add (GVA) and employment in the area. However, this lucrative market is adversely affected by high numbers of people (including farm workers) infected with HIV/AIDS within the municipal area. Considering the district average of 17 %, the Kouga municipality has an estimate of 12 000 persons living with HIV/AIDS. Kouga currently has 14 330 patients with Tuberculosis (TB), 20 % of the total local population. As a consequence of the linkages between TB and HIV/AIDS, this should raise concerns for the delivery of primary health care.

A district survey indicated that Kouga is performing above average in terms of access to good roads, clinic services and public schools. Unfortunately the municipal area is doing particularly poorly in terms of access to hospitals and ambulance services.

Kouga has among the highest Formal Economy Performance scores, with positive factors including the positive trade balance, a fairly diversified economy, low financial grant dependence, and strong Gross Domestic Product (GDP) and employment growth performance. The local

economy has experienced a positive shift increase in employment and GDP from 1996 to 2004, and is one of only two municipalities in the Province to emerge as leading economies in respect of both GDP and formal employment, provincially and nationally.

Kouga municipality is predominantly a rural area with seasonal influx of visitors to the popular coastal tourist destinations such as Jeffrey's Bay and Cape St Francis. It offers a wide range of tourist activities and attractions. These include historical and heritage sites, the Kouga Cultural Centre, surfing, fishing, hiking, biking, sand boarding, birding and game viewing, and various other outdoor and adventure activities (Kouga Municipality Annual Report 2005-2006).

Note: More detailed information on the demographics, employment and economic growth of the Kouga Municipality are provided in the Economics Chapter, Chapter 10 of this report.

3.4 PLANNING CONTEXT AND SURROUNDING LAND USES

The economy of the Kouga Municipal area has grown considerably over the last 10 years and has become a major holiday destination. The tourism market is growing tremendously and will further benefit from the establishment of a game reserve near Jeffrey's Bay. A Tourism Forum, where all the local tourism organisations are represented, was established to drive tourism in the Kouga region.

Agricultural production is on the increase and as the benefits of intensive land utilisation are becoming apparent its growth is constantly gaining momentum. Jeffrey's Bay is earmarked for intensive industrial development. A R1,2 billion commercial, residential and industrial development, known as The Fountains Estate, has been established in Jeffrey's Bay.

Activities on the land surrounding the wind farm site include:

- Stock farming;
- Crop farming; and
- Untransformed land (natural vegetation).

The site for the proposed Ubuntu wind farm is presently zoned for Agriculture. Farms Zuurbron and Vlakteplaas comprise old wheatfields that have been planted with indigenous grasses which now structurally resemble natural grassland. The site is currently being used for general farming activities and grazing and has been ploughed extensively in the past. The entire area for the proposed wind energy facility is covered mainly by dense grass with small patches of fynbos and alien vegetation

The area is not pristine and has been transformed by various human activities over the last two centuries. Nevertheless development should only proceed with due cognizance of environmental features.