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PROPOSED WIND ENERGY DEMONSTRATION FACILITY IN THE WESTERN CAPE

SPECIALIST HERITAGE STUDY

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1. INTRODUCTION:

CSIR Environmentek was appointed in compliance with the provisions of the Environment Conservation Act 1989 (Act 73 of 1989) to undertake an environmental impact assessment (EIA) for eskom's SABRE-Gen wind energy demonstration facility in the Western Cape. Two sites are under consideration: Farm Radio 918, Klipheuwel - owned by Telkom Properties; and Groot Oliphantskop Farm, Blaauwberg.
The CSIR has completed the Draft Scoping Report and the public was requested to comment by 9 July 2001.

The South African Heritage Resources Agency (SAHRA) requested the CSIR to ensure that the evaluation included the identification of heritage resources and of mitigatory measures for the period of the demonstration programme.

Aikman Associates: Heritage Management was subsequently appointed to undertake the specialist study. Discussions were held with officials of SAHRA to establish the scope of the report to be submitted.

1.1 Method

- Site inspections were carried out and the following documents were studied:
- Draft Scoping Report: Environmental Impact Assessment for the Eskom Wind Energy Demonstration Facility in the Western Cape: June 2001.
- Archaeological and Cultural Impact Assessment: Omega Substation: August 1996.
- A Visual Impact Assessment of a Proposed Wind Turbine Installation: May 2001.
- Aerial Photographs.

2. TERMS OF REFERENCE

In terms of SAHRA's requirements, the heritage review must:

- Assess the significance of heritage resources.
- Assess the impact of the development against the social and economic gains resulting from the development.
- Include the outcome with the Interested and Affected Parties.
- Identify alternatives if there is a negative impact.
- Identify mitigatory measures for the period of the development and subsequent management.

SAHRA will then consult with the developer and decide on:

- Whether or not the development may proceed.
- Any conditions that should be applied.
- What general protections apply.
- What formal protections may be applied (see Figure 1).

speeds. The components include the wind turbines, transformer building, visitor centre and parking.

3.1 The Wind Turbines

The main components of the horizontal axis turbine are the following:

- The 4m-diametre base and 4 - 6 m deep foundation.
- The 40m high tower, which tapers towards the top.
- The three-blade rotor with each blade 20m long.
- The nacelle, which houses the generator.

The vertical axis turbines are much smaller standing only 15m high. The main components are:

- The 200m² base housing the generator, 3m high.
- The turbines housed in a 3m diameter housing about 12m high.

3.2 TRANSFORMER:

A single storey structure of about 100m² is required.

3.3 VISITORS CENTRE:

A structure of about 200m² is required for demonstration and training, research and educational purposes. A small parking area is required.

3.4 UNDERGROUND CABLES:

Cables will be buried and will run from the turbines to the transformer and thence to the Eskom grid.

3.5 LAYOUT:

The topography and size of the two selected sites dictates the demonstration facility layout.

3.5.1 Klipheuwel

On this site the turbines will be in a line at right angles to the prevailing southeast and northwest winds i.e. a line running from a point in the southwest near the R304 to the northeast and the boundary of the abutting farm.

The turbines will be about 200m apart. The visitor centre would be located about 500m from the turbines close to the R304 for easy vehicular access (see Figure 2).

Eskom has selected two suitable sites for the proposed demonstration facility.

4.1 Farm Radio 918: Klipheuwel

The site selected is on the southeastern and southern portion of the farm near the intersection of the R302, Durbanville Malmesbury Road and the R304, Stellenbosch Malmesbury Road.

4.1.1 Topography

The topography is characterised by gently rolling hills, the geology is composed of shale and limestone, overlain with sands. There are small outcrops of silcrete throughout the area, which is of archeological significance. A small stream, the Mosselbank, runs across the southeast portion of the farm.

4.1.2 Vegetation

The farm is being used for wheat production, which is the dominant agricultural activity in the area. There is some dairying on nearby farms.

4.1.3 Structures

The area as a whole and this farm in particular has been used for many years for radio telecommunication. Radio masts are sited on many properties all along the R302 leading to the site. In addition massive concrete anchor blocks for the mast cable supports are found in many of the farm fields.

On this farm there are a number of these anchor blocks set in the wheat fields. There is also an extensive Telkom installation up against the bluegum avenue where a number of telecommunication receiver dishes are sited.

There is a tall Telkom tower on the farm. There are no farm buildings in close proximity to the part of the farm to be used for the demonstration facility. There is however the Telkom Radio Station complex at the head of the bluegum avenue set in mature trees. The complex comprises industrial and residential buildings dating from the early 20th Century (not researched). These buildings are not visible from the demonstration facility site (see Figures 3, 4 and 5).

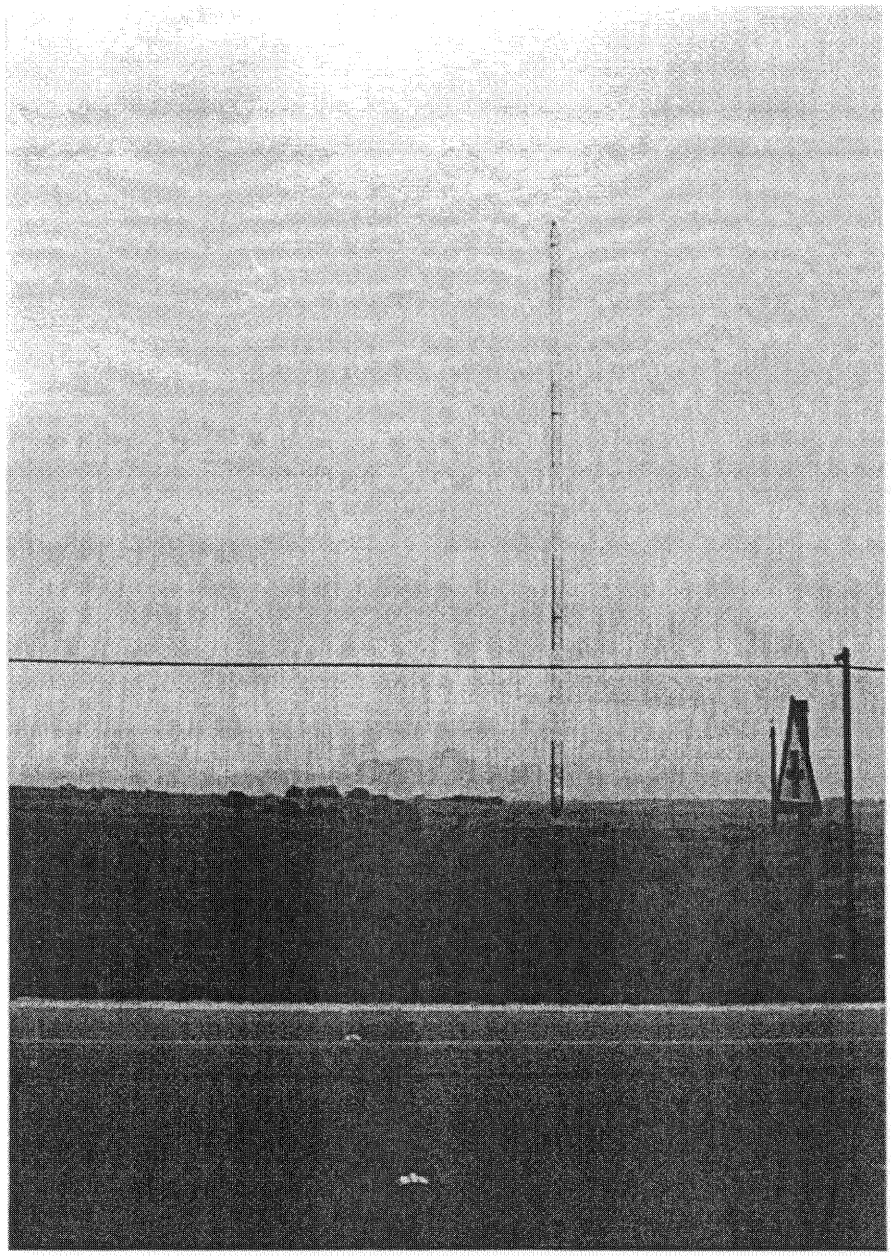


Figure 4: Telkom Mast at Klipheuwel

4.2 GROOT OLIPHANTSKOP

The farm lies to the west of the N7, (Cape Town Malmesbury). The M19, the Melkbosstrand Road runs in an east west direction to the south of the farm. Melkbosstrand is 6km west of the site.

4.2.1 Topography

Groot Oliphantskop is one of the hills forming a ridge through the gently rolling countryside of the area. The geology is composed of shale and limestone overlain with windblown sands.

4.2.2 Vegetation

The farm is being used for wheat production, dairying and some sheep farming. There are thickets of bluegum, Pine and Port Jackson (severely infected with the introduced fungus). On some of the smaller ridges there are remnants of Strandveld Dune Thicket vegetation.

A large stand of bluegums shades part of the farmstead and is a prominent landscape feature.

4.2.3 Structures

The most dominant structure is the 4 x 400kva power line which bisects the farm.

Also a dominant feature notwithstanding the scale of the powerlines is the Groot Olifantskop farmstead just below the crest of the hill backed by the bluegums.

The centerpiece of an ensemble of barns, dairy, labourers' cottages, sheds and enclosures is the homestead.

Rennie and Scurr Architects, in their survey of conservation worthy elements in the former Blaauwberg municipal area identified the farmstead as being conservation worthy because of its historical importance (parts of the complex date from the late 18c) and rarity, as so many of these coastal farms has disappeared. (personal comment J. Rennie 18/9/01).

There are also other outlying groups of labourers' cottages.

The survey undertaken by the Agency for Cultural Resource Management in 1996 identified two Later Stone Age sites, two stone lined wells and a farm cemetery

5. HERITAGE SIGNIFICANCE

Each farm has been assessed in terms of its heritage significance (section 3: National Estate: National Heritage Resources Act, No 25 of 1999) (see Figure 6).

5.1 Klipheuwel

5.1.1 Landscape and natural features of cultural significance.

The Klipheuwel site is part of a mature agricultural landscape where farming has taken place since the 18c. This activity has created an intricate pattern of farmsteads (frequently on small hill tops), groups of labourers cottages set on rolling fields of winter wheat: green in the spring, turning to gold and then after harvest the grey stubble. Silos are also a feature of this landscape.

The Durbanville Malmesbury road largely follows the historic 18th Century road alignment and in places bluegums flank the route. Bluegums also border farm roads and farm boundary wind breaks and are a significant element.

An important feature of this landscape, present for most of the 20th Century are the masts and towers of the country's telecommunication system. This landscape is of a high heritage significance.

5.1.2 Archaeological and Palaeolontological Sites

Because of the thick vegetative cover (spring wheat) it was not possible to assess this aspect of the site. It is recommended that all trenching or excavation work be monitored by a professional archaeologist.

5.1.3 Creative or Technical Achievement

As discussed above, the farm accommodates an important radio station and other telecommunication systems, lattice masts and towers. These symbolize our country's technological growth and are of high heritage significance.

5.2 GROOT OLIPHANTSKOP

5.2.1 Landscape and natural features of cultural significance.

This site is also part of a mature agricultural landscape where winter wheat is also farmed. Dairying however is a widespread activity and herds of black and white cows are a common feature.

Like Klipheuwel bluegum avenues and shelterbelts are also important landscape elements as are fields infested with Port Jackson. There are remnant patches of Strandveld Dune Thicket in areas where ploughing has been difficult.
The massive powerline network from the Koeberg power station is also a dominant landscape element.

This landscape is of high heritage significance.

The farmstead up against the crest of the hill with bluegums forming a backdrop has a powerful presence when seen from the Melkbosstrand Road. The view from the entrance gate is particularly dramatic with the white buildings seen against the wheatlands.

The turbines would be seen together with the farmstead, which would diminish its presence in the landscape. The farm structures are no higher that 8m to the top of the ridge of the roof whereas the turbine towers are 40m high and the rotor blades are an additional 20m long. The buildings would be dwarfed.

6.2.2 Historical Settlement

As discussed above the presence of the turbines in close proximity to the settlement would negatively affect its significance.

6.2.3 Graves

The turbines and other structures of the facility would have no impact on the cemetery.

6.2.4 Slavery

This is unresearched. It is unlikely that the facility would have any impact.

7. DISCUSSION OF IMPACT

As required in terms of the brief from CSIR, 17 August 2001 the impacts on heritage resources are summarized in the following tables:

7.1 Klipheuwel

IMPACT	STATUS	EXTENT	DURATIOI	INTENSITY	PROBABIL	LEGAL RE	MITIGATI	SIGNIF'CE	CONFIDEI
Cultural L'	Positive	Regional	Short Term	Negligible	Medium	Act 73/'89	See Sec. 8	Low	High

7.2 Groot Oliphantskop

IMPACT	STATUS	EXTENT	DURATIOI	INTENSITY	PROBABIL	LEGAL RE	MITIGATI	SIGNIF'CE	CONFIDEI
Cultural L'	Negative	Regional	Long Term	High	Definite	Act 73/'89	See Sec. 8	High	High
Historical S	Negative	Regional	Long Term	High	Definite	Act 73/'89	See Sec. 8	High	High
Graves	Neutral	N/A	N/A	N/A	N/A	Act 73/'89	See Sec. 8	Low	High
Slaves	Neutral	N/A	N/A	N/A	N/A	Act 73/'89	See Sec. 8	Low	High

The negative impact on the cultural landscape at Groot Oliphantskop will not significantly extend beyond the 1000m zone as set out in the Cave Klapwijk report.

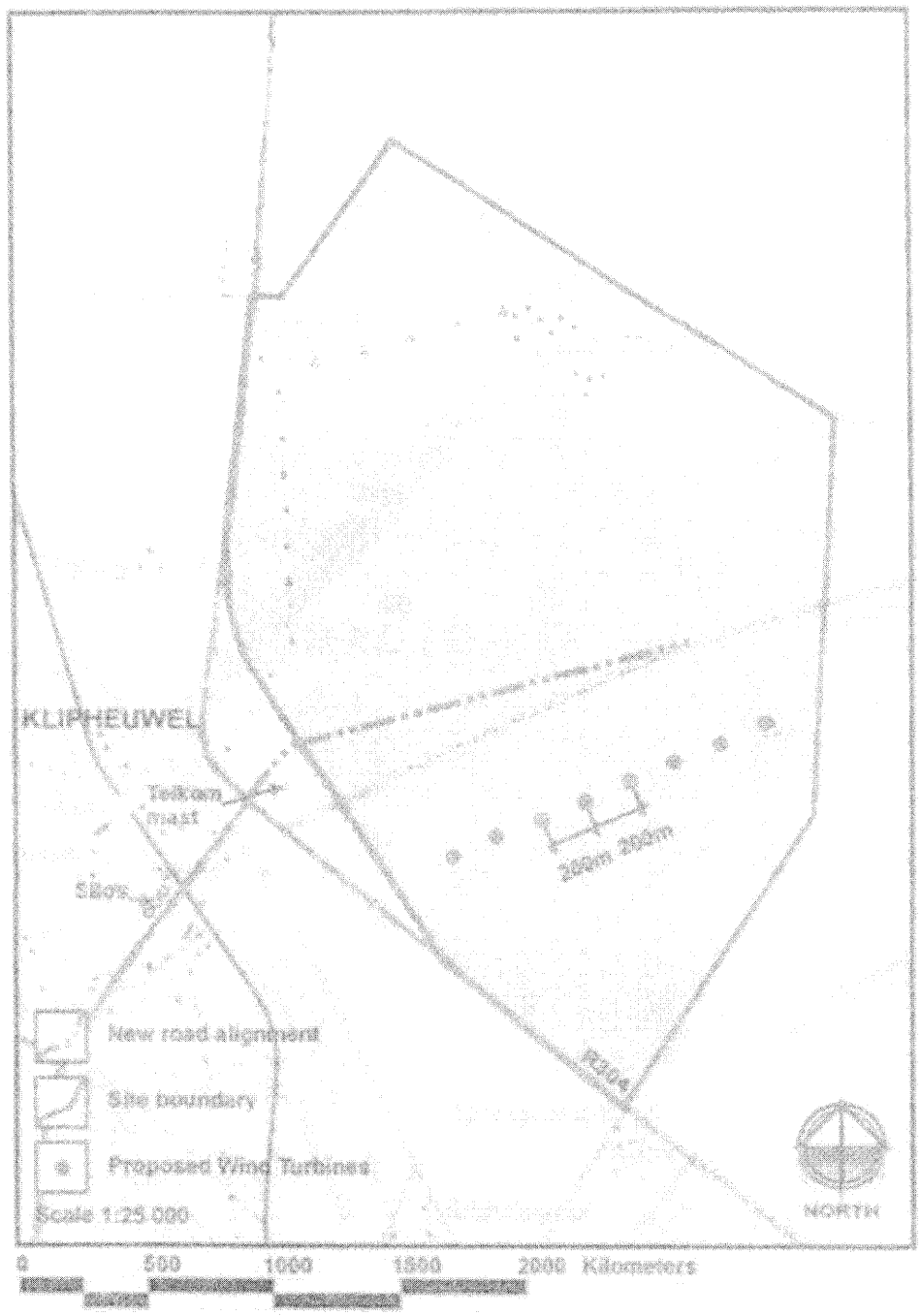
7.2 Duration

The impact will last until the facility is decommissioned.

recommendation erected, no additional structures such as the proposed visitors' centre or transformer building should be erected. It is recommended that existing farm buildings could be adapted to accommodate these uses.

Detailed recommendations relating to the site are as follows.

- The positioning and detailed design of the transformer building and visitors' centre should be carefully considered and related to the rural/technological setting. Eskom should give consideration to holding an architectural design competition, which could enhance the projects' profile.
- Landscape design related to the above should respond to cultural landscape patterns of the area eg. bluegum used to screen buses parked at the visitors' centre.
- Signage should be strictly controlled and responsive to the rural setting.



KLIPHEUWEL SITE LAYOUT PLAN