HERITAGE IMPACT ASSESSMENT: PROPOSED WEST COAST ONE WIND ENERGY FACILITY, VREDENBURG DISTRICT, WESTERN CAPE

(Assessment conducted under Section 38 (8) of the National Heritage Resources Act as part of an EIA.)

Prepared for:

Savannah Environmental (Pty) Ltd
26 August 2010

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EXECUTIVE SUMMARY

ACO Associates CC was appointed by Savannah Environmental (Pty) Ltd on behalf of the client, Moyeng Energy, to undertake a Heritage Impact Assessment, as part of the EIA process, for the establishment of a wind energy facility on Portion 1 (remaining extent) and Portion 4 of Boebezaks Kraal 40, Portion 1, 2, 3, 4, 5, 6 and 9 of Frans Vlei 46 and Portion 4 and 5 of Zoutzaksfontyn 95 on the Vredenburg Peninsula, Western Cape.

Up to 55 wind turbines, a substation, a 132 kV overhead power line linking to the electricity grid and access roads are planned within the 28 km² site. At this stage, no alternative sites have been proposed for the facility but two alternative power lines routes, one connecting to the Aurora Substation and one connecting to the Blouwater Substation are proposed.

A heritage survey of the turbine footprints and substation was conducted during the week 20-23 July 2010. At the time of the survey, the final location for the substation, the alternative routes for the power line and access roads had not been finalised. The assessment of this component of the WEF is based on aerial photography and knowledge gained from previous work in the area..

Heritage Indicators:

- A significant complex of 32 pre-colonial archaeological sites on Kasteelberg kopje (Boebezaks Kraal). Large numbers of sheep, cattle and pottery from previous archaeological excavations point to pastoralist settlement on the kopje. Kasteelberg was an important aggregation site with high symbolic/spiritual significance. It is of great scientific importance as it has the potential to inform on the development of pastoralism in South Africa. **Its importance was recognised in 1998 when SAHRA initiated the process of having Kasteelberg declared a National Heritage Site. Heritage Western Cape has recently revived the process of declaration of Kasteelberg as a Provincial Heritage site**;
- Isolated scatters of pre-colonial and historical archaeological material were identified in some of the turbine footprints although they are of lesser significance;
- A ruined 19th C structure of rough calcrete blocks and mud-brick at the base of Kasteelberg kopje, with potential to inform on early *architectural development* on the West Coast;
- Two 19th C farmsteads, namely Rooiheuwel and Klipheuwel on Boebezaks Kraal with elements of *historic significance* (transformed residential buildings on Rooiheuwel and a barn on Klipheuwel) with possible Grade 3C status. There are also a number of historic farmsteads adjoining the boundaries of the WEF. The Boesakskraal and Frans Vlei farmsteads exist on the 1938 aerial photographs but have been substantially transformed;
- Overhead Power Line Alternative 2 crosses over Patrysenberg which has potential historical significance;
- The *scenic* route, R45 between Vredenburg and Paternoster passes the western edge of the WEF with a distance of 1.1km between Turbine 55 and the road. The local gravel road from Vredenburg to Stompneusbaai travels through the centre of the WEF, with Turbine 37 only 20m from the road and Turbine 38 at 190m from the road;

- Kasteelberg kopje represents a *significant archaeological landscape* with the granite kopje a significant landmark on the peninsula;
- *Cultural landscape* comprises a rural agricultural landscape of rolling wheat fields interspersed with small granite kopjes which dominate the skyline. Nestling in the rolling hills are farmsteads associated with historic groves of trees adding further to the rural character of the landscape.

Recommended mitigation

Pre-colonial and Historical Archaeology: A few isolated clusters of archaeological material, identified in the wheat fields, should be avoided, and if this is not possible then mitigation should take the form of sampling. Sites on granite kopjes, first recognised by the Sadr et al (1993) survey and confirmed by this study may be impacted by both the placement of turbines and access roads. It is therefore recommended that:

- The proposed locations of Turbines 2, 27, 32, 37, 47 and 49 should be re-considered or appropriate mitigation measures taken;
- Archaeological monitoring must be implemented if any access roads are constructed over or close to granite kopjes; furthermore it is recommended that an archaeologist be consulted with respect to the relocation of turbines around Kasteelberg Kopje. A buffer of at least 2km is proposed for the kopje;
- From a review of aerial information, power line Alternative 1 is preferred. It is recommended that an archaeologist should be involved in the final walk down phase for the construction of the 132kV power line and roads to ensure that no archaeological/historical material is negatively impacted;
- If there are any changes to the final layout of the turbines, then additional survey work will be required in order to ensure that no sites are directly impacted and/or to identify the need for an excavation permit.

Built Environment: The turbines and power line will result in a visual intrusion on the historic farmsteads of Rooiheuwel and Klipheuwel - some turbines will be placed less than 500m from the farmsteads.

- Provincial guidelines recommend that a minimum distance of 500m between the farmstead and the closest turbines be adhered to.

Scenic Routes: The R45 can be considered a scenic route and the construction of turbines and power line along the route will essentially be a visual intrusion on a pre-colonial cultural landscape.

- Provincial guidelines recommend that Turbines should be situated at least 500m from local roads, and further (up to 1km) for scenic routes. It is recommended that this should be followed.

Cultural Landscape: Significant visual impacts are anticipated from the placement of the turbines, substation and power line and it is recommended that:

- The VIA specialist consider the visual impacts of the turbines on the archaeological landscape represented by the kopje of Kasteelberg, the

historic farmsteads of Rooiheuwel and Klipheuwel as well as on the rural agricultural landscape of the Vredenburg Peninsula;

- The view of the Kasteelberg kopje from the two local roads should not be obstructed by the position of turbines and powerlines. From a heritage perspective a buffer of 500m is not acceptable. It is recommended that no turbines, substations or power line should be placed along the lower slopes of the Kasteelberg kopje and this would include Turbines 53, 51, 50, 47, 45, 44, 42, 40, 39, 38 & 37. This essentially means a buffer of 2km around Kasteelberg kopje.

Conclusion

The most significant negative impact of the WEF is expected to the visual impact of the turbines on the pre-colonial cultural landscape represented by the Kasteelberg kopje. Heritage Western Cape is in the process of proclaiming Kasteelberg as a Provincial Heritage Site because of its archaeological significance. For this reason, it is recommended that no turbines or substations are placed along the lower slopes of the kopje where they would be visible from the R45 or the gravel road to Stompneusbaai. This effectively means a buffer of at least 2km.

Declaration:

Dr Lita Webley, Jayson Orton and Mr Tim Hart are independent specialist consultants who are in no way connected with the proponent, other than delivery of consulting services.

Lita Webley (PhD) is an archaeologist with 14 years of working experience in heritage consultancy. She is also accredited with Principal Investigator status with the Association of Professional Archaeologists of Southern Africa.

Jayson Orton (MA) is an archaeologist who has worked in the ACO offices since 2004. He is a accredited with Principal Investigator status with the Association of Professional Archaeologists of Southern Africa.

Tim Hart (MA) is an archaeologist with 22 years of working experience in heritage throughout southern Africa. He is accredited with Principal Investigator status with the Association of Professional Archaeologists of Southern Africa.

GLOSSARY

Archaeology: *Remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures.*

Early Stone Age: *The archaeology of the Stone Age between 700 000 and 2500 000 years ago***.**

Fossil: *Mineralised bones of animals, shellfish, plants and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.*

Heritage: *That which is inherited and forms part of the National Estate (Historical places, objects, fossils as defined by the National Heritage Resources Act 25 of 1999.*

Holocene: *The most recent geological time period which commenced 10 000 years ago.*

Late Stone Age: *The archaeology of the last 20 000 years associated with fully modern people.*

Middle Stone Age: *The archaeology of the Stone Age between 20-300 000 years ago associated with early modern humans.*

National Estate: *The collective heritage assets of the Nation*

Palaeontology: *Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.*

SAHRA: *South African Heritage Resources Agency – the compliance authority which protects national heritage.*

Structure (historic:) *Any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith. Protected structures are those which are over 60 years old.*

Acronyms

BP	Before the Present
DEA	Department of Environmental Affairs
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
HWC	Heritage Western Cape
LSA	Late Stone Age
MSA	Middle Stone Age
NHRA	National Heritage Resources Act
SAHRA	South African Heritage Resources Agency

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1. INTRODUCTION

ACO Associates CC have been appointed by Savannah Environmental (Pty) Ltd on behalf of the client, Moyeng Energy, to undertake a Heritage Impact Assessment, as part of the EIA process, for the establishment of a wind energy facility on Portion 1 (remaining extent) and Portion 4 of Boebezaks Kraal 40, Portion 1, 2, 3, 4, 5, 6 and 9 of Frans Vlei 46 and Portion 4 and 5 of Zoutzaksfontyn 95 on the Vredenburg peninsula, Western Cape.

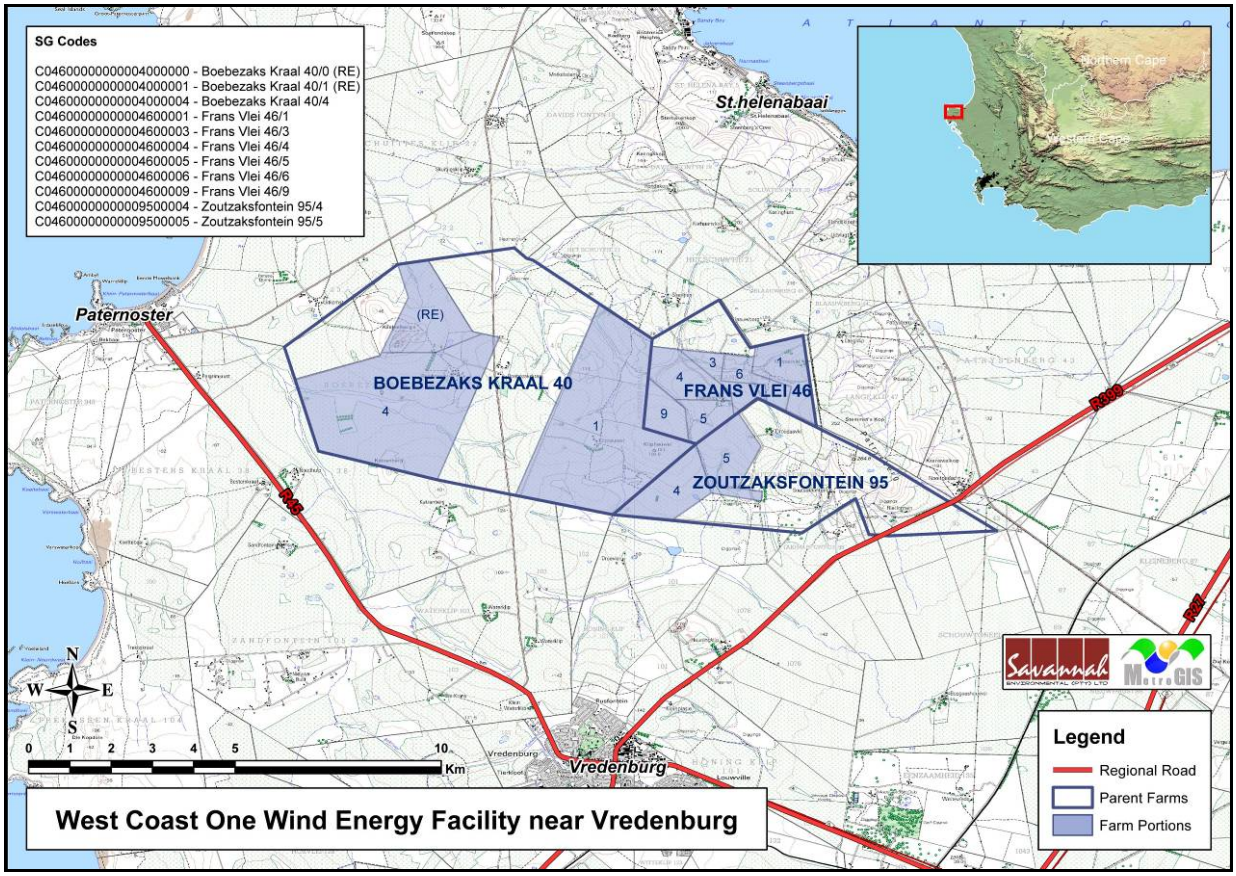

Figure 1: Locality map of 1:50 000 map sheets 3217 DB & DD Vredenburg showing the portions of the farms Boebezaks Kraal, Frans Vlei and Zoutzaksfontein which will be affected by the proposed WEF. Map supplied by Savannah Environmental (Pty) Ltd.

1.1 Development Proposals

Up to 55 wind turbines, a substation, a 132 kV power line linking to the electricity grid and access roads are planned within the 28 km² site. At this stage, no alternative sites have been proposed for the facility, however two power line alternatives have been provided.

It is proposed that the facility will include:

» up to 55 wind turbines with concrete support bases

» a substation
» A 132kV overhead power line linking to the electricity grid. Two alternative power line routes have been proposed – Alternative 1 connects to the Blouwater substation while Alternative 2 connects to the Aurora substation (Figures 2 & 3). Alternative 2 has the advantage of using a vacant 66kV line servitude (22m) which can be converted to a 132kV servitude (31m) which runs all the way from the WEF to the 400kV (Aurora-Juno) line;
» Underground cables connecting to the turbines;
» And internal access roads to each turbine (Figure 4).

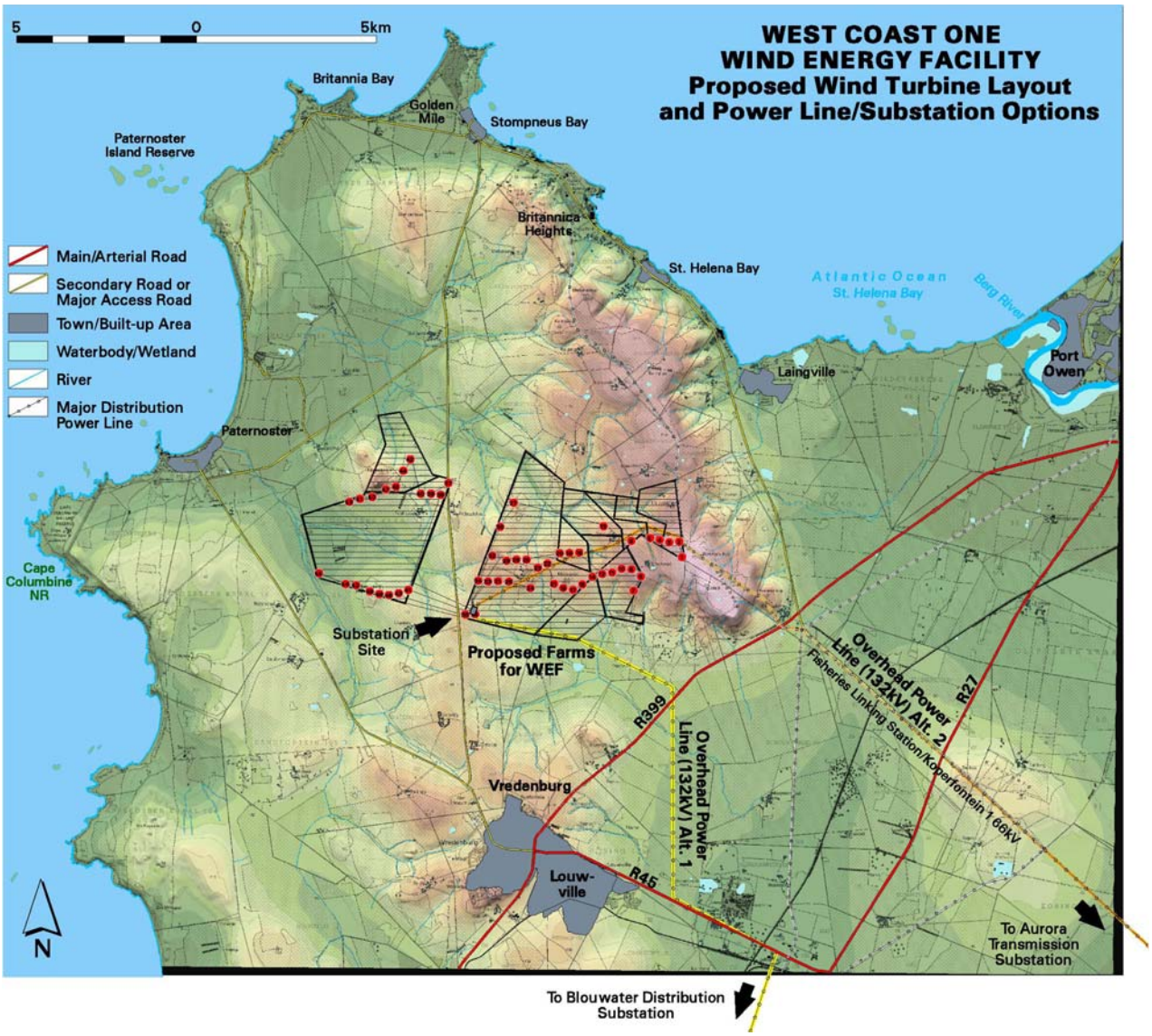

Figure 2: Proposed wind turbine layout and power line/substation options (Map supplied by Savannah Environmental (Pty) Ltd.)

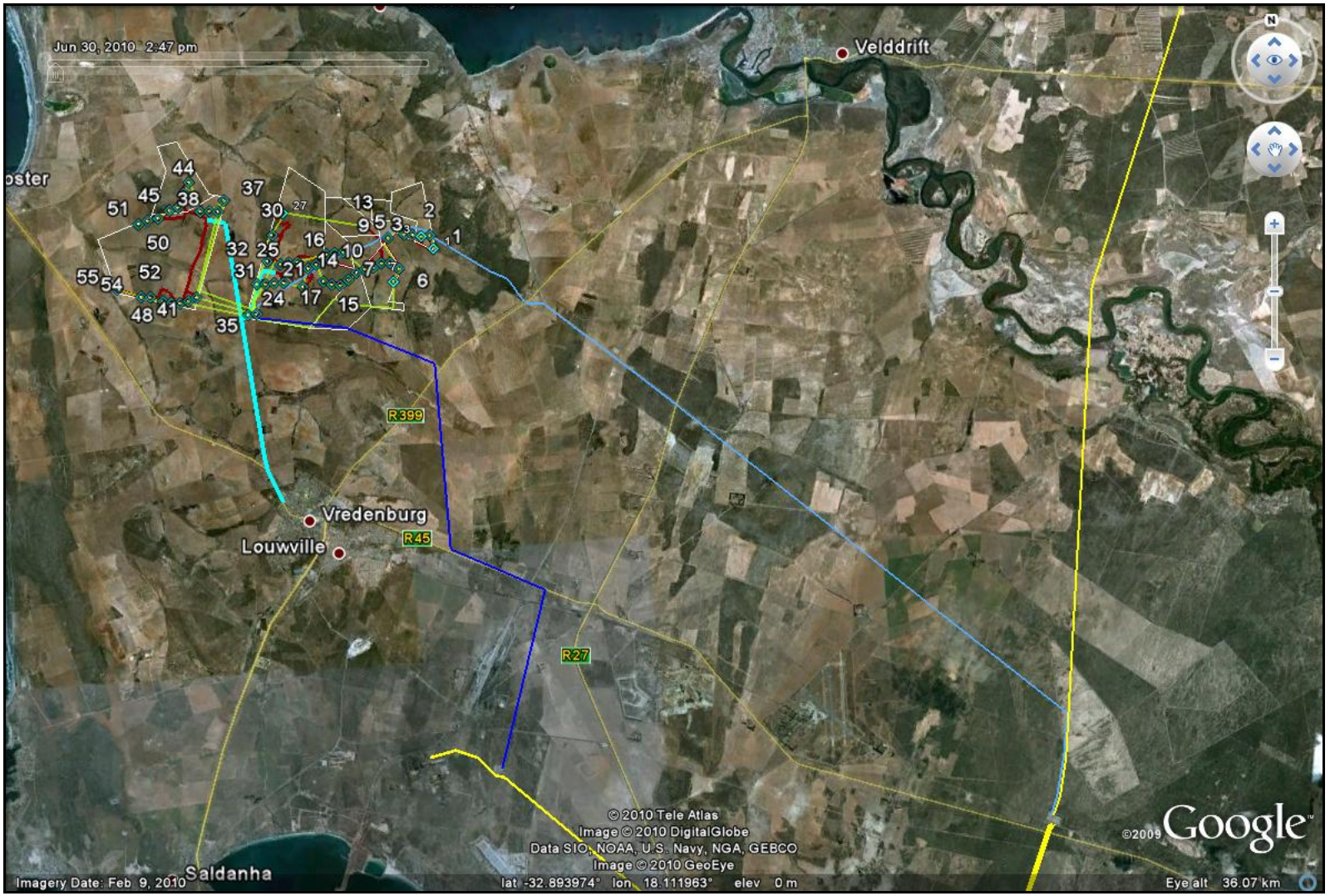

Figure 3: Proposed power line connections to the grid. Alternative 1 (dark blue) connects directly south to the Blouwater substation while Alternative 2 (pale blue line) connects to the Aurora Substation.

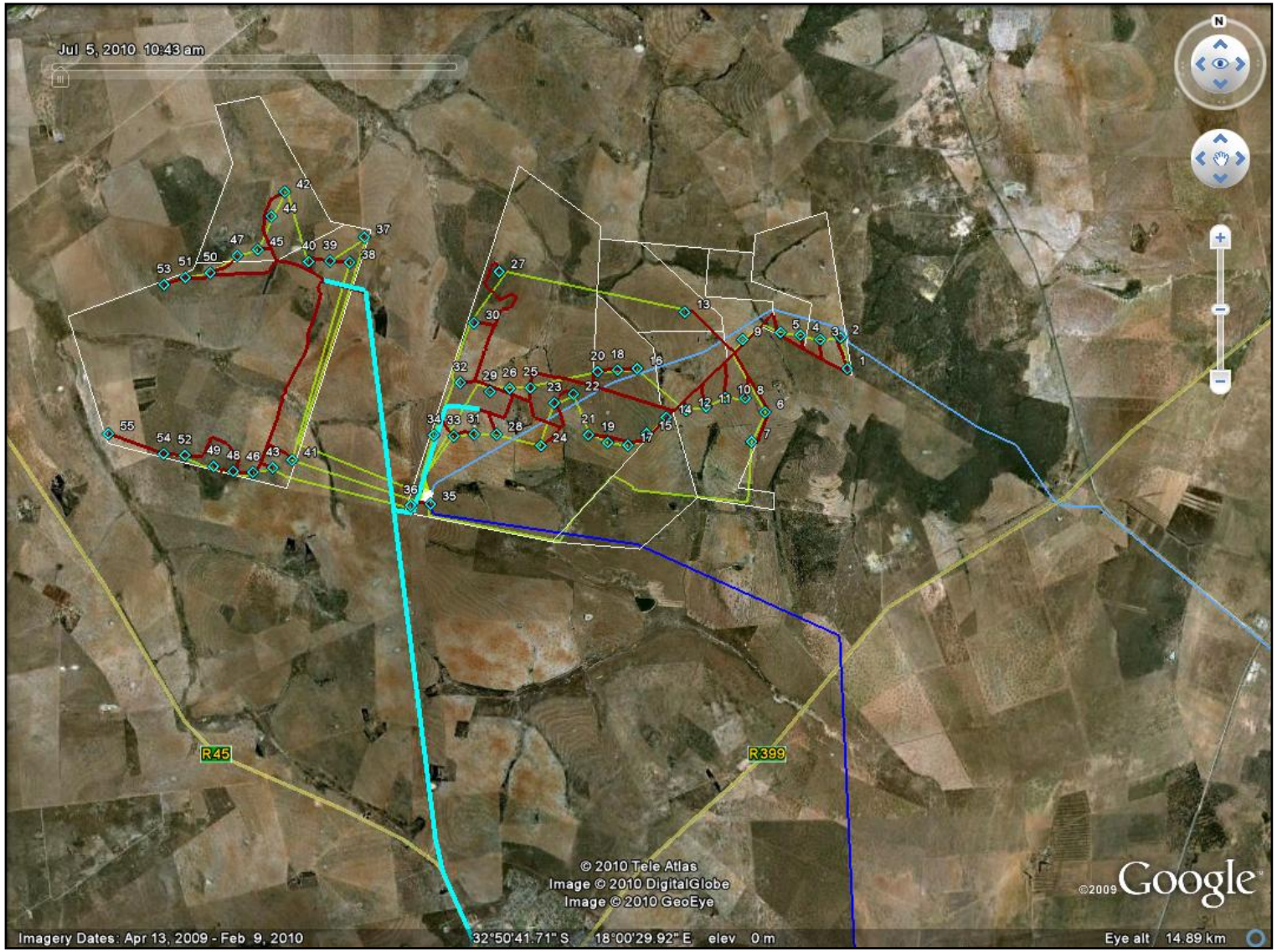

Figure 4: Proposed layout for the internal (red lines) roads to the proposed turbines. The turquoise line represent the existing roads which will be used to access the site.

1.2 Terms of Reference

The HIA considers the range of heritage resources which may be impacted during the *construction*, *operation* and *decommissioning* phases of the project and makes recommendations regarding mitigation and future management.

The heritage practitioner is required to provide:

- Description of the affected environment;
- Description of the range of heritage resources which may be impacted;
- Description of the significance of heritage resources which may be impacted;
- An assessment of the potential loss of heritage resources;
- Recommendation of mitigation procedures which may include avoidance;

2. LEGISLATION, POLICIES AND GUIDELINES

The basis for all heritage impact assessment is the National Heritage Resources Act 25 (NHRA) of 1999, which in turn prescribes the manner in which heritage is assessed and managed. The National Heritage Resources Act 25 of 1999 has defined certain kinds of heritage as being worthy of protection, by either specific or general protection mechanisms. In South Africa the law is directed towards the protection of human made heritage, although places and objects of scientific importance are covered. The National Heritage Resources Act also protects intangible heritage such as traditional activities, oral histories and places where significant events happened. Generally protected heritage which must be considered in any heritage assessment includes:

- Cultural landscapes
- Buildings and structures (greater than 60 years of age)
- Archaeological sites (greater than 100 years of age)
- Palaeontological sites and specimens
- Shipwrecks and aircraft wrecks
- Graves and grave yards.

Section 38 of the NHRA requires that Heritage Impact Assessments (HIA's) are required for certain kinds of development such as rezoning of land greater than 10 000 sq m in extent or exceeding 3 or more sub-divisions, or for any activity that will alter the character or landscape of a site greater than 5000 sq m.

2.1 Cultural Landscapes

Section 3(3) of the NHRA, No 25 of 1999 defines the cultural significance of a place or objects with regard to the following criteria:

(a) its importance in the community or pattern of South Africa's history;
(b) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
(c) its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
(d) its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
(e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
(f) its importance in demonstrating a high degree of creative or technical achievement at a particular period;
(g) its strong or special association with a particular community or cultural group for social cultural or spiritual reasons;
(h) its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
(i) sites of significance relating to the history of slavery in South Africa.

2.2 Scenic Routes

While not specifically mentioned in the NHRA, No 25 of 1999, Scenic Routes are recognised by DEA&DP as a category of heritage resources. In the DEA&DP Guidelines for involving heritage specialists in the EIA process, Baumann & Winter (2005) comment that the visual intrusion of development on a scenic route should be considered a heritage issue. This is also given recognition in the Notice of Intent to Develop (NID) application which is used by Heritage Western Cape.

2.3 Heritage Grading

Heritage resources are graded following the system established by Baumann and Winter (2005) in the guidelines for involving heritage practitioners in EIAs (Table 1).

Table 1: Grading of heritage resources (Source: Winter & Baumann 2005: Box 5).

Grade	Level of significance	Description
1	National	Of high intrinsic, associational and contextual heritage value within a national context, i.e. formally declared or potential Grade 1 heritage resources.
2	Provincial	Of high intrinsic, associational and contextual heritage value within a provincial context, i.e. formally declared or potential Grade 2 heritage

		resources.
3A	Local	Of high intrinsic, associational and contextual heritage value within a local context, i.e. formally declared or potential Grade 3A heritage resources.
3B	Local	Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources.
3C	Local	Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3C heritage resources.

2.4 Wind Energy Guidelines

A pilot study commissioned by the Provincial Government of the Western Cape "Towards a Regional Methodology for Wind Energy Site Selection in the West Cape region" (May 2006) is the only locally available policy guideline. The study looked at landscape character rather than at the "cultural landscape" or "heritage" but concluded that wind energy facilities can have a profound impact on the landscape in terms of quality of place. In general terms it recommends a buffer of at least 500m from heritage sites. Neither SAHRA nor HWC have developed policies with respect to heritage and renewable energy.

3. RECEIVING ENVIRONMENT

The farms Boebezaks Kraal, Frans Vlei and Zoutzaksfontyn are located on the central area of the Vredenburg peninsula, immediately north of the town of Vredenburg (Figure 1). The geological structures exposed today include the granite rocks of the Vredenburg pluton, interspersed with recent sands. The vegetation on the undisturbed lands is variously described as Strandveld or West Coast Renosterveld. The vegetation is a short scrub with taller shrubs in protected places amongst the granite boulders.

The kopje of Kasteelberg (Plate 1) is part of a batholith of young intrusive granite of the Saldanha Bay area standing 187 m above sea level surrounded by agricultural land on the granite derived soils of the Vredenburg peninsula.

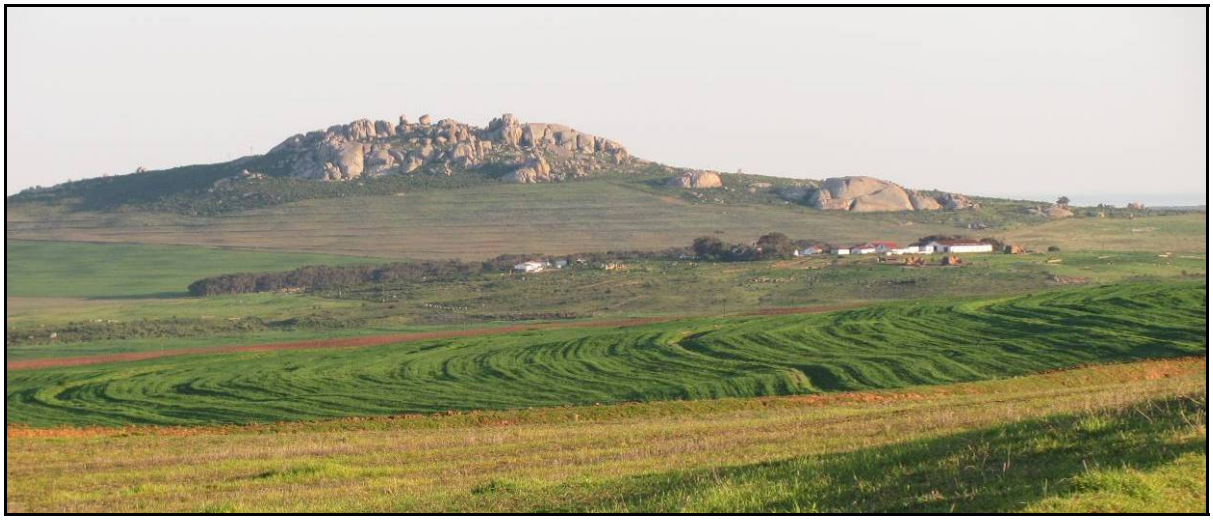

Plate 1: View of Kasteelberg kopje from the location of Turbine 33. Note the Rooiheuwel farmhouse in the foreground and the rolling wheat fields which characterise the area. It is proposed to place Turbines 42, 44, 45, 47, 50, 51 and 53 around the base of the kopje, with Turbines 40, 39, 38 and 37 between the kopje and the road.

Plate 2: View of the Katzenberg kopje from Kasteelberg. It is proposed to place Turbines 41, 43, 46, 48, 49, 52, 54 and 55 along the lower slopes of the kopje.

There are a number of turbines planned for a number of other granite kopjes, and these are:

- Katzenberg (Plate 2) is located on the southern margins of Boebezaks Kraal (Portion 4 of 40);
- Luislangklip, located on a small triangle of Boebezaks Kraal (Portion 4 of 40);
- An un-named kopje to the north of the farm Klipheuwel (Portion 1 of Boebezaks Kraal 40);
- A granite rock on the farm Frans Vlei (Portion 1 of 46).

However, the majority of the landscape consists of undulating lands covered in various cereals (Plate 3). During our survey, ploughing was taking place in some lands while others were covered in recently germinated wheat and lucerne crops (to a height of 20cm).

Plate 3: View of the location of Turbine 36, showing the ploughing which was taking place at the time of the survey.

The study area is bisected by the gravel road between Vredenburg and Stompneus Bay, and the farm lands are crossed by numerous farm roads. The R45 between Vredenburg and Paternoster runs along the western edge of the WEF site. A number of locations in the study area, such as the Kasteelberg kopje and the Klipheuwel farmhouse are clearly visible from the town of Vredenburg, and conversely Vredenburg is visible from many of the turbine locations.

Plate 4: View of Vredenburg from the position of Turbine 17. The wheat fields in the foreground fall within the study area but the ploughed lands are outside of it.

3.1 Pre-colonial Archaeology

The West Coast of South Africa has been settled for at least 100 000 years. There are shell middens dating to the Middle Stone Age (MSA) both north and south of the Vredenburg peninsula. Associated with these

middens are MSA stone tools and a single clearly modern human tooth from Sea Harvest. All these sites are older than 50 000 years.

Hunter-gatherers living on the Vredenburg Peninsula during the latter part of the Holocene (last 10 000 years) also made seasonal use of the coastal resources. Archaeological excavations at coastal sites confirm the importance of shellfish, seals, marine birds, crayfish and beached whales. Archaeologists have discovered, that around 2000 years ago, a new mix is added to the hunter-gatherer economy. Sheep and cattle bones, as well as pottery are introduced to the sub-continent. We know that by the time of European settlement at the Cape in the 17th century there were pastoralist groups, called the Khoekhoen, who were living in large tribal groupings, with herds of sheep and cattle, across the coastal forelands of the southern Cape. Their ancestors may have been responsible for the introduction of the sheep, cattle and pottery some 2000 years ago.

However, archaeologists have had great difficulty in locating the large pastoralist encampments described in the 17th century accounts and surveys in the wheat fields further south have shown that the Khoekhoen were highly nomadic and interior sites are therefore difficult to locate, partially due to the impact of agricultural activities in the area (Hart 1987). Favelle-Aymar et al. (2006) have recently claimed to have located such an open encampment at KFS5, located to the north of Kasteelberg, but the evidence is not as convincing as that of Kasteelberg.

The significance of the archaeological sites on the Kasteelberg kopje on the farm Boebezaks Kraal needs to be evaluated in the light of this brief background.

Kasteelberg

Kasteelberg is a large granite kopje on the farm Rooiheuwel (Boebezaks Kraal). There are two main extrusions of the granite, but only one of these formed the main focus of human attention since Middle Stone Age times. Of the 32 sites located around the kopje, five have been excavated and labelled KBA-KBE. The kopje is 4km from the sea, explaining the vast amounts of shellfish, crayfish and seal remains in the excavated sites. Pebbles from the beach may also have been used to make the stone artefacts found in the excavations.

Initial excavations by AB Smith of the University of Cape Town at Kasteelberg A (KBA) and Kasteelberg B (KBB) started in 1981.

Kasteelberg A: There is a lower stratum of MSA tools and faunal remains at the base of this site. KBA produced large numbers of sheep bones and a few cattle bones dated to circa 100 AD and Smith (2006) that this represents a pastoralist group herding sheep with limited numbers of cattle.

Kasteelberg B: is the largest of the Later Stone Age sites with high concentrations of pottery. It has an estimated area of at least 1 500m² and a depth of deposit of up to 1.7m thick. It has three main occupation horizons; the lowest dated to c. 700-900 AD. The upper layers of the site contain large amounts of seal and tortoise bones, but much fewer sheep. Smith suggests that the inhabitants were becoming large scale cattle herders at this time. However, domestic stock were clearly becoming important in the ritual life of the inhabitants as archaeologists recovered a lamb skeleton, covered in red ochre, which had been deliberately buried. There are more than 100 bedrock grinding grooves on the flat rocks around the site where the inhabitants were grinding red ochre. Smith (2006) has postulated that the inhabitants combined the ochre with seal fat and smeared this on their skin karosses.

Kasteelberg C: is a small rock shelter half the way up the kopje, with a stratified sequence with domestic stock in the top layers and microlithic stone artefacts in the lower levels dating to c. 200 BC. This site is interesting as it shows the replacement of a possible San hunter-gatherer occupation of the kopje with an incoming pastoralist group.

Subsequently, from 1985 further excavations were undertaken at several other sites on the Vredenburg Peninsula, such as Witklip, De Krans, Heuningklip, Eerste Mosselbank, Vonk se Stal and Steenberg's Cove.

These archaeological sites, as well as Kasteelberg, have featured prominently in the academic literature concerned with identifying exactly what represents a pastoralist site. Can we identify the ancestors of the 17th century Khoekhoen groups encountered by the Cape by early Dutch colonists? Were they a different group from the San hunter-gatherers or could San acquire sheep and cattle and become pastoralists? The "Great Debate", which has attracted the views of both archaeologists and historians working in southern Africa and elsewhere, is concerned with whether the pastoralists had a different cultural signature from the hunter-gatherer groups.

The faunal composition (large numbers of sheep), lack of formal stone tools, pottery and the large size of the ostrich eggshell beads appear to support Smith's hypothesis that Kasteelberg was a prehistoric herder site. Its location on a dominant feature on the landscape, the kopje, was determined by both its panoramic view of the surrounding countryside and proximity to the sea.

In 1991/2 Sadr et al. (1992) set out to test Smith's hypothesis with a more detailed archaeological survey of the peninsula. The survey strategy was to find and record sites within the two minor drainage basins around Kasteelberg hill although they concentrated their search around the granite outcrops. They recorded 129 archaeological sites (these sites are

shown as red triangles in Figures 5 & 6). They noted that during the dry season in this open landscape of extensive agricultural fields, pre-colonial sites are highly visible as surface scatters of shell sample and flaked stone. They removed small samples of shell for radio carbon dating and obtained a total of 89 dates for shell distributions on the Vredenburg Peninsula. Sadr (2009) concluded on the basis of this survey, that he was unable to identify two separate cultural signatures on the Vredenburg peninsula.

Nevertheless, despite these opposing views, Kasteelberg was clearly the most significant pastoralist site excavated in southern Africa.

3.2 Colonial Heritage

Early travellers reported that large numbers of cattle and sheep were being pastured around St Helena Bay by the 17th century. Nienaber (1989) in his review of the historic accounts, confirms that the C*hariguriqua* (later the Griqua?), a Khoekhoen group, occupied the area around St Helena Bay during the 17th century, with the Cochoquas or Saldanhars further to the west around Saldanha Bay. The name "Boebezaks Kraal" implies the presence of a Khoekhoen group in this area. Smith (2006) has postulated a seasonal transhumant cycle between the coast and the interior which was disrupted by the Dutch settlement.

The Saldanha Bay area was the focus of intense competition between French and Dutch interests during the 17th and 18th centuries. The Dutch established their first outpost at St Helena Bay in 1734 (Sleigh 1993). To determine the best location for their outpost, they asked the opinion of the most respected farmers with farms along the coast of St Helena Bay, and these included Hendrik Oostwald Eksteen who had already established a small fishing business in Saldanha in 1717 (Groenewald 2009). The farmers proposed that the outpost should be established at the foot of the Patrysenberg – located to the east of the WEF.

In 1745 the VOC negotiated with the widow Eksteen promising that she could obtain ownership of her loan farm, De Patrijse Berg in St Helena Bay, if she provided the soldiers at the outpost with supplies. The outpost was occupied again in 1781, with the soldiers quartered on the farm Patrijzenberg belonging to Pieter Laubscher (Eksteen's son-in-law).

In 1789, the Politieke Raad enquired whether the farmers of the St Helena Bay area were prepared to provide wheat to the VOC, confirming that wheat cultivation was already taking place on the Peninsula. A dispute arose between the farmers and the VOC around the arrangements for the collection of the wheat and the names of the disgruntled farmers are the same families who still own farms on the Vredenburg Peninsula to this day

(Sleigh 1993).In 1803, the Governor J.W. Janssens visited the farm Patrijsenberg of the veldkornet J. Laubscher (Pieter's son). There was a government building on the farm which was occupied by the "flagman" of the post. *The farm Patrysenberg features prominently in all these early records of European settlement on the Vredenburg Peninsula. Subsequently, the farm was subdivided into a number of smaller farms, one of them becoming Frans Vlei 46*.

The Surveyor General diagrams show that the farms Boebezaks Kraal, Frans Vlei and Zoutzaksfontyn were surveyed in the 1830s. The aim of the survey was to demarcate the actual boundaries of the farms for their registration as a perpetual quitrent holding. Prior to the introduction of perpetual quitrent, the farms were leased from the Dutch East India Company. The SG diagram 1318/1881 shows that the farm Lange Klip 47, like the farm Frans Vlei 46, formed part of the original Patrysenberg quitrent and was granted to the widow Hendrik Oostwald Eksteen on 12 October 1750. Her husband assisted the VOC with the identification of the location of the Soldaten Post at the foot of the Patrysenberg in 1734.

The SG diagram 1016/1857 shows the original Patrysenberg farmhouse was located well outside the borders of the portion of the farm which became Frans Vlei 46. Fransen (2004) describes the house on Patrysberg as "an elongated house now under iron, with an outside chimney and bakoond". Fransen makes no mention of the significance of any of the houses in the WEF area.

Frans Vlei itself comprises portions of the quitrent Patrysenberg which was granted to Jacob Lauscher in 1857 and the "Old Quitrent" originally granted to the widow Jacob Laubscher in 1813. Zoutzaksfontyn was originally a "lening plaats" and was also owned by J. Laubscher (S.G. 154/1831).

All three farms were clearly being farmed by the mid-18th century with wheat cultivation introduced from at least the 1790s, perhaps earlier. The farms are associated with families who had farmed in the area for many generations.

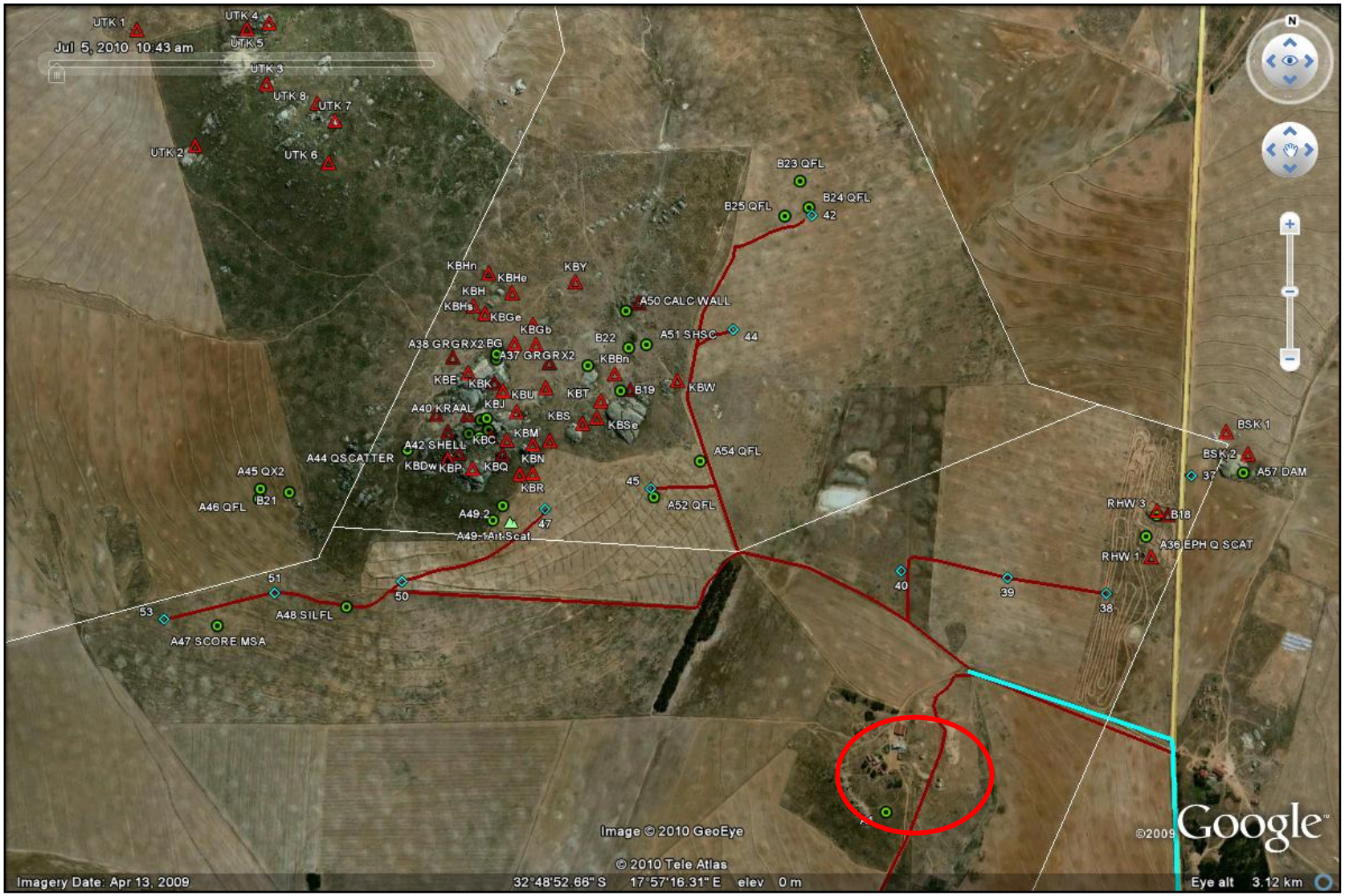

Figure 5: The Kasteelberg kopje on Boebezaks Kraal, with the archaeological sites recorded by Sadr et al. (1992) as red triangles, the turbines as blue stars and the archaeological sites recorded during the survey as green circles (Appendix 1). The Rooiheuwel farm house is shown encircled in red.

4. METHODOLOGY

The locations of the proposed turbines were loaded onto handheld GPS receivers (set to the WGS84 datum) to facilitate the identification of the search area during field work. Fieldwork was undertaken by Lita Webley and Jayson Orton during the week 20-23 July 2010. Walk paths and site locations were recorded with GPS and finds were photographed and described.

- We examined the proposed locations of all the 55 proposed turbines (Figure 2 & 5) on foot;
- We re-visited all the sites which had been identified by the Sadr et al. (1992) survey within the boundaries of the WEF, in order to determine their significance and the possible impact of the proposed turbines;
- Aerial maps of 1938 were consulted to determine whether the farm complexes were older than 60 years;
- We visited all three farm complexes within the study area (Figure 7) and recorded the farm buildings in order to assess the impact of the WEF on the built environment and possible farm graveyards;
- We visited a number of farm complexes adjoining the WEF in order to assess the impact of the turbines on the farmsteads (Figure 7);
- We held brief discussions with the owners of Rooiheuwel, Klipheuwel, Frans Vlei and Skuitjies.

4.1 Limitations

- Since the locations of the substation, access roads and alternative power line had not been finalised at the time of the survey, detailed surveys of the routes were not undertaken. This assessment infers the sensitivity of these routes based on information obtained during the survey, from aerial photography and from existing information;

- Some of the proposed turbines positions are located in agricultural lands. During the time of our fieldwork, some fields were being ploughed while others were already under wheat to the height of around 20cm. We tried to avoid walking across the wheat lands and followed existing contour lines. Other turbines will be placed on granite kopjes. The indigenous vegetation on these kopjes was in many cases very dense reaching a height of 2m and the dense ground cover after good winter rains prevented a close examination of the soil surface.

5. FINDINGS

5.1 Pre-colonial and historical archaeology

The database of pre-colonial archaeological sites for the Vredenburg peninsula is extensive and prior to our field survey we anticipated identifying numerous archaeological sites, particularly in the ploughed lands between the granite kopjes. We were particularly fortunate to have access to Sadr et al.'s (1992) database of sites. However, Sadr (pers comm.) has indicated that his threshold for a "site" was as low as one flaked stone every six square meters. We were unable to locate some of Sadr's sites, and others comprised very low density surface scatters of stone tools, sometimes associated with a few fragments of marine shell. The current survey located a number of additional "sites" in ploughed lands. These sites often comprised of a single stone artefact, on occasions associated with a few fragments of marine shell (Appendix 1). Stone artefacts comprised quartz flakes, silcrete flakes, a broken grooved stone and a broken hammerstone. No pottery fragments were recovered. Photographs of selected archaeological material and sites are included at the end of the report as Appendix 3.

Two archaeological sites have information potential:

- The site B6 comprises a fairly dense scatter of marine shell in an open field. It is not associated with any cultural material (such as stone tools or pottery). It represents a deflated shell midden which has probably been disturbed by agricultural activities over the course of the last 200 years. However, it retains enough cohesion as a site to be of scientific interest to archaeologists and should not be destroyed without sampling;
- The site B17 comprises a scatter of stone artefacts around a large boulder near Turbine 2. The construction of a power line or access roads in close proximity to the boulder can result in damage to the archaeological remains.

A number of newly discovered pre-colonial archaeological sites (Appendix 1) were identified on Kasteelberg kopje. They add to the list of 32 sites identified by Sadr et al. (1992). They are however, not directly threatened by the placement of the turbines.

Two historical archaeological middens were recorded:

- The site B4 comprises a scatter of marine shell, glass and some 20th century ceramics on the edge of the Klipheuwel farmstead. The site probably reflects an historical midden;
- The site B15 and A29-A35 comprises stone tools, glass and 20th century ceramics distributed in an open field in the location of T6.

While the sites are probably of 20th C date, observations on historical middens are rare and they offer the potential to inform on the date for the buildings and the lifestyles of the inhabitants.

Ruined structures on the lower slopes of Kasteelberg kopje:

According to the owner of Rooiheuwel the original farmhouse on Boebezaks Kraal was constructed on the lower slopes of Kasteelberg and was occupied by his grandfather during the 19th C. There are a number of ruined structures of roughly packed granite blocks, calcrete slabs and mud brick (Figure 7 & Plates 5 & 6).

One rectangular structure, possibly the ruins of a long house, is located near the archaeological site of KBB (Site B19). There is a further group of structures near the site of KBV (Site B22). They include two possible farm houses; the one appears to have had a more recent L addition. There is a kraal, some pig pens and a number of sub-surface reservoirs. The reservoir next to the farm house is rectangular and retains its corrugated iron roof. The two farm houses have mud brick walls above a foundation of granite blocks and there is still some evidence for plasterwork and paint details.

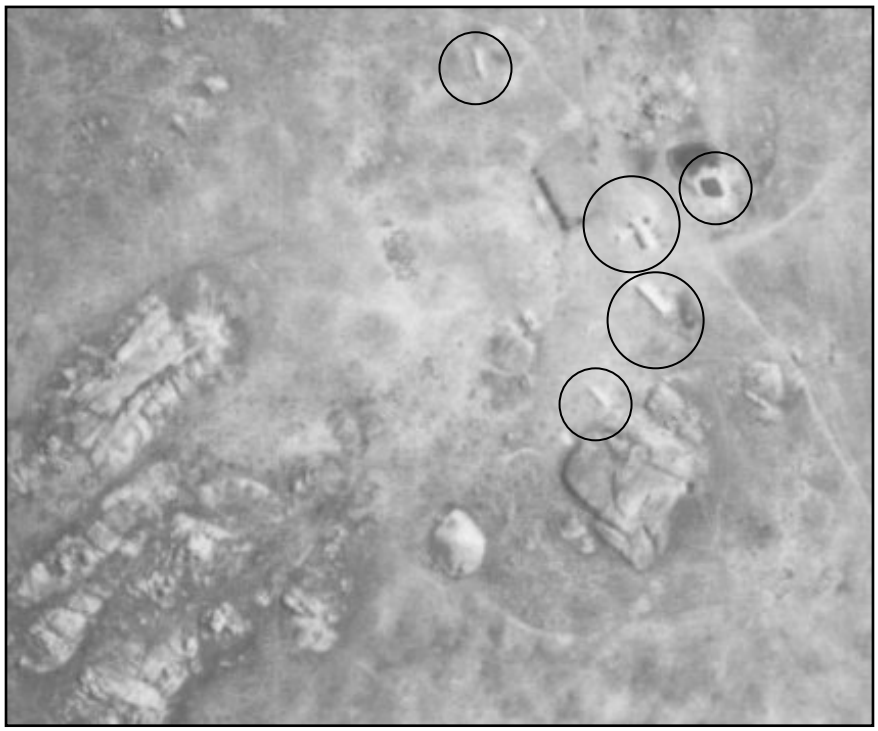

Figure 7: The Kasteelberg kopje with pre-1938 structures clearly visible on the aerial photograph.

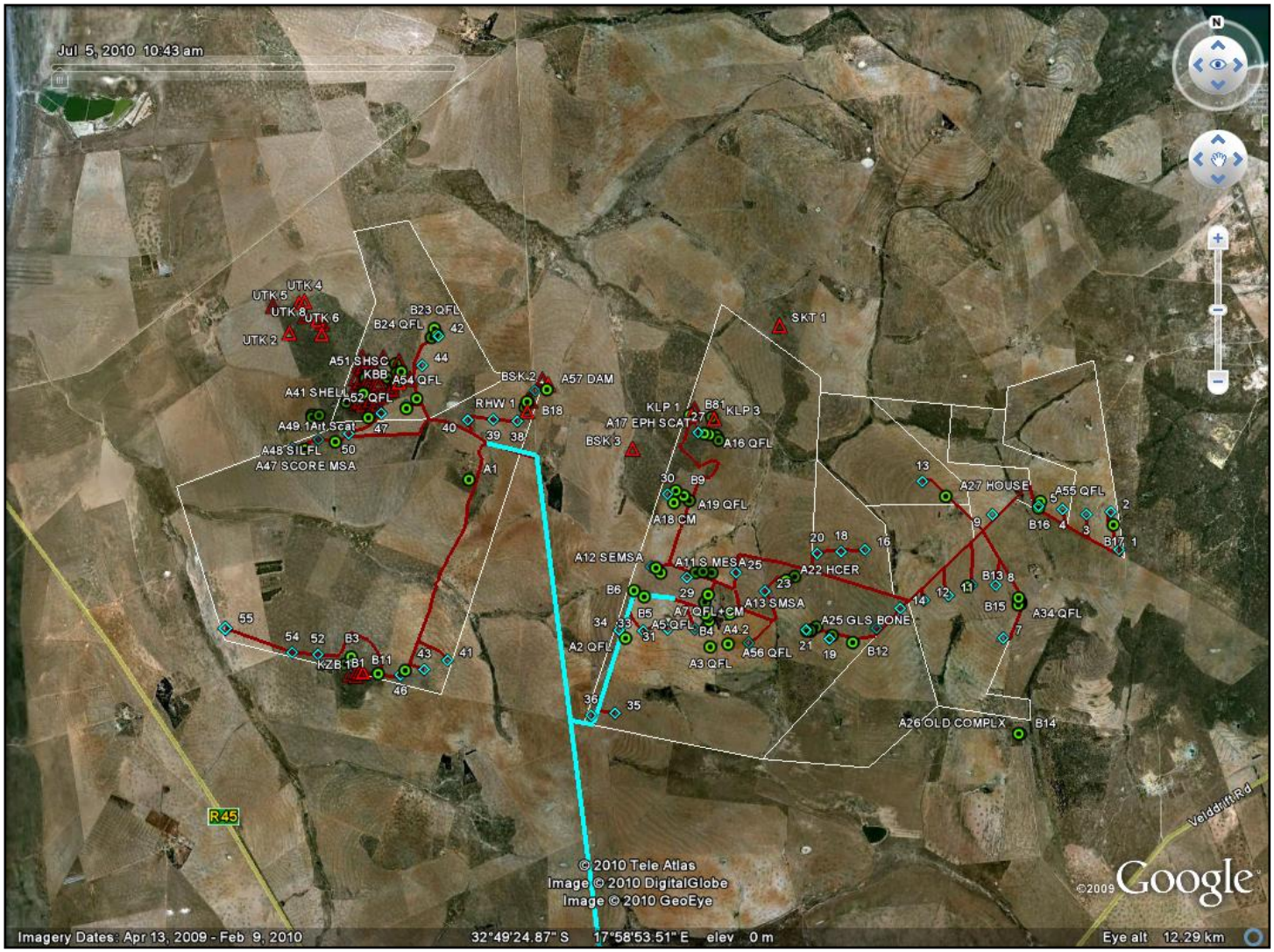

Figure 6: Map showing the position of the turbines (blue stars), the archaeological sites recorded by Sadr et al. (1992) as red triangles, the archaeological sites recorded by Orton and Webley (2010) as green circles and the internal access roads in red..


Plate 5: Ruins of the original granite, calcrete and mud brick Rooiheuwel farmhouse on Kasteelberg kopje; Plate 6: ruins of old kraal on the right.

5.2.1 Nature of impact

The placement of the following turbines, power line, substation and associated infrastructure (roads and lay down areas) may result in the destruction of some archaeological sites:

Turbine 2 is located close to a granite kopje with archaeological remains (B17 this survey) and it may be negatively impacted by the construction of an access road and the placement of the pylons for head power line;

Turbine 27 located on a granite kopje with a number of archaeological sites identified by Sadr et al. (1992) and confirmed by this survey. Granite kopjes have been shown to attract prehistoric occupation and the construction of access roads and pylon foots may result in their destruction;

Turbine 32 is located some distance from open site B6. The site is not threatened by the current proposal for access roads (Figure 4) but may be impacted by the placement of the power line pylons footings. Care should be taken during construction as the site may extend beneath the soil surface;

Turbine 37 is located between a number of archaeological sites identified by Sadr et al. (1992) and access roads as well as pylon footings may result in its destruction;

Turbine 47, on the lower slopes of Kasteelberg, is close to a spread of stone artefacts (A49.1 & A49.2) found in a gravel road below the archaeological site of KBQ suggesting that material from the site is running down slope. The placement of access roads and pylon footings may damage sub-surface remains;

Turbine 49 on Katzenberg (Boebezaks Kraal) is placed on the side of a granite kopje with a number of archaeological sites identified by Sadr et al. (1992) and confirmed by this survey. The construction of access roads and pylon footings may result in the destruction of potential sub-surface sites.

5.2.2 Extent of impact

While the archaeological sites discussed above are not of high significance, the area in and around Kasteelberg has been the focus of intense archaeological research since the mid-1980s and these sites have the potential to add further information. Sites of medium significance need to be sampled prior to destruction. Further, there is a chance that the deep excavations for the turbine bases, power line pylons as well as the foundations for the substation could potentially impact significant buried archaeological material. Similarly the construction of access roads could impact material that lies buried in the surface sand.

Table 2

Nature: Disturbance of pre-colonial and historical archaeological material by turbine footings, sub-station, access roads and pylon footings for power line		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (5)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	Low < 30	Low < 18
Status (positive or negative)	Negative	Neutral
Reversibility	No	No
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: Re-location of Turbines 27 and 49 which are placed on granite kopjes (associated with archaeological sites) is recommended. If the Turbines are not relocated, then archaeological mitigation (excavations) will be required with a permit issued by Heritage Western Cape. An archaeologist will need to be present to ensure that access roads and turbine as well as pylon footings do not damage sub-surface remains. With regard Turbines 2, 32, 37 and 47 – these sites will need to be fenced off to ensure that they are not impacted by roads or pylon footings. If this is not possible, then sampling (excavation) with a permit issues by Heritage Western Cape, is recommended. A walk down by a heritage specialist for the proposed power line is recommended to ensure that pylon footings are not placed on archaeological sites.		
Cumulative impacts: The cumulative impact is not likely to differ from the above.		
Residual impacts: The residual impacts are likely to be low.		

5.2 Colonial Period Heritage

Two out of the three farmstead complexes (Appendix 2) within the borders of the WEF contain buildings which pre-date 1938 and which are therefore protected by the NHRA, 1999.

The Bauman & Winter (2005) report recommends assessing the following when recording historic farm werfs: the setting of the werf and its context; composition of the structures; historical/architectural value of individual structures; tree alignments; views to and fro; axial relationships; system of enclosures, e.g. werf walls; system of water irrigation, e.g. furrows; sites associated with slavery and farm labour and colonial period archaeology.

Rooiheuwel Farmstead

Turbines are proposed both to the north (400m) and south (2.2km) of the main farm building complex Rooiheuwel on Boebezaks Kraal (Plates 7-12). In addition, power line connecting the turbines, will be located 400m to the north of the farmstead and 250m to the east. Many of the current buildings are present on the 1938 aerial map.

The main farm complex (Figure 8) consists of the current main farmhouse, which according to the owner dates to around 1910. Two gables have been added to the front façade, probably during the 1930s (Plate 7). The stairway to the solder against the south end gable of the house has been removed and all the windows are post-1960s (Plate 8). According to Mr Kotze, the adjoining converted barn represents an earlier dwelling dating to the mid 19th C. However, it has been substantially transformed with numerous modern additions and only a small portion of the front stoep, original door and sash window remains (Plate 9 & 10). There are a number of outbuildings, including an older barn and a newer barn and a square reservoir with a corrugated iron roof.

Plate 7: View of the early 20th century farmhouse from front; Plate 8: View from the side showing solder door, modern windows and outside chimney and bakoond.

Plates 9 & 10: Late 19th century building on Rooiheuwel currently used as a garage and store.

Plate 11: Barn on left; Plate 12: Ruined mud brick long house to the south of the farmstead.

The late 19th C store and 20th C farmhouse both retain architectural features which suggest that they are of local (Grade 3C) significance.

There are the ruins of a mud brick house to the south of the main farm complex (Appendix 1: Site A1). It is a longhouse in design, with the remains of a hearth on one end, and two mud brick buttresses on either side, suggesting that the walls may have been collapsing outward (Plate 12). The original floor may have been wood, subsequently replaced with concrete. The interior walls are painted in bright greens and blues.

Klipheuwel Farmstead

The closest turbines are 300m to the northeast of the homestead, 250m to the northwest and 270m to the southwest (Plates 13-18). The farmstead will be completely surrounded by power lines; 300m to the

north, 300m to the east, 200m to the south (but shielded by an avenue of trees) and 700m to the west.

The location of the farmstead (Figure 8) was clearly dictated by the large granite outcrop and small pool of water, which may originally have supplied the water for the house. The farmhouse, sheds and labourers cottages are all present on the 1938 aerial map.

The main house may have an older core as suggested by the solder door in the east end gable but it has been substantially altered with a new addition to the front, creating an L-shape. It has recently constructed concrete pillars supporting the front stoep and modern iron windows (Plate 13). There are two barns on the werf. One barn has arched windows and appears to be of 20th C date (Plate 16).

Plate 13: Front view of the Klipheuwel farmhouse showing the addition to the front, the modern windows and pillars.

Plate 14: Collapsing 19th C barn made of mud-brick.

Plate 15: Inside of barn showing wooden ceiling, mud brick walls and wooden pegs.

Plate 16: 20th century barn with arched windows

Plate 17: Labourer's cottage 1

Plate 18: Labourer's cottage 2

There is an older barn with a wooden lintel above the entrance door (on the eastern end of the building) as well as a solder door (Plate 14 & 15). The foundations are of granite boulders and calcrete blocks, surmounted with mud brick walls and a pitched roof under iron, with wooden beams and ceilings. The inside walls are plastered with mud and there are wooden pegs inserted into the plaster, to suspend items. This barn clearly dates to the 19th C, possibly even earlier.

It is proposed that the 19th C barn above retains architectural features which suggest that that it should be graded as of local (Grade 3C) significance.

There are two labourer cottages (Plate 17 & 18); Cottage 1 may date to the same period as the oldest barn while Cottage 2 has a flat roof and bakoond at the end.

The homestead is shielded from Vredenburg by an avenue of Eucalyptus trees. The 1938 aerial map suggests that this avenue may have originally comprised a grove of trees to the south-west of the property.

Frans Vlei Farmstead

The closest turbines to the farmstead are located 360m to the northwest and 500m to the east (Figure 8; Plates 19-21). **The building does not warrant a Grade 3C grading.**

The 1938 aerial map shows a number of structures in the farm werf. It does not appear that any of them still exist. It is possible that the modern farmhouse has an older core, but this is not evident from the outside. The large, modern barns all date to the end of the 20th century. There is one labourer cottage which may pre-date 1960 but portions of it appear to consist of breeze blocks post-dating 1940s.

Plate 19: The location of Frans Vlei homestead with views to the Kasteelberg kopje and sea.

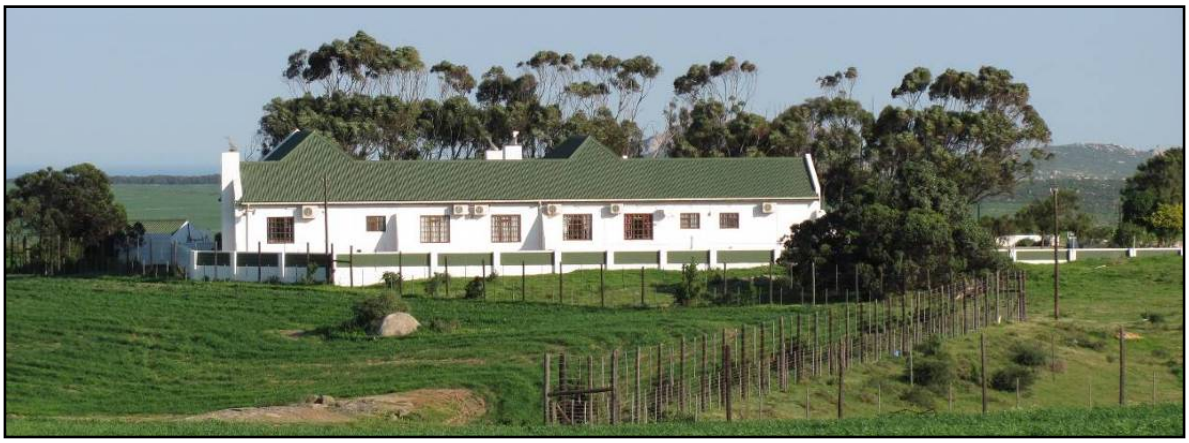

Plate 20: The Main house was recently constructed or may have an earlier core which has been completely erased.

Plate 21: The farm labourer's cottage on the farm.

Farmsteads adjoining the WEF (Figure 8):

- **Koppiesveld Slagtery (Droedasvlei):** We were unable to gain access to this property but we could view if from across the valley from the position of Turbines 1-5. It appears to consist mostly modern structures;

- **Skuitjies** (Plate 22 above)**:** The current farm house is post 1960, but there is an older mud brick barn in the centre of the yard which dates to the 19th C. The building may be considered to be of Grade 3C significance.

- **Tuindrif** (Plate 23 above)**:** Comprises an abandoned mud brick, 19th C house with a pitched roof under iron. This house may be considered to be a Grade 3B significance.

- **Boesakskraal** (Plate 24 above)**:** Comprises a post-1960 house and modern barn. However, the 1938 aerial map shows buildings on this werf which have presumably been incorporated into the modern structure. No grading is warranted for this building.

No graveyards were recorded.

5.3.1 Nature of Impact

Rooiheuwel and Klipheuwel contain calcrete as well as mud brick buildings pre-dating 1938 and they are protected by the NHRA, 1999. None of these structures will be physically impacted by the construction of the turbines or substation. However, they will have direct line of sight to the turbines as well as the power line and power line footings in their immediate vicinity. In some cases the closest turbines and power line will be less than 500m from the farmstead. Similarly, some farmsteads situated outside the borders of the WEF will also have a direct view of turbines located in close proximity to their boundary fences (i.e. Boesakskraal and Koppiesveld).

5.3.2 Extent of the Impact

The construction of turbines and power line in or in close proximity to historic farm buildings will result in a visual intrusion on the historical farm werfs of Rooiheuwel and Klipheuwel.

Table 3

Nature: The potential impact of the construction of the turbines, substation, access roads and power line on historic buildings, ruins and other structures		
	Without Mitigation	**With Mitigation**
Extent	Local (1)	Local (1)
Duration	Long-term (4)	Long-term (4)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Improbable (2)
Significance	Medium ()33	Low < 18
Status (positive or negative)	Negative	Neutral
Reversibility	Yes	Yes
Irreplaceable loss of resources?	Yes, in a few cases	No
Can impacts be mitigated?	Yes	
Mitigation: Mitigation should take the form of a 500m or more buffer zone between identified farmstead buildings and the closest turbines.		
Cumulative impacts: The cumulative impact is not likely to differ from the above.		
Residual impacts: The impact will disappear when the turbines are decommissioned.		

5.3 Cultural landscape, including scenic routes and sense of place

Kasteelberg has no proclaimed existing formal heritage status. In 1998 the National Monuments Council completed the paperwork for the nomination of Kasteelberg as a National Heritage site. The nomination form was submitted to the then Minister of Arts, Culture, Science and Technology. The final declaration was never completed. Heritage Western Cape has currently re-opened the process for declaration of the Kasteelberg complex as a provincial heritage site.

The granite kopje represented by Kasteelberg is significant for the following reasons:

- It has *historical significance* with over 30 archaeological sites on the kopje providing a cultural sequence from Middle Stone Age times up to the 19th century;
- It has *scientific potential* to provide information on the interaction between the San hunter-gatherers and the Khoekhoen pastoralist and how they shared the landscape;
- It has great *scientific value* as it has contributed to our understanding of the development of pastoralism not only in the Western Cape but also in southern Africa as a whole. This has been precipitated by the “Great Debate” in pastoralist studies regarding the nature of Khoekhoen and San identity;

- The kopje clearly had a strong and special association for the ancestors of the Khoekhoen. It was a focus for aggregation, perhaps for *social, cultural, religious, spiritual or symbolic* reasons. For example the sheep skeleton covered in red ochre and the numerous grinding grooves used for the manufacture of red ochre suggests the site had high ritual and social significant during the period 2000 BP to the advent of colonialism;
- The kopje is of *architectural* interest as there is evidence for early colonial settlement, in the form of roughly constructed calcrete buildings at the base of the kopje which offer the potential to examine the nature of early European settlement;
- Kopjes like Kasteelberg, which are still in their pristine state, are rare on the Vredenburg Peninsula and their conservation is important in terms of future research opportunities;
- The Kasteelberg kopje is a relatively intact and unaltered granite kopje in an area which has been transformed by wheat cultivation since the 1790s;
- It has high *aesthetic value/landmark* status on the Vredenburg peninsula as it is a prominent landscape feature with panoramic views of the surrounding landscape. This is what probably initially attracted settlement, i.e. shelter from winds and views to the sea. inland as far as Vredenburg.

Vulnerability: The Kasteelberg kopje is one of the last unspoilt kopjes on the Vredenburg Peninsula. It is highly vulnerable to any development that would alter the context of the archaeological and historical sites and their setting in the landscape.

Rarity: Archaeological research at other sites on the Vredenburg Peninsula, shows that Kasteelberg is unique on the Vredenburg Peninsula, on the West Coast of South Africa, and possibly also nationally as the best preserved site to demonstrate the emergence of the pastoralist way of life.

<u>Scenic route (R45 and Stompneusbaai Road)</u>
The R45 to Paternoster and the gravel road from Vredenburg travels through a rural, agricultural landscape comprising rolling wheat fields, granite kopjes such as Kasteelberg which dominate the horizon, and rural farmsteads. Motorists have an undisturbed view of the highly significant pre-colonial site of Kasteelberg from the R45.

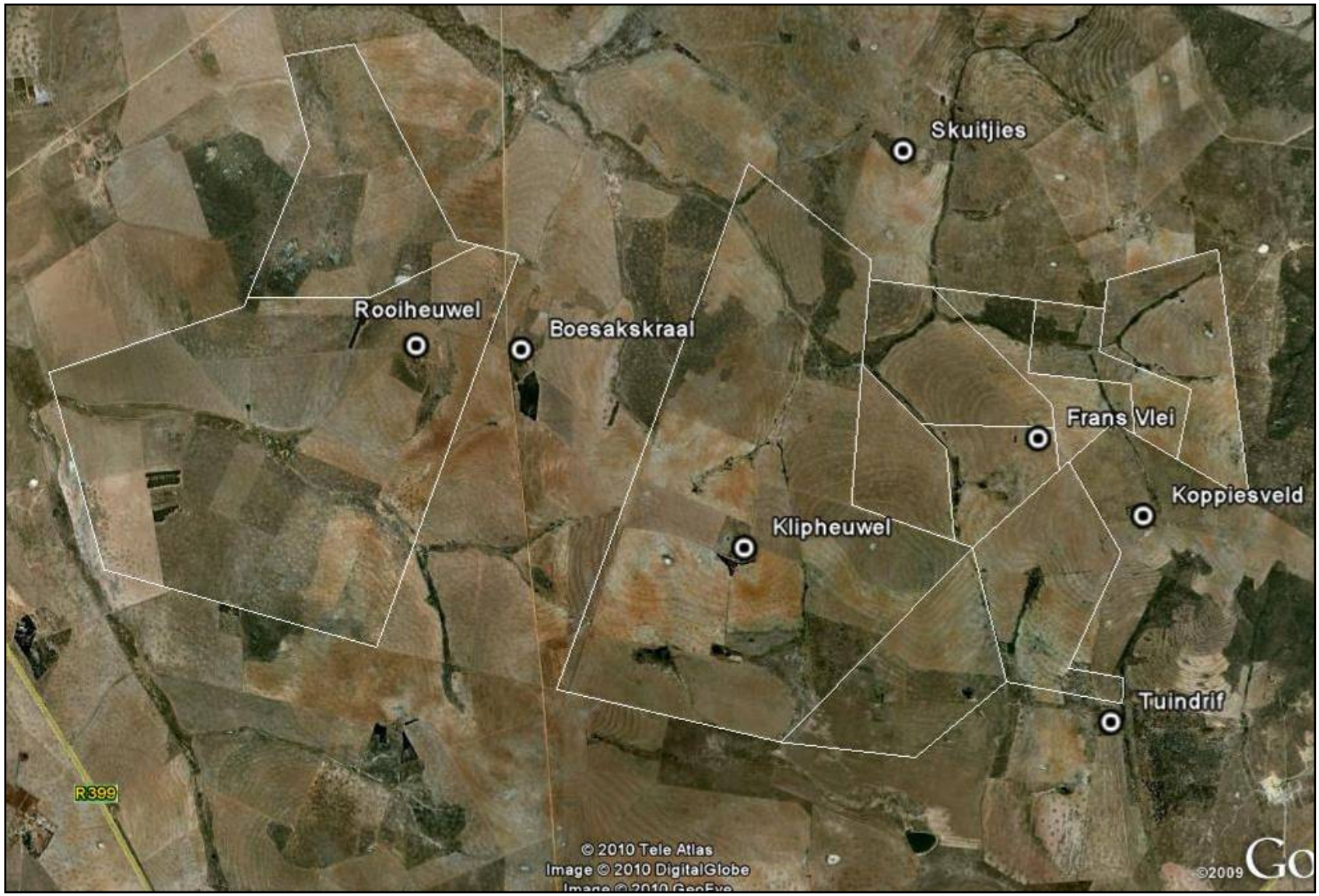

Figure 8: The location of the farmsteads discussed in the text.

Rural, agricultural landscape (landscape status)
Inland of the coastal zone, the Vredenburg peninsula comprises predominantly farm lands which are used for small stock grazing and wheat production. The rolling farmlands are interspersed with small granite kopjes which dominate the skyline. These farms provide the rural character of the Vredenburg peninsula which is being rapidly eroded by recent coastal development. Nestling in the rolling hills are farmsteads associated with historic groves of trees which from a distance add further to the rural character of the landscape.

Plate 24: Avenue of trees running along the southern edge of the Klipheuwel farmstead.

5.4.1 Nature of impacts

The vegetation on the Vredenburg peninsula comprises cereal crops and shrubs which are generally less than 1m in height. Wind turbines are up to 80m in height. This means that the wind turbines will be visible for a considerable distance on the Vredenburg peninsula. The proposed activity is essentially a visual intrusion that is very difficult to mitigate.

The construction of 55 wind turbines with an approximate height of 80 m, as well as a network of power line, is likely to have a significant visual impact on the rural landscape and will be visible from the town of Vredenburg. The wind turbines (notably turbines 53, 51, 50, 47, 45, 44 and 42 but also Turbines 40, 39, 38, and 37)) as well as power line will also affect the sense of place, particularly of the Kasteelberg kopje with its 32 recorded archaeological sites. At present the surrounds of the kopje closely resemble the landscape used by the Khoekhoen pastoralists thousands of years ago. The aesthetic qualities of this rich archaeological landscape will be transformed by the construction of the wind turbines and power line.

The Landscape will take on a more industrial character. While people will perceive the turbines as a novelty at first, this effect will wear off in time, especially if wind energy facilities proliferate. *The nature of the impact will need to be informed by a visual impact assessment and re-interpreted in terms of impacts to heritage.*

5.4.2 Extent of impacts

The extent of the visual impact of the turbines and power line on the town of Vredenburg will need to be assessed by the Visual Impact Specialist. This report considers the visual impact of the turbines and power line on the Cultural Landscape (including scenic routes and sense of place) as required in terms of the NHRA, No 25 of 1999.

The construction of the turbines on the lower slopes of the Kasteelberg kopje is likely to impact on the sense of place of a significant archaeological site of regional significance. The appearance and prominence of Kasteelberg Kopje will be diminished by turbines and power line clustered around it, and thus negatively affect the heritage significance of the feature and sterilise its future potential for commemoration as a heritage site.

Table 4

Nature: The potential impact of the construction of the turbines, substation, access roads and power line on the Cultural Landscape, including scenic routes		
	Without Mitigation	**With Mitigation**
Extent	Regional (4)	Local (2)
Duration	Long-term (4)	Long-term (4)
Magnitude	High (8)	Low (4)
Probability	Highly Probable (5)	Improbable (2)
Significance	High (80)	Low 20
Status (positive or negative)	Negative	Neutral
Reversibility	Yes	yes
Irreplaceable loss of resources?	Yes around Kasteelberg kopje	No
Can impacts be mitigated?	Yes	
Mitigation: It is recommended that Turbines 53, 51, 50, 47, 45, 47 and 42 should not be constructed around the base of the Kasteelberg kopje. No turbines or power line should be allowed on the lower slopes of the hill. The impact of Turbines 40, 39, 38 and 37 are also likely to be significant, especially from the gravel road to Stompneusbaai. It is recommended that a buffer of at least 2km be implemented to protect the sense of place. Turbines should be placed at least 500m from the local road to Stompneus Bay, and 1km from the R45 scenic route to Paternoster.		
Cumulative impacts: The cumulative impact is not likely to differ from the above.		
Residual impacts: The impact will disappear when the turbines are decommissioned.		

6. RECOMMENDATIONS FOR MITIGATION AND CONSERVATION

6.1 Archaeological heritage

It is concluded that the positions of Turbine 2, 27, 32, 37, 47 and 49 may have a negative impact on archaeological remains. These remains are considered of medium significance. If they are destroyed, they will result in a loss of archaeological knowledge.

It is recommended:

- that the granite kopje near Turbine 2 is fenced off by an archaeologist during construction to avoid accidental damage to site B17;
- that the position of Turbine 27 on a granite kopje with archaeological sites recorded by Sadr et al. (1992) and by Webley & Orton (this report) should be re-located. The construction of access roads as well as power line pylons on the kopje may result in the destruction archaeological sites (both above and below ground). If the turbine cannot be relocated, then archaeological testing of the areas (with a permit issued by Heritage Western Cape) will be required;
- that the access road and power line pylons to Turbine 32 should avoid crossing site B6. This will require an archaeologist fencing the site off prior to construction. If the site cannot be avoided then an archaeologist should obtain a shell sample from the site for radiocarbon dating. This will require a permit from Heritage Western Cape;
- that since Turbine 37 is situated between two granite boulders with archaeological sites recorded by Sadr et al. (1992) and Webley & Orton (this survey), both the access road and power line pylons may result in their destruction. If the turbine cannot be re-located, then an archaeologist should be present when the position of the turbine and power line pylons are finalised to ensure no archaeological remains are destroyed. Alternatively, archaeological mitigation (with a permit issued by Heritage Western Cape) will be required;
- that the archaeological remains around the position of Turbine 47 suggest that material from site KBQ (on the slopes of Kasteelberg) are eroding down the talus slope. It is recommended that this turbine should be removed entirely (see further recommendations under Cultural Landscape);
- that the postion of Turbine 49 on the granite kopje of Katzenberg, should be relocated to the lower slopes of the hill. The construction of a turbine, access roads and power line pylons may result in the destruction of archaeological sites on this hill recorded previously by Sadr et al. (1992) and Webley & Orton (this survey). If the

turbine cannot be relocated, then archaeological testing of the areas (with a permit issued by Heritage Western Cape) will be required;
- No access roads or power line pylons should be allowed on granite kopjes without a prior foot survey by an archaeologist;
- An archaeologist should be involved in the walk down phase of the final turbine positions, power line, substation and roads to ensure that the structures are not placed on sensitive archaeological material;
- An archaeologist should be contracted to consult where needed and remain on standby during the final design and construction phases.

6.2 Un-identified archaeological material, fossils and fossil bone

There is always a possibility that archaeological material may be exposed during excavations for turbine foundations, substations, access roads and power line pylons. All archaeological material over 100 years of age is protected by Section 38.5 of the NHRA, 1999 and it is an offence to destroy material. If archaeological material, including graves, is uncovered, all work must cease and the HWC archaeology unit must be consulted immediately so that mitigation action can be determined and be implemented if necessary. Mitigation is at the cost of the developer, while time delays and diversion of machinery/plant may be necessary until mitigation in the form of conservation or archaeological/palaeontological sampling is completed.

It is recommended that an archaeological survey is conducted during the walk down phase for the construction of the 132kV power line to ensure that no material is negatively impacted.

6.3 Built Environment

The built environment, comprising three farmsteads within the study area, and a number farmsteads on adjoining farms, will not be physically impacted by the construction of the turbines, substation, access roads or associated power line. They will, however, be indirectly impacted because of the visual intrusion of the proposed turbines on their immediate landscape.

The farm house at Rooiheuwel has views towards both Kasteelberg and Katzenberg kopjes and the turbines will be highly visible. The closest turbine will be 400m from the farmstead. Further, 132 kV power line will be be highly visible from the farmstead, being placed 400m to the north and 250m to the east.

The farm house at Klipheuwel is sheltered from turbine placements to the south of the farm house by a long avenue of trees and these will provide

some visual cover. The closest turbine will be 300m to the north of the historic farmstead. However, 132kV power line will be located 300m to the north, 300m to the east, 200m to the south and 700m to the west of the farmstead. The farm buildings will essentially be completely encircled by power line.

The farm house at Frans Vlei is built on a small rise of the land and has uninterrupted views in all directions. Turbines will be highly visible from the main house. The closest turbine will be 400m from the farmstead.

The CNdV and PGWC report recommends that the buffer between the turbines and heritage/cultural sites should be 500m. It is recommended that turbines are placed as far away as possible (ideally more than 500 m) from the farmsteads of Rooiheuwel and Klipheuwel.

6.4 Cultural landscape, scenic routes and sense of place

The CNdV and PGWC report regarding the development of Wind Energy Facilities in the Western Cape recommended that the visual impact assessment component of the EIA should consider:

- both the natural and the cultural landscape, and their inter-relatedness;
- all scenic resources, protected areas and sites of special significance, together with their relative importance in the region;
- and that the consideration of the landscape should include “settlement patterns” which gives the landscape its character or scenic attributes.

Unfortunately, no heritage practitioners were consulted during the establishment of these guidelines, with the result that the heritage component is not included in the recommendations.

There is no doubt that the turbines will be highly visible from the R45 to Paternoster and from the gravel road between Vredenburg and Stompneus Bay, as well as from the town of Vredenburg itself. The R45 can be considered a scenic route and the construction of turbines and power line along the route will essentially be a visual intrusion on a pre-colonial cultural landscape. The local gravel road to Stompneus Bay winds through the agricultural landscape interspersed with granite kopjes and rural homesteads. The rolling topography has low visual absorption capacity as there is little screening by the topography or the vegetation (wheat fields).

The archaeological site of Kasteelberg can be considered to have a very high visual sensitivity in view of its prominence – and its significance as an archaeological landscape. The 80m high turbines as well as connecting

power line will have a significant visual intrusion on its “sense of place”. For this reason it is recommended that no turbines should be placed around the foot of the hill (this would include Turbines 53, 51, 50, 47, 45, 44, 42, 40, 39, 38 & 37). The landscape has a low visual absorption capacity – there is little screening by topography or vegetation.

7. CONCLUSIONS

A few turbines will impact directly on archaeological material and recommendations are made about avoiding the placement of turbines and access roads over certain kopjes.

An archaeologist should be consulted during the final design stages to assist with appropriate placement of turbines. The services of the consultant should be continued during the construction phase so that road and power line alignments can be checked, and any heritage issues that arise can be dealt with at the time.

While the final layout of the 132kV power line was not available at the time of the survey, an assessment has been made based on aerial maps and knowledge of the area. Overhead power line Alternative 1 to the Blouwater Substation crosses agricultural lands, avoiding farmsteads (with the exception of Juffrouhoogte), and does not cross any significant river systems or kopjes. It crosses the R399 to Veldrif at right angles and follows the R45 for 3km. Alternative 2 follows an easterly direction, passing within 100m of the Klipheuwel and 100m of the Frans Vlei farmstead. The biggest concern with this alternative is the route which is follows over the top of the Patrysenberg. However, it appears to follow an existing power line over the hill, before descending at Nooitgedacht to cross the Veldrif Road. It then travels in a south-easterly direction to Aurora substation. It is recommended that Alternative 1 should be used. Further, that a walk down of the power line will ensure that no significant heritage resources are impacted by pylon footings.

A few farm buildings, namely Rooiheuwel, Klipheuwel and Frans Vlei fall within the proposed facility. Some of these complexes have buildings of low to medium significance (Grade 3C). It is recommended that the turbines are placed at least 500m from the farmsteads.

In terms of the cultural landscape, significant negative visual impacts are expected on the rural agricultural landscape which comprises rolling wheat fields, interspersed with granite kopjes and farmsteads. Turbines and the power line should be placed where they are screened, where this is possible, from important viewsheds by the local topography.

Heritage Western Cape is in the process of proclaiming Kasteelberg as a Provincial Heritage Site because of its archaeological significance. For this reason, it is recommended that no turbines or substations are placed along the lower slopes of the kopje where they would be visible from the R45 or the gravel road to Stompneusbaai. This effectively means a buffer of at least 2km.

8. REFERENCES

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SG diagram 1318/1881
SG diagram 1016/1857
SG diagram 154/1831

APPENDIX 1: List of Heritage sites identified by Orton (Prefix A) and Webley (prefix B)

Site Name	GPS Co-ordinates	Proximity to Turbines	Description	Significance
A1	S32 49 23.7 E17 57 40.8	-	Ruined house on Rooiheuwel	Medium
A2 [QFL]	S32 50 23.2 E17 58 46.1	Between T33 and T34	Quartz flake	Low
A3 [QFL]	S32 50 27.5 E17 59 22.6	-	Quartz flake	Low
A4.1	S32 50 20.4 E17 59 21.3	Between T28 and house	Ephemeral scatter of *Choromytilus* sp and *C. granatina* sp shell and one silcrete radial core at Klipheuwel;	Low
A4.2	S32 50 17.9 E17 59 22.5	Between T28 and house	A scatter of marine shell up slope to the avenue of blue gums on Klipheuwel, very diffuse marine shell, 1 *Choromytilus* sp. and 1 *C. granatina* – possibly washing down slope (from an historical dump).	Low
A5 [QFL]	S32 50 16.2 E17 59 22.0	Between T28 and Klipheuwel house	Quartz flake	Low
A6 [HCER]	S32 50 11.1 E17 59 20.9	On Klipheuwel werf	Historic ceramic fragment	Low
A7 [QFL+CM]	S32 50 08.5 E17 59 22.5	On Klipheuwel werf	Quartz flake & *Choromytilus* sp. fragment	Low
A8 [QFL]	S32 50 00.5 E17 59 24.5	Near T26	Quartz flake	Low
A9 [QIRREG]	S32 50 00.0 E17 59 20.6	-	Quartz irregular core	Low
A10 [CM]	S32 50 00.3 E17 59 17.5	-	*Choromytilus* sp. fragment	Low
A11 [S MESA]	S32 50 00.0 E17 59 02.3	-	Silcrete ESA/MSA artefact	Low
A12 [SEMSA]	S32 49 58.1 E17 59 00.3	-	Silcrete ESA/MSA artefact	Low
A13 [SMSA]	S32 50 15.7 E17 59 31.7	-	Silcrete ESA/MSA artefact	Low
A14 [QFL]	S32 49 12.4	On kopje near	Quartz flake	Medium

Site Name	GPS Co-ordinates	Proximity to Turbines	Description	Significance
	E17 59 29.3	T27		
A15 [CAIRN]	S32 49 10.8 E17 59 28.4	On kopje near T27	Possible granite stone feature?	Medium
A16 [QFL]	S32 49 10.2 E17 59 25.3	On kopje near T27	Quartz flake	Low
A17 [EPH SCAT]	S32 49 09.8 E17 59 23.2	On kopje near T27	Ephemeral scatter (1 shell, 6 quartz) on east side of boulder	Medium
A18 [CM]	S32 49 34.6 E17 59 09.0	-	*Choromytilus* sp. fragment	Low
A19 [QFL]	S32 49 32.2 E17 59 13.4	-	Quartz flake	Low
A20 [QFL]	S32 49 34.0 E17 59 15.7	-	Quartz flake	Low
A21 [CM]	S32 50 02.9 E18 00 00.2	-	*Choromytilus* sp. fragment	Low
A22 [HCER]	S32 50 04.2 E17 59 56.3	Near T22	Historic ceramic fragment	Low
A23 [CM]	S32 50 22.6 E18 00 06.1	-	Ephemeral shell scatter, *Choromytilus* sp. frag, *S. granularis* frag	Low
A24 [GLARIS]	S32 50 22.9 E18 00 06.4	Near T21	Ephemeral shell scatter, *Choromytilus* sp. fragment, *S. granularis* fragment	Low
A25 [GLS BONE]	S32 50 22.8 E18 00 04.6	-	*S. granularis* (whole) and bone fragment	Low
A26 [OLD COMPLX]	S32 51 02.8 E18 01 34.8	-	Old farm complex, unmodified, 19th century - Tuindrif	High (Grade 3C)
A27 [HOUSE]	S32 49 35.6 E18 01 06.7	-	Small early 20th C farm workers cottage on Frans Vlei	Low
A28 [QFL]	S32 50 24.8 E18 00 15.6	-	Quartz flake	Low
A29 [HCER]	S32 50 15.5	On T 6	Historic ceramic fragment	Low

Site Name	GPS Co-ordinates	Proximity to Turbines	Description	Significance
	E18 01 37.6			
A30 [QFL]	S32 50 15.1 E18 01 37.5	On T6	Quartz flake	Low
A31 [QFL]	S32 50 14.6 E18 01 37.2	On T6	Quartz flake	Low
A32 [HCER]	S32 50 14.9 E18 01 36.8	On T6	Historic ceramic fragment	Low
A33 [QIRREG]	S32 50 15.0 E18 01 36.7	On T6	Quartz irregular core	low
A34 [QFL]	S32 50 15.9 E18 01 36.5	On T6	Quartz flake	Low
A35 [HCER]	S32 50 15.4 E18 01 37.1	On T6	Historic ceramic fragment	Low
A36 [EPH Q SCAT]	S32 48 58.0 E17 58 06.1		Ephemeral quartz artefact scatter	Low
A37 [GRGRX2]	S32 48 45.7 E17 57 07.1		2 x bedrock grooves on Kasteelberg	High
A38 [GRGRX2]	S32 48 45.1 E17 56 57.6		2 x bedrock grooves on Kasteelberg	High
A39 [GRX2]	S32 48 45.6 E17 56 57.6		2 x bedrock grooves on Kasteelberg	High
A40 [KRAAL]	S32 48 50.9 E17 56 56.9		? Kraal and shell midden on Kasteelberg	High
A41 [SHELL]	S32 48 51.0 E17 56 56.3		Shell midden scatter on Kasteelberg.	High
A42 [SHELL]	S32 48 52.5 E17 56 56.3		Shell midden scatter on Kasteelberg.	High
A43 [SHELL]	S32 48 52.3 E17 56 55.2		Shell midden scatter on Kasteelberg.	High
A44 [QSCATTER]	S32 48 54.1 E17 56 48.9		Quartz artefact scatter	Low

Site Name	GPS Co-ordinates	Proximity to Turbines	Description	Significance
A45 [QX2]	S32 48 58.2 E17 56 33.9		Two quartz flakes	Low
A46 [QFL]	S32 48 59.1 E17 56 33.8		Quartz flake	Low
A47 [SCORE MSA]	S32 49 10.5 E17 56 30.2		MSA silcrete core (1 platform)	Low
A48 [SILFL]	S32 49 08.2 E17 56 43.5		Silcrete flake	Low
A49.1[ART SCATTER]	S32 48 59.8 E17 56 58.2	Near T47	Artefact scatter mostly quartz, some silcrete, no shell.	Medium
A49.2	S32 48 58.5 E17 56 59.1	Near T47	Artefact scatter mostly quartz, some silcrete, no shell.	Medium
A50 [CALC WALL]	S32 48 40.7 E17 57 10.7		Calcrete wall between boulders, on Kasteelberg.	Medium
A51 [SHSC]	S32 48 43.6 E17 57 13.1		Shell scatter on Kasteelberg.	Medium
A52 [QFL]	S32 48 57.0 E17 57 14.7	Near T45	Quartz flake	Low
A54 [QFL]	S32 48 53.6 E17 57 19.3		Quartz flake	Low
A55 [QFL]	S32 49 38.7 E18 01 47.6		Quartz flake	Low
A56 [QFL]	S32 50 26.6 E17 59 30.4		Quartz flake	Low
A57 [DAM]	S32 48 51.9 E17 58 15.8		Historic dam on granite outcrop on Kasteelberg.	Medium
A58 [SHELL]	S32 48 53.3 E17 56 53.5		Shell scatter on Kasteelberg.	Medium
B1	S32 50 33.1 E17 56 58.6	Close T48	Heuweltjie – not an archaeological site	n/a
B2	S32 50 29.3 E17 56 44.3	Close T49 and Sadr sites	Two quartz flakes and a silcrete flake in a slight wash	Low
B3	S32 50 26.7 E17 56 47.2	Close T49 and Sadr sites	Single marine shell fragment and one flaked quartzite cobble; nearby	Medium

Site Name	GPS Co-ordinates	Proximity to Turbines	Description	Significance
			two silcrete flakes	
B4	S32 50 15.6 E17 59 21.1	Between T28 and farm house	Historic collection of glass, ceramic and shell close to the entrance gate of Klipheuwel. Historic dump material?	Low
B5	S32 50 08.4 E17 58 54.8		Silcrete core in the road leading to Klipheuwel.	Low
B6	S32 50 06.0 E17 58 50.5	On route to T32 – avoid crossing site	Shell scatter consisting of *C. granatina*, *Choromytilus* sp, and *S. argenvillei*. Covers area around 10m², possibly relating to a single episode of settlement. No lithics	Medium
B7	S32 49 04.0 E17 59 26.6	Close T27	Single marine shell fragment and 1 quartz flake near some large boulders, Sadr site KLP3	Medium
B8 (1)	S32 49 02.9 E17 59 17.4	Close T27	Scatter of marine shell around large boulder with several “klipbakke” holding water. Sadr site KLP1	Medium
B9	S32 49 30.3 E17 59 10.0		Single C. granatina flake on the way to T. 30	Low
B10	S32 50 21.5 E18 00 08.8		?	
B11	S32 50 32.3 E17 57 10.3		No site	n/a
B12	S32 50 27.6 E18 00 24.3	T17	Two quartz cores on position of T17.	Low
B13	S32 50 08.6 E18 01 14.8		Three quartz cores in a wheat field.	Low
B14	S32 51 02.9 E18 01 35.6	Below T 7	B14 is ruined house, barn etc outside study area. Below T 7 (Tuindrif)	High
B15	S32 50 13.4 E18 01 36.7	T6	Scatter of quartz core, chunks and glass opposite the Koppiesveld slagtery at T6.	Low
B16	S32 49 40.9 E18 01 46.7		Single quartz flake in a wheat field.	Low
B17	S32 49 48.0 E18 02 18.9	Close T2	Located at some large boulders close to T2. A flaked silcrete grindstone, with evidence of use as a	Medium

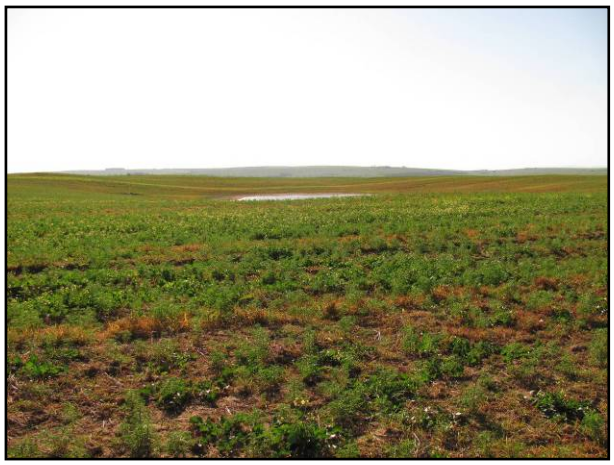
Site Name	GPS Co-ordinates	Proximity to Turbines	Description	Significance
			hammerstone. Some quartz flake and glass nearby.	
B18	S32 48 56.1 E17 58 07.1	Between T37 and T38	Half a grooved stone on a granite boulder.	Medium
B19	S32 48 47.8 E17 57 10.7		Ruins of a calcrete structure. A "langhuis"? Near KBB on Kasteelberg	Medium
B20	S32 48 51.9 E17 56 57.2		Shell midden on top of the Kasteelberg with fragments of pottery.	High
B21	S32 48 58.4 E17 56 36.9		Single quartz flake just below vegetated area.	Low
B22	S32 48 43.9 E17 57 11.2		Ruins of original farmhouse and outbuildings at the foot of Kasteelberg kopje.	Medium
B23 QFL	S32 48 28.3 E17 57 28.0	Near T42	Quartz flake	Low
B24 QFL	S32 48 30.6 E17 57 29.1	Near T42	Quartz flake	Low
B25 QFL	S32 48 31.5 E17 57 26.6	Near T42	Quartz flake	Low

APPENDIX 2: Farm House complexes

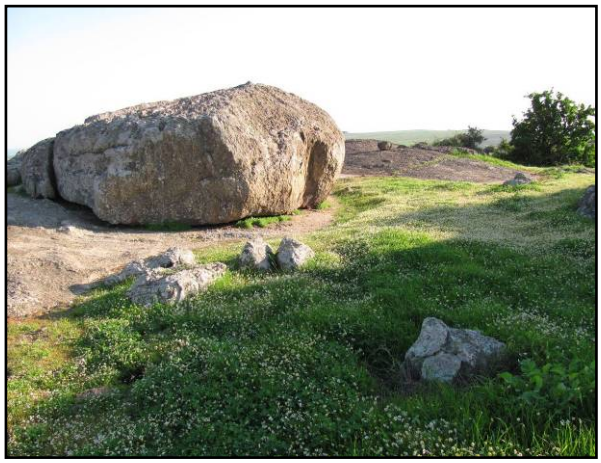
Farm	Possible heritage issues
Rooiheuwel	Calcrete and mud brick structures on lower slopes of Kasteelberg kopje; Current farmhouse (1900's) significantly transformed; Older house (mid 19th C), transformed into barn and store (Grade 3C) Pre-1950's barn Mid-19th C mud-brick ruins on south of farming complex
Klipheuwel	Main farmhouse, transformed with possible older core; Old mud brick and calcrete barn probably mid-19th C with mud plaster, wooden hooks, wooden beam ceiling, etc (Grade 3C) More recent barn with arched windows – pre-1960s 2 labourer's cottages, one of mud brick
Frans Vlei	Modern, post 1960s home; Recently constructed barns Labourer's cottage – possibly early 20th C

APPENDIX 3: ARCHAEOLOGICAL SITES


Site B2, located on Katzenberg with view to Kasteelberg (left), artefacts recovered (right).




Site B6, located in the foreground, with selection of marine shell recovered right.




Site B17 is located around the rock, with flaked grindstone/hammerstone on right.