

HERITAGE IMPACT ASSESSMENT: PROPOSED CONSTRUCTION OF THE 132Kv POWERLINE FOR THE MARALLA WIND ENERGY FACILITY NEAR SUTHERLAND NORTHERN CAPE

(Assessment conducted under Section 38 (8) of the
National Heritage Resources Act No 25 of 1999)

Case No: 16041211AS0418E

Prepared for:
Ashlea Strong
WSP/Parsons Brinckerhoff

On behalf of:
BioTherm Energy (Pty) Ltd

January 2017



ACO Associates cc
Archaeology and Heritage Specialists

Prepared by:

Lita Webley & David Halkett
ACO Associates cc
8 Jacobs Ladder
St James

Email: lita.webley@aco-associates.com
Tel: 0217064104
Fax: 0866037195

EXECUTIVE SUMMARY

Site Name:

The Powerline connecting the Maralla Wind Energy Facility to the Komsberg substation is located to the east of the R354, between Laingsburg and Sutherland in the Western Cape Province. An on-site substation will be required.

Location



Figure: The Maralla West (yellow) and Maralla East (pink) Wind Farms are in the Northern Cape Province. Two alternative powerline options are proposed to connect them with the Komsberg substation.

South African Heritage Resources Agency

The proposed powerline connecting the Maralla West and Maralla East WEF sites is in the Northern Cape Province and the heritage authority responsible for providing comments is the *South African Heritage Resources Authority (SAHRA)*.

The have made the following interim comments:

- Impacts to Palaeontological heritage resources (Dr John Almond of Natura Viva cc)
- Impacts to Archaeological heritage resources (Dr Lita Webley and Mr David Halkett of ACO Associates cc)
- Visual Impacts on the Cultural Landscape (Ms Belinda Genhardt)

Limitations

- The limitations of this study are primarily related to the rough terrain, with many of the areas identified for turbines and powerline situated on the high ridges which were completely inaccessible;

- This assessment of powerline options is a desktop study. This because assessment of alternative linear developments is expensive and time-consuming and heritage specialists recommend that a targeted assessment is undertaken at the EMPr stage of the final alternative;
- This is not considered a significant limitation of the study, as the powerline is 132kV, and impacts to heritage sites are not expected to be high;
- There were no limitations with respect the substation options.

Palaeontological Resources

To be supplied by Dr John Almond

Archaeological Resources

Even though no surveys have been conducted, it is anticipated that the archaeological resources will include:

- Scatters of LSA stone artefacts along river beds and near any small rock shelters;
- Potentially “pastoralist settlements” with LSA artefacts, ceramics and grindstones along dry river beds in the bottom of valleys. They are of medium significance;
- Potential rock art sites near rocky outcrops. Rock art sites are of high significance because of their scarcity;
- Possible early 20th century historical material relating to the South African War, such as recorded on the Esizayo WEF;
- Numerous roughly-packed, circular enclosures of dry stone walling, which may represent both pre-colonial and colonial era stone kraals, distributed along the lower slopes of small koppies, and close to streams or fountains across the study area. They are of low to medium significance.

Built Environment and Graves

Booth (2012) has identified a few farmsteads, graveyards and dry stone walling occurrences along the route of the powerlines, during her assessment of the Hidden Valley WEF.

Cultural Landscape

Visual Impacts to be supplied by Belinda Gebhardt

Anticipated Impacts on Heritage Resources - Powerlines

The impacts of a 132kV powerline on heritage resources are generally low. The size of the pylon base is very small, and generally no roads are bulldozed for maintenance of the line. The only impacts which can occur, is when the pylon is placed directly on top of an archaeological site or grave.

- The powerlines will cross several deep river valleys and these may contain archaeological sites, including graves;
- At least three homesteads occur along the route of the powerline alternatives. These have not been assessed and their significance not determined.

Anticipated Impacts on Heritage Resources – Substations

The impact of the proposed substation on the heritage resources is generally low. However, a field survey identified a cairn which may represent a burial on substation 1. No heritage resources were identified on substation 2. Substation 2 is the preferred alternative.

Cumulative Impacts

Several renewable energy facilities have received environmental authorisation in an area around the Eskom Komsberg substation. This report consulted the following HIA reports:

- The Suurplaat Wind Energy facility (Hart et al. 2010)
- The Roggeveld Wind Energy facility (Hart & Webley 2011, 2013)
- The Sutherland WEF facility (Halkett & Webley 2011 & 2016)
- The Kareebosch Wind Energy facility (Roggeveld Phase 2) (Hart & Kendrick 2015)
- The Hidden Valley Wind Energy facility (Phases 1, 2 & 3) (Booth 2012)
- The Komsberg Wind Energy Facility (Hart 2016).

This report is concerned with the electrical infrastructure which connects each of the wind farms to the Komsberg substation. It is important to point out that the base of a 132kV (particularly if it is a single steel mono pole), will be extremely small and unlikely to result in any impacts unless it is placed directly on top of a site.

However, visually, there will be numerous powerlines connecting authorised wind energy facilities, joining up with the Komsberg substation, in addition to the very large 765Kv lines which already intersect with the Komsberg substation.

No-Go Areas

None have been identified from this desktop assessment.

The following heritage recommendations are proposed

- This desktop assessment of the powerline options, recommends that the shortest route is followed to the Komsberg substation;
- Once the final powerline option has been determined, it will be necessary to undertake a targeted walk down of the preferred alternative to assess sensitive locations along the powerline route. Micro-siting of pylons may be required;
- Substation 2 is the preferred substation location;
- If any archaeological remains, including human remains, are uncovered during construction, then work must stop in that area SAHRA must be notified.

Comments from Interested and Affected Parties

STAKEHOLDER DETAILS	COMMENT	SPECIALIST RESPONSE
Heritage Western Cape has responded to the NID	Requested: An HIA comprising Impacts to Palaeontological heritage resources (Dr John Almond of Natura Viva cc); Impacts to Archaeological heritage resources (Dr Lita Webley and Mr David Halkett of ACO Associates cc); Visual Impacts on the Cultural Landscape (Ms Belinda Gebhardt) The required HIA must have an integrated set of recommendations. The comments of registered conservation bodies and the relevant Municipality must be requested and included in the HIA where provided. Proof of these requests must be supplied	This report addresses these issues
DEA&DP (Western Cape) have responded to the Scoping HIA	"The final WEF layout must be subjected to an intensive heritage and	It is not possible to do an intensive survey at the EIA phase, as the final

requesting:	archaeological survey and impact assessment, as per the specialist recommendations. All resulting micro-sitting mitigation measures identified must be reported on the in Draft EIA Report".	layout of the facility has not been finalised. The walk-down of the most sensitive area must take place during the EMPr.
Mr B Kleinbooi has commented:	"There is also a graveyard that we want protected"	The exact location of the graveyard which Mr Kleinbooi is referring to is unknown. Several graveyards were recorded during the survey. They will all be protected.

Author/s and Dates

Lita Webley
John Almond
Belinda Gebhardt

ACO Associates cc
Natura Viva cc

Archaeology
Palaeontology
Visual Impact Assessment

GLOSSARY

Archaeology: Remains resulting from human activity which is 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.

Pleistocene: A geological time period (of 3 million – 20 000 years ago).

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

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

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
WEF	Wind Energy Facility

CONTENTS

1 INTRODUCTION	9
1.1 Scope of Work.....	9
1.2 Objectives of the Report.....	9
1.3 Legislative Framework	10
1.3.1 Structures (Section 34(1))	10
1.3.2 Archaeology & Palaeontology (Section 35(4))	10
1.3.3 Burial grounds and Graves (Section 36(3)).....	10
1.3.4 Grading	11
1.3.5 Heritage Authority.....	11
1.4 Study Approach and Methodology.....	11
1.5 Assumptions	12
1.6 Limitations to this study	12
1.7 Declaration of Independence.....	12
2 DESCRIPTION OF THE PROJECT	13
3 DESCRIPTION OF THE AFFECTED ENVIRONMENT	14
3.1 Environmental attributes.....	14
4 findings for the maralla powerline.....	14
4.1 Palaeontology	14
4.2 Archaeology	14
4.3 Historical Background	15
4.4 Landscape and Scenic Routes.....	16
4.5 Anticipated Impacts to the heritage of the Area	17
4.5.1 Construction Phase	17
4.5.2 Operational Phase.....	18
4.5.3 De-commissioning Phase.....	18
5 ASSESSMENT OF IMPACTS.....	19
6 MITIGATION MEASURES AND MANAGEMENT MEASURES.....	21
7 STAKEHOLDER CONSULTATION.....	22
7.1 Stakeholder Consultation Process.....	22
8 CUMULATIVE IMPACTS	23
9 CONCLUSIONS.....	24
10 REFERENCES	24

List of Figures

Figure 1: The two powerline options connecting the Maralla WEF with the Komsberg substation in the Northern Cape Province

Figure 2: The proposed powerline alternatives, cross the Hidden Valley WEF, which was assessed by Booth (2012). The red dots indicate heritage sites which she recorded during her field assessment.

Figure 3: A landscape assessment by Winter & Oberholzer (2013) identifies the R354 (purple line) as a route of high scenic and rural value and an important tourist route to Sutherland (Route III). The abbreviation Knl.6 represents the Klein Roggeveldberge which is described as lying on an important scenic tourist route between Matjiesfontein on the N1 and Sutherland on the plateau (Grade III).

Figure 4: The location of a farmhouse within the buffer zone of the proposed eastern line (Booth 2012).

Figure 5: The location of a farmhouse within the buffer zone of the proposed eastern line (Booth 2012).

Figure 6: The location of the farmhouse along the proposed joint powerline (Booth 2012).

Figure 7: At least two heritage resources, including one cairn which may represent a grave, were found at substation 1.

Figure 8: No heritage resources were found on substation 2.

List of Tables

Table 1: Grading of Heritage Resources

Table 2: The significance of potential impacts of the 132kV powerline to the heritage of the two powerline alternatives.

Table 3: The significance of potential impacts of the two substation alternatives to the heritage of the area.

Table 4: Cumulative Impacts – Wind Heritage

Table 5: Cumulative impacts of the proposed powerline. Cumulative impacts for Alternative 1 are the same as for Alternative 2.

1 INTRODUCTION

ACO Associates cc was appointed by WSP/Parsons Brinckerhoff on behalf of BioTherm Energy (Pty) Ltd to undertake a Heritage Impact Assessment for the construction of the 132kV powerline connecting the Maralla Wind Energy Facility with the Komsberg substation in the Northern Cape Provinces (Figure 1). An on-site substation is also required and assessed in this report

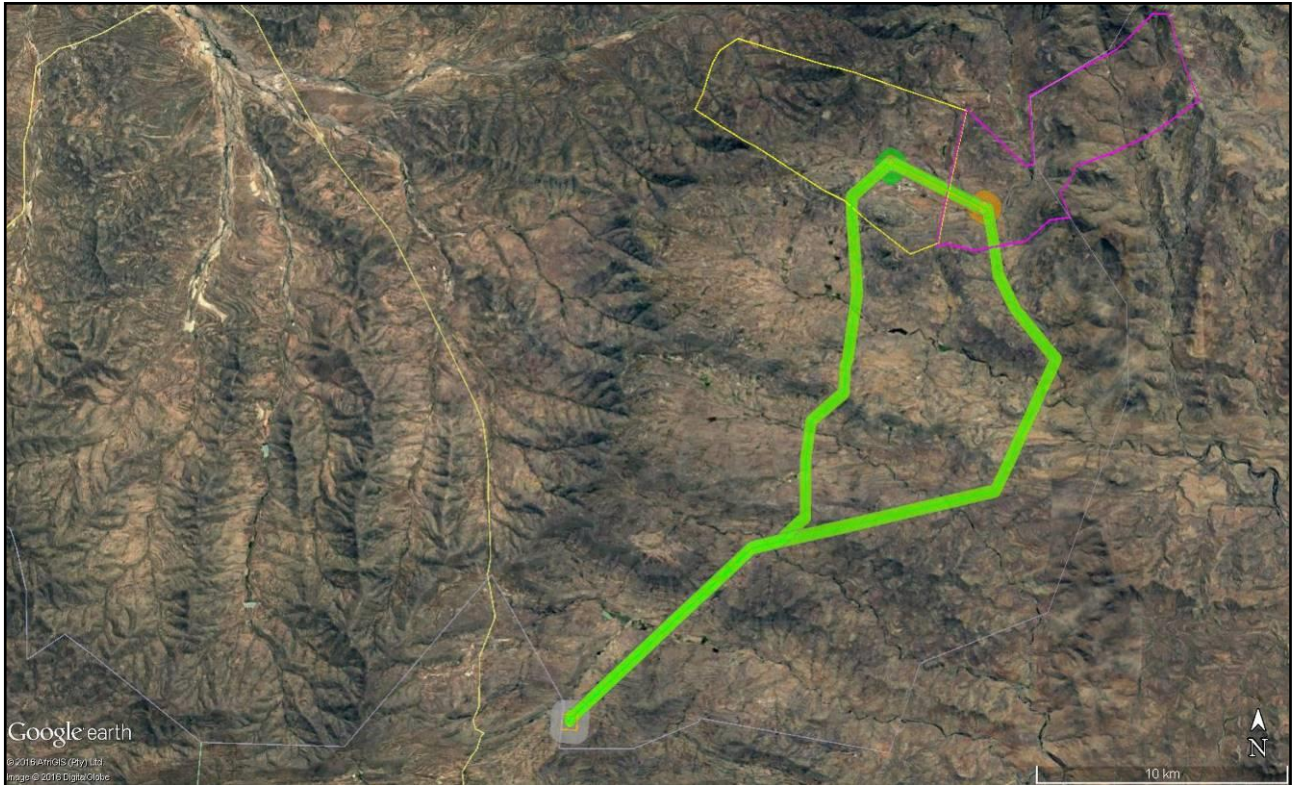


Figure 1: The two powerline options connecting the Maralla East and West WEF with the Komsberg substation in the Northern Cape Province. Note the location of the two substation locations.

1.1 Scope of Work

This Heritage Impact Assessment considers the potential impacts of the proposed construction of a 26km or 36km long powerline connecting the Maralla WEF to the Komsberg substation (**Figure 1**), as well as an on-site substation. The HIA specifically addresses:

- The potential impacts on the archaeology (including rock art) and history (including South African War) of the site;
- Impacts on graves and cemeteries;
- Visual impacts of the proposed facility on the heritage of the area; and
- Addresses any comments of the public with regard impacts to heritage resources.

This impact assessment is based on the knowledge which has been accumulated from heritage impact assessment undertaken in surrounding areas for other wind farm facilities, most specifically the field work undertaken in 2012 by Booth for the Hidden Valley WEF.

1.2 Objectives of the Report

The objectives of the report are to:

- Identify any potential impacts which may result from the proposed construction of the wind energy facility and associated infrastructure;

- Determine the significance of the heritage resources;
- Provide recommendations for mitigation of impacts.

1.3 Legislative Framework

While the National Department of Environmental Affairs is the decision making authority acting in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) and Regulations (2014), they must ensure that the evaluation of the statutorily defined broad range of heritage resources fulfils the requirements of the relevant heritage resources authority in terms of Section 38 (3) of the National Heritage Resources Act (Act 25 of 1999) (NHRA) and that any comments and recommendations of the relevant heritage resources authority with regard to proposed development have been taken into account prior to the granting of the consent.

This report is conducted in terms of Section 38 (8) of the National Heritage Resources Act, No 25 of 1999.

The NHRA provides protection for the following categories of heritage resources:

- Landscapes, cultural or natural (Section 3 (3))
- Buildings or structures older than 60 years (Section 34);
- Archaeological Sites, palaeontological material and meteorites (Section 35);
- Burial grounds and graves (Section 36);
- Public monuments and memorials (Section 37);
- Living heritage (defined in the Act as including cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems and the holistic approach to nature, society and social relationships) (Section 2 (d) (xxi)).

1.3.1 Structures (Section 34(1))

No person may alter or demolish any structure part of a structure which is older than 60 years without a permit issued by SAHRA or HWC, i.e. the responsible provincial heritage resources authority.

1.3.2 Archaeology & Palaeontology (Section 35(4))

No person may, without a permit issued by SAHRA, destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite.

Archaeological is defined as: “material remains resulting from human activity which is in a state of disuse and is in or on land and which is older than 100 years, including artefacts, human and hominid remains and artificial features and structures”.

Palaeontological is defined as: “any fossilised remains or 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”.

1.3.3 Burial grounds and Graves (Section 36(3))

No person may, without a permit issued by the South African Heritage Resources Authority (SAHRA), destroy, damage, alter, exhume or remove from its original position or otherwise disturb

any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority.

1.3.4 Grading

The significance of heritage resources is assessed per the grading criteria established by the National Heritage Resources Act, No 25 of 1999.

Table 1: Grading of Heritage Resources

Grade	Level of significance	Description
I	National	Of high intrinsic, associational and contextual heritage value within a national context, i.e. formally declared or potential Grade 1 heritage resources.
II	Provincial	Of high intrinsic, associational and contextual heritage value within a provincial context, i.e. formally declared or potential Grade 2 heritage resources.
IIIA	Local	Of high intrinsic, associational and contextual heritage value within a local context, i.e. formally declared or potential Grade 3a heritage resources.
IIIB	Local	Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3b heritage resources.
IIIC	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.

The subdivision of Grade III sites has been introduced in the Western Cape to facilitate significance grading at the local level.

1.3.5 Heritage Authority

The Maralla WEF powerline falls inside the boundaries of the Northern Cape. The heritage authority responsible for providing comments (in terms of Section 38(8) of the NHRA) on the proposed development is the South African Heritage Resources Agency (SAHRA).

SAHRA is required to provide comment on the proposed project to facilitate final decision making by the Department of Environmental Affairs (DEA).

1.4 Study Approach and Methodology

This study has been commissioned as Heritage Impact Assessment.

It includes a review of the published material as well as unpublished reports on the SAHRIS database. The 1:50 000 maps of the area as well as Google Earth aerial images were consulted. Numerous impact assessments have been conducted in proximity to the proposed facility as reflected on the SAHRIS database. Little was known of the archaeology of the study area until recently, when the area was identified as suitable for wind farm development. The following CRM reports provide valuable information on the heritage resources of the area and were consulted:

- The Suurplaat Wind Energy facility (Hart et al. 2010)
- The Roggeveld Wind Energy facility (Hart & Webley 2011, 2013)
- The Sutherland WEF facility (Halkett & Webley 2011 & 2016)
- The Kareebosch Wind Energy facility (Roggeveld Phase 2) (Hart & Kendrick 2015)
- The Hidden Valley Wind Energy facility (Phases 1, 2 & 3) (Booth 2012)
- The Komsberg Wind Energy facility (Hart 2016).

1.5 Assumptions

This impact assessment is based on the knowledge which has been accumulated from heritage impact assessment undertaken in surrounding areas as well as a site visit to the Maralla WEF in March 2016. It assumes that the heritage resources immediately to the south of the Maralla WEF are like the heritage resources recorded during the field survey of the wind farm. Moreover, this report also draws on the findings of Booth (2012) who surveyed the Hidden Valley WEF and recorded heritage resources.

1.6 Limitations to this study

- Due to the mountainous nature of the terrain, the absence of roads, and the difficulty with access to private property, the various powerline options connecting the substations alternatives to the Komsberg substation could not be field assessed;
- The resolution on aerial photography (Google Earth) is not sufficiently high to identify all stone structures (including kraals), archaeological sites or graves;
- This assessment of powerline options is a desktop study. This because assessment of alternative linear developments is expensive and time-consuming and heritage specialists recommend that a targeted assessment is undertaken at the EMPr stage of the final alternative.

1.7 Declaration of Independence

Lita Webley is an archaeologist (PhD from the University of Cape Town 1992) with ACO Associates cc and has been conducting Heritage Impact Assessment and archaeological specialist studies in the Western Cape, Northern Cape and Eastern Cape Provinces since 1996. She is a member of the Archaeology, Palaeontology and Meteorites Committee and the Impact Assessment Committee of Heritage Western Cape (HWC), the Provincial Heritage Resources Authority. She is accredited as a Principal Investigator by the Association of Southern African Professional Archaeologists (ASAPA) CRM section as follows:

- Principal Investigator: Stone Age, Shell Middens and Colonial Period; and
- Field Director: Grave Relocations.

ACO Associates cc has no financial or other interest in the proposed development and will derive no benefits other than fair remuneration for consulting services provided.

David Halkett (BA, BA Hons, MA (UCT)) is an Archaeologist and Member of the Association of Professional Archaeologists of Southern Africa (ASAPA) and accredited with Principal Investigator status. He has been working in heritage management for 23 years and has considerable experience in impact assessments with respect to a broad range of archaeological and heritage sites in the Northern Cape.

SPECIALIST DECLARATION

I, Lita Webley, declare that –

- I act as the independent specialist in this application;

- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have potential of influencing – any decision to be taken with respect to the application by the competent authority; and – the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offense in terms of regulation 71 and is punishable in terms of section 24F of the Act.

Signature of specialist



Specialist Field: Archaeology and Heritage
Name of Company: ACO Associates

2 DESCRIPTION OF THE PROJECT

The proposed 132kV powerline will connect the Maralla WEF with the Komsberg substation. The Esizayo WEF will have a 132kV powerline, with a 250m corridor, linking to the Komsberg substation. Two alternative routes have been proposed, one of 26km and the other 36km in length.

The onsite substation will consist of two parts, the IPP substation and the Eskom substation. The onsite IPP 33/132kV substation will have transformers for voltage step up from medium voltage to high voltage. The IPP Substation will occupy an area of 150m x 150m. The Eskom substation part and the 132kV powerline, connecting the Wind farm to the Komsberg MTS Substation or an adjacent IPP substation, are assessed through this separate EIA Process.

There will be a laydown area, with a maximum size of 4ha, for the temporary storage of materials during the construction activities.

The powerline will require:

Operations and Maintenance compound area including O&M building, car part and storage area. At least two powerline alternatives have been proposed (**Figure 1**).

They are:

- Eastern route;
- Western Route.

There are also two alternative on-site substation locations (**Figure 1**).

3 DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 Environmental attributes

The Study Area is located some 35km south-east of Sutherland, beneath the plateaux. The R354 between Matjiesfontein and Sutherland skirts the western edge of the Maralla WEF while the old road to Sutherland including the Komsberg pass runs through the Maralla West WEF and provides access to the plateaux. The high ridges are windswept, dry, inhospitable and undeveloped. The main river channels in the area are the Venters, Komsberg and Riet River. The area is sparsely populated and many of the farms have absentee landlords. Old settlements tend to focus on the water resources and along river valleys. There are numerous kraals and stone walling, located near water and built against the rocky ridgelines along the valley sides.



Plate 1: The landscape around the Komsberg substation, indicating the electrical infrastructure which dominates this landscape.

4 HERITAGE FINDINGS

4.1 Palaeontology

A palaeontological impact assessment (PIA) of the site was commissioned as part of a comprehensive HIA for BioTherm Energy (Pty) Ltd. The detailed PIA report is attached separately.

4.2 Archaeology

Recent surveys by heritage practitioners as well as academics from the University of Cape Town have increased our knowledge of the archaeology of the area. In addition, Booth (2012) conducted a field assessment for the Hidden Valley WEF, which is located immediately south of the Maralla WEF and recorded some heritage sites which are shown in **Figure 2**. The field survey identified the following heritage resources within the boundary of the Maralla WEF and we may assume that similar heritage resources will be found along the route of the powerline options.

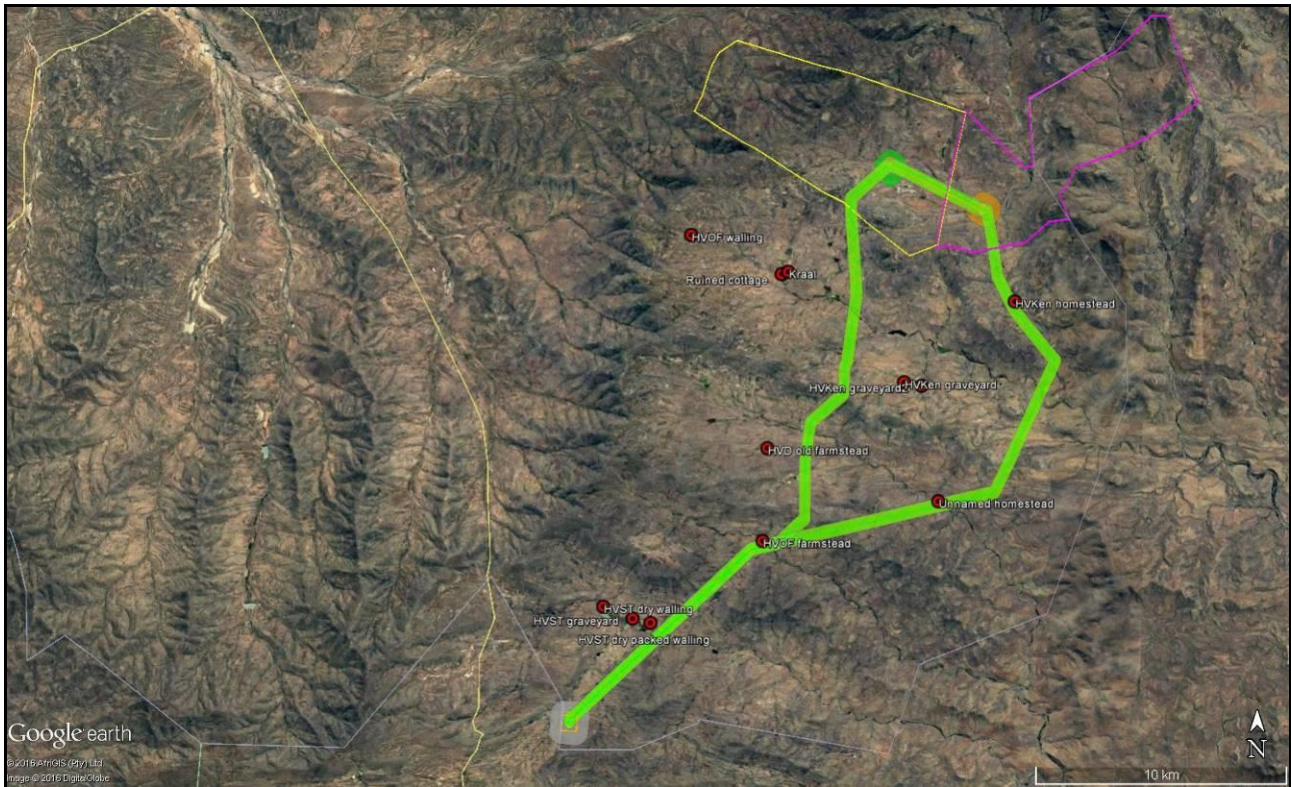


Figure 2: The proposed powerline alternatives, cross the Hidden Valley WEF, which was assessed by Booth (2012). The red dots indicate heritage sites which she recorded during her field assessment.

The two powerline routes have not been field tested. The assumptions below are based on the field assessments undertaken for the Esizayo WEF and the Maralla East and West WEF:

- There is very little evidence for ESA or MSA material in the area;
- Scatters of LSA stone artefacts do occur in the study area. Artefacts scatters are often found on the talus slopes, below shelters some of which have rock art sites. They are of medium significance;
- A few “pastoralist settlements” were identified within the boundary of the Maralla WEF. They contain LSA artefacts, ceramics and grindstones along dry river beds in the bottom of valleys. They are of medium significance;
- At least three rock art sites were reported from the Maralla WEF study area. It is possible that rock art sites may occur along the route of the powerline. They are of high significance;
- There are, potentially, graves/cairns within the study area. They are of high significance;
- There are numerous roughly-packed, circular enclosures of dry stone walling, which may represent both pre-colonial and colonial era stone kraals, distributed along the lower slopes of small koppies, and close to streams or fountains across the study area. They are of low to medium significance. Booth (2012) reports examples of stone walling in the Hidden Valley WEF.

4.3 Historical Background

The Roggeveld and Sutherland area were settled from as early as 1750 (Schoeman 1986; Penn 2005). The early farmers found the escarpment, which enjoys the highest rainfall, particularly suitable for small stock farming during the summer months but they moved down into the valleys and plains of the Karoo to escape the extreme winters. Drought, poor grazing and attacks by the San caused many farms to be abandoned. Per Penn (2005), in the 18th century there were numerous independent Khoekhoen kraals located amongst the Trekboer farms in the Roggeveld.

While the violent conflict between the various groups has been well documented, very little is known of the peaceful interaction and assimilation which took place over the last 200 years.

The Built Environment of the area is characterised by farmhouses (some containing an inner core dating to the 19th century), barns, stone kraals, shepherds stockposts, etc. The generic house comprised a “small oblong low hut” built of slabs of *leiklip* piled on top of each other, un-plastered, with a reed roof. However, very few of these structures have been preserved. A fine example, although much altered, of a 19th century vernacular farmhouse can be found on Wolven Hoek (Maralla West WEF). Some of the stone structures described above under pre-colonial settlements, may in fact represent colonial-era stockposts. They are generally identified by associated historic ceramics and glass. These colonial settlements are invariably found in river valleys, close to a permanent source of water.

According to Google Earth, there are at least two homesteads which fall within the buffer zone of the eastern powerline option, and one homestead within the joint powerline option.

4.4 Landscape and Scenic Routes

According to Winter & Oberholzer (2013), the R354 between Matjiesfontein and Sutherland, which crosses the Klein Roggeveld Mountains, is an area of high scenic and rural value. It is an important tourism route to the Sutherland Observatory and is considered of Route III significance.

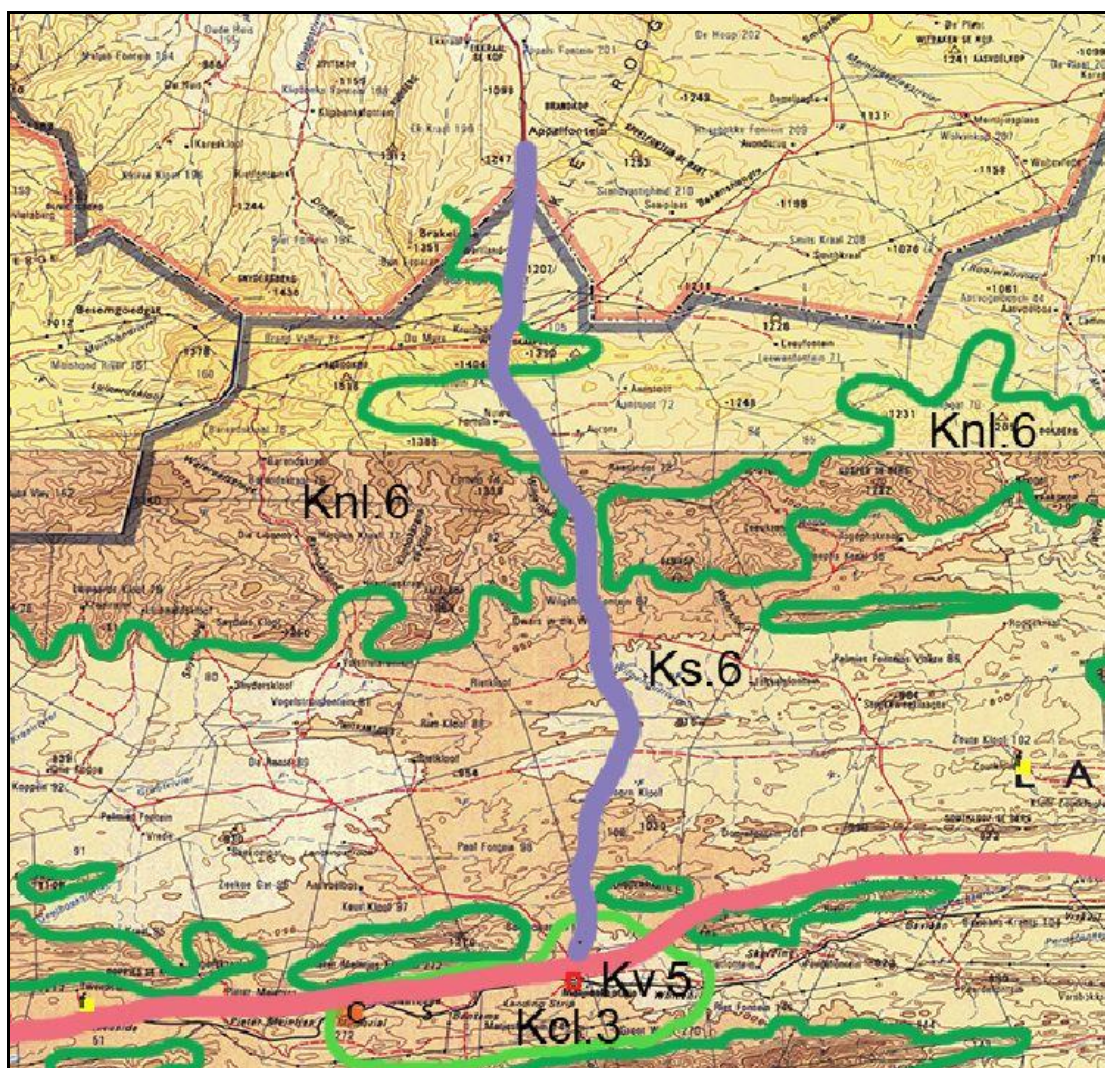


Figure 3: A landscape assessment by Winter & Oberholzer (2013) identifies the R354 (purple line) as a route of high scenic and rural value and an important tourist route to Sutherland (Route III). The abbreviation

Kn1.6 represents the Klein Roggeveldberge which is described as lying on an important scenic tourist route between Matjiesfontein on the N1 and Sutherland on the plateau (Grade III).

4.5 Anticipated Impacts to the heritage along the powerlines

4.5.1 Construction Phase

According to Google Earth, there are at least two homesteads which fall within the buffer zone of the eastern powerline option, and one homestead within the joint powerline option.

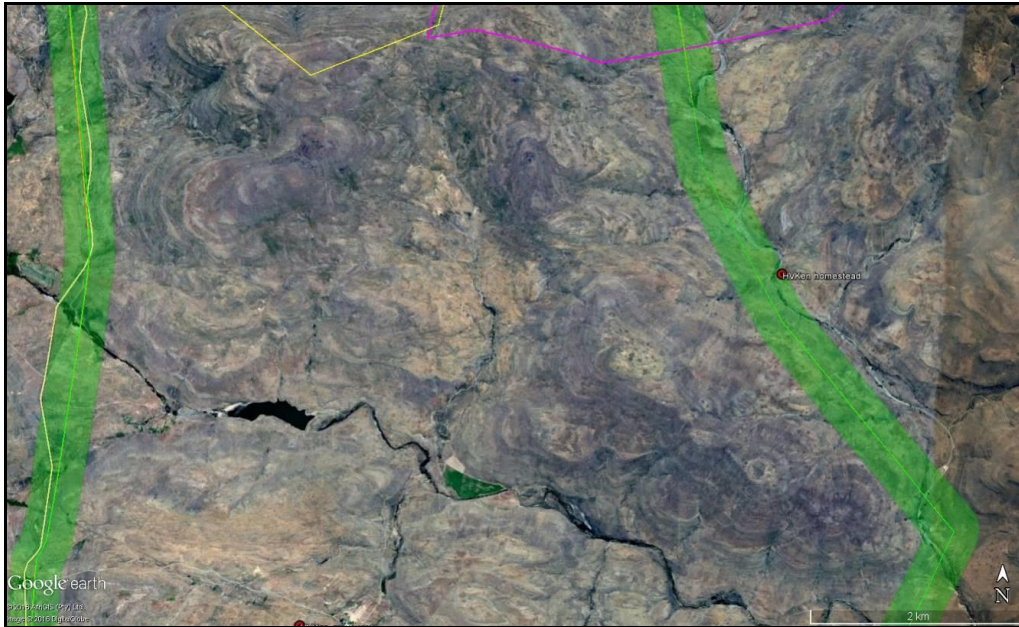


Figure 4: The location of a farmhouse within the buffer zone of the proposed eastern line (Booth 2012).

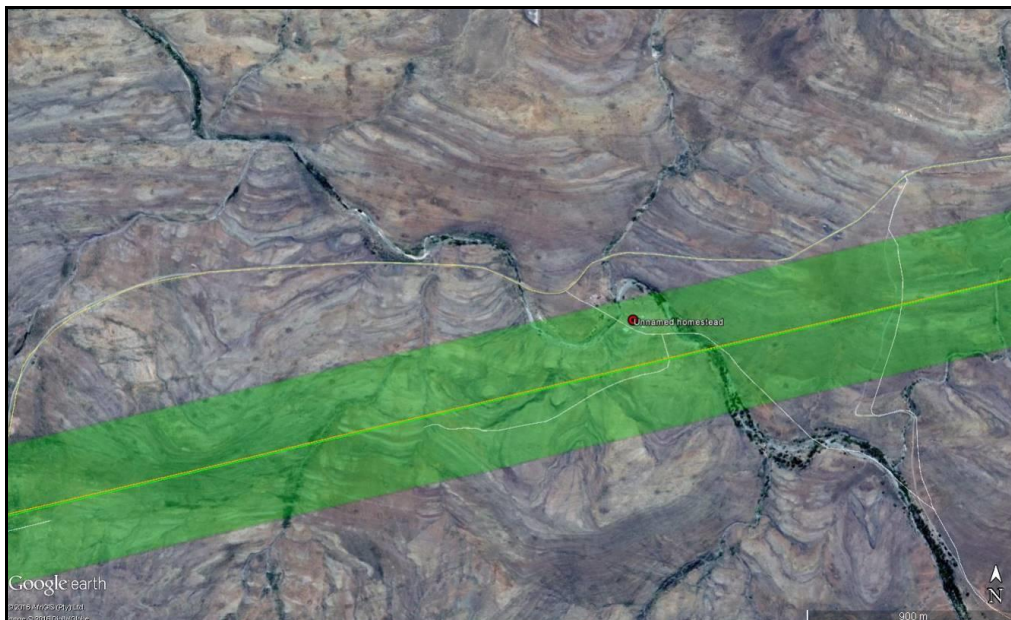


Figure 5: The location of a farmhouse within the buffer zone of the proposed eastern line (Booth 2012).



Figure 6: The location of the farmhouse along the proposed joint powerline (Booth 2012).

Potential impacts to the built environment (including graves), as well as potential archaeological sites along river banks is possible because of the construction of the 132kV powerline and mitigation measures will be required to assess this.

4.5.2 Operational Phase

No impacts are anticipated during the operational phase.

4.5.3 De-commissioning Phase

No impacts are anticipated during the decommissioning phase.

4.6 Anticipated impacts to heritage at the substations

Two alternative substation locations were assessed during the fieldwork (Figures 7 & 8).

4.6.1 Construction Phase

There is a very small probability that the construction of substation 1 may result in the destruction of heritage resources (Figure 7). No heritage remains were recorded on substation 2 (Figure 8).

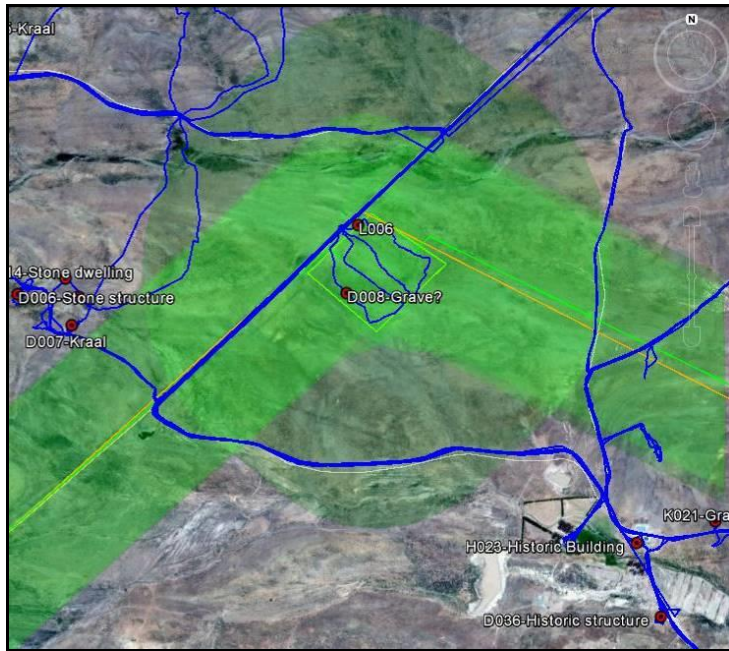


Figure 7: At least two heritage resources, including one cairn which may represent a grave, were found at substation 1.

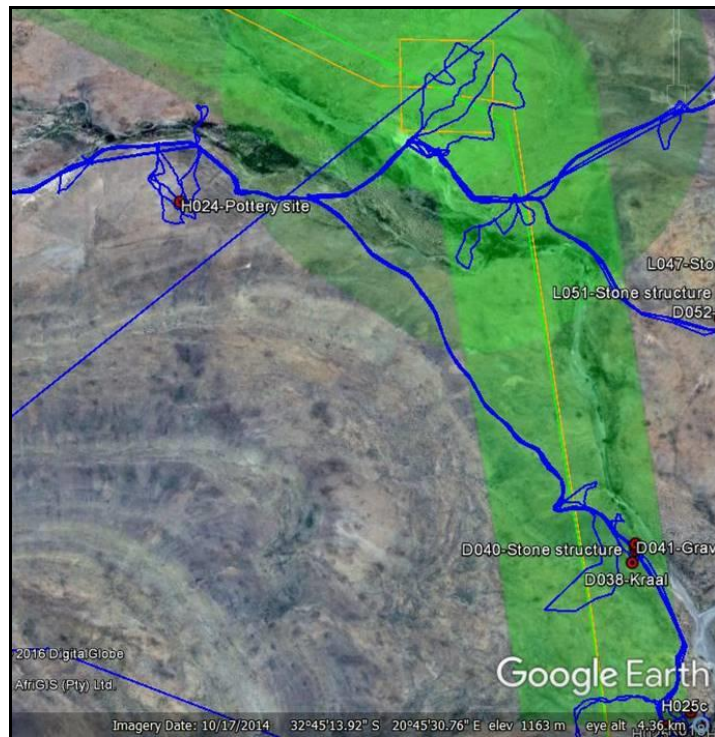


Figure 8: No heritage resources were found on substation 2.

5 ASSESSMENT OF IMPACTS

The direct impacts of a 132kV powerline on heritage resources are generally low. The size of the pylon base is very small, and usually no roads need to be bulldozed for maintenance of the line. Tracks in the veld are used to access the powerlines. The only direct impacts which can occur, is when the pylon is placed directly on top of an archaeological site or grave and this can be mitigation through micro-placement of the pylons are the walk down phase.

With respect **rock art sites**, they are difficult (and expensive) to mitigate and it is recommended that they are retained in-situ. Generally, powerlines pose no direct threat to rock art sites – as the paintings are located under rock overhangs and caves, and this is not suitable for the construction of electrical infrastructure. However, construction crew, if not properly supervised, may be responsible for the vandalism of rock art sites. For this reason, mitigation measures such as declaring the site off limits during construction are recommended.

With respect to cemeteries and graves, any impacts which result in a disturbance to a grave are considered high. They are best avoided by development. An extensive consultation process with interested and affected parties is required if exhumation is considered. All graves should be declared “No-Go” areas.

It is very unlikely that contractors to place pylons directly on top of ruined buildings and appropriate buffers are generally enforced around occupied residences. However, visual impacts may occur when a pylon is placed near an occupied farmhouse.

Table 2: addresses the significance of potential impacts of the two 132kV powerline alternatives to the heritage of the area.

BioTherm Energy - Maralla Powerline									
HERITAGE IMPACTS									
Significance Rating Table									
Construction Phase									
Komsberg Connection - Powerline Alternative 1									
Potential Impact		Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)	Status (+ve or -ve)	Confidence	
To archaeological sites, including rock art	Nature of impact:	Negative impacts - resulting in destruction of archaeological sites and rock art							
	Without Mitigation	2	5	4	2	22	Low	-	Medium
	degree to which impact can be reversed:	Heritage resources are non-renewable and impacts cannot be reversed							High
	degree of impact on irreplaceable resources:	Low to medium impact on heritage resources							Medium
	Mitigation Measures	Micro-siting of pylon locations, especially along river banks and near rockshelters/caves, will avoid direct impacts							High
With Mitigation	1	5	4	1	10	Low	-	High	
To historic ruins, including kraals and graves	Nature of impact:	Negative impacts - destruction of historic ruins and graves							
	Without Mitigation	1	5	4	2	20	Low	-	Medium
	degree to which impact can be reversed:	Heritage resources are non-renewable and impacts cannot be reversed							High
	degree of impact on irreplaceable resources:	Low to medium impact on heritage resources							High
	Mitigation Measures	Micro-siting of pylon locations in proximity to farmhouses, and ruined settlements will avoid direct impacts							High
With Mitigation	1	5	4	1	10	Low	-	High	

Impacts of Alternative 1 will be slightly lower than Alternative 2, merely because Alternative 1 is slightly shorter resulting in less likelihood of impacts.

In the case of the proposed powerline, it is expected that impacts to heritage will be low if the most sensitive areas are avoided (No-Go areas are implemented).

This study notes that the proposed powerlines will run over the high lying ridges and hills and that these areas are generally devoid of heritage resources. The severity impacts to heritage are likely to range between “low” on the tops of the ridges and “moderately severe”. In other words, mitigation (preferably avoidance of sensitive sites) would be possible. The study has identified that

the most significant heritage sites, both colonial settlements and archaeological sites, are in river valleys and kloofs, and they can be easily avoided by micro-siting of the pylon locations.

Table 3: addresses the significance of potential impacts of the two substation alternatives to the heritage of the area.

Substation Alternative 1								
Potential Impact		Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)	Status (+ve or -ve)	Confidence
To heritage resources including a possible grave	Nature of impact: Without Mitigation	Negative impacts - resulting in destruction of archaeological material						
	degree to which impact can be reversed:	2	5	4	2	22	Low	Medium
	degree of impact on irreplaceable resources:	Heritage resources are non-renewable and impacts cannot be reversed						High
	Mitigation Measures	Substation 2 is the preferred alternative						Medium
	With Mitigation	1	5	4	1	10	Low	Medium

Substation 2 is the preferred alternative.

6 MITIGATION MEASURES AND MANAGEMENT MEASURES

6.1 Powerline Alternatives

Two alternative 132kV powerlines, of approximately 26km or 36km in length, and with a 250m corridor, has been proposed to connect the Maralla Wind farms with the Komsberg substation.

This study notes that the powerlines will be running over high lying ridges and hills and that these areas are generally devoid of heritage resources. The probability of impacts to heritage sites is low. These impacts can be mitigated by micro-siting of pylons and avoidance of sensitive areas.

- Construction Phase
 - Once the final alternative has been selected, the archaeologist must undertake a targeted walk-down of the most sensitive areas (close to farm houses or where the powerline crosses streams) to verify that the pylons will not damage archaeological sites or graves. Micro-siting may be required to ensure that heritage resources are not damaged;
 - If any human remains are uncovered during the excavations for pylons, work must stop in that area and SAHRA must be alerted immediately.

Activity	Mitigation and management measure	Responsible Person	Applicable Development Phase	Include as Condition of Authorisation	Monitoring requirements
Construction	Targeted walk down of selected areas along the final powerline option	Archaeologist	EMPr	Yes	No
	Report human remains	ECO	Construction	Yes	No

- Operational Phase - no further requirements
- De-commissioning Phase – no further requirements
- Cumulative impacts – see Section 8.

6.2 Substation Alternatives

Two alternative substations have been proposed to connect the Maralla Wind farms with the Komsberg substation.

- Construction Phase
- Substation 2 is the preferred alternative to avoid negative impacts to a potential grave;
- If any human remains are uncovered during the excavations for pylons, work must stop in that area and SAHRA must be alerted immediately.

Activity	Mitigation and management measure	Responsible Person	Applicable Development Phase	Include as Condition of Authorisation	Monitoring requirements
Construction	Report human remains	ECO	Construction	Yes	No

- Operational Phase - no further requirements
- De-commissioning Phase – no further requirements
- Cumulative impacts – see Section 8.

7 STAKEHOLDER CONSULTATION

7.1 Stakeholder Consultation Process

Public consultation has been completed for the Scoping Phase of the proposed development. The only comments received to the Scoping Report were from SAHRA.

STAKEHOLDER DETAILS	COMMENT	SPECIALIST RESPONSE
Heritage Western Cape has responded to the NID	Requested: An HIA comprising Impacts to Palaeontological heritage resources (Dr John Almond of Natura Viva cc); Impacts to Archaeological heritage resources (Dr Lita Webley and Mr David Halkett of ACO Associates cc); Visual Impacts on the Cultural Landscape (Ms Belinda Gebhardt) The required HIA must have an integrated set of recommendations. The comments of registered conservation bodies and the relevant Municipality must be requested and included in the HIA where provided. Proof of these requests must be supplied	This report addresses these issues
DEA&DP (Western Cape) have responded to the Scoping HIA requesting:	"The final WEF layout must be subjected to an intensive heritage and archaeological survey and impact assessment, as per the specialist recommendations. All resulting micro-sitting mitigation measures identified must be reported on the in Draft EIA Report".	It is not possible to do an intensive survey at the EIA phase, as the final layout of the facility has not been finalised. The walk-down of the most sensitive area must take place during the EMPr.
Mr B Kleinbooi has commented:	"There is also a graveyard that we want protected"	The exact location of the graveyard which Mr Kleinbooi is referring to is unknown. Several graveyards were recorded during the survey. They will

8 CUMULATIVE IMPACTS

Several renewable energy facilities have been authorized in the area around the Eskom Komsberg substation and they have been subjected to the EIA process. They include:

- The Suurplaat Wind Energy facility (Hart et al. 2010)
- The Roggeveld Wind Energy facility (Hart & Webley 2011, 2013)
- The Sutherland WEF facility (Halkett & Webley 2011)
- The Kareebosch Wind Energy facility (Roggeveld Phase 2) (Hart & Kendrick 2015)
- The Hidden Valley Wind Energy facility (Phases 1, 2 & 3) (Booth 2012)

This report is concerned with the electrical infrastructure which connects each of the wind farms to the Komsberg substation. It is important to point out that the base of a 132kV (particularly if it is a single steel mono pole), will be extremely small and unlikely to result in any impacts unless it is placed directly on top of a site.

However, visually, there will be numerous powerlines connecting authorised wind energy facilities, joining up with the Komsberg substation, in addition to the very large 765Kv lines which already intersect with the Komsberg substation.



Plate 2: View of the powerlines connecting to the Komsberg substation.

Table 4 at the end of the report, summarizes the impact assessment ratings which have been assigned to the various renewable energy facilities which have been authorized around the proposed Maralla East and West WEF sites.

There are no specific assessments with respect the cumulative impacts of powerlines, which need to connect the authorized wind farms to the Komsberg substation. Plate 2 above, indicates that increasing numbers of powerlines will result in a visual impact on the landscape.

The cumulative impacts on of the two proposed powerline options on heritage resources, such as archaeological sites, graves, ruined settlements as well as occupied farmhouses is likely to be low to medium in impact. This is because pylons are placed around 400m apart, and the exact location of the pylon can be micro-sited within the powerline corridor. Direct impacts can be avoided, and therefore cumulative impacts are less.

In general, the farms in this area are large, and there are very few sites which have buildings older than 60 years. Cumulative impacts to the built environment are low. The cumulative impacts to graves are also low.

The cumulative impacts of the substation on the heritage resources of the area are extremely low.

Table 5: Cumulative impacts of the proposed powerline. Cumulative impacts for Alternative 1 are the same as for Alternative 2.

BioTherm Energy - Maralla Powerline										
HERITAGE IMPACT ASSESSMENT										
Significance Rating Table										
Cumulative Impacts										
Komsberg Connection - Powerline Alternative 1										
Potential Impact		Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence	
To heritage resources including historic farm buildings and archaeological sites	Nature of impact:	Negative Impacts - resulting in destruction of resources								
	Without Mitigation	2	5	4	2	22	Low	-	Medium	
	degree to which impact can be reversed:	Heritage resources are non-renewable and impacts cannot be reversed								High
	degree of impact on irreplaceable resources:	Low to Medium impacts to heritage resources								High
	Mitigation Measures	Targeted walk down of sections of the powerline. Alternative 1 is preferred as the shortest option								Medium
	With Mitigation	1	5	4	1	10	Low	-	Medium	

9 CONCLUSIONS

No-Go Areas

None have been identified from this desktop assessment.

The following heritage recommendations are proposed

An aerial desktop (Google Earth) assessment of the two line options, suggest that there are at least three farmhouses within the powerline corridors. The farmhouses have not been subject to a field assessment and their heritage significance has not been determined.

- This desktop assessment of the powerline options, recommends that the shortest route is followed to the Komsberg substation;
- Once the final powerline option has been determined, it will be necessary to undertake a targeted walk-down at the EMPr stage to assess sensitive locations along the powerline route. Micro-siting of pylons may be required;
- Substation 2 is the preferred substation location;
- If any archaeological remains, including human remains, are uncovered during construction, then work must stop in that area SAHRA must be notified.

10 REFERENCES

Almond, J.E. 2005. Palaeontological scoping report: Proposed golf estate, Sutherland, Northern Cape, 10 pp. Natura Viva cc, Cape Town.

- Almond, J.E. 2010a. Eskom Gamma-Omega 765kV transmission line: Phase 2 palaeontological impact assessment. Sector 1, Tanqua Karoo to Omega Substation (Western and Northern Cape Provinces), 95 pp + Appendix. Natura Viva cc, Cape Town.
- Almond, J.E. 2010b. Palaeontological impact assessment: desktop study – Proposed Suurplaat wind energy facility near Sutherland, Western Cape, 33 pp. Natura Viva cc, Cape Town.
- Almond, J.E. 2010c. Proposed Mainstream wind farm to the southeast of Sutherland, Northern Cape and Western Cape Provinces. Palaeontological impact assessment: pre-scoping desktop study, 19 pp. Natura Viva cc, Cape Town.
- Almond, J.E. 2011. Proposed photovoltaic solar energy facility on the farm Jakhals Valley (RE/99) near Sutherland, Karoo Hoogland Municipality, Northern Cape Province. Palaeontological specialist study: combined desktop and field assessment, 34 pp. Natura Viva cc, Cape Town.
- Almond, J.E. 2014. Proposed Karreebosch Wind Farm (Roggeveld Phase 2) near Sutherland, Northern Cape Province. Palaeontological heritage assessment: combined desktop & field-based study, 63 pp. Natura Viva cc, Cape Town.
- Almond, J.E. 2015a. Proposed expansion of the existing Komsberg Main Transmission Substation on Farm Standvastigheid 210 near Sutherland, Northern Cape Province. Paleontological heritage assessment: combined desktop & field-based study (basic assessment), 39 pp. Natura Viva cc, Cape Town.
- Almond, J.E. 2015b. Proposed Karusa Wind Farm near Sutherland, Namaqua District Municipality, Northern Cape Province. Palaeontological heritage assessment: combined desktop & field-based study, 57 pp. Natura Viva cc.
- Almond, J.E. 2015c. Proposed Soetwater Wind Farm near Sutherland, Namaqua District Municipality, Northern Cape Province. Palaeontological heritage assessment: combined desktop & field-based study, 57 pp. Natura Viva cc.
- Almond, J.E. & Pether, J. 2008. Palaeontological heritage of the Western Cape. Interim SAHRA technical report, 20 pp. Natura Viva cc., Cape Town.
- Almond, J. 2016. Recommended Exemption from further Palaeontological studies: Proposed construction of the Eskom Karusa switching station complex, 132kV double circuit overhead power line, Karusa facility substation complex and ancillary developments near Sutherland, Northern Cape.
- Almond, J. 2016. Recommended Exemption from further Palaeontological studies: Proposed construction of the Eskom Soetwater switching station complex, 132kV double circuit overhead power line, Soetwater facility substation complex and ancillary developments near Sutherland, Northern Cape.
- Baumann, N. & Winter, S. 2005. Guideline for involving heritage specialists in EIA process. Edition 1. CSIR report No ENV-S-C 2005 053E. Provincial Government of the Western Cape: Department of Environmental Affairs and Developmental Planning.
- Booth, C. 2012. A Phase 1 Archaeological Impact Assessment for the proposed Hidden Valley Wind Energy facility, near Sutherland, Northern Cape Province. Unpublished report for Savannah Environmental (Pty) Ltd.
- Booth, C. 2015. A Phase 1 Archaeological Impact Assessment for the proposed Karusa facility substation and ancillaries, near Sutherland, Karoo Hoogland Local Municipality, Namakwa District Municipality, Northern Cape Province. Unpublished report for Savannah Environmental (Pty) Ltd.

- Booth, C. 2015. A Phase 1 Archaeological Impact Assessment for the proposed Soetwater facility substation and ancillaries, near Sutherland, Karoo Hoogland Local Municipality, Namakwa District Municipality, Northern Cape Province. Unpublished report for Savannah Environmental (Pty) Ltd.
- Halkett, D & Webley, L. 2011. Heritage Impact Assessment: Proposed renewable energy facility at the Sutherland Site, Western and Northern Cape Provinces. Unpublished report for ERM SA.
- Hart, T. 2005. Heritage Impact Assessment of a proposed Sutherland Golf Estate, Sutherland, Northern Cape Province. Prepared for DJ Environmental Consultants. Archaeology Contracts Office, UCT
- Hart, T., Halkett, D., Webley, L and Bluff, K. 2010. Heritage impact assessment: proposed Suurplaat wind energy facility near Sutherland, Western Cape and northern Cape. Prepared for Savannah Environmental (Pty) Ltd. ACO Associates cc.
- Hart, T. & Webley, L. 2013. Heritage Impact Assessment: Revised report on a proposed wind energy facility situated in the Roggeveld. Unpublished report for Savannah Environmental (Pty) Ltd
- Hart, T. & Kendrick, N. 2014. Heritage Impact Assessment: Kareebosch Wind Farm (Phase 2 of the Roggeveld Wind Farm). Unpublished report for Savannah Environmental (Pty) Ltd.
- Hopkins, H.C. & Marais, G.V. 2005. Kudde onder the Suidersterre: Ned Gereformeerde Kerk Sutherland se geskiedenis die afgelope 150 jaar.
- Lloyd Evans, T. Thackeray, A.I. & Thackeray, J. F. 1985. Later stone age rescue archaeology in the Sutherland district. South African Archaeological Bulletin 40: 106-108.
- Miller, D. 2011. Roggeveld Wind Farm: palaeontology study, 7 pp. Appendix to Archaeological, Heritage and Paleontological Specialist Report prepared by ACO Associates, St James.
- Millstead, B. 2013. Desktop Palaeontological Heritage Impact Assessment report on the site of the proposed Gunstfontein Wind Energy Generation Facility to be located on various farms near Sutherland, Northern Cape Province. Unpublished report for Savannah Environmental (Pty) Ltd.
- Orton, J. & Halkett, D. 2011. Heritage Impact Assessment for the proposed photovoltaic solar energy facility on the remainder of farm Jakhalsvalley 99, Sutherland Magisterial District, Western Cape Province. Unpublished report for Environmental Evaluation Unit.
- Patrick, M. 2009. Final scoping heritage impact assessment: Gamma-Omega 765Kv transmission line. V1&2. Prepared for PD Naidoo and Associates on behalf of Eskom Holdings. Cape Archaeological Survey cc.
- Penn, N. 2005. The forgotten frontier: colonist and Khoisan on the Cape's northern frontier in the 18th century. Double Story Books, Cape Town.
- Schoeman, K. 1986. Die wêreld van die digter: 'n boek oor Sutherland en die Roggeveld ter ere van NP van Wyk Louw. Human & Rosseau.
- Van der Walt, J. 2013 (revised 2015). Archaeological Scoping Report for the proposed Gunstfontein Renewable Energy Project: Wind and Solar Energy facilities and the associated grid connection infrastructure, Northern Cape. Unpublished report for Savannah Environmental (Pty) Ltd.
- Webley, L. 2016. Heritage Impact Assessment: Proposed Construction of the Bon Espirange Substation on the Remainder of the farm Bon Espirange73 and a 132kV powerline from the substation in the Western Cape to the Komsberg substation in the Northern Cape. Unpublished report for Savannah Environmental (Pty) Ltd.

Winter, S. & Oberholzer, B. 2013. Heritage and Scenic Resources: Inventory and Policy Framework. A study prepared for the Western Cape Provincial Development Framework.

Table 4: Cumulative Impacts – Wind Heritage

PROPOSED DEVELOPMENT NAME	DEA REFERENCE	CURRENT EA STATUS	PROPONENT	EXTENT	PROPOSED CAPACITY	FARMS	IMPACTS													PROPOSED MITIGATION MEASURES							
							Construction					Operation					Decommissioning										
							Overall	Archaeology	Built Environment	Graves	Cultural Landscape	Overall	Archaeology	Built Environment	Graves	Cultural Landscape	Overall	Archaeology	Built Environment		Graves	Cultural Landscape					
Proposed 280 MW Gunstfontein Wind Energy Project	14/12/16 /3/3/2/39 5	S&EIR	Network Eolos Renewables (Pty) Ltd	12 000	280 MW			M	L	M	M																<ul style="list-style-type: none"> For archaeology, open air sites should be identified and mitigated either in the form of a fence or other physical barrier of the sites within the development. Phase 2 study where the sites are recorded and sampled before development. This will apply for a destruction permit prior to development. All grave sites should be identified before the development and avoided. It is not envisaged that the sites will be directly impacted on by the development. Should any buildings older than 100 years need to be demolished, the sites should be assessed by a conservation expert. Formal and informal cemeteries and pre-colonial graves occur within the region. These must be protected during development. They can also be protected if conservation is not possible. The sites should be seen as the last resort and mitigation is advisable.
Proposed development of renewable energy facility at the Sutherland site, Western and Northern Cape.	12/12/20 /1782/A M1	S&EIR	Mainstream Power Sutherland	28 600	811 MW			L	M	L	M																<ul style="list-style-type: none"> For archaeology, micro siting should be avoided during the EMP process. Micro siting is not an option for mitigation (e.g. micro siting may be required for collection). A permit may be required from HWC in order to undertake micro siting. For the built environment, the locations of turbine positions and infrastructure must be done in a way to avoid placing turbines directly over built environment buildings or bisecting cohesive

PROJECT ID	DEAR	CURRENT	PROJECT	EXT	PROJECT	FORM	IMPACTS										PROPOSED MITIGATION MEASURES		
																			complexes. <ul style="list-style-type: none"> For graves, once the exact location of infrastructure is known, an assessment of the access roads, laydown areas, substations and cable routes needs to be conducted to identify all marked graves and affected areas. In the case of graves, there will need to be a plan in place in order to deal with them on a case by case basis if and when encountered during the course of construction. HWI must be notified immediately if any human remains are uncovered during construction. Work in the specific area must be stopped for inspection and mitigation as required. For cultural landscape, existing facilities on site must be protected and that avoids visual clutter.
Proposed Hidden Valley Wind Energy Facility, Northern Cape	12/12/202370/2	S&EIR	Hidden Valley Wind-African Clean Energy Developments (Pty) Ltd	9 530	150 MW		L												<ul style="list-style-type: none"> A 10m perimeter boundary must be established around the structures (dry packed gravel) dwelling on Portion of the Fontein 201 (HVOFSW1) farm gravel road before construction and development. If concentrations of archaeological remains are exposed during construction work must stop for an archaeological investigation. If any human remains or other concentrations of archaeological material (including heritage material) are exposed during construction, all work must be stopped and reported immediately to the nearest museum or archaeological authority (SAHRA), so that a site investigation can be undertaken. Sufficient time must be allowed to investigate and collect such material.
Proposed Hidden Valley wind energy facility, Northern cape	12/12/202370/3	S&EIR	Hidden Valley Wind-African Clean Energy	9 180	150 MW		L												<ul style="list-style-type: none"> Refer to 12/12/20/2370/2 ab

PROJECT DESCRIPTION	DATE	CURRENT STATUS	PROJECT NAME	POWER CAPACITY	TYPE	IMPACTS	PROPOSED MITIGATION MEASURES
Proposed Hidden Valley wind energy facility , Northern cape	12/12/20/2370/1	S&EIR	Hidden Valley Wind-African Clean Energy Developments (Pty) Ltd	13 620	150M W	L	• Refer to 12/12/20/2370/2 at
Proposed Hidden Valley wind energy facility , Northern cape	12/12/20/2370	S&EIR	Hidden Valley Wind-African Clean Energy Developments (Pty) Ltd		650 MW	L	• Refer to 12/12/20/2370/2 at
Proposed Construction Of The 140Mw Roggeveld Wind Farm Within The Karoo Hoogland Local Municipality Of The Northern Cape Province And Within The Laingsburg Local Municipality Of The Western Cape Province	12/12/20/1988/1/AM1	Amendment	G7 Renewable Energies (Pty) Ltd	26 529	140 MW	L L L M	<ul style="list-style-type: none"> For colonial archaeology, a of the proposed route alignments and transmission done. Heritage resource identified, flagged and construction. No substations in prominent positions or historic farms. These are avoided for power line route For the built environment, turbine positions and infrastructure must be done to avoid placing turbines directly over built environment buildings or bisecting cohesive complexes. The sensitive buildings is encouraged (as is sort on heritage sensitivity help sustain them. No practical mitigation impacts on the cultural land
Proposed Photovoltaic (PV)	12/12/20/2235	BAR	Inca Komsber	2	10 MW	L N/A L H	• Use Option 1 as it has stone-walled structures abo

PROJECT DESCRIPTION	DATE	CURRENT	PROJECT	EXT	PROJECT	FA	IMPACTS	PROPOSED MITIGATION MEASURES
Solar Energy Facility On A Site South Of Sutherland, Within The Karoo Hoogland Municipality Of The Namakwa District Municipality , Northern Cape Province			g Wind (Pty) Ltd					<ul style="list-style-type: none"> of it compared to Option 2 <50 m to the east of it. Consider option 1 as it is closer to Anglo-Boer War sites. Option 1 is preferable v as it is partially screened by a low wall which lies between it and R35. The central and eastern parts of the site will be visible.
Proposed establishment of the Suurplaat wind energy facility and associated infrastructure on a site near Sutherland, Western Cape and Northern Cape.	12/12/201583	S&EIR	Moyeng Energy (Pty) Ltd	28600	120 MW		L L H H	<ul style="list-style-type: none"> Existing farm tracks must be upgraded to minimise the area of impact to un-transformed landscape. In general terms, construction of roads in valley bottoms should be to a minimum. Archaeological investigations of the access roads at Hartbeesfontein in the valley bottoms close to the site between Klipfontein and Modderfontein need active protective measures including even archaeological sampling. Any pre-colonial kraal compounds should be affected by the proposed roads should be mapped, and measures should be taken to protect the sites. During the detailed planning phase drawings of proposed roads and infrastructure and near the site should be submitted to an archaeologist for review and approval. Micro-adjustment of alignment and road positions is likely to be sufficient to provide adequate mitigation. A "walkdown" of final cable routes, power lines, substation sites and roads will be required. If farm buildings at Looi and Modderfontein are to be retained, middens should be protected.

P R O P O S E D	D E A R	C U R R E N T	P R O P O S E D	E X T	P R O P O S E D	F A R M	IMPACTS	PROPOSED MITIGATION MEASURES
								<ul style="list-style-type: none"> • It is illegal at all times to demolish and archaeological site with • Conserve old buildings, kraal wall alignments – do not damage. • Do not demolish wind pumps these are protected structures greater than 60 years of age • Follow a policy of non-interventive farm buildings such as Modderfontein should be rehabilitated. • Theft of fittings from buildings monitored and offenders fined under NHRA. • Seek guidance from a heritage expert any buildings are to be restored • Keep infrastructure at least 500m from all farm complexes and kraals elements that are of heritage value • Apply to the relevant provincial authorities to demolish or alter structures (buildings, historical kraals etc). • Turbines must be positioned such that they are at least 500m from farm complexes. • Turbines must be positioned such that shadow flicker does not occur on farm complexes. • Road alignments must be planned in a way that the minimum clearance operations are required.
Proposed establishment of the Witberg Bay wind energy facility, Laingsburg Local Municipality	12/12/201966/A2	Amendment	Witberg Wind Power (Pty) Ltd		Unknown			

PROJECT DESCRIPTION	DATE	CURRENT	PROJECT	EXT	PROJECT	FORM	IMPACTS										PROPOSED MITIGATION MEASURES	
Central Karoo District, Western cape																		
Proposed renewable energy facility at Konstabel	12/12/20/1787	S&EIR	South Africa Mainstream Renewable Power Development		170 MW													
Proposed development of a renewable Energy facility at Perdekraal, Western Cape - Split 1	12/12/20/1783/2/AM1	Amendment	South Africa Mainstream Renewable Power Development		Unknown													
Proposed Touwsrivier Solar energy facility	12/12/20/1956	S&EIR	Unknown	215	36 MW		L	L	L	L	L	L	L	L	L	M	<ul style="list-style-type: none"> For cultural landscape, the embankments would provide amount of screening of activity from the N1. No mitigation measures are respect to pre-colonial heritage as no significant identified within the study area on the type and location of selected, a final walk down transmission line would be tower positions can be modified to avoid any sensitive areas. The old 1876 rail alignment protected as an archaeological element of the built environment 1930 railway line alignment foundations, 1946 tunnel protected as elements environment over 60 years recommended that a positive intervention is implemented structures are left as is. 	

