

**HERITAGE IMPACT ASSESSMENT: PROPOSED CONSTRUCTION OF
THE 132 KV POWERLINE FOR THE ESIZAYO WIND ENERGY FACILITY
NEAR LAINGSBURG IN THE WESTERN 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

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EXECUTIVE SUMMARY

Site Name:

The Powerline connecting the Esizayo Wind Energy Facility to the Komsberg substation is located to the east of the R354, between Laingsburg and Sutherland in the Western Cape Province.

Location



Figure: The powerline options from the Esizayo WEF to the Komsberg substation are indicated in yellow and turquoise. The powerlines all run through the Western Cape Province, but then terminate at the Komsberg substation, which is immediately across the provincial boundary in the Northern Cape Province.

Two alternative on-site substations are proposed, as well as three powerline options. The blue substation is the preferred option, and the powerline route along the road is the preferred option.

Heritage Western Cape/South African Heritage Resources Agency

The 132kV powerline which connects the Esizayo WEF with the Komsberg substation falls inside the boundaries of the Western Cape. The heritage authority responsible for providing comments (in terms of Section 38(8) of the NHRA) on the proposed development is *Heritage Western Cape* (HWC).

NID Response and Specialist Studies

A NID was submitted to Heritage Western Cape for the Esizayo WEF as well as its associated infrastructure. HWC have asked for:

- 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)

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.

While Heritage Western Cape have only requested palaeontological, archaeological and visual assessments, the EIA phase study needs to fulfil the requirements of heritage impact assessments as defined in Section 38 of the NHRA. This means that the assessment must cover the full range of potential heritage resources as defined in the NHRA. For this reason, this report also briefly comments on the Built Environment on the affected farms.

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 field assessment of the two substation locations.

Heritage Resources Identified

Palaeontology

To be supplied by Dr John Almond

Archaeology

The archaeological remains were identified within the boundaries of the Esizayo WEF. It is anticipated that similar remains will be found along the route of the powerlines.

- A few large scatters of LSA stone artefacts were identified within the Esizayo WEF. Two scatters were found on the talus slopes, below the rock art sites. They are of medium significance;
- A few “pastoralist settlements” were identified containing LSA artefacts, ceramics and grindstones along dry river beds in the bottom of valleys. They are of medium significance;
- In addition to the two rock art sites recorded within the boundaries of the WEF, there is also an overhang with paintings next to the R354, in close proximity to the preferred powerline connection to the Komsberg substation. Rock art sites are of high significance because of their scarcity;
- The Nuwerus cemetery is located next to the R354. There are also several other potential graves/cairns within the study area. They are of high significance;
- There is a spread of early 20th century historical material on the lower slopes of two koppies, in association with several stone enclosures (fortifications) on the farm Aanstoot.

They may represent the debris from the South African War. The proposed Substation 1 (yellow) is located on top of this koppie with historic material.

Built Environment and Graves

There are no farmsteads along the powerline routes and it seems unlikely that cemeteries or graves will be impacted. However a watching brief must be implemented should human remains be uncovered during construction.

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.

- Two of the powerline options (blue and yellow), run along the R354, near a rock art site and potential impacts may occur through potential vandalism by construction crew;
- Most archaeological sites are located along river beds. The powerlines will cross the high lying mountains to the north of the wind facility, and it is unlikely that they will impact archaeological remains;
- There are no homesteads along the routes of the powerline options. Since informal cemeteries and farm graves are generally located close to settlements, impacts to graves along powerline routes is likely to be low.

Anticipated impacts on Heritage Resources – Substations

- Construction of Substation 1 (yellow) will result in the destruction of stone walled enclosures and historic material, which probably date to the South African War. This site should be considered a “No-Go” area. It is recommended that Substation 2 (blue) should be the preferred option.

Cumulative Impacts

Several renewable energy facilities have received environmental authorisation in an area around the Eskom Komsberg substation and 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 & 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

The following highly sensitive areas have been identified and they should be declared *no-go* areas during the construction:

- The rock art site next to the R354;
- Potential South African War stone structures and historic material on a small koppie on Esizayo (the location for the yellow substation – Substation 1).

The following heritage recommendations are proposed

- No-Go areas should be avoided;
- This desktop assessment of the powerline options, recommends that the inland route is followed to the Komsberg substation. If this is not followed, the suitable measures should be put in place to protect the rock art site next to the R354, which may be vandalised by construction crews during the erection of the powerline;
- Once the final powerline option has been determined, it may be necessary to undertake a field assessment to assess sensitive locations along the powerline route. Micro-siting of pylons may be required;
- The blue substation (2) is the preferred option – the yellow substation (1) must be avoided;
- If any archaeological remains, including human remains, are uncovered during construction, then work must stop in that area HWC 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 Genhardt) The required HIA must have an integrated set of recommendations. The comments of registered conservation bodes 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. A number of graveyards were recorded during the survey. They will all be protected.

From a heritage perspective, it is preferable that the inland powerline option to the Komsberg substation is selected.

Author/s and Dates

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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

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Figure 2: The farm boundaries are outlined in purple and our survey tracks are shown in mauve. The Komsberg substation is located to the north of the Esizayo Wind Farm, and is shown in orange. The two blue powerline alternatives from the blue substation to the Komsberg are visible, but the two yellow powerline alternatives from the yellow substation are obscured by the blue lines. The concentration of archaeological sites (red dots) on the yellow substation is clear. Note also Sites D056/D057 along the R354.

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: A close-up view of the sensitive heritage locations (red polygons) on the farms Aanstoot and Aurora close to the R354. The substation (1) near the road is situated on a number of stone wall structures and associated historic material indicating a site/s of significance during the South African War. It is preferable that substations 2 (the turquoise square) is used instead to avoid impacts.

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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 Esizayo Wind Energy Facility in the Western Cape Province with the Komsberg substation (**Figure 1**). This Basic Assessment report is concerned with the construction of a 132kV powerline which runs through the Western Cape Province, and connects with the Komsberg substation which is just inside the border of the Northern Cape Province. An on-site substation is also required and assessed in this report.



Figure 1: The powerline options from the Esizayo WEF to the Komsberg substation originate at either the yellow and turquoise substations. The powerlines all run through the Western Cape Province, but then terminate at the Komsberg substation, which is immediately across the provincial boundary in the Northern Cape Province. There are two yellow powerline options and two turquoise powerline options to the Komsberg substation.

1.1 Scope of Work

This Heritage Impact Assessment considers the potential impacts of the proposed construction of a 2km long powerline connecting the Esizayo WEF to the Komsberg substation (**Figure 1**). 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 as well as a site visit in March 2016.

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 HWC, 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 according to 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 Esizayo WEF falls inside the boundaries of the Western Cape. The heritage authority responsible for providing comments (in terms of Section 38(8) of the NHRA) on the proposed development is Heritage Western Cape.

Heritage Western Cape (HWC) is required to provide comment on the proposed project in order 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).

Not all these wind farms have received environmental authorisation.

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 Esizayo WEF in March 2016. It assumes that the heritage resources immediately to the north of the Esizayo WEF are similar to the heritage resources recorded during the field survey of the wind farm.

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 Esizayo WEF with the Komsberg substation. It is located 28km north-west of Laingsburg, in the Central Karoo District Municipality of the Western Cape Province.

The Esizayo WEF will have a 132kV powerline, with a 250m corridor, linking to the Komsberg substation, a distance of around 2km.

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 4h, 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 4 powerline alternatives have been proposed (**Figure 1**). They are:

- from the yellow substation north, then east to the Komsberg substation;
- from the yellow substation east, then north to Komsberg;
- from the blue substation north to the Komsberg;
- from the blue substation west, then north along the R354 and then east to the Komsberg.

3 DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 Environmental attributes

The Study Area is located some 35 km south-east of Sutherland, beneath the plateaux. The R354 between Matjiesfontein and Sutherland skirts the western edge of the Esizayo WEF.

Although myriad streams are to be found on all the farms, the main channel draining the Esizayo WEF is the Roggeveld River. Old settlements tend to focus on the water resources and along river valleys. These areas contain numerous kraals, located near water and built against the rocky ridgelines along the valley sides.



Plate 1: View in a north-westerly direction across the landscape for the proposed Esizayo WEF. Note the location of the Aurora farmhouse in the centre of the photograph.

4 FINDINGS FOR THE ESIZAYO POWERLINE

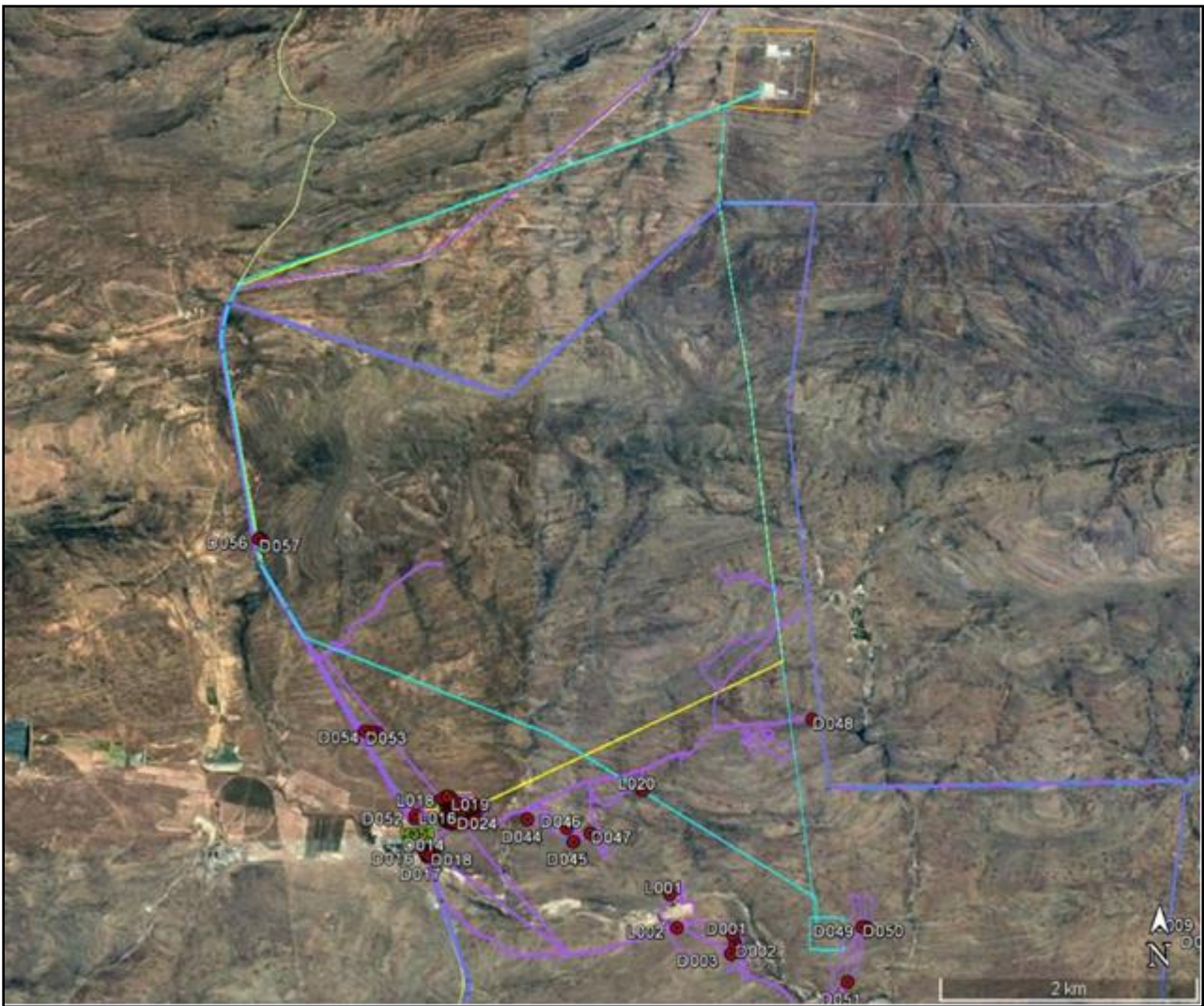


Figure 2: The farm boundaries are outlined in purple and our survey tracks are shown in mauve. The Komsberg substation is located to the north of the Esizayo Wind Farm, and is shown in orange. The two blue powerline alternatives from the blue substation to the Komsberg are visible, but the two yellow powerline alternatives from the yellow substation are obscured by the blue lines. The concentration of archaeological sites (red dots) on the yellow substation is clear. Note also Rock Art sites, Sites D056/D057, along the R354.

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. The field survey identified the following heritage resources within the boundary of the Esizayo WEF and we may assume that similar heritage resources will be found along the route of the powerline options. The powerline routes have not been field tested:

- A few large scatters of LSA stone artefacts were identified. Two scatters were found on the talus slopes, below the rock art sites. They are of medium significance;
- A few “pastoralist settlements” were identified containing LSA artefacts, ceramics and grindstones along dry river beds in the bottom of valleys. They are of medium significance;

- At least two rock art sites were identified within the boundaries of the WEF and another rock art site was recorded *along the route of two powerline alternatives* which follow the R354. They are of high significance;



Plate 2: The rock art panel next to the R354 includes some human figures, cross-hatching and finger daubs (Site D056/D057). There is a considerable distribution of stone artefacts on the talus slope in front of the site.

- The Nuwerus cemetery is located next to the R354. There are also several other potential graves/cairns within the study area. They are of high significance;
- There is a spread of early 20th century historical material on the lower slopes of two koppies, in association with several stone enclosures (fortifications) on the farm Aanstoot, on the location of the yellow on-site substation. They may represent the debris from the South African War. This site is of high significance;



Plate 3: Some of the historic tin cans found on top of a small hill, together with numerous stone walled enclosures, possibly relating to the South African War.

- 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.

An examination of Google Earth imagery suggests that there are no significant heritage sites on the high lying ridges which separate the Esizayo WEF with the Komsberg substation.

4.3 Historical Background

Heritage Western Cape's response to the NID did not include a request for information on the Built Environment. However, many of the farmhouses in the Roggeveld and Sutherland environment have historic farmhouses and they are briefly described and illustrated below.

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. According to 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.

There are no buildings along the routes of the powerline or substation alternatives.

4.4 South African War

During the South African War, the threat of Boer incursions led British forces to build fortifications at several strategic passes through the Roggeveld. With Manie Maritz active in the district, many young men from the Roggeveld joined the Boer cause. A stone redoubt was built at the top of the Brandkloof and Maleishoek passes. Orton & Halkett (2011) reported finding stone-walled structures relating to the South African War on the farm Jakhalsvalley 99, outside Sutherland. They related that stone-walled defensive enclosures were made by both Boer and British and it is difficult to distinguish between them, even when they are associated with historic tin cans, glass and ceramics.

The yellow on-site substation alternative for the Esizayo WEF (Aanstoot 72) is located on top of a little koppie which has a number of stone walled enclosures and associated historic midden material, probably from the South African War.

4.5 Cemeteries and Graves/Cairns

Farm cemeteries and graves have been recorded on the Esizayo WEF. The cemeteries are generally closely associated with farm settlements but in the case of Aanstoot, the cemetery is separated from the farmhouse of Klawer by the R354. There are also several isolated graves in the veld, many of them covered with flat slabs and without headstones. These are very difficult to identify. It seems highly unlikely that any burials or graves will occur along the 2km powerline linking the Esizayo WEF with the Komsberg substation as there are no farm houses along this route.

4.6 Landscape and Scenic Routes

Hart (2016) describes the Cultural Landscape of the region thus: “The ridge tops where the proposed activities will take are windswept and bleak; some areas are completely devoid of farm tracks making access to the higher mountain areas a tortuous task. The sense of isolation, nature and desertification do impart a certain beauty and distinct sense of place. Overall a Grade IIIB is recommended (medium local significance), however there are enclaves of high aesthetic value and views from the higher ridges are spectacular and worthy of Grade IIIA”.

Per 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.

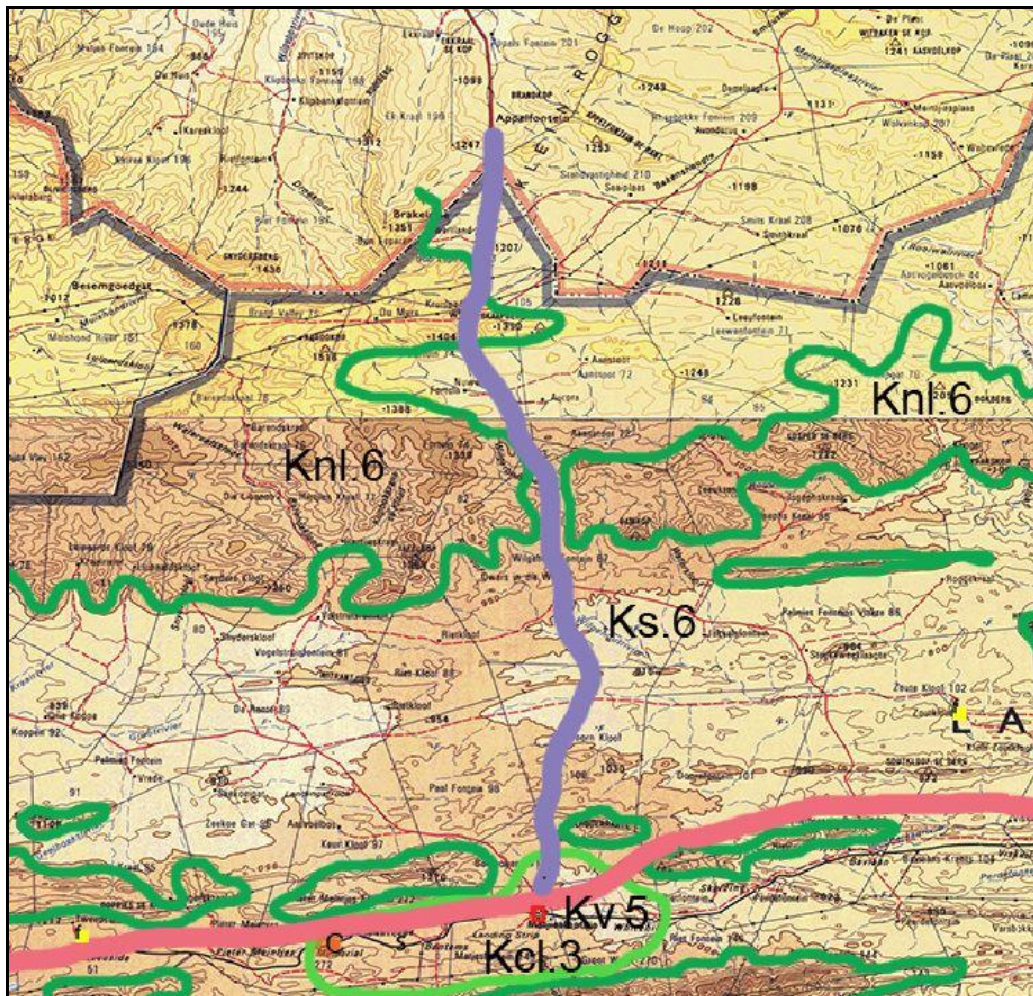


Figure 3: A landscape assessment by Winter & Oberholzer (2013) identifies the R354 (purple line) as a route of high scenic and rural value and an important tourist route to Sutherland (Route III). The abbreviation Knl.6 represents the Klein Roggeveldberge which is described as lying on an important scenic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

The VIA report by Belinda Gebhardt is attached separately.

4.7 Anticipated Impacts to the heritage of the Area

4.7.1 Construction Phase

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. Generally the

potential for direct impacts, when the pylon is placed directly on top of an archaeological site or grave, are low. Indirect impacts however may also occur. With respect the two proposed powerline alternatives which run parallel to the R354, they will pass in close proximity to a small rock face which includes a painted shelter. The potential impacts which may occur include the vandalism of the rock art by the construction workers.

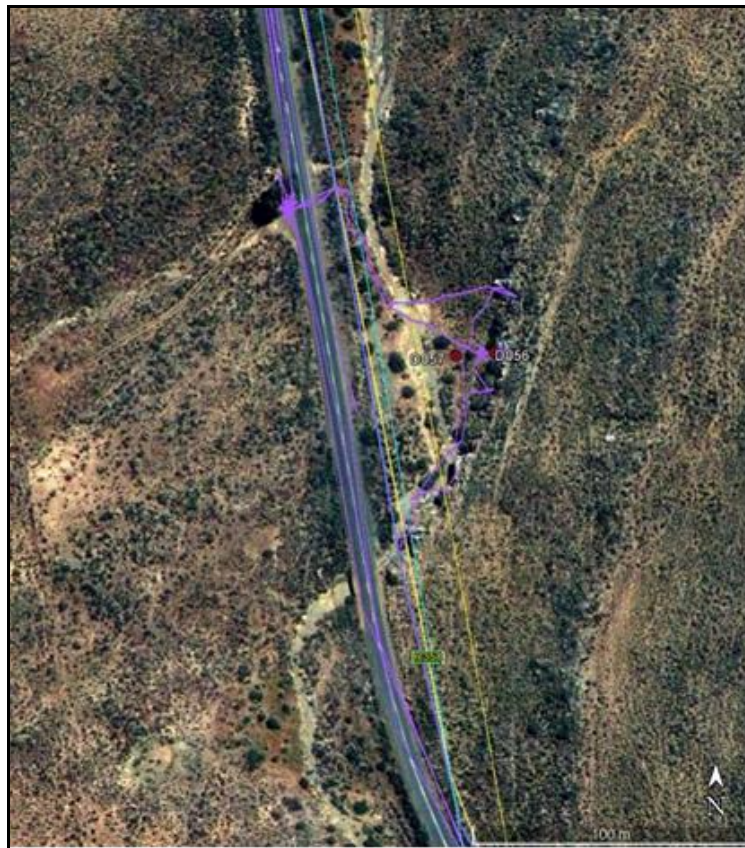


Plate 4: The painted shelter along the R354 (Sites D056/D057) are near the position of two powerline alternatives (blue and yellow).

With regard the construction of electrical infra-structure in the form of sub-stations. Substation 1 is positioned on the top of a dense scatter of archaeological material dating to the early 20th century and appears to be a temporary South African War settlement. The construction of the substation and associated infrastructure, such as access roads and construction camps, will result in the destruction of the stone enclosures and historic material on and around the small hillside.

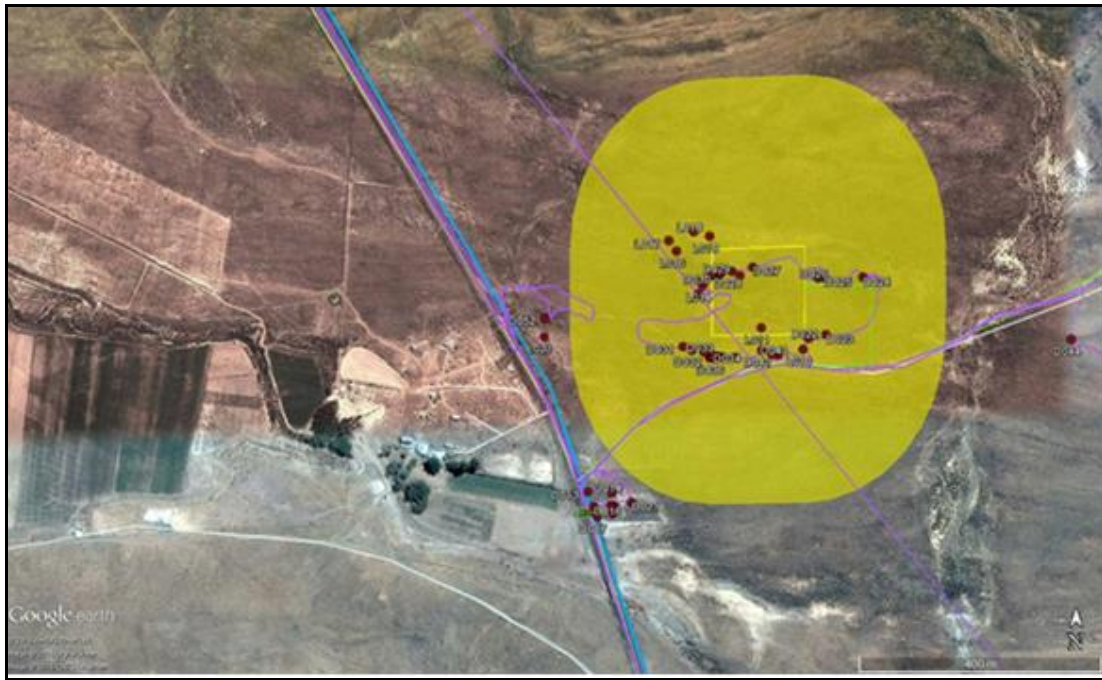


Figure 4: A close-up view of the sensitive heritage locations (red polygons) on the farms Aanstoot and Aurora close to the R354. The substation (1) near the road is situated on a number of stone wall structures and associated historic material indicating a site/s of significance during the South African War. It is preferable that substations 2 (the turquoise square) is used instead to avoid impacts.

4.7.2 Operational Phase

No impacts are anticipated during the operational phase.

4.7.3 Dec-commissioning Phase

No impacts are anticipated during the decommissioning phase.

5 ASSESSMENT OF IMPACTS

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 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.

The early 20th century scatters of historical material and stone structures, possibly from the South African War, on the farm Aanstoot must be conserved (**Figure 4**). The construction of substation 2 (yellow substation) will result in the destruction of this site. Mitigation, in the form of archaeological excavations, means that while the material may have been retained and conserved in a museum, the context of the archaeological site has been lost forever. This particular site, which comprises a number of stone-walled structures as well as an extensive spread of historic material, would be technically difficult to excavate and record. *For this reason, it is recommended that this location is declared “No-Go”.*

With respect to **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 (No-Go) during construction are recommended. It is therefore recommended that suitable measures are taken to fence off/declare off limits Sites D056/D057 (Plate 4).*

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 graveyards should be declared “No-Go” areas.

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).

The severity impacts to heritage are likely to range between “low” on the tops of the ridges and “moderately severe”. Mitigation, in the avoidance of sensitive sites, is possible.

Table 3: Two No-Go areas to be mitigated

Powerline - No-Go									
Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)	Status (+ve or -ve)	Confidence	
Powerlines running along R354, will impact on the rock art site D056/057		Negative impacts - potential vandalism of rock art							
	Without Mitigation	2	5	8	4	60	Medium	-	Medium
	degree to which impact can be reversed:	Heritage resources are non-renewable and destruction is permanent							High
	degree of impact on irreplaceable resources:	Rock art has high heritage significance and the site may potentially be vandalised if its location is made public							High
	Mitigation Measures	Use alternative powerline options or make the rock art site off limits during construction							High
	With Mitigation	1	5	4	2	20	Low	-	Medium
Construction of Substation 1 will result in destruction of South African War military outpost		Negative impacts - destruction of site							
	Without Mitigation	2	5	8	4	60	Medium	-	High
	degree to which impact can be reversed:	Heritage resources are non-renewable and destruction is permanent							High
	degree of impact on irreplaceable resources:	High impact							High
	Mitigation Measures	Use alternative substation 2							High
	With Mitigation	1	5	0	1	6	Low	-	Medium

6 MITIGATION AND MANAGEMENT MEASURES

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
 - The hill and surrounds on which the yellow substation (substation 1) is located, must be declared a “No-Go” area;
 - The rock art site next to the R354 must be protected from vandalism, either by a temporary fence during construction, or else by supervision of construction staff. Alternatively, use the other line options;
 - If any high concentrations of archaeological material, such as stone artefacts are recovered, HWC must be notified;

- If any human remains are uncovered during the excavations for pylons, work must stop in that area and HWC must be alerted immediately.

Activity	Mitigation and management measure	Responsible Person	Applicable Development Phase	Include as Condition of Authorisation	Monitoring requirements
Construction	Hill on which yellow substation is located must be declared a "No Go" area;	ECO	Construction	Yes	No
	Rock art site D056/D057 along R354 must be protected from vandalism	ECO	Construction	Yes	Yes, periodic check by ECO
	Report high concentrations of archaeological material	ECO	Construction	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.

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 Genhardt) 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 all be protected.
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8 CUMULATIVE IMPACTS

A number of renewable energy facilities have been proposed 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 4: View of powerlines from the Komsberg substation.

9 CONCLUSIONS

The following highly sensitive areas have been identified and they should be declared *no-go* areas during the construction:

- Potential South African War stone structures and historic material on a small koppie on Esizayo (the location for the yellow substation);
- The rock art site (D056/057) next to the R354;

The following heritage recommendations are proposed

- No-Go areas should be avoided;
- This desktop assessment of the powerline options, recommends that the inland route is followed to the Komsberg substation. If this is not followed, the suitable measures should be put in place to protect the rock art site next to the R354, which may be vandalised by construction crews during the erection of the powerline;
- Once the final powerline option has been determined, it may be necessary to undertake a field assessment to assess sensitive locations along the powerline route. Micro-siting of pylons may be required;
- If any archaeological remains, including human remains, are uncovered during construction, then work must stop in that area SAHRA must be notified.

From a heritage perspective, it is preferable that the inland powerline option to the Komsberg substation is selected.

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Table 2a: Archaeological Sites (and Built Environment) recorded during the field survey for Esizayo WEF (NCW = No research potential or other cultural significance). Farm Aanstoot 72 = Aa; Annex Joseph's Kraal 84 = AJK; Aurora 285 = Au.

Farm	Site	Lat S Lon E	Lon E	Type	Description	Significance
Aa	L001	-32.99082496	20.58594799	"Kraal"	Rectangular stone structure (kraal?), skin walling with inner rubble, about 1m high in one corner. Size 2.5m x 2.5m, associated with white refined earthenware and green glass. Against small koppie, overlooking stream	IIIC
Aa	L002	-32.99313200	20.58651301	Homestead	Aurora farmhouse, older core with "solder" outside and old kitchen hearth. But with many additions, including red brick. A large stone kraal next to the house, between it and the river.	IIIC
Aa	L003	-32.99972797	20.59818104	"Kraal" or shepherd hut	At base of small koppie, a small square structure, about 2m x 3m. Stone packed walling with outer skin and inner rubble. A small stone semi-circle attached to the back – a kookskerm? About 5 m from a small stream, across the stream old dump with ash, burnt bone, clear glass and <i>Patella miniata</i> shell.	IIIC
Aa	L004	-32.99954298	20.60734699	Cave with paintings and stone artefacts	Small overhang on edge of long kloof. Finger paintings (daubs in red). In groups on all the flat surfaces, 7, 6, 6, 6, 5, 3. Down along the talus slope are artifacts, oes and one modified cartridge case. Two cores (chert & hornfels), 2 large hornfels flakes, 1 hornfels bladelet, 7 chert flakes, 1 quartz crystal flake, 1 ccs backed bladelet, 1 tiny thumbnail chert scraper.	IIIA
Aa	L006	-33.00654598	20.60408399	Stone scatter	Small scatter of quartz flakes and chips over small area near test mast. Quartz has grainy appearance.	NCW
AJK	L007	-33.00929097	20.65162498	Homestead	Die Bron, abandoned house. Shed, including stone shed. Small stone rondavel with reed roof, cement lined square reservoir, stone kraal behind house, near a large dam/weir.	IIIC
Aa	L008	-32.99033102	20.67439601	Stone artefact scatter	6 quartz chunks, chips and flakes, over a small area. Grainy quartz.	NCW
Aa	L009	-32.99274299	20.63053703	Stone artefact scatter	Along sandy banks of river, a single slug (Wesley Richards?), an indurated shale core and one chert adze/reduced core?	NCW
Au	L010	-32.98570303	20.56940203	Boer War scatter	Historic (Boer War?) tin cans (round with lead dot on base), spread of aqua glass	IIIC
Au	L011	-32.98538502	20.56866501	Boer War scatter	Extension of above	
Au	L012	-32.98462403	20.56828396	Boer War scatter	As above, four tin cans and some purple glass, on the koppie, near L013	IIIC
Au	L013	-32.98462504	20.56777501	Stone kraal/ fortification	A roughly rectangular shaped stone wall structure, on the edge of the koppie. 6m x 3m. Roughly packed. Plus some broken glass and a tin can nearby.	IIIC
Au	L014	-32.98476996	20.56762900	Stone kraal/ fortification	A circular stone structure below the koppie (2mx3m), it has a small annex in stone (2mx3m). Dense accumulation of metal, and glass (20 th Century).	IIIC
Au	L015	-32.98489803	20.56755398	Historic midden	Large spread of 20 th century midden material	NCW
Au	L016	-32.98426403	20.56717101	Stone kraal/ fortification	Semi-circle of stone, on the edge of a little ridge, overlooking the road (R354), 3mx4m. Packed rubble, there does not appear to be any associated historic rubbish	IIIC
Au	L017	-32.98410896	20.56703699	Stone kraal/ fortification	4 th stone structure on the koppie. A stone circle looking up the R354 toward the pass. 3mx4m. Roughly packed, no historic rubbish	IIIC
Au	L018	-32.98398198	20.56747201	Stone kraal/ fortification	5 th stone structure. A long oval extent, about 7m x 3m. But the ends of the oval are better packed than the central sections. 1 sardine can.	IIIC
Au	L019	-32.98404601	20.56775196	Stone kraal/ fortification	A structure on the koppie which seems to have collapsed in onto itself. 2m x 3m. No historic material nearby.	IIIC
Au	L020	-32.98354000	20.58362704	Stone walling	A short section of stone walling in front of a shelter next to a small waterfall. No associated material.	NCW
Au	L021	-32.98551897	20.56485501	Stone ruins	Next to the road, a square building, only one course of rough stones left. About 3mx3m. Associated with ceramics, glass, metal and wire.	IIIC
	D001	-32.99366903	20.59116698	Stone walling	Stone alignment /walling -possible kraal?	NCW
	D002	-32.99428602	20.59135297	Stone walling	Rock ledge with crude stone walling	NCW

	D003	-32.99495799	20.59101200	Stone artefact	Isolated chert bladelet core - LSA	NCW
	D004	-32.99922799	20.59706398	Stone Scatter	Small artefact scatter on rocky outcrop – quartzitic material, mostly flakes, some large. 1 small grey chert bladelet. Nearby is a place where large slabs of rock have been quarried for boundary markers.	IIIC
	D005	-32.99918097	20.59721301	Graves?	Possible graves x3	IIIB
	D006	-33.00043900	20.60658096	Stone walling	Isolated section straight (boundary?) walling separated by a gap from D007	NCW
	D007	-33.00027204	20.60639002	Stone walling	Isolated section straight (boundary?) walling separated by a gap from D006	NCW
	D008	-33.00696901	20.60080399	Stone artefact	Isolated very weathered MSA flake	NCW
	D009	-33.00887103	20.63765201	Stone scatter	Scatter of ESA artefacts near quarried lens of material – flakes/cores	IIIC
	D011	-32.99261701	20.63075596	Stone scatter	Isolated lower grindstones x2 next to stream. Lita notes a few flakes, 1 core, 1x adze (chert)	IIIB
	D012	-32.99297802	20.63066502	Grindstone	Lower grindstone on slab	NCW
	D013	-32.98780496	20.56562204	Cemetery	Cemetery – fenced. Some headstones and crosses	IIIA
	D014	-32.98781502	20.56604700	Cemetery		IIIA
	D015	-32.98801300	20.56603200	Cemetery		IIIA
	D016	-32.98802197	20.56572204	Cemetery		IIIA
	D017	-32.98817502	20.56578699	Cemetery	Area outside formal cemetery containing “informal graves – stones. 1x LGS found on one of the graves.	IIIA
	D018	-32.98812700	20.56606402			
	D019	-32.98800998	20.56604298			
	D020	-32.98801702	20.56608899	Cemetery	Outlier grave and few hornfels artefacts scattered about	IIIA
	D021	-32.98796003	20.56639401	Grave?	Possible grave	IIIC
	D022	-32.98554101	20.56949699	Grave ?	Isolated grave – foot/head stones	IIIC
	D023	-32.98548401	20.56980000	Boer War scatter	Area containing a number of Anglo-Boer era tin cans, some glass	IIIB
	D024	-32.98464398	20.57044096	Stone fortification	Large stone walled enclosure on top of prominent low koppie. Walling covers most of the top of the koppie. Suspect this is a military feature (lookout/fortification). A few green glass fragments, and occasional isolated MSA artefacts.	IIIB
	D025	-32.98464700	20.56975901	Boer War scatter	Tin can	IIIB
	D026	-32.98465798	20.56965801	Boer War scatter	Tin can	IIIB
	D027	-32.98449897	20.56850499	Boer War scatter	Iron chunk	IIIB
	D028	-32.98456200	20.56814399	Boer War scatter	Tin can	IIIB
	D029	-32.98458899	20.56794399	Boer War scatter	Tin can, small stone structure	IIIB
	D030	-32.98460802	20.56792002	Boer War scatter	Tin can	IIIB
	D031	-32.98566297	20.56729096	Boer War scatter	Tin can lid, glass	IIIB
	D032	-32.98571401	20.56744703	Boer War scatter	Tin can	IIIB
	D033	-32.98574503	20.56766496	Boer War scatter	Concentration of tin cans. Also some glass and other metal frags	IIIB
	D034	-32.98579498	20.56781801	Boer War scatter	Tin can	IIIB
	D035	-32.98580403	20.56790099	Grave?	Possible grave. Tightly packed stone mound, semi-circular. A number of tin cans scattered about.	IIIC
	D036	-32.98583102	20.56784400	Grave ?	Possible grave	IIIC
	D037	-32.98582398	20.56779203	Grave?	Possible grave	IIIC
	D038	-32.98582499	20.56776001	Grave?	Possible grave	IIIC
	D039	-32.98581501	20.56798096	Grave?	Possible grave	IIIC
	D040	-32.98582197	20.56820903	Grave?	Possible grave??	IIIC
	D041	-32.98571804	20.56867397	Stone kraal	Small stone enclosure – single stone high	IIIC

	D042	-32.98577604	20.56886299	Boer War scatter	Tin cans, few ceramics (white glassy material)	IIIB
	D043	-32.98578501	20.56896399	Boer War scatter	Tin can	IIIB
	D044	-32.98556004	20.57411098	Boer War scatter	Tin can	IIIB
	D045	-32.98709996	20.57789398	Stone kraal	Stone enclosure – crescent-shaped, 1x tin can on turbine road	
	D046	-32.98616404	20.57734204	Stone kraal/ fortification	Stone enclosure where the centre has been dug down marginally. Looks like hole dug first and soil piled around then walling placed on top of the surrounding mound. Suspect this is military?	IIIB
	D047	-32.98654600	20.57931899	Stone kraal?	small circular stone enclosure approx. 1.5 meter diam. Views obscured by hilly ground so not sure if military?	IIIC
	D048	-32.97864798	20.59761199	Boundary markers	Line of boundary markers of local stone slabs	NCW
	D049	-32.99312102	20.60226504	Stone artefact	Isolated weathered MSA chert flake with retouch	NCW
	D050	-32.99309797	20.60188802	Stone scatters	Small number of very weathered Hornfels artefacts, all likely to be MSA. 1x chert blade.	IIIC
	D051	-32.99694300	20.60070299	Stone artefact	Isolated weathered Hornfels flake MSA?	NCW
	D052	-32.98524597	20.56486197	Stone kraal	semi-circular stone enclosure built up against an outcropping ridge approx. 3m long. One wall collapsed inward. 1x farg telephone insulator, 1x frag refined earthenware. Unsure of age.	IIIC
	D053	-32.97944401	20.56067697	Stone wall	Three points on a stone boundary wall partially destroyed by borrow pit. The wall is mostly on the property to the west of the road but makes a right angle on this farm. Clearly visible on Google Earth.	NCW
	D054	-32.97950604	20.56126596			
	D055	-32.97955298	20.56170098			
	D056 D057	-32.96614897 -32.96616096	20.55210597 20.55195400	Cave with paintings and stone aretefacts	Shallow overhang in rock face with rock paintings. Small level floor with shallow deposit. Numerous LSA artefacts on talus, including pottery, oes. A few Adzes, backed scraper, side scraper, flakes, chunks, predominantly on grey chert, others on quartzitic material. Possible re-use of older MSA flakes for adzes. Two painted panels at left – 2x distinct human figures (fl) one appears to have tassles from bag? At far left – lines with cross hatching. 3-4 meters to right, 10 finger daubs. Also several dubs and smudges. All paint red.	IIIA

Table 5: Cumulative Impacts – Wind Heritage

PROPOSED DEVELOPMENT NAME	DEA REFERENCE	CURRENT EA STATUS	PROONENT	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	14/12/16/3/3/2/395	S&EIR	Networkx Eolos Renewables (Pty) Ltd	12 000	280 MW			M	L	M	M													<ul style="list-style-type: none"> For archaeology, open air sites mitigated either in the form of conservation of the sites with development or by a Phase 1 where the sites will be recorded and sampled before the client can apply for a destruction permit for these sites during development. All grave sites should be identified before the development and avoided. It is not envisaged that the built environment will be directly impacted on during development. Should any buildings more than 60 years need to be demolished the site should be assessed by a conservation architect. Formal and informal cemeteries are scattered across the region. These should be preserved within a development where possible, but this must be not possible, but this must be the last resort and is not advisable.
Proposed development of renewable energy facility at the Sutherland site, Western Cape	12/12/20/1782/AM1	S&EIR	Mainstream Power Sutherland	28 600	811 MW			L	M	L	M													<ul style="list-style-type: none"> For archaeology, micro siting of turbine positions during the EIA should be done. If micro siting is not achieved, some physical mitigation measures may be required (excavation or collection) and a permit may be required from the relevant authority in order to undertake such mitigation measures. For the built environment, micro siting of turbine positions and associated infrastructure must be done during the EIA.

PROPOSED PROJECTS	DATE	CURRENT	PROPOSED	EXT	PROPOSED	FA	IMPACTS	PROPOSED MITIGATION MEASURES
Northern Cape.								<p>EMP to avoid placing turbine infrastructure directly over environment features and built bisecting coherent complexes.</p> <ul style="list-style-type: none"> For graves, once the exact position of infrastructure is known, a more detailed assessment of the access roads, construction roads, laydown roads, substation positions and cable routes needs to be undertaken to identify marked graves within the affected area. In the case of unmarked graves, a protocol will need to be a protocol in place in order to deal with them on a case by case basis if and when discovered during the course of construction. HWC will be notified immediately if a human remains are uncovered during construction. Work in the specific area must stop pending inspection and mitigation as required. For cultural landscape, any facilities on site must be placed in a way that avoids visual clutter.
Proposed Hidden Valley Wind Energy Facility, Northern Cape	12/12/2020/2370/2	S&EIR	Hidden Valley Wind-African Clean Energy Developments (Pty) Ltd	9530	150 MW	L		<ul style="list-style-type: none"> A 10m perimeter boundary fence must be established around the heritage structures (dry packed walling dwelling on Portion of the Orange Fontein 201 (HV) adjacent to the farm gravel road) and during all construction and development activities. If concentrations of archaeological materials are exposed during construction, then all work must stop and an archaeologist to investigate for human remains (or any concentrations of archaeological heritage material) are exposed during construction, all work must cease and must be reported immediately to the nearest museum or archaeologist in the SAHRA, so that a systematic professional investigation can be undertaken. Sufficient time should

PROPOSED PROJECTS	DATE	CURRENT	PROPOSED	EXT	PROPOSED	FA	IMPACTS	PROPOSED MITIGATION MEASURES
								allowed to investigate and to re collect such material.
Proposed Hidden Valley wind energy facility , Northern cape	12/12/20/2370/3	S&EIR	Hidden Valley Wind-African Clean Energy Develop ments (Pty) Ltd	9 180	150 MW		L	<ul style="list-style-type: none"> Refer to 12/12/20/2370/2 above.
Proposed Hidden Valley wind energy facility , Northern cape	12/12/20/2370/1	S&EIR	Hidden Valley Wind-African Clean Energy Develop ments (Pty) Ltd	13 620	150M W		L	<ul style="list-style-type: none"> Refer to 12/12/20/2370/2 above.
Proposed Hidden Valley wind energy facility , Northern cape	12/12/20/2370	S&EIR	Hidden Valley Wind-African Clean Energy Develop ments (Pty) Ltd		650 MW		L	<ul style="list-style-type: none"> Refer to 12/12/20/2370/2 above.
Proposed Constructi on Of The 140Mw Roggeveld Wind Farm Within The Karoo Hoogland Local Municipality Of The	12/12/20/1988/1/AM1	Amend ment	G7 Renera ble Energies (Pty) Ltd	26 529	140 MW		L L L M	<ul style="list-style-type: none"> For colonial archaeology, a fi down of the proposed route of alignments and transmission lin be done. Heritage resources identified, flagged and avoided construction. No substations built in prominent positions o sight of historic farms. These should be avoided for power line For the built environment, micro turbine positions and as

PROJECT NAME	DATE	CURRE	PRO	EXT	PRO	FA	IMPACTS	PROPOSED MITIGATION MEASURES
Northern Cape Province And Within The Laingsburg Local Municipality Of The Western Cape Province								<p>infrastructure must be done du EMP to avoid placing tur infrastructure directly ove environment features and buil bisecting coherent se complexes. The sensitive r vacant buildings is encouraged as advice is sort on sensitivities) as this will help them.</p> <ul style="list-style-type: none"> No practical mitigation meas impacts on the cultural landscap
Proposed Photovoltaic (PV) Solar Energy Facility On A Site South Of Sutherland, Within The Karoo Hoogland Municipality Of The Namakwa District Municipality, Northern Cape Province	12/12/202235	BAR	Inca Komsberg Wind (Pty) Ltd	2	10 MW		L N/A L H	<ul style="list-style-type: none"> Use Option 1 as it has the pre stone-walled structures abou north of it compared to Option they are <50 m to the east of it. Consider option 1 as it does n Anglo-Boer War sites. Option 1 is preferable visually partially screened by a low ro that lies between it and R354 the central and eastern parts o would be visible.
Proposed establishment of the Suurplaat wind energy facility and associated infrastructure on a site near Sutherland, Western Cape and	12/12/201583	S&EIR	Moyeng Energy (Pty) Ltd	28 600	120 MW		L L H H	<ul style="list-style-type: none"> Existing farm tracks must be re upgraded to minimise the an change to un-transformed lands In general terms, construction of and roads in valley bottoms sh kept to a minimum. Archaeolog close to the access ro Hartebeestfontein and in the bottoms close to the roads Klipfontein and Modderfontein v active protective intervention a archaeological sampling. Any pre-colonial kraal comple

PROPOS	DEAR	CURRE	PROP	EXT	PROP	FARM		IMPACTS	PROPOSED MITIGATION MEASURES
Northern Cape.									<p>will be affected by the proposed should be mapped, and measures to protect the sites.</p> <ul style="list-style-type: none"> • During the detailed planning drawings of proposed road alignment infrastructure and near-final positions should be submitted to an archaeologist for review and proofing. Micro-adjustment of alignment and turbine positions is likely sufficient to achieve adequate mitigation. • A “walkdown” of final cable route all power lines, substation sites and access roads will be required. • If farm buildings at Louw s and Modderfontein are to be re-used middens should be protected. • It is illegal at all times to demolish change and archaeological sites without permit. • Conserve old buildings, kraals and wall alignments – do not demolish damage. • Do not demolish wind pumps. If these are protected structures and are greater than 60 years of age they should be conserved. • Follow a policy of non-intervention. Farm buildings such as those at Modderfontein should be conserved or rehabilitated. • Theft of fittings from buildings should be monitored and offenders fined or charged under NHRA. • Seek guidance from a heritage consultant if any buildings are to be restored. • Keep infrastructure at least 500m away from all farm complexes as most of the elements that are of heritage value are in the farm complexes. • Apply to the relevant provincial authorities to demolish or alter historic structures (buildings, etc.)

PROJECTS	DATE	CURRENT	PROPOSED	EXT	PROPOSED	FA	M	IMPACTS										PROPOSED MITIGATION MEASURES
Proposed Touwsrivier Solar energy facility	12/12/201956	S&EIR	Unknown	215	36 MW			L	L	L		L	L	L	L	L	M	<ul style="list-style-type: none"> For cultural landscape, the old embankments would provide considerable amount of screening for proposed activity from the N1. No mitigation measures are required with respect to prehistoric archaeological heritage as no significant finds were identified within the area. Depending on the type and location of grid connection selected, the final walk down of the transmission line would be negotiated so that tower positions can be adjusted to avoid any sensitive areas. The old 1876 rail alignment is protected as an archaeological site as an element of the built environment. The 1930 railway line alignment, station foundations, 1946 tunnels are protected as elements of the environment over 60 years of operation. It is recommended that a policy of no intervention is implemented where structures are left as is. Any necessary changes, destruction or physical alteration of these structures would necessitate applying for a permit to modify a protected structure under HWC. It is recommended that in the interests of resource conservation and sustainability, re-use of ballast from the 1930 railway alignment is permitted provided that the structure remains a legible feature in the landscape. This means not demolishing the embankments, culverts, cuttings or other railway related features.
		Total Ha	Total MW															
		128 276	2667 MW															
Significance Totals	Significance			Total Hectares per impact														

