# ARCHAEOLOGICAL IMPACT ASSESSMENT REPORT

**FOR THE PROPOSED GUNSTFONTEIN WIND ENERGY FACILITY,**

**NORTHERN CAPE**

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**EXECUTIVE SUMMARY**

**EXECUTIVE SUMMARY**

**Site name and location:** The Gunstfontein Wind Energy Facility is located approximately 14km south of Sutherland in the Northern Cape. The proposed development is located on the farm Gunstfontein 131.

**1: 50 000 Topographic Map:** 3220 DA
**EIA Consultant:** Savannah Environmental (Pty) Ltd.

**Developer**: Gunstfontein Wind Farm (Pty) Ltd

**Heritage Consultant:** Heritage Contracts and Archaeological Consulting CC (HCAC).
Contact person: Jaco van der Walt Tel: +27 82 373 8491 E –mail jaco.heritage@gmail.com.

**Date of Report:** 16 December 2015.

**Findings of the Assessment:**

The impacts to heritage resources by the proposed development are considered to be acceptable if the correct mitigation measures are implemented. Eight heritage features were recorded during the Archaeological Impact Assessment that focussed on the infrastructure for the project. These consist of Anglo Boer War (South African War) fortifications, rock art, stone cairns and farm labourer ruins. Only one of these features consisting of a fortification will be indirectly impacted on by a tower. Therefore some recommendations are made to protect the site from accidental damage during the construction phase of the project and are discussed in Section 8 of this report.

If the recommendations made in this report are adhered to and based on the approval from SAHRA we are of the opinion that the project can proceed.

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**ABBREVIATIONS**

| |
|---|
| AIA: Archaeological Impact Assessment |
| ASAPA: Association of South African Professional Archaeologists |
| BIA: Basic Impact Assessment |
| CRM: Cultural Resource Management |
| ECO: Environmental Control Officer |
| EIA: Environmental Impact Assessment* |
| EIA: Early Iron Age* |
| EIA Practitioner: Environmental Impact Assessment Practitioner |
| EMP: Environmental Management Plan |
| ESA: Early Stone Age |
| GPS: Global Positioning System |
| HIA: Heritage Impact Assessment |
| LIA: Late Iron Age |
| LSA: Late Stone Age |
| MEC: Member of the Executive Council |
| MIA: Middle Iron Age |
| MPRDA: Mineral and Petroleum Resources Development Act |
| MSA: Middle Stone Age |
| NEMA: National Environmental Management Act |
| PRHA: Provincial Heritage Resource Agency |
| SADC: Southern African Development Community |
| SAHRA: South African Heritage Resources Agency |

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

**GLOSSARY**

Archaeological site (remains of human activity over 100 years old)

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

# 1 BACKGROUND INFORMATION

Heritage Contracts and Archaeological Consulting CC (HCAC) was appointed to conduct an Archaeological Impact Assessment for the proposed Gunstfontein Renewable Energy Project, a development comprising of a 200 MW wind energy facility.

The aim of the study is to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, a desktop study (van der Walt 2013) that includes collection from various sources and consultations; Phase 2, the physical surveying of the study area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey 8 heritage sites were identified. General site conditions and features on sites were recorded by means of photographs, GPS locations, and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report.

This report must also be submitted to the SAHRA for review.

## 1.1 Terms of Reference

### Field study

Conduct a field study to:

a) Visit the proposed tower positions to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest;

b) Record GPS points of identified as significant areas; and

c) Determine the levels of significance of the various types of heritage resources affected by the proposed towers.

### Reporting

Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with Heritage legislation and the code of ethics and guidelines of ASAPA.

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

## 1.2. Archaeological Legislation and Best Practice

Phase 1, an AIA or a HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of a heritage specialist input is to:

- » Identify any heritage resources, which may be affected;
- » Assess the nature and degree of significance of such resources;
- » Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- » Assess the negative and positive impact of the development on these resources; and
- » Make recommendations for the appropriate heritage management of these impacts.

The AIA or HIA, as a specialist sub-section of the EIA, is required under the National Heritage Resources Act NHRA of 1999 (Act 25 of 1999), Section 23(2) (b) of the NEMA and section s.39 (3) (b) (iii) of the MPRDA.

The AIA should be submitted, as part of the EIA, BIA or EMP, to the PHRA if established in the province or to SAHRA. SAHRA will be ultimately responsible for the professional evaluation of Phase 1 AIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 AIA reports and additional development information, as per the EIA, BIA/EMP, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level).

Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 AIAs are primarily concerned with the location and identification of sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for from SAHRA by the client before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare.

Authorisation for exhumation and reinternment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

## 1.3 Description of Study Area

### *1.3.1 Location Data*

The Gunstfontein Wind Energy Facility is located approximately 20km south of Sutherland in the Northern Cape. The project is located on the farm Gunstfontein 131 (Figure 1). The study area falls within a semi-arid region with rainfall mainly in the form of summer thunderstorms.

The topography of the area is undulating and includes low lying sandy areas with several ridges. The area is sparsely populated being limited to a number of farms with farmsteads in low lying areas close to water sources as indicated on the 1: 50 000 map of the area. The road between Matjiesfontein and Sutherland (R356) is located on the western side of the project area with a gravel road traversing the northern portion of the study area roughly east to west. The study area falls mostly within the Karoo Renosterveld

Bioregion as described by Mucina *et al* (2006) with the vegetation described as Roggeveld Shale Renosterveld. Land use in the general area is characterized by sheep farming. The soils of the study area are derived from mudstones, siltstones and sandstones. The sandy soils in the study area are relatively deep, while in some portions it consists of clayey silt soil. The study area is fairly uniform and consists of flat, sandy areas with low bushes with vegetation cover predominantly below knee-height (Figure 2 -5).

### *1.3.2. Location Map*

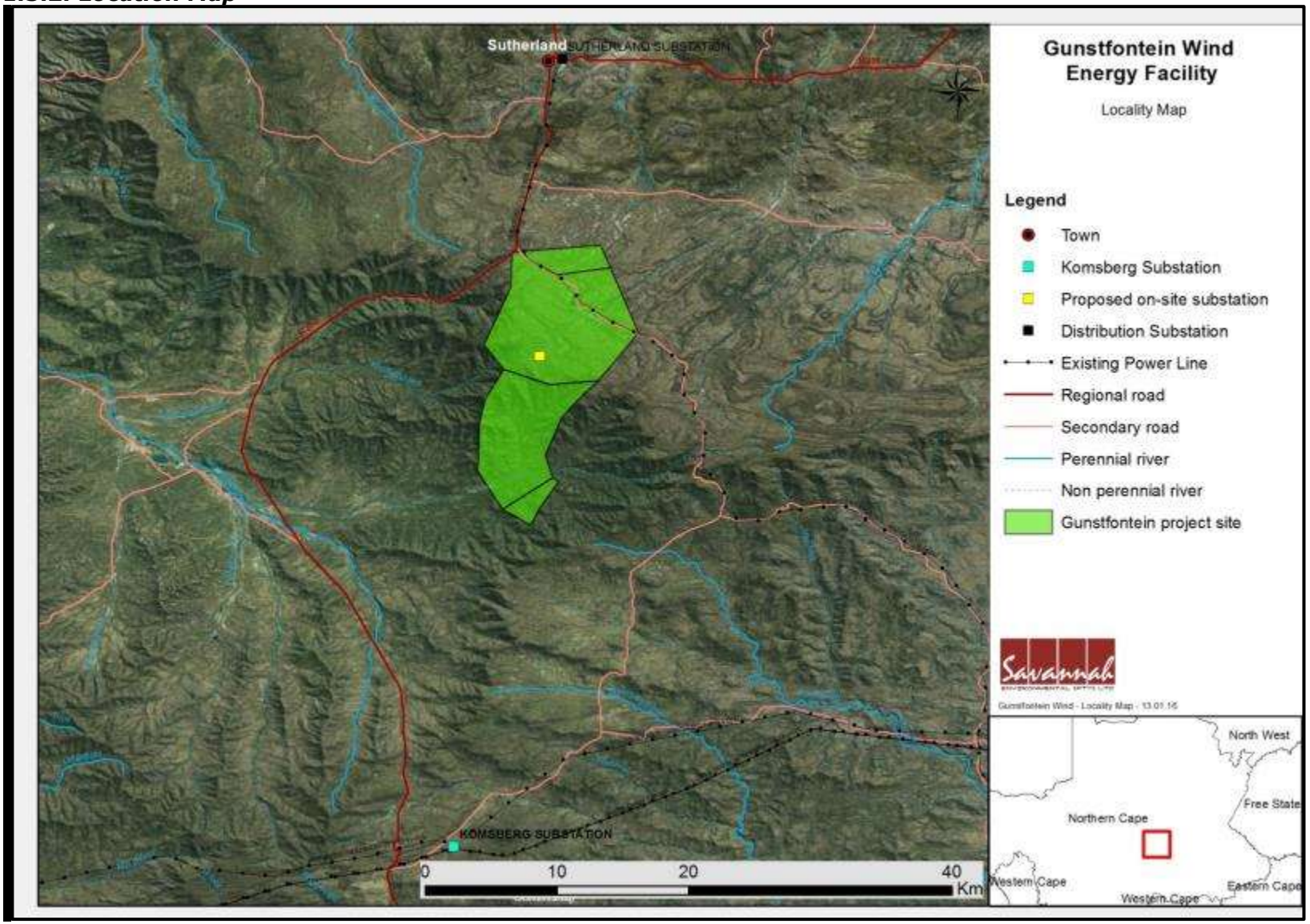


Figure 1: Location map provided by Savannah Environmental (Pty) Ltd.

Figure 2. Rocky ridges in the study area.

Figure 3. Site conditions in the northern portion of the study area.

Figure 4. General site conditions in the central portion of the study area.

Figure 5. General site conditions in the southern portion of the study area.

## 2. APPROACH AND METHODOLOGY

The aim of the study is to cover archaeological databases to compile a background of the archaeology that can be expected in the study area followed by field verification; this was accomplished by means of the following phases.

### 2.1 Phase 1 - Desktop Study

The first phase comprised a scoping study, scanning existing records for archaeological sites, historical sites, graves, architecture (structures older than 60 years) of the area (van der Walt 2013). The following approached was followed for the compilation of the scoping report.

#### *2.1.1 Literature Search*
Utilising data for information gathering stored in the national archives and published reports relevant to the area. The aim of this is to extract data and information on the area in question.

#### *2.1.2 Information Collection*
SAHRIS was consulted to collect data from previously conducted CRM projects in the region to provide a comprehensive account of the history of the study area.

#### *2.1.3 Consultation*
No public consultation was done during the study as this was done as part of the EIA. The team did however consult with the farm owner Mr Andreas Muller regarding graves or sites of archaeological and historical significance.

#### *2.1.4 Google Earth and Mapping Survey*
Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located.

#### *2.1.5 Genealogical Society of South Africa*
The database of the Genealogical Society was consulted to collect data on any known graves in the area.

### 2.2 Phase 2 - Physical Surveying
Due to the nature of cultural remains, the majority of which occurs below surface, a field survey of the study area was conducted. Two layout alternatives consisting of 100 and 68 towers were provided. As a result of ecological reasons the 100 tower alternative is not feasible and therefore the survey focussed on the 68 towers alternative, internal power lines, two substations (a preferred and alternative option) and access routes was conducted over 4 days. The study area was surveyed by means of vehicle and extensive surveys on foot during the week of 5 December 2015. The survey was aimed at covering the proposed infrastructure, but also focused on specific areas on the landscape that would be more likely to contain archaeological and/or other heritage remains like drainage lines, rocky outcrops as well as slight elevations in the natural topography. These areas were searched more intensively, but many other areas were walked in order to confirm expectations in those areas. Track logs of the areas covered were taken (Figure 6).

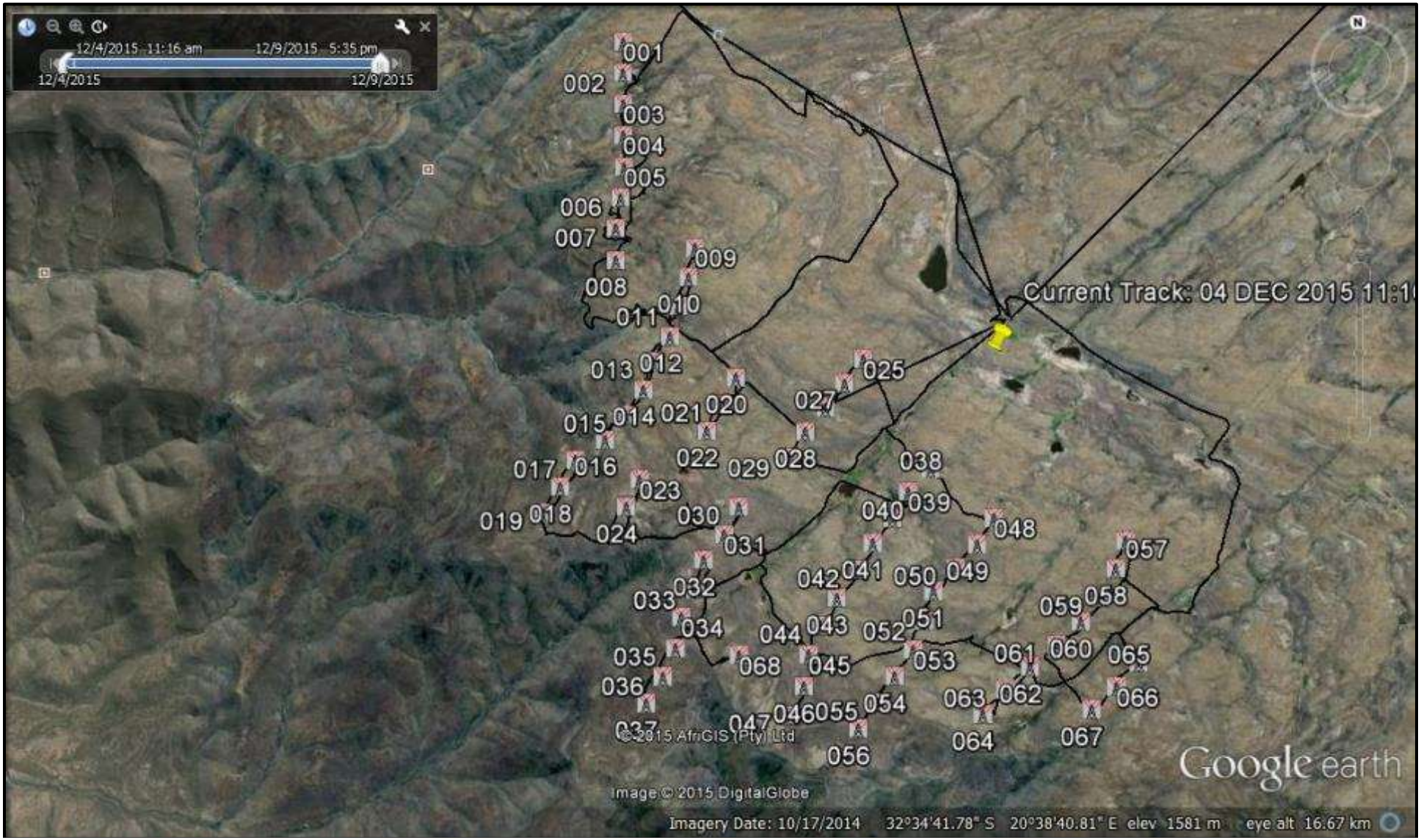


Figure 6. Track logs of the areas surveyed indicated in black.

### 2.3. Restrictions

Due to the fact that most cultural remains may occur below surface, the possibility exists that some features or artefacts may not have been discovered/ recorded during the survey. Low ground visibility of parts of the study area is due to sand cover and vegetation, and the possible occurrence of unmarked graves and other cultural material cannot be excluded. Only the footprint of the development was surveyed as indicated in the location map, and not the entire farm or the power line corridors. This study did not assess living or intangible heritage or the impact on the palaeontology of the area. Although HCAC surveyed the area as thoroughly as possible, it is incumbent upon the developer to stop operations and inform the relevant heritage agency should further cultural remains, such as stone tool scatters, artefacts, bones or fossils, be exposed during the process of development.

## 3. NATURE OF THE DEVELOPMENT

The proposed Gunstfontein Wind Energy Facility project specifications are as follows:

- Installed Capacity - up to 200MW
- No of WTGs - up to 68 No
- MW / WTG – up to 3.0MW
- Rotor – up to 140m
- Hub Height – up to 120m

# 4. HISTORICAL AND ARCHAEOLOGICAL BACKGROUND OF THE STUDY AREA

A detailed scoping report was compiled for this project (van der Walt 2013). The scoping comprised a complete desktop study and below is a short summary of the findings.

## 4.1 Databases Consulted

### *SAHRA Report Mapping Project*

Very little systematic archaeological research was conducted in the area apart from the rescue excavations of a LSA deposit in Sutherland (Evans et al 1985) several CRM projects in the area (Rossouw 2007, Halkett & Webley 2011, Booth 2011 & 2012, Orton & Halkett 2011 and Hart & Webley 2011) provide a baseline of the heritage resources expected for the study area. Several other studies are currently conducted as part of mineral right applications and wind farms but these studies are not in the public domain at the time of this report. From these studies it is clear that the study area is characterised by Pre-colonial and Colonial Archaeology sites consisting of Middle Stone Age scatters, LSA sites containing ceramics, shelters with rock art, structures older than 60 years with middens, stone build kraals and graves.

### *Genealogical Society and Google Earth Monuments*

Neither the Genealogical Society nor the monuments database at Google Earth (Google Earth also include some archaeological sites and historical battlefields) have any recorded sites in the study area.

## 4.2. A Brief History of Human Settlement and Black And White Interaction in the Sutherland Area

The Sutherland area is located in the Southern Karoo, in the low-lying southeastern section with an average height of 700 meters above sea level. This area connects with the Nuweveld and Roggeveld Mountains to the north and west. A high plateau of 1400 meters above sea level is located to the northeast of Sutherland. Some of the mountain peaks of the Nuweveld and Roggeveld Mountain ranges are up to 19 000 meters high (Theron 1983: 3).

Due to the geological nature of the Sutherland area, some early geologists, like E. J. Dunn and A. H. Green, suspected that coal could be found in the region. Two boreholes were dug in 1886 and 1887 respectively near the Kruidfontein Station at Sutherland, but nothing was found. Prospectors also dug for oil; three boreholes were constructed between 1939 and 1970. These endeavors were however equally unsuccessful.

During the excavation for oil it was however discovered that uranium deposits were present in the area. These deposits were spread over a large area, but rewarding concentrations of uranium were in most cases only found in isolated patches. (Theron 1983: 23-24)

Long before black or white people set foot in the Cape, the area was already inhabited. Evidence has been found that the predecessors of today's Khoi-San Bushmen lived in the area thousands of years ago. According to the source of Hocking, the Khoikhoi, nomadic cattle herders, had their forbears in East Africa and lived in the Northern Cape for at least 3000 years and dominated the region until the eighteenth century when the Tswana tribe arrived in the north of the province from the west (Hocking 1983: 2).

It was in the early nineteenth century that the Griqua frontiersmen of the old Cape Colony crossed the Orange River from the south. The Griquas were half white and half Khoikhoi. These people dressed like Europeans and lived aboard wagons, much like the *Trekboere* who migrated northward from the Cape Colony. (Hocking 1983: 2)

The *Trekboer* movement had already begun by the end of the seventeenth century, as the quest for land, grazing and hunting inspired farmers to move into the central spaces of South Africa. These people were semi-nomadic, moving from fountain to fountain by ox wagon, without any desire to build a house or improve the land in which they were living. For more than a generation before the Great Trek, the first migration led to settlement across the Orange River. Trekboer families were however discouraged by the scarcity of surface water in the Northern Cape, and therefore advancement into the area was slow. The first Europeans to settle in the Northern Cape were missionaries, but there was a larger influx of white men into the province during the 1860s and 1870s when diamonds were discovered in Griqualand. (Wagenaar 1984: 122, 128; Hocking 1983: 2)

When Willem Adriaan van der Stel issued grazing licences to stock farmers and lifted the ban on the bartering of cattle in the early eighteenth century, this opened up a new world of possibilities for white farmers. A new attitude was acquired among the stock farmers; he was able to occupy greater areas of land, and would need more land to obtain farms for his children. (Wagenaar 1984: 122, 125)

By the late 1820's, a mass-movement of Dutch speaking people in the Cape Colony started advancing into the northern areas. This was due to feelings of mounting dissatisfaction caused by economical and other circumstances in the Cape. This movement later became known as the Great Trek. This migration resulted in a massive increase in the extent of that proportion of modern South Africa dominated by people of European descent. (Ross 2002: 39)

The discovery of diamonds and gold in the Northern provinces had very important consequences for South Africa. After the discovery of these resources, the British, who at the time had colonized the Cape and Natal, had intensions of expanding their territory into the northern Boer republics.

This eventually led to the Anglo-Boer War, which took place between 1899 and 1902 in South Africa, and which was one of the most turbulent times in South Africa's history. Even before the outbreak of war in October 1899 British politicians, including Sir Alfred Milner and Mr Chamberlain, had declared that should Britain's differences with the Z.A.R. result in violence, it would mean the end of republican independence. This decision was not immediately publicized, and as a consequence republican leaders based their assessment of British intentions on the more moderate public utterances of British leaders. Consequently, in March 1900, they asked Lord Salisbury to agree to peace on the basis of the status quo ante bellum. Salisbury's reply was, however, a clear statement of British war aims. (Du Preez 1977)

Little evidence could be found of skirmishes or battles during the Anglo-Boer War (now refer to as the South African war) in the Sutherland area. One can however visit Anglo-Boer War cemeteries near the town. The graveyards in this area are unique, as the gravestones were etched using handmade sandstone tools. Interestingly, in the English graveyard one soldier is named on two gravestones. This soldier received a communal burial after drowning in a flash flood and a military cross was awarded later by the British government which was placed in the same graveyard. A Jewish graveyard is the resting place of some of Sutherland's business owners. These gravesites are also registered on the database of the eGGSA Library, and information on these graves can be accessed on their site (SA-Venues N/d; eGGSA Library 2008).

The Anglo Boer War left a wake of forts and blockhouses in the area. One such is Rebelskop, a hill topped by the ruins of a fort and named after a Boer division of 200 men that opposed the British forces. Under Commandant Abraham Louw, and reinforced by a further 50 men under the command of Albert Smith from Fraserburg, the rebels rained gunfire into the British-occupied town for 10 hours in a mini-siege.
Other ruins are still visible on the road to Salpeterkop and on the farm Gunsfontein. Here two blockhouses stand on opposite sides of a cliff, guarding a pass (http://www.discoversutherland.co.za/).

Sutherland originated on the farm De List as a centre for the wool producing district of the Roggeveld and was named after Rev. Henry Sutherland, who came to the Roggeveld annually from Worcester for church services. In 1855 it was decided to establish congregations in Sutherland and in 1858, 30 of the 50 available plots were sold. (Open Africa *N/d*).

Some famous figures came from the Sutherland area. The Louw House Museum is a tribute to the family which produced the brothers N.R van Wyk Louw and W.E.G. Louw – big names in South African literature (especially Afrikaans literature). Both were born in the house and both were inspired by the environment they grew up in. N.R van Wyk Louw wrote many poems about Sutherland.

They were not the only writers to be inspired by the town and its environment Anna Jordaan, Datei Pieter Jordaan and D.C. Esterhuyse were also born and raised here.

Another son of Sutherland was the civil engineer Sir Henry Olivier; who specialised in hydroelectric power projects. A tribute to him in the museum shows his accomplishments, such as being the chief engineer in the Kariba Dam project, contributing to building the Mulberry Harbours used during the D-Day invasion of World War II, working on one of the largest dams in the world on the Ugandan Nile, and engineering the Gariep Dam in South Africa.

## 4.3. Stone Age Background

### 4.3.1. Stone Age Background of the study area

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For Cultural Resources Management (CRM) purposes it is often only expected/ possible to identify the presence of the three main phases.

Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable (Lombard 2011). The three main phases can be divided as follows;

- Later Stone Age; associated with Khoi and San societies and their immediate predecessors. Recently to ~30 thousand years ago
- Middle Stone Age; associated with Homo sapiens and archaic modern humans. 30-300 thousand years ago.
- Earlier Stone Age; associated with early Homo groups such as Homo habilis and Homo erectus. 400 000-> 2 million years ago.

Hart *et al* (2010) and Halkett & Webley (2011) recorded artefact scatters dating to all three main phases in the vicinity of the general study area. They recorded discrete scatters of Middle Stone Age artefacts in a variety of locations but these sites were marginal and lacked stratification or the presence of associated organic material and are not considered to be of high significance by them. A few LSA sites containing ceramics and occasional formal stone microliths were also recorded, occurring in the lee of ridges and near water sources. Some of these have been accorded high significance by them. Hart noted that open sites are extremely sparse on the upper plateau with only one MSA site recorded that is associated with a dry pan.

Furthermore they identified a number of colonial household dumps/refuse heaps that are considered to be of high significance by Hart *et al* 2010 with numerous stone built ruins, kraals and other stone features relating to late 19th and early 20th use of the land. These were ascribed as having medium-high significance.

## 5. HERITAGE SITE SIGNIFICANCE AND MITIGATION MEASURES

The presence and distribution of heritage resources define a 'heritage landscape'. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed quarry extension the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface.

This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance:

- The unique nature of a site;
- The integrity of the archaeological/cultural heritage deposits;
- The wider historic, archaeological and geographic context of the site;
- The location of the site in relation to other similar sites or features;
- The depth of the archaeological deposit (when it can be determined/is known);
- The preservation condition of the sites; and
- Potential to answer present research questions.

Furthermore, The National Heritage Resources Act (Act No 25 of 1999, Sec 3) distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

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

## 5.1. Field Rating of Sites

Site significance classification standards prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 7 of this report.

| ***FIELD RATING*** | ***GRADE*** | ***SIGNIFICANCE*** | ***RECOMMENDED MITIGATION*** |
|---|---|---|---|
| National Significance (NS) | Grade 1 | - | Conservation; national site nomination |
| Provincial Significance (PS) | Grade 2 | - | Conservation; provincial site nomination |
| Local Significance (LS) | Grade 3A | High significance | Conservation; mitigation not advised |
| Local Significance (LS) | Grade 3B | High significance | Mitigation (part of site should be retained) |
| Generally Protected A (GP.A) | - | High/medium significance | Mitigation before destruction |
| Generally Protected B (GP.B) | - | Medium significance | Recording before destruction |
| Generally Protected C (GP.C) | - | Low significance | Destruction |

## 5.2 Impact Rating of Assessment

The criteria below are used to establish the impact rating of sites as per the impact rating methodology employed by Savannah environmental:

» The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.

» The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):

» The **duration**, wherein it will be indicated whether:

- the lifetime of the impact will be of a very short duration (0-1 years), assigned a score of 1;
- the lifetime of the impact will be of a short duration (2-5 years), assigned a score of 2;
- medium-term (5-15 years), assigned a score of 3;
- long term (> 15 years), assigned a score of 4; or
- permanent, assigned a score of 5;

» The **magnitude**, quantified on a scale from 0-10 where; 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.

» The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5 where; 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).

» The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and

» the **status**, which will be described as either positive, negative or neutral.

» the degree to which the impact can be reversed.

» the degree to which the impact may cause irreplaceable loss of resources.

» the *degree* to which the impact can be mitigated.

The **significance** is calculated by combining the criteria in the following formula:

S=(E+D+M)P

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

» < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),

» 30-60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),

» > 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

## 6. BASELINE STUDY-DESCRIPTION OF SITES

A wide variety of heritage resources are recorded for the wider study area (e.g. Halkett & Webley 2011, Orton & Halkett 2011 and Hart & Webley 2011) and several features including an alleged mass grave, Corbelled hut, historical farmsteads and a British war camp are located on the farm Gunstfontein. These sites are located approximately 1.7km from the closes tower position and will not be impacted on by the proposed development.

During the current survey it should be noted that very few heritage resources were recorded and almost none of them will be directly impacted on by the proposed development (Figure 13).

### 6.1. Pre-colonial archaeology

A few background scatters of isolated stone artefacts were recorded in open rocky areas. These background scatters consist of LSA miscellaneous flakes and adzes usually located close to large, prominent boulders. It should be noted that none of these were located within the immediate vicinity (160 meters) of the development footprint. These artefacts are scattered too sparsely (less than 2 artefacts per 3m²) to be of any significance apart from noting their presence, which has been done in this report.

One rock art site (Feature 1) was found in the valley to the south east of the study area. The site consists of a small shallow shelter (Figure 7). The paintings are black in colour and very faded due to the soft rock face that weathers away and peels off. It seems as if more paintings existed on the small panel that is now almost entirely eroded. The paintings consist of a human figure that is standing looking to the right. Its left hand is bent at the elbow. The figure is possibly dancing and part of row of figures (Figure 8). It seems to be classic San/hunter gatherer paintings made with a brush (personal communicating Dr Jeremy Hollman 2015) as opposed to "finger paintings" ascribed to Khoekhoe herders of which examples were recorded on the neighbouring farm Jakhalsfontein (Orton & Halkett 2011). Due to the poor condition of the paintings and the lack of archaeological deposit the site is of low -medium significance and given a field rating of Generally Protected B. The site is located 173 meters from the closest development infrastructure that consist of the powerline from substation alternative 1 (Figure 14).

Figure 7. Shelter viewed from the north east

Figure 8. Enlargement of Human Figurine

## 6.2 Historical Archaeology

### Anglo Boer War

A number of fortifications relating to the Anglo-Boer War were recorded to the south of the study area (Feature 2, 3, 5, 7 and 8). These fortifications are focused on the edge of the escarpment guarding the valleys that would have provided access to the top of the plateau where a British camp was situated at the Gunstfontein farm house.

Two types of blockhouses were recorded. The first (Feature 7 & 8) comprised circular stone walls enclosing a stone platform on top of which once stood circular corrugated iron structures of which the walls were filled with small stones. These platforms are slightly variable in diameter but all are in the region of 5 m diagonally. These blockhouses are referred to as "Rice Blockhouses" (Figure 9). Artefacts around these blockhouses consist of lead sealed cans, gun ports and wire.

The second type of fortifications consists of two almost circular stone walls, the one forming an entrance into the main structure (Feature 2, 3 & 5). At these sites gun ports in various stages of manufacture, cans with hollows presumably for showers and corrugated iron sheets cut into triangles were found. The blockhouse at feature 5 yielded the richest finds consisting of porcelain, glass fragments of alcoholic drinks bottles; spent cordite mark II cartridges from Kynoch (Figure 10 – 12). Feature 5 is also close to tower 14 and a direct impact is foreseen on the site.

Similar fortifications were recorded on the neighbouring farm Jakhalsfontein (Orton & Halkett 2011). These fortifications form part of the Anglo Boer war layer to the cultural landscape. These sites are well preserved with various artefacts scattered around the sites and are of medium heritage significance and given a field rating of Local Significance (LS) - Grade 3B. Feature 2 and 3 is located within the construction buffer zone of the powerline from substation alternative 1 (Figure 14).

### Stone Cairns

A single stone cairn (Feature 4) was recorded on a rocky ridge. The purpose of this stone cairn (Figure 4) is not known but it could either be a marker and would then be of Low Significance. Worst case scenario this cairn could mark an informal grave (although unlikely) and would then be of high significance. Similar features were recorded on the neighbouring farm Jakhalsfontein (Orton & Halkett 2011).

### Ruin

A Single rectangular ruin was identified relating to farm labourer dwellings. The site consists of rectangular stone wall foundations with modern industrial artefacts scattered over the site. The site is of low significance and there is no direct impact foreseen on the site.

Figure 9. Example of Rice blockhouse.

Figure 10. Unfinished gun port at Feature 3.

Figure 11. Stone wall fortification at feature 2.

Figure 12. Artefacts at feature 5.

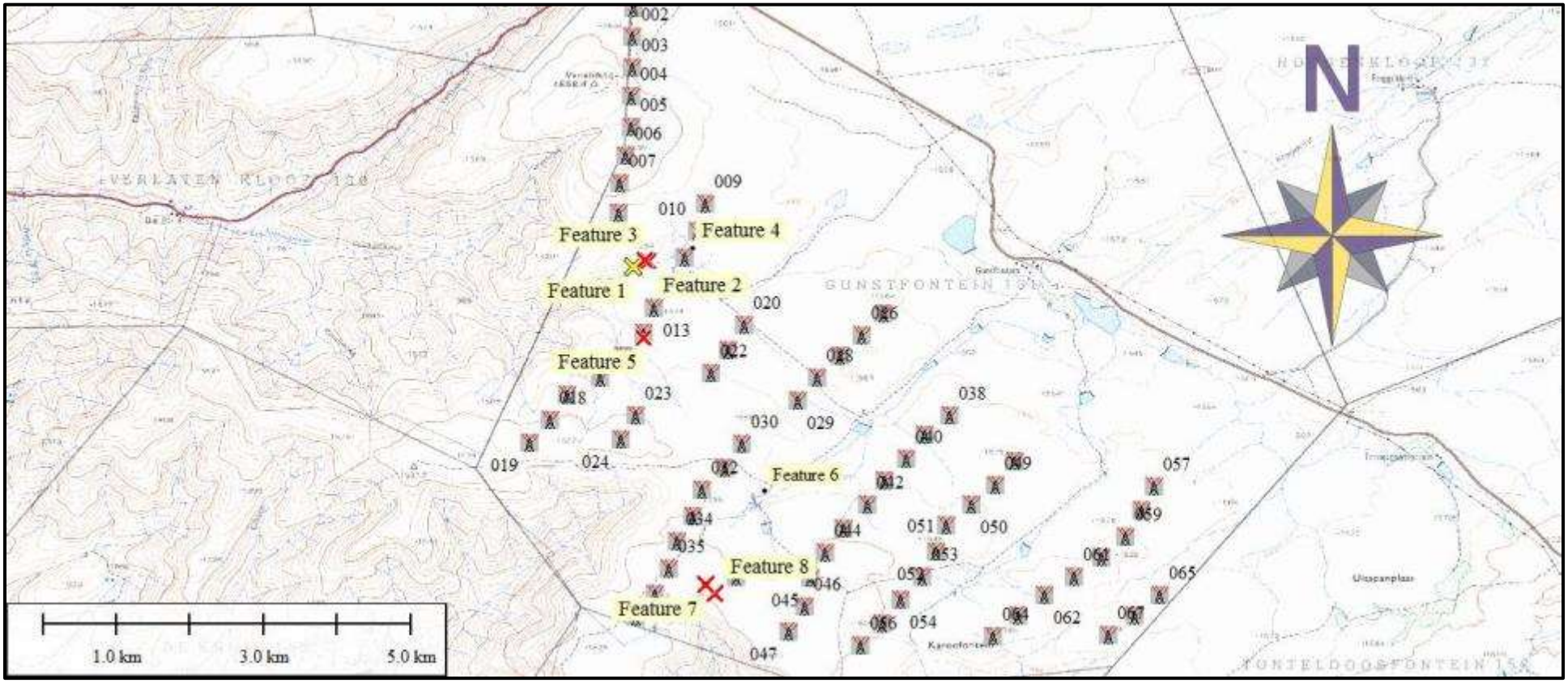


Figure 13: Site distribution map.


Figure 14. Feature 1, 2, 3 and 4 in relation to developments. The Orange line and light green line represent new roads.


Figure 15: Feature 5 in relation to tower 15 and new roads represented by an orange and light green line.

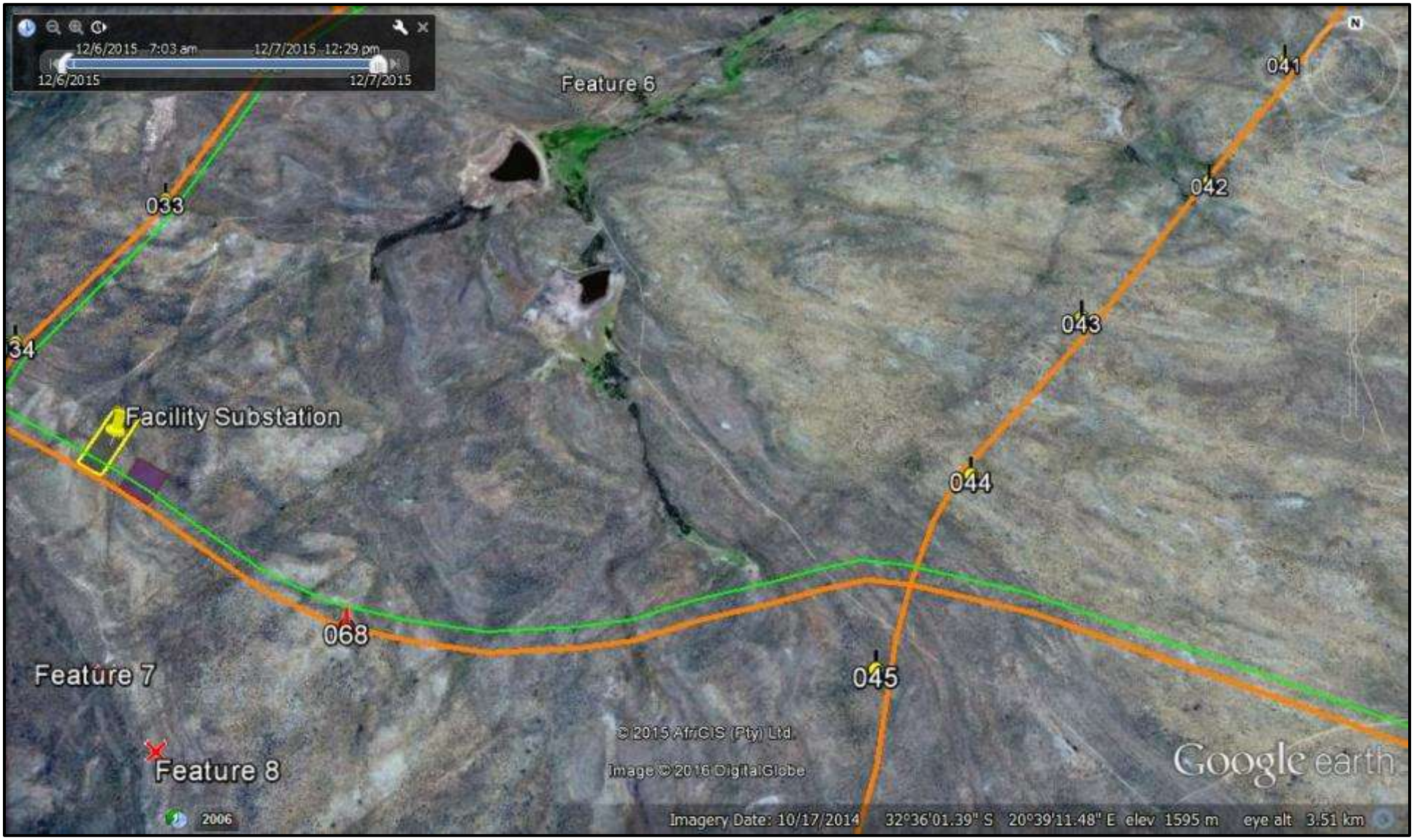


Figure 16: Feature 6, 7 and 8 in relation to the development

**Table 1:** Identified heritage features with Coordinates

| Feature Number | Type Site | Cultural Markers | Coordinate (accuracy 4 meters) | Impact |
|---|---|---|---|---|
| 1 | Rock Art | Small shelter with faded paintings | 32° 33' 59.3532" S, 20° 38' 05.0171" E | No Impact |
| 2 | Fortification | Stone packed feature, gun ports, corrugated iron | 32° 33' 56.5955" S, 20° 38' 11.2343" | No Impact |
| 3 | Fortification | Stone packed feature, gun ports, corrugated iron | 32° 33' 56.2283" S, 20° 38' 09.7763" E | No Impact |
| 4 | Unknown | Stone cairn | 32° 33' 51.0588" S, 20° 38' 31.0776" E | No direct impact |
| 5 | Fortification | Stone packed feature, corrugated iron, glass, cartridges. | 32° 34' 30.0576" S, 20° 38' 09.2256" E | Indirect impact from tower 14 and access road. |
| 6 | Ruin | Rectangular stone foundations, glass and plastic fragments. | 32° 35' 37.4821" S, 20° 39' 02.7072" E | No direct impact |
| 7 | Fortification | Stone packed feature, gun ports, corrugated iron | 32° 36' 18.3263" S, * 20° 38' 36.2343" E | No direct impact |
| 8 | Fortification | Stone packed feature, gun ports, corrugated iron | 32° 36' 21.8872" S, * 20° 38' 40.4091" E | No direct impact |

## 6.3. Impact evaluation of the proposed project and of the proposed substations (1 &2) on heritage resources
## Feature 1,2,3

| | | |
|---|---|---|
| ***Nature:*** During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects. | | |
| | **Without mitigation** | **With mitigation (Preservation/ excavation of site)** |
| ***Extent*** | Local (2) | Local (1) |
| ***Duration*** | Permanent (5) | Permanent (5) |
| ***Magnitude*** | Low (4) | Low (3) |
| ***Probability*** | Not probable (2) | Not Probable (2) |
| ***Significance*** | **22 (Low)** | **18 (Low)** |
| ***Status (positive or negative)*** | Negative | Negative |
| ***Reversibility*** | Not reversible | Not reversible |
| ***Irreplaceable loss of resources?*** | Yes | Yes unless sites can be preserved. |
| ***Can impacts be mitigated?*** | Yes | Through preservation or excavation of sites. |
| ***Mitigation:***<br>The site will not be impacted as per the current lay out and will be preserved. It has also been recorded in this report. | | |
| ***Cumulative impacts:***<br>In any archaeological contexts the impacts are once-off permanent destructive events. | | |
| ***Residual Impacts:***<br>If sites are destroyed this results in the depletion of archaeological record of the area. However if sites are recorded and preserved or mitigated this adds to the record of the area. | | |

**Feature 5**

| | | |
|---|---|---|
| ***Nature:*** During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects. | | |
| | **Without mitigation** | **With mitigation (Preservation site)** |
| ***Extent*** | Regional (4) | Regional (4) |
| ***Duration*** | Permanent (5) | Permanent (5) |
| ***Magnitude*** | Moderate (6) | Low (4) |
| ***Probability*** | Probable (3) | Not Probable (2) |
| ***Significance*** | **45** (Medium) | 26 (Low) |
| ***Status (positive or negative)*** | Negative | Negative |
| ***Reversibility*** | Not reversible | Not reversible |
| ***Irreplaceable loss of resources?*** | Yes | Yes unless sites can be preserved. |
| ***Can impacts be mitigated?*** | Yes | Through preservation or excavation of sites. |
| ***Mitigation****:*<br><br>It is recommended that the sites should be preserved and demarcated as a NO-GO area. | | |
| ***Cumulative impacts:***<br>In any archaeological contexts the impacts are once-off permanent destructive events. | | |
| ***Residual Impacts:***<br>If sites are destroyed this results in the depletion of archaeological record of the area. However if sites are recorded and preserved or mitigated this adds to the record of the area. | | |

## Feature 7 and 8

| ***Nature:*** During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects. | | |
|---|---|---|
| | **Without mitigation** | **With mitigation (Preservation/ excavation of site)** |
| ***Extent*** | Regional (4) | Regional (4) |
| ***Duration*** | Permanent (5) | Permanent (5) |
| ***Magnitude*** | Low (4) | Low (3) |
| ***Probability*** | Not probable (2) | Not Probable (2) |
| ***Significance*** | **26 (Low)** | **24 (Low)** |
| ***Status (positive or negative)*** | Negative | Negative |
| ***Reversibility*** | Not reversible | Not reversible |
| ***Irreplaceable loss of resources?*** | Yes | Yes unless sites can be preserved. |
| ***Can impacts be mitigated?*** | Yes | Through preservation or excavation of sites. |
| ***Mitigation:*** The sites will not be impacted as per the current lay out and will be preserved. It has also been recorded in this report. | | |
| ***Cumulative impacts:*** In any archaeological contexts the impacts are once-off permanent destructive events. | | |
| ***Residual Impacts:*** If sites are destroyed this results in the depletion of archaeological record of the area. However if sites are recorded and preserved or mitigated this adds to the record of the area. | | |

**Feature 4**

| | | |
|---|---|---|
| ***Nature:*** During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects. | | |
| | **Without mitigation** | **With mitigation (Preservation/ excavation of site)** |
| ***Extent*** | Local (2) | Local (1) |
| ***Duration*** | Permanent (5) | Permanent (5) |
| ***Magnitude*** | Low (4) | Low (3) |
| ***Probability*** | Not probable (2) | Not Probable (2) |
| ***Significance*** | **22 (Low)** | **18 (Low)** |
| ***Status (positive or negative)*** | Negative | Negative |
| ***Reversibility*** | Not reversible | Not reversible |
| ***Irreplaceable loss of resources?*** | Yes | Yes unless sites can be preserved. |
| ***Can impacts be mitigated?*** | Yes | Through preservation or excavation of sites. |
| ***Mitigation:*** The site will not be impacted on as per the current lay out and will be preserved. It has also been recorded in this report. If the site is confirmed to be a grave it will be of high social significance and must then be fenced off with an access gate for family members. | | |
| ***Cumulative impacts:*** In any archaeological contexts the impacts are once-off permanent destructive events. | | |
| ***Residual Impacts:*** If sites are destroyed this results in the depletion of archaeological record of the area. However if sites are recorded and preserved or mitigated this adds to the record of the area. | | |

**Feature 6**

| ***Nature:*** During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects. | | |
|---|---|---|
| | **Without mitigation** | **With mitigation (Preservation site)** |
| ***Extent*** | Local (2) | Local (2) |
| ***Duration*** | Permanent (5) | Permanent (5) |
| ***Magnitude*** | Low (4) | Low (4) |
| ***Probability*** | Not Probable (2) | Not Probable (2) |
| ***Significance*** | **22** (Low ) | 22 (Low) |
| ***Status (positive or negative)*** | Negative | Negative |
| ***Reversibility*** | Not reversible | Not reversible |
| ***Irreplaceable loss of resources?*** | Yes | Yes unless sites can be preserved. |
| ***Can impacts be mitigated?*** | Yes | Through preservation or excavation of sites. |
| ***Mitigation:*** The sites will not be impacted as per the current lay out and will be preserved. It has also been recorded in this report. | | |
| ***Cumulative impacts:*** In any archaeological contexts the impacts are once-off permanent destructive events. | | |
| ***Residual Impacts:*** If sites are destroyed this results in the depletion of archaeological record of the area. However if sites are recorded and preserved or mitigated this adds to the record of the area. | | |

**Cumulative Assessment**

Cumulative impacts are not seen as a major concern for this project.

Through CRM studies for developments in the area heritage sites are identified and protected from accidental damage, this can be regarded as a positive impact as it adds to the heritage database of the area.

In terms of the cumulative impact of this and other developments in the Sutherland area, as there are numerous similar projects in the area the impact on the heritage landscape is increased slightly.

The impact of the project on identified heritage resources will be mitigated.

| **Action trigger** | **Development impact** |
|---|---|
| Is the proposed action one of several similar past, present or future actions in the same geographic area? | Yes |
| Do other activities (whether state or private) in the region have environmental effects similar to those of the proposed action? | Yes |
| Will the proposed action (in combination with other planned activities) affect any natural resources, cultural resources, socio or economic units, or ecosystems of local, regional or national concern? | There is a secondary impact that can be managed through the correct mitigation. |
| Have any recent heritage studies of similar actions identified important adverse or beneficial cumulative effects issues? | Data on the heritage resources on the area is being collected through systematic surveys and identified resources are recorded and managed through mitigation. |
| Has the impact been historically significant, such that the importance of the resource is defined by past loss, gain or investments to restore resources? | Identified resources are being recorded and mitigated for projects such as these that would otherwise have remained unidentified. |
| Does the proposed action involve any of the following?<br>» Loss of natural habitats or historic character through residential, commercial and industrial development<br>» Social, economic or cultural effects on marginalised communities resulting from ongoing development | Currently the area is not inhabited aside from the farm house. The project and others in the area will have an impact on the cultural landscape, but the social benefits of the project have been classified as beneficial. |

The project aims to provide a renewable source of energy to the South Africa power grid. The power generation capacity of South Africa is presently under significant pressure. Therefor the positive impacts of the project outweigh the negative impact on heritage resources of the area that can be successfully mitigated.

**Cumulative Impact Assessment**

| ***Nature:*** Heritage impacts associated with the establishment of Wind energy Facilities on the archaeology of the area | | |
|---|---|---|
| | **Without mitigation** | **With mitigation (Preservation/ excavation of site)** |
| ***Extent*** | Local (2) | Local (2) |
| ***Duration*** | Permanent (5) | Permanent (5) |
| ***Magnitude*** | Low (4) | Low (3) |
| ***Probability*** | Not probable (2) | Not Probable (2) |
| ***Significance*** | **22 (Low)** | **20 (Low)** |
| ***Status (positive or negative)*** | Negative | Negative |
| ***Reversibility*** | Not reversible | Not reversible |
| ***Irreplaceable loss of resources?*** | Yes | Yes unless sites can be preserved. |
| ***Can impacts be mitigated?*** | Yes | Through preservation or excavation of sites. |
| ***Mitigation:*** Identified resources are being recorded and mitigated for projects such as these that would have otherwise remained unidentified. In terms of the impact on the cultural landscape the impact is considered low, with the correct mitigation measures as well as the vast physical area in which these projects are constructed. | | |
| ***Cumulative impacts:*** If sites are destroyed this results in the depletion of archaeological record of the area. However if sites are preserved or recorded and mitigated this adds to the archaeological record of the area. | | |
| ***Residual Impacts:*** In any archaeological contexts the impacts are once-off permanent destructive events. | | |

## 7. CONCLUSIONS AND RECOMMENDATIONS

During the Archaeological Impact Assessment for the project eight heritage features were recorded. The survey was conducted over a period of 4 days and focussed on the infrastructure footprint for the project. The heritage features that were recorded consisted of Anglo Boer War (South African War) fortifications, rock art, stone cairns and farm labourer ruins. Three of these features consisting of fortifications will be directly impacted on by a tower or a power line alternative.

The rock art site (Feature 1), the stone cairn (Feature 4), the ruin (Feature 6) and four fortifications (Feature 2, 3,7 & 8) are all located well away from any development footprint and will not be impacted on by the proposed wind farm development. As such no mitigation is needed for these features but it is recommended that these features are marked on development plans and preserved *in situ.*

A third fortification (Feature 5) will be indirectly impacted on by tower 14 located 48 meters to the north and the proposed access road that is located 20 meters to the North West. It is recommended that the tower and access roads are micro adjusted to have a no development buffer zone of at least 60 meters from feature 5. The site must also be demarcated during construction to prevent accidental damage to the site during the construction phase.

It is also recommended that the ECO should ensure that the recorded features are protected from damage during the construction phase of the project and that no historical artefacts are collected and removed from the sites or its surroundings. More fortifications can be expected in the southern portion of the study area and any deviation to the current footprint must be assessed by the archaeologist.

If the recommendations made in this report are adhered to and based on the approval from SAHRA we are of the opinion that the project can proceed.

Due to the subsurface nature of archaeological material the possibility of the occurrence of unmarked or informal graves and subsurface archaeological finds cannot be excluded. If during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find.

### 7.1 Reasoned Opinion

Both of the substation alternatives are acceptable from a heritage perspective as none of these alternatives impact on any heritage sites. From a heritage perspective the proposed 68 Tower alternative project is acceptable. If the above recommendations are adhered to and based on approval from SAHRA, HCAC is of the opinion that the development can continue as the development will not impact negatively on the archaeological record of Northern Cape. If during the pre-construction phase or during construction, any archaeological finds are made (e.g. graves, stone tools, and skeletal material), the operations must be stopped, and the archaeologist must be contacted for an assessment of the finds. Due to the subsurface nature of archaeological material and graves the possibility of the occurrence of unmarked or informal graves and subsurface finds cannot be excluded, but can be easily mitigated by preserving the sites *in-situ* within the development.

## 8. PROJECT TEAM

Jaco van der Walt, Project Manager

## 9. STATEMENT OF COMPETENCY

I (Jaco van der Walt) am a member of ASAPA (no 159), and accredited in the following fields of the CRM Section of the association: Iron Age Archaeology, Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation. This accreditation is also valid for/acknowledged by SAHRA and AMAFA.

I have been involved in research and contract work in South Africa, Botswana, Zimbabwe, Mozambique, Tanzania and the DRC; having conducted more than 300 AIAs since 2000.

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