Archaeological Impact Assessment

Archaeological Impact Assessment Report for the proposed Garob Wind Energy Facility Project, located close to Copperton in the Northern Cape.

Prepared For

Savannah Environmental (Pty) Ltd

By

HERITAGE
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I, Jaco van der Walt as duly authorised representative of Heritage Contracts and Archaeological Consulting CC, hereby confirm my independence as a specialist and declare that neither I nor the Heritage Contracts and Archaeological Consulting CC have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which the client was appointed as Environmental Assessment practitioner, other than fair remuneration for work performed on this project.

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EXECUTIVE SUMMARY

Savannah Environmental (Pty) Ltd, on behalf of Juwi Renewable Energies (Pty) Ltd, appointed Heritage Contracts and Archaeological Consulting CC (HCAC) to conduct an Archaeological Impact Assessment for a proposed wind energy power generation facility (referred to as Garob) and power lines for connection into the national grid. Three alternative options with a 300m buffer (option 1:14km, option 2 & 3:12km) were assessed at a desktop level on the farms Vogelstruisbult 104. 45 Turbines (between 2 and 3MW each) are proposed. Each turbine has a maximum depth of 3m and a spatial footprint of 20m x 20m depending on the geo-technical conditions. The wind farm and power lines are proposed on portion 5 of the farm Nels Poortje 103 approximately 11 km to the east of the town of Copperton within the Siyathemba Municipality in the Northern Cape Province.

The site lies on a featureless flat plain with relatively low vegetation. Other studies in the area highlighted the archaeological importance of pans in the area (Kiberd 2006, Wiltshire 2011, Orton 2012) however no pans are present within the study area, although ancient pans might be buried underneath the Aeolian sands and the possibility of finding important subsurface material cannot be excluded. Low densities of Early Stone Age (ESA), Middle Stone Age (MSA) and Later Stone Age (LSA) scatters were found across the site and are of low archaeological significance, some of these were documented as find spots. However, several discrete MSA and LSA sites were found and documented as sites. A single stone enclosure was also found as well as several sites with historic material.

MSA artefacts consisted of large flakes, radial and bipolar cores, points, end scrapers, large utilized and retouched blade tools, and utilized and retouched flakes. Raw materials were predominant in fine grained quartzite, hornfels, banded ironstone, chert and vein quartz. Localised Stone Age quarries exploiting the quartzitic bedrock and boulders of vein quartz were also found.

LSA tools were found in comparatively fewer concentrations compared to the MSA tallies. LSA tools consisted of chert, hornfels and other indurated shales, banded ironstone, vein quartz and quartzites. Adzes, scrapers, retouched and utilized flakes, bladelets, small round cores, and unmodified flakes and chunks were seen and this was also noted by Kaplan (2010) south-east of Copperton mine, and by Wiltshire (2011) just east of the current study area on Vogelstruisfontein.

Small numbers of isolated weathered ESA scatters were documented with a number of bifaces (handaxes) made from quartzite. No buildings exist on the site and no cultural landscape elements were noted. Visual impacts to scenic routes and sense of place are slightly higher due to the project's close proximity to the road but are still not assessed to be high.

If the recommendations as made in section 7 of this report are adhered to (subject to approval from SAHRA) there is, from an archaeological point of view, no reason why the development should not proceed.

General

Due to the subsurface nature of archaeological material and unmarked graves, the possibility of the occurrence of such 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/s.

Disclaimer: *Although all possible care is taken to identify sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. Heritage Contracts and Archaeological Consulting CC and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.*

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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 Garob wind energy power generation facility and associated infrastructure on portion 5 of the farm Nels Poortje 103. Juwi Renewable Energies (Pty) Ltd proposes to construct 45 turbines (between 2 and 3MW each) together with a distribution substation on this farm. Three power line corridors were also accessed at a desktop level traversing the farm Vogelstruisbult 104 for connection to the national grid. The study area is located approximately 11 km to the east of the town of Copperton within the Siyathemba Municipality in the Northern Cape Province.

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 2012) that includes collection from various sources and consultations; Phase 2, the physical surveying of the turbine positions on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey 10 heritage sites were identified as well as a number of find spots (18) consisting of low density scatters of mainly LSA and MSA material. 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

Desktop study

Conduct a brief desktop study where information on the area is collected to provide a background setting of the archaeology that can be expected in the area.

Field study

Conduct a field study to: a) systematically survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points identified as significant areas; c) determine the levels of significance of the various types of heritage resources recorded in the project area.

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;
- » 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 a legal body, 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 reinterment 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 proposed development will be located on portion 5 of the farm Nelspoortje 103 (Figure 1). The site is bordered by the 357 provincial road to the south and an Eskom power line traverses the site from east to west in the northern portion of the study area. There are various drainage lines draining the study area all flowing in a south westerly direction. No major landscape features like pans or hills occur on site although some small ridges are found in the western and northern portions of the study area. The vegetation is predominantly Bushmanland Arid Grassland vegetation in the Nama-Karoo biome (Mucina & Rutherford 2006) which consists of Karoo scrub and grass and a few isolated *Acacia karoo* trees. Historical imagery on Google earth indicates that the land has been fallow for a number of years.

1.3.2. Location Map

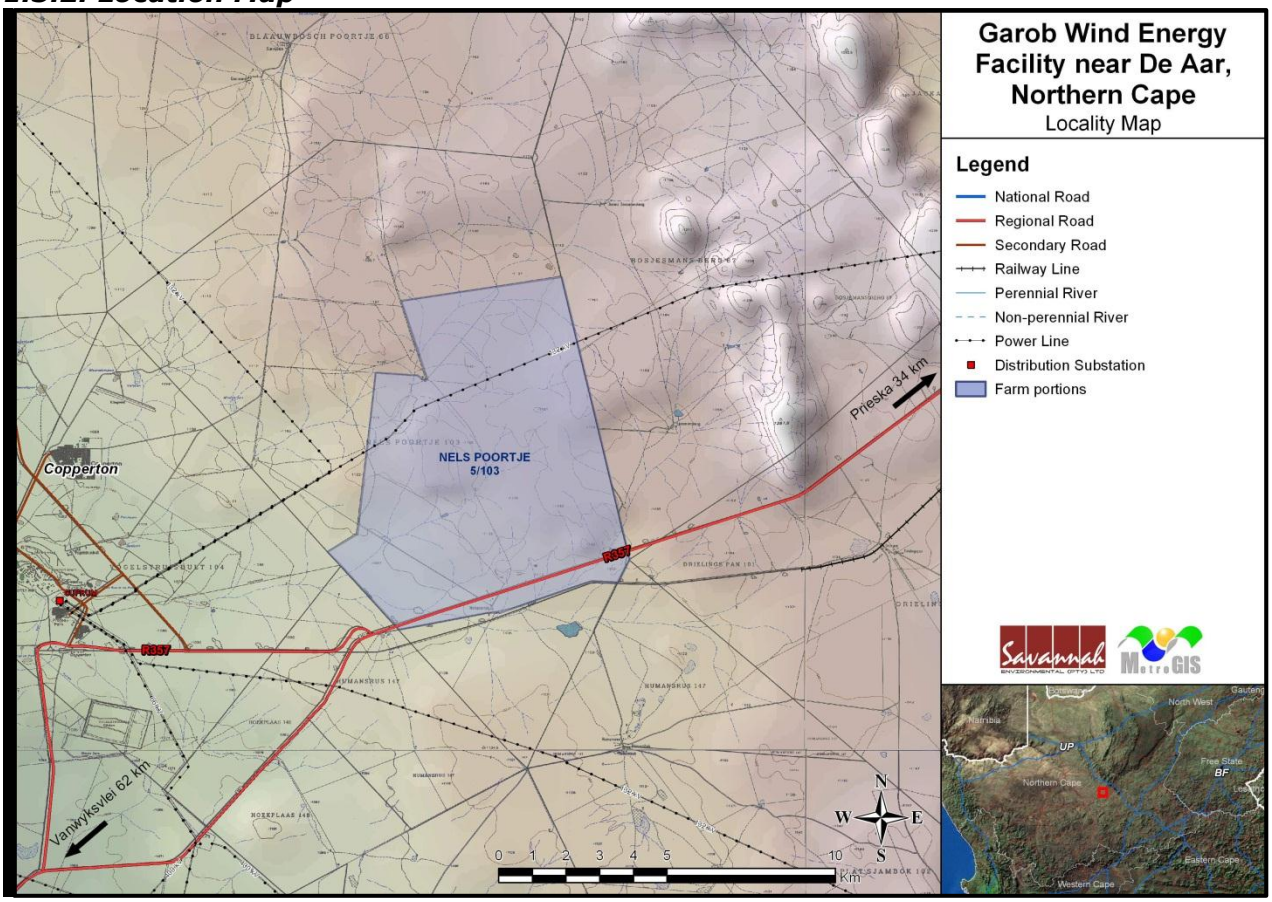

Figure 1: Location map showing the study area in blue.

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 desktop study scanning existing records for archaeological sites, historical sites, graves, architecture (structures older than 60 years) of the area.

2.1.1 Literature Search

Utilising data for information gathering stored in the archaeological database at Wits and previous CRM reports done in the area. The aim of this is to extract data and information on the area in question.

2.1.2 Information Collection

The SAHRA report mapping project (Version 1.0) 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. Pieter Fourie 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 over 4 days was conducted. The study area was surveyed by means of vehicle and extensive surveys on foot during the week of 27 – 30 August 2012. 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. It is important to note that no pans occur on this portion of the farm. Track logs of the areas covered were taken (Figure 2).

Figure 2. Track logs of the survey indicated in black.

The locations of all the turbine positions were visited and the new access routes between the turbines were physically walked. The section of the power line on Nelspoortjie portion 5 was also physically surveyed, while the portion on Vogelstruisfontein was subjected to a desktop evaluation.

At the start of the survey a high density of Stone Age material was immediately noticed scattered in varying densities throughout the study area. Therefor low density scatters (between 3 - 5 artefacts per m²) was recorded as find spots. Scatters higher than 5 artefacts per m² were given site numbers. Scatters with densities less than 2 artefacts per m² were not recorded as they occur throughout the area. Individual occurrences were not point plotted within the recorded scatters however an attempt was made at determining site extent. GPS readings were taken roughly in the middle of each identified scatter.

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 turbine positions and access roads were surveyed as indicated in the location map, and not the entire farm or the power line corridors. This was assessed at a desktop level. The study did not include a visual specialist or a palaeontological assessment.

In the northern portion of the study area archaeological visibility was at its lowest due to moderate to deep red Aeolian sands and low bushes. The Aeolian sands that covered most of the recorded sites also hampered an accurate estimation of site density and site extent. Depending on erosion and movement of the sand these counts can vary to a large degree when the site is revisited in future. It is assumed that information obtained for the wider region is accurate and applicable to this study.

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 wind energy facility will have a maximum generating capacity of 135 MW. The following associated infrastructure (Figure 3 and 4) is part of the project proposal and were assessed during the AIA:

- 45 Wind Turbines of between 2 – 3 mw in capacity.
- Concrete foundations to support the turbines.
- Cabling between the turbines, to be laid underground where practical.
- An on-site substation to facilitate the connection between the wind energy and the electricity grid.
- An overhead power line (only the portion on Nelspoortjie 103 was subjected to a field survey)
- Internal access roads to each turbine.
- Workshop/ area of control, maintenance and storage area.

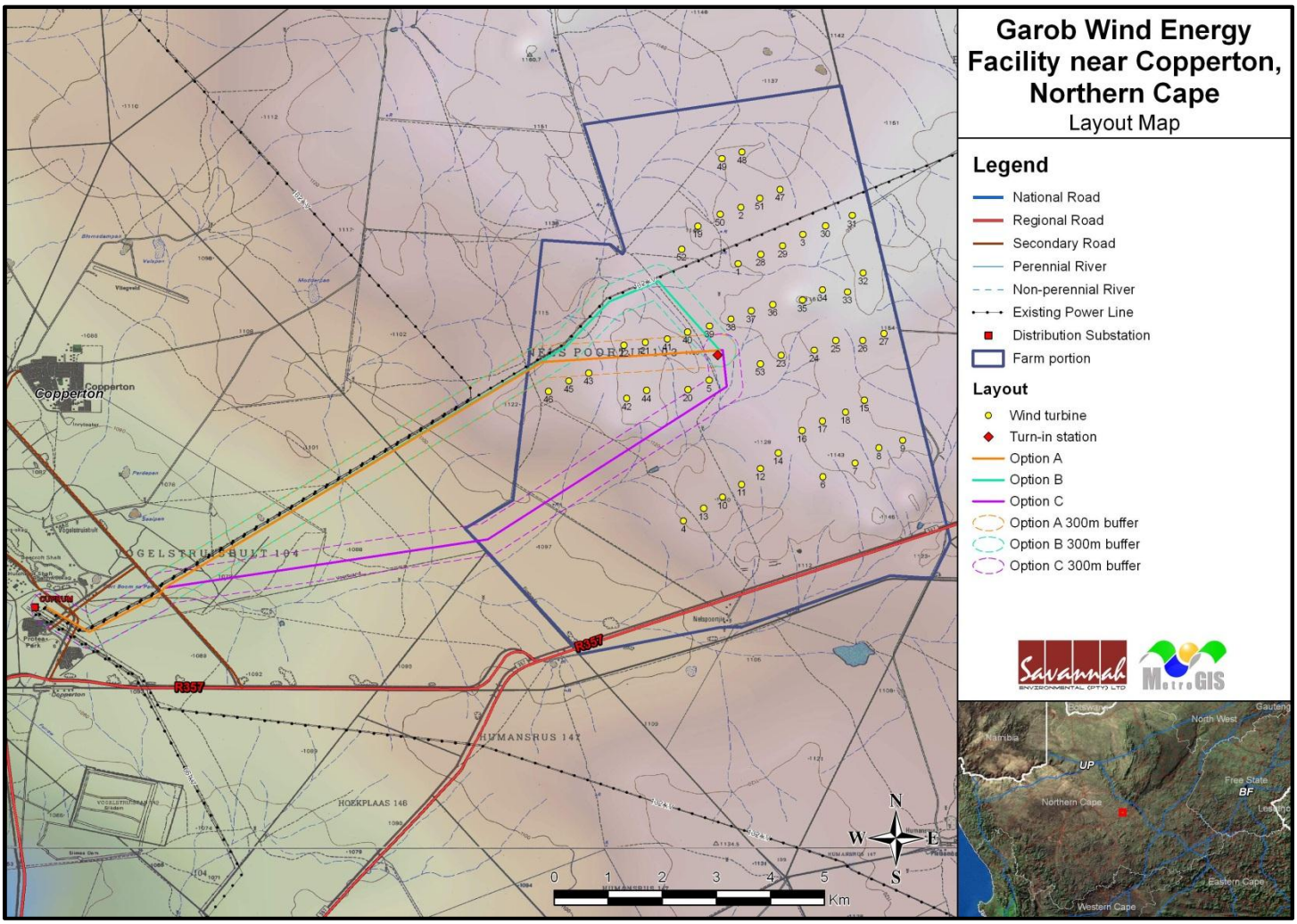

Figure 3. Power line corridors and turbine positions as indicated by Savannah.

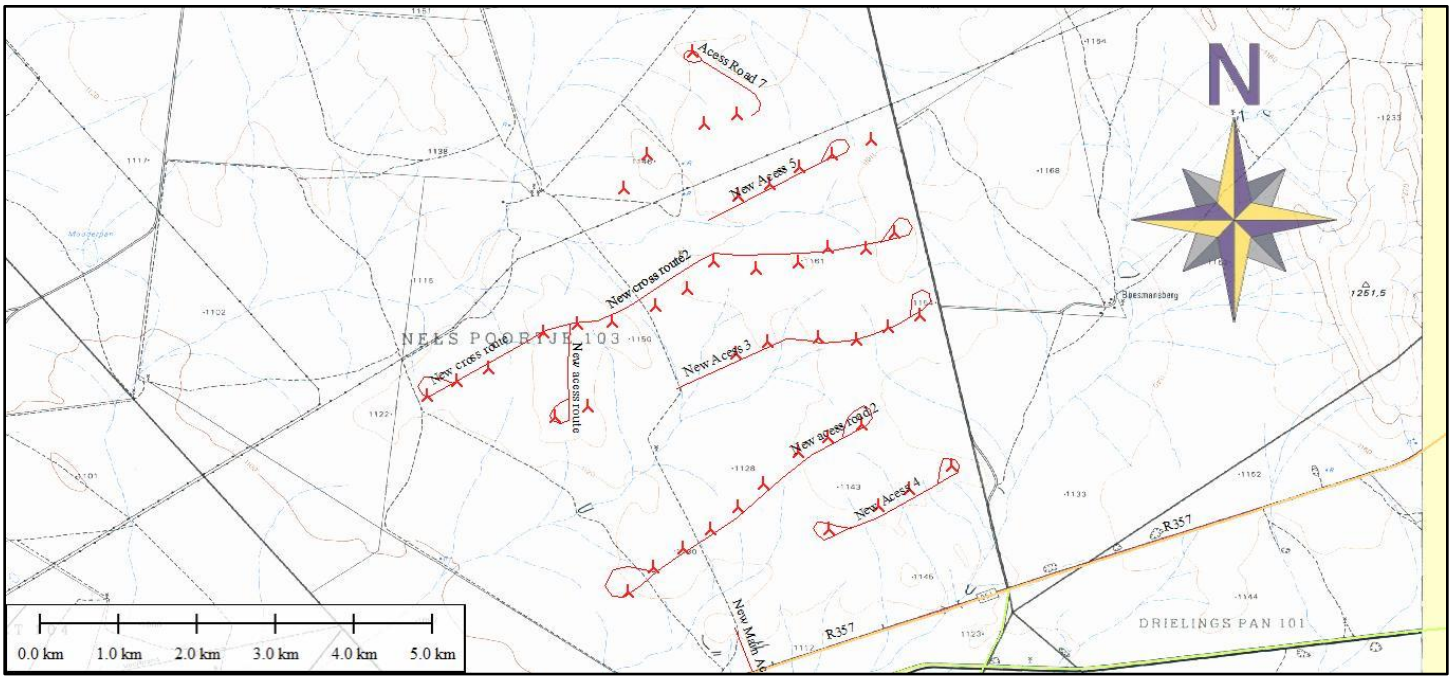

Figure 4. Turbine positions and new access roads.

4. HISTORICAL AND ARCHAEOLOGICAL BACKGROUND OF THE STUDY AREA

4.1 Databases Consulted

Wits Archaeological Data Bases

No previously recorded sites are on record for the study area at the Wits database (referenced 2009). Due to the short timeline for the project it was not possible to get access to the archaeological database at the McGregor Museum in Kimberly.

SAHRA Report Mapping Project

Two previous heritage studies were conducted to the west of the study area (SAHRA report mapping project V1.0) by K van Ryneveld (2006 a,b,c). More recently J Orton (2012) conducted a study to the south west of the study area on the farm Hoekplaas and Wiltshire (2011) on portion 3 and 4 of the farm Nelspoortjie (now called Vogelstruisfontein). All these studies recorded ESA, MSA and LSA artefacts scattered over the landscape with MSA and LSA sites centred around pans. Orton also recorded stone walled enclosures.

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. Historiography and Methodology

It was necessary to use a range of sources in order to give an accurate account of the history of the area in which the farm Nelspoortje No. 103 is located. Sources included secondary source material, maps and archival documents. Although many sources exist on the history of towns and districts, it is often difficult to compile histories that focus on very specific parts of the area, such as individual farms. No documents could be found in the National Archives of South Africa that specifically refer to this farm. One document specifically referring to the farm Nelspoortje No. 103 can be found in the Cape Town Archives Repository. Unfortunately, it was not possible to obtain this document for this report. This is the following:

- Cape Town Archives Repository. 1889-1890. *KAB, LND: 1/327 L3329. Lot 4826, "Nelspoortje", Prieska: Messrs. Loots' application to purchase out of hand.*

Unfortunately, due to time limitations, not all of the sources that were found could be incorporated into the report. The following are relevant sources that can be consulted in the future, if a more thorough investigation is done on the history of the farm area:

- Anderson, E. A. 1987. *A history of the Xhosa of the Northern Cape, 1795-1879.* MA Thesis. Cape Town: University of Cape Town.
- Evans, M. M. 2000. *Encyclopedia of the Boer War. 1899 – 1902.* Cornwall: MPG Books Limited.
- Hocking, A. 1983. *Kaias and cocopans: the story of mining in South Africa's Northern Cape*. Johannesburg: Hollards Publishers.
- Mountain, A. 2003*. The first people of the Cape*. Claremont: David Philip Publishers.
- Nasson, B. 1988. The War of Abraham Esau 1899-1901: Martyrdom, Myth and Folk Memory in Calvinia. *African Affairs*, Vol. 87, No. 347 (Apr., 1988), pp. 239-265.
- South Africa. Railways and Harbours Board. 1914. *Report of the Board of the South African Railways and Harbours on a proposed line of railway from Prieska to Upington*. Cape Town.

4.3. A Brief History of Human Settlement And Black And White Interaction In The Copperton Area

In order to understand the historical context of a certain area, it is necessary to consider the geographic and climatic nature of the region in question. The town of Copperton is located in a region in South Africa known as the Upper Karoo. One gets a good idea of what the natural landscape in the Upper Karoo was like between the late 1700s and early 1800s when one reads the transcripts of some of the early European travellers who passed through the area. One C. J. Skead compiled a book in which many of these texts are assembled. In November 1900, the traveller W. Somerville wrote about the Groot Riviers Poort, or Prieskapoort, 10km south of Prieska and therefore not very far from Copperton. He noted that grasslands and thorn trees covered the landscape, but that no tree was to be seen. When he neared the Orange River, he noted that the banks were covered with wood, but only along the margin of the river. These were mainly willow and karee trees. Along the tributary streams were thorn trees (Skead 2009: 87).

Exactly one year later, One P. B. Borcherds wrote about the Grootrivierpoort at Prieska, making similar remarks about the flora as Somerville did. He also noted that the *poort* at the entrance to the Orange River was known by the "natives" under the name of t'Gariep. When this traveller passed along the banks of the Orange River near Prieska in the same year, he made notes on the Bushmen, who were still present in the area at that time. Regarding the manufacturing of bows and arrows by the Bushmen, he noted that the wood of the bow was of a type of tree commonly known as *caree boomen,* which was very tough and pliable. The arrows were made of a type of reed fairly common along all springs and river flowing there, known as *fluitjies riet*. The Bushmen apparently used the poison of venomous plants and poison extracted from the fangs of snakes to smear on their arrow points. These people also found sustenance in a type of small bulb, commonly called *mans uitjies* by the Khoikhoi, which were described to be the size of small marbles and not unpleasant in taste (Skead 2009: 87-88).

In September 1822, W. J. Burchell passed through Prieska, as well as the area to the south and southwest thereof. Some 50km southwest of Prieska, he found a large muddy dam, which was situated in a very extensive hollow flat. This would become a lake in the rainy season. There was apparently still some clean water to be found. The area around this was hard and dry, and plentifully strewed with stones and low shrubs. Burchell passed through Prieska to the Orange River in the same month. He noted that none of the bushes exceeded a foot in height. Nearer to the Orange River, the travelling party found a group of Khoikhoi camped in a grove.

By 1903, Copperton was located in an area in which the annual rainfall measured between 10 and 20 inches, and was therefore quite arid. The farm area is located in a summer rainfall region. By the early 1900s, the Prieska district, in which Copperton would be located, could not be considered a very agriculturally active area. Only between 25 and 50 sheep were kept per square mile, and only between 2 and 5 heads of cattle. The area where Copperton was later founded would have been too dry and too far from the Orange River to allow for the growing of crops (Burton 1903: 40; 256).

The farm Nelspoortje No. 103 is located in close proximity of the small town of Copperton, and the history of this town is therefore of importance. On 16 November 1991, an article was published in *Die Burger* with regards to the town Copperton. It was asserted that the old deserted Northern Cape mining town would be developed and populated as a "Volkstaatsdorp" (city state / Volkstaat town) by the Oranje Development Corps. It was said that Copperton would then be the second Volkstaat town in South Africa that had been developed exclusively to be inhabited by whites. Earlier that year, Orania had been developed as such a town. Though the town of Copperton had been abandoned at the time, a business centre, primary school, nursery school, an office development and a drive-in theatre had been developed. About 50% of the town's streets were tarred (Anon 1991: 2).

In November 1991, the Weekend Argus also published an article regarding the development of Copperton as an Orania-like town. It was noted that the 300 hectares mine area near the town would be used for industrial development, and that agriculture, as well as light industry such as steel, rubber and textile industries, were expected to be developed in the town. It could not be ascertained whether this town was eventually developed in this way (Anon 1991: 5).

In an article in the Patriot, dated December 1995, some background information is given on the history of the town of Copperton. This town is not very old, as it was only developed in 1972 with the establishment of a copper mine in the area. The mine closed in 1992, and Copperton was sold to a private person, on the condition that the houses in the town would be demolished. About 300 houses were broken down, when it was decided that some homes would be kept in order to develop a retirement town. These houses were apparently solidly built, with stone walls and corrugated roofs. It was noted that the area was very sparsely populated, and that the farmers in the area farmed with sheep. Next to the Orange River, maize and grapes were planted. It was noted that the closest hospitals were located at Prieska, some 35 to 40 minutes' drive from Copperton, and linked with a tarred road (Anon 1995: 4).

4.4. Historical Overview of the Ownership and Development Of The Farm Nelspoortje No. 103

Unfortunately, no documents referring to this farm could be found at the National Archives of South Africa. It is however possible to draw some conclusions with bits and pieces of information that could be found elsewhere.

It seems that the Messrs. Loots applied to buy the farm Nelspoortje, at that time known as Lot 4826 and located in the Prieska district, between 1889 and 1890 (Cape Town Archives Repository *KAB, LND: 1/327 L3329).*

Unfortunately, for the purpose of this report it was not possible to find records with regards to the ownership of Nelspoortje from the late 1800s onwards. It is likely that such records will be available in the Cape. It was however found that one Gideon Bertus Jacobs became the owner of Portion 6 of the farm in 1981 (Deeds Office Property 2012).

Beaumont *et al.* (1995: 240) observed that "thousands of square kilometres of Bushmanland are covered by a low density lithic scatter". These artefacts are generally very well weathered and mostly pertain to the ESA and MSA. Occasional LSA artefacts are also noted. What is noteworthy of the Northern Cape archaeological record is the presence of pans which frequently display associated archaeological material. Of interest here is the work of Kiberd (2001, 2005, 2006) who excavated Bundu Pan, some 25 to 30 km northwest of Copperton. The site yielded ESA, MSA and LSA horizons and the artefacts were accompanied by warthog and equid teeth to name a few (Beaumont *et al.* 1995).

Orton (2011) noted that to the northwest, west and southwest of Copperton sites have been investigated by Beaumont and colleagues (1995), Smith (1995a) and Parsons (2003, 2004, 2007, 2008) yielding LSA deposits. Work on these sites led to a distinction between hunter-gatherer and herder sites, based on stone artefact assemblages (Beaumont *et al.* 1995). All these Later Stone Age sites have very few, if any, organic items on them. The only organic material found on sites like these is fragments of ostrich eggshell probably belonging to broken water containers. Such flasks have been widely recorded across the Northern Cape (Morris 1994).

4.5. Palaeontology

Dr Johan Almond (2011) conducted a Palaeontological Impact Assessment in the form of a desk top study for a wind farm facility on portion 3 and 4 of the farm Nelspoortjie and found that the fossil sensitivity in this area is low.

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;
- 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;
- 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

From the site distribution map (Figure 5) it is clear that most of the recorded find spots and sites occur within the southern portion of the surveyed area where the calcrete is eroding from under the Aeolian sands or in areas where hard packed Aeolian sands are found. In the northern portion the Aeolian sands

are much deeper, in some cases deeper than 30-40 cm, vegetation in this area is also much higher with grasses and shrubs standing 50-70 cm high hampering archaeological visibility. Artefact counts drops drastically as one moves from south to north into this sandy area, however, the occasional MSA or LSA flake was noted in these areas, where the Aeolian sands most probably buried most of the MSA and ESA. The area of deep Kalahari sands is easily visible on Google earth and a red line has been added to roughly outline the border where the sands begin to deepen and where they thin out (Figure 4).

Artefacts were observed in low densities over much of the study area where quartz, quartzite and cryptocrystalline silica (CCS) is used as raw material. Some of the artefacts show a high degree of weathering probably being washed in from their original context and are therefore of little archaeological value. In areas where slightly elevated frequencies of artefacts occurred these where documented as find spots and when the artefact ratio is higher than 5 per m² these were documented as 'sites'. The use of the term 'site' was entirely arbitrary and does not necessarily reflect a knapping, quarry or habitation site. GPS points were taken at such places and selections of artefacts were photographed. ESA, MSA and LSA artefacts are mixed and indicate that downward deflation had occurred in the study area.

Ten sites were recorded consisting of seven Stone Age sites **(Site 1, 3, 4, 5, 7, 8, and 10)** a stone kraal (**Site 2** that is a **no-go** area in development with a **100m buffer** from the kraal wall) and 2 historical sites consisting of porcelain, glass and metal artefacts **(Site 6)** as well as historical/recent exploration or quarrying **(Site 9)**. A further total of 18 find spots were mapped, recorded and digitally photographed. Again, assemblages at the locations are mixed, mainly consisting of MSA and LSA artefacts with some ESA artefacts recorded. The latter are mostly heavily weathered, testifying to their prolonged exposure.

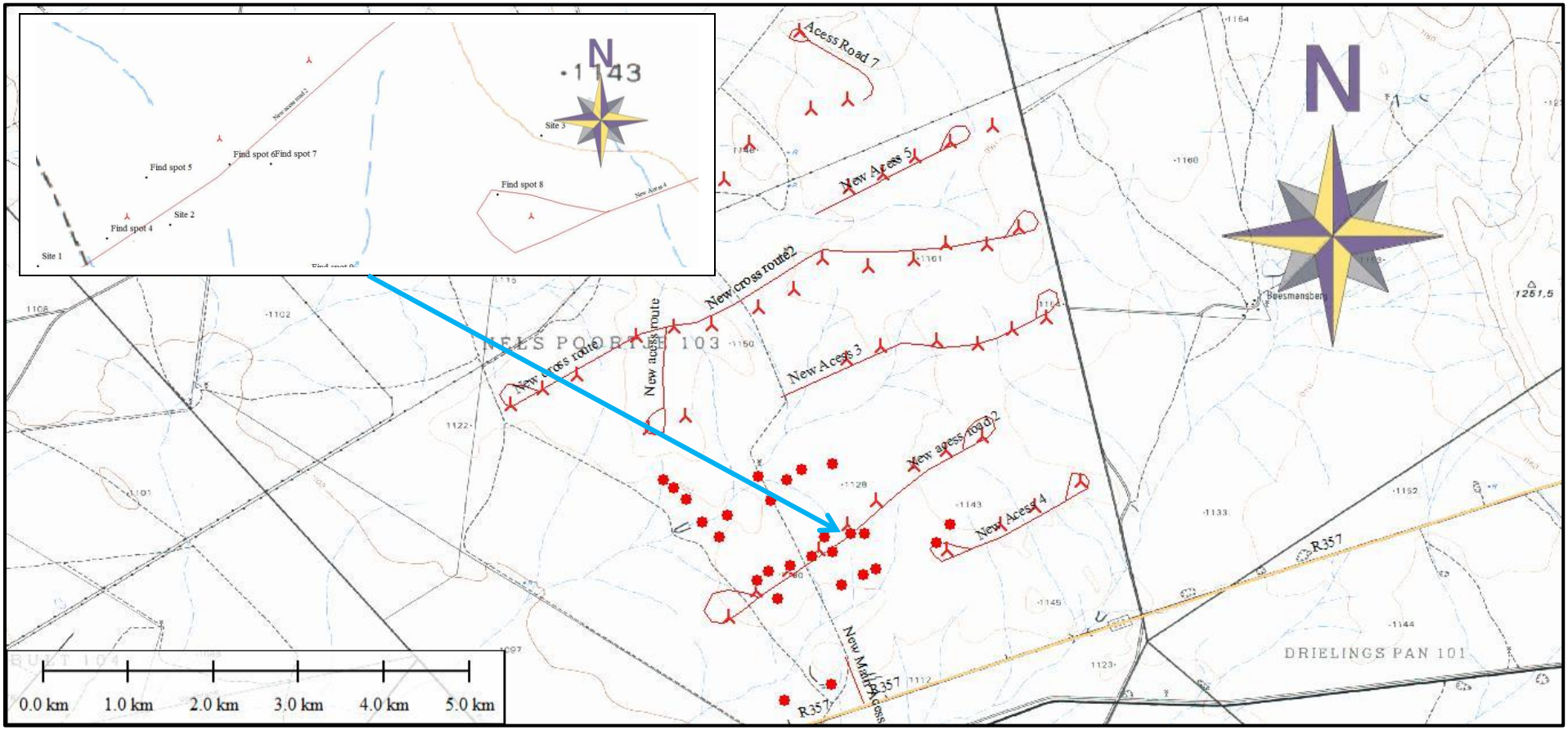

Figure 5. Site distribution map showing sites and find spots in relation to turbines and new access roads.

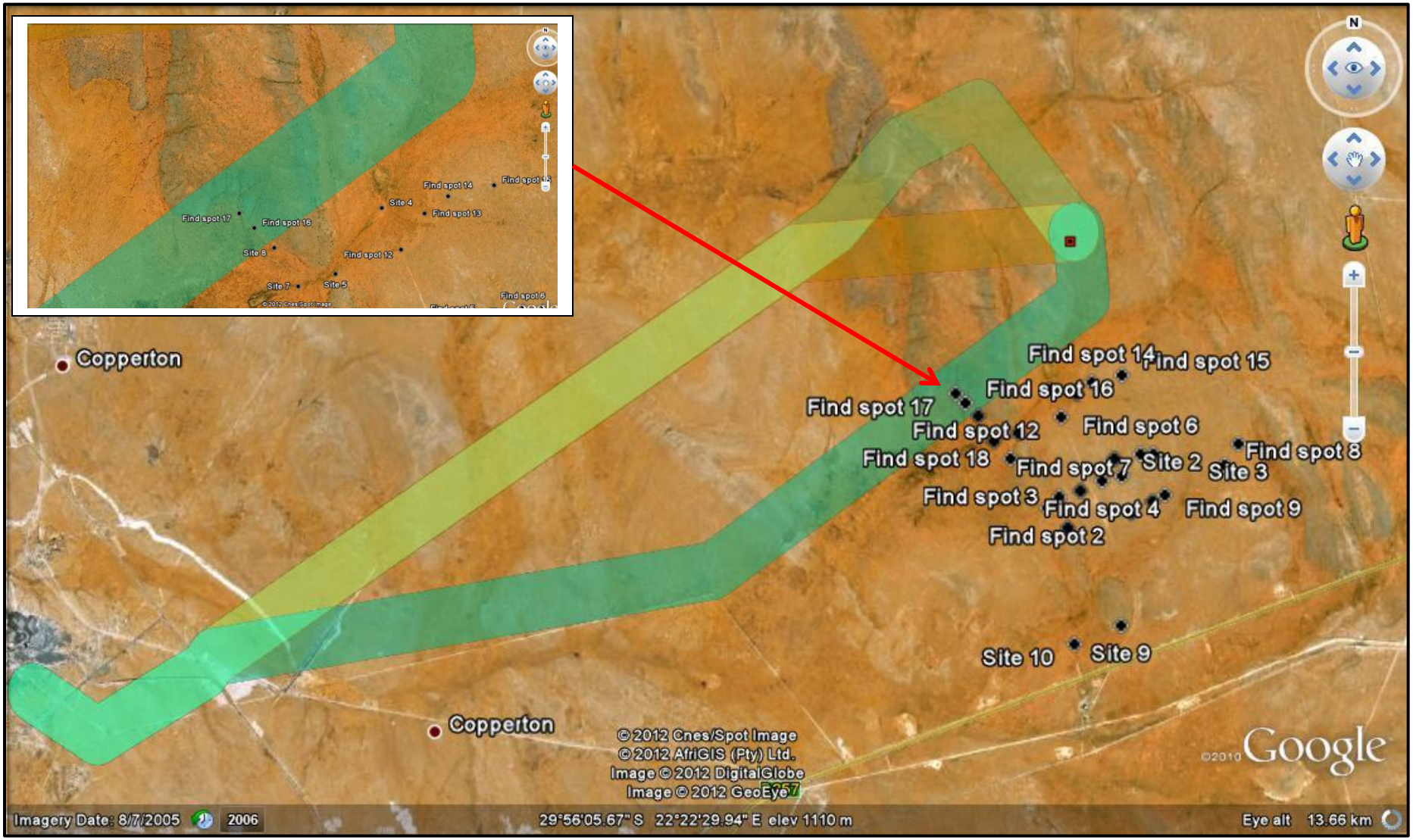

Figure 6: Sites found in relation to the power line corridors

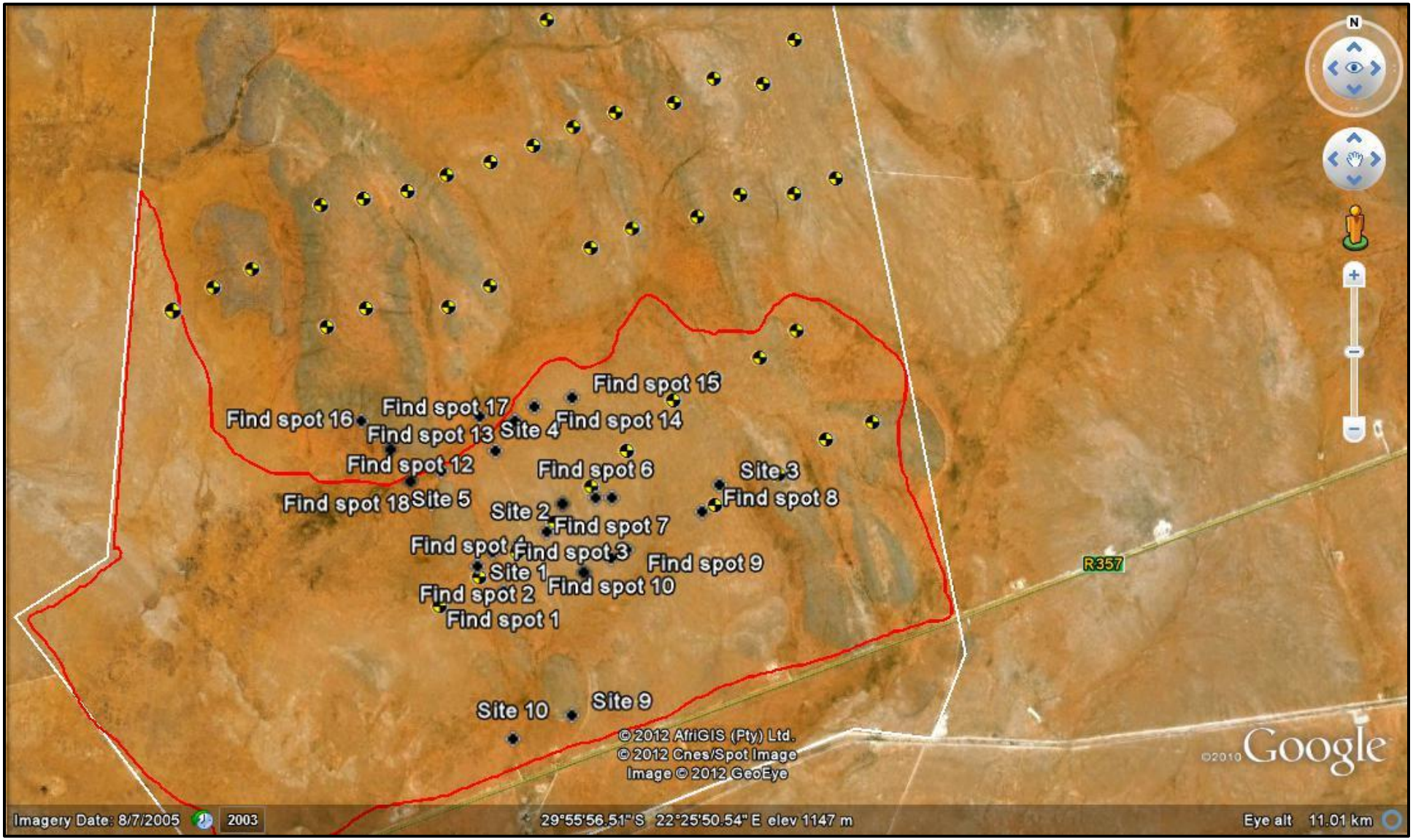

Figure 7: Red polygon indicates hard packed Aeolian sands and exposed calcrete where most of the sites were found. Outside of the polygon are deep Aeolian sands.

Figure 8. Southern portion of the study area, where the access gate is, viewed from the south

Figure 9. General conditions in the southern portion of study area viewed from the west.

Figure 10. General view of middle portion of study area viewed from the south.

Figure 11. Middle portion of study area viewed from the west.

6.2 DESCRIPTION OF FINDS

6.2.1 Sites with Coordinates

Site Number	Type Site	Cultural Markers	Co ordinate
Site 1	Stone Age	Area with quartz and quartzite veins. ESA/MSA tools and flakes.	S29 56 29.1 E22 24 53.4
Site 2	Stone enclosure	Circular stone packed feature and a few MSA tools.	S29 56 24.1 E22 25 09.4
Site3	Stone Age	Medium density scatter of tools. Blades, flakes, cores. MSA mainly on quartz and quartzite. LSA on felsite and chert tools.	S29 56 13.4 E22 25 54.1
Site 4	Stone Age	Fairly dense scatter of MSA and LSA tools eroding out of the red Aeolian sands. MSA mainly on quartzite as well as chert and hornfels. LSA on banded iron stone and cherts.	S29 55 55.4 E22 24 41.3
Site 5	Stone Age	Scatter of MSA and LSA tools out of red Aeolian sands. Same raw material as others.	S29 56 09.8 E22 24 29.6
Site 6	Historical	Historical area/midden with glass, porcelain, metal. Late 19th century/early 20th century.	S29 56 04.1 E22 24 14.2
Site 7	Stone Age	MSA/LSA scatter in erosion donga. Also porcelain late 19th century.	S29 56 12.5 E22 24 20.2
Site 8	Stone Age	Scatter of MSA and LSA eroding from red dune sand.	S29 56 15.0 E22 24 23.3
Site 9	Recent/Historical	Exploration trenches	S29 57 14.0 E22 25 09.3
Site 10	Stone Age	MSA and LSA eroding from under red dunes.	S29 57 20.3 E22 24 51.4

Site 1

The site consists of a blue-grey quartzite outcrop that is fairly low standing, approximately 30 cm above the surface, with some evidence of flake scarring. This may suggest a source for knapping material. Several MSA flakes and possibly some ESA flakes are found scattered around the area with an artefact

density of > 5 per m². The site is on hard packed Aeolian sands that are slowly eroding out and the site could possible extend over 100m². The flakes found showed no retouch.

The site will not be impacted by the proposed development as no turbines or access routes are planned close to it.

Heritage significance: Generally Protected B (GP.B)

Site 2

A stone enclosure was found on a gentle rise on the western portion of the study area. The enclosure did not contain an assemblage characteristic of the LSA (pottery and or micro lithics). Some MSA flakes are scattered around the site, but are probably originating from Site 1 that is located approximately 400 meters to the west. The site has been included in the NO-GO zones for the wind farm and a no development buffer of 100m around the kraal will suffice to protect the site. Similar features were recorded by Orton (2012) to the south west of the current study area.

The site will not be impacted by the proposed development as no turbines or access routes are planned close to it.

Heritage significance: Generally Protected A (GP.A)

Site 3

The site consists of a low to medium density of artefacts (3 per m²) with a MSA and possible LSA component. Artefacts consist of unretouched flakes, blades, radial cores made mainly on quartz and quartzite. The site is found on an open patch in the natural vegetation exposed by sheet erosion and livestock.

The site will not be impacted on by the proposed development as no turbines or access routes are planned close to it.

Heritage significance: Generally Protected B (GP.B)

Site 4 and 5

The site consists of a fairly dense scatter of MSA/LSA flakes and tools in an open eroded area. The site is located close to a perennial stream. Wind and sheet erosion as well as livestock activity is exposing the material underneath red Aeolian sands. Artefacts are made mainly from quartz, quartzite and felsite and chert, consisting of scrapers, blades, unretouched flakes and radial cores. Site density is 5 per m² over an estimated area of 50 x 50 meter.

The site will not be impacted by the proposed development as no turbines or access routes are planned close to it.

Heritage significance: Generally Protected B (GP.B)

Site 6

The site is located close to a perennial stream at the bottom of a slightly elevated area. No features exist on the site but artefacts are scattered over the area, partially covered by red sands and exposed by wind and sheet erosion. Material is typical late 19th to mid-20th century and includes glass, porcelain and metal artefacts probably originating from a deflated midden. According to Mr Fourie (personal communication,

28 August 2012) after the Anglo Boer War poor white 'bywoners' travelled from farm to farm and camped in this area.

The site will not be impacted by the proposed development as no turbines or access routes are planned close to it.

Heritage significance: Generally Protected B (GP.B)

Site 7

The site consists of a dense concentration (20 artefacts per m²) of MSA and LSA flakes and tools in an open eroded area. The site is located close to a perennial stream. Wind and sheet erosion as well as livestock activity is exposing the material underneath the red Aeolian sands. Artefacts are made mainly from quartz, quartzite and felsite and chert consisting of scrapers, blades, unretouched flakes and radial cores. Also some scattered late 19th century porcelain is found and more artefacts might be covered by the red sand.

The site will not be impacted by the proposed development as no turbines or access routes are planned close to it.

Heritage significance: Generally Protected B (GP.B)

Site 8, 10

The site consists of a low density scatter of artefacts (3 per m²) with a MSA and a possible LSA component with horizontal deflation. Artefacts consist of unretouched flakes, blades, radial cores mainly on quartz and quartzite. The artefacts are eroding out from under the red Aeolian sands.

The site will not be impacted by the proposed development as no turbines or access routes are planned close to it.

Heritage significance: Generally Protected B (GP.B)

Site 9

The site consists of exploration trenches where according to the farm owner, Mr Pieter Fourie (personal communication, 28 Aug 2012), exploration for copper was conducted after the 1930's.

The site will not be impacted by the proposed development as no turbines or access routes are planned close to it.

Heritage significance: Generally Protected C (GP.C)

Figure 12: General view of Site 1

Figure 13: Quartz veins at Site 1

Figure 14: Circular stone walled enclosure at Site 2

Figure 15: MSA blade from quartzite at Site 2

Figure 16: Range of artefacts and raw material from Site 3

Figure 17: General site conditions at Site 4

Figure 18: Range of artefacts and raw material from Site 4

Figure 19: Range of artefacts and raw material from Site 4

Figure 20: General site conditions at Site 5

Figure 21: Concentrated scatter of artefacts at Site 7

Figure 22: Porcelain from Site 7

Figure 23: General site condition at Site 8

6.2.1 Find Spots with Coordinates

Site Number	Type Site	Cultural Markers	Co ordinate
Find Spot 1	Stone Age	MSA flakes from quartzite and chert.	S29 56 41.4 E22 24 48.7
Find Spot 2	Stone Age	MSA and LSA flakes from Chert and Quartz. Eroding out of Aeolian sands.	S29 56 34.8 E22 24 40.7
Find Spot 3	Stone Age	MSA Flakes from quartz and quartzite	S29 56 31.1 E22 24 45.3
Find Spot 4	Stone Age	MSA and LSA flakes from quartzite and felsite.	S29 56 25.7 E22 25 01.7
Find Spot 5	Stone Age	MSA and LSA tools and flakes on slightly elevated area with some patches of red Aeolian sand	S29 56 18.4 E22 25 06.5
Find Spot 6	Stone Age	MSA and LSA tools	S29 56 16.8 E22 25 16.5
Find Spot 7	Stone Age	Low scatter of possible ESA flakes, very heavily rolled/ weathered	S29 56 16.8 E22 25 21.5

Find Spot 8	Stone Age	Low density scatter of possible MSA flakes.	S29 56 20.4 E22 25 48.8
Find Spot 9	Stone Age	Very low density scatter of MSA and LSA tools. Near open patch with calcrete.	S29 56 30.4 E22 25 25.9
Find Spot 10	Stone Age	Very low density scatter of MSA and LSA tools. Near open patch with calcrete.	S29 56 32.6 E22 25 21.2
Find Spot 11	Stone Age	Very low density scatter of MSA and LSA tools. Near open patch with calcrete.	S29 56 36.5 E22 25 12.9
Find Spot 12	Stone Age	Single possible ESA tool in the road	S29 56 04.5 E22 24 46.1
Find Spot 13	Stone Age	Very low density scatter of MSA and LSA tools. Near open patch with calcrete.	S29 55 56.6 E22 24 52.0
Find Spot 14	Stone Age	Similar scenario as above	S29 55 52.9 E22 24 57.9
Find Spot 15	Stone Age	Similar scenario as above	S29 55 50.5 E22 25 09.4
Find Spot 16	Stone Age	Low density scatters dating to MSA and LSA.	S29 55 59.8 E22 24 09.2
Find Spot 17	Stone Age	Low density LSA flakes	S29 55 56.6 E22 24 05.4
Find Spot 18	Historical	Porcelain as well and ostrich egg shell fragments. (Late 19th century).	S29 56 18.4 E22 24 26.6

Artefacts were observed in low densities over much of the study area where Quartzite strongly dominates the MSA component and to a lesser degree quartz and banded Iron stone. Artefacts consist mostly of radial and bipolar cores, large flakes and blades. The LSA component is mostly made from cherts, cryptocrystalline silica (CCS), hornfels and banded iron stone and is micro lithic supporting an ascription to the LSA.

Figure 24: Quartzite artefacts from Find spot 1

Figure 25: Site conditions at Find spot 2

Figure 26: General view of Find spot 3

Figure 27: Range of cores and raw material from Find spot 3

Figure 28: Quartzite flake from Find spot 4

Figure 29: Highly weathered artefact from Find

spot 4

Figure 30:’ Highly weathered artefacts from Find Spot 7

Figure 31: Range of MSA artefacts, mostly fakes mainly from quartzite from Find spot 14

Impact evaluation of the proposed project on heritage resources

Sites 1 -10

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**
Extent	Local (2)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (1)
Probability	Probable (1)	Probable (1)
Significance	**9 (low)**	**8 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation: 10 sites were identified during the survey. None of these sites will be directly impacted by the proposed development. However, if any archaeological material is uncovered during construction or operation a qualified archaeologist must be contacted to verify and record the find. Mitigation will then include documentation and sampling of the material. This will also be required if any paleontological material is uncovered.		
Cumulative impacts: Archaeological sites are non-renewable and impact on any archaeological context or material will be permanent and destructive.		
Residual Impacts: Depletion of archaeological record of the area.		

Find Spots that might be impacted ~~on~~. Find spots 6, 8, 16 and 17.

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may impact in the following manner: Road 2 on find spot 6 Road 4 on find spot 8 Southern power line corridor on find spot 16 and 17		
	Without mitigation	**With mitigation**
Extent	Local (2)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	High (8)	Low (2)
Probability	Probable (3)	Probable (3)
Significance	**45 (Medium)**	**24 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be	Yes	

mitigated?		
Mitigation: The sites should be monitored during construction. Alternatively, the general location should be demarcated to avoid impact on the sites.		
Cumulative impacts: Archaeological sites are non-renewable and impact on any archaeological context or material will be permanent and destructive.		
Residual Impacts: Depletion of Archaeological record of the area.		

Find Spots 1-5, 7, 9 -15 and 18

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**
Extent	Local (2)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (1)
Probability	Probable (1)	Probable (1)
Significance	**9 (low)**	**8 (low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation: 10 sites were identified during the survey. None of these sites will be directly impacted by the proposed development. However, if any archaeological material is uncovered during construction or operation a qualified archaeologist must be contacted to verify and record the find. Mitigation will then include documentation and sampling of the material. This will also be required if any paleontological material is uncovered.		
Cumulative impacts: Archaeological sites are non-renewable and impact on any archaeological context or material will be permanent and destructive.		
Residual Impacts: Depletion of archaeological record of the area.		

7. RECOMMENDATIONS

Most of the Stone Age archaeology in the study area consists of low densities of scattered (and mixed) MSA and LSA artefacts. These occurrences are documented as 'find spots' and are of low significance, but more substantial and significant MSA and LSA archaeological sites do occur, and were recorded as 'sites'. None of these sites will be impacted by the proposed development. Apart from the Stone Age component a low circular stone enclosure was documented in the eastern portion of the study area. This site will also not be impacted by the proposed development. These low structures are not well studied, but work further east along the Orange River and also at Bloubos northwest of Upington (Parsons 2004) suggest that they may well have been the bases in which huts or windbreaks were constructed. Similar stone circles have recently also been discovered at De Aar in the central Karoo (Orton 2011) and to the south west of the study area on the farm Hoekplaas (Orton 2012). The proposed power line corridors were assessed at a desktop level. The three alternatives traverse the farm Vogelstruisbult that was extensively surveyed by Wiltshire (2011). Unfortunately there was not enough time to obtain co-ordinates for the significant sites identified by him. These could, however, be obtained from SAHRA and assist the planning team in avoiding sensitive areas.

For the proposed power line the following recommendations are made

- » All pans must be avoided with at least a hundred meter buffer zone.
- » On the farm Vogelstruisbult the following sites have been identified as **no go** areas. VGSTR4, NPRT4 & VGSTR12 (refer to Wiltshire 2011).
- » When the route alignment have been finalised the pylon positions must be subjected to a "walk down".
- » Find spot 16 and 17 might be impacted if the southern power line corridor is chosen. These sites are sufficiently recorded and no further mitigation will be necessary as the impact of the pylon positions are considered to be extremely low and comparative material will remain on the unaffected areas of the site.

For the proposed Turbine positions and new access roads the following recommendations are made:

- » Any deviation in the turbine positions must be assessed by an archaeologist.
- » The excavation of the foundations for the turbines will open up pits 20x20 m and up to 4 m deep, depending on the geology of the area. The Palaeontological Impact Assessment (Almond 2011) found that the fossil sensitivity in this area is low and therefore fulltime Palaeontological monitoring for the construction phase of this project is not deemed necessary.
- » Find spot 6 and 8 will be impacted by access roads; these will be gravel roads approximately 7 meters wide. These sites are sufficiently recorded and no further mitigation is necessary as the impact is considered to be extremely low and comparative material will remain on the unaffected areas of the site.
- » The stone walled enclosure (**Site 2**) must be avoided as a **no go** area. On the current layout this site will not be impacted, however future expansion must take this area into account.
- » It is further recommended that a Conservation Management Plan is drawn up and included in the EMP for the project to protect no go areas in the study areas.
- » If any possible finds such as tool scatters, bone or fossil remains are exposed or noticed during construction, the operations must be stopped and a qualified archaeologist must be contacted to assess the find.

No buildings exist on the site and no cultural landscape elements were noted. Visual impacts to scenic routes and sense of place are slightly higher due to the projects close proximity to the road but are still not assessed to be high. No further mitigation is recommended for this aspect.

8. CONCLUSIONS

The impacts to heritage resources by the proposed development are not considered to be highly significant and the impact on archaeological sites can very easily be mitigated. Other studies (Kiberd 2006), Wiltshire (2011) and Orton (2012) indicated the high archaeological significance associated with pans in the area; fortunately no pans occur in the study area. The area is, however, not devoid of archaeological material and artefact scatters mainly dating to the MSA occur throughout the study area. Some heavily weathered isolated Early Stone Age artefacts were also found with a slightly higher occurrence of Later Stone Age artefacts usually mixed with a MSA component. A single quarry site was identified associated with the MSA as well as a historical midden and a possible stone walled windbreak. No grave sites or engravings were recorded.
Athough some "find spots" will be impacted by the proposed project better preserved representative samples are found in the area like Bundu Pan (Kiberd 2006), Modder Pan (Wiltshire 2011), Hoekplaas (Orton 2012) and no excavations are necessary at these sites.

Due to the subsurface nature of archaeological material and unmarked graves the possibility of the occurrence of unmarked or informal graves and subsurface 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.

If the recommendations as made in section 7 of this report are adhered to (subject to approval from SAHRA) there is from an archaeological point of view no reason why the development should not proceed

9. PROJECT TEAM

Prof M Lombard, Principle Investigator

Jaco van der Walt, Project Manager

Anton Pelser, Archaeologist

10. 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.

Currently, I serve as Council Member for the CRM Section of ASAPA, and 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.

Prof Marlize Lombard lectures in the Anthropology Department of the University of Johannesburg, where she also conducts research and publishes on the Stone Age of southern Africa. She is an accredited Stone Age Principal Investigator with ASAPA, SAHRA and AMAFA.

Anton Pelser is a professional archaeologist with more than 10 years of experience in CRM in South Africa. He is also an accredited CRM practitioner with ASAPA.

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