

# ARCHAEOLOGICAL SCOPING REPORT

## FOR THE PROPOSED ORKNEY SOLAR FARM AND ASSOCIATED INFRASTRUCTURE ORKNEY, NORTH WEST PROVINCE

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Project Reference:

2151201



Report date:

December 2015

Revised 29 March 2016

**DOCUMENT PROGRESS**  
**Archaeological Impact Assessment**

**Document status**

<b>Document Version</b>	<b>V 1.0</b>		
<b>Report Purpose</b>	<b>Draft document for review by Savannah Environmental (Pty) Ltd</b>		
<b>Report Ref. No.</b>	<b>2151201</b>		
	<b>Name</b>	<b>Signature</b>	<b>Date</b>
<b>Mapping</b>	<b>Mr. J. Van der Walt</b>		<b>December 2015</b>
<b>Document Compilation</b>	<b>Mr. J. van der Walt</b>		<b>December 2015</b>

**Distribution List**

<b>Date</b>	<b>Report Reference number</b>	<b>Document Distribution</b>	<b>Number of Copies</b>
2015/12/09	2151201	Draft for review - Savannah (Pty) Ltd	Electronic copy
2016/03/29	2151201	Amended Report for review - Savannah (Pty) Ltd	Electronic copy

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## EXECUTIVE SUMMARY

**Site name and location:** The proposed Orkney Solar Farm and associated infrastructure is located on the Remaining Extent of Portion 7 and the Remaining Extent of Portion 21 of the Farm Wolvehuis 114, situated approximately 11.8km to the south west from the town of Orkney and in close proximity to Vaal River. The proposed study area falls under the jurisdiction of the City of Matlosana Local Municipality and within the greater Dr Kenneth Kaunda District Municipality in the North West Province

**1: 50 000 Topographic Map:** 2726 BA.

**EIA Consultant:** Savannah Environmental (Pty) Ltd

**Developer:** Genesis Orkney Solar (Pty) Ltd

**Heritage Consultant:** Heritage Contracts and Archaeological Consulting CC (HCAC).

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**Date of Report:** 5 December 2015

### Findings of the Assessment:

The brief desktop study indicated that an extensive range of archaeological material have been previously recorded in the general area. Those that are most sensitive are the Later Stone Age engravings and sites relating to the Boer war. The current area earmarked for the proposed solar farm is how ever disturbed by agricultural activities which would have destroyed surface indicators of heritage sites. Based on the current information obtained for the area at a desktop level it is anticipated that a range of heritage sites occur in the larger region and, although unlikely, similar sites can be expected within the study area. Every site is relevant to the Heritage Landscape, but it is anticipated that only a few, if any, has conservation value, therefore no fatal flaws are expected to be associated with the development of the Orkney Solar Farm. This assumption must be verified by a field survey in the impact assessment phase.

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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 million to 300 000 years ago)

Middle Stone Age (300 000 to 30 000 years ago)

Late Stone Age (30 000 years ago until recent)

Historic (approximately AD 1840 to 1950)

Historic building (over 60 years old)

Lithics: Stone Age artefacts

## **1. INTRODUCTION**

Heritage Contracts and Archaeological Consulting CC was contracted by Savannah Environmental (Pty) Ltd to conduct a Heritage Scoping report for the proposed Orkney Solar Farm. This heritage scoping report forms part of the scoping phase of the EIA process for the proposed Orkney Solar Farm.

The aim of this scoping report is to conduct a desktop study to identify possible heritage resources within the study area and to assess their importance within a local, provincial and national context. The study furthermore aims to assess the impact of the proposed development on non - renewable heritage resources and to submit appropriate recommendations with regards 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, in order to protect, preserve and develop them within the framework provided by Heritage legislation.

The report outlines the approach and methodology utilised for the Scoping phase of the project. The report includes information collected from various sources. Potential impacts are identified and mitigation measures are proposed in the report. It is important to note that no field work was conducted as part of the scoping phase but will be conducted as part of the Impact Assessment phase of the EIA process.

### 1.1. Locality Map



Figure 1: Locality Map of the study area proposed for the Orkney Solar Farm.

## **1.2 Terms of Reference**

The main aim of this scoping report is to determine if any known heritage resources occur within the study area and to predict the occurrence of any possible heritage significant sites that might present a fatal flaw to the proposed development. The objectives of the scoping report were to:

- » Conduct a desktop study:
  - \* Review available literature, previous heritage studies and other relevant information sources to obtain a thorough understanding of the archaeological and cultural heritage conditions of the area;
  - \* Gather data and compile a background history of the area;
  - \* Identify known and recorded archaeological and cultural sites; and
  - \* Determine whether the area is renowned for any cultural and heritage resources, such as Stone Age sites, Iron Age sites, informal graveyards or historical homesteads.

- » Report

The reporting of the scoping component is based on the results and findings of the desktop study, wherein potential issues associated with the proposed development will be identified, and those issues requiring further investigation through the IA Phase highlighted. Reporting will aim to identify the anticipated impacts, as well as cumulative impacts, of the operational units of the proposed project on the identified heritage resources for all 3 development stages of the project, i.e. construction, operation and decommissioning. Reporting will also consider alternatives should any significant sites be impacted on by the proposed project. This is done to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve and develop them within the framework provided by Heritage Legislation.

## **1.3 Nature of the development**

The solar farm is proposed to include several arrays (static or tracking) of photovoltaic solar panels with a contracted capacity of up to 100MW. The development footprint of the solar farm is anticipated to be approximately 300 hectares in extent, depending on the specific technology to be implemented.

Infrastructure associated with the solar farm will include:

- » Arrays of PV panels (either a static or tracking PV system) with a capacity of up to 100MW.
- » Mounting structures to support the PV panels.

- 
- » On-site inverters to convert the power from a direct current to an alternating current and a substation to facilitate the connection between the solar farm and the Eskom electricity grid.
  - » A new 132kV power line between the on-site substation and the Eskom grid connection point. Four grid connection point alternatives are being considered including the Dean Traction-Regina Traction 132kV power line, the Mercury-Vaal Reefs Ten 132kV power line, the Dean Traction 132 KV Substation and the Vaal Reefs Ten 132/22/6.6kV Substation.
  - » Cabling between the project components, to be laid underground where practical.
  - » Offices and workshop areas for maintenance and storage.
  - » Temporary laydown areas.
  - » Internal access roads and fencing around the development area

#### **1.4. The receiving environment**

The proposed commercial photovoltaic (PV) solar energy facility (known as the Orkney Solar Farm) will be located on the Remaining Extent of Portion 7 and the Remaining Extent of Portion 21 of the Farm Wolvehuis 114, situated approximately 11.8km to the south west from the town of Orkney and in close proximity to Vaal River. The proposed study area falls under the jurisdiction of the City of Matlosana Local Municipality and within the greater Dr Kenneth Kaunda District Municipality in the North West Province.

The study area falls within the Dry Highveld Grassland Bioregion as described by Mucina *et al* (2006) with the vegetation described as Klerksdorp thornveld. Land use in the general area is characterised by agriculture, dominated by cattle farming as well as extensive mining activities. The study area is characterised by deep sandy to loamy soil and consists of a featureless flat plain without any major drainage systems or focal points on the landscape like hills.



Figure 2: Google image of the study area (i.e. the Remaining Extent of Portion 7 and the Remaining Extent of Portion 21 of the Farm Wolvehuis 114) indicated by the blue polygon.



## **2. APPROACH AND METHODOLOGY**

The assessment is to be undertaken in two phases, a desktop study as part of the Scoping phase and an Archaeological Impact Assessment as part of the Environmental Impact Assessment phase. This report concerns the scoping phase. The aim of the scoping phase is to cover archaeological and cultural heritage data available to compile a background history of the broader study area and the study area proposed for the project in order to identify possible heritage issues or fatal flaws that should be avoided during development.

This was accomplished by means of the following phases (the results are represented in section 4 of this report):

### **2.1 Literature search**

Utilising data for information gathering stored in the archaeological database at Wits University and published articles on the archaeology and history of the area. The aim of this is to extract data and information on the area in question, looking at archaeological sites, historical sites and graves of the area.

### **2.2 Information collection**

The SAHRIS was consulted to further collect data from CRM practitioners who undertook work in the area to provide the most comprehensive account of the history of the area where possible.

### **2.3 Public consultation**

No public consultation was conducted during this phase.

### **2.4 Google Earth and mapping survey**

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where archaeological sites might be located.

### **2.5 Genealogical Society of South Africa**

The database of the genealogical society was consulted to collect data on any known graves in the area.

### 3. LEGISLATION

For this project the National Heritage Resources Act, 1999 (Act No. 25 of 1999) is of importance and the following sites and features are protected:

- a. Archaeological artefacts, structures and sites older than 100 years
- b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography
- c. Objects of decorative and visual arts
- d. Military objects, structures and sites older than 75 years
- e. Historical objects, structures and sites older than 60 years
- f. Proclaimed heritage sites
- g. Grave yards and graves older than 60 years
- h. Meteorites and fossils
- i. Objects, structures and sites of scientific or technological value.

The national estate that includes the following:

- a. Places, buildings, structures and equipment of cultural significance
- b. Places to which oral traditions are attached or which are associated with living heritage
- c. Historical settlements and townscapes
- d. Landscapes and features of cultural significance
- e. Geological sites of scientific or cultural importance
- f. Archaeological and palaeontological importance
- g. Graves and burial grounds
- h. Sites of significance relating to the history of slavery
- i. Movable objects (e.g. archaeological, palaeontological, meteorites, geological specimens, military, ethnographic, books etc.)

Section 34 (1) of the act deals with structures which are older than 60 years. Section 35(4) of this act deals with archaeology, palaeontology and meteorites. Section 36(3) of the National Heritage Resources Act, deals with human remains older than 60 years. Unidentified/unknown graves are also handled as older than 60 years until proven otherwise.

### 3.1 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 development area. 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. National and Provincial Monuments are recognised for conservation purposes. The following interrelated criteria were used to establish site significance:

- » The unique nature of a site;
- » The integrity of the archaeological/cultural heritage deposit;
- » 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 or is known);
- » The preservation condition of the site;
- » Potential to answer present research questions.

The criteria above will be used to place identified sites within SAHRA's (2006) system of grading of places and objects which form part of the national estate. This system is approved by ASAPA for the SADC region. The recommendations for each site should be read in conjunction with section 11 of this report.

<b>FIELD RATING</b>	<b>GRADE</b>	<b>SIGNIFICANCE</b>	<b>RECOMMENDED MITIGATION</b>
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	-	Medium	Recording before

B (GP.B)		significance	destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

#### 4. REGIONAL OVERVIEW

##### 4.1.1. Information collection

Two unpublished CRM projects were conducted in the general broader study area (Coetzee 2012 & Pelsler 2012). Coetzee (2012) conducted a study to the north (5 km east of Orkney) and recorded no archaeological material; he did however record two demolished structures, younger than 60 years. Pelsler (2012) also conducted a study to the north (close to Klerksdorp) and recorded Stone Age sites associated with water sources.

##### 4.1 2. Public consultation

No public consultation was conducted by the heritage consultant during the scoping phase.

##### 4.1.3. Google Earth and mapping survey

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where archaeological sites might be located.

##### 4.1.4. Genealogical Society of South Africa

No grave sites are indicated within the study area proposed for the project.

#### 4.2 Archaeological and Historical Information Available on the Study Area

##### Archaeological Background

The archaeological background and timeframe of the study area proposed for the project can be divided into the Stone Age and Iron Age.

##### 4.2.1. Stone Age

The Stone Age is divided in Early; Middle and Late Stone Age and refers to the earliest people of South Africa who mainly relied on stone for their tools.

Early Stone Age: The period from  $\pm$  2.5 million yrs. -  $\pm$  250 000 yrs. ago. Acheulean stone tools are dominant. No Acheulean sites are on record near the study area, but isolated finds may be possible. However, isolated finds have little value. Therefore, the development is unlikely to disturb a significant site.

**Middle Stone Age:** The Middle Stone Age includes various lithic industries in SA dating from  $\pm 250\ 000$  yrs. – 25 000 yrs. before present. This period is first associated with archaic Homo sapiens and later Homo sapiens sapiens. Material culture includes stone tools with prepared platforms and stone tools attached to handles. MSA material is found widespread in South Africa and material dating to this period can be expected along the Vaal River.

**Late Stone Age:** The period from  $\pm 25\ 000$ -yrs before present to the period of contact with either Iron Age farmers or European colonists. This period is associated with Homo sapiens sapiens. Material culture from this period includes: microlithic stone tools; ostrich eggshell beads and rock art. Sites in the open are usually poorly preserved and therefore have less value than sites in caves or rock shelters.

Since there are no caves located in the study area no LSA sites of significance are expected. The Matlwase LSA site is on record close to Wolmaransstad (Bergh 1999) north east of the study area. According to Bergh there are no known Stone Age sites close to the study area, although a number of rock engraving sites are known to occur in the larger geographical area (Bergh 1999: 4-5).

#### **4.2.2. Iron Age (general)**

The Iron Age as a whole represents the spread of Bantu speaking people and includes both the pre-Historic and Historic periods. It can be divided into three distinct periods:

The Early Iron Age: Most of the first millennium AD.

The Middle Iron Age: 10th to 13th centuries AD.

The Late Iron Age: 14th century to colonial period.

The Iron Age is characterised by the ability of these early people to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living.

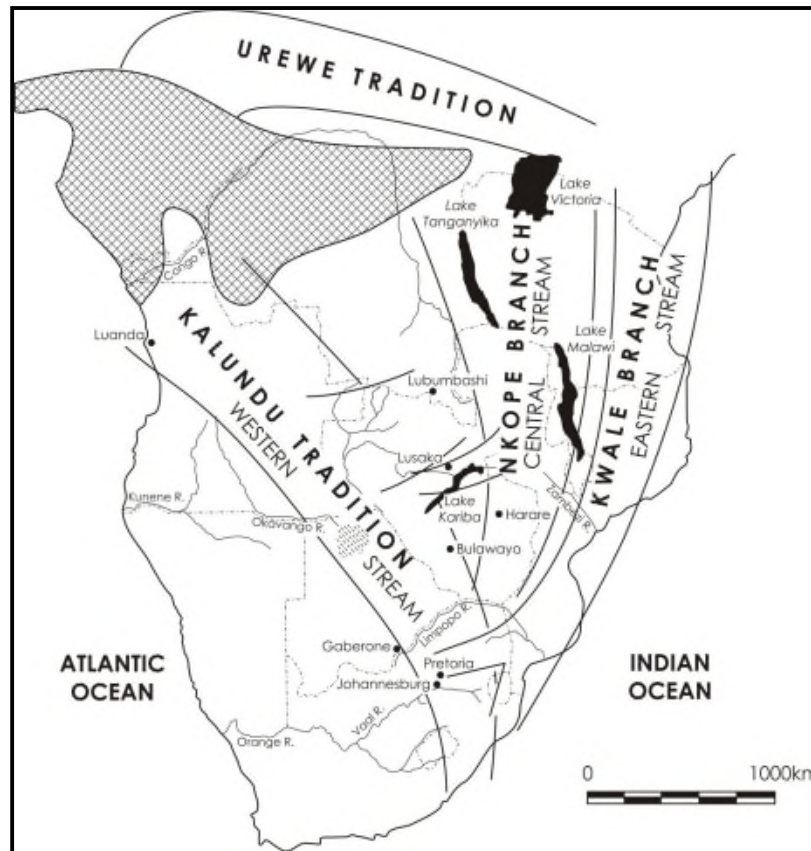


Figure 3: Movement of Bantu speaking farmers (Huffman 2007)

No sites dating to the Early or Middle Iron Age have been recorded or is expected within the study area. The same goes for the Later Iron Age period where the study area is situated outside the southern periphery of distribution of Late Iron Age settlements in the North West Province.

However, to the north west of the study area towards Zeerust and towards Mafikeng, the area is well known for Later Iron Age stone walled settlements archaeologically referred to as Molokwane settlements (Pistorius 1992, Booyens 1998, Huffman 2007). Bergh (1999) recorded some 88 Late Iron Age sites towards Klerksdorp. No sites dating to this period is expected in the study area.

There are some Late Iron Age sites in the larger geographical area north and west of the study area (Bergh 1999: 6-7). Some well-known examples are Platberg (Wells 1933) and Buisfontein (Thabeng) (Maggs 1976). Another site at Palmietfontein (30km north of Klerksdorp), was excavated in 1975 by D.A. White. An article on this work also indicated that the area north of Klerksdorp is relatively rich in terms of Late Iron Age sites, and that the Rolong capital of Thabeng lies within this area (White 1977: 89). Based on the research by Huffman it is possible that these sites are related to the Olifantspoort facies of the Urewe

Tradition, dating to around AD 1500-1700, and the Thabeng facies of the same tradition (AD 1700-1840) could possibly be found in the area (Huffman 2007).

The well-known rock art site of Bosworth that also included Later Stone Age artefacts (Mason 1962) is located to the north of the study area.

## 5. HISTORICAL BACKGROUND

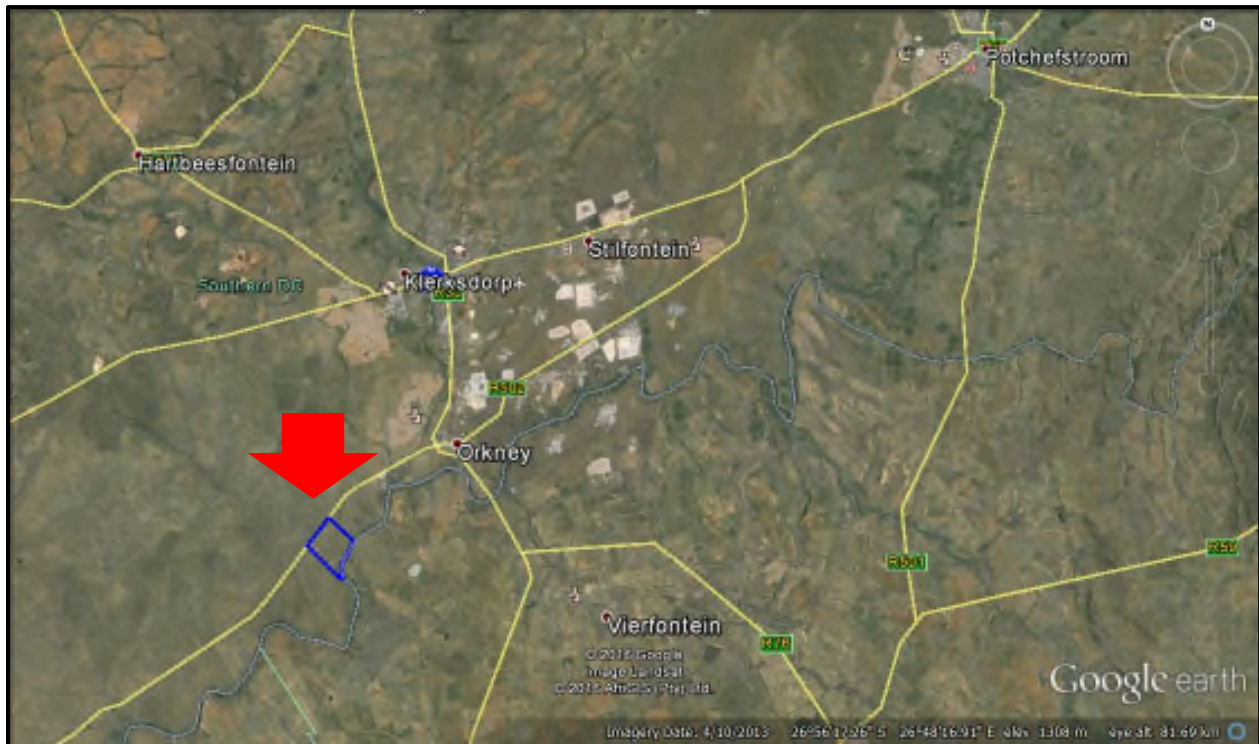


Figure 4: Google Earth image of the study area (illustrated by the blue polygon) in relation to the towns of Klerksdorp, Stilfontein, Orkney and Potchefstroom.

### 5.1. A Brief background to the greater study area

During the Second Boer War (1899-1902), there were many battles in the Klerksdorp area, the area also housed a large concentration camp. Just under a thousand graves of the victims of the concentration camps, mostly of Boer women and children can still be visited today in the old cemetery just outside of Klerksdorp.

The most famous battle in the Klerksdorp area is the Battle of Ysterspruit. The Boer General, Koos de la Rey, achieved a great victory and this battle is one of the most celebrated of the general's career. It was this battle in which the Boer soldiers pioneered the art of firing from horseback.

On April 11, 1920, Rooiwal, near Klerksdorp, saw the battle of Rooiwal, the last major engagement of the war, where a Boer charge was beaten off by entrenched British troops.

Sites relating to the Anglo Boer War have been recorded and indicated by Meyer (1971), Breytenbach (1978), Van den Berg (1996) as well as Scheepers-Strydom (1970) for the greater study area.

## **5.2 Brief History of Orkney**

"Orkn" is the ancient Islandic word for sea lion, and "Ey" a Nordic word meaning island. The sea lion is the emblem of the town. The town was named after Orkney Isles off the north coast of Scotland, the birthplace of Simon Fraser, one of the gold mining pioneers of the 1880s. The town was proclaimed in 1940 on the farm Witkoppes, where Fraser had first started gold mining ([http://www.orkney.co.za/history\\_orkney](http://www.orkney.co.za/history_orkney)).

The town was laid out by a Scot by the name of Maconachie. His naming of the streets was interesting: he used the names of poets and authors from the British Isles. The rule was broken as Afrikaner nationalism grew dominant in the 1960's, and some of the UK literary names were replaced (<http://www.orkney.co.za/historyorkney>).

Orkney became rather famous in the late 1980s and early 1990s as the setting for a popular Afrikaans television sitcom called Orkney Snork Nie. The word "snork" means "snore": so the joke in the title means "Orkney doesn't snore". Even further back the Afrikaans jab at the sleepy town was "Ook nie dorp nie; ook nie plaas nie". The pun is on the "ook nie" ('also not' or 'neither') sounding like "Orkney"; and the full meaning being "neither town nor farm"([http://www.orkney.co.za/history\\_orkney](http://www.orkney.co.za/history_orkney)).

The notion of "sleepy" is misleading. Some of the deepest and richest gold mines have been worked in the area for decades. But the social life for the youth was better in Klerksdorp. The Orkney Stadium Disaster, when 42 fans died at the stadium in 1991, was the second worst sporting disaster in South Africa ([http://www.orkney.co.za/history\\_orkney](http://www.orkney.co.za/history_orkney)).



## 6 PROBABILITY OF OCCURRENCE OF SITES

Based on the above information, it is possible to determine the probability of finding archaeological and cultural heritage sites within the study area to a certain degree. For the purposes of this section of the report the following terms are used – low, medium and high probability. Low indicates that no known occurrences of sites have been found previously in the general study area, medium probability indicates that some known occurrences in the general study area are documented and can therefore be expected in the study area proposed for the project and a high probability indicates that occurrences have been documented close to or within the study area and that the environment of the study area has a high degree of probability for the occurrence of sites.

### » Archaeological and Cultural Heritage Landscape

NOTE: *Archaeology is the study of human material and remains (by definition) and is not restricted in any formal way as being below the ground surface.*

*Archaeological* remains dating to the following periods can be expected within the study area:

#### » Stone Age finds

ESA: *Low Probability*

MSA: *Low to Medium Probability*

LSA: *Low to Medium Probability*

LSA –Herder: *Low Probability*

#### » Iron Age finds

EIA: *Low Probability*

MIA: *Low Probability*

LIA: *Low to Medium Probability*

#### » Historical finds

Historical period: *-Low to Medium Probability*

Historical dumps: *Low to Medium Probability*

Structural remains: *Low to Medium Probability*

Cultural Landscape: *Low probability*

#### » Living Heritage

For example rainmaking sites: *Low Probability*

» Burial/Cemeteries

Burials over 100 years: *Low -Medium Probability*

Burials younger than 60 years: *Low -Medium Probability*

Subsurface excavations including ground levelling, landscaping, and foundation preparation can expose any number of these.

## **7. ASSUMPTIONS AND LIMITATIONS**

The study area proposed for the project was not subjected to a field survey as this will be undertaken in the EIA phase. It is assumed that information obtained for the broader study area is applicable to the study area proposed for the project.

## **8. FINDINGS**

The heritage scoping study revealed that the following heritage sites, features and objects can be expected within the study area proposed for the project.

### **8.1. Archaeology**

#### ***8.1.1 Archaeological finds***

There is a low likelihood of finding Iron Age sites within the study area. No Iron Age sites have been recorded in the general area however this could be attributed to the lack of systematic surveys. However these LIA stone walled settlements are easily visible on Google Earth and based on the available imagery of the area no indications of sites dating to this period was identified. MSA material is known to occur along watercourses in the area and in some instances in the Vaal gravels.

#### ***8.1.2 Nature of Impact***

The construction phase of the project could directly impact on surface and subsurface archaeological sites.

#### ***8.1.3 Extent of impact***

Since the development will not be located close to the Vaal River (100m flood line) a low negative impact on any possible Stone Age sites or material next to the river is expected.

## **8.2. Historical period**

### ***8.2.1 Historical finds:***

Historical finds include middens, structural remains and cultural landscape. The brief desktop study highlighted the fact that various historical activities occurred in the larger area and features dating to this period can be expected. Two farm house complexes are indicated on the second edition topographic maps (Figure 5) and could be older than 60 years.

### ***8.2.2 Nature of Impact***

The construction of the project can directly impact on both the visual context and sense of place of historical sites.

### ***8.2.3 Extent of impact***

The construction of the project could have a low - medium impact on a local scale.

## **8.3. Burials and Cemeteries**

### ***8.3.1 Burials and Cemeteries***

Graves and informal cemeteries can be expected anywhere on the landscape. Family cemeteries can be expected close to the farmsteads (Figure 5).

### ***8.3.2 Nature of Impact***

The construction of the proposed project could directly impact on marked and unmarked graves.

### ***8.3.3 Extent of impact***

The project could have a low to medium impact on a local scale.

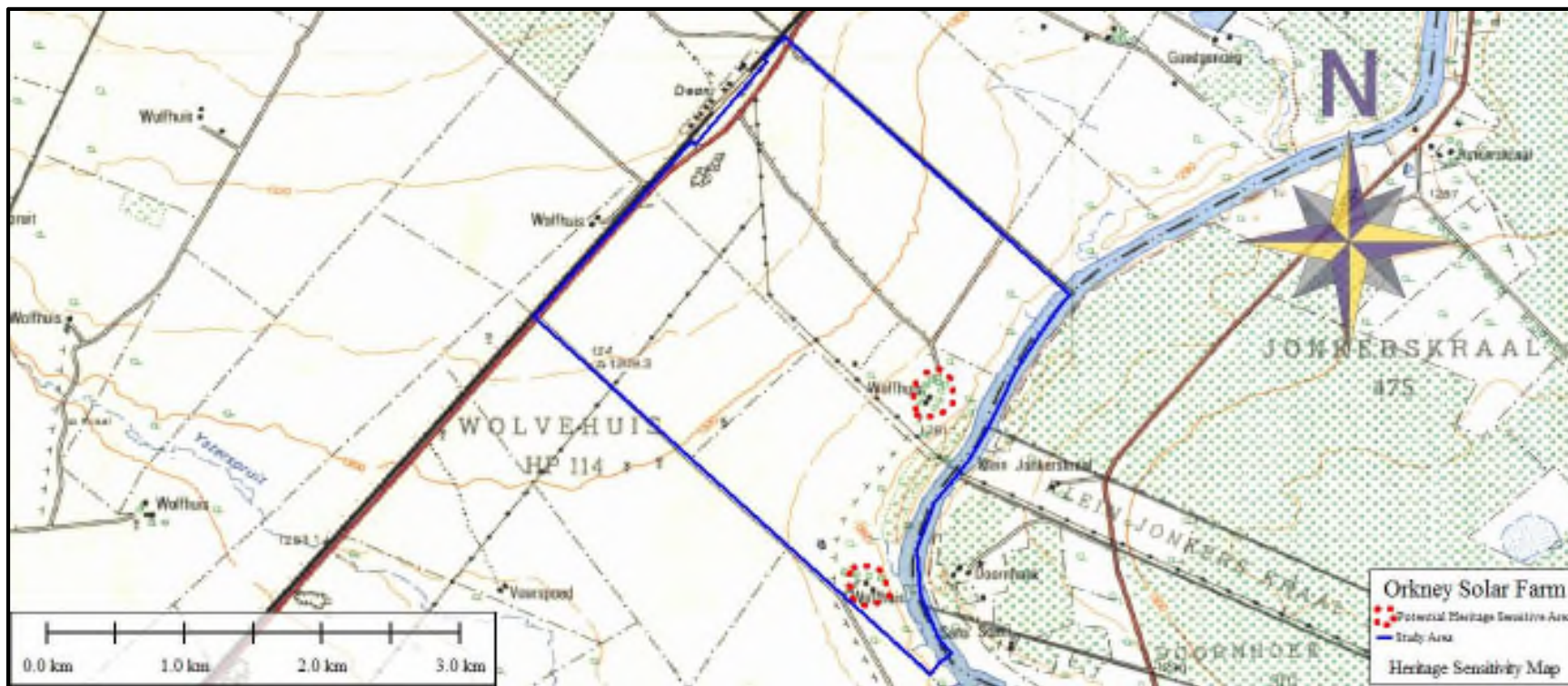


Figure 5: Areas of potential Heritage Significance could potentially include two farm house (farmsteads) complexes.

## 9. POTENTIAL SIGNIFICANCE OF HERITAGE RESOURCES

### Impacts

The construction of the photovoltaic solar farm could have a low to medium impact on a local scale on possible archaeological material and graves. The sense of place of cultural sites and the cultural landscape will be impacted on a local scale but the impact is assumed to be low.

### Desktop Sensitivity Analysis of the Site:

Based on the current information obtained for the area at a desktop level it is anticipated that any sites that occur within the study area will have a Generally Protected B (GP.B) field rating apart from graves and rock art that could have a Generally Protected A (GP.A) field rating. Any site located within the study area proposed for the project should be mitigatable and no red flags have been identified. With the implementation of appropriate and correct mitigation measures the impact to potential heritage resources will be acceptable.

Issue	Nature of Impact	Extent of Impact	No-Go Areas
Loss of heritage resources.	Stone Age material, historical sites and burial sights might occur in the project site. The construction phase could have a negative impact on the heritage resources in the study area.	Local	None

### Gaps in knowledge & recommendations for further study:

It is assumed that information obtained for the wider region is accurate and applicable to this study. The description and assessment of possible heritage sites expected for the study area stems from superficial observations and a desktop study only. The study area proposed for the project was not subjected to a field survey as this will be done in the EIA phase. Due to the size of the study area and the possible occurrence of Stone Age material and graves in the study area and to comply with the National Heritage Resources Act (Act 25 of 1999) a Phase 1 Archaeological Impact Assessment is recommended.

## 10. CONCLUSIONS AND RECOMMENDATIONS

This scoping study revealed that few heritage sites occur in the larger region surrounding the study area proposed for the project but that MSA material, structures older than 60 years and possibly burial sites can be expected within the study area. Every site is relevant to the Heritage Landscape, but it is anticipated that few sites in the study area could be of conservation value. The following conclusions are applicable to the following sites:

- » Archaeological sites

All sites could be mitigated either in the form of conservation of the sites within the development area or by a Phase 2 study where the sites will be recorded and sampled before the client can apply for a destruction permit for these sites prior to development.

» Historical finds and Cultural landscape

It is not anticipated that the built environment will be severely impacted upon as few structures occur within the study area (based on Google Earth). This assumption will however have to be verified in the field. If any sites dating to the Anglo Boer War occur in the study area it is recommended that these sites are conserved.

» Burials and cemeteries

Formal and informal cemeteries as well as pre-colonial graves occur widely across Southern Africa. It is generally recommended that these sites are preserved within development areas. These sites can however be relocated if conservation is not possible, but this option must be seen as a last resort and is not advisable. The presence of any grave sites must be confirmed during the field survey and the public consultation process.

» General

It is recommended that as part of the public consultation process the presence of graves, archaeological and historical sites should be determined.

From an archaeological perspective the proposed Orkney Solar Farm is a viable land use option for the study area that will not have major significant impacts on heritage resources.

## 11. PLAN OF STUDY

In order to comply with the National Heritage Resources Act (Act 25 of 1999) a Phase 1 Archaeological Impact Assessment must be undertaken. During this study sites of archaeological, historical or places of cultural interest must be located, identified, recorded, photographed and described. During this study the levels of significance of recorded heritage resources must be determined and mitigation proposed should any significant sites be impacted upon, ensuring that all the requirements of SAHRA are met.

Action Trigger	Yes/No	Description
Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300 m in length.	Yes	Powerline and internal roads
Construction of a bridge or similar structure exceeding 50 m in length.	No	
Development exceeding 5000 m <sup>2</sup>	Yes	Footprint of impact area exceeds 5000 m <sup>2</sup>
Development involving more than 3 erven or sub divisions	No	
Development involving more than 3 erven or sub divisions that have been consolidated in the past 5 years	No	
Re-zoning of site exceeding 10 000 m <sup>2</sup>	Yes	Re-zoning from agricultural to renewable energy related
Any other development category, public open space, squares, parks or recreational grounds	No	

### **11.1 Reasoned Opinion**

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 impact of the development on heritage will not impact negatively on the archaeological record of the area. It is possible that new information, which could change the recommendations, could come to light through the following:

- » Systematic archaeological survey of the area;
- » Exposure of archaeological and historical sites and objects that are hidden or are buried during site clearance activities;
- » Exposure of hidden archaeological and historical sites and objects (obscured by tall grass etc.).

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.

### **12. LIST OF PREPARERS**

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### **13. STATEMENT OF COMPETENCY**

The author of the report is a member of the Association of Southern African Professional Archaeologists and is also accredited in the following fields of the Cultural Resource Management (CRM) Section, member number 159: Iron Age Archaeology, Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation. Jaco is also an accredited CRM Archaeologist with SAHRA and AMAFA.

Jaco has been involved in research and contract work in South Africa, Botswana, Mozambique, Zimbabwe, Tanzania and the DRC and conducted well over 400 AIAs since he started his career in CRM in 2000. This involved several mining operations, Eskom transmission and distribution projects and infrastructure developments. The results of several of these projects were presented at international and local conferences.



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