

ARCHAEOLOGICAL SCOPING REPORT

FOR THE H2 ENERGY POWER STATION, MPUMALANGA PROVINCE

Client:
Savannah Environmental (Pty) Ltd

Client information:
Sarah Watson
Tel: 011 656 3237

E – Mail: sarah@savannahsa.com



HCAC - Heritage Consultants

Private Bag X 1049

Suite 34

Modimolle

0510

Tel: 082 373 8491

Fax: 086 691 6461

E-Mail: jaco.heritage@gmail.com

Report Author:

Mr. J. van der Walt

Project Reference:


216111

Report date:

November 2016

DOCUMENT PROGRESS
Archaeological Impact Assessment

Document status

Document Version	v1.0		
Report Purpose	Draft for review Savannah Environmental (Pty) Ltd		
Report Ref. No.	216111		
	Name	Signature	Date
Document Compilation	Mr. J. van der Walt		November 2016

Distribution List

Date	Report Reference number	Document Distribution	Number of Copies
2016/11/05	216111	Savannah Environmental (Pty) Ltd	Electronic copy

Indemnity and Conditions Relating to this Report

The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information. The report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken and Heritage Contracts and Archaeological Consulting (HCAC) CC and its staff reserve the right to modify aspects of the report including the recommendations if and when new information becomes available from ongoing research or further work in this field, or pertaining to this investigation.

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. HCAC CC and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.

This report must not be altered or added to without the prior written consent of the author. This also refers to electronic copies of this report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

Copyright

Copyright on all documents, drawings and records, whether manually or electronically produced, which form part of the submission and any subsequent report or project document, shall vest in HCAC CC.

The Client, on acceptance of any submission by HCAC CC and on condition that the Client pays to HCAC CC the full price for the work as agreed, shall be entitled to use for its own benefit:

- » The results of the project;
- » The technology described in any report; and
- » Recommendations delivered to the Client.

Should the Client wish to utilise any part of, or the entire report, for a project other than the subject project, permission must be obtained from HCAC CC to do so. This will ensure validation of the suitability and relevance of this report on an alternative project.

EXECUTIVE SUMMARY

Site name and location: The project is referred to as the H2 Energy Power Station. The project is located approximately 9 km south of KwaMhlanga, and approximately 1 km north of the Palesa Coal Mine in the Thembisile Hani Local Municipality of the Nkangala District in Mpumalanga Province.

1: 50 000 Topographic Map: 2528 DA & 2528 DB.

EIA Consultant: Savannah Environmental (Pty) Ltd.

Developer: H2 Clean Energy (Pty) Ltd.

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

Contact person: Jaco van der Walt, Tel: +27 82 373 8491, Email: jaco.heritage@gmail.com.

Date of Report: 4 November 2016.

Findings of the Assessment:

An extensive field based heritage survey (Nel, 2010) adjacent to the area under investigation recorded no archaeological sites or features; this study did however record several cemeteries and structures. Similarly few archaeological sites are expected for the area marked for the proposed power station although cemeteries and structures possibly older than 60 years can occur in the area. Every site is relevant to the Heritage Landscape, but it is anticipated that few sites in the study area could have conservation value. It is recommended that heritage sites should be preserved in situ as far as possible. If this is not possible 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

Several buildings and structures occur in the study area. Some of these could be older than 60 years and therefore protected by legislation. A destruction permit will be required to demolish these features. A field and archival study is required in the EIA Phase to confirm the significance of structures in the study area.

» 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 a development. 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 point of view the proposed project is considered to be viable and no fatal flaws are expected. This will be confirmed through a Heritage Impact Assessment to be undertaken in the EIA Phase.

Contents

Indemnity and Conditions Relating to this Report	3
Copyright.....	4
ABBREVIATIONS	9
GLOSSARY.....	9
1. INTRODUCTION.....	11
1.1 Terms of Reference	14
1.2 Nature of the development	14
1.3 The receiving environment.....	15
2. APPROACH AND METHODOLOGY.....	17
2.1 Literature review	17
2.2 Information collection.....	17
2.3 Public consultation	17
2.4 Google Earth and mapping survey	17
2.5 Genealogical Society of South Africa	17
2.6. Restrictions.....	17
3. LEGISLATION	18
3.1 Heritage Site Significance and Mitigation Measures	19
4. REGIONAL OVERVIEW.....	21
4.1 General Information.....	21
4.1.1. Literature search	21
4.1.2. Public consultation	21
4.1.3. Google Earth and mapping survey.....	21
4.1.4. Genealogical Society of South Africa.....	21
5. ARCHAEOLOGICAL AND HISTORICAL INFORMATION AVAILABLE ON THE STUDY AREA	22
5.1. Earlier Stone Age.....	22
5.2. Middle Stone Age.....	22
5.3. Later Stone Age.....	22
5.4. The Iron Age (AD 400 to 1840)	23
6 PROBABILITY OF OCCURRENCE OF SITES.....	24
7. ASSUMPTIONS AND LIMITATIONS	25
8. FINDINGS	25
8.1. Archaeology.....	26
8.1.1 Archaeological finds	26
8.1.2 Nature of Impact	26
8.1.3 Extent of impact	26
8.2. Historical period	26
8.2.1 Historical finds: I	26
8.2.2 Nature of Impact	26
8.2.3 Extent of impact	26
8.3. Burials and Cemeteries.....	26
8.3.1 Burials and Cemeteries.....	26
8.3.2 Nature of Impact	26
8.3.3 Extent of impact	26
9. POTENTIAL SIGNIFICANCE OF HERITAGE RESOURCES	29

10. CONCLUSIONS AND RECOMMENDATIONS	29
11. PLAN OF STUDY	30
12. LIST OF PREPARERS.....	32
13. STATEMENT OF COMPETENCY	32
14. REFERENCES	33

Figures

Figure 1. Regional location of the site proposed for the development of the Power Station.	12
Figure 2. Extract of the 1: 50 000 map of the study area.	13
Figure 3. Areas of possible heritage interest.	28

ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BIA: Basic Impact Assessment
CRM: Cultural Resource Management
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
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
SAHRIS: South African Heritage Resources Information System

**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 (HCAC) was contracted by Savannah Environmental (Pty) Ltd to conduct a Heritage Scoping Study for the proposed H2 Energy Power Station and associated infrastructure. The project is located approximately 9 km south of KwaMhlanga, and approximately 1 km north of the Palesa Coal Mine in the Thembisile Hani Local Municipality of the Nkangala District in Mpumalanga Province. The heritage scoping report forms part of the Environmental Impact Assessment (EIA) for the proposed project.

The aim of the scoping report is to conduct a desktop study to identify possible heritage resources within the project area and to assess their importance within a Local, Provincial and National context. The study furthermore aims to assess the impact of the proposed project 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.

This report outlines the approach and methodology utilised for the Scoping phase of the project. The report includes information collected from various sources and consultations. Possible impacts are identified and mitigation measures are proposed in the following 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 EIA phase.



Figure 1. Regional location of the site proposed for the development of the H2 Energy Power Station and associated infrastructure.

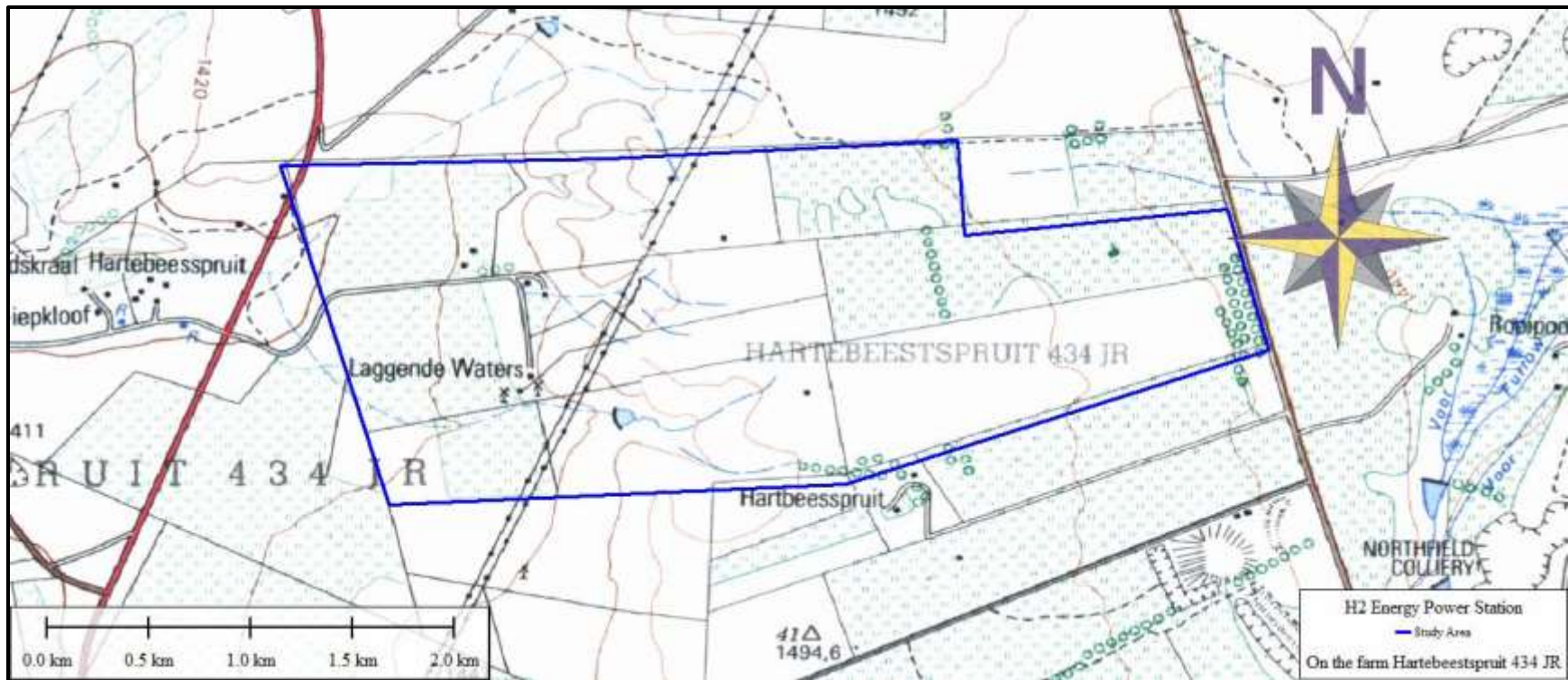


Figure 2. Extract of the 1:50 000 map of the study area.

1.1 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 project. 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.
- » Compile a specialist Heritage Scoping Report in line with the requirements of the EIA Regulations, 2014.

The reporting of the scoping component is based on the results and findings of the desktop study, wherein potential issues associated with the proposed project 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 activity 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.

1.2 Nature of the development

The Coal-fired Power Station is proposed to make use of Supercritical (SC) or Ultra-supercritical (USC) Pulverised Coal (PC) or Circulating Fluidised Bed (CFB) boiler technology. It will have a total generation capacity of up to 600 MW. It will have up to 2 emission stacks 80 m in height. The project will utilise dry cooling and dry ashing methods.

Coal required for the project will be sourced from the existing Palesa Coal Mine, located approximately 1 km south of the project site.

Electricity generated by the project will feed into and supplement the national electricity grid. Power line route alternatives will be determined based on the final project layout and grid connection point. These will be assessed through a separate application for Authorisation.

The main infrastructure components associated with the project include:

- » Overland coal conveyor.
- » Raw materials loading and offloading, storage areas, and handling facilities.
- » Coal crusher (and screening plant in the case of PC technology).
- » Power generation units.
- » Ash dump.
- » Water infrastructure including a raw water storage dam, wastewater treatment plant, and storm water runoff and ash dump runoff dams.
- » A substation/switching yard.
- » Office and maintenance area/s and buildings.
- » Access roads.

1.3 The receiving environment

The project is located approximately 9 km south of KwaMhlanga, and approximately 1 km north of the Palesa Coal Mine in the Thembisile Hani Local Municipality of the Nkangala District in Mpumalanga Province (Figure 1 & 2).

The project site comprises the following properties

Description:	SG 21 Code	Parcel
Portion 21 of the Farm Hartebeestspruit No. 434	T0JR00000000043400021	21/434
Portion 22 of the Farm Hartebeestspruit No. 434	T0JR00000000043400022	22/434
Portion 23 of the Farm Hartebeestspruit No. 434	T0JR00000000043400023	23/434

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 EIA phase. This report concerns the scoping phase. The aim of the scoping phase is to cover available data regarding archaeological and cultural heritage to compile a background history of the study area in order to identify possible heritage issues or fatal flaws that could possibly be associated with the project and 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 review

A review was conducted utilising data for information gathering from 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 South African Heritage Resources Information System (SAHRIS) was consulted to further collect data from Cultural Resource Management (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.

2.6. Restrictions

This study did not assess the impact on intangible resources or the palaeontological component of the project.

3. LEGISLATION

For this project the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) 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 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 that are older than 60 years. Section 35(4) of this Act deals with archaeology, palaeontology and meteorites. Section 36(3) of the 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 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; and
- » Potential to answer present research questions.

The criteria above will be used to place identified sites within the South African Heritage Resources Agency's (SAHRA's) (2006) system of grading of places and objects that form part of the national estate. This system is approved by the Association of South African Professional Archaeologists (ASAPA) for the Southern African Development Community (SADC) region. The recommendations for each site should be read in conjunction with Section 11 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

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
Generally Protected B (GP.B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

4. REGIONAL OVERVIEW

4.1 General Information

4.1.1. Literature search

One previous heritage study was conducted close to the study area by Johan Nel (2010). No sites of archaeological significance were identified. However, a total of six burial grounds, as well as three structures were identified and recorded.

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 was 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.

5. ARCHAEOLOGICAL AND HISTORICAL INFORMATION AVAILABLE ON THE STUDY AREA

5.1. Earlier Stone Age

Hominids began to make stone tools about 2.6 million years ago. Known as the Oldowan industry, most of the earliest tools were rough cobble cores and simple flakes. The flakes were used for such activities as skinning and cutting meat from scavenged animals. These early artefacts are difficult to recognize and have so far only been found in rock shelters such as the Sterkfontein Caves (Kuman, 1998); they are unlikely to occur in the study area.

At about 1.4 million years ago hominids started producing more recognizable stone artefacts such as hand axes, cleavers and core tools (Deacon & Deacon, 1999). Among other things these Acheulian tools were probably used to butcher large animals such as elephants, rhinoceros and hippopotamus that had died from natural causes. Acheulian artefacts are usually found near the raw material from where they were quarried, at butchering sites, or as isolated finds. However, isolated finds have little value. Therefore, the project is unlikely to disturb a significant site. The presence and significance of finds can be determined by a field investigation.

5.2. Middle Stone Age

By the beginning of the Middle Stone Age (MSA), tool kits included prepared cores, parallel-sided blades and triangular points hafted to make spears (Volman, 1984). MSA people had become accomplished hunters by this time, especially of large grazing animals such as wildebeest, hartebeest and eland.

These hunters are classified as early humans, but by 100,000 years ago, they were anatomically fully modern. The oldest evidence for this change has been found in South Africa, and it is an important point in debates about the origins of modern humanity. In particular, the degree to which behaviour was fully modern is still a matter of debate. The repeated use of caves indicates that MSA people had developed the concept of a home base and that they could make fire. These were two important steps in cultural evolution (Deacon & Deacon, 1999). As there are no caves in the study area, there is a low possibility of finding sites of high significance in the area.

5.3. Later Stone Age

By the beginning of the Later Stone Age (LSA), human behaviour was undoubtedly modern. Uniquely human traits, such as rock art and purposeful burials with ornaments, became a regular practice. These people were the ancestors of the San (or Bushmen).

San rock art has a well-earned reputation for aesthetic appeal and symbolic complexity (Lewis-Williams, 1981). In addition to art, LSA sites contain diagnostic artefacts, including microlithic scrapers and segments made from very fine-grained rock (Wadley, 1987). Spear hunting probably continued, but LSA people also hunted small game with bows and poisoned arrows. Important LSA deposits have been excavated in Oliboompoot Cave (Mason, 1962) and other sites in the Waterberg to the south (Van der Ryst, 1998). Sites in the open are

usually poorly preserved and therefore have less value than sites in caves or rock shelters. As there are no caves in the study area, there is a low possibility of finding sites of high significance in the area.

5.4. The Iron Age (AD 400 to 1840)

Bantu-speaking people moved into Eastern and Southern Africa about 2,000 years ago (Mitchell, 2002). These people cultivated sorghum and millets, herded cattle and small stock and manufactured iron tools and copper ornaments. Because metalworking represents a new technology, archaeologists call this period the Iron Age. Characteristic ceramic styles help archaeologists to separate the sites into different groups and time periods. The first 1,000 years is called the Early Iron Age.

As mixed farmers, Iron Age people usually lived in semi-permanent settlements consisting of pole-and-daga (mud mixed with dung) houses and grain bins arranged around a central area for cattle (Huffman, 1982). Usually, these settlements with the 'Central Cattle Pattern' (CCP) were sited near water and good soils that could be cultivated with an iron hoe. For the project area, archaeological sites such as these may occur.

According to the most recent archaeological cultural distribution sequences by Huffman (2007), the study area falls within the distribution area of various cultural groupings originating out of both the Urewe Tradition (eastern stream of migration) and the Kalundu Tradition (western stream of migration). The facies that may be present are:

- » Urewe Tradition: Moloko Branch – Icon facies AD 1300 - 1500 (Late Iron Age)
- » Madikwe facies AD 1500-1700 (Late Iron Age)
- » Blackburn Branch- Uitkomst facies AD 1650-1820 (Late Iron Age)
- » Rooiberg facies AD 1650-1750 (Late Iron Age)
- » Kwale branch- Mzonjani facies AD 450 – 750 (Early Iron Age)
- » Kalunda Tradition: Benfica sub-branch – Bambata facies AD 150-650 (Early Iron Age)
- » Happy Rest sub-branch – Diamant facies AD 750-1000 (Early Iron Age)
- » Eiland facies AD 1000-1300 (Middle Iron Age)

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 some known occurrences in the general study area are documented and can therefore be expected in the study area, and a high probability indicates that occurrences have been documented close to or in the study area and that the environment of the study area has a high degree of probability having 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-Medium Probability*
MSA: *Low-Medium Probability*
LSA: *Low-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-Medium Probability*
Historical dumps: *Low-Medium Probability*
Structural remains: *Low-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: *Medium Probability*
Subsurface excavations including ground levelling, landscaping, and foundation preparation can expose any number of these.

7. ASSUMPTIONS AND LIMITATIONS

The study area was not subjected to a field survey at this stage in the process. This will be done in the EIA phase. It is assumed that information obtained for the wider area is applicable to the study area. Additional information could become available in future that could change the results of this report.

8. FINDINGS

In terms of the current area of investigation several areas of interest (Table 1) are noted from archival maps of the study area. Based on this information and previous experience a heritage sensitivity map was compiled (Figure 3) indicating areas of possible heritage sensitivity. It must be noted that findings must be confirmed during a field survey of the study area.

Table 1: Areas of possible heritage interest

LABEL	DESCRIPTION	LONGITUDE	LATITUDE
Area 1	Structures and higher likelihood of finding graves	28° 44' 33.6346" E	25° 30' 46.4697" S
Area 2	Structures and higher likelihood of finding graves	28° 45' 12.1618" E	25° 30' 41.4704" S
Area 3	Structures and higher likelihood of finding graves	28° 44' 42.3266" E	25° 30' 51.4197" S
Area 4	Low ridge, higher likelihood of finding archaeological sites	28° 44' 53.0770" E	25° 30' 55.8889" S
Area 5	Structures and higher likelihood of finding graves	28° 44' 41.9084" E	25° 31' 07.7725" S
Area 6	Structures and higher likelihood of finding graves	28° 45' 26.2885" E	25° 31' 06.7380" S
Area 7	Structures and higher likelihood of finding graves	28° 44' 48.9268" E	25° 31' 21.8588" S

Based on the results of the heritage scoping study the following heritage sites, features and objects can be expected within the study area.

8.1. Archaeology

8.1.1 Archaeological finds

A study adjacent to the area under investigation (Nel 2010) recorded no archaeological sites, similarly very few archaeological sites area expected in the study area. However if any pans, drainage lines or high lying areas (e.g., Area 4) occur in the study area Stone Age artefact scatters or even Iron Age Sites might be expected. Impacts to heritage resources will occur primarily during the construction phase and some impacts could occur during the operational phase, no impacts are expected during the decommissioning phase.

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

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

8.2. Historical period

8.2.1 Historical finds:

Historical finds include middens, structural remains and cultural landscape. An extensive field based heritage survey (Nel 2010) adjacent to the area under investigation recorded several structures. Several buildings and structures also occur in the study area. Some of these could be older than 60 years and therefore protected by legislation. A destruction permit will be required to demolish these features.

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 to 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.

8.3.2 Nature of Impact

The construction and operation 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.

Impact on Heritage resources			
The construction of the proposed project could directly impact on graves, archaeological sites and historical sites.			
Issue	Nature of Impact	Extent of Impact	No-Go Areas
Disturbance and destruction of archaeological sites and graves.	Construction activities could cause irreversible damage or destroy heritage resources and depletion of the archaeological record of the area.	Low to Medium on a local scale.	TBC after field work
Description of expected significance of impact			
Significance of sites, mitigation and significance of possible impact can only be determined after the field work has been conducted, but based on previous work in the area structures older than 60 years and grave sites can be expected. It should be possible to mitigate impacts to heritage sites by micro adjustments to the lay out to preserve the sites. Alternatively grave sites can be relocated, structures older than 60 years can be recorded and a demolition permit applied for. If any archaeological sites occur in the study area, these can be test excavated and mapped if warranted by the site. All these mitigation measures will require adherence to the NHRA and the required permits from the SAHRA.			
Gaps in knowledge & recommendations for further study			
The study area has not been subjected to a cultural resource survey and it is assumed that information obtained for the wider region is applicable to the study area. To address these gaps it is recommended that an archival and field study should be conducted to confirm the presence of heritage resources after which mitigation will be recommended.			

The following impacts can be expected to heritage resources in the area:

- » Direct impacts to heritage resources including damage and destruction of sites.
- » Indirect impacts including impacts on the cultural landscape and sense of place of the area.
- » Cumulative impacts including the permanent destruction of heritage resources throughout the wider region due to various mining and associated developments in the area.
- » Residual risks for the proposed project include depletion of the archaeological record of the wider region.

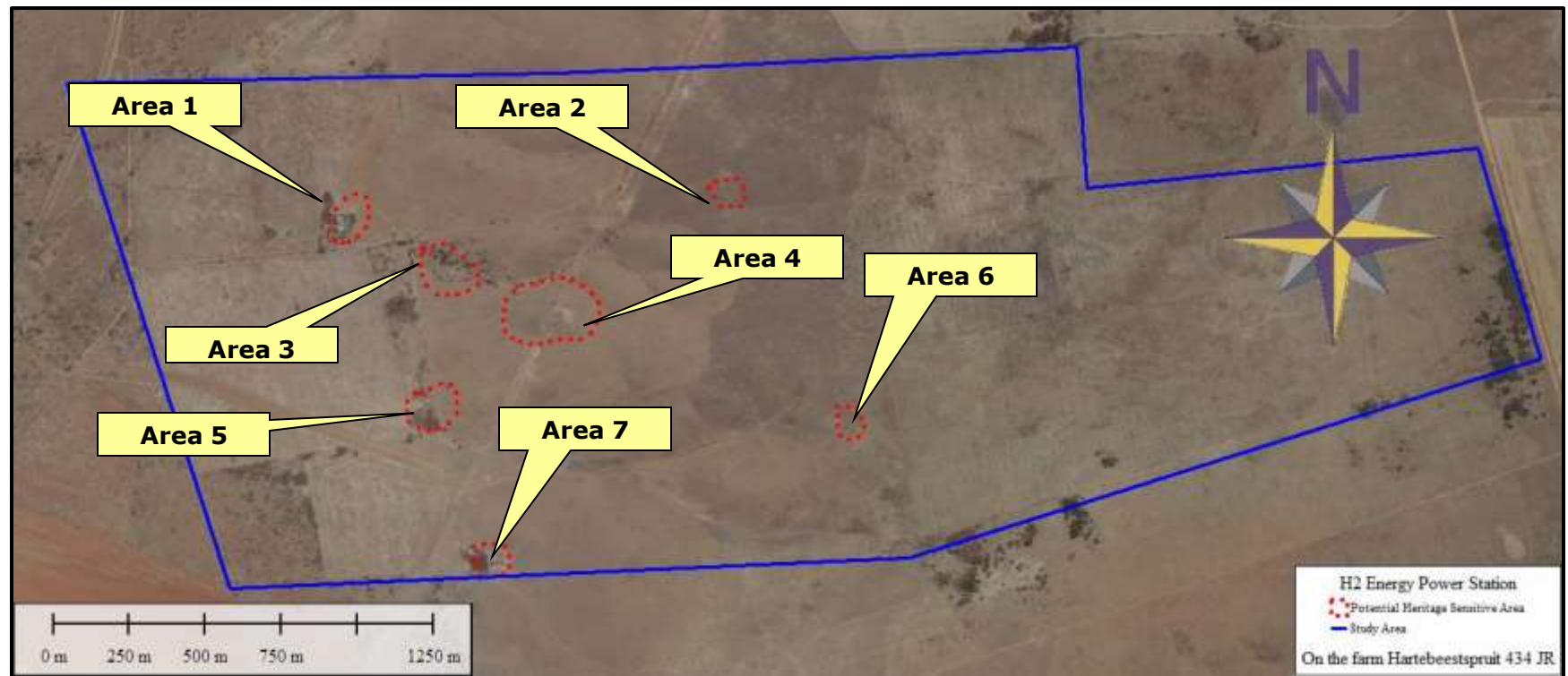


Figure 3. Areas of possible heritage interest.

9. POTENTIAL SIGNIFICANCE OF HERITAGE RESOURCES

Based on the current information obtained for the area at a desktop level it is anticipated that any sites that occur within the proposed development area will have a Generally Protected B (GP.B) or lower field rating apart from graves and rock art that could have a Generally Protected A (GP.A) field rating and all sites should be mitigatable and no red flags are identified.

10. CONCLUSIONS AND RECOMMENDATIONS

An extensive field based heritage survey (Nel 2010) adjacent to the area under investigation recorded no archaeological sites or features. This study did however record several cemeteries and structures. Similarly few archaeological sites are expected for the area marked for the proposed power station although cemeteries and structures possibly older than 60 years can occur in the area. Every site is relevant to the Heritage Landscape, but it is anticipated that few sites in the study area could have conservation value. It is recommended that impacts to heritage sites should be mitigated by micro adjustments to the layout to preserve the sites in situ as far as possible. , If this is not possible, 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 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

Several buildings and structures occur in the study area. Some of these could be older than 60 years and therefore protected by legislation. A destruction permit will be required to demolish these features. A field and archival study is required to confirm the significance of structures in the study area.

» 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 a development. 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 viewpoint the proposed project is considered to be viable. This will be confirmed through a Heritage Impact Assessment to be undertaken in the EIA Phase.

11. PLAN OF STUDY

The development triggers the NHRA in the following areas and therefore a Phase 1 Archaeological Impact Assessment (AIA) is recommended:

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	Internal access roads
Construction of a bridge or similar structure exceeding 50 m in length.	No	
Development exceeding 5000 m ²	Yes	Footprint of impact area exceeds 5000m ²
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 ²	Yes	Unknown
Any other development category, public open space, squares, parks or recreational grounds	No	

With cognisance of the recorded archaeological sites in the wider area and in order to comply with the National Heritage Resources Act (Act 25 of 1999) it is recommended that a Phase 1 AIA 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.

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. This will be confirmed through a Heritage Impact Assessment to be undertaken in the EIA Phase.

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

Jaco van der Walt (Archaeologist and project manager)

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 300 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.

14. STATEMENT OF INDEPENDENCE

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.



SIGNATURE:

14. REFERENCES

Archaeological Database Wits University Referenced 2009

Deacon, H.J. & Deacon, J. 1999. *Human Beginnings in South Africa: Uncovering the Secrets of the Stone Age*. Cape Town: David Phillips Publishers.

Huffman, T.N. 1982. Archaeology and ethnohistory of the African Iron Age. *Annual Review of Anthropology* 11: 133-50.

Huffman, T.N. 2007. *Handbook to the Iron Age: The Archaeology of Pre-Colonial Farming Societies in Southern Africa*. University of KwaZulu-Natal Press, Scottsville.

Kuman, K., 1998. The earliest South African Industries. In: *Lower Palaeolithic Settlement of the Old World*. Eds by M.D. Petraglia and R. Korisetter, pp 151-186. Routledge Press, London.

Lewis-Williams, J.D., 1981. *Believing and Seeing: Symbolic Meanings in southern San Rock Paintings*. Academic Press, London.

Mason, J.R. 1962. *The Prehistory of the Transvaal*. Johannesburg: Witwatersrand University Press.

Mitchell, P. 2002. *The Archaeology of Southern Africa*. Cambridge: Cambridge University Press.

Mucina, L. & Rutherford, M.C. 2006. *The vegetation map of South Africa, Lesotho and Swaziland*. SANBI, Pretoria.

National Heritage Resources Act NHRA of 1999 (Act 25 of 1999)

Nel, J. 2010. Archaeological Impact Assessment For The HCI Khusela Coal: Palesa Extension ESIA Update On portions of the farm Roodepoort 349 JR, Thembisile Local Municipality (Mpumalanga) & Kungwini Local Municipality (Gauteng). Unpublished report.

Van der Ryst, M.M., 1998. *The Waterburg Plateau in the Northern Province, Republic of South Africa, in the Later Stone Age*. BAR International Series 715, Oxford.

Van der Ryst, M.M., 2006. *Seeking Shelter: Later Stone Age Hunters, Gatherers and Fishers of Oliboompoot in the western Waterberg south of the Limpopo*. Unpublished doctoral thesis, University of the Witwatersrand, Johannesburg

SAHRIS (Cited 2016)