HERITAGE IMPACT ASSESSMENT

(REQUIRED UNDER SECTION 38(8) OF THE NHRA (No. 25 OF 1999)

FOR THE CONSTRUCTION OF THE ZONNEBLOEM SWITCHING STATION (132/22KV) AND TWO LOOP-IN LOOP-OUT POWER LINES (132KV), MIDDELBURG, MPUMALANGA PROVINCE

Type of development:

Electrical Infrastructure

Client:

Savannah Environmental (Pty) Ltd

Thalita Botha

Developer:

Eskom Holdings SOC Limited

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:

218310

Report date:

March 2018

APPROVAL PAGE

Project Name	Construction of The Zonnebloem Switching Station (132/22kv) And Two Loop-In Loop-Out Power Lines (132kv) In the Mpumalanga Province
Report Title	Heritage Impact Assessment Zonnebloem
Authority Reference Number	Savannah Project SE1911
Report Status	Draft Report
Applicant Name	Eskom Holdings SOC Limited

	Name	**Qualifications and Certifications**	**Date**
Archaeologist	Jaco van der Walt	MA Archaeology ASAPA #159	March 2018
Archaeologist	Ruan van der Merwe	BA Hons Archaeology	March 2018
Archival Specialist	Liesl Bester	BHSC Hons	January 2018

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Amendments on Document

Date	Report Reference Number	Description of Amendment

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REPORT OUTLINE

Appendix 6 of the GNR 326 EIA Regulations published on 7 April 2017 provides the requirements for specialist reports undertaken as part of the environmental authorisation process. In line with this, Table 1 provides an overview of Appendix 6 together with information on how these requirements have been met.

Table 1. Specialist Report Requirements.

Requirement from Appendix 6 of GN 326 EIA Regulation 2017	Chapter
(a) Details of - (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae	Section a Section 12
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority	*Declaration of Independence*
(c) Indication of the scope of, and the purpose for which, the report was prepared	Section 1
(cA)an indication of the quality and age of base data used for the specialist report	Section 3.4 and 7.1.
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	9
(d) Duration, Date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3.4
(e) Description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 3
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 8 and 9
(g) Identification of any areas to be avoided, including buffers	Section 9
(h) Map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	Section 8
(i) Description of any assumptions made and any uncertainties or gaps in knowledge	Section 3.7
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity **including identified alternatives on the environment** or activities;	Section 9
(k) Mitigation measures for inclusion in the EMPr	Section 9 and 10
(l) Conditions for inclusion in the environmental authorisation	Section 9 and 10
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 9 and 10
(n) Reasoned opinion - (i) as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Section 10.2
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report	Section 6
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to EIA report
(q) Any other information requested by the competent authority	Section 10

Executive Summary

HCAC was appointed to conduct a Heritage Impact Assessment of the proposed Construction of the Zonnebloem switching station (132/22kv) and two loop-in loop-out power lines (132kv) in the Mpumalanga Province to determine the presence of cultural heritage sites and the impact of the proposed development on these non-renewable resources. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the impact area of the proposed project on the Remaining Extent of the Farm Patattafontein 412, Mpumalanga Province.

The study area is entirely transformed by previous cultivation of the area. In terms of the archaeological component of Section 35 of the NHRA Act 25 of 1999 no Stone Age sites, ceramics or stone walls attributed to the Iron Age were recorded. The lack of stone age sites can be attributed to the lack of raw material suitable for stone tool manufacture in the study area. No further mitigation prior to construction is recommended in terms of the archaeological component for the proposed development to proceed. In terms of the palaeontological component the area is indicated as of very high paleontological significance and this aspect is dealt with separately by an independent specialist.

In terms of the built environment of the area (Section 34 of the NHRA) several structures occur in the project area although only one feature (Feature 1) will be impacted on by the current development layout. In terms of Section 36 of the NHRA no burial sites were recorded. If any graves are discovered in future they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation. No public monuments are located within or close to the study area. The study area is located in a rural area away from main tourist routes and the proposed development will not impact negatively on significant cultural heritage viewscapes. The public participation process for this project will be undertaken by Savannah Environmental (Pty) Ltd.

The impact of the proposed project on heritage resources can be mitigated and is therefore considered to be of a low significance and it is recommended that the proposed project can commence provided that the recommendations below are adhered to and based on approval from SAHRA.

- Implementation of a chance find procedure as part of the EMPr.

Declaration of Independence

Specialist Name	Jaco van der Walt
Declaration of Independence	I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I: • I act as the independent specialist in this application; • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant; • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity; • I will comply with the Act, Regulations and all other applicable legislation; • I have no, and will not engage in, conflicting interests in the undertaking of the activity; • I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority; • All the particulars furnished by me in this form are true and correct; and • I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.
Signature	
Date	26/03/2018

a) Expertise of the specialist

Jaco van der Walt has been practising as a CRM archaeologist for 15 years. He obtained an MA degree in Archaeology from the University of the Witwatersrand focussing on the Iron Age in 2012 and is a PhD candidate at the University of Johannesburg focussing on Stone Age Archaeology with specific interest in the Middle Stone Age (MSA) and Later Stone Age (LSA). Jaco is an accredited member of ASAPA (#159) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, KZN as well as he Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, DRC Zambia and Tanzania. Through this he has gained a sound understanding of the IFC Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage.

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ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
BIA: Basic Impact Assessment
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DEA: Department of Environmental Affairs
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Programme
ESA: Early Stone Age
ESIA: Environmental and Social Impact Assessment
GIS Geographical Information System
GPS: Global Positioning System
GRP Grave Relocation Plan
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, 1998 (Act No. 107 of 1998)
NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID Notification of Intent to Develop
NoK Next-of-Kin
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 Introduction and Terms of Reference:

Heritage Contracts and Archaeological Consulting CC (HCAC) has been contracted by Savannah Environmental (Pty) Ltd to conduct a heritage impact assessment for the proposed development footprint and study area. The report forms part of the Basic Assessment (BA) and Environmental Management Programme Report (EMPR) for the Construction of the Zonnebloem Switching Station (132/22kV) and two loop-in loop-out power lines (132kV) in the Mpumalanga Province.

The aim of the study is to survey the proposed development footprint 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 No 25 of 1999). The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, review of relevant literature; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey four features were recorded. General site conditions and features on the site were recorded by means of photographs, GPS locations, and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report. SAHRA as a commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) require all environmental documents, complied in support of an Environmental Authorisation application as defined by the NEMA EIA Regulations section 40 (1) and (2), to be submitted to SAHRA. As such the report and its appendices (including the EMPr) must be submitted to the case, once it's completed by the Environmental Assessment Practitioner (EAP).

1.1 Terms of Reference

Field study
Conduct a field study to: (a) locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources affected by the proposed development.

Reporting
Report on the identification of anticipated and cumulative impacts that the operational units of the proposed project and its associated activities 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 the relevant legislation, SAHRA minimum standards and the code of ethics and guidelines of ASAPA.

The reporting will also 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 No 25 of 1999).

Table 2: Project Description

Size of farm and portions	The site is located within the Steve Tshwete Local Municipality and within the greater Nkangala District Municipality. The project site is 2456ha and the study area is 84ha in extent.
Magisterial District	The site is located within the Steve Tshwete Local Municipality and within the greater Nkangala District Municipality.
1: 50 000 map sheet number	2529DA
Central co-ordinate of the development	25°45'13.20"S 29°42'7.26"E

Table 3: Infrastructure and project activities

Type of development	Electrical Infrastructure
Project size	
Project Components	Eskom Holdings SOC Ltd is proposing the establishment of the new Zonnebloem 132/22kV switching station and two loop-in loop-out chickadee power lines from the proposed switching station to the Mafube/Pan Traction power line approximately 20 km east of Middelburg. Each power line will be 500m in length. Infrastructure associated with the switching station will include a new access road and a communication tower. Two alternatives will be proposed for the access roads.

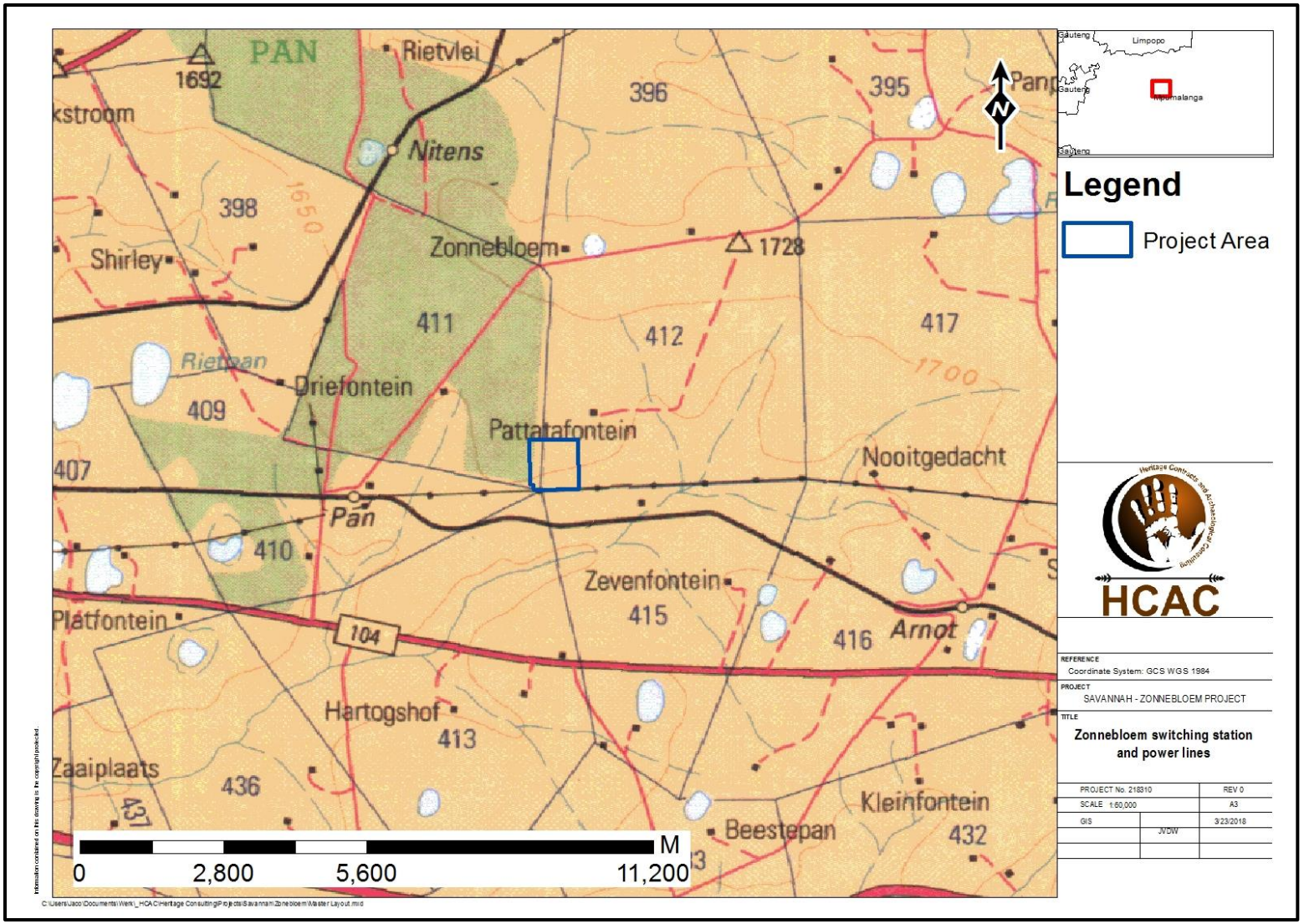


Figure 1. Provincial locality map (1: 250 000 topographical map)

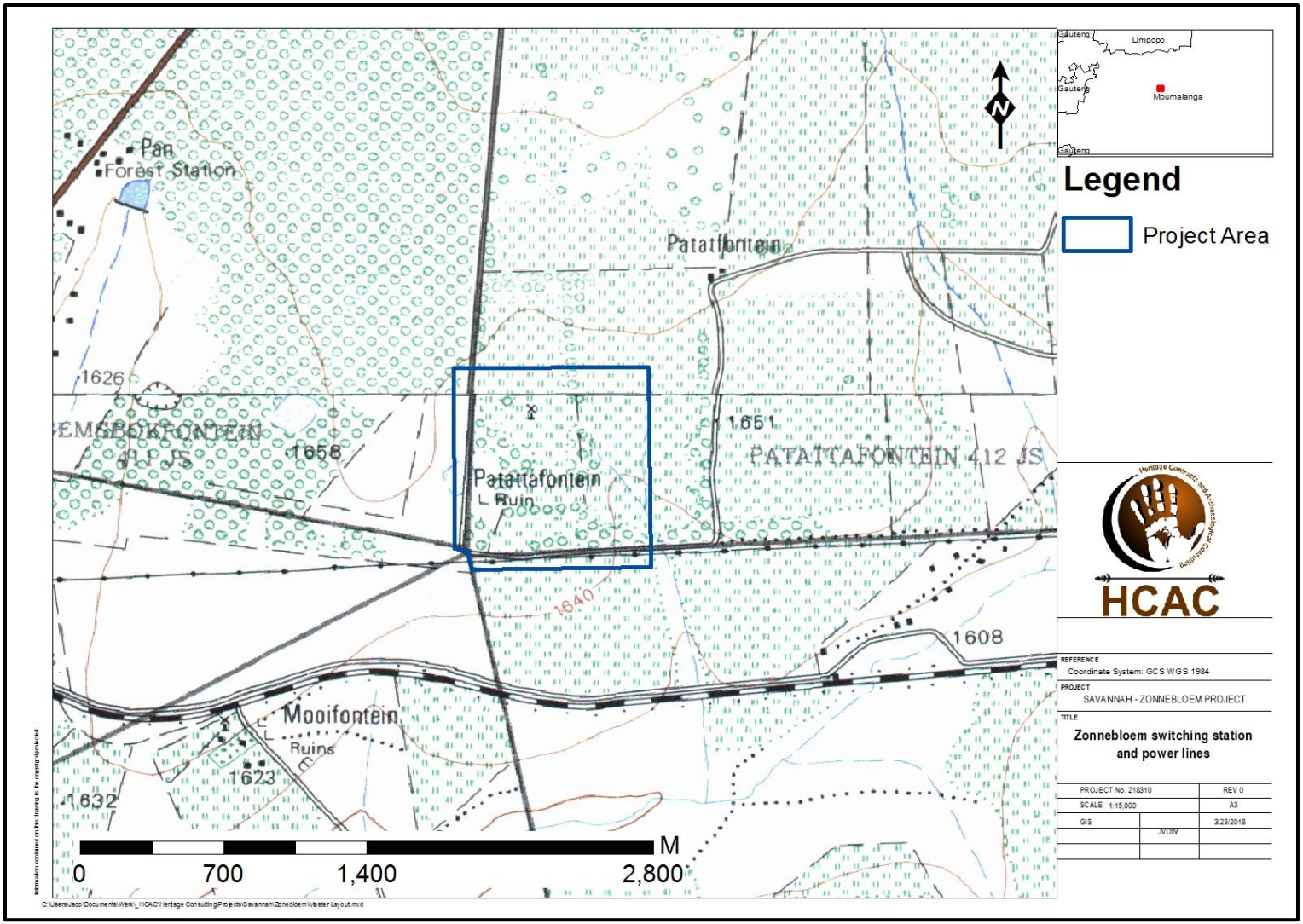


Figure 2: Regional locality map (1:50 000 topographical map).

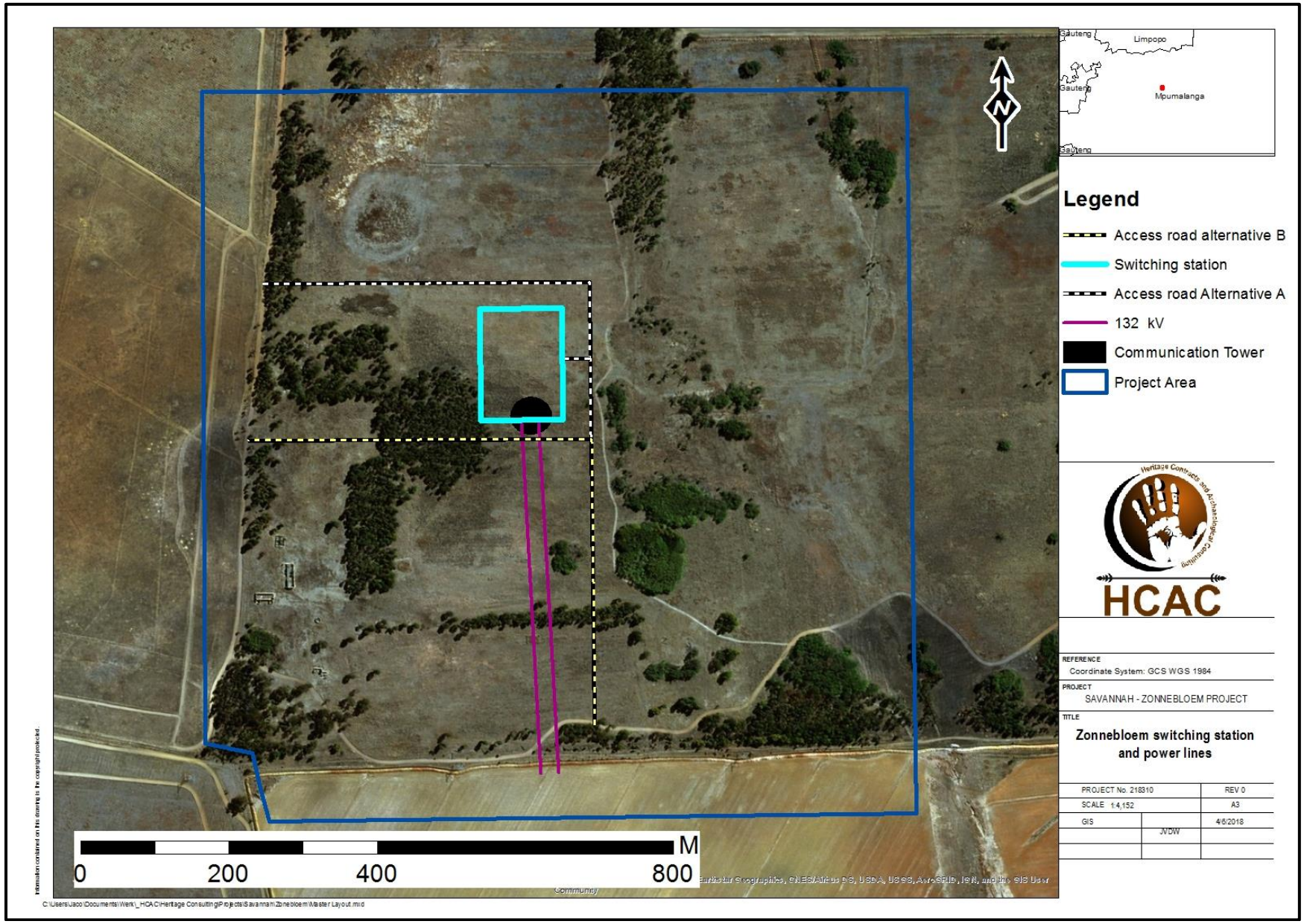


Figure 3. Development layout

2 LEGISLATIVE REQUIREMENTS

The HIA, as a specialist sub-section of the BA/ EIA, is required under the following legislation:

- National Heritage Resources Act (NHRA), Act No. 25 of 1999)
- National Environmental Management Act (NEMA), Act No. 107 of 1998 - Section 23(2)(b)
- Mineral and Petroleum Resources Development Act (MPRDA), Act No. 28 of 2002 - Section 39(3)(b)(iii)
- The Kwazulu-Natal Heritage Act, No. 4 of 2008

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

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

The HIA should be submitted, as part of the impact assessment report or EMPr, to the PHRA if established in the province or to SAHRA. SAHRA will ultimately be 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 impact assessment report and/or EMPr, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level). Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 AIA's are primarily concerned with the location and identification of heritage 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 the 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 with SAHRA by the applicant before development may proceed.

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

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare. Authorisation for exhumation and reinternment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

3 METHODOLOGY

3.1 Literature Review

A brief survey of available literature was conducted to extract data and information on the area in question to provide general heritage context into which the development would be set. This literature search included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).

3.2 Genealogical Society and Google Earth Monuments

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located; these locations were marked and visited during the field work phase. The database of the Genealogical Society was consulted to collect data on any known graves in the area.

3.3 Public Consultation and Stakeholder Engagement:

Stakeholder engagement is a key component of any BAR process, it involves stakeholders interested in, or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation process was to capture and address any issues raised by community members and other stakeholders during key stakeholder and public meetings.

3.4 Site Investigation

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 of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources recorded in the project area.

During the survey, no heritage sites were identified. General site conditions and features on site were recorded by means of photographs, GPS locations, and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report.

Table 4: Site Investigation Details

	Site Investigation
Date	22 February 2018
Season	Summer - vegetation in the study area is high hampering archaeological visibility. The study area was however sufficiently covered (Figure 4) to adequately record the presence of heritage resources.

Figure 4: Track logs of the survey in black.

3.5 Site Significance and Field Rating

Section 3 of the NHRA 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.
- 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 project 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 with cognisance of Section 3 of the NHRA:
    - The unique nature of a site;
    - The integrity of the archaeological/cultural heritage deposits;
    - The wider historic, archaeological and geographic context of the site;
    - The location of the site in relation to other similar sites or features;
    - The depth of the archaeological deposit (when it can be determined/is known);
    - The preservation condition of the sites; and
    - Potential to answer present research questions.
- In addition to this criteria field ratings 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 10 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

3.6 Impact Assessment Methodology

The criteria below are used to establish the impact rating on sites:

- 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).

3.7 Limitations and Constraints of the study

The authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the subsurface nature of archaeological artefacts, the possibility exists that some features or artefacts may not have been discovered/recorded during the survey and the possible occurrence of unmarked graves and other cultural material cannot be excluded. Similarly, the depth of the deposit of heritage sites cannot be accurately determined due its subsurface nature. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

4 DESCRIPTION OF SOCIO ECONOMIC ENVIRONMENTAL

According to the Steve Tshwete Municipality IDP (2016– 2017)

Mining, trade and manufacturing are the major leading employment drivers in Steve Tshwete LM. Out of the 107069 economically active population in the municipality, 21 101 are unemployed while 85968 are employed. The unemployment rate has dropped from 35.4% in 2001 to 19.7% in 2011. Youth unemployment remains a major challenge both provincially and the municipality. Limited number of the population with tertiary education might be the major causes of youth unemployment. The current rate of unemployment and poverty is a concern.

The following indicators were recorded in 2011:

- » Poverty rate 25.9%
- » Number of people in poverty 59 929

(Statistics South Africa Census 2001 and 2011)

5 DESCRIPTION OF THE PHYSICAL ENVIRONMENT:

The project area is situated about 23 km East of Middelburg, 3.5km North of the R104 and about 8,6km North of the N4 highway. The site is situated in an extremely lush grass field with scattered wooded areas (Figure 6 – 9). The southern edge of the survey area runs parallel to an existing powerline. The Northern edge is bordered by a maize field and the Western edge loosely follows a gravel road. The Eastern edge of the survey area has no clear border on the landscape. The area is covered by grass, which in some areas reach over 1.5 m, hampering archaeological visibility. The vegetation of the general area and the proposed site consists of the Rand Highveld Grassland (Mucina & Rutherford 2006).

Figure 5.General site conditions – Northern view

Figure 6. General site conditions – Southern view

Figure 7. General site conditions – North Eastern Corner

Figure 8. Deforestation in the study area.

6 RESULTS OF PUBLIC CONSULTATION AND STAKEHOLDER ENGAGEMENT:

Adjacent landowners and the public at large were informed of the proposed activity as part of the BA process. Site notices and advertisements notifying interested and affected parties were placed at strategic points and in local newspapers as part of the process.

7 LITERATURE / BACKGROUND STUDY:

7.1 Literature Review

Author	Year	Project	Findings
Murimbika, M.	2006	Proposed two power lines and construction of Mafube Power Station at Springboklaagte Farm 416 JS in Steve Tswete Municipality in Mpumalanga Province	No sites were identified.
Pistorius, J.C.C.	2014	A Revised Phase I Heritage Impact Assessment (HIA) study for the proposed Rietvlei open cast coal mining operation between Middelburg, Belfast and Stofberg in the Mpumalanga Province of South Africa	5 Graveyards
Van Wyk Rowe, C.	2015	Specialist report a phase 1 archaeological / heritage impact assessment for the proposed establishment of a waste transfer and sorting facility at Sikhululiwe Village, On Portion 9 of the farm Springboklaagte 416JS, East of Middelburg (Steve Tshwete Local Municipality)	Graveyard

7.1.1 Genealogical Society and Google Earth Monuments

No known grave sites are indicated close to the study area.

7.2 General History of the area

7.2.1 Archaeology of the area

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.

Very few Early Stone Age sites are on record for Mpumalanga and no sites dating to this period are expected for the study area. An example in Mpumalanga is Maleoskop on the farm Rietkloof where ESA tools have been found. This is one of only a handful of such sites in Mpumalanga.

The MSA has not been extensively studied in Mpumalanga but evidence of this period has been excavated at Bushman Rock Shelter, a well-known site on the farm Klipfonteinhoek in the Ohrigstad district. This cave was excavated twice in the 1960's by Louw and later by Eloff. The MSA layers show that the cave was repeatedly visited over a long period. Lower layers have been dated to over 40 000 BP (Before Present) while the top layers date to approximately 27 000 BP (Esterhuizen & Smith in Delius, 2007; Bergh, 1998). Some isolated finds were recorded to the north east of the project site close to Witbank as well by Huffman (1999) on the farm Rietfontein directly west of the project site.

The Later phases of the Stone Age began at around 20 000 years BP. This period was marked by numerous technological innovations and social transformations within these early hunter-gatherer societies. These people may be regarded as the first modern inhabitants of Mpumalanga, known as the San or Bushmen. They were a nomadic people who lived together in small family groups and relied on hunting and gathering of food for survival. Evidence of their existence is to be found in numerous rock shelters throughout the Eastern parts of Mpumalanga where some of their rock paintings are still visible. A number of these shelters have been documented throughout the Province (Bornman, 1995; Schoonraad in Barnard, 1975; Delius, 2007). These include areas such as Witbank, Ermelo, Barberton, Nelspruit, White River, Lydenburg and Ohrigstad.

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. No Sites dating to the Early or Middle Iron Age have been recorded or is expected for the study area. The same goes for the Later Iron Age period where the study area is situated outside the known distribution of Late Iron Age settlements in Mpumalanga. This phase of the Iron Age (AD 1600-1800's) is represented by various tribes including Ndebele, Swazi, BaKoni, Pedi marked by extensive stonewalled settlements found throughout the Mpumalanga escarpment.

7.2.2 Historical Background

J. S. Bergh's historical atlas of the four northern provinces of South Africa is a very useful source for the writing of local and regional history. Through this source it could be ascertained that there might have been sporadic occurrences of Malaria infections in the area during the rainy season, up until the 1930's. Tsetse flies were however, not present in the area at that time. (Bergh 1999: 2)

Though the rarity of such pests may have facilitated early settlement in the area, there are no signs of Stone Age or Early Iron Age remains in the immediate vicinity. (Bergh 1999: 4-6) There are however signs that a large Late Iron Age (1000-1800) site was located approximately 50 km to the east and northeast of where the farm is located today (Bergh 1999: 7) By the beginning of the 19th century, the major black communities in the area of the farm would have been the Ndzundza Ndebele to the north, and the Kôpa even further to the north. (Bergh 1999: 11)

The Ndzundza Ndebele had moved away from the Pretoria District, and from the upper parts of the Steelpoort River, to the area where the Stoffberg is located today. This group of people were attacked and defeated by Mzilikazi's Khumalo-Ndebeles in 1821. Mzilikazi apparently settled in the area for a while, after he had attained his victory. (Bergh 1999: 110-111) Mzilikazi's attack on the Ndzundza Ndebele was however not isolated. The Difaqane (Sotho), or Mfekane ("the crushing" in Nguni) was a time of bloody upheavals in Natal and on the Highveld, which occurred around the early 1820's until the late 1830's (Bergh 1999: 10). It came about in response to heightened competition for land and trade, and caused population groups like gun-carrying Griquas and Shaka's Zulus to attack other tribes (Bergh 1999: 14; 116-119).

During the time of the Difaqane, a northwards migration of white settlers from the Cape was also taking place. Some travellers, missionaries and adventurers had gone on expeditions to the northern areas in South Africa, some already as early as the 1720's. In 1934, the "Association for the Exploration of Central Africa" was established in Cape Town, with Andrew Smith as its Director. As a member of this party, one Robert Scoon also undertook a journey that led him through, or at least very close to the study area. His journey led him from the Strydpoortberge in the north, close to Potgietersrus, through Middelburg and to Chrissiesmeer in the east, and back to Pretoria (Bergh 1999: 13; 120).

It was however only by the late 1820's that a mass-movement of Dutch speaking people in the Cape Colony started advancing into the northern areas. This was due to feelings of mounting dissatisfaction caused by economical and other circumstances in the Cape. This movement later became known as the Great Trek. This migration resulted in a massive increase in the extent of that proportion of modern South Africa dominated by people of European descent (Ross 2002: 39). The Tregardt and Van Rensburg "trek" advanced past the Middelburg district, to the west thereof, in 1844. This migration ended in the area of the Soutpansberg (Bergh 1999: 14).

On 25 July 1846, the Volksraad (Council) at Ohrigstad bought a very large portion of land, stretching from the Olifants River in the north, the Crocodile River, the Elandspruit (Elands River) and to the Portuguese area in the east. This land was bought from the Swazi, who claimed to have a right to the area, for an amount of 100 heads of cattle. The Middelburg District formed part of this area (Bergh 1999: 16; 131).

As can be expected, the movement of whites into the Northern provinces would have had a significant impact on the black people who populated the land. This was also the case in Mpumalanga, the then Eastern Transvaal area. By 1860, the population of whites in the central Transvaal was already very dense and the administrative machinery of their leaders was firmly in place. Many of the policies that would later be entrenched as legislation during the period of apartheid had already been developed (Bergh 1999: 170).

Long after white settlers had moved into the Transvaal, they avoided the Eastern Transvaal Highveld area. This was due to the cold winters, which at first kept farmers at bay. Farmers from

the Free State and Cape colony however gradually started moving into the area, due to the sufficient grazing that it offered to their cattle (Green 1986: 2).

Since the mid 1800's up until the present, South Africa had been subdivided into various districts. Since 1945, the area where the modern-day Middelburg area is located formed part of the Lydenburg district. As of 1872, the farm area was located in the Middelburg district. By 1994, the property under investigation still formed part of the Middelburg district (Bergh 1999: 17, 20-27).

The decision to establish the town of Middelburg was based on the fact that Pretoria was situated very far from towns like Lydenburg and Ohrigstad, which had been established before 1850. In order to facilitate a link between Lydenburg and Pretoria, the establishment of a town between these two centres was considered. (Green 1986: 3) in October 1859, it was decided that the town of Middelburg would be established. (Green 1986: 5) It is interesting that the town was at first known by two names; Nazareth by the Dutch Reformed Church and Middelburg by the ZAR Government. The name Middelburg was eventually accepted, and since the town was situated in the middle, between Pretoria and Lydenburg, it was considered to be the most appropriate title (Green 1986: 14-16).

7.2.3 The Anglo-Boer War (1899-1902)

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

Three individual battalions of British troops moved through Middelburg between February and September 1900. These included the regiments of Lieutenant General F. Roberts, Lieutenant General R. Pole-Carew and Lieutenant General French. During this period, a fleeing Boer commando had also gone through Middelburg. This town was perhaps a strategic point, since there was a railway line running through it (Bergh 1999: 51). During the latter phase of the war, the British followed a scorched earth policy. This entailed that whole towns and thousands of farm dwellings were set alight, that all sources of sustenance that were provided to the Boer Commandos would be destroyed and that women and children who had remained on the farms would be moved into concentration camps. (Bergh 1999: 250) Both a white and a black concentration camp were established at Middelburg (Bergh 1999: 54).

The early defeats suffered by the British Army and the subsequent rebellion of many colonial subjects ensured a general endorsement by the British public of government policy. The republics were soon afterwards annexed. The meeting between Lord Kitchener and Louis Botha at Middelburg on 27 February 1901, made it clear that diplomacy could not bring the war to an end. Both sides were now made aware of the political objectives of the other. The terms that Kitchener presented to Botha were that the republics surrender their independence in exchange for a promise of a form of self-government 'as soon as possible'. (Readers Digest 1992: 257). Since the Boers were unwilling to surrender their independence, it became evident that the only possible conclusion was a military decision, and that only total defeat would force either party to relinquish its political views (Du Preez 1977).

7.2.4 Cultural Landscape of the area

The site under investigation is located about 20 km east of Middelburg and 28 km west of Belfast, just to the north of the R104 in Mpumalanga Province. The immediate area is characterised by agricultural activities and the wider area with mining developments.

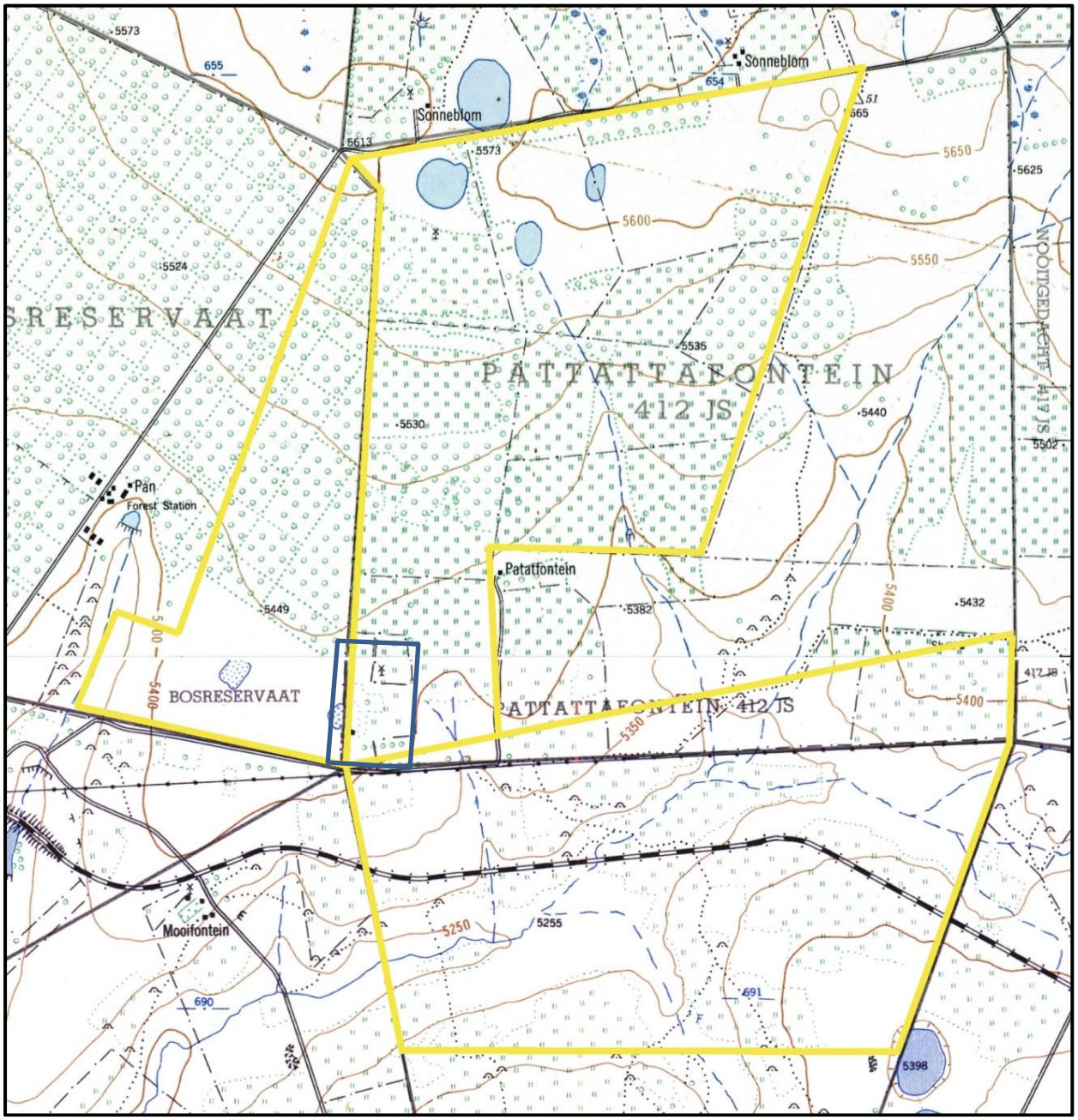


Figure 9. 1967-1968 Topographical map of the larger area under investigation. The approximate impact area is indicated with a blue border. Developments on the property included cultivated lands and forests. In the north western part of the property one can see a bush reserve and two dams. In the north eastern section, one can see three dams, a river, a windmill and a building. In the southern part of the property a railway line, a power line, rivers, tracks/hiking trails and about eight traditional huts can be seen. (Topographical Map 1967; Topographical Map 1968)

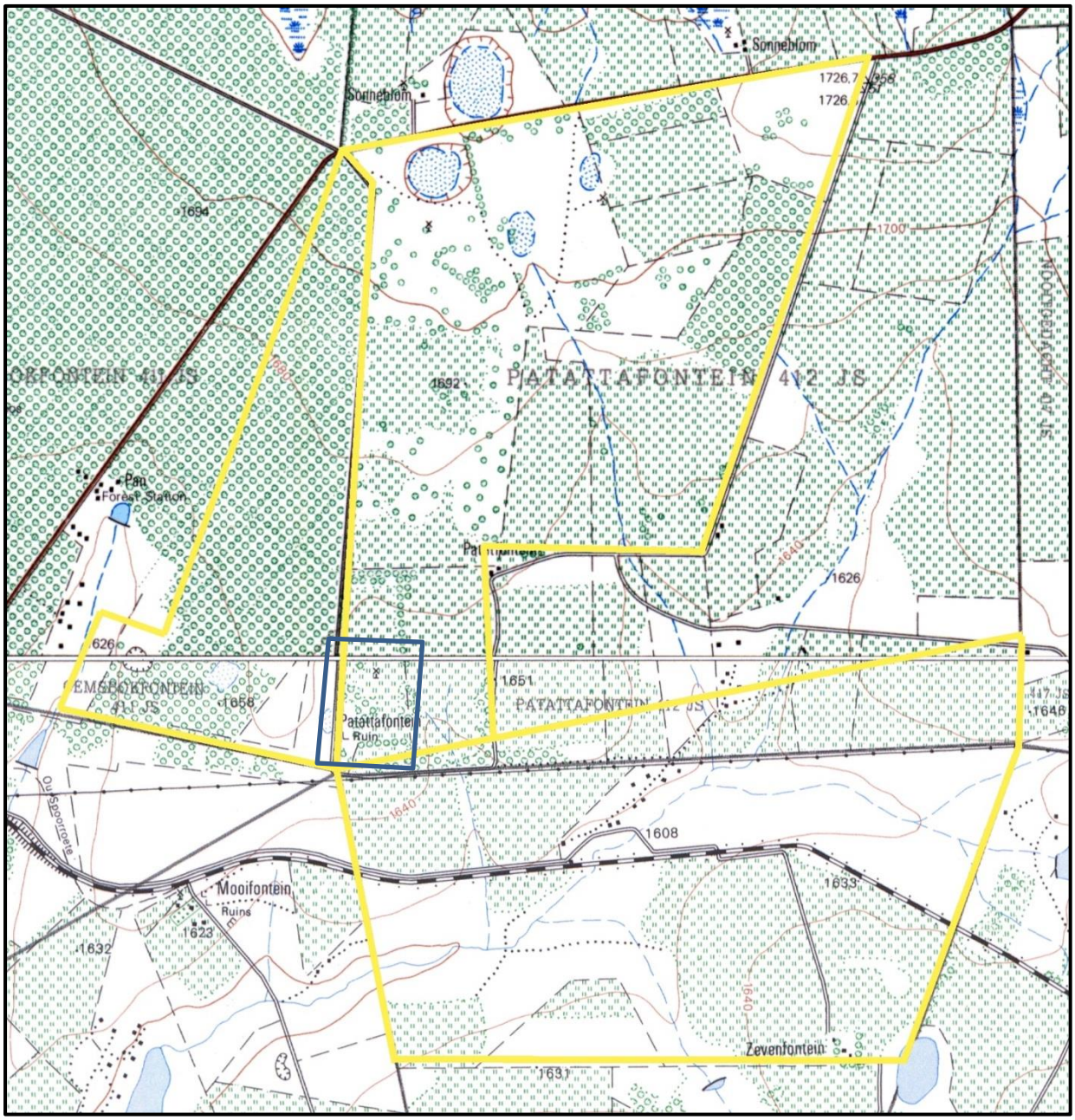


Figure 10. 1984 Topographical map of the site under investigation. The approximate impact area is indicated with a blue border. In the north western part of the property one can see forests. In the north eastern section, one can see cultivated lands and forests, three dams, two windmills and a river. In the southern section one can see cultivated lands and forests, a railway line, a minor road that runs parallel to it, tracks/hiking trails and about 15 buildings. (Topographical Map 1984; Topographical Map 1984)

8 FINDINGS OF THE SURVEY

The project area was surveyed by two archaeologists over a period of one day. The site was extensively cultivated in the past but has been fallow for a number of years resulting in an extremely lush grass field with scattered wooded areas. During the survey four features (Figure 11) were recorded all relating to previous farmstead and out buildings

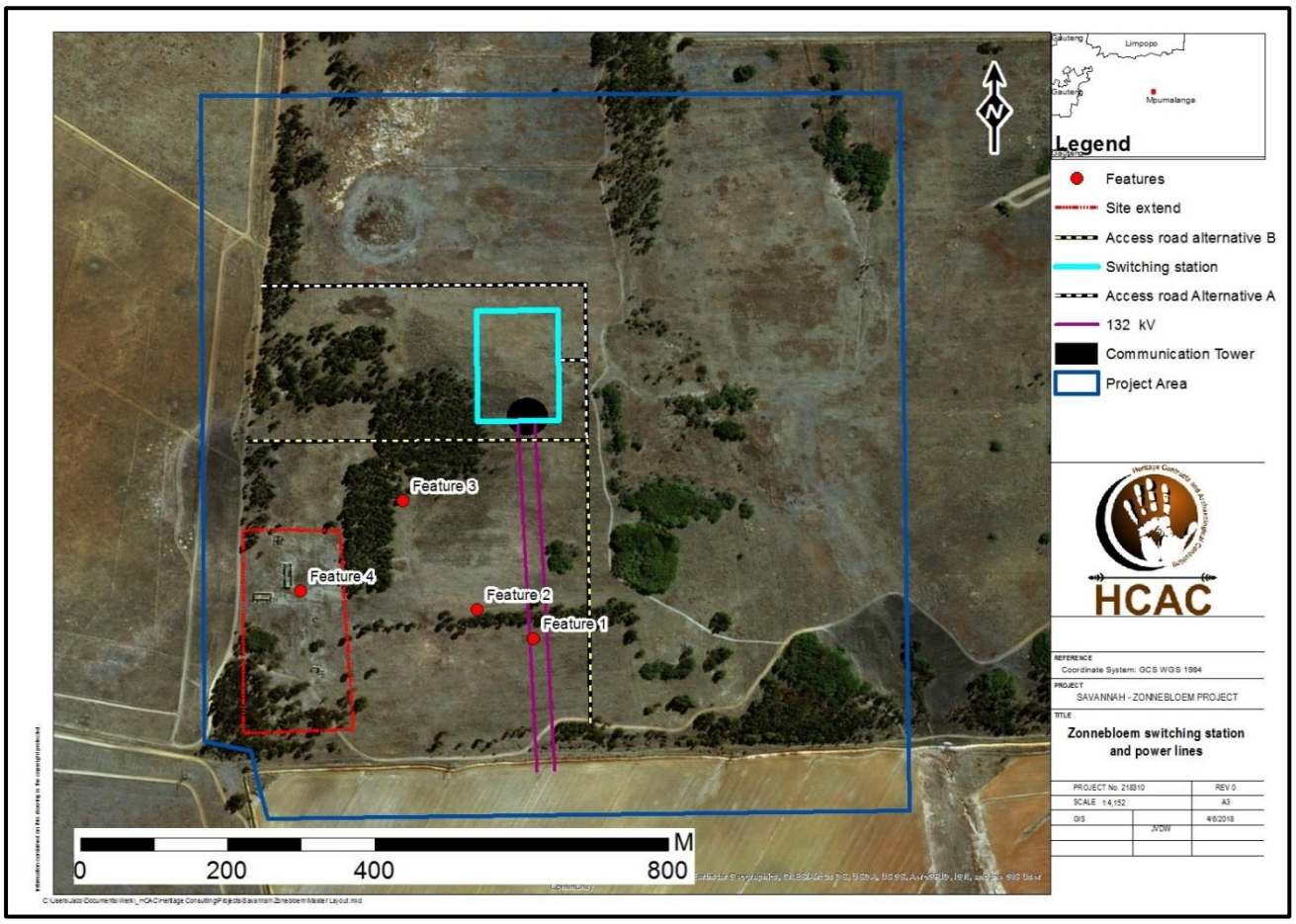


Figure 11. Site distribution map.

Table 5: Recorded features.

Label	Longitude	Latitude	Description
Feature 1	29° 42' 07.6789" E	25° 45' 22.1184" S	Linear Wall
Feature 2	29° 42' 05.1804" E	25° 45' 20.8296" S	Stone built walling
Feature 3	29° 42' 01.9188" E	25° 45' 16.0164" S	Dug out feature
Feature 4	29° 41' 57.3952" E	25° 45' 19.9977" S	Dilapidated structures

9 DESCRIPTION OF IDENTIFIED HERITAGE RESOURCES (NHRA SECTION 34 -36):

9.1.1 Built Environment (Section 34 of the NHRA)

During the survey four features were recorded. These consist of farm related infrastructure and dwellings. These structures are all demolished, dilapidated, and currently inhabited by vagrants and safety was a concern close to these structures during the survey.

Feature 1
The feature is marked by a cement slab measuring approximately 8 x 4 meter and the remnants of a stone and cement wall is visible on the corners of the feature and along the western elevation of the feature (Figure 12 & 13). The feature is possibly a stock enclosure but is almost completely demolished and overgrown. According to the archival maps consulted (Figure 10) this structure is not older than 60 years as development in the area only commenced post 1968. Feature one's potential to contribute to aesthetic, historic, scientific and social aspects is non-existent and is therefore of no heritage significance.

Feature 2
Feature 2consisit of the ephemeral foundations of a linear stone wall. The stone wall foundation is about 10m in length mostly covered by grass and sand. The stone wall foundations do not form part of another feature and due to its ephemeral nature are of no heritage significance.

Feature 3
Is a large dug out hole/reservoir with stone-built walling against the sides of the excavated area acting as a buttress (Figure 16 & 17). The feature measures approximately 8 X 4 meters. Although its specific purpose is unknown it is assumed to be farming related and associated with Feature 4 and therefore of low significance.

Field Rating -Generally Protected B (GP. B): Recording before destruction

Feature 4
Is located in the south western portion of the project area and is marked by several dilapidated and partially demolished sand stone structures (Figure 20 – 25). These ruins area inhabited by vagrants and it was not possible to document the structures up close.

According to the archival maps consulted (Figure 10) these structures are not older than 60 years as development in the area only commenced post 1968. The features potential to contribute to aesthetic, historic, scientific and social aspects are non-existent but does form part of the cultural landscape relating to farming practises in the area and are therefore of low heritage significance.

Field Rating -Generally Protected B (GP. B): Recording before destruction

Figure 12. Feature 1 – General site conditions

Figure 13. Feature 1 – Western wall

Figure 14 Feature 2. – Stone wall foundations

Figure 15. Feature 2. – General site conditions

Figure 16. Feature 3

Figure 17. Feature 3

Figure 18. Feature 4

Figure 19. Feature 4

Figure 20. Feature 4

Figure 21. Collapsed stone-built structures.

Figure 22. Informal house next to stone built structures

Figure 23. Collapsed stone built structures.

9.1.2 Archaeological resources (Section 35 of the NHRA)

No Stone Age or Iron Age resources were identified in the study area and no further mitigation is recommended in terms of the archaeological component of Section 35 for the proposed development to proceed.

9.1.3 Burial Grounds and Graves (Section 36 of the NHRA)

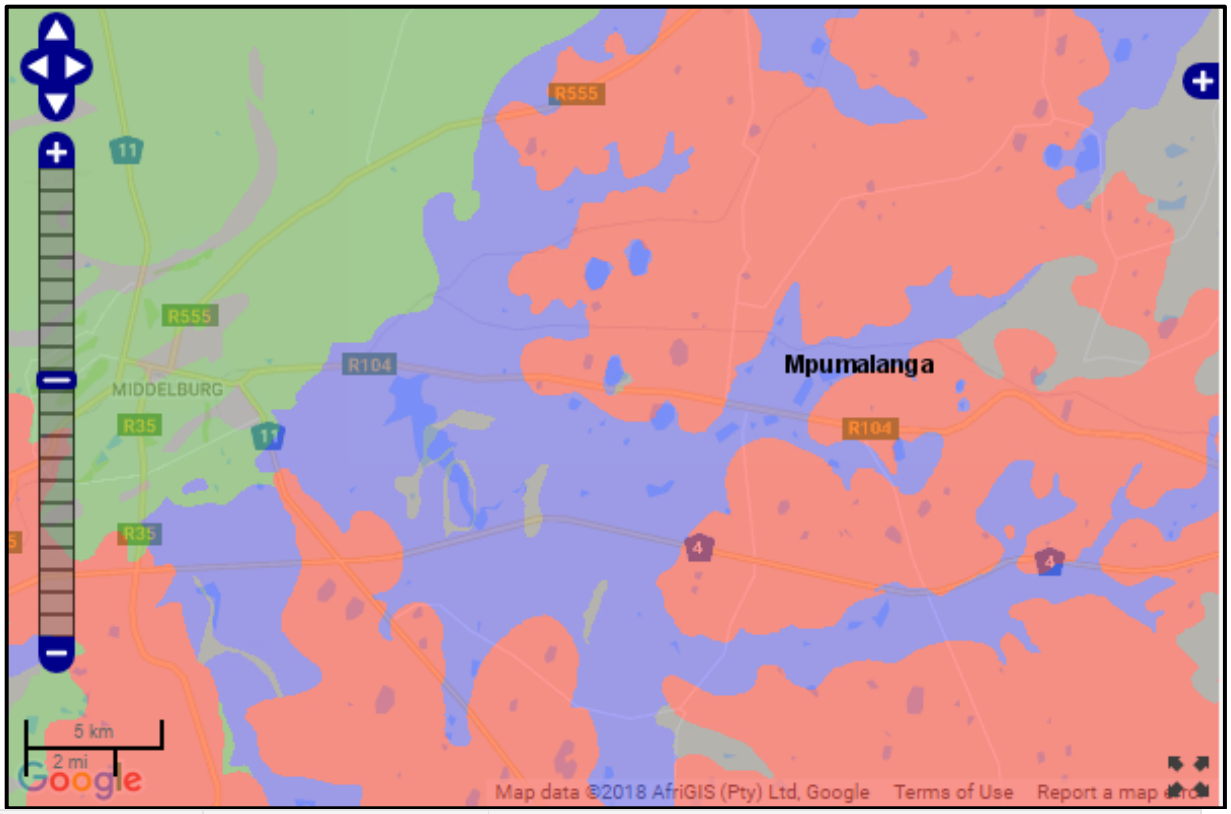
In terms of Section 36 of the Act no burial sites were recorded. If any graves are located in future they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation.

9.1.4 Cultural Landscapes, Intangible and Living Heritage.

The cultural landscape of the study area is rural in character and characterised by open spaces with some agricultural developments as well as powerline and road infrastructure and the project will not impact on significant viewscapes.

9.1.5 Paleontological Resources

The paleontological sensitivity of the area is indicated as ranging from low to very high significance.



Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 24. Palaeontological map of the study area.

The paleontological component was assessed in an independent study by Butler (2018).

9.1.6 Battlefields and Concentration Camps

No Battlefield sites were identified in the study area.

9.2 Potential Impact

The impact on heritage sites by the proposed development is considered to be of low significance. Any direct impacts that may occur would be during the construction phase only by the proposed power lines and would be of very low significance confined to Feature 1 (Figure 25).

The impact on heritage sites by both access road Alternative A and Alternative B is considered to be of low significance.

9.2.1 Pre-Construction phase:

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure needed for the construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

9.2.2 Construction Phase

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

9.2.3 Operation Phase:

No impact is envisaged for the recorded heritage resources during this phase.

Figure 25. Feature 1 in relation to the proposed powerline.

Table 6. Impact table (including switching station, power lines and associated infrastructure but excluding access roads) – Archaeological heritage resources.

Nature: During the pre-construction and construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (2)
Probability	Probable (3)	Probable (3)
Significance	**24 (Low)**	**24 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	No resources were recorded therefore no loss is expected	No resources were recorded therefore no loss is expected.
Can impacts be mitigated?	Yes, a chance find procedure should be implemented.	Yes
Mitigation: Chance Find Procedure should be implemented for the project should any sites be identified during the construction process.		
Residual Impacts: If sites are destroyed it will result in the depletion of the heritage sites relating to the cultural landscape of the area. However, if sites are recorded and preserved or mitigated this adds to the record of the area.		

Table 7. Impact table (access roads) – Archaeological heritage resources

Nature: During the pre-construction and construction phase activities related to the access roads may result in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.				
	Alternative A		**Alternative B**	
	Without mitigation	**With mitigation (Preservation/ excavation of site)**	**Without mitigation**	**With mitigation (Preservation/ excavation of site)**
Extent	Local (1)	Local (1)	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (2)	Low (2)	Low (2)
Probability	Probable (3)	Probable (3)	Probable (3)	Probable (3)
Significance	**24 (Low)**	**24 (Low)**	**24 (Low)**	**24 (Low)**
Status (positive or negative)	Negative	Negative	Negative	Negative
Reversibility	Not reversible	Not reversible	Not reversible	Not reversible
Irreplaceable loss of resources?	No resources were recorded therefore no loss is expected	No resources were recorded therefore no loss is expected.	No resources were recorded therefore no loss is expected	No resources were recorded therefore no loss is expected.
Can impacts be mitigated?	Yes, a chance find procedure should be implemented.	Yes	Yes, a chance find procedure should be implemented.	Yes
Mitigation:				

Chance Find Procedure should be implemented for the project should any sites be identified during the construction process.
Residual Impacts: If sites are destroyed it will results in the depletion of the heritage sites relating to the cultural landscape of the area. However, if sites are recorded and preserved or mitigated this adds to the record of the area.

9.3 Potential Cumulative Impact

Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. This and other projects in the area could have an indirect impact on the heritage landscape.

There are similar infrastructure within a 10km radius from the project site. These include:

- Mafube 13kV Substation situated ~7,9km south-east of the study area;
- Nitens 132kV Substation~7,8 km north of the study area
- 132kV Mafube/Pan Traction power line which traverses the southern boundary of the project site;
- 132kV Nitens Trac-Pan Traction power line ~4km west of the study area;
- 132kV Kleindam Traction/Nitens Traction power line ~7,9km south-east of the study area
- 132kV Arnot Traction/Mafube power line ~7,3km north of the study area;
- 275kV Arnot Simplon power line ~7,9km south-east of the study area;
- 400kV Arnot Merensky power line ~7,9km south-east of the study.

Table 8. Impact table (Cumulative) – Archaeological heritage resources

Nature: During the pre-construction and construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (2)
Probability	Probable (3)	Probable (3)
Significance	**24 (Low)**	**24 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	No resources were recorded therefore no loss is expected	No resources were recorded therefore no loss is expected.
Can impacts be mitigated?	Yes, a chance find procedure should be implemented.	Yes
Mitigation: Chance Find Procedure should be implemented for the project should any sites be identified during the construction process.		
Residual Impacts:		

If sites are destroyed it will results in the depletion of the heritage sites relating to the cultural landscape of the area. However, if sites are recorded and preserved or mitigated this adds to the record of the area.

10 RECOMMENDATIONS AND CONCLUSION

HCAC was appointed to conduct a Heritage Impact Assessment of the proposed Construction of the Zonnebloem switching station (132/22kv) and two loop-in loop-out power lines (132kv) in the Mpumalanga Province. The study area is entirely transformed by previous cultivation of the area. The site has been fallow for a number of years resulting in an extremely lush grass field with scattered wooded areas. Both access road alternatives are acceptable from a heritage point of view.

In terms of the archaeological component of Section 35 of the NHRA Act 25 of 1999 no Stone Age sites, ceramics or stone walls attributed to the Iron Age were recorded. The lack of stone age sites can be attributed to the lack of raw material suitable for stone tool manufacture in the study area. No further mitigation prior to construction is recommended in terms of this component for the proposed development to proceed. In terms of the palaeontological component the area is indicated as of very high paleontological significance and this aspect is dealt with separately by an independent specialist.

In terms of the built environment of the area (Section 34 of the NHRA) several structures occur in the project area although only one feature (Feature 1) will be impacted on by the current development layout. According to the archival maps consulted this structure is not older than 60 years as development in the area only commenced post 1968. Feature one's potential to contribute to aesthetic, historic, scientific and social aspects are non-existent and are therefore of no heritage significance. No further actions are recommended based on approval from SAHRA.

In terms of Section 36 of the NHRA no burial sites were recorded. If any graves are located in future they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation. No public monuments are located within or close to the study area. The study area is located in a rural area away from main tourist routes and the proposed development will not impact negatively on significant cultural viewscapes. During the public participation process conducted for the project no heritage concerns was raised.

The impact of the proposed project on heritage resources (including the cumulative impact) is considered to be of low significance and it is recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA.

- Implementation of a chance find procedure as outlined below.

10.1 Chance Find Procedures

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, 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 and therefor chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below.

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

10.2 Reasoned Opinion

The impact of the proposed project on heritage resources is considered low and no further pre-construction mitigation in terms of archaeological resources is required based on approval from SAHRA. Furthermore, the socio-economic benefits also outweigh the possible impacts of the development with the correct mitigation measures (i.e. chance find procedure and avoidance of sites) implemented for the project. Any changes to the proposed layout will have to be assessed by a heritage specialist.

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MAPS

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12 APPENDICES:

Curriculum Vitae of Specialist

Jaco van der Walt
Archaeologist

jaco.heritage@gmail.com
+27 82 373 8491
+27 86 691 6461

Education:

Particulars of degrees/diplomas and/or other qualifications:

Name of University or Institution:		University of Pretoria
Degree obtained	**:**	BA Heritage Tourism & Archaeology
Year of graduation	**:**	2001
Name of University or Institution:		University of the Witwatersrand
Degree obtained	**:**	BA Hons Archaeology
Year of graduation	**:**	2002
Name of University or Institution	**:**	University of the Witwatersrand
Degree Obtained	**:**	MA (Archaeology)
Year of Graduation	:	2012
Name of University or Institution:		University of Johannesburg
Degree	**:**	PhD
Year	:	Currently Enrolled

EMPLOYMENT HISTORY:

2011 – Present: **Owner – HCAC (Heritage Contracts and Archaeological Consulting CC)**.
2007 – 2010 : **CRM Archaeologist,** Managed the Heritage Contracts Unit at the University of the Witwatersrand.
2005 - 2007: **CRM Archaeologist**, Director of Matakoma Heritage Consultants
2004: **Technical Assistant**, Department of Anatomy University of Pretoria
2003: **Archaeologist**, Mapungubwe World Heritage Site
2001 - 2002: **CRM Archaeologists,** For R & R Cultural Resource Consultants, Polokwane
2000: **Museum Assistant**, Fort Klapperkop.

Countries of work experience include:

Republic of South Africa, Botswana, Zimbabwe, Mozambique, Tanzania, The Democratic Republic of the Congo, Lesotho and Zambia.

SELECTED PROJECTS INCLUDE:

Archaeological Impact Assessments (Phase 1)

Heritage Impact Assessment Proposed Discharge Of Treated Mine Water Via The Wonderfontein Spruit Receiving Water Body Specialist as part of team conducting an Archaeological Assessment for the Mmamabula mining project and power supply, Botswana
Archaeological Impact Assessment Mmamethlake Landfill
Archaeological Impact Assessment Libangeni Landfill

Linear Developments

Archaeological Impact Assessment Link Northern Waterline Project At The Suikerbosrand Nature Reserve
Archaeological Impact Assessment Medupi – Spitskop Power Line,
Archaeological Impact Assessment Nelspruit Road Development

Renewable Energy developments

Archaeological Impact Assessment Karoshoek Solar Project

Grave Relocation Projects

Relocation of graves and site monitoring at Chloorkop as well as permit application and liaison with local authorities and social processes with local stakeholders, Gauteng Province.
Relocation of the grave of Rifle Man Maritz as well as permit application and liaison with local authorities and social processes with local stakeholders, Ndumo, Kwa Zulu Natal.
Relocation of the Magolwane graves for the office of the premier, Kwa Zulu Natal
Relocation of the OSuthu Royal Graves office of the premier, Kwa Zulu Natal

Phase 2 Mitigation Projects

Field Director for the Archaeological Mitigation For Booysendal Platinum Mine, Steelpoort, Limpopo Province. Principle investigator Prof. T. Huffman
Monitoring of heritage sites affected by the ARUP Transnet Multipurpose Pipeline under directorship of Gavin Anderson.
Field Director for the Phase 2 mapping of a late Iron Age site located on the farm Kameelbult, Zeerust, North West Province. Under directorship of Prof T. Huffman.
Field Director for the Phase 2 surface sampling of Stone Age sites effected by the Medupi – Spitskop Power Line, Limpopo Province

Heritage management projects

Platreef Mitigation project – mitigation of heritage sites and compilation of conservation management plan.

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:

- Association of Southern African Professional Archaeologists. Member number 159

  Accreditation:
  - Field Director Iron Age Archaeology
  - Field Supervisor Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation
- Accredited CRM Archaeologist with SAHRA
- Accredited CRM Archaeologist with AMAFA
- Co-opted council member for the CRM Section of the Association of Southern African Association Professional Archaeologists (2011 – 2012)

PUBLICATIONS AND PRESENTATIONS

- A Culture Historical Interpretation, Aimed at Site Visitors, of the Exposed Eastern Profile of K8 on the Southern terrace at Mapungubwe.
  - J van der Walt, A Meyer, WC Nienaber
  - Poster presented at Faculty day, Faculty of Medicine University of Pretoria 2003
- 'n Reddingsondersoek na Anglo-Boereoorlog-ammunisie, gevind by Ifafi, Noordwes-Provinsie. South-African Journal for Cultural History 16(1) June 2002, with A. van Vollenhoven as co-writer.
- Fieldwork Report: Mapungubwe Stabilization Project.
  - WC Nienaber, M Hutten, S Gaigher, J van der Walt
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2004
- A War Uncovered: Human Remains from Thabantšho Hill (South Africa), 10 May 1864.
  - M. Steyn, WS Boshoff, WC Nienaber, J van der Walt
  - Paper read at the 12th Congress of the Pan-African Archaeological Association for Prehistory and Related Studies 2005
- Field Report on the mitigation measures conducted on the farm Bokfontein, Brits, North West Province .
  - J van der Walt, P Birkholtz, W. Fourie
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2007
- Field report on the mitigation measures employed at Early Farmer sites threatened by development in the Greater Sekhukhune area, Limpopo Province. J van der Walt
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2008
- Ceramic analysis of an Early Iron Age Site with vitrified dung, Limpopo Province South Africa.

- J van der Walt. Poster presented at SAFA, Frankfurt Germany 2008

- Bantu Speaker Rock Engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga (*In Prep)*
    - J van der Walt and J.P Celliers
- Sterkspruit: Micro-layout of late Iron Age stone walling, Lydenburg, Mpumalanga. W. Fourie and J van der Walt. A Poster presented at the Southern African Association of Archaeologists Biennial Conference 2011
- Detailed mapping of LIA stone-walled settlements' in Lydenburg, Mpumalanga. J van der Walt and J.P Celliers
    - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Bantu-Speaker Rock engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga. J.P Celliers and J van der Walt
    - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Pleistocene hominin land use on the western trans-Vaal Highveld ecoregion, South Africa, Jaco van der Walt.
    - J van der Walt. Poster presented at SAFA, Toulouse, France. Biennial Conference 2016

REFERENCES:

1. Prof Marlize Lombard — Senior Lecturer, University of Johannesburg, South Africa
   E-mail: mlombard@uj.ac.za
2. Prof TN Huffman — Department of Archaeology Tel: (011) 717 6040
   University of the Witwatersrand
3. Alex Schoeman — University of the Witwatersrand
   E-mail:Alex.Schoeman@wits.ac.za