

# HERITAGE IMPACT ASSESSMENT

(REQUIRED UNDER SECTION 38(1) OF THE NHRA (No. 25 OF 1999))

FOR THE PROPOSED PAMPIERSTAD 22 KV POWERLINE (1961M LONG),  
NORTHWEST OF JAN KEMPDORP, NORTHERN CAPE PROVINCE

**Type of development:**

Powerline

**Developer:**

ESKOM



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## APPROVAL PAGE

<b>Project Name</b>	Pampierstad 22 Kv Powerline, Northern Cape Province
<b>Report Title</b>	Heritage Impact Assessment for the Pampierstad 22Kv Powerline, Northern Cape Province
<b>Authority Reference Number</b>	Case ID: 16643
<b>Report Status</b>	Final Report
<b>Applicant Name</b>	Eskom

<b>Responsibility</b>	<b>Name</b>	<b>Qualifications and Certifications</b>	<b>Date</b>
<b>Fieldwork and reporting</b>	Jaco van der Walt - Archaeologist	MA Archaeology ASAPA #159 APHP #114	October and November 2021
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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	<i>Declaration of Independence</i>
(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 site plan identifying site alternatives;	Section 8 and 9
(g) Identification of any areas to be avoided, including buffers	Section 8 and 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
(l) 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 1.3
(k) Mitigation measures for inclusion in the EMPr	Section 10.1
(l) Conditions for inclusion in the environmental authorisation	Section 10. 1.
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 10. 5.
(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 10.3
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report	NA
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	NA
(q) Any other information requested by the competent authority	NA

## Executive Summary

1World Consultants was appointed by Eskom to facilitate the required heritage studies for the proposed Pampierstad 22 kV powerline in the Pampierstad area, in the Northern Cape Province. Beyond Heritage was appointed to conduct a Heritage Impact Assessment (HIA) for the project and the study area was assessed on desktop level and by a non-intrusive pedestrian field survey. Key findings of the assessment include:


- The project area is situated on a farm about 10km south of Pampierstad along the Hartsriver. The project is a proposed powerline running from an existing transformer near a farmhouse to a proposed location near the Hartsriver;
- Heritage finds were limited to a ruin and Stone Age scatters;
- According to the South African Heritage Resource Information System (SAHRIS) the study area is of insignificant to moderate palaeontological sensitivity and an independent study was conducted for this aspect. The study concluded that it is unlikely that any fossils would be preserved in the sands and alluvium of the Quaternary. There is only a small chance that fossils may have been transported or trapped in features such as palaeo-pans or palaeo-springs, but no such feature is visible in satellite imagery.

The impact of the project on heritage resources can be mitigated to an acceptable level and the project can commence provided that the recommendations in this report are adhered to, based on the South African Heritage Resource Authority (SAHRA) 's approval.

## Recommendations:

- Implementation of a chance find procedure for the project for both the cultural heritage and paleontological components;
- FEAT 01 and 02 must be indicated on development maps and avoided for pylon placement and during construction.

**Declaration of Independence**

<b>Specialist Name</b>	Jaco van der Walt
<b>Declaration of Independence</b>	<p>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:</p> <ul style="list-style-type: none"> <li>• I act as the independent specialist in this application;</li> <li>• 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;</li> <li>• I declare that there are no circumstances that may compromise my objectivity in performing such work;</li> <li>• 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;</li> <li>• I will comply with the Act, Regulations and all other applicable legislation;</li> <li>• I have no, and will not engage in, conflicting interests in the undertaking of the activity;</li> <li>• 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;</li> <li>• All the particulars furnished by me in this form are true and correct; and</li> <li>• 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.</li> </ul>
<b>Signature</b>	
<b>Date</b>	05/11/2021

**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, Guinea and Tanzania. Through this, he has a sound understanding of the IFC Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage.

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**ABBREVIATIONS**

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
EMPr: 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, 2002 (Act No. 28 of 2002)
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

Beyond Heritage was appointed to conduct a HIA for the proposed powerline measuring proximately 1961m close to Pampierstad in the Northern Cape Province (Figure 1.1 to 1.3). 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, Stone Age scatters as well as a ruin were recorded. General site conditions and features on sites were recorded by means of photographs, GPS locations and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report. 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 to be submitted to SAHRA for commenting. Upon submission to SAHRA the project will be automatically given a case number as reference.

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

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999).

## 1.2 Project Description

Eskom has applied for a proposed 22kv powerline to be constructed close to Pampierstad the Northern Cape Province. Project components and the location is outlined under Table 2 and 3.

**Table 2: Project Description**

<b>Property Details</b>	VH20 and VH22 Mocumi Farming
<b>Magisterial District</b>	Phokwane Local Municipality and Frances Baard District Municipality
<b>Central co-ordinate of the development</b>	27°51'44.68"S 24°40'0.92"E
<b>Topographic Map Number</b>	2724 DC

**Table 3: Infrastructure and project activities**

<b>Type of development</b>	Powerline
<b>Size of development</b>	1961 meter in length
<b>Project Components</b>	The project comprises a 22 kV powerline with 20 pylons

## 1.3 Alternatives

No alternatives were provided to be assessed although the extent of the area assessed allows for micro siting of pylons to minimise impacts to heritage resources.

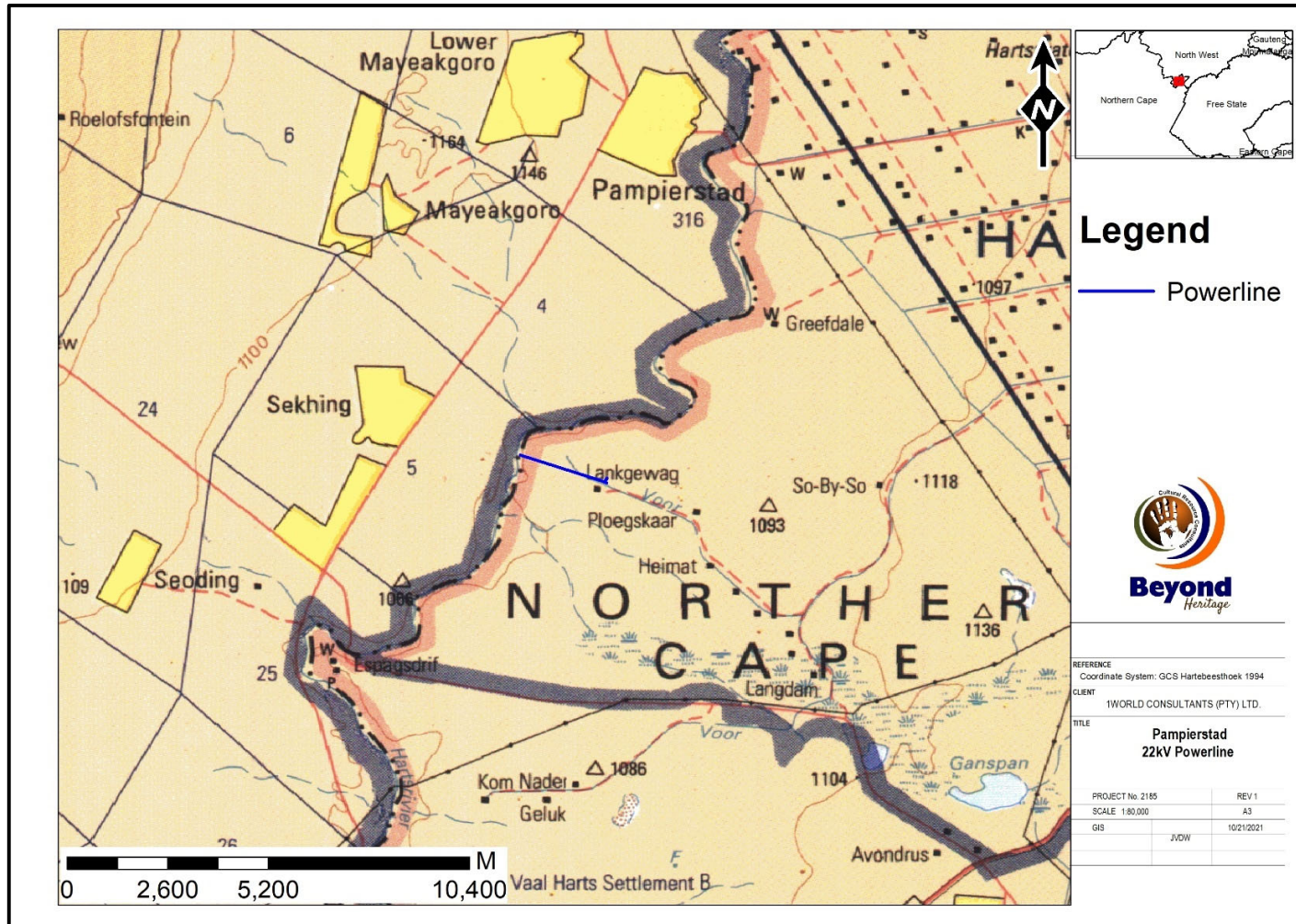


Figure 1.1. Regional setting (1: 250 000 topographical map) of the project.

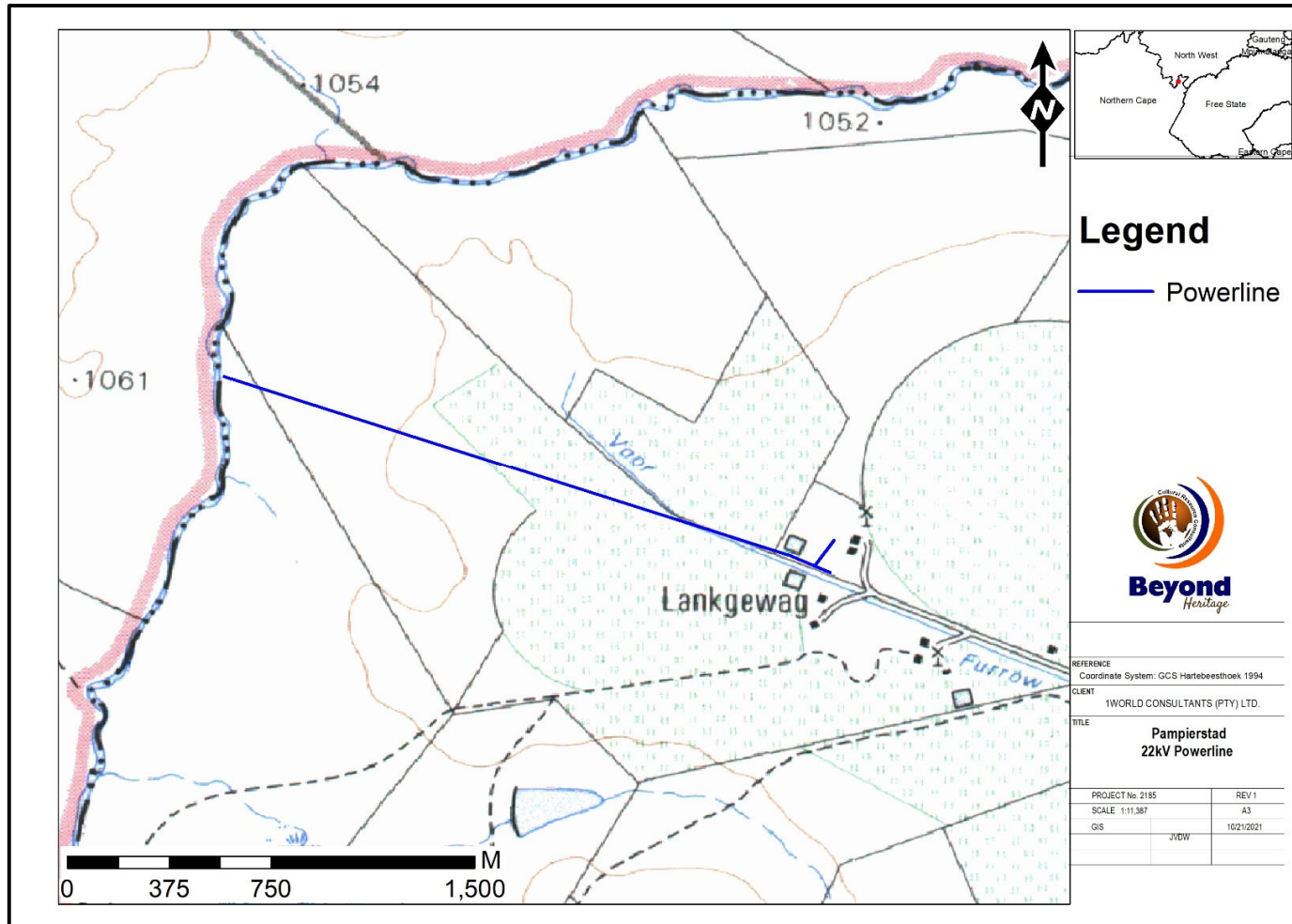


Figure 1.2. Local Setting (1: 50 000 topographical map) of the project.



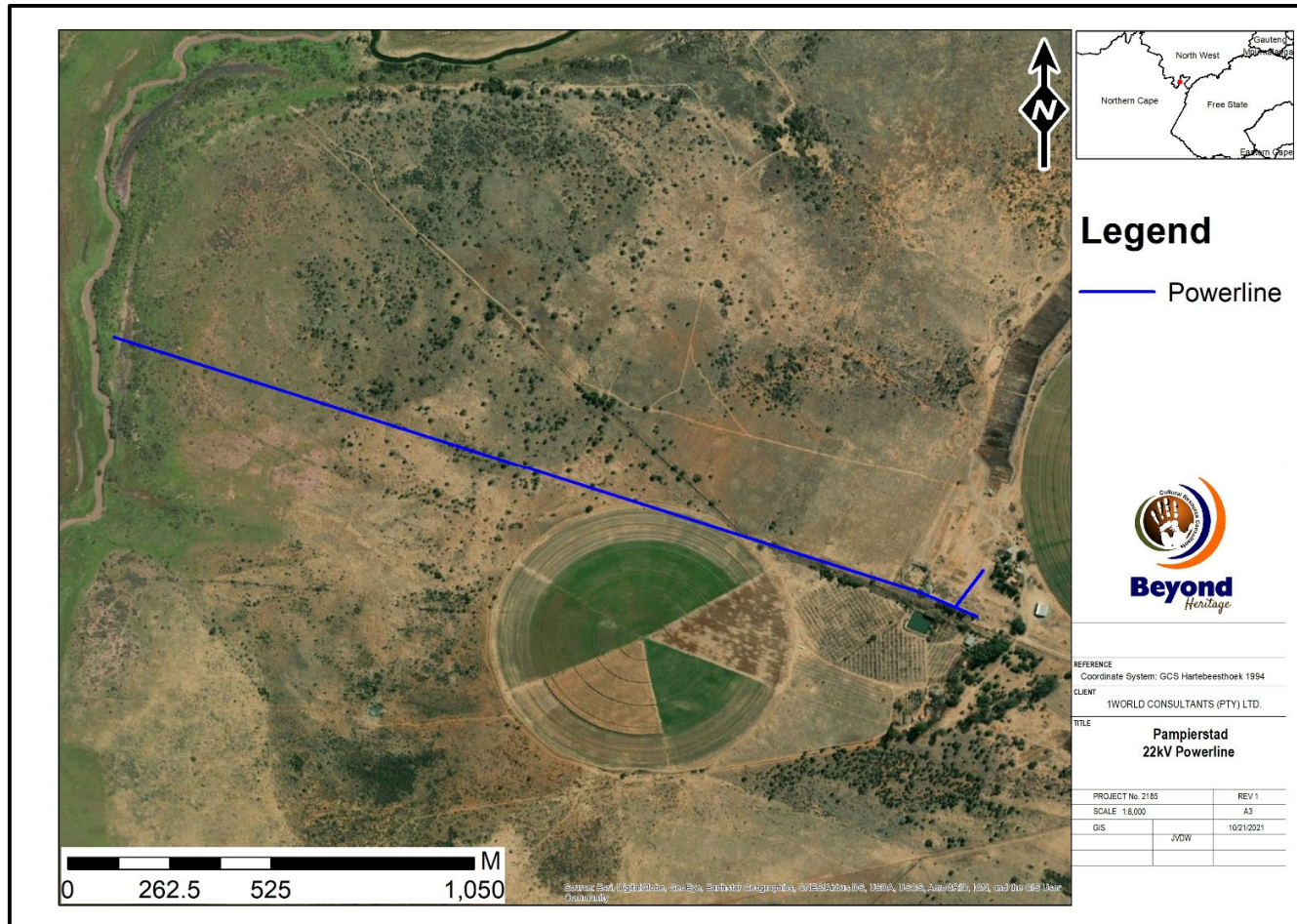


Figure 1.3. Aerial image of the development footprint.

## 2 Legislative Requirements

The HIA, as a specialist sub-section of the 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)

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 to the PHRA if established in the province or to SAHRA. SAHRA will ultimately be responsible for the evaluation of Phase 1 HIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 HIA reports and additional development information to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 HIA 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 HIA'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 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 fieldwork 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:

No public consultation was conducted by the author of this report.

#### 3.4 Site Investigation

The aim of the site visit was to:

- a) 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.

**Table 4: Site Investigation Details**

	<b>Site Investigation</b>
Date	15 October 2021
Season	Summer – Dense vegetation cover along with the existing agricultural developments hampered archaeological visibility. The project area was however sufficiently covered to understand the heritage character of the area. (Figure 3.1).

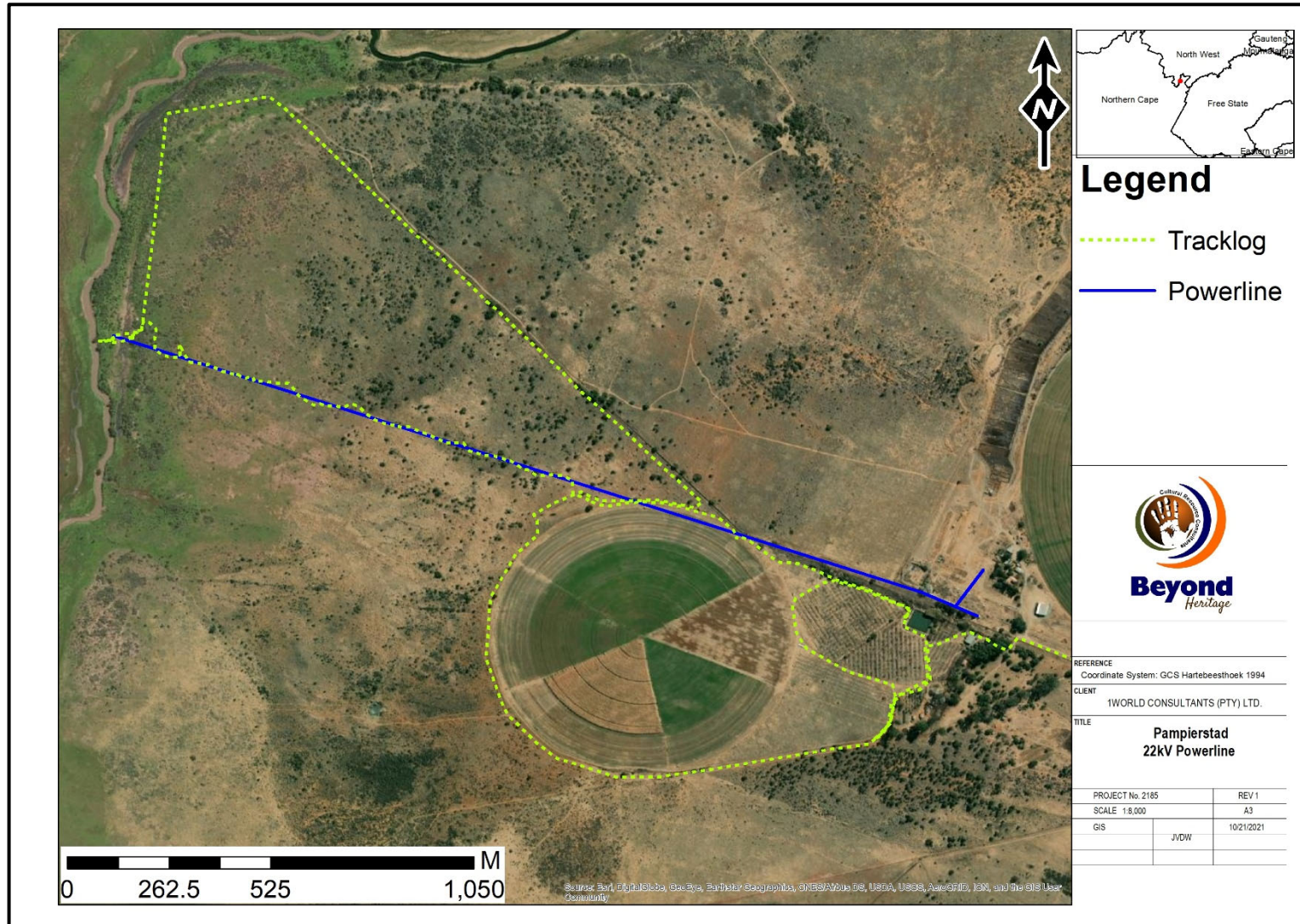


Figure 3.1: Tracklog of the survey in green.

### 3.5 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).

### 3.6 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 (Table 5). The recommendations for each site should be read in conjunction with section 10 of this report.

Table 5. Heritage significance and field ratings

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

### 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 nature of heritage resources and pedestrian surveys, the possibility exists that some features or artefacts may not have been discovered/recorded and the possible occurrence of graves and other cultural material cannot be excluded. Similarly, the depth of cultural deposits and the extent 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 Environment

The Phokwane municipality has a total population of 61 321 inhabitants of whom the majority is found in the peri-urban areas of the municipality. A significant characteristic of the Phokwane population is the youth who account for 33% (ages 15–34) of the total population. The economy of Phokwane is based on agriculture, community development, retail, private household and informal sectors. These five sectors alone provide jobs to 11 160 persons within the municipal area. This accounts for 65% of employment within Phokwane.. Of those 20 years and older 30,2% has completed some secondary schooling, 22,0% has Grade 12, 18,9% some primary, 17,7% no schooling, 6,6% has some higher education, and 4,7% has completed primary. Of the 20 200 economically active (employed or unemployed but looking for work) people in the municipality, 37,6% (7 589) are unemployed. Among the 10 297 economically active youth (aged 15 – 34) in the municipality, 48,3% (4 974) are unemployed.

## 5 Results of Public Consultation and Stakeholder Engagement:

### 5.1.1 Stakeholder Identification

No stakeholder engagement was conducted as part of this HIA.



## 6 Literature / Background Study:

### 6.1 Literature Review (SAHRIS)

Very few CRM studies were conducted close to the area. Kusel conducted an assessment of the Vaalharts Irrigations Scheme (Kusel 2015) and mentions the architecture of the scheme as well as cemeteries that are the only heritage related features recorded. A survey by van der Walt (2016) in Jan Kempdorp recorded no sites.

### 6.2 Genealogical Society and Google Earth Monuments

No known grave sites are indicated in the study area.

### 6.3 Background to the general area

Southern African archaeology is broadly divided into the Early, Middle and Later Stone Ages; Early, Middle and Later Iron Ages; and Historical or Colonial Periods.

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

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

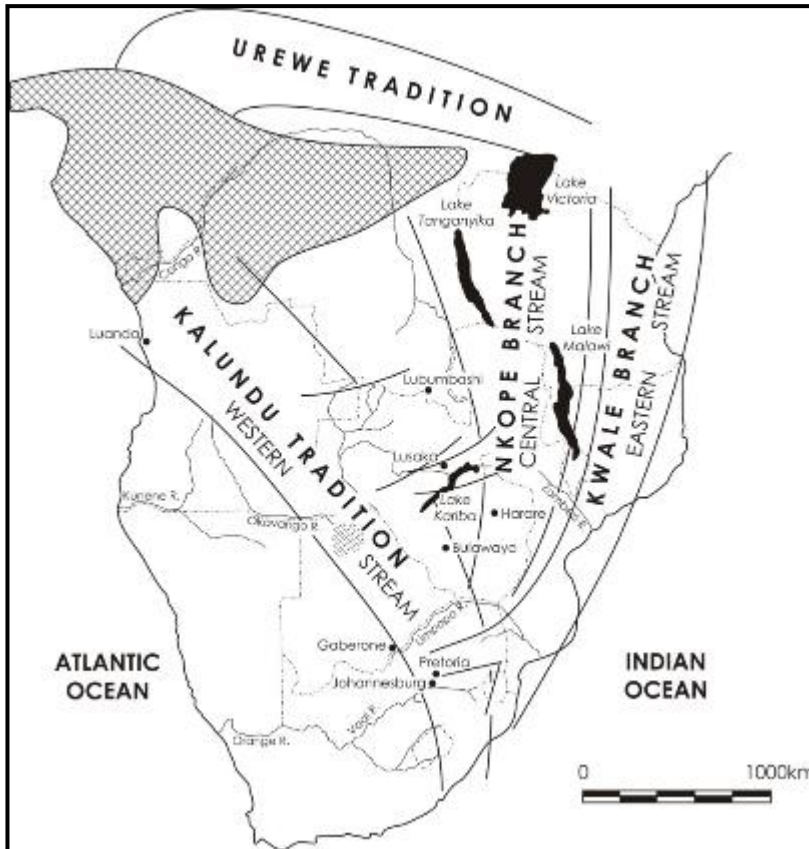
According to Kusel (2015) the Hartsriver gravels should also contain Earlier Stone Age and Middle Stone Age lithics. The Christy 1810-1865 collection in the British Museum contains lithics from the Harts River; the J.A. Swan collection (1948.1.97-102; 1954.7.11) contains lithics from Ricket's Road Drift, Harts (Hartz) River and from the Vaal-Harts Dam J.A. Swan Collection (1947.6.26) (Mitchell 2002, Kusel 2015). Some lithics in the Christy collection are MSA and some were collected from the bed of the Harts River. A salt pan near the Harts River also yielded lithics on hornfels (Kusel 2015).

Several rock art sites are also on record for the area. Morris (1988) found that geometric motifs comprise 33% of the rock art images at Vaalharts. He noted that the engraved sites are mostly concentrated in river valleys and on higher ground beside streams, springs or pans. Breutz (1968) recorded engravings at Dikwana near Tlapeng Valley in the north-eastern corner of the Manthe area of the Taung Reserve. The engravings were predominantly the outlines of animals including giraffe, rhinoceros, zebra and antelope.

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

- The Early Iron Age: Most of the first millennium AD.
- The Middle Iron Age: 10th to 13th centuries AD
- The Late Iron Age: 14th century to colonial period.

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



○ Figure 6.1: Movement of Bantu speaking farmers (Huffman 2007)

In the greater study area Rossouw (2008) reported that several ruins were documented along the Vaalharts Irrigation Scheme canal system. Breutz (1968) was also informed of ruined stone kraals in the Taung District, on the farms Modimong and Killarney, Mogogong and Modutung areas and west of Pampierstad (Kusel 2015).

#### 6.4 Cultural Landscape

Historical land use and the cultural landscape are linked since the cultural landscape is shaped to some extent by the history of the area. The general area is associated with agriculture from prior to 1967 (Figure 6.2 and 6.3).

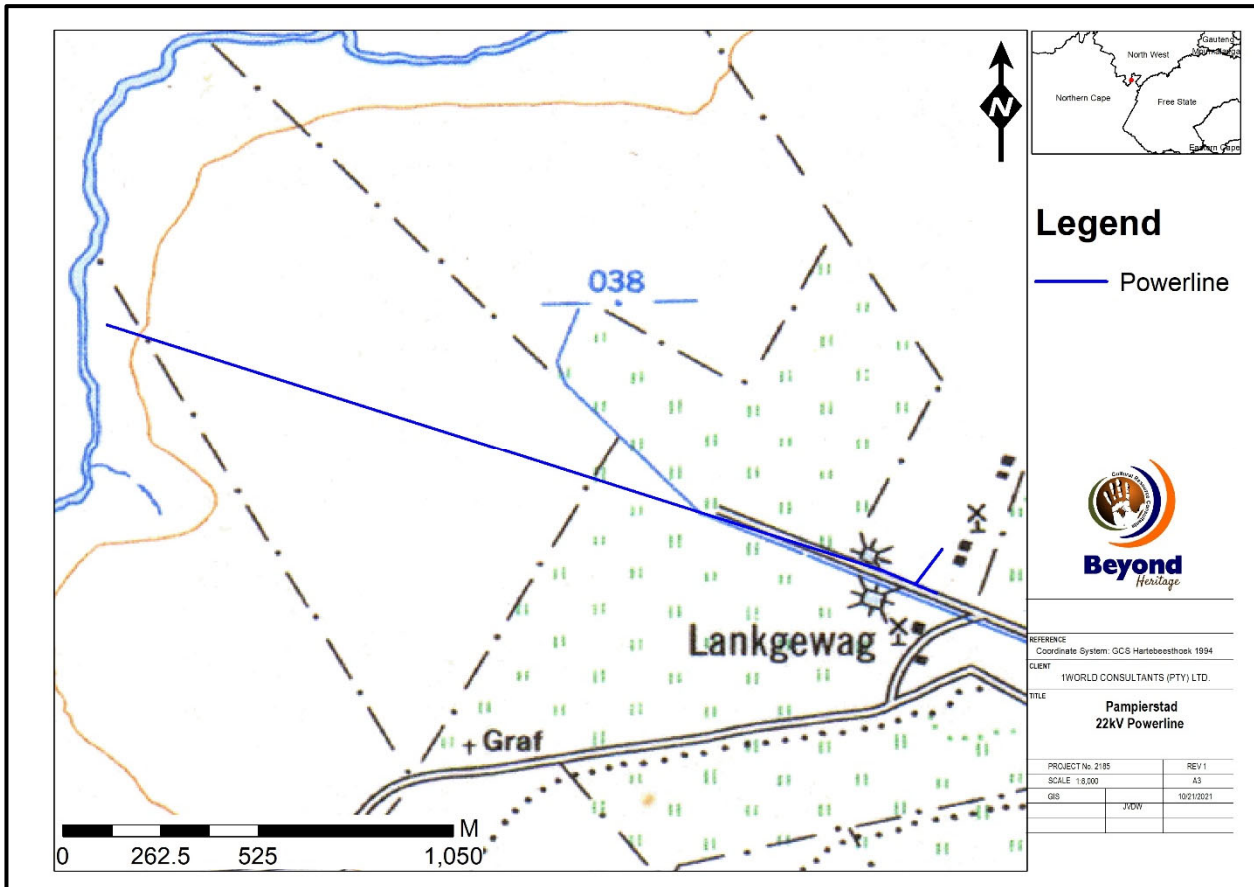


Figure 6.2. The eastern portion of the line is indicated as cultivated on the 1967 Topographical map with a grave located approximately 800 meter to the south of the proposed line.

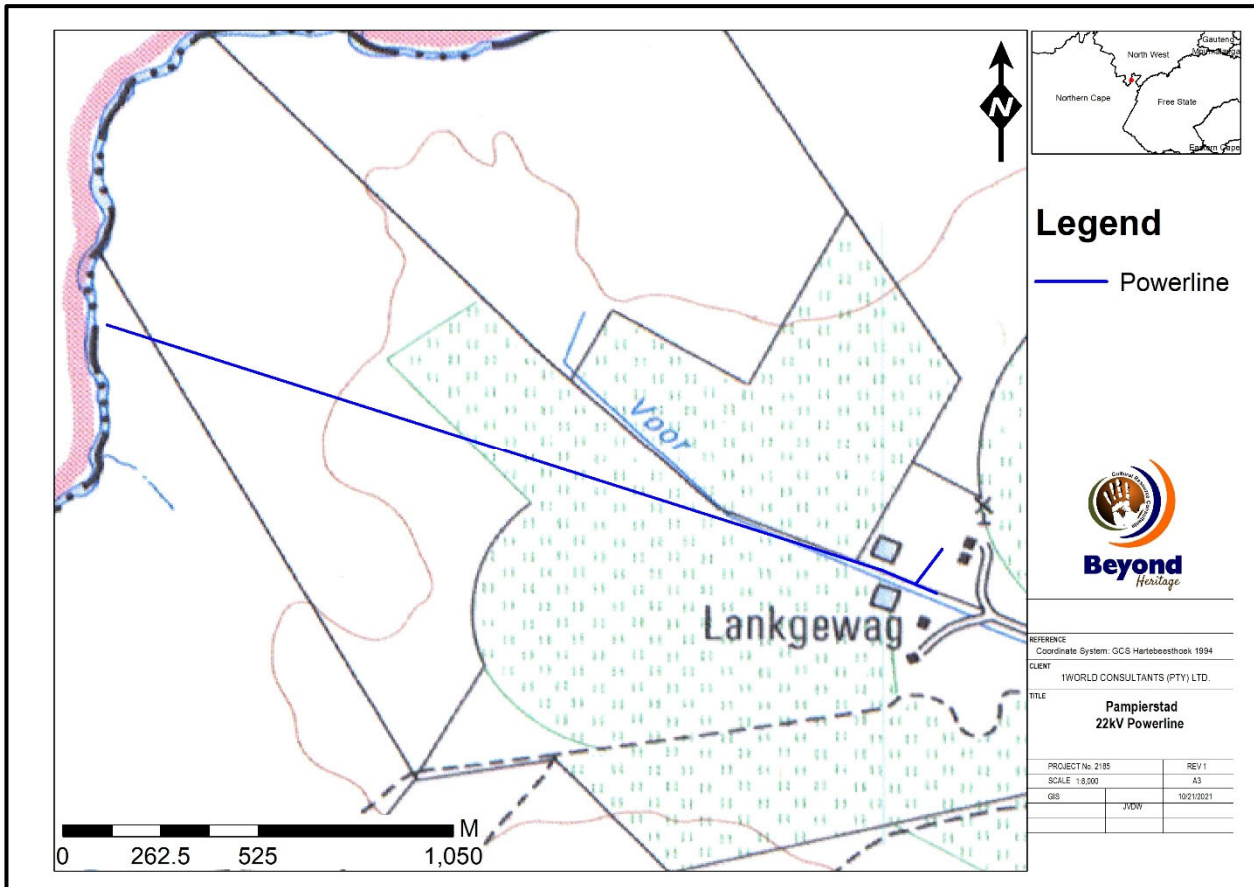


Figure 6.3. 1984 Topographical map of the line. Cultivation activities intensified.

## 7 Description of the Physical Environment

The project area is situated approximately 10km south of Pampierstad along the Hartsriver. The project consists of a proposed powerline, from an existing transformer near a farmhouse to a proposed location near the river. The proposed line traverses a section of the farm that is actively being farmed with large irrigation and crops present. The rest of the section of the proposed line closer to the river is in an area with thick grass cover and thickets of shrubs that are in some areas inaccessible. The section closest to the river is located within the 100-year flood line. General site conditions are shown in Figure 7.1 to 7.4.



Figure 7.1. Cultivation in the study area.



Figure 7.2. General site conditions in the western section.



Figure 7.3. General site conditions in the western section.



Figure 7.4. Site conditions close to the Hartsriver.

### 8 Findings of the Survey

It is important to note that only the proposed alignment was surveyed over one day by a professional archaeologist. Site conditions are characterised by agricultural activities, thick grass and vegetation cover on the floodplain next to the Hartsriver. Agricultural activities altered the landscape in the eastern section of the line and would have impacted on heritage features if any were present in these areas. This was confirmed during the survey where heritage finds were limited to a cement foundation and scatters of Stone Age lithics. The recorded finds were numbered with the Prefix Feat (for Feature). Recorded features are spatially illustrated in Figure 8.1 and briefly described in Section 8.1.

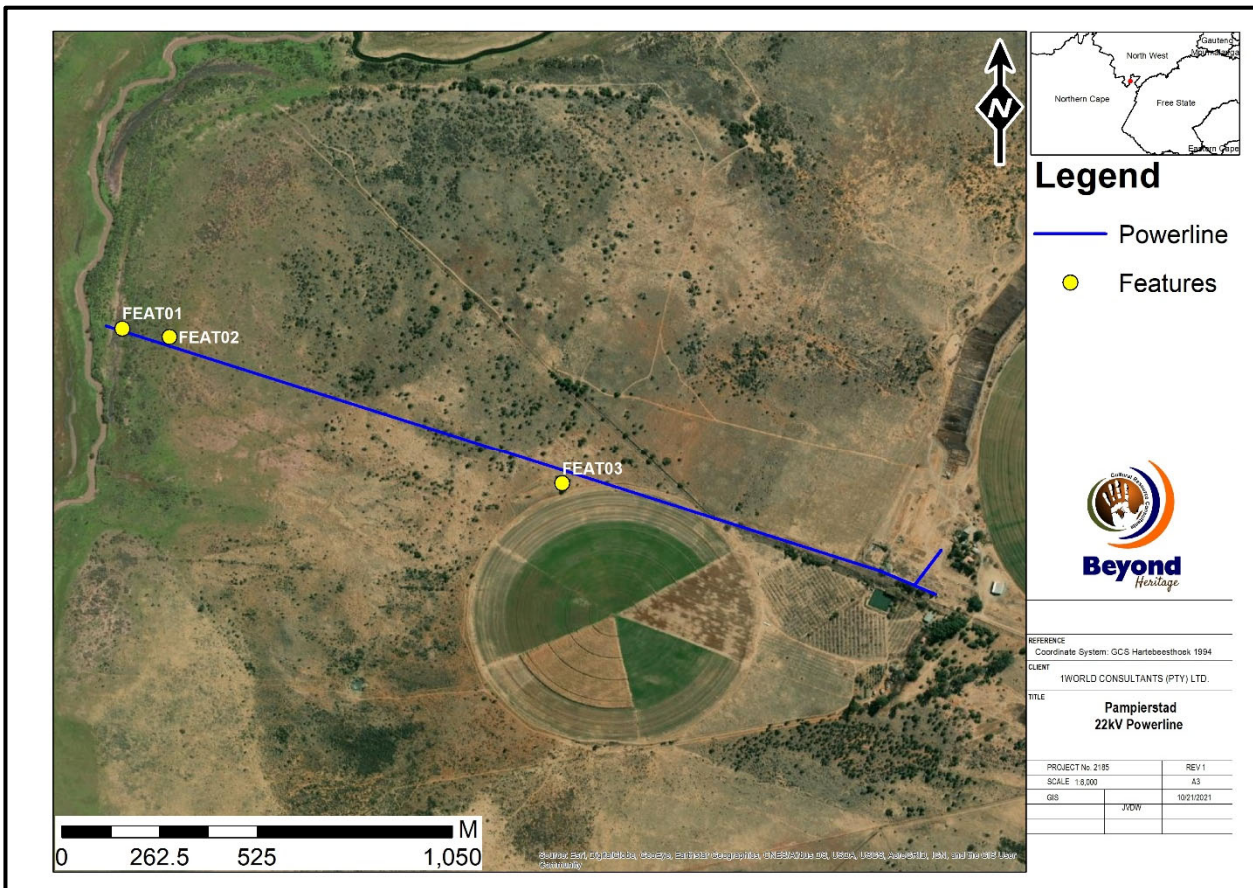


Figure 8.1. Recorded features in relation to the project.

### 8.1 Stone Age Artefacts

General site conditions where stone age artefacts were recorded are indicated in Figure 8.2 to Figure 8.5 and the features are described in Table

**Table 6. Stone Age scatters recorded during the survey.**

Label	Description	Coordinates	Significance
FEAT 01	The feature is located within the flood plan of the river and was exposed by an animal burrow. There is a high density (< 15 Artefacts per square meter) spread over 10 x 10 m. The MSA lithics occur in higher density due to the readily available raw materials for stone tool manufacturing from the stream bed. The lithic material show signs of being rolled due to the consistent water erosion from the periodic flooding of the stream. Artefacts are made from a range of raw material (Hornfells & Crypto Crystalline Cilica) with points and blades with faceted striking platforms.	-27.8594644, 24.6570993	Medium significance (the site should be retained or recorded prior to destruction) Field Rating GP B
FEAT 03	Small scatter of isolated MSA lithics (irregular core, chunks and flakes) located on a gravel road next to a cultivated field.	-27.863304, 24.667934	Isolated find Low significance Field Rating GP C



Figure 8.2. General site conditions at FEAT01 with scatters of artefacts visible



Figure 8.3. Dorsal and ventral view of artefacts recorded at FEAT 01 illustrating range of raw material used



Figure 8.4. Isolated lithics recorded at FEAT03.



Figure 8.5. General site conditions at FEAT03.



## 8.2 Built Environment / multi component feature

FEAT 02 consists of a completely broken-down feature of which only a cement slab remains, as well as industrial artefacts. A few Stone Age (possibly LSA) artefacts are found out of context. A brief site description (Table 7) with general site conditions are illustrated in Figure 8.6 to 8.8. Although unlikely features like these can be associated with burial sites of still born babies.

**Table 7. Built environment features**

Label	Description	Coordinates	Significance
FEAT02	Large cement foundation situated near the river. Contains historical material such as bullet casings, glass and tin. A scatter of Lithics (possibly LSA) on fine grained material are found out of context and washed in on top of the cement slab by periodic flooding of the stream.	-27.8597166, 24.6582143	Low significance Field Rating GP C However if associated with a unmarked burial site the feature is of high social significance and has a field rating of GP A and should be mitigated prior to destruction.



Figure 8.6. Stone Age scatter recorded at FEAT02



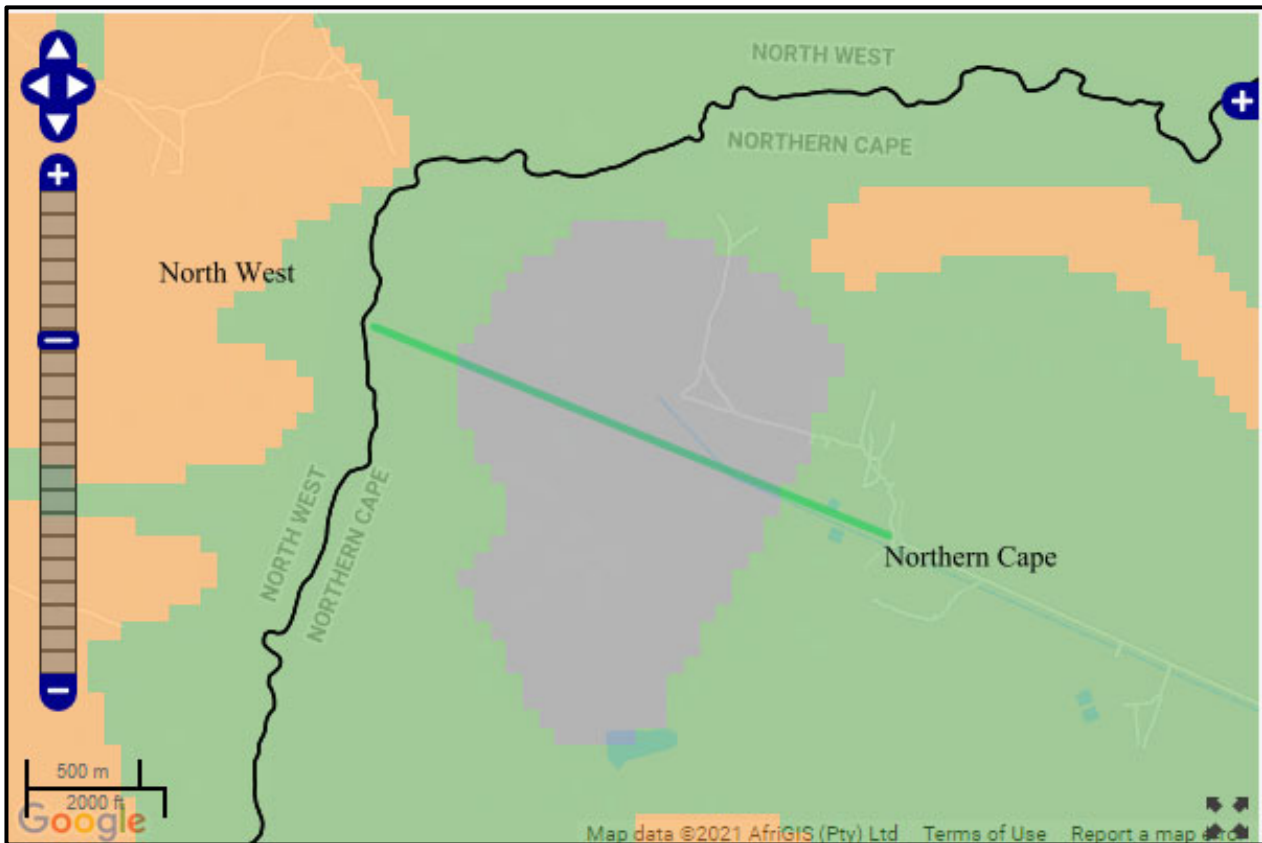
Figure 8.7. Cement floor at FEAT 02



Figure 8.8. Small collection of industrial artefacts found on top of the cement foundation. Bullet casing, Glass bottle fragment, small metal sheet.

### 8.3 Paleontological Heritage

Based on the SAHRA Paleontological map the study area is of insignificant to moderate sensitivity (Figure 8.9) and an independent study was conducted by Prof Marion Bamford for this aspect. The study concluded that there is a very small chance that fossils occur here if there are such features as palaeo-pans or palaeo-springs that could have trapped fossils. No such feature is visible in the satellite imagery.



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 8.9.** Paleontological sensitivity of the approximate study area as indicated on the SAHRA Palaeontological sensitivity map.

## 9 Potential Impact

The Stone Age scatters range from medium (FEAT 01) to low significance (FEAT 03). The pylons are located more than 40 meters away from the features and they are not located under the proposed line. The proposed powerline will not directly affect the recorded Stone Age scatters and the impact on these scatters is low (Figure 9.1 and 9.2).

The heritage value of the recorded built environment feature (FEAT 02) is low. It is demolished and based on historical imagery there is no conclusive evidence that a feature was constructed there prior to 1967 and it is therefore not protected by the NHRA. It should be noted that although unlikely features like these can be associated with human remains and if this is the case the features would be of high social significance. The site is not located under the powerline with pylons more than 45 meters away and FEAT 02 will not be directly impacted on (Figure 9.1).

Powerlines have a relatively small impact on heritage features due to the small footprint of the pylons as shown by Sampson (1985). Therefore, possible indirect impacts can be mitigated to an acceptable level by ensuring that the areas around recorded FEAT 01 and 02 are indicated on development maps and avoided during construction and for pylon placement.

Any additional impacts to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure. Mitigation measures as recommended in this report should be implemented during all phases of the project. Impacts of the project on heritage resources is expected to be low with the implementation of the mitigation measures in this report during all phases of the development (Table 8 and 9).

### 9.1.1 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. These activities can have a negative and irreversible impact on heritage features if any occur. Impacts include destruction or partial destruction of non-renewable heritage resources.

### 9.1.2 Construction Phase

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. Potential impacts include destruction or partial destruction of non-renewable heritage resources.

### 9.1.3 Operation Phase

No impacts are expected during this phase.

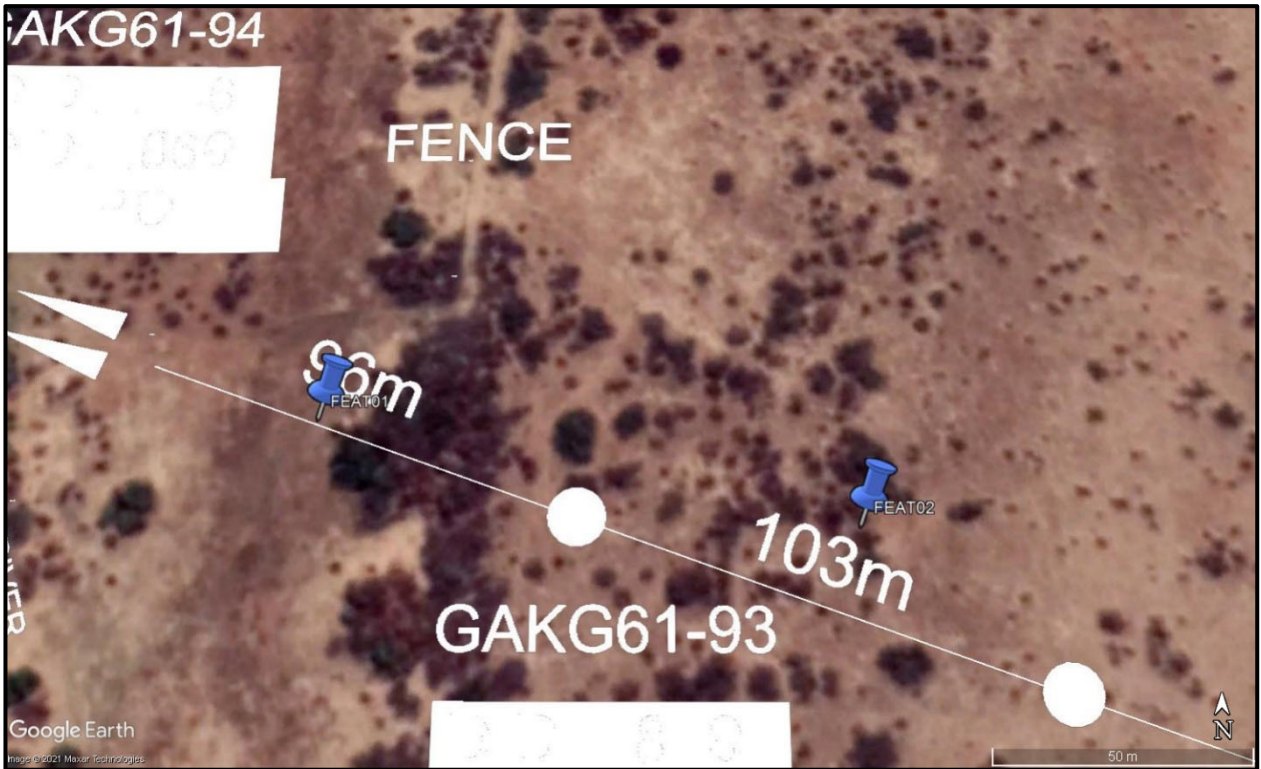


Figure 9.1. Proposed pylon positions in relation to FEAT 01 and 02.

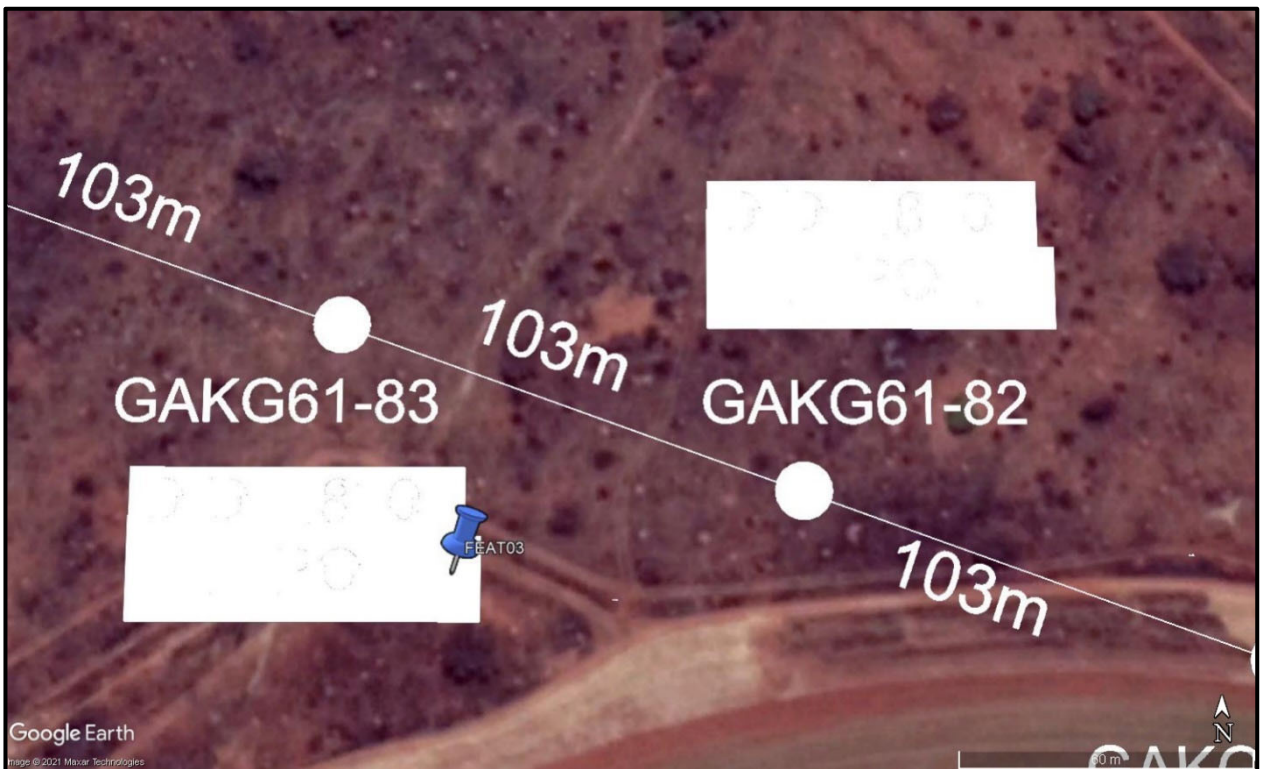


Figure 9.2. Feat 03 in relation to the proposed pylon positions.

### 9.1.4 Impact Assessment for the Project

Table 8. Impact assessment of the proposed project on FEAT 01, 02 and 03 (No direct impact)

<b>Nature:</b> During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects.		
	<b>Without mitigation</b>	<b>With mitigation (Preservation/excavation of site)</b>
<b>Extent</b>	Local (2)	Local (2)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	Low (4)	Minor (2)
<b>Probability</b>	Probable (3)	Improbable (2)
<b>Significance</b>	<b>33 (Low to Medium)</b>	<b>18 (Low)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Not reversible	Not reversible
<b>Irreplaceable loss of resources?</b>	Yes	Yes
<b>Can impacts be mitigated?</b>	NA	NA
<b>Mitigation:</b> Implementation of a chance find procedure for the project. Areas around FEAT 01 and 02 must be indicated on development maps and avoided for pylon placement and during construction.		
<b>Cumulative impacts:</b> The proposed project will have a low cumulative impact since these sites will be directly impacted.		
<b>Residual Impacts:</b> Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on, but this cannot be quantified.		

## 10 Conclusion and recommendations

Site conditions are characterised by agricultural activities, thick grass and vegetation cover on the floodplain next to the Hartsvier. Agricultural activities altered the landscape in the eastern section of the line and would have impacted on heritage features if any were present in these areas. This was confirmed during the survey where heritage finds were limited to a demolished ruin (FEAT 02) and isolated widely scattered Stone Age lithics (FEAT 01 and 03). The heritage value of the recorded features is low to medium. They are all located away from proposed pylon positions and not under the powerline (Figure 9.1 to 9.3) and will not be directly impact on.

The study area is indicated as of insignificant to moderate paleontological sensitivity and an independent study was conducted by Prof Marion Bamford. The study concluded that it is unlikely that any fossils would be preserved in the sands and alluvium of the Quaternary. There is only a small chance that fossils may have been transported or trapped in features such as palaeo-pans or palaeo-springs, but no such feature is visible in the satellite imagery.

The impact of the proposed project on heritage resources is low and it is recommended that the proposed project can commence on the condition that the following recommendations (Section 10.1) are implemented and based on approval from SAHRA:

### 10.1 Recommendations for condition of authorisation

The following recommendations apply, and the project may only proceed based on approval from SAHRA:

#### Recommendations:

- Implementation of a chance find procedure for the project for both the cultural heritage and paleontological components as outlined under 10.2.
- FEAT 01 and 02 must be indicated on development maps and avoided for pylon placement and during construction.

### 10.2 Chance Find Procedures

#### 10.2.1 Heritage Resources

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 therefore 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.

### 10.2.2 Palaeontological resources

#### **Monitoring Programme for Palaeontology – to commence once the excavations and construction activities begin.**

- The following procedure is only required if fossils are seen on the surface and when excavations commence.
- When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, shells or trace fossils) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
- Photographs of similar fossil plants and vertebrates must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures.
- Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
- If there is any possible fossil material found by the developer/environmental officer then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the excavations where feasible.
- Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site, a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
- If no good fossil material is recovered, then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
- If no fossils are found and the excavations have finished, then no further monitoring is required.



### 10.3 Reasoned Opinion

The overall impact of the project with the correct implementation of the mitigation measures in this report is considered to be low and the project can commence with the implementation of the recommendations made in this report. The socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project.

### 10.4 Potential risk

Potential risks to the proposed project are the occurrence of intangible features and unrecorded cultural resources (of which graves are the highest risk). This can cause delays during construction, as well as additional costs involved in mitigation and possible layout changes.

### 10.5 Monitoring Requirements

Ideally, site monitoring should be conducted by an experienced archaeologist or heritage specialist. Monitoring can be conducted by the Environmental Control Officers (ECO). The ECO or other responsible persons should be trained along the following lines:

- *Induction training:* Responsible staff identified by the developer should attend a short course on heritage management and identification of heritage resources.
- *Site monitoring and watching brief:* As most heritage resources occur below surface, all earth-moving activities need to be routinely monitored in case of accidental discoveries. The greatest potential impacts are the initial soil removal and subsequent earthworks during construction. The ECO should monitor all such activities daily. If any heritage resources are found, the chance finds procedure must be followed as outlined above.

Monitoring requirements for the project is outlined in Table 8.

Table 9. Heritage monitoring required for the project.

Heritage Monitoring					
Aspect	Area	Responsible for monitoring and measuring	Frequency	Proactive or reactive measurement	Method
Clearing activities and construction	Entire project area	ECO	Biweekly (Pre construction and construction phase)	Proactively	<ul style="list-style-type: none"> <li>• If risks are manifested (accidental discovery of heritage resources) the chance find procedure should be implemented:               <ol style="list-style-type: none"> <li>1. Cease all works immediately;</li> <li>2. Report incident to the Sustainability Manager;</li> <li>3. Contact an archaeologist/ palaeontologist to inspect the site;</li> <li>4. Report incident to the competent authority; and</li> <li>5. Employ reasonable mitigation measures in accordance with the requirements of the relevant authorities.</li> </ol> </li> </ul>

Heritage Monitoring					
Aspect	Area	Responsible for monitoring and measuring	Frequency	Proactive or reactive measurement	Method
					<ul style="list-style-type: none"> <li>Only recommence operations once impacts have been mitigated.</li> </ul>
Clearing and construction	FEAT 01 and 02	ECO	Biweekly (Pre construction and construction phase)	Proactively	<ul style="list-style-type: none"> <li>Measure levels of subsidence and compare with recorded baseline conditions;</li> <li>Status quo will be recorded through photographs; and</li> <li>Results will be reported in the progress reporting.</li> </ul>

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**10.6 Management Measures for the project.**

Table 10. Heritage Management Plan for the project

Area	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Target	Performance indicators (monitoring tool)
<b>General project area</b>	Implement chance find procedures in case possible heritage finds are uncovered	Pre-Construction and construction	Throughout the project	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	ECO Checklist/Report
<b>FEAT 01 and 02</b>	Indicate on development plans and avoid area during construction	Pre-Construction and construction	Throughout the project	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35 and 38 of NHRA	ECO Checklist/Report

### 10.7 Knowledge Gaps

Due to the subsurface nature of heritage resources, the possibility of discovery of heritage resources during the construction phase cannot be excluded. This limitation is successfully mitigated with the implementation of a chance find procedure.

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