

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

**FOR THE PROPOSED CONSTRUCTION AND OPERATION OF THE
HENDRINA SOUTH 132KV POWERLINE TO HENDRINA POWER
STATION IN THE MPUMALANGA PROVINCE OF SOUTH AFRICA**

Type of development:

Grid Infrastructure

Developer:

Enertag (Pty) South Africa

Report prepared for:

SiVEST SA (Pty) Ltd (SiVEST)

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APPROVAL PAGE

Project Name	Hendrina South 132 kV Powerline
Report Title	Heritage Impact Assessment for the Hendrina South 132 kV Powerline, Mpumalanga Province
Authority Reference Number	TBC
Report Status	Draft Report
Applicant Name	Enertrag South Africa (Pty) Ltd

	Name	Qualifications and Certifications	Date
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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	<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	Section 6
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to BA report
(q) Any other information requested by the competent authority	N.A

Executive Summary

SiVEST SA (Pty) Ltd was appointed as the Environmental Assessment Practitioner (EAP) by Enertrag South Africa (Pty) Ltd to undertake the required Environmental Authorisation Process for the construction and operation of the required connection and grid infrastructure for the proposed Hendrina South 132 kV Powerline in the Mpumalanga 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:


- Two alternatives were assessed with a 500-meter corridor and three substations;
- The Project area is characterised by extensive cultivated fields and is considered to be of low archaeological potential;
- This was confirmed during the field survey and no archaeological sites of significance were noted, and finds were limited to graves and ruins;
- Both powerline alternatives will have a direct impact on recorded burial sites while the Hendrina North (HN) and Hendrina South (HS) Connector substation will impact directly on ruins and a burial site;
- According to the SAHRA Paleontological sensitivity map the study area is of very high paleontological significance and an independent study was conducted for this aspect. Bamford (2022) concluded that it is extremely unlikely that any fossils would be preserved in the loose soils and sands of the Quaternary. There is a very small chance that fossils may occur in the shales and siltstones of the early Permian Vryheid Formation, but only more than 5m below the surface, therefore, a Fossil Chance Find Protocol should be added to the EMP.

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

Recommendations:

- Burial sites at points 093, 094, HD 004, HD101 and HD102 must be preserved *in situ* with a 30-meter buffer as mitigation measure (prescribed by SAHRA), which means that the line will have to be micro sited in the area where 93, 94, HD004 and HD102 were recorded.
- Additionally, burial site HD101 is in the footprint of the HS Collector Substation and will have to be avoided with a 30 m buffer zone, if this is not possible the graves can be relocated adhering to all legal requirements;
- Based on the current lay the ruins at 089, 090, 091, 092 are located within the HN Collector Substation footprint and should preferably be avoided. Although of low significance the possible presence of graves at the ruins is a risk. If avoidance is not possible the presence of graves should be confirmed during social consultation and the area should be monitored during construction;
- A secondary impact to ruins (097) is possible but unlikely and the site should be indicated on development plans and avoided during development;
- Implementation of the ENERTRAG Chance Find Procedure for the project (Appendix A and Bamford 2023);
- Pre-construction heritage walkdown of final pylon positions.

Declaration of Independence

Specialist Name	Jaco van der Walt
Declaration of Independence	<p>I declare, as a specialist appointed in terms of the National Environmental Management Act (NEMA) (Act No 107 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations (as amended), that I:</p> <ul style="list-style-type: none"> • I act as an 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 49 A of the Act. of regulation 48 and is punishable in terms of section 24F of the Act.
Signature	
Date	11/01/2023

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 the Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, DRC Zambia, Guinea, Afghanistan, Nigeria 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
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DARDLEA: Provincial Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EAP Environmental 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 grid connection infrastructure for the Hendrina South 132 kV Powerline in the Mpumalanga Province (Figure 1.1 to 1.2). The proposed project aims to feed the electricity generated by the proposed Hendrina South WEF into the national grid. The WEF will form part of the Renewable Energy Independent Power Producer Programme (REIPPP) (in line with the Integrated Resource Plan (IRP) – renewable wind energy) The report forms part of the Basic Assessment (BA) Report and Environmental Management Programme Report (EMPr) for the development.

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, burial sites and ruins were recorded along the powerline with various other structures in the corridor. 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, compiled in support of an Environmental Authorisation application as defined by NEMA EIA Regulations section 40 (1) and (2), to be submitted to SAHRA for commenting. Upon submission to SAHRA the project will be automatically given a case number as reference. As such the BA report and its appendices must be submitted to the case as well as the EMPr, 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 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

Project components and the location of the grid connection corridor are outlined under Table 2 and 3.

Table 2: Project Description

Project details	location	The proposed project is located approximately 15km west of Hendrina, within the Steve Tshwete Local Municipality, in the Nkangala District Municipality, Mpumalanga Province. The Hendrina Power Station is located approximately 17km northwest of Hendrina, near Pullens Hope (refer to Figure 1.1). The proposed powerline (up to and including 132kV) to Hendrina Power Station will be ~26km long depending on the exact route. A 500m corridor is proposed (250m from the centre lines)																																																																											
Properties		<p>The proposed project (including site area and powerline corridors) will be located on the following properties / farm portions:</p> <table border="1"> <thead> <tr> <th>Portion No.</th> <th>Farm No.</th> <th>Farm Name</th> </tr> </thead> <tbody> <tr><td>12</td><td>153</td><td>Driefontein</td></tr> <tr><td>37</td><td>153</td><td>Driefontein</td></tr> <tr><td>2</td><td>153</td><td>Driefontein</td></tr> <tr><td>17</td><td>153</td><td>Driefontein</td></tr> <tr><td>14</td><td>151</td><td>Roodepoort</td></tr> <tr><td>13</td><td>151</td><td>Roodepoort</td></tr> <tr><td>2</td><td>151</td><td>Roodepoort</td></tr> <tr><td>18</td><td>151</td><td>Roodepoort</td></tr> <tr><td>1</td><td>151</td><td>Roodepoort</td></tr> <tr><td>8</td><td>154</td><td>Boschmanskop</td></tr> <tr><td>3</td><td>185</td><td>Haartebeestkuil</td></tr> <tr><td>4</td><td>185</td><td>Haartebeestkuil</td></tr> <tr><td>1</td><td>25</td><td>Broodsneyerplaats</td></tr> <tr><td>0</td><td>162</td><td>Hendrina Power Station</td></tr> <tr><td>0</td><td>186</td><td>Gloria</td></tr> <tr><td>11</td><td>162</td><td>Hendrina Power Station</td></tr> <tr><td>1</td><td>158</td><td>Aberdeen</td></tr> <tr><td>0</td><td>189</td><td>Dunbar</td></tr> <tr><td>1</td><td>189</td><td>Dunbar</td></tr> <tr><td>3</td><td>189</td><td>Dunbar</td></tr> <tr><td>4</td><td>189</td><td>Dunbar</td></tr> <tr><td>5</td><td>189</td><td>Dunbar</td></tr> <tr><td>6</td><td>189</td><td>Dunbar</td></tr> <tr><td>7</td><td>189</td><td>Dunbar</td></tr> </tbody> </table>	Portion No.	Farm No.	Farm Name	12	153	Driefontein	37	153	Driefontein	2	153	Driefontein	17	153	Driefontein	14	151	Roodepoort	13	151	Roodepoort	2	151	Roodepoort	18	151	Roodepoort	1	151	Roodepoort	8	154	Boschmanskop	3	185	Haartebeestkuil	4	185	Haartebeestkuil	1	25	Broodsneyerplaats	0	162	Hendrina Power Station	0	186	Gloria	11	162	Hendrina Power Station	1	158	Aberdeen	0	189	Dunbar	1	189	Dunbar	3	189	Dunbar	4	189	Dunbar	5	189	Dunbar	6	189	Dunbar	7	189	Dunbar
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Topographic Map Number		2629 BA																																																																											

Table 3: Infrastructure and project activities

Type of development	Grid Infrastructure
Size of development	The proposed powerline (up to and including 132kV) to Hendrina Power Station will be 23 - 26 long depending on the exact route options. A 500m corridor is proposed (250m from the centrelines).

Project details and components	<p>The Project entails the development of electricity transmission and distribution infrastructure required to connect the proposed Hendrina South WEF to the National Grid via the existing Eskom substation, located at the Hendrina Power Station. The Applicant intends to develop the Project under a self-build agreement with Eskom. Once construction is complete it is anticipated that the Grid Infrastructure, and associated Environmental Authorisation, will be transferred to the Grid Operator. The proposed grid connection infrastructure will include the following components:</p> <p><i>132kV powerline</i></p> <p>Up to 132kV powerline connecting the grid operator substation at Hendrina South WEF to the Hendrina Power Station. The 132kV powerline from the authorized grid operator substation on the Hendrina South WEF will lead to the Hendrina North collector substation (subject to a separate application for EA). Should the Hendrina North Wind Farm not be built, the connection will continue from the grid operator substation on Hendrina South all the way to the Hendrina Power Station. Power line towers being considered for this development include self-supporting suspension monopole structures for relatively straight sections of the line and angle strain towers where the route alignment bends to a significant degree. Maximum tower height is expected to be approximately 40m.</p> <p>Technical Details:</p> <p>Powerline capacity: 132kV powerlines (single circuit or double circuit)</p> <p>Powerline corridor length Approx. 23-26km (To be confirmed prior to construction)</p> <p>Powerline corridors width 500m (250m on either side of centre line)</p> <p>Powerline servitude 32m per 132kV powerline</p> <p>Powerline pylons: Monopole or Lattice pylons, or a combination of both where required</p> <p>Powerline pylon height: Maximum 40m height</p>
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1.3 Alternatives

The proposed grid connection infrastructure proposals include two (2) powerline route alignment alternatives within a 500m wide corridor. These alternatives will be considered and assessed as part of the BA process and will be amended or refined to avoid identified environmental sensitivities.

The two alternative grid connection solutions (within a 500m wide corridor) will include:

- Grid Connection Alternative 1 (Preferred) (Option A):** The proposed powerline will be approximately 23.7km and will connect the Hendrina South WEF to the Hendrina Power Station. The 132kV powerline from the authorized grid operator substation on the Hendrina South WEF will lead to the Hendrina North collector substation (subject to a separate application for EA). Should the Hendrina North WEF not be built, the connection will continue from the grid operator substation on Hendrina South all the way to the Hendrina Power Station. This alternative spans over existing road and farm boundaries. This is the landowners preferred routing. The preferred pylon and powerline will be 132 kV Intermediate Self-Supporting single circuit or double circuit Monopole.
- Grid Connection Alternative 2: (Option B):** The proposed powerline will be approximately 22.8km and will connect the Hendrina South WEF to the Hendrina Power Station. The 132kV powerline from the authorized grid operator substation on the Hendrina South WEF will lead to the Hendrina North collector substation (subject to a separate application for EA). Should the

Hendrina North WEF not be built, the connection will continue from the grid operator substation on Hendrina South all the way to the Hendrina Power Station. This alternative spans over farm portions.

The 'no-go' alternative is the option of not undertaking the proposed grid connection infrastructure project. Hence, if the 'no-go' option is implemented, there would be no development. This alternative would result in no environmental impacts from the proposed project on the site or surrounding local area. It provides the baseline against which other alternatives are compared and will be considered throughout the report.

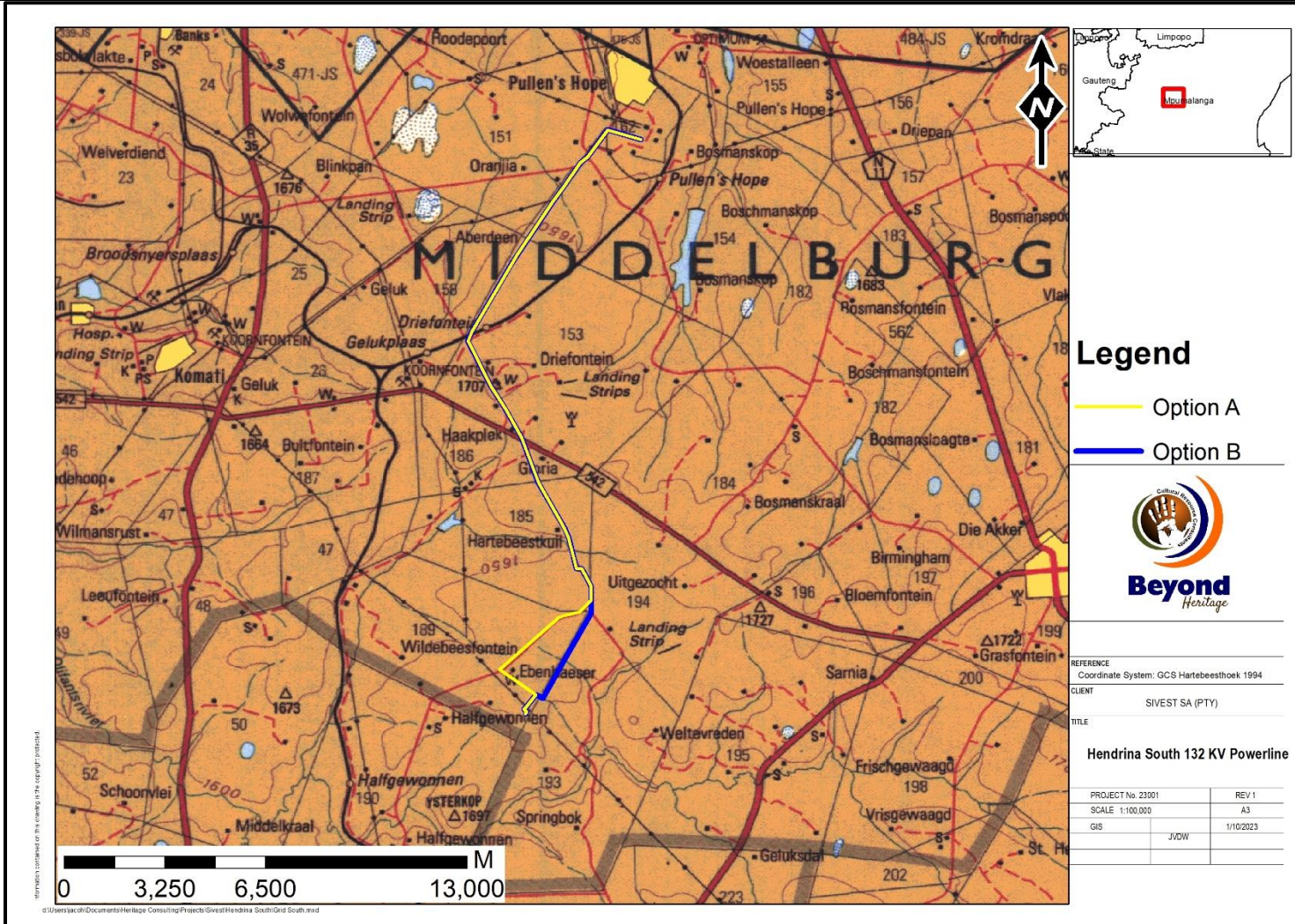


Figure 1.1. Regional setting of the Project (1: 250 000 topographical map).

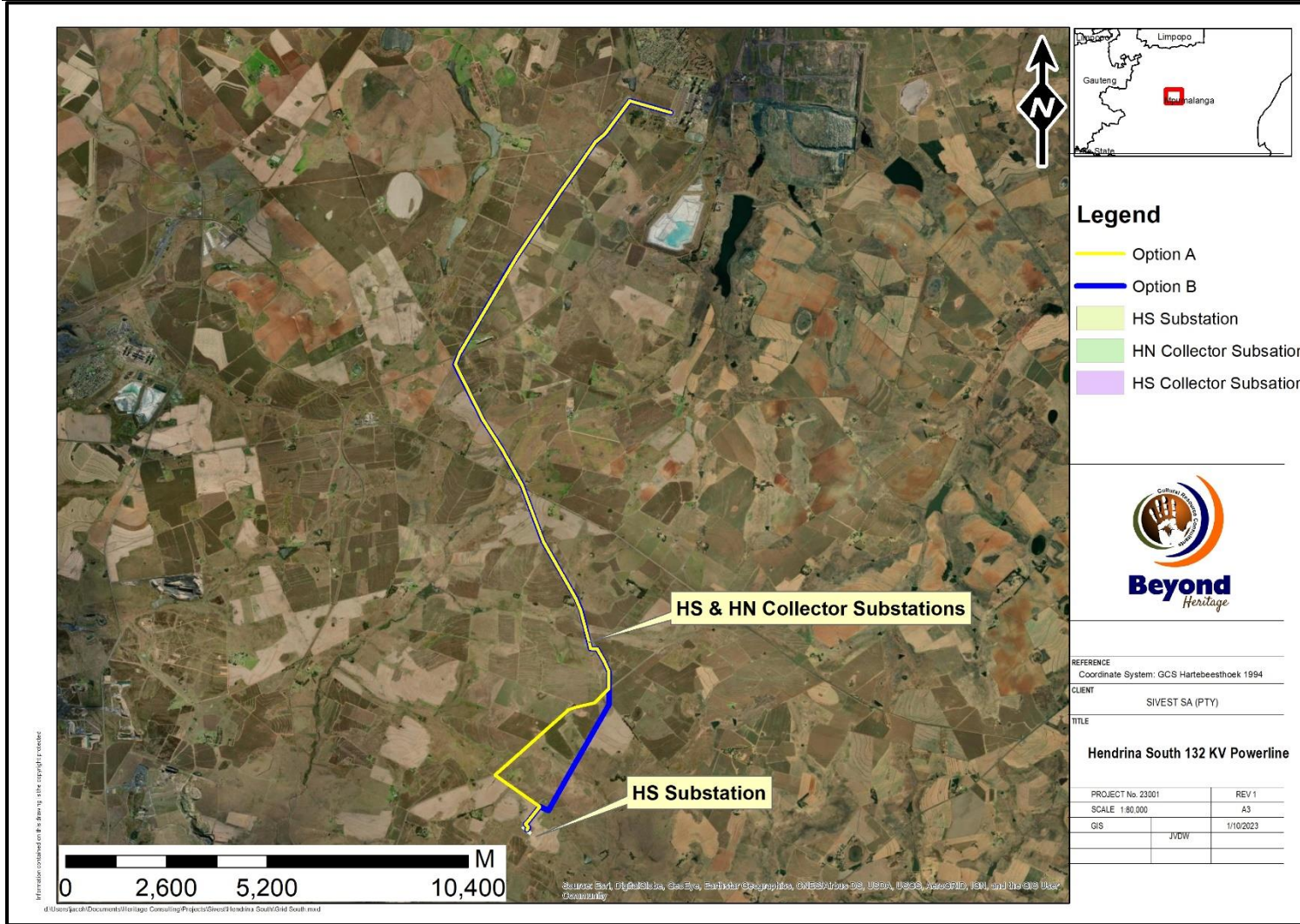


Figure 1.2. Aerial image of the development footprint and surrounds showing the project components.

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))

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 (or avoidance) of these impacts.

The HIA should be submitted, as part of the impact assessment report or EMP, to the Provincial Heritage Resource Agency (PHRA) 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, as per the impact assessment report and/or EMP, 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 Southern African Development Community (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 and GNR 548 as well as the SAHRA BGG Policy 2020. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (NHRA), as well as the National Health Act of 2003 and are under 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) re-instituted by Proclamation 109 of 17 June 1994 and implemented by CoGHSTA as well as the National Health Act of 2003 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. . 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 the National Health Act of 2003.

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:

Stakeholder engagement is a key component of any EA 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

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

	Site Investigation
Date	13 December 2022
Season	Summer – The time of year and season did affect the survey since vegetation was high after the rains. The powerline corridor was however sufficiently covered to understand the heritage character of the area (Figure 3.1).

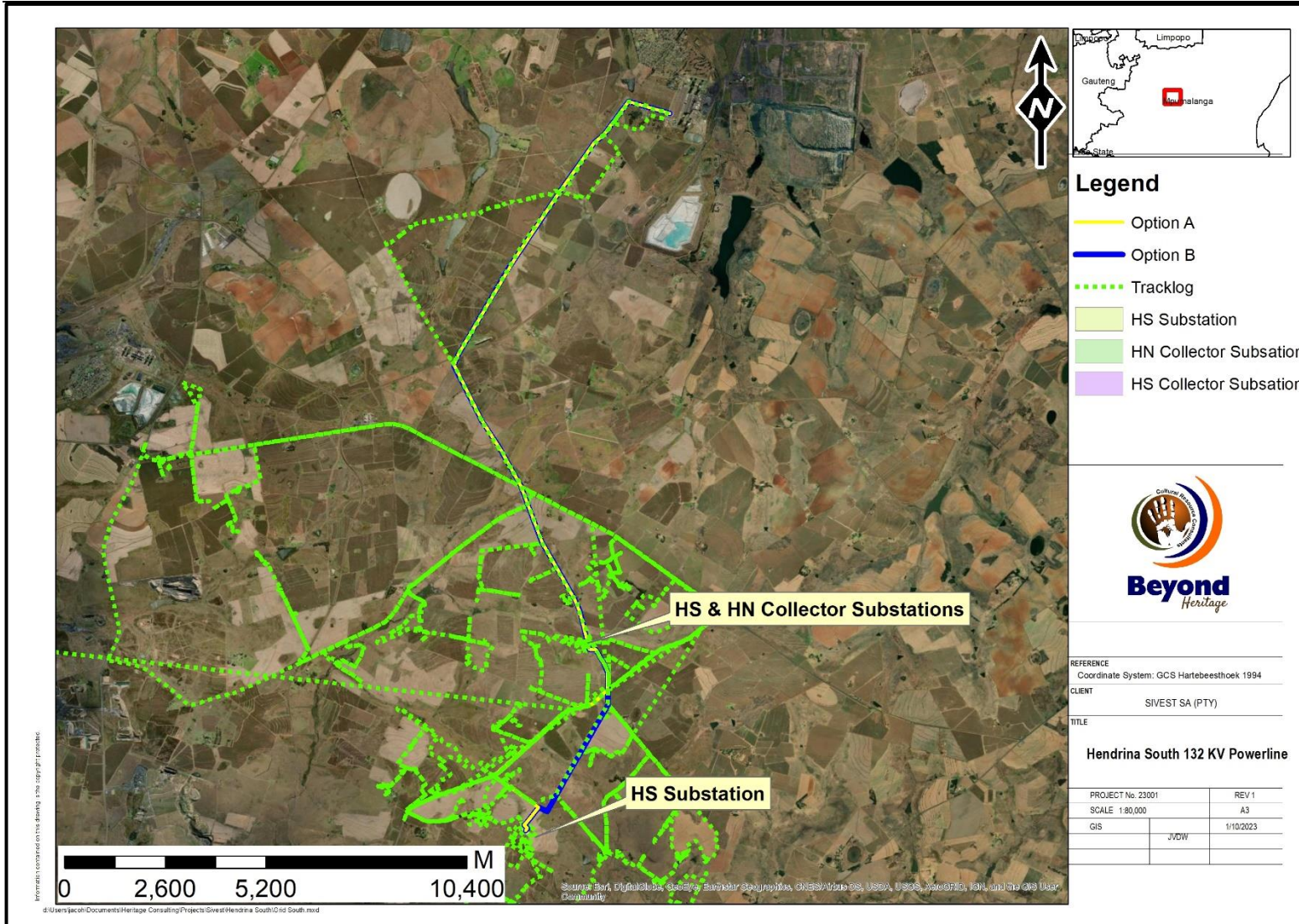


Figure 3.1. Tracklog of the survey path in green.

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.

Table 5. Heritage significance and field ratings

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 impact assessment was done as per the provided SiVEST Environmental Impact Assessment Methodology.

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. The discrepancy between Google Earth, handheld GPS and GIS projections could cause some deviation on actual locations of sites and should be verified. The EAP must also confirm if all the project components have been addressed during this study. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys focussing on tangible heritage along the powerline. The corridors were assessed on desktop level only. 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

According to Census 2011, Steve Tshwete Local Municipality has a total population of 217 073 people, of whom 73,6% are black African, and 21,8% are white. The other population groups make up the remaining 4,6%. Of those aged 20 years and older, 3,4% have completed primary school, 30,8% have some secondary education, 35% have completed matric, and 14,4% have some form of higher education, while 7,4% of have no form of schooling. According to Census 2011, Govan Mbeki Local Municipality has a total population of 294 538, of which 80,5% are black African, 16,0% are white, with the other population groups making up the remaining 3,5%.

Of those 20 years and older, 3,9% completed primary school, 33,9% have some secondary education, 31,4% completed matric, and 12,6% have some form of higher education. The percentage of those aged 20 years and older with no form of schooling is 7,9%.

5 Results of Public Consultation and Stakeholder Engagement:

5.1.1 Stakeholder Identification

Adjacent landowners and the public at large were informed of the proposed activity as part of the BA process by the EAP. Site notices and advertisements notifying interested and affected parties were placed at strategic points and in local newspapers as part of the process. No heritage concerns were raised thus far.

6 Literature / Background Study:

6.1 Literature Review (SAHRIS)

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). Studies listed in Table 6 were consulted for this project.

Table 6. Studies consulted for this report.

Author	Year	Project	Findings
Huffman, T.N.	1995	Archaeological Survey of Forzano Coal Holdings	Homesteads and Cemeteries
Van Schalkwyk, J	1997	A Survey of Cultural Resources in The Proposed Kleinfontein Mining Area, Mpumalanga Province	Cemeteries and a farm house as well as Stone Age scatters
Van Schalkwyk, J.	2002	A Survey of Cultural Resources for the Koorfontein Mining Development, Middelburg District, Mpumalanga Province	Farmsteads and cemeteries
Van Schalkwyk, J.	2003	Goedehoop Mine, Mpumalanga: Archaeological and Cultural Historical Survey and Impact Assessment	No Sites
Van Vollenhoven, A.C.	2013	A Report on A Cultural Heritage Impact Assessment for A Proposed Mining Right Amendment Application at The Halfgewonnen Colliery, Between Bethal And Hendrina, Mpumalanga Province	No Sites
Van der Walt, J.	2019	Heritage Impact Assessment For The Proposed Dunbar Opencast Coal Mine Mpumalanga Province	Stone cairn, a farmstead and a structure
Van der Walt, J.	2022	Heritage Impact Assessment for the Hendrina North Wind Energy Facility	Ruins and Graves

6.1 Archaeological Background

6.1.1 Stone Age

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

Very few Early Stone Age (ESA) 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 Middle Stone Age (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 close to Witbank as well by Huffman (1999) on the farm Rietfontein.

The Later phases of the Stone Age (LSA) 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 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.

Three LSA sites are on record in the greater area. The sites are Welgelegen Skuiling close to Ermelo, Chrissiesmeer (also known for rock art) and lastly Groenvlei close to Carolina, this area is also known for rock art (Bergh 1999).

6.1.2 Iron Age

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 Early Iron Age sites are on record in the greater region. Around 220 Late Iron Age stone walled sites are on record to the east of the study area (Bergh 1999) and is also associated with numerous pre-*difaqane* and *difaqane* wars that took place during the last quarter of the 18th century and during the first three decades of the 19th century. The sites are located close to Bethal. The study area was most probably inhabited by the Phuting group (Berg 1999). Around the study area the Phuting moved south due to the Ndebele migration (Difaqane). These wars led to the displacement of large numbers of Tswana clans on the Highveld where Mzilikazi's Ndebele caused chaos and havoc.

Late Iron Age settlements are characterised by extensive dry stonewalls and dates back to the 17th century. Late Iron Age communities who contributed to this stone walled architecture were the Sotho, Pedi, Ndebele and Swazi. The stone building tradition that these indigenous groups established many decades before the first colonial settlers arrived, may have influenced the colonial farmers to utilize these same resources as building material for the first farmsteads which arose on the Eastern Highveld (Pistorius 2006).

6.1.3 Historical Background

Sites dating to the historic period occur sporadically in the study area. These are mostly farming related, although some mining sites also occur. The farming related sites are usually farmsteads and farm cemeteries, either belonging to the landowners or their labourers. Mining related sites are for example the old Albion Colliery, dating to the 1940's.

6.1.4 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 publicized, and therefore republican leader 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 based on the status quo ante bellum. Salisbury's reply was, however, a clear statement of British war aims (Du Preez 1977).

During the Anglo-Boer War, several battles took place in the region. The one closest to the study area took place on the farm Wilmansrust, some distance to the east, in June 1901. During this clash, more than 50 British troops were killed.

7 Description of the Physical Environment

The landscape consists of slightly to moderately undulating plains with some low hills and pan depressions. The vegetation is short dense grassland dominated by the usual highveld grass composition, including species from the genera *Aristida*, *Digitaria*, *Eragrostis*, *Themeda* and *Tristachya*, with small, scattered rocky outcrops of wiry, sour grasses and some woody species such as *Senegalia caffra*, *Celtis africana*, *Diospyros lycioides* subsp *lycioides*, *Parinari capensis*, *Protea caffra*, *P. welwitschii* and *Englerophytum magalismontanum* (Mucina & Rutherford, 2010). Large sections of the area consist of ploughed fields that have been extensively cultivated for several years and other areas are used for grazing. The study area also includes existing water and powerline infrastructure, roads and farm fences. General site conditions are illustrated in Figure 7.1 to 7.6.



Figure 7.1. General site conditions indicating grass cover in the corridor used for grazing.

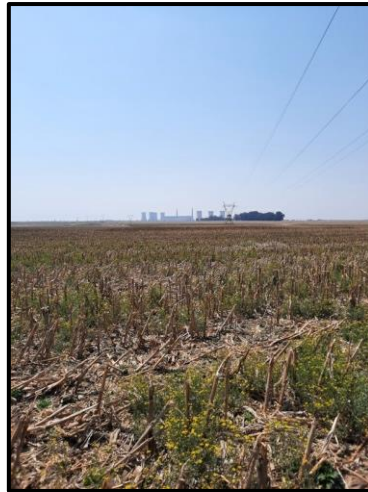


Figure 7.2. General site conditions in the study area showing the flat topography, existing powerline infrastructure and agricultural fields to the north of the study area.



Figure 7.3. Roads and farm fences in the study area.



Figure 7.4. Railway infrastructure in the study area.



Figure 7.5. Water pipelines in the study area.

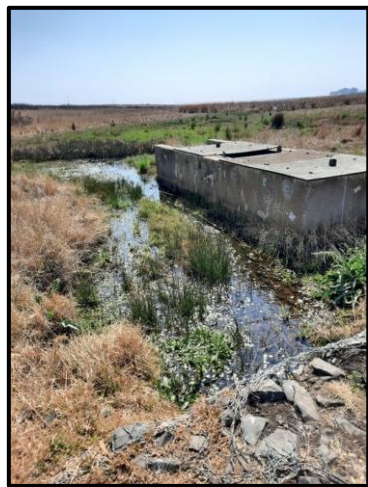


Figure 7.6. Existing water pipelines traversing the study area.

8 Findings of the Survey

8.1 Heritage Resources

Most of the proposed project area and surrounding environment consists of active agricultural lands that have been cultivated. Existing powerlines, water pipelines and railroad infrastructure traverse the Project area. The continuous ploughing and the existing infrastructure would have impacted on archaeological sites if any were present in these areas and the Project area is of low archaeological potential.

This was confirmed during the survey and finds were limited to burial sites and ruins. The survey focused on the centre line of the powerline however several features (residential dwellings and settlements) were also noted within the proposed corridor. These features (Figure 8.1) were not assessed as they will not be directly impacted on, but burial sites can be found in these areas. If impacted on in future these areas of heritage potential should be verified prior to development. Potential heritage resources are centred around the following coordinates:

Longitude	Latitude
29° 33' 31.3475" E	26° 07' 08.1805" S
29° 33' 45.3948" E	26° 07' 09.5882" S
29° 34' 47.8472" E	26° 09' 51.1498" S
29° 34' 51.1175" E	26° 10' 11.4387" S
29° 34' 45.6673" E	26° 10' 15.0985" S

Recorded heritage features along the line were given waypoint numbers recorded in the field. General site conditions, site distribution and selected features are illustrated in Figures 8.2 – 8.12. Recorded observations are briefly described in Table 7.

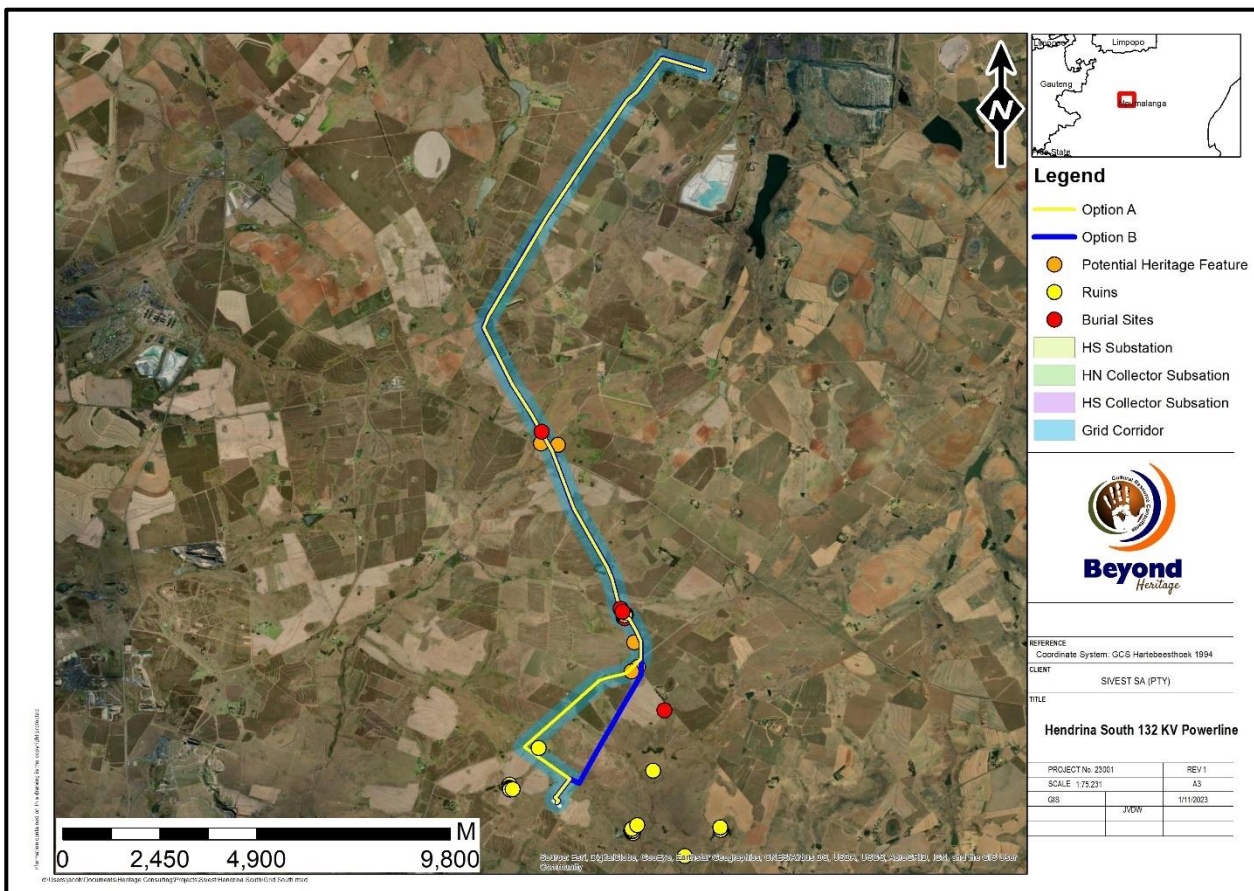


Figure 8.1. Site distribution map.

Table 7. Recorded features

Label	Location	Type Site	Description	Significance and Field Rating
089, 090, 091, 092	-26.1580157, 29.5780821	Ruins	Remains of a small homestead on the side of a large gravel road. The site consists of the remains of multiple small, demolished structures that are half buried under overgrown grass over an area measuring ~ 40 x 40m. Only the ephemeral foundations of the structures are left. These features are located in association with burial sites recorded as 093 and 094.	The ruins potential to contribute to aesthetic, historic, scientific and social aspects are non-existent, and it is therefore of low heritage significance (GP C) unless associated with burial sites (e.g., still born graves) in which case the burial sites are of high social significance (GP A)
093	-26.158594, 29.577451	Cemetery	Four graves situated in a small fenced off area (4 x 10 m) near the main access road traversing the study area. New granite gravestones and skirting have been placed over the graves with the older material laying on the side of the small cemetery.	GP A High Social significance
094	-26.158772, 29.577805	Cemetery	A single grave similar to that of feature 093. This grave is also fenced off and is probably that of a child due to its size. The grave also has a fairly modern granite gravestone and cover. - Dated 1932.	GP A High Social significance
097	-26.18833, 29.5581918	Ruins	Large partially broken-down farmstead situated near the main road. The farmstead contains multiple broken-down structures scattered across a wide area including a large farmhouse, brick silo and various cement foundations. The structures are mostly broken down and overgrown. The site is also surrounded by a maize crop.	The ruins potential to contribute to aesthetic, historic, scientific and social aspects are non-existent, and it is therefore of low heritage significance (GP C)
HD004 (Previously recorded waypoint 098)	-26.1565282, 29.576831	Cemetery	4 to 5 graves in a small cemetery situated on the fence line of a large crop field. The cemetery is degraded and overgrown. The feature measures 4 x 2 m.	GP A High Social significance
HD101	-26.1574507, 29.5768876	Grave	Possible packed stone grave situated in an area close to the aforementioned sites. The potential grave site consists of multiple stones that seem to have been packed as grave dressing with a piece of corrugated iron situated nearby that could have formed part of a grave marker.	GP A High Social significance if it is a burial site

<p>HD102</p>	<p>-26.1208848, 29.5613845</p>	<p>Cemetery</p>	<p>Family graves of the Van Wyks dating to 1936 and 1942 respectively situated directly under the proposed lines. The grave markers are made from granite headstones and covers. These graves are older than 60 years.</p>	<p>GP A High Social significance</p>
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Figure 8.2. Demolished remains of structures at Feature 091.



Figure 8.3. General site conditions showing the ephemeral remains of the structures at Feature 091.



Figure 8.4. Grave dressings at Feature 093.



Figure 8.5 Single grave at Feature 094.



Figure 8.6. Brick structures at Waypoint 097.



Figure 8.7. Cemetery recorded at HD004.



Figure 8.8. Potential stone packed grave at HD101.



Figure 8.9. Corrugated iron that could have been a grave marker at HD101.



Figure 8.10. Headstone of Aletha van Wyk dating to 1936 at HD102.



Figure 8.11. Headstone of Barend van Wyk at HD102 dating to 1942.



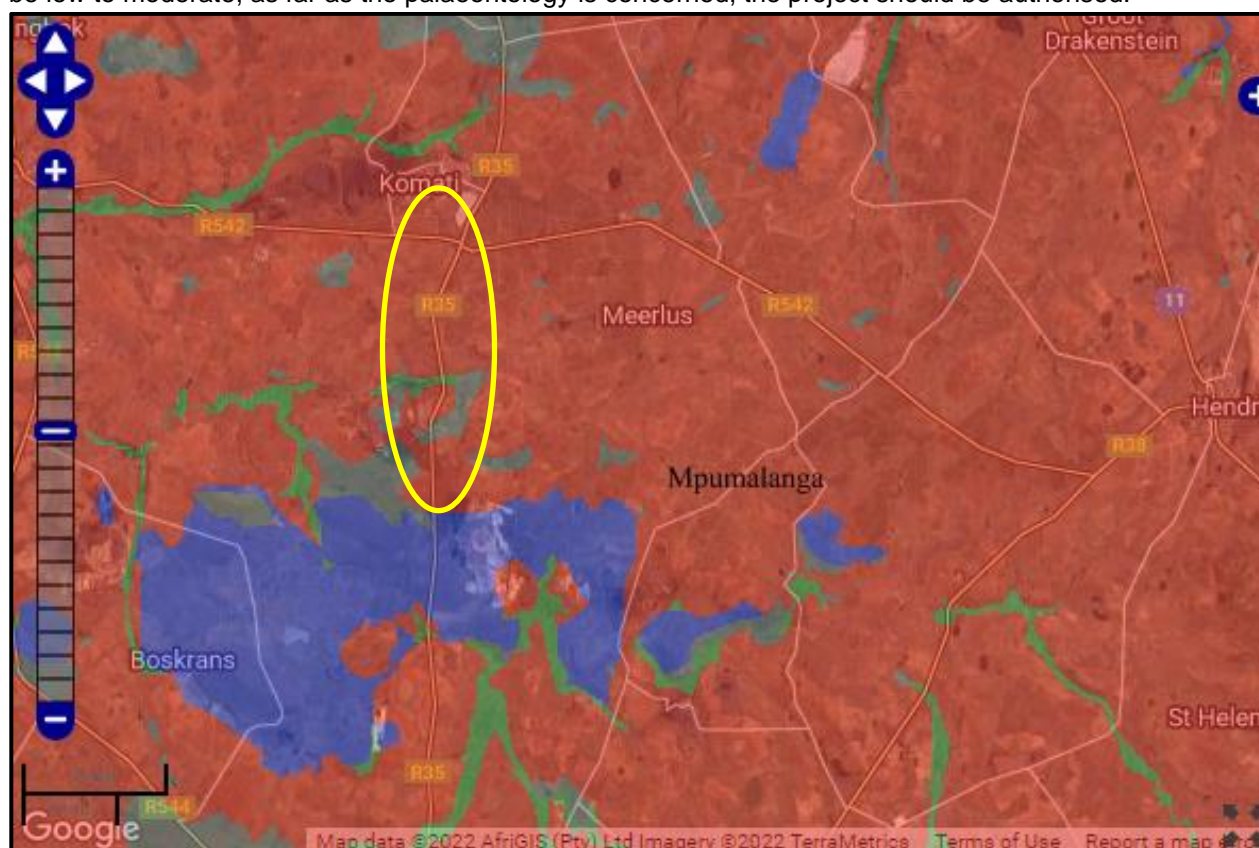
Figure 8.12. General site conditions at HD102.

8.2 Cultural Landscape

The study area is in a rural setting and characterised by cultivation and agricultural activities with a historical layering consisting of burial sites and historical occupation.

8.3 Paleontological Heritage

According to the SAHRA Paleontological map the study area is of very high paleontological significance (Figure 8.13) and an independent study was conducted for this aspect. Bamford (2023) found that the proposed routes lie on the potentially very highly sensitive Vryheid Formation (Ecca Group, Karoo Supergroup) that could preserve impressions of fossil plants of the *Glossopteris* flora. The site visit and walk through by the palaeontologist at the end of 2022 (summer) confirmed that there were NO FOSSILS of any kind present on the land surface. Most of the route is adjacent to existing roads and servitudes or across secondary grasslands or agricultural fields so there were no rocky outcrops and no fossils. Nonetheless, a Fossil Chance Find Protocol should be added to the EMP. Based on this information it is recommended that no further palaeontological impact assessment is required unless fossils are found by the contractor, developer, environmental officer, or other designated responsible person once excavations for pole foundations, access roads or the new substation have commenced. Both routes are on the Vryheid Formation so there is no preferred option as far as the palaeontology is concerned. Since the impact will be low to moderate, as far as the palaeontology is concerned, the project should be authorised.



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 8.13. Paleontological sensitivity of the approximate study area (yellow polygon) as indicated on the SAHRA Palaeontological sensitivity map.

9 Potential Impact

Both powerline Options 1 and 2 will have a direct impact on some of the identified heritage features. Table 8 indicates the distance of the sites from the centre line and recommended mitigation.

Table 8. Recorded features in relation to the project infrastructure.

Feature	Potential Impact	Mitigation
Ruins at observation points 089, 090, 091, 092	More than 72 m to the east and north of both options Located within the footprint of the HN Collector Substation	No action required, but ensure the site is avoided during construction
Burial site at observation point 093	12 m to the north of both options	Micro siting of the line to avoid the feature with a 30 m buffer zone.
Burial site at observation point 094	11 m to the south of the line	Micro siting of the line to avoid the feature with a 30 m buffer zone.
Ruins at observation point 097	174 m from the line	Avoid the sites during development
Burial site at observation point HD004	15 m to the east of both options	Micro siting of the line to avoid the feature with a 30 m buffer zone.
Burial site at observation point HD101	HS Collector Substation	The site must be avoided with a 30 m buffer.
Burial site at observation point HD102	7 m to the east of Option A and 13 m to the east of Option B.	Micro siting of the line to avoid the feature with a 30 m buffer zone.

Impacts to heritage resources without mitigation within the project footprint will be permanent and negative and occur during the pre-construction and construction activities. Graves at 093, 094, HD 004, HD101 and HD102 must be preserved *in situ* with a 30-meter buffer as mitigation measure (prescribed by SAHRA), which means that the line will have to be micro sited in the area where 93, 94, HD004 and HD102 were recorded. Additionally, HD101 is located in the footprint of the HS Collector Substation and will have to be avoided with a 30 m buffer zone (Figure 9.1 to 9.3). After mitigation the impact will be Low.

Based on the current layout the ruins at 089, 090, 091, 092 is located within the HN Collector Substation footprint and should preferably be indicated on development plans and avoided. Although of low significance the possible presence of graves at the ruins is a risk. If avoidance is not possible the presence of graves should be confirmed during social consultation and the area should be monitored during construction.

Any additional effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure. With the implementation of the recommended mitigation measures impacts of the project on heritage resources is acceptable (Table 9).

Cumulative impacts considered as an effect caused by the proposed action that results from the incremental impact of an action when added to other past, present, or reasonably foreseeable future actions. (Cornell Law School Information Institute, 2020). 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. In the case of this project, impacts can be mitigated to an acceptable level. However, this and other projects in the area can have a negative impact on heritage sites in the area where these sites have been destroyed unknowingly.

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 the operation phase.

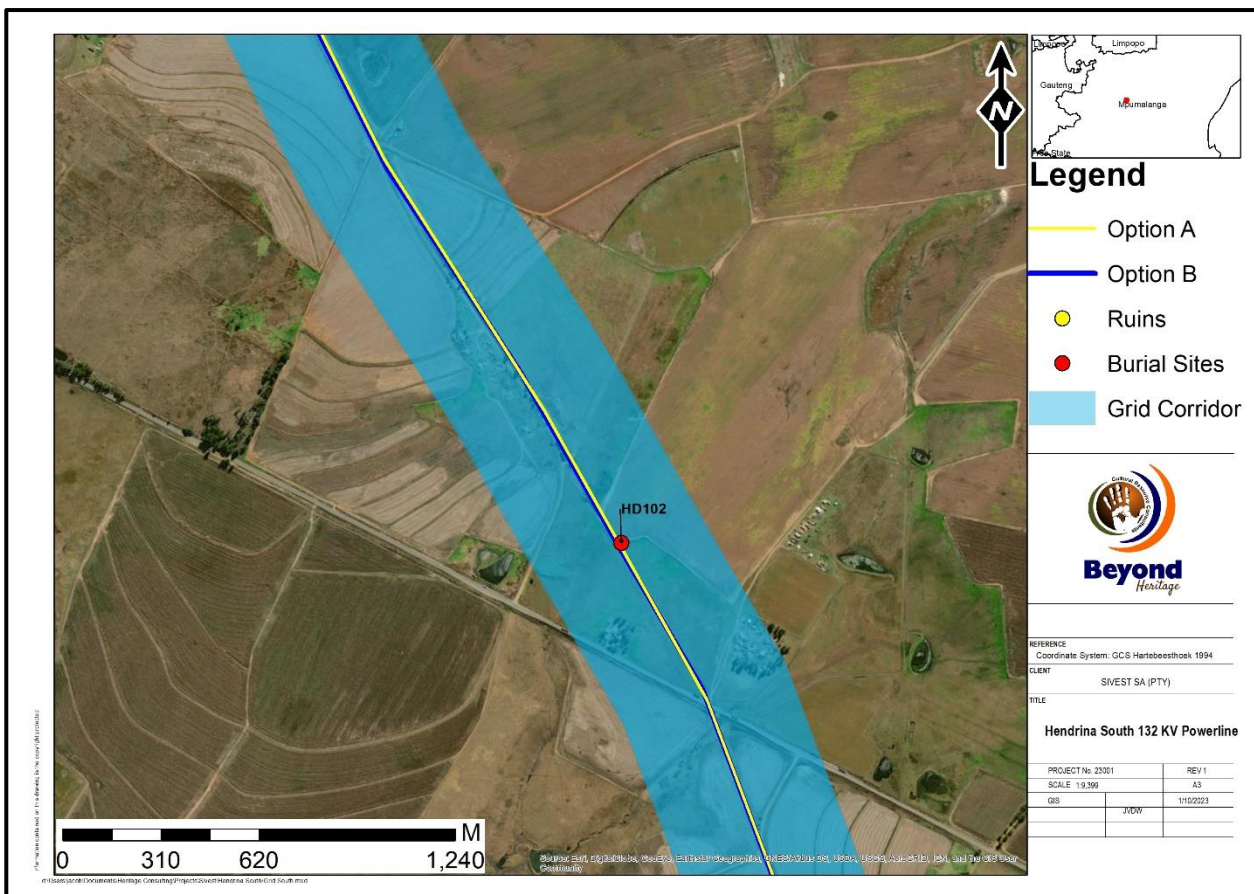


Figure 9.1. Recorded features (HD102) in relation to the centre line and corridor.

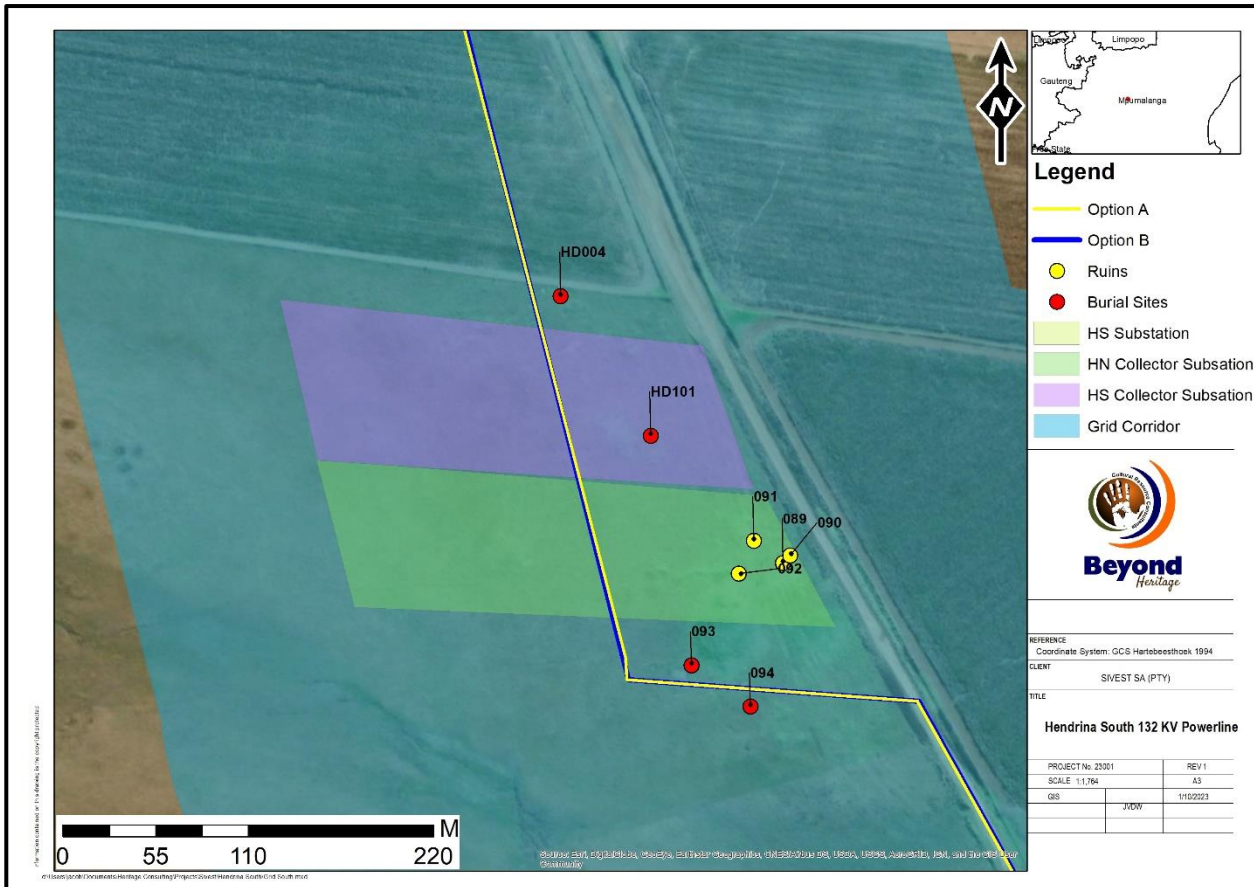


Figure 9.2. Recorded features (HD004, HD101, 089 – 092, 093 and 094) in relation to the collector substations, centre line and corridor.

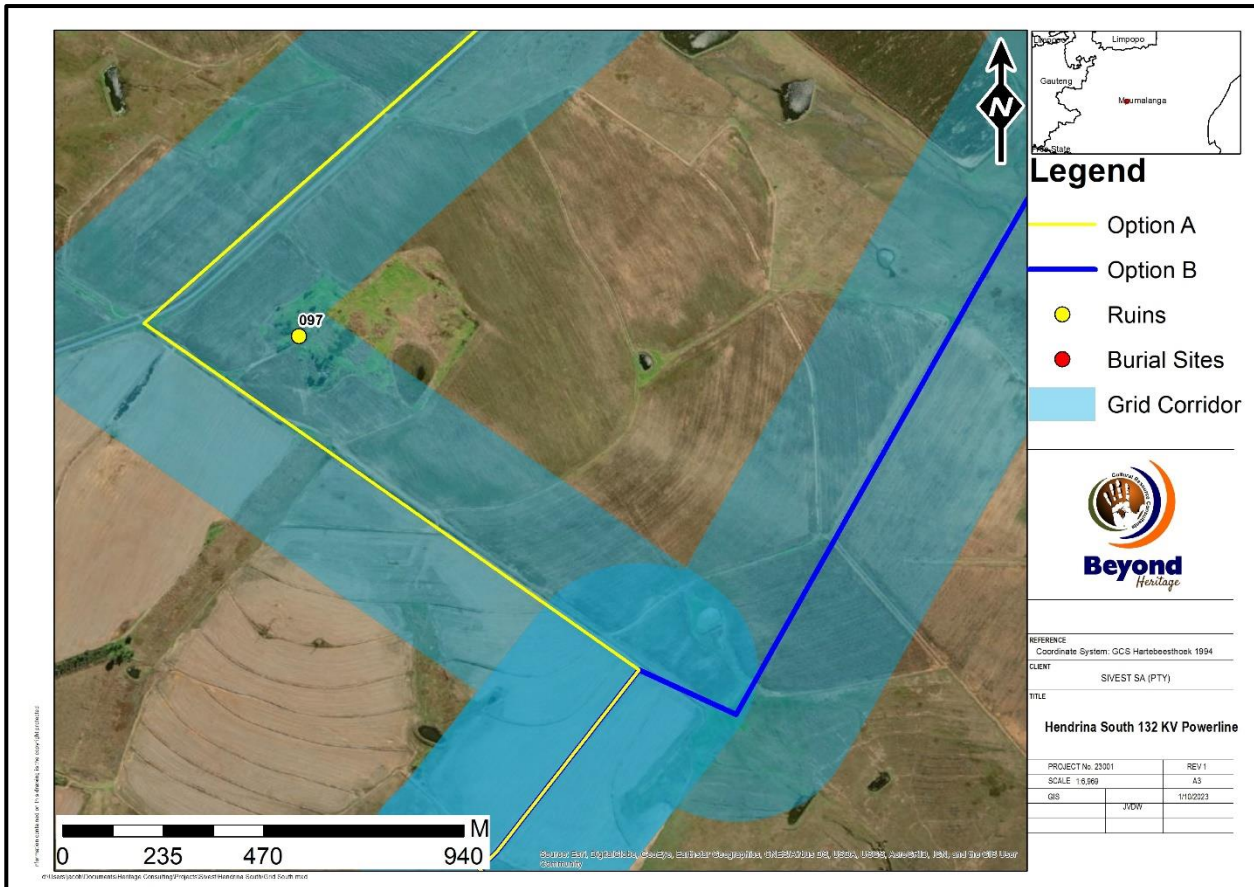


Figure 9.3. Recorded features in relation to the centre line and corridor.

9.1.4 Impact Assessment for the Project

Table 9. Impact assessment of the proposed project on the recorded heritage features

HENDRINA SOUTH																				
ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I/M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I/M	TOTAL	STATUS (+ OR -)	S
Construction Phase																				
Impact on ruins at Feature 089, 090, 091, 092	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.	1	4	3	3	3	2	28	Negat	Negative Medium impact	<ul style="list-style-type: none"> Recorded ruins (097) must be indicated on development plans and avoided during construction. Implementation of the ENERTRAG Chance Find Procedure for the project (Appendix A); Pre-construction heritage walkdown of final pylon positions. 	1	1	3	3	3	2	22	Negat	Negative Low impact

<p>Impact on ruins at Feature 097</p>	<p>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.</p>	1	1	3	3	3	2	22	Negat	<p>Negative Low impact</p>	<ul style="list-style-type: none"> Recorded ruins (089, 090, 091, 092) must be indicated on development plans and avoided during construction. Implementation of the ENERTRAG Chance Find Procedure for the project (Appendix A); Pre-construction heritage walkdown of final pylon positions. 	1	1	3	3	3	2	22	Negat	<p>Negative Low impact</p>
<p>Impact on graves at Feature HD 101</p>	<p>During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position graves and associated material. The site will be directly impacted on by the BS Collector Substation.</p>	3	4	4	3	3	3	51	Negat	<p>Negative High impact</p>	<ul style="list-style-type: none"> Recorded burial sites (HD101) must be indicated on development plans and avoided during construction with a 30 m buffer. Implementation of the ENERTRAG Chance Find Procedure for the project (Appendix A); Pre-construction heritage walkdown of final pylon positions. 	3	1	4	3	3	2	28	Negat	<p>Negative Medium impact</p>

<p>Impact on graves at Feature 093, 094, HD004 and HD 102</p>	<p>During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position graves and associated material</p>	3	4	4	3	3	3	51	Negat	<p>Negative High impact</p>	<ul style="list-style-type: none"> • The line must be micro sited to avoid recorded burial sites (093, 094, HD004 and HD102). The sites must be indicated on development plans and avoided during construction with a 30 m buffer. • Implementation of the ENERTRAG Chance Find Procedure for the project (Appendix A); • Pre-construction heritage walkdown of final pylon positions. 	1	1	4	3	3	2	24	Negat	<p>Negative Medium impact</p>
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Table 10. Comparative Assessment of Alternatives

Alternative	Preference	Reasons (incl. potential issues)
POWERLINE alternatives		
Powerline Option A	No Preference	Both alternatives will directly impact on burial sites of high social significance and with the implementation of mitigation measures the impact of both alternatives can be mitigated to an acceptable level.
Powerline Option B	No Preference	Both alternatives will directly impact on burial sites of high social significance and with the implementation of mitigation measures the impact of both alternatives can be mitigated to an acceptable level.

10 Conclusion and recommendations

The Project area is characterised by extensive cultivated fields and is considered to be of low archaeological potential. This was confirmed during the field survey and no archaeological sites of significance were noted and finds were limited to burial sites (Feature 093, 094, HD004, HD101 and HD102) as well as ruins (Feature 089, 090, 091, 092 and 097). The survey focused on tangible heritage resources along the centre line of the powerline however several features (residential dwellings and settlements) were also noted within the proposed corridor. These features (Figure 8.1) were not assessed as they will not be directly impacted on, but burial sites can be found in these areas.

Both powerline alternatives (Option A and B) will impact the burial sites at Feature 093, 094, HD004 and HD102 and the collector Substation will directly impact on HD101. Based on the current lay the ruins at 089, 090, 091, 092 is located within the HN Collector Substation footprint and a secondary impact to ruins (097) is possible but unlikely due to the distance from the powerline (more than 70 meters). Although of low significance the possible presence of graves at the ruins is a risk, and the indirect impact for both graves and ruins is rated as low.

The following table provides a summary of the recorded heritage features in relation to the proposed powerlines.

Table 11. Features in relation to project components.

Feature	Potential Impact
Ruins at observation points 089, 090, 091, 092	More than 72 m to the east and north of both options. Located within the footprint of the HN Collector Substation
Burial site at observation point 093	12 m to the north of both options
Burial site at observation point 094	11 m to the south of the line
Ruins at observation point 097	174 m from the line
Burial site at observation point HD004	15 m to the east of both options
Burial site at observation point HD101	HS Collector Substation
Burial site at observation point HD102	7 m to the east of Option A and 13 m to the east of Option B.

According to the SAHRA Paleontological sensitivity map the study area is of very high paleontological significance (Figure 8.13) and an independent study was conducted for this aspect. Bamford (2023) concluded that it is extremely unlikely that any fossils would be preserved in the loose soils and sands of the Quaternary. There is a very small chance that fossils may occur in below the ground surface in the shales of the Vryheid Formation but more than 20m down, so a Fossil Chance Find Protocol should be added to the EMPr.

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

10.1 Recommendations for condition of authorisation

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

Recommendations:

- Graves at 093, 094, HD 004, HD101 and HD102 must be preserved *in situ* with a 30-meter buffer as mitigation measure (prescribed by SAHRA), which means that the line will have to be micro sited in the area where 93, 94, HD004 and HD102 were recorded.
- Additionally, HD101 is located in the footprint of the HS Collector Substation and will have to be avoided with a 30 m buffer zone, if this is not possible the graves can be relocated adhering to all legal requirements;
- Based on the current lay the ruins at 089, 090, 091, 092 is located within the HN Collector Substation footprint and should preferably be indicated on development plans and avoided. Although of low significance the possible presence of graves at the ruins is a risk. If avoidance is not possible the presence of graves should be confirmed during social consultation and the area should be monitored during construction.
- A secondary impact to ruins (097) is possible but unlikely and the site should be indicated on development plans prior to development
- Implementation of the ENERTRAG Chance Find Procedure for the project (Appendix A and Bamford 2023);
- Pre-construction heritage walkdown of final pylon positions.

10.2 Reasoned Opinion

The overall impact of the project and residual impacts can be mitigated to an acceptable level through 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

Day to day 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 from pre-construction and construction activities. The ECO should monitor all such activities daily. If any heritage resources are found, the chance finds procedure must be followed as outlined above.

Table 12. Monitoring requirements for the project

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

10.6 Management Measures for inclusion in the EMPr

Table 13. Heritage Management Plan for EMPr implementation

Impact Management Actions		Implementation		Monitoring	
Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
Applicant EAP	Implementation of the ENERTRAG Chance Find Procedure for the project (Appendix A);	Throughout the construction phase	EO	Daily	ECO Checklist/Report
Applicant EAP	Monitoring by the ECO.	Throughout the construction phase	ECO	Weekly	ECO Checklist/Report
Applicant EAP	Heritage Walkdown of the final pylon positions prior to construction.	Pre-Construction	Archaeologist appointed by developer	Once off	Walkdown report
Applicant EAP	Based on the current lay the ruins at 089, 090, 091, 092 is located within the HN Collector Substation footprint and should preferably be indicated on development plans and avoided. Although of low significance the possible presence of graves at the ruins is a risk. If avoidance is not possible the presence of graves should be confirmed during social consultation and the area should be monitored during construction.	Pre-Construction	Developer	Continuously	ECO Checklist/Report

Applicant/ EAP	HD101 is located in the footprint of the HS Collector Substation and will have to be avoided with a 30 m buffer zone, if this is not possible the graves can be relocated adhering to all legal requirements	Pre-Construction	Developer	Continuously	ECO Checklist/Report

10.7 Knowledge Gaps

Due to the often-ephemeral 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 and monitoring of the study area by the ECO. The discrepancy between Google Earth, handheld GPS and GIS projections could cause some project components to not be addressed during this study. This should be verified by the client.

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Appendix A

ENERTRAG Chance Find Procedure

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1 Introduction

Cultural heritage can represent irreplaceable sources of life and inspiration and should be safeguarded. Although there are always cultural heritage studies conducted in the Project and its area of influence, there is always potential for new discoveries to be made, especially during excavation activities. Finds can include fossils, archaeological, paleontological or sacred sites as well as more modern graves.

Heritage resources are protected in terms of the Heritage Resources Act (Act No 25 OF 1999). The Act usually sets out the overarching administrative processes for protecting and preserving cultural heritage and management by the Developer. Successful implementation requires everyone being alert to the possibility of finds, applying the specified measures and notifying immediate Site Supervisor, Environmental Officer, Environmental Control Officer (ECO) that should in turn inform relevant Authorities as appropriate.

2. Objectives

This Procedure aims to protect and preserve any cultural heritage discovery from potential adverse impacts associated with the construction and operation activities of the proposed Project.

3. Responsibilities

a. Developer

Developer shall:

- Ensure correct implementation of chance find procedure upon any chance finds or suspected discoveries.

b. Contractor

The Contractor shall:

- Oversee and provide resources for the implementation of this procedure;
- Co-ordinate the chance find with the Archaeologist / other Heritage Specialist.
- Inform relevant Authorities as appropriate in case of find; and
- Obtain any necessary permits if required

4. Training

Awareness training should be conducted by the EPC Environmental Officer (EO) for all Employees. The training should include, as a minimum, the following:

- Identifying potential features of heritage significance;
- Procedures for dealing with heritage resources discovered on site;
- Applicable Legislation pertaining to the protection of heritage resources; and
- The importance of protecting heritage resources.

Photographs of similar fossil plants must be provided to the EPC 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

5. Procedure

a. Archaeological Heritage and Palaeontological Discoveries during Works

Any archaeological or heritage site discoveries during works should be reported to immediate Supervisor, EO and/ECO and treated as an incident. Following the incident and within two hours the Contractor EO

notify Developer in writing. Work at the affected area should cease immediately, the area should be demarcated until further instructions by relevant Specialist and /or relevant Authorities. The EPC Contractor or other person discovering a potentially significant site or artefact should initiate the following actions:

i. Stop Work

- Inform the immediate Supervisor, EO, ECO and Developer;
- Stop work in the immediate area and take digital photographs to record the find; and
- Install temporary site protection measures (e.g. delineate a 'no-go' area using warning tape, stakes and signage / deploy worker and give instructions to prevent access or further disturbance) and take all reasonable steps to avoid any further disturbance or damage from excavation, vibration, plant or machinery.

ii. Reporting

- Inform all relevant Employees of the chance find and whether access to the work area is being restricted;
- EPC EO to consult with an Archaeologist / Palaeontologist Specialist, providing photographic records for a preliminary assessment.
- The specialist shall be responsible for evaluating whether the chance find needs to be classified as cultural heritage etc and if so, whether it is isolated or part of a larger site or feature;
- The specialist will be required to highlight the way forward
- EPC will notify the relevant Authorities
- Should any fossils or artefact need to be removed from the site a SAHRA permit must be obtained by the EPC.
- Annual reports must be submitted to SAHRA as required by the relevant permits.

iii. General Mitigation / Treatment Strategies

- Artefacts are to be left in place for recording by the specialist/archaeologist. It is important they are not disturbed or moved as their setting is as important as the artefact/fossil; if materials are to be collected they should be placed in bags and labelled by the Specialist /Archaeologist and forwarded to the Authorities in a manner that ensures the integrity of the 'chain of custody';
- Project personnel are not permitted to take or keep artefacts as personal possessions as that is a criminal offence;
- Any damage, accidental or otherwise, should be investigated by the EPC Contractor detailing corrective actions, with digital images, maps and plans showing any locations that are no-go, limited access or present risks of further chance finds;
- Stakeholder engagement may be needed with affected communities to determine the correct mitigation actions or, if applicable, suitable compensation (e.g. reburial costs). Site treatment scenarios may include:
 - Preservation in place through avoidance or re-routing or specialized construction techniques, and/or
 - Rescue excavations to remove, record and relocate in advance of further construction work if avoidance is not possible.
- If the chance find is an isolated artefact/site or is not classed as cultural heritage, the Site Supervisor should approve the removal of site protection measures and activity can resume only with consultation and approval of the Local Authorities;
- While required treatment is ongoing, EPC Contractor should coordinate with the relevant Employees keeping them informed as to the status and schedule of investigations / actions, and informing them when activities may resume;

6. Monitoring

Monitoring should be conducted as required to assess control success, to gauge the effectiveness of prevention plans. The Contractor should monitor their activities to prevent the damaging of heritage resources. Monitoring for heritage resources should be integrated into EO and ECO monitoring Programme.