HERITAGE IMPACT ASSESSMENT

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

FOR THE PROPOSED CAMDEN UP TO 400KV POWERLINE AND COLLECTOR SUBSTATION, NEAR ERMELO, MPUMALANGA PROVINCE

Type of development:

Renewable Energy Grid Infrastructure

Applicant:

ENERTRAG South Africa Proprietary Limited

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APPROVAL PAGE

Project Name	Camden Powerline and collector substation
Report Title	Heritage Impact Assessment for the proposed Camden powerline and collector substation, Mpumalanga Province
Authority Reference Number	TBC
Report Status	Draft Impact Assessment Report
Applicant Name	ENERTRAG South Africa Proprietary Limited

	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
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority	*Declaration of Independence*
(c) Indication of the scope of, and the purpose for which, the report was prepared	Section 1
(cA)an indication of the quality and age of base data used for the specialist report	Section 3.4
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 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
(I) Description of any assumptions made and any uncertainties or gaps in knowledge	Section 3.7
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity including identified alternatives on the environment or activities;	Section 1.3
(k) Mitigation measures for inclusion in the EMPr	Section 10.1
(I) 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 5
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to the EIA report
(q) Any other information requested by the competent authority	No other information is requested at this time

Executive Summary

WSP Group Africa (Pty) Ltd was appointed as the Environmental Assessment Practitioner (EAP) by ENERTRAG South Africa Proprietary Limited (hereafter ENERTRAG) to undertake the required Environmental Authorisation Process for the Camden up to 400kV powerline and Collector Substation and associated corridors were assessed to allow for micro siting on the following properties near Ermelo, Mpumalanga:

- Indicative Option 1

Mooiplaasts 290 IT (Portion 14)
Welgelegen 322 IT (Portion 1)

- Indicative Option 2

Mooiplaasts 290 IT (Portion 14)
Welgelegen 322 IT (Portion 1)
Welgelegen 322 IT (Portion 2)

- Gridlines

Camden Power Station 329 IT (Portion 0)
Welgelegen 322 IT (Portions 1 and 2)
Uitkomst 292 IT (Portion 2 and 12)
Mooiplaats 290 IT (Portion 14 and 20)

The project forms part of the Camden Renewable Energy Cluster. It is proposed that the broader Camden developments will connect to the nearby Camden Power Station substation (Camden substation and Uitkoms substation) through an up to 400kV powerline (either single or double circuit) either directly (alternate option), or via a Loop-In-Loop-Out (LILO) option into the existing Eskom Camden I – Incandu 400kV line traversing the Camden I project site. 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 characterised by extensive cultivated fields, and livestock farming 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 ruins and burial sites;
- The fieldwork component was conducted as part of the assessment of the entire Camden Renewable Energy Cluster (i.e. broader study area) providing a thorough understanding of the heritage character of the area and the range of heritage resources expected;
- Two alternative new powerline routes are being investigated for direct connection into the Camden Power Station. In addition, two alternate routes are envisaged from the respective on-site Collector Substation for the Loop-In-Loop-Out option connection (with a 250 m assessment corridor on either side) and are assessed in this report and are all acceptable from a heritage point of view as with the implementation of mitigation measures, they will not directly impact any known heritage sites;
- This assessment recorded the range of heritage resources expected in the Project area however more sites could be recorded during the pre-construction walkthrough;
- An assessment of the paleontological significance of the area (Bamford 2022) concluded that the impact on palaeontological resources is low and the project should be authorised from a paleontological point of view.

The impact on heritage resources is low 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 (as outlined in Section 10.2).
- The study area should be monitored by the ECO during construction.
- Recorded heritage features should be indicated on development plans and avoided with a 30 m buffer; and
- Prior to construction commencing, the final alignment should be subjected to a heritage walkthrough.

Declaration of Independence

Specialist Name	Jaco van der Walt
Declaration of Independence	I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 107 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations (as amended), that I: • 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 24F of the Act.
Signature	
Date	06/06/2022

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 has 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
DFFE: Department of Fisheries, Forestry and Environment,
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EAP: Environmental Assessment Practitioner
EO: Environmental Officer
EPC: Engineering Procurement and Construction
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 Heritage Impact Assessment (HIA) for the proposed Camden up to 400kV Collector Substation and powerline(s) including assessment corridors, and collector substation near Ermelo, Mpumalanga Province (Figure 1.1 to 1.3). The report forms part of the Environmental Impact Assessment (EIA) Report and Environmental Management Programme Report (EMPr) for the development.

The aim of the study is to survey the proposed development footprint including assessment corridor 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, ruins and cemeteries were recorded in the wider area which includes the grid assessment corridor and all alternative grid routes. 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 this report. SAHRA 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 EIA 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 proposed Camden powerline and collector substation are outlined under Table 2 and 3.

Table 2: Project Description

Affected farm portions	• Indicative Option 1 Mooiplaasts 290 IT (Portion 14) Welgelegen 322 IT (Portion 1) • Indicative Option 2 Mooiplaasts 290 IT (Portion 14) Welgelegen 322 IT (Portion 1) Welgelegen 322 IT (Portion 2) • Gridlines Camden Power Station 329 IT (Portion 0) Welgelegen 322 IT (Portions 1 and 2) Uitkomst 292 IT (Portion 2 and 12) Mooiplaats 290 IT (Portion 14 and 20)
Central co-ordinate of the development	30.069550; -26.656320
Topographic Map Number	2630 CA

Table 3: Infrastructure and project activities

Type of development	Renewable Energy Grid Infrastructure
Size of development	Where direct connection is envisaged, the powerline will be approximately 8km in length. Depending on location, the LILO into the Camden I – Incandu 400kV line will require a 400kV line of approximately 2km in length
Project Components	It is proposed that the broader Camden developments will connect to the nearby Camden Power Station substation (Camden substation and Uitkoms substation) through an up to 400kV powerline (either single or double circuit) either directly (alternate option), or via a Loop-In-Loop-Out (LILO) option into the existing Eskom Camden I – Incandu 400kV line traversing the Camden I project site (preferred option). Where direct connection is envisaged, the powerline will be approximately 8km in length. Depending on location, the LILO into the Camden I – Incandu 400kV line will require a 400kV line of approximately 2km in length. The onsite Collector Substation (MTS)(two alternatives being provided for the purposes of assessment) will consist of a high voltage substation yard to allow for multiple (up to) 400kV feeder bays and transformers, control building, telecommunication infrastructure, access roads, etc. This substation will comprise the high-voltage components of the export solution for the broader Camden Cluster development and will comprise 132kV Collector substation components, which collect all the incoming 132kV power lines from the respective facilities, as well as the 400kV step-up infrastructure required for connection to the Camden Power Station. In addition, the expansion of the Camden Power Station substation as required forms part of this application. The area for the onsite Collector Substation (MTS) will be up to 7ha and up to 1ha for the Camden Power Station substation expansion (if and as required). The up to 400kV powerline and substation will have a 250m assessment corridor to allow for micro-siting.

1.3 Alternatives

Two alternative new powerline routes are being investigated for direct connection into the Camden Power Station. In addition, two alternate routes are envisaged from the respective on-site Collector Substation for the Loop-In-Loop-Out option connection. Each of these will have a 250m assessment corridor to allow for micro-siting to minimize impacts to heritage resources.

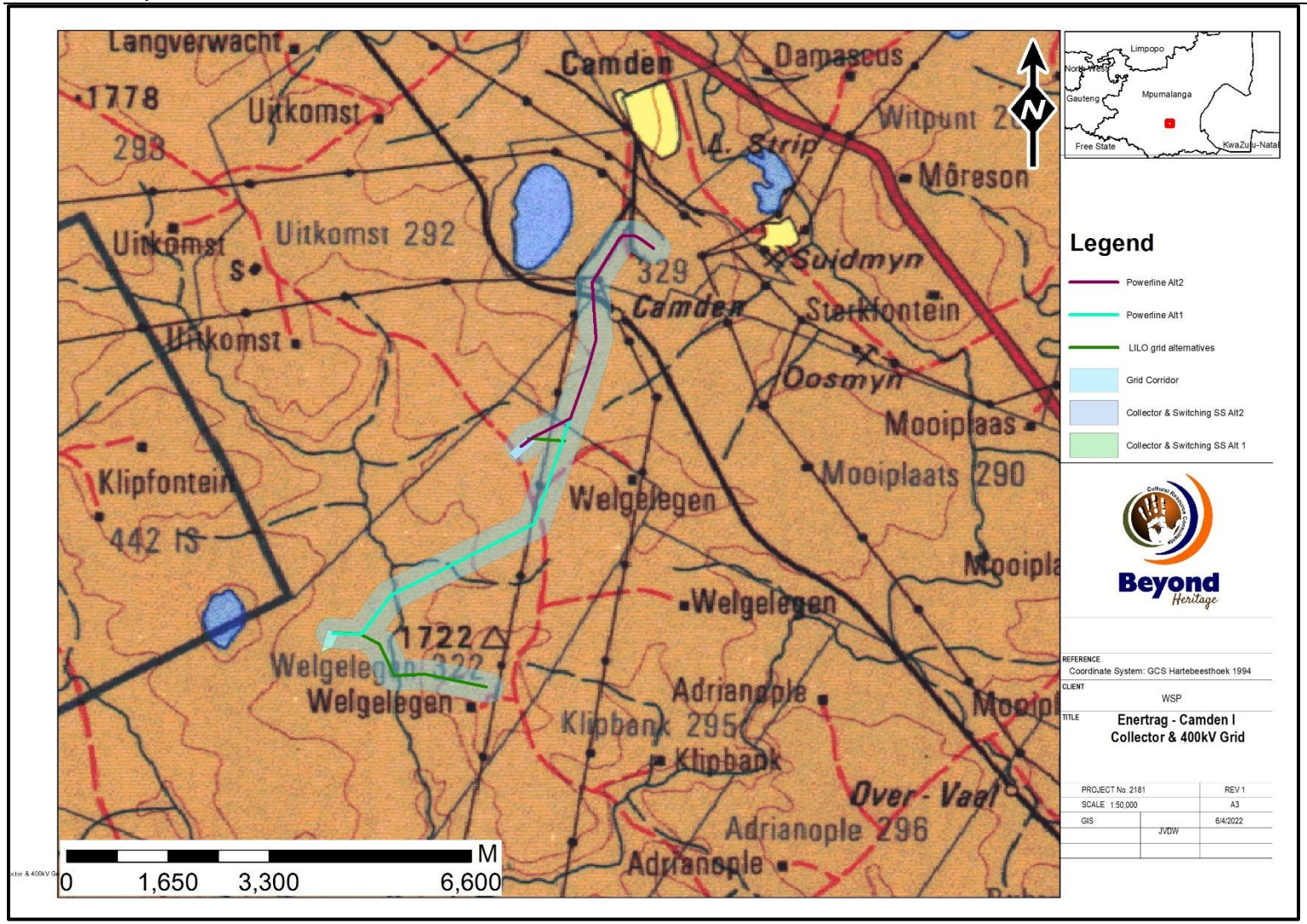


Figure 1.1. Regional setting of the Project (1: 250 000 topographical map).

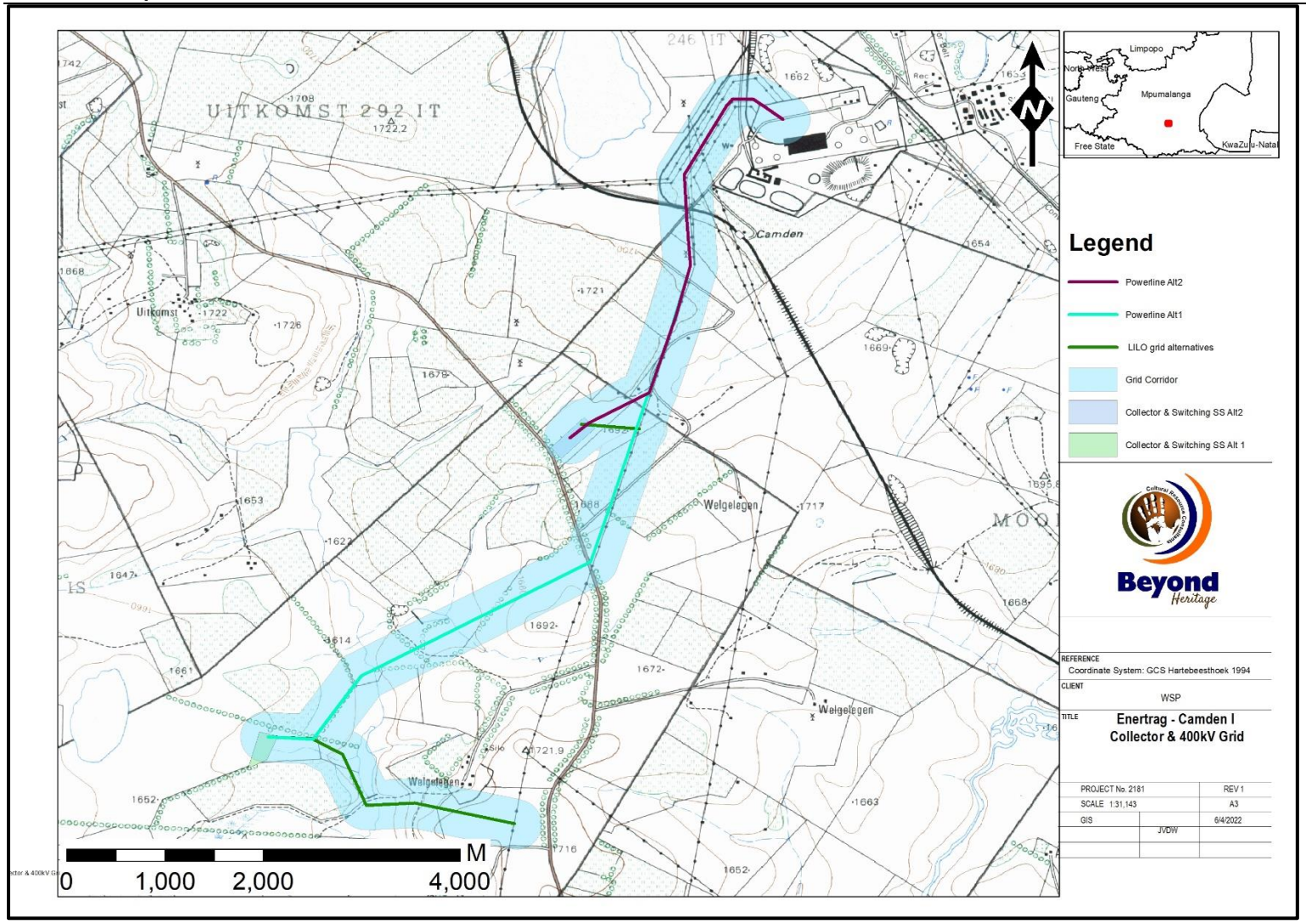


Figure 1.2. Local setting of the Project (1: 50 000 topographical map).

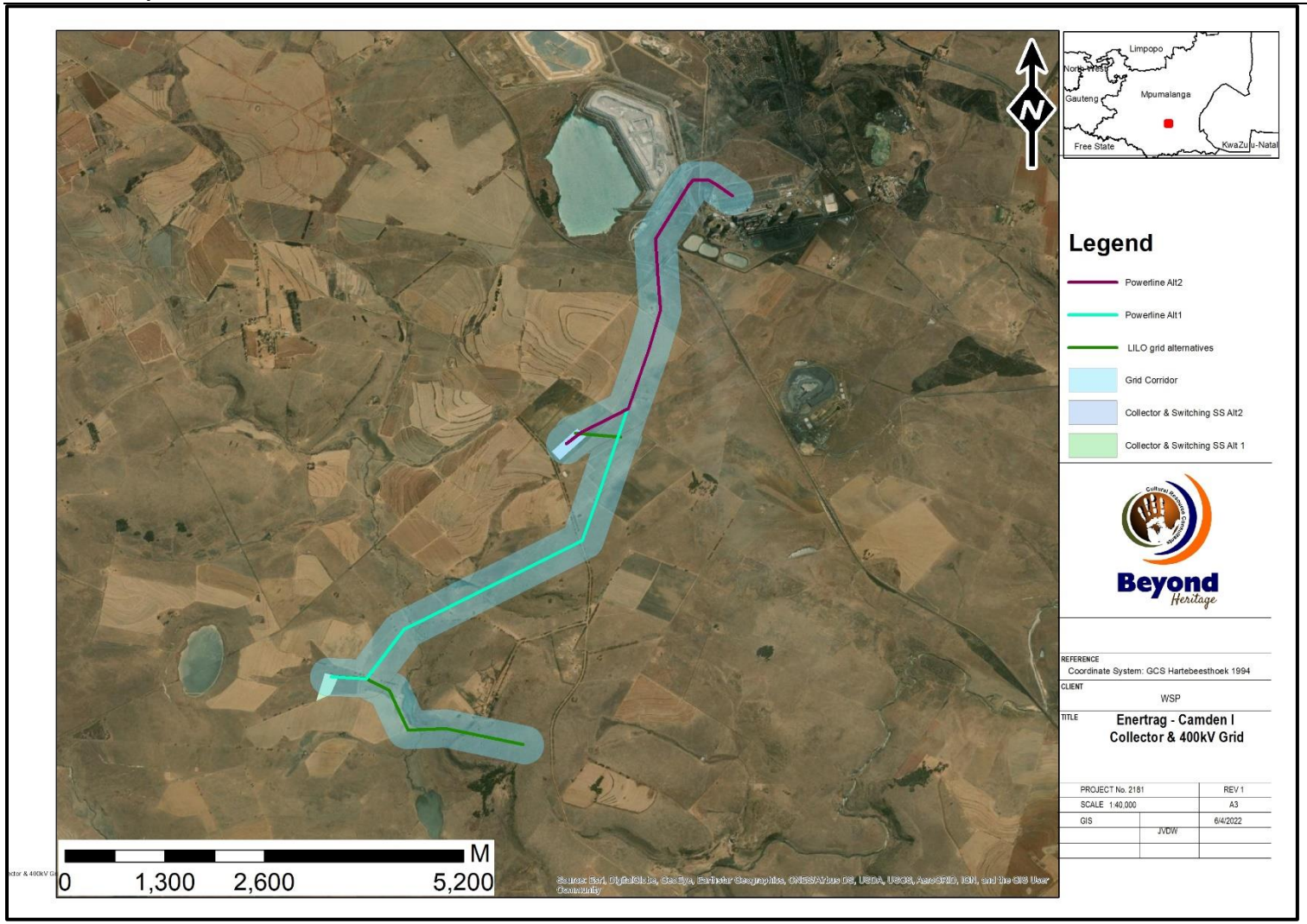


Figure 1.3. Aerial image of the development footprint and surrounds.

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 of these impacts.

The HIA should be submitted, as part of the impact assessment report or EMPr, to the PHRA if established in the province or to SAHRA. SAHRA will ultimately be responsible for the 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 EMPr, 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:

Stakeholder engagement is a key component of any Environmental Assessment (EA) process, it involves stakeholders interested in, or affected by the proposed development. The Public Participation Process is undertaken by the Environmental Assessment Practitioner (EAP, WSP). 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 undertaken by WSP was to capture and address any issues raised by community members and other stakeholders.

3.4 Site Investigation

The aim of the site visit was to:

a) survey the proposed project area (including assessment corridor) to understand the heritage character of the area and to 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	19 - 26 April 2022 and 12 and 13 May
Season	Summer/Autumn – The time of the year and season influenced the survey. Archaeological visibility was extremely low due to waterlogged areas after heavy rainfall during the site visit, cultivated fields and dense grass cover. The development footprint was surveyed during the combined field work for the Camden Renewable Energy Cluster (i.e. broader study area) to understand the heritage character of the area and the range of heritage resources expected (Figure 3.1). Areas not covered are located in cultivated fields and inaccessible.

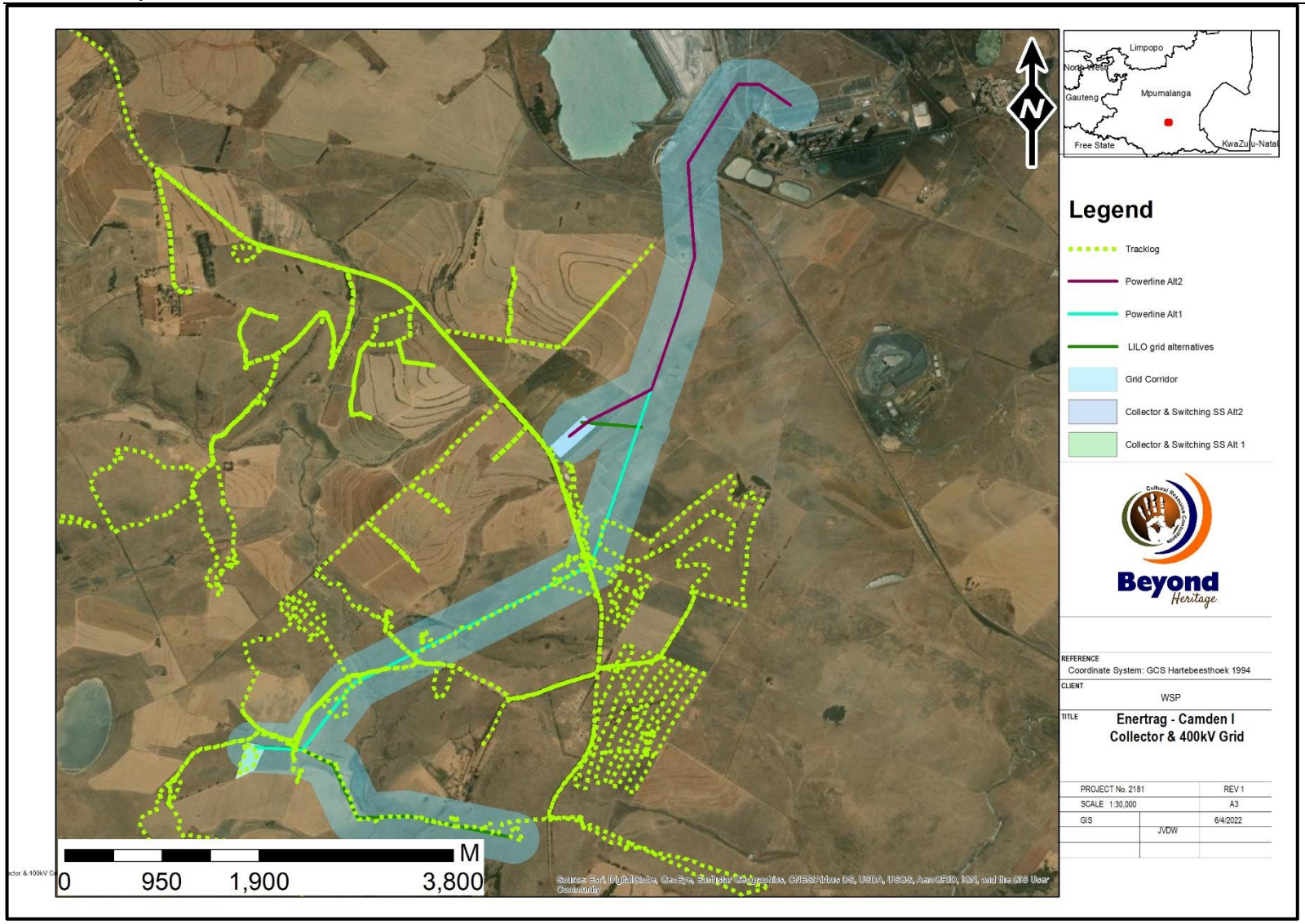


Figure 3.1. Tracklog of the survey path in green.

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 (and associated assessment corridors in the case of linear features) 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 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 following sections on impact assessment methodology and mitigation were provided by WSP.

3.6.1 Assessment methodology

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria, to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The key objectives of the risk assessment methodology are to identify any additional potential environmental issues and associated impacts likely to arise from the proposed project, and to propose a significance ranking. Issues / aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions between activities and aspects, and resources and receptors to provide a detailed discussion of impacts. The assessment considers direct, indirect, secondary as well as cumulative impacts.

A standard risk assessment methodology is used for the ranking of the identified environmental impacts pre-and post-mitigation (i.e., residual impact). The significance of environmental aspects is determined and ranked by considering the criteria presented in Table 6.

Table 6. Impact Assessment Criteria

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Impact Magnitude (M) The degree of alteration of the affected environmental receptor	Very low: No impact on processes	Low: Slight impact on processes	Medium: Processes continue but in a modified way	High: Processes temporarily cease	Very High: Permanent cessation of processes
Impact Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries
Impact Reversibility (R) The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change	Reversible: Recovery without rehabilitation		Recoverable: Recovery with rehabilitation		Irreversible: Not possible despite action
Impact Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite
Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
Significance (S) is determined by combining the above criteria in the following formula:	$[S = (E + D + R + M) \times P]$ $Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$				
IMPACT SIGNIFICANCE RATING					
Total Score	4 to 15	16 to 30	31 to 60	61 to 80	81 to 100
Environmental Significance Rating (Negative (-))	Very low	Low	Moderate	High	Very High
Environmental Significance Rating (Positive (+))	Very low	Low	Moderate	High	Very High

3.6.2 Impact Mitigation

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed development's actual extent of impact and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this report.

The mitigation measures chosen are based on the mitigation sequence/hierarchy which allows for consideration of five (5) different levels, which include avoid/prevent, minimise, rehabilitate/restore, offset and no-go in that order. The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

The mitigation sequence/hierarchy is shown in Figure 3.2 below.

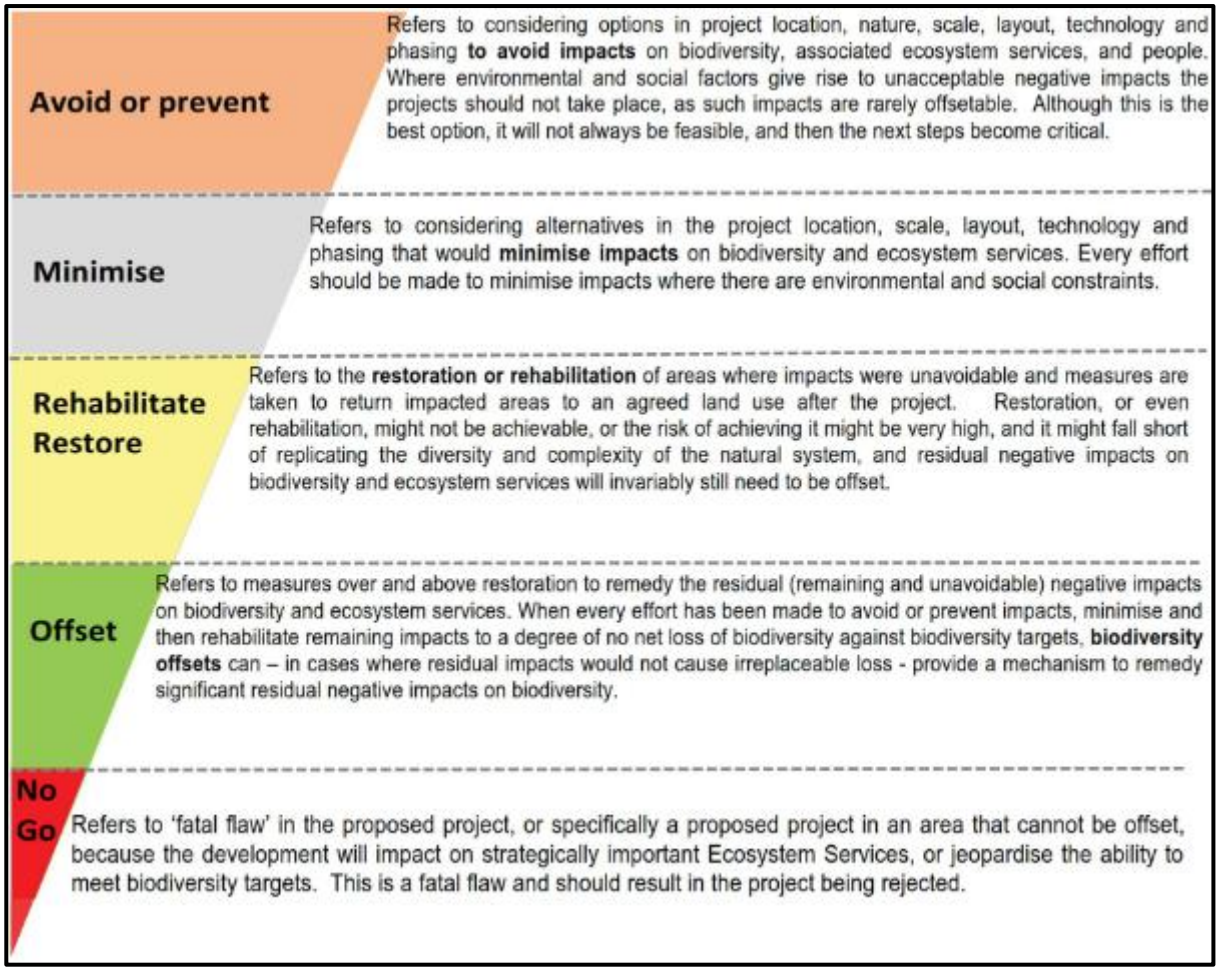


Figure 3.2. Mitigation Sequence/Hierarchy

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. This limitation is successfully mitigated with the implementation of a Chance Find Procedure, pre-construction walkthrough and monitoring of the study area by the Environmental Control Officer (ECO). This report only deals with the footprint area (including the assessment corridor for linear features) 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 will be 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, Msukaligwa Local Municipality has a total population of 149 377 people, of which 88,1% are black African, 9,8% are white, 1,1% are Indian/Asian,and 0,6% are coloured. The other population groups make up the remaining 0,3%.Of those aged 20 years and older, 4,5% have completed primary school, 32,7% have some secondary education, 29,3% have completed matric, 9,6% have some form of higher education, and 12,3% have no form of schooling. According to Census 2011, 41 698 are employed whereas 5 311 are discouraged work-seekers. The unemployment rate is 26,8%. There are 15 267 unemployed people. Of the youth aged 15–34, 20 261 are employed while 10 679 are unemployed. The unemployment rate for the youth is 34,5%.

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 EIA 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 have been raised thus far.

6 Literature / Background Study:

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).

6.1 Literature Review (SAHRIS)

The area under investigation was not previously covered by heritage surveys and few HIA's was conducted in the immediate area. Studies conducted in the general area that were consulted is listed in Table 6.

Table 7. Heritage reports conducted in the greater study area

Author	Year	Project	Findings
Van Schalkwyk, L.	2006	Heritage Impact Assessment for the Majuba-Umfolozi 765 KV Transmission Line in Mpumalanga and KwaZulu-Natal, South Africa, Pietermartizburg: eThembeni Cultural Heritage	Ancestral graves; Rock painting sites that were recorded along and below the eastern uKhahlamba escarpment; Stone Age open air sites; Stone walled settlements dating to the Late Iron Age; Battlefields of: - Majuba (1887); - Hlobane (1879); - Holkrantz (1879); - Khambula (1879
Fourie, W.	2008	Camden Power Station Rail expansion project on portions of the farm Mooiplaats 290 IT and the farm Camden Power Station 329 IT, District Ermelo, Mpumalanga	The remains of a stone ruin were identified at this location. The structure consists of two rooms. Only the foundations and rubble remain of the structure. Recent historic
Gaigher, S.	2011	First Phase Heritage Impact Assessment for the Proposed Extension to the Camden Ash Disposal Facilities	Small graveyard (5 graves), historic farmland reservoirs, furrows, pathways.
Pistorius, J.C.C.	2011	Kusipongo Expansion Project: A Heritage Baseline Study for Proposed Adit Positions in a Project Area near the Heyshope Dam to the West of Piet Retief in the Mpumalanga Province of South Africa, KwaZulu-Natal: Environmental Resources Management (South Africa) Pty Ltd (ERM)	A single, historic informal grave with stone dressing. A single square cattle enclosure. Late Iron Age site with stone wall enclosures. historical graveyard demarcated with stone walling. A sandstone bank that may be associated with Stone Age sites.
Van Schalkwyk, J.	2012	Basic assessment and environmental management programme: Construction of a 132kV transmission Line from the Kliphoek to Panbult Substation and Kliphoek to Uitkoms Substation: Mpumalanga Province	Some farmsteads and other farming related features. A number of formal and informal cemeteries
Nel, J. & Karodia, S.	2013	Heritage Impact Assessment Report Kangra Coal	Historical structures and associated trees, cemeteries, sandstone outcrop with potential for Rock Art

Van der Walt, J.	2015	Camden Ash Disposal – Grave confirmation study	Four cemeteries and two historical structures as well as stone cairns.
Gaigher, S.	2015	Report on the Social Consultation Regarding the Relocation of Graves within the Proposed Development Area for the Camden Ash Disposal Facilities	Burial sites (19 graves, 7 graves 2 graves and 5 graves respectively).
Van Schalkwyk, J.	2016	Cultural Heritage Impact assessment for the planned borrow pits and quarries for the improvement of the national route N2, km 60 (Leiden) to km 87.4 (Camden), Gert Sibande District Municipality, Mpumalanga Province	Historic informal cemetery with more than 35 graves. Three old railway culverts that formed part of the original railroad alignment which was constructed in 1911. An old sheep dip constructed from concrete.
Matenga, E.	2020	Heritage Impact Assessment for the proposed improvements to the existing waste reticulation system at Camden power station in Ermelo, Mpumalanga Province	None

The Camden power station and associated small town is situated 16km south from Ermelo in Mpumalanga. The archaeological record for the greater study area consists of the Stone Age and Iron Age (Figure 6.1).

South Africa: A short chronology

Early Stone Age: 2 million - 250 000 BP. Hominins producing core and pebble tools, later stages includes handaxes and blades.

Middle Stone Age: 250 000 - 40 000 / 25 000 BP. *Homo Sapiens.* Prepared core techniques, formal tools, points, scrapers and backed artefacts. Occasionally includes bone points and ostrich eggshell fragments and grindstones.

Later Stone Age: 40 000 - 100 BP. Wide range of formal microlithic tools. Ostrich eggshell fragments, beads, rock art.

Ceramic Final Later Stone Age: 2000 BP. Wide range of formal microlithic tools, with thin-walled pottery, with some sites having faunal remains of ovicaprids.

Early Iron Age: 200 - 900 CE. Arrival of Bantu-speaking farmers who lived in sedentary settlements often located next to rivers. They kept livestock, cultivated sorghum, beans and cowpeas. Introduced metallurgy to the region and manufactured thick-walled pottery.

Middle Iron Age: 900 - 1300 CE. Confined to the modern-day Limpopo Province, and associated with early state formation, such as Mapungubwe and associated sites.

Late Iron Age: 1300 - 1840 CE. Marks the arrival of ancestral Eastern Bantu-speaking Nguni and Sotho-Tswana communities. Settlements are often located on or near hilltops for defensive purposes. The Iron Age as an archaeological period ends with the Mfecane, 1820s to 1840s CE. An event that caused major socio-political upheavel.

Historic events

1652: Dutch East India Company establishes refreshment station at modern-day Cape Town.

1658: First slave ships arrive at Table Bay.

1660 - 1793: Various armed conflicts between Khoisan and Europeans, several frontier wars between Europeans, Khoisan and Xhosa communities.

1795 - 1807: First British occupation of the Cape, the Dutch East India Company collapses, and slave trade is abolished.

1808 - 1820: Several frontier wars and first British Settlers arrive.

1820 - 1840: Onset of the Mfecane, abolishment of slavery and slaves are freed at the Cape. Dutch farmers started to migrate towards the interior of South Africa, what will become known as the 'Great Trek'.

1860 - 1880: Discovery of mineral wealth, diamons and gold. Establishment of the Zuid-Afrikaansche Republiek (ZAR).

1899 - 1902: The South African War.

1910 - 1945: Unifaction of South Africa, formation of the ANC, World War I and World War II.

BP - Before Present
CE - Common Era

Figure 6.1.Summary of archaeological and historical events in South Africa.

6.1.1 Stone Age

The Stone Age of southern Africa starts when hominins (ancestral to modern-day humans) first started to produce crude tools made with stone. The Earlier Stone Age (2 million - 200 000 years ago) is associated with hominins such as *Homo habilis* and *Homo erectus* (Dusseldorp *et al*. 2013). Mpumalanga currently does not have an extensive ESA archaeological record, at Maleoskop on the farm Rietkloof, only a few ESA artefacts have been found and stone tools consisted of choppers (Oldowan), hand axes, and cleavers (Acheulean) (Esterhuysen & Smith 2007) and some surface scatters have been recorded near Piet Retief (Nel & Karodia 2013).

Middle Stone Age artefacts represents archaic and modern humans that occupied the landscape between 300 000 to 40 000 before present. Later Stone Age occupational sequences reflect San and Khoisan communities from 40 000 years ago until recently (Dusseldorp *et al.* 2013). Although the MSA and LSA has not been extensively studied in Mpumalanga, evidence for these periods has been excavated from Bushman Rock Shelter in the Ohrigstad District (Esterhuysen & Smith 2007; Lombard *et al*. 2012) and it is known that San communities lived near Lake Chrissie as recently as the 1950s (e.g., Schlebusch *et al*. 2016). MSA and LSA surface scatters have also been investigated in the vicinity of Piet Retief, and De Wittekrans nearby Camden is a Later Stone Age archaeological rock art site complex (Nel & Karodia 2013).

6.1.2 Iron Age

The archaeology of farming communities of southern Africa encompasses three phases. The Early Iron Age (200-900 CE) represents the arrival of Bantu-speaking farmers in southern Africa. Living in sedentary settlements often located next to rivers, these farmers cultivated sorghum, beans, cowpeas, and kept livestock. The Middle Iron Age (900-1300 CE) is mostly confined to the Limpopo Valley in southern Africa with Mapungubwe Hill probably representing the earliest ‘state’ in this region (Huffman 2007).

The Late Iron Age (1300-1840s CE) marks the arrival and spread of ancestral Eastern Bantu-speaking Nguni and Sotho-Tswana communities into southern Africa. The location of Late Iron Age settlements is usually on or near hilltops for defensive purposes. The Late Iron Age as an archaeological period ended by 1840 CE, when the Mfecane caused major socio-political disruptions in southern Africa (Huffman 2007).

Dates from Early Iron Age sites indicated that by the beginning of the 5th century CE Bantu-speaking farmers had settled in the Mpumalanga lowveld. Subsequently, farmers continued to move into and between the lowveld and highveld of Mpumalanga. Iron Age sites such as Welgelegen Shelter, Robertsdrift and Tafelkop situated 50-100 km west of Camden dates from the 12th to the 18th century (Derricourt & Evers 1973; Esterhuysen & Smith 2007).

During the mid-17th century Europeans started to settle in modern-day Cape Town. During and after the conflict caused by the Mfecane (1820-1840), during the reign of king kaSenzangakhona Zulu, known as Shaka, Dutch-speaking farmers started to migrate to the interior regions of South Africa. A period that is marked by various skirmishes and battles between the local inhabitants, Dutch settlers and the British (Giliomee & Mbenga 2007).

6.1.3 Historical context of Camden

Camden power station was commissioned in 1967 (Gaigher 2011; Matenga 2020). However, the nearby town of Ermelo has a rich history. The earliest record for settlers in Ermelo is from 1860, when the area was under the jurisdiction of Zulu-speaking Nhlapo communities (Nhlapo 1945). The construction of the town of Ermelo was initiated by the Dutch Reform Church, which purchased the eastern part of the farm Nooitgedacht on 26 May 1879. The town was officially proclaimed on 12 February 1880 by William Owen Lanyon, the Administrator of the Transvaal (Greyling 2017).

6.1.4 Battlefields and war history

Due to the proximity of Ermelo to the Nederlandsche Zuid-Afrikaansche Spoorweg-Maatskappij railway line linking Pretoria with Lourenço Marques (Maputo), the area was subject to various skirmishes during the Anglo-Boer War of 1899-1902. At the time there were about 100 families residing in the town and many women and children were sent to British concentration camps. In 1901, British troops burnt the town down due to their scorched earth policy, and Ermelo was rebuilt in 1903 (Moody 1977; Pretorius 2000; Van Schalkwyk 2012; Greyling 2017).

6.1.5 Graves and Burial sites

No graves are indicated by the Genealogical Society of the South Africa for the study area. The Klipbank cemetery with 21 graves is indicated ~4,6 km to the south of the Project.

7 Description of the Physical Environment

The Project is situated within a rural setting dominated by an agricultural landscape 11km south of Ermelo and directly south of the Camden Power Station between the N2 and N11 highways. The landscape is slightly undulating located in a Grassland Biome and the vegetation is described as eastern highveld 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 lycioide* subsp *lycioides, Parinari capensis, Protea caffra, P. welwitschia* and *Englerophytum magalismontanum* (Mucina & Rutherford, 2006). Several perennial rivers that drain into the Vaal to the south of the study area traverse the Project site. Large sections of the area consist of ploughed fields that have been extensively cultivated for several years and other areas are used for grazing, a section of the proposed powerline follows existing infrastructure like roads and a powerline corridor. General site conditions are illustrated in Figures 7.1 to 7.4.

Figure 7.1. General site conditions showing the undulating topography of the area. .

Figure 7.2. Open areas used for grazing.

Figure 7.3. Existing powerline in the study area and field used for grazing.

Figure 7.4. General view of the study area.

8 Findings of the Survey

8.1 Heritage Resources

This assessment focusses on the grid connection infrastructure (substation and the grid assessment corridor on either side) and fieldwork were conducted for this Project and other Projects in the immediate vicinity that are being evaluated by the proponent. recorded observations were numbered sequentially with the prefix CA for Camden.

Heritage finds are limited to burial sites and the demolished remains of structures in the greater area (Figure 8.1). Only site CA 002, CA 010 and CA 012 are close enough to be affected by the Project. The sites are briefly described in Table 8 and general site conditions are indicated in Figure 8.2 – 8.7)

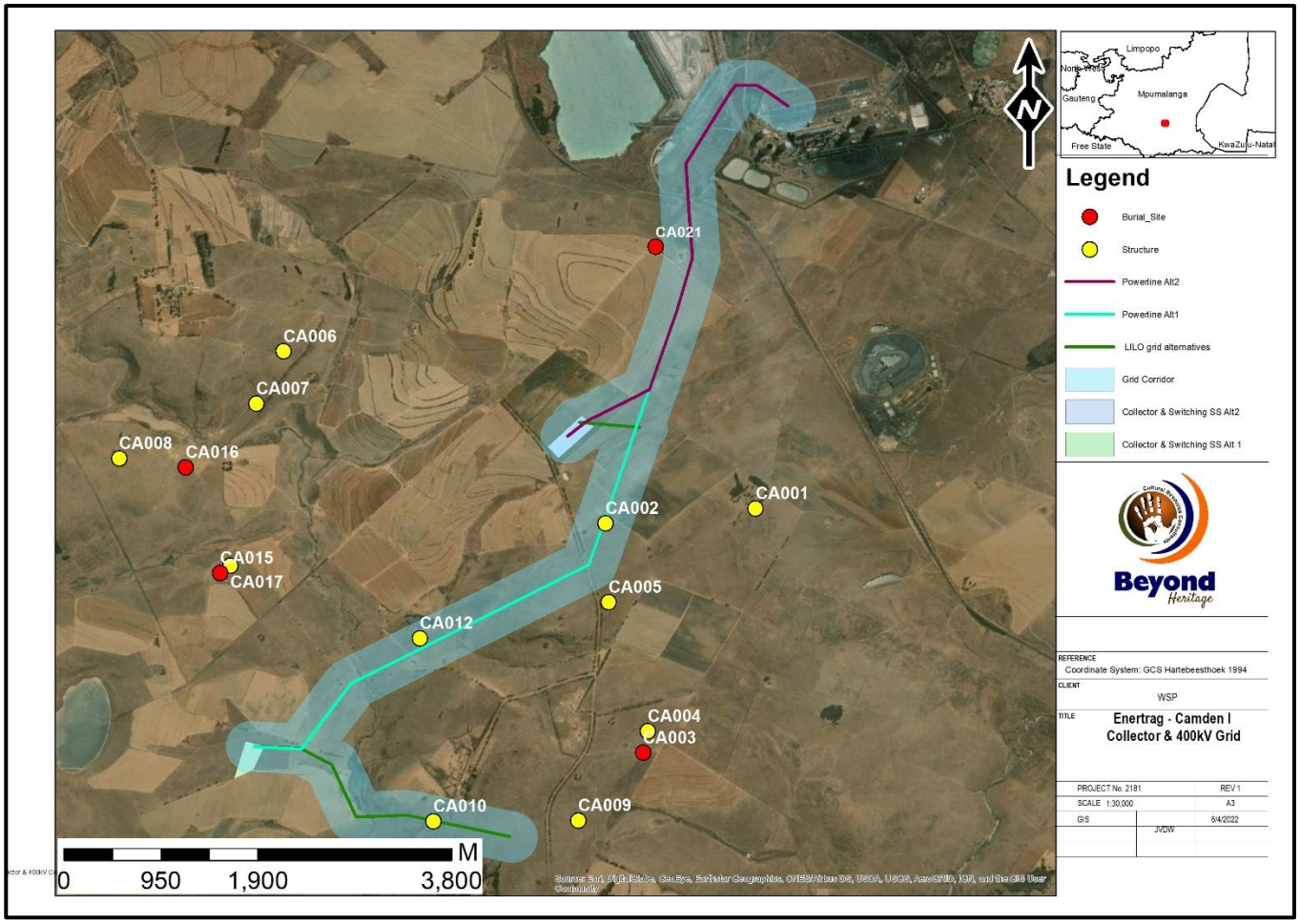


Figure 8.1. Observation points in relation the project area.

Table 8. Recorded observations in the study area.

LABEL	LONGITUDE	LATITUDE	DESCRIPTION	SIGNIFICANCE
CA002	30° 04' 17.9363" E	26° 39' 18.3757" S	Remnants of a square packed stone structure or kraal (5 x 3 m). The feature is situated right next to the existing powerline.	GP C - Low significance
CA010	30° 03' 23.2758" E	26° 40' 53.0306" S	Extensive packed stone wall extending about 1 km around an existing farmstead located on a small hill. The stone wall seems to form part of large grazing paddocks that were built around the farmstead. The feature is degraded and overgrown.	GP C Low Significance
CA012	30° 03' 19.0655" E	26° 39' 54.9277" S	The site consists of the remains of three stone structures. One is rectangular and is 20mx13m in size while the other is circular and 4m x4m in size The third is 12mx9m in size and the entire site extends over an 80mx50m area with a dam 50 m to the south.	GP C Low Significance

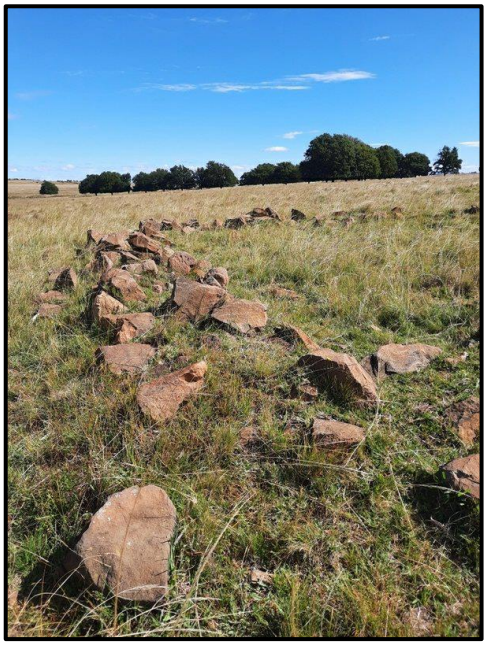


Figure 8.2. Ephemeral stone packed wall at CA002

Figure 8.3. Location of CA002 in relation to the powerline

Figure 8.4. General site conditions at CA010.

Figure 8.5. Extensive stone packed wall at CA010.

Figure 8.6. Series of stone packed structures at CA012.

Figure 8.7. Remnants of a stone packed feature at CA012.

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 the remnants of stone packed structures/ settlements. A more recent industrial element is introduced by the Camden Power Station that was commissioned in 1967, along with the development of coal-mining in the broader region.

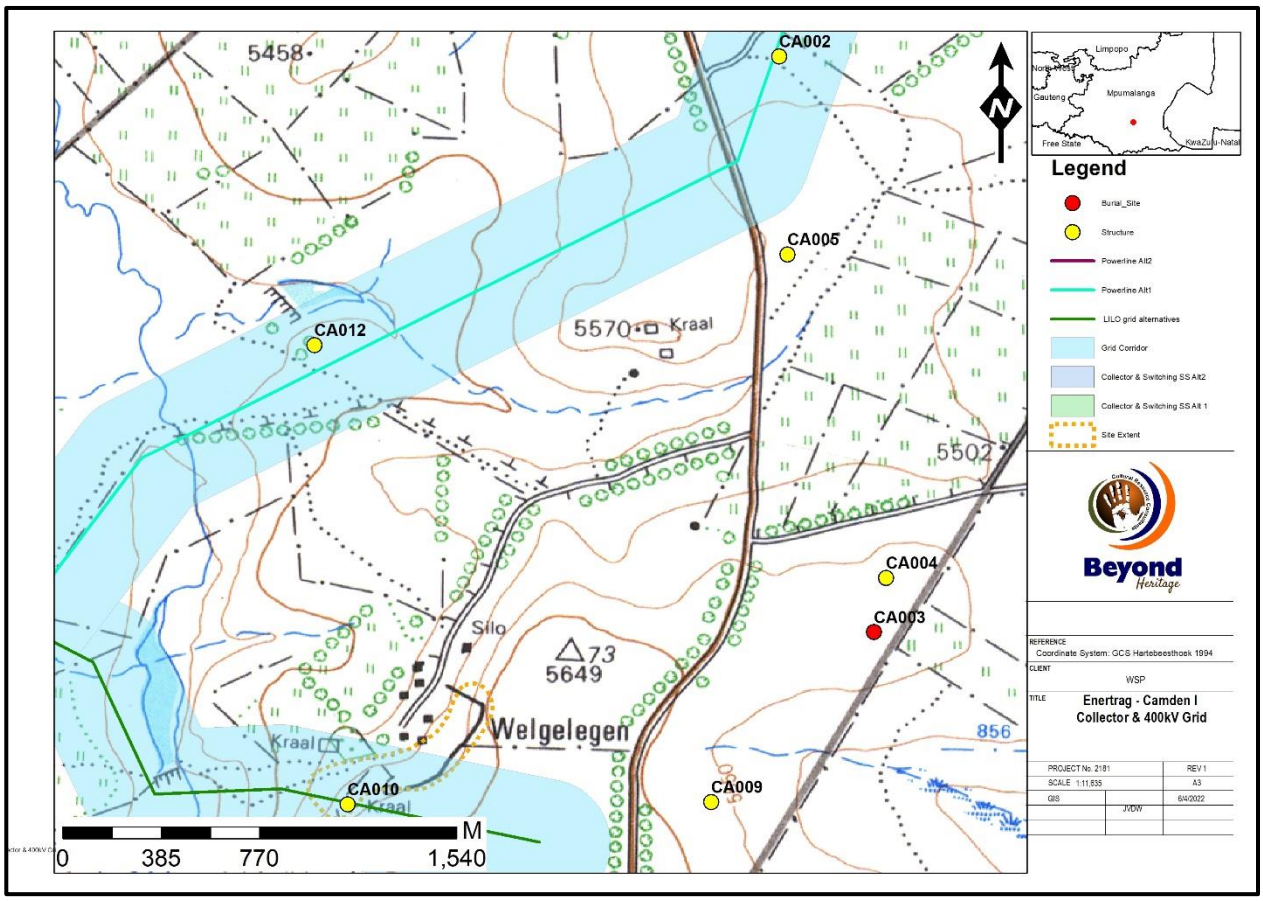
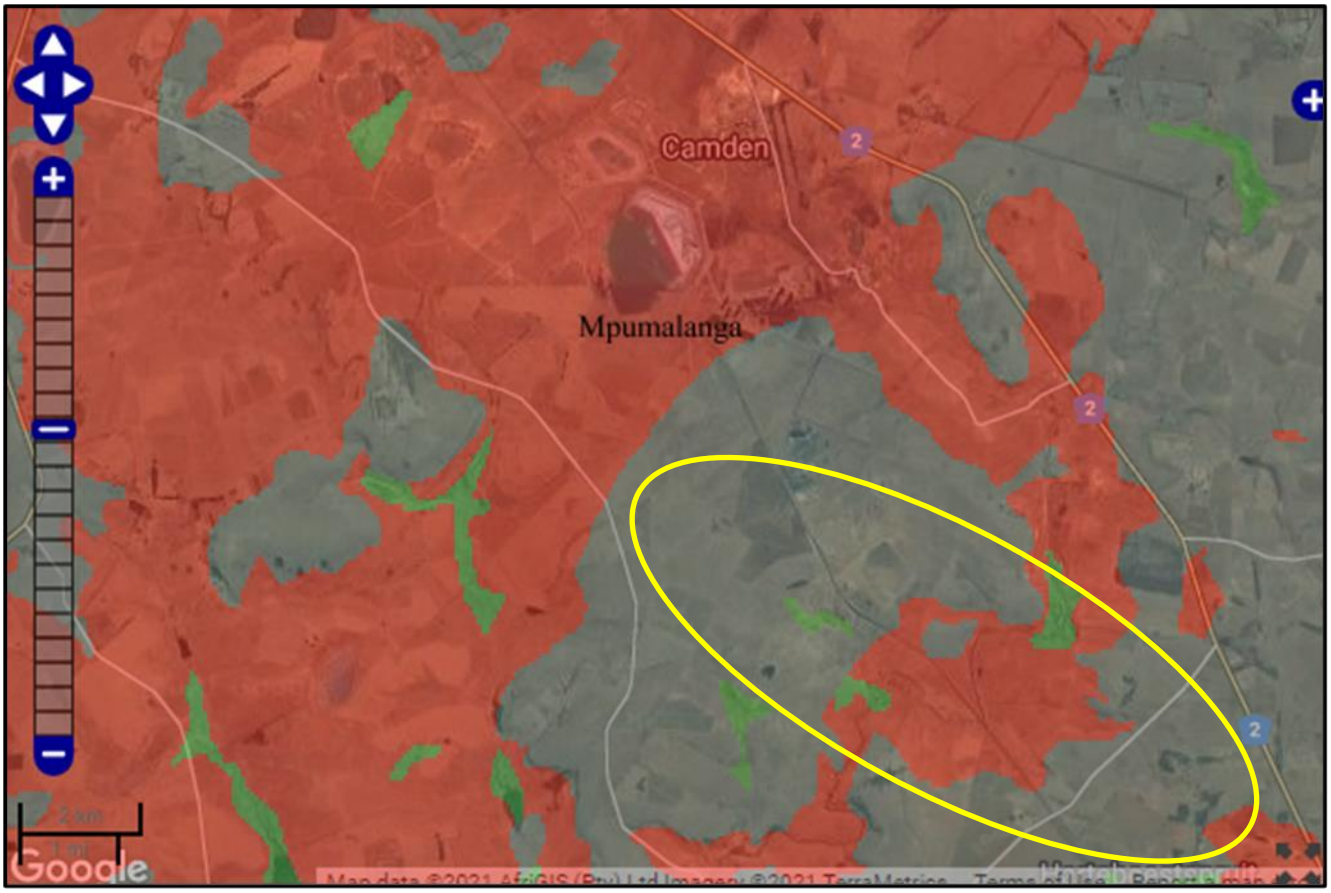


Figure 8.8. 1968 Topographic map of the study area indicating a kraal in the area where CA010 was recorded as well as a tree lane to the north. Some small tracks are indicated in the proposed corridors.

8.3 Paleontological Heritage

According to the SAHRA Paleontological map the study area is of zero to very high paleontological significance (Figure 8.8) and an independent study was conducted for this aspect. Bamford (2022) concluded that based on the fossil record but confirmed by the site visit and walk through, there are NO FOSSILS of the *Glossopteris* flora even though fossils have been recorded from rocks of a similar age and type in South Africa. It is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary. There is a very small chance that fossils may occur below the ground surface in the shales of the Vryheid Formation (Ecca Group, Karoo Supergroup) so a Fossil Chance Find Protocol should be added to the EMPr.



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 (yellow polygon) as indicated on the SAHRA Palaeontological sensitivity map.

9 Potential Impact

Based on the current layout, three ruins will be directly impacted on by the proposed Grid infrastructure. Alt 1 will impact on CA 002 and CA012 and the LILO will impact on CA 010. The significance of the recorded ruins (CA002, 010 and 012) ranges from low to high (if associated with stillborn graves) and the sites should be indicated on development plans and avoided during construction (and this can be done with micro siting of pylons of the powerline) after which the impacts will be very low Impacts to heritage resources without mitigation within the project footprint will be permanent and negative and occur during the construction activities. No impacts are anticipated for operation or decommissioning phases

Any additional effects to subsurface heritage resources can be successfully mitigated by implementing a Chance Find Procedure. All known sites should be avoided and additional recommendations in this report should be implemented during all phases of the project. 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 Construction Phase

It is assumed that the 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 Operation Phase

No impacts are expected during the operation phase.

9.1.3 Decommissioning Phase

No impacts are expected during the decommissioning phase.

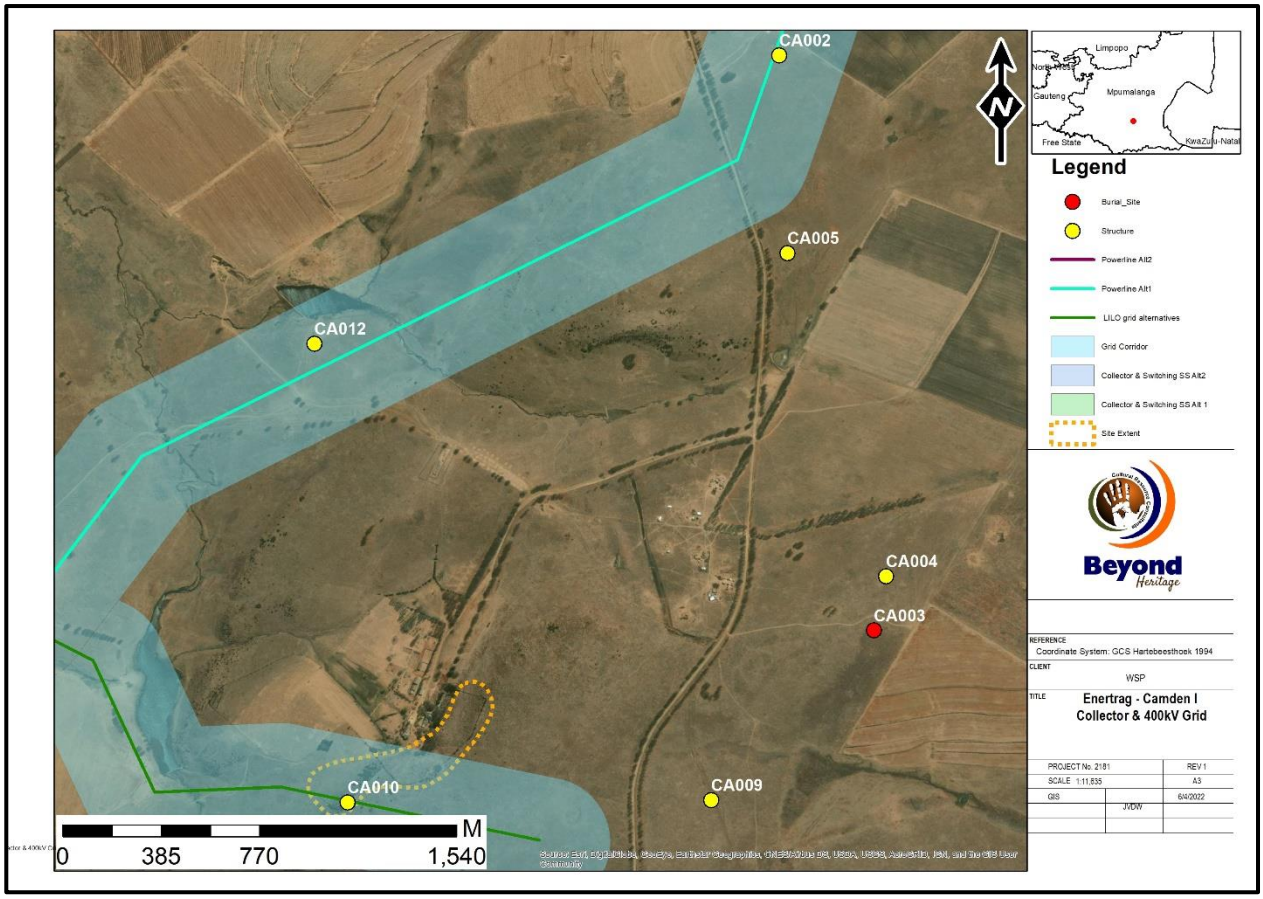


Figure 9.1. Recorded sites in relation to the proposed Project.

9.1.4 Impact Assessment for the Project (construction phase only)

Table 9. Impact assessment of the proposed project.

Impact number	Aspect	Description	Stage	Character	Ease of Mitigation	Pre-Mitigation							Post-Mitigation						
						(M+	E+	R+	D)x	P=	S	Rating	(M+	E+	R+	D)x	P=	S	Rating
Impact 1	Ruins (CA002, CA010, CA0012)	Destruction or damage to recorded ruins	Construction	Negative	moderate	3	1	5	5	2	**28**	**N2**	3	1	5	5	1	**14**	**N1**
					Significance	**N2 - Low**							**N1 - Very Low**						

10 Conclusion and recommendations

The Project area is a characterised by agricultural activities (mainly grazing and cultivated fields) without any major focal points like pans or hills that would have attracted human occupation in antiquity 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 ruins (CA002, CA010, CA0012) in the wider impact area. The impact of the project on the recorded heritage resources can be avoided with micro siting of pylons of the powerline. The project and the assessed alternatives are acceptable from a heritage point of view.

According to the SAHRA Paleontological sensitivity map the study area is of zero to very high paleontological significance (Figure 8.8) and an independent study was conducted for this aspect. Bamford (2022) concluded an assessment of the paleontological significance of the area (Bamford 2022) concluded that the impact on palaeontological resources is low and the project should be authorised from a paleontological point of view. A Fossil Chance Find Protocol should be added to the EMPr.

The project can commence with the implementation of the recommendations in this report are implemented as part of the EMPr, 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:

- Implementation of a Chance Find Procedure for the Project (as outlined in Section 10.2).
- The study area should be monitored by the ECO during construction.
- Recorded heritage features should be indicated on development plans and avoided with a 30 m buffer;
- Prior to construction commencing, the final alignment should be subjected to a heritage walkthrough.

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 therefor chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below and monitoring guidelines for this procedure are provided in Section 10.5.

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 Monitoring Programme for Paleontology – to commence once the excavations / drilling activities begin.

1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.
2. When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (trace fossils, fossils of plants, insects, bone or coalified material) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
3. Photographs of similar fossils must be provided to the contractor/s to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the contractor(s)/environmental officer then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. 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. If required annual reports must be submitted to SAHRA as required by the relevant permits.
7. 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 construction has been completed and only if there are fossils.
8. 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 is considered to be low but can be mitigated to an acceptable level. Residual impacts can be managed 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 and subsurface cultural material are the highest risk). This can cause delays during construction, as well as additional costs involved in mitigation, as well as possible layout changes.

10.5 Monitoring Requirements

Periodical 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 contractor/ECO 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 construction activities. The ECO should monitor all such activities weekly. If any heritage resources are found, the chance finds procedure must be followed as outlined above.

Table 10. Monitoring requirements for the project

Heritage Monitoring					
Aspect	**Area**	**Responsible for monitoring and measuring**	**Frequency**	**Proactive or reactive measurement**	**Method**
Cultural Heritage Resources	Entire project area	ECO	Weekly (construction phase)	Proactively	• If risks are manifested (accidental discovery of heritage resources) the chance find procedure should be implemented: 1. Cease all works immediately; 2. Report incident to the Sustainability Manager or similar; 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 11. Heritage Management Plan for EMPr implementation

Area	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Target	Performance indicators (Monitoring tool)
General project area	Implement Chance Find Procedure in case possible heritage finds are uncovered	Construction	Throughout the construction phase	EPC Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	ECO Checklist/Report
General project area	Monitoring by the ECO.	Construction	Throughout the construction phase	Applicant EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	ECO Checklist/Report
Final alignment	Heritage walkdown of final pylon positions.	Pre-Construction	Pre-Construction	Applicant/EAP to appoint qualified archaeologist	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	Heritage Statement

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