

HERITAGE IMPACT ASSESSMENT

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

FOR THE PROPOSED MANYEDING MOTHIBISTAD 22 KV POWERLINE, NORTHERN CAPE PROVINCE

Type of development:

Powerline

Developer:

ESKOM



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Project Reference:

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APPROVAL PAGE

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Authority Reference Number	TBC
Report Status	Draft Report
Applicant Name	Eskom

Responsibility	Name	Qualifications and Certifications	Date
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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
(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	NA
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	NA
(q) Any other information requested by the competent authority	NA

Executive Summary

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


- The proposed powerline from West Derby to Mothibistad will be 9.671 km long, with a section adjacent to the N14 and another section through undisturbed areas along a water course;
- Heritage finds were limited to stone packed features and Stone Age scatters;
- According to the South African Heritage Resource Information System (SAHRIS) the study area is of in an area of low and very high palaeontological sensitivity as per the SAHRIS Palaeo Sensitivity map and an independent study was conducted for this aspect. The study concluded that it is extremely unlikely that any fossils would be preserved in the loose sands of the Quaternary. No fossils were found in the proposed powerline routes. One stromatolite exposure was seen, but not on the route. There is a very small chance that fossil stromatolites might occur beneath the soils but this will not be evident until excavations for the pole foundations have commenced.

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

Recommendations:

- Implementation of a chance find procedure for the project for both the cultural heritage and paleontological components.
- If stromatolites are discovered during excavations, it is recommended that they be put aside, near their original place, and not removed from the site. Removal will require a relevant SAHRA permit. Stromatolites are of very limited interest and no institution has the space to house more stromatolites. If their occurrence is recorded on GPS, then the stromatolites can be relocated in the future should any researcher want to collect and study them.
- Pylons located close to Site MANR1 should be micro sited to ensure that the features are preserved with a 15 m buffer;
- Site MANR1 and Waypoint 286/287 and 288 must be indicated on development maps and avoided for pylon placement and during construction.

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 (Act No 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I:</p> <ul style="list-style-type: none"> • I act as the independent specialist in this application; • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant; • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity; • I will comply with the Act, Regulations and all other applicable legislation; • I have no, and will not engage in, conflicting interests in the undertaking of the activity; • I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority; • All the particulars furnished by me in this form are true and correct; and • I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.
Signature	
Date	03/11/2021

a) Expertise of the specialist

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

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

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ABBREVIATIONS

ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
BIA: Basic Impact Assessment
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DEA: Department of Environmental Affairs
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMPr: Environmental Management Programme
ESA: Early Stone Age
ESIA: Environmental and Social Impact Assessment
GIS Geographical Information System
GPS: Global Positioning System
GRP Grave Relocation Plan
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MSA: Middle Stone Age
NEMA National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID Notification of Intent to Develop
NoK Next-of-Kin
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

GLOSSARY

Archaeological site (remains of human activity over 100 years old)

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

1 Introduction and Terms of Reference

Beyond Heritage was appointed to conduct a HIA for the proposed powerline of approximately 9,671 km close to Kuruman in the Northern Cape Province (Figure 1.1 to 1.3).

The aim of the study is to survey the proposed development footprint to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999). The report outlines the approach and methodology utilized before and during the survey, which includes Phase 1, review of relevant literature; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey, Stone Age scatters as well as stone packed features were recorded. General site conditions and features on sites were recorded by means of photographs, GPS locations and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report. SAHRA as a commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) require all environmental documents to be submitted to SAHRA for commenting. Upon submission to SAHRA the project will be automatically given a case number as reference.

1.1 Terms of Reference

Field study

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

Reporting

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

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

1.2 Project Description

Eskom has applied for a proposed 22kv powerline to be constructed from West Derby to Mothibistad in the Northern Cape Province. Project components and the location is outlined under Table 2 and 3.

Table 2: Project Description

Property Details	Kuruman 690 HM Pakhane 165 HM Pakhane 165 HM Portion 1 Pakhane 165 HM Portion 5 Pakhane 165 HM Portion 15 Yale 165 HM
Magisterial District	Ga-Segonyana Local Municipality
Central co-ordinate of the development	27°26'25.08"S 23°30'40.07"E
Topographic Map Number	2723 AD & BC

Table 3: Infrastructure and project activities

Type of development	Powerline
Size of development	9,671 km
Project Components	The project comprises a 22 kV power line of approximately 9,671 km length with 107 Pylons. The powerline will be constructed using wooden poles of 11m in length.

1.3 Alternatives

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

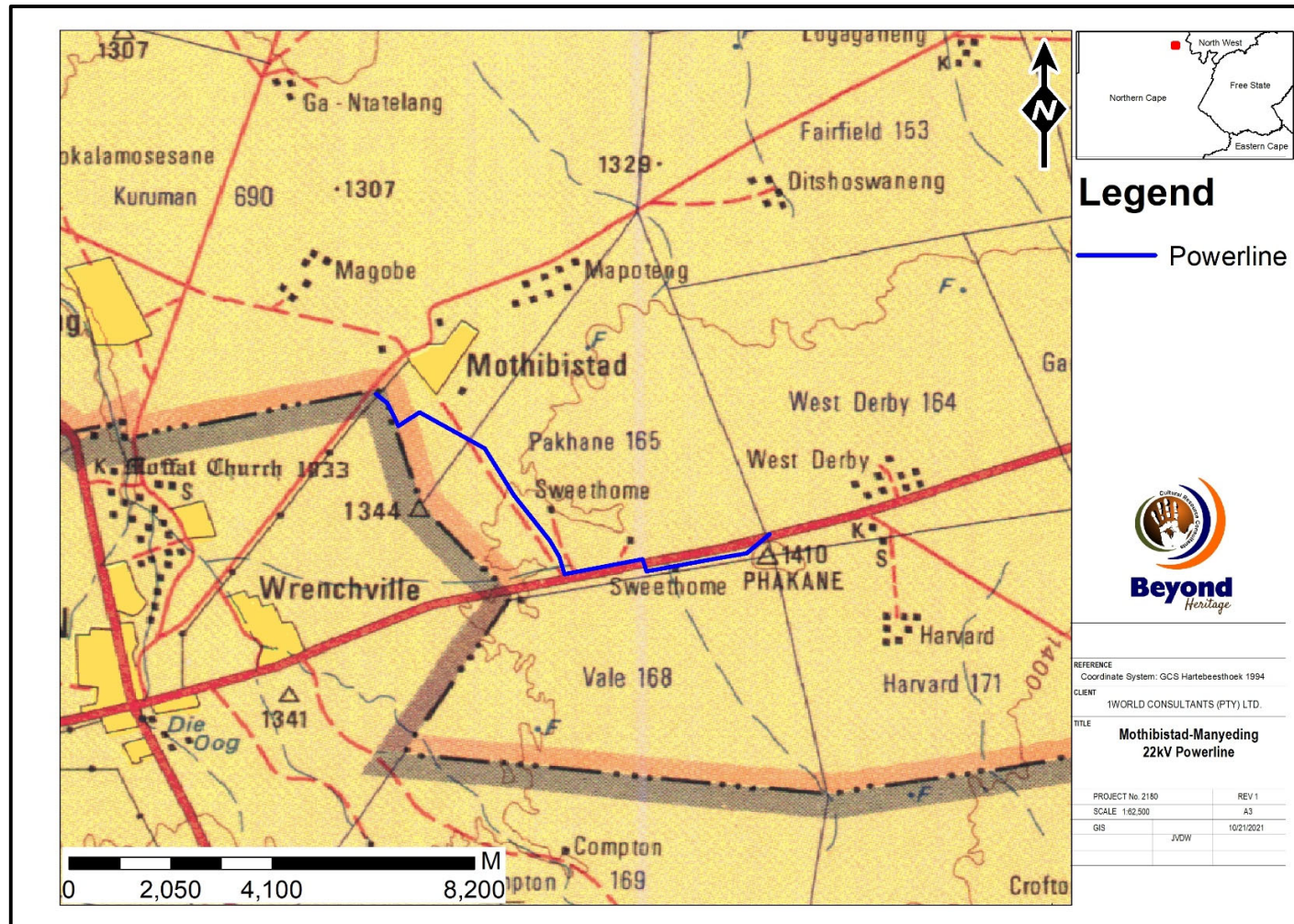


Figure 1.1. Regional setting (1: 250 000 topographical map) of the project.

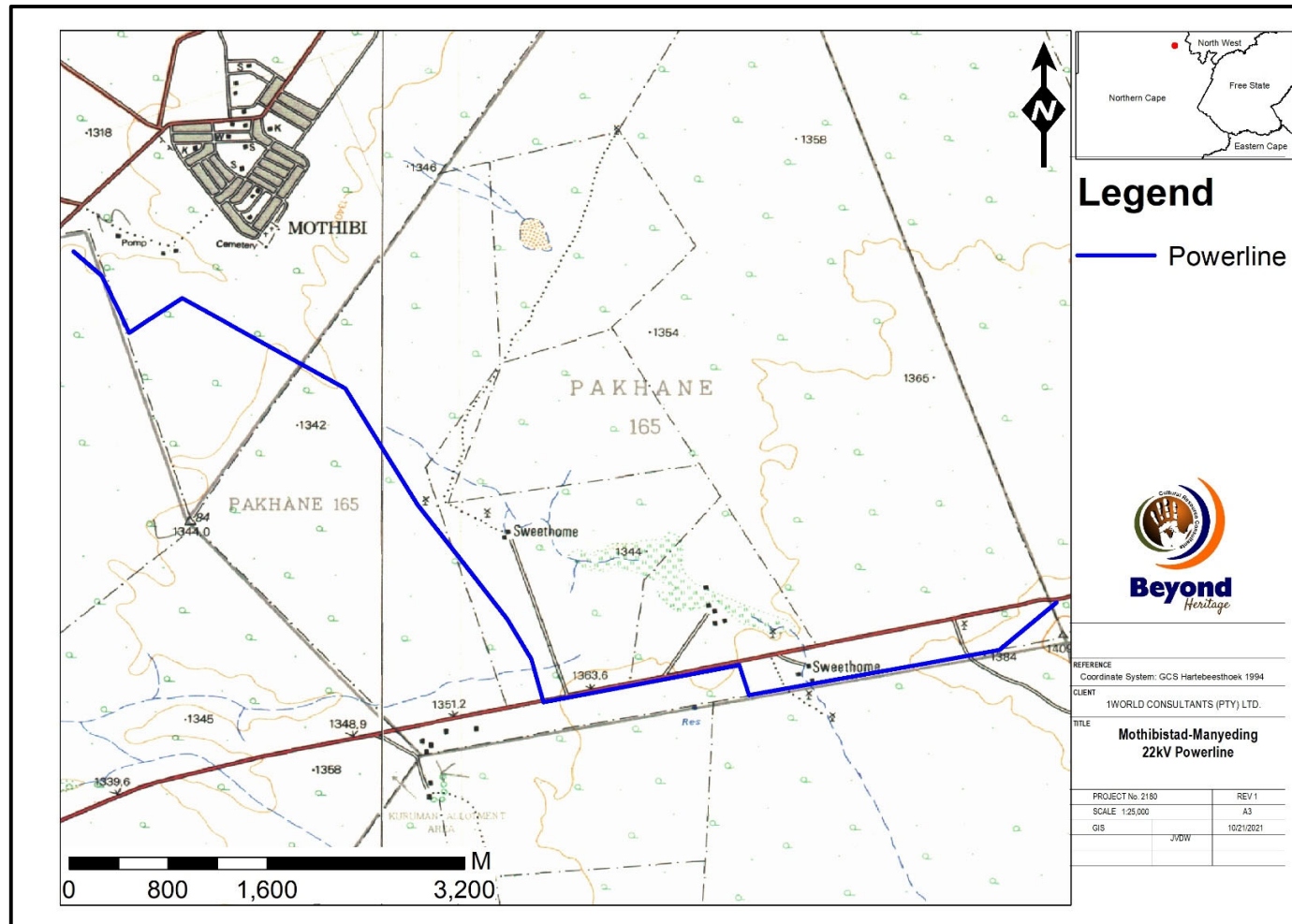


Figure 1.2. Local Setting of the project.

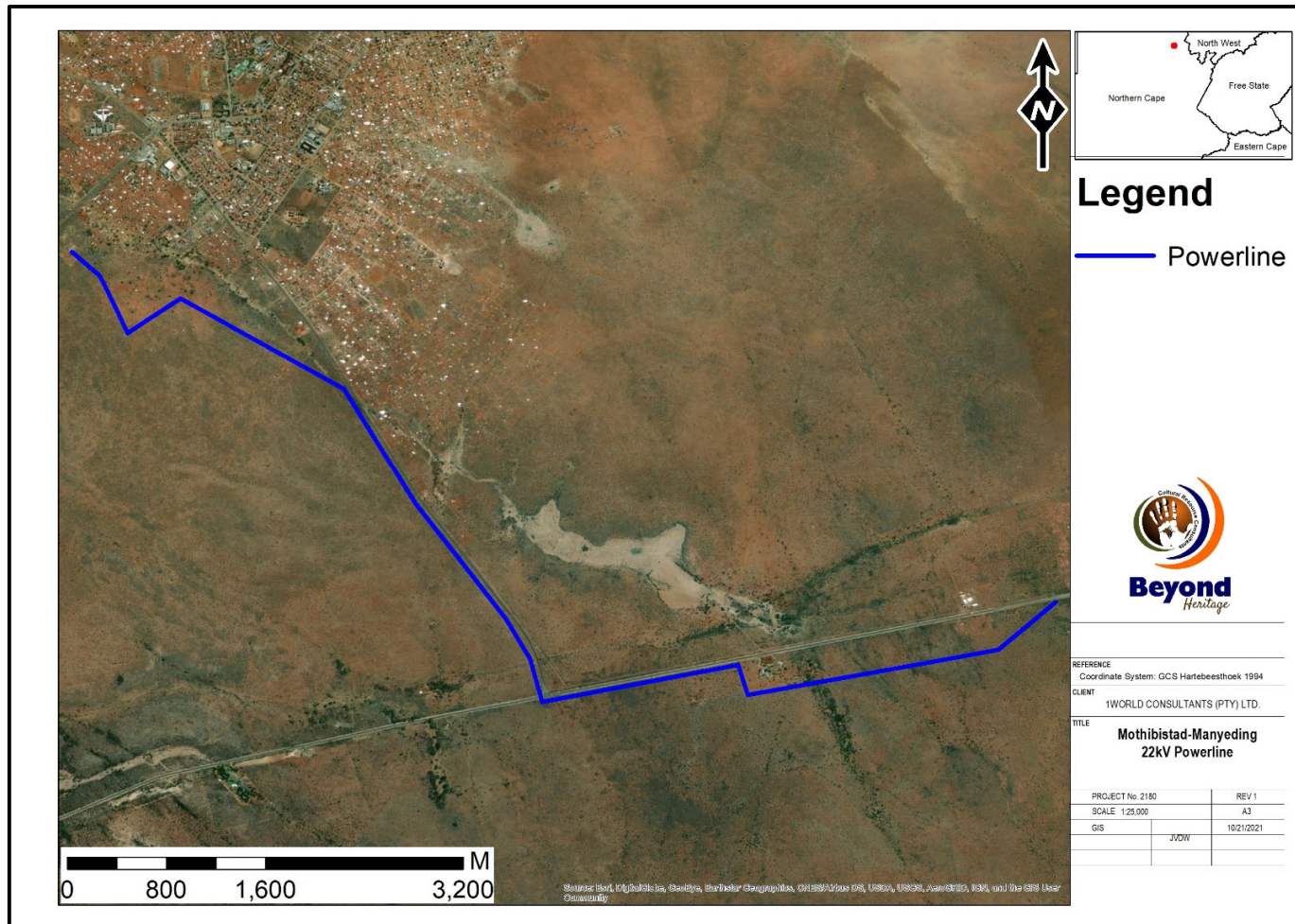


Figure 1.3. Aerial image of the development footprint.

2 Legislative Requirements

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

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

A Phase 1 HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation.

The overall purpose of heritage specialist input is to:

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

The HIA should be submitted to the PHRA if established in the province or to SAHRA. SAHRA will ultimately be responsible for the evaluation of Phase 1 HIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 HIA reports and additional development information to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 HIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

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

Phase 1 HIA's are primarily concerned with the location and identification of heritage sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision-making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for with SAHRA by the applicant before development may proceed.

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

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

3 METHODOLOGY

3.1 Literature Review

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

3.2 Genealogical Society and Google Earth Monuments

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

3.3 Public Consultation and Stakeholder Engagement:

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

3.4 Site Investigation

The aim of the site visit was to:

- survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest;
- record GPS points of sites/areas identified as significant areas;
- 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	15 September 2021
Season	Spring – The project area is situated within a built up informal settlement and adjacent to the National N14 road with varying amounts of ground disturbance. The project area was sufficiently covered to understand the heritage character of the area. (Figure 3.1).

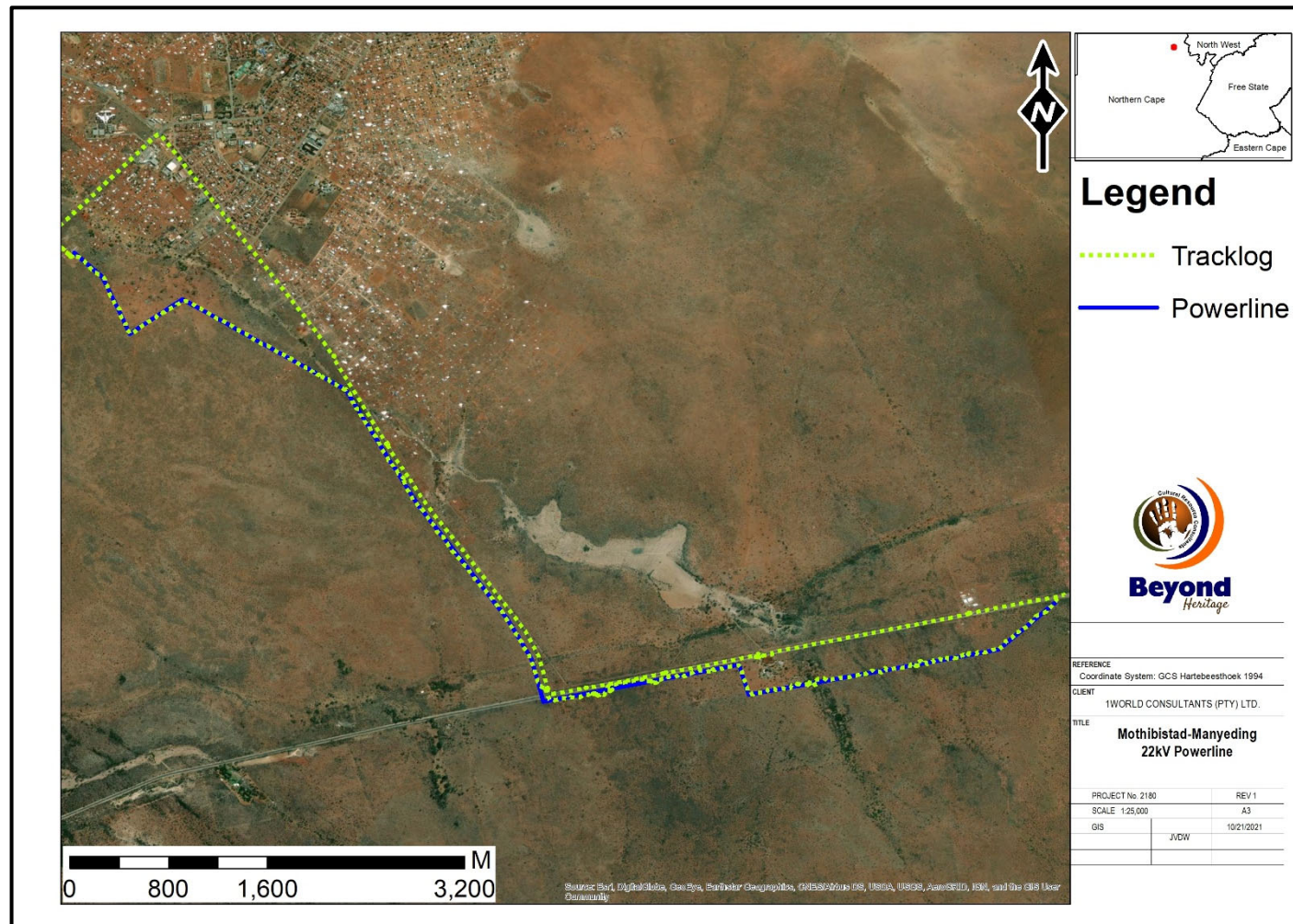


Figure 3.1: Tracklog of the survey in green.

3.5 Impact Assessment Methodology

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

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- The **duration**, wherein it will be indicated whether:
 - * the lifetime of the impact will be of a very short duration (0-1 years), assigned a score of 1;
 - * the lifetime of the impact will be of a short duration (2-5 years), assigned a score of 2;
 - * medium-term (5-15 years), assigned a score of 3;
 - * long term (> 15 years), assigned a score of 4; or
 - * permanent, assigned a score of 5;
- The **magnitude**, quantified on a scale from 0-10 where; 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5 where; 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- the **status**, which will be described as either positive, negative or neutral.
- the degree to which the impact can be reversed.
- the degree to which the impact may cause irreplaceable loss of resources.
- the *degree* to which the impact can be mitigated.

The **significance** is calculated by combining the criteria in the following formula:

$$S=(E+D+M) P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

3.6 Site Significance and Field Rating

Section 3 of the NHRA distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

- Its importance in/to the community, or pattern of South Africa's history;
- Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;
- Sites of significance relating to the history of slavery in South Africa.
-

The presence and distribution of heritage resources define a 'heritage landscape'. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed project the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface. This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance with cognisance of Section 3 of the NHRA:

- The unique nature of a site;
- The integrity of the archaeological/cultural heritage deposits;
- The wider historic, archaeological and geographic context of the site;
- The location of the site in relation to other similar sites or features;
- The depth of the archaeological deposit (when it can be determined/is known);
- The preservation condition of the sites; and
- Potential to answer present research questions.

In addition to this criteria field ratings prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report (Table 5). The recommendations for each site should be read in conjunction with section 10 of this report.

Table 5. Heritage significance and field ratings

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

3.7 Limitations and Constraints of the study

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

4 Description of Socio-Economic Environment

According to the Integrated Development Plan for 2020 to 2021 Ga-Segonyana Municipality originated as a cross-boundary municipality that straddled the boundary between the North-West and Northern Cape Provinces. It was established in 2000 through the amalgamation of Kuruman and Mothibistad Municipalities that includes sections of the Bophirima District Municipality. 80% of the population stays in rural villages. There are 34 residential areas divided into fourteen wards, and the council consists of 14 ward councillors and 13 proportional representative (PR) councillors. The ultimate vision of the Municipality is to achieve land formalization however the first phase is to rather concentrate on protection of Municipal services through registration of servitudes. Kuruman is the main town of the area and is known as the "Oasis of the Kalahari". Kuruman is situated on the Namaquari tourist route, forming part of the main route between Gauteng and Namibia and Cape Town via Upington. This route is growing in popularity because of the unspoiled nature and the wide variety of tourist attractions found on the route.

5 Results of Public Consultation and Stakeholder Engagement:

5.1.1 Stakeholder Identification

No stakeholder engagement was conducted as part of this HIA.

6 Literature / Background Study:

6.1 Literature Review (SAHRIS)

Numerous previous heritage studies were conducted in vicinity of the study area [e.g., D Morris (2010); A Pelser (2012 a, b); Tobias & George (2012); Angel and Fourie (2016); Van der Walt (2016, 2017 and 2019)] and were consulted for this report. Heritage finds were limited to Middle Stone Age artefacts scattered over the landscape.

6.2 Genealogical Society and Google Earth Monuments

No known grave sites are indicated in the study area.

6.3 Background to the general area

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

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

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

The Northern Cape has a wealth of heritage sites (Beaumont & Morris 1990; Morris & Beaumont 2004). Archaeological sites include the world renowned Wonderwerk Cave (Chazan et al 2008, Chazan et al 2012) and the major Tswana town and the LIA stone-walled settlements at Dithakong 40 km north of Kuruman (De Jong 2010). Other important sites in the larger area include Tsantsabane, an ancient specularite working site on the eastern side of Postmasburg and Doornfontein, another specularite working site north of Beeshoek.

Sotho-Tswana and Nguni societies, the descendants of the LIA mixed farming communities, found the region already sparsely inhabited by the Late Stone Age (LSA) Khoisan groups, the so-called 'first people'. Most of them were eventually assimilated by LIA communities and only a few managed to survive, such as the Korana and Griqua. This period of contact is referred to as the Ceramic Late Stone Age (De Jong 2010) and is represented by the Blinkklipkop specularite mine near Postmasburg and a cluster of important finds at Kathu Pan. Additional specularite workings with associated Ceramic Later Stone Age material and older Fauresmith sites (early Middle Stone Age) are known from Lylyfeld, Demaneng, Mashwening, King, Rust & Vrede, Paling, Gloucester and Mount Huxley to the north. Rock engraving sites are known from Beeshoek and Bruce to the south of the study area (Morris 2005: 3).

More locally, the two shelters on the northern and southern faces of GaMohaani (in the Kuruman Hills northwest of the town) contain Later Stone Age remains and rock paintings. Studies done by Kusel (2009) and by Pelser & Van Vollenhoven (2011) at Black Rock and Gloria Mines near Hotazel, also revealed several Early to Later Stone Age artefacts and sites in the area.

The Difaqane coincided with the penetration of the interior of South Africa by white traders, hunters, explorers and missionaries. The first was PJ Truter's and William Somerville's journey of 1801, which reached Dithakong at Kuruman. They were followed by Cowan, Donovan, Burchell and Campbell and

resulted in the establishment of a London Mission Society station near Kuruman in 1817 by James Read. Robert Moffat and his wife Mary came to Kuruman in 1820 and the mission has been known as The Moffat Mission Station ever since.

The 'Eye' and the water course springing from it have been a focus of utilisation and settlement and it was in its immediate vicinity that Kuruman, as town, evolved from the late nineteenth century. Kuruman's name is thought to be derived from the name of an 18th century San leader Kudumane.

6.4 Cultural Landscape

Historical land use and the cultural landscape are linked since the cultural landscape is shaped to some extent by the history of the area. The general area is associated with agriculture and mining developments with widespread Stone Age occurrences.

7 Description of the Physical Environment

The project area is situated northeast of Kuruman near the Mothibistad suburb. The proposed line traverses an informal township with various occupied stands in the northern section of the line. To the south the project area is used for cattle, goat and sheep grazing with high levels of disturbance present. The portion of the powerline along Tlhabane road follows an existing powerline as well as a dry stream with multiple rocky outcrops linking up with a section along the N14. This section is dominated by impenetrable blackthorn thickets. General site conditions are indicated in Figure 7.1 to 7.4.



Figure 7.1. Existing powerline and road infrastructure.



Figure 7.2. General site conditions with the informal dwellings visible.



Figure 7.3. Existing powerline in the study area.



Figure 7.4. Blackthorn thickets limited accessibility along the N14.

It is important to note that only the proposed alignment was surveyed over one day by two professional archaeologists. The environment in which the proposed power line is located is mostly used for grazing for cattle and has in some areas been built up with various occupied stands present. The powerline follows an existing power line and roads in the area. These activities altered the landscape and would have impacted on heritage features if any were present in these areas. This was confirmed during the survey where heritage finds were limited to stone packed features and scatters of Stone Age lithics. Field waypoints taken during the survey were retained for the recorded observations and one distinct MSA site was recorded with the prefix MANR. Recorded features are spatially illustrated in Figure 8.1 and briefly described in Section 8.1.

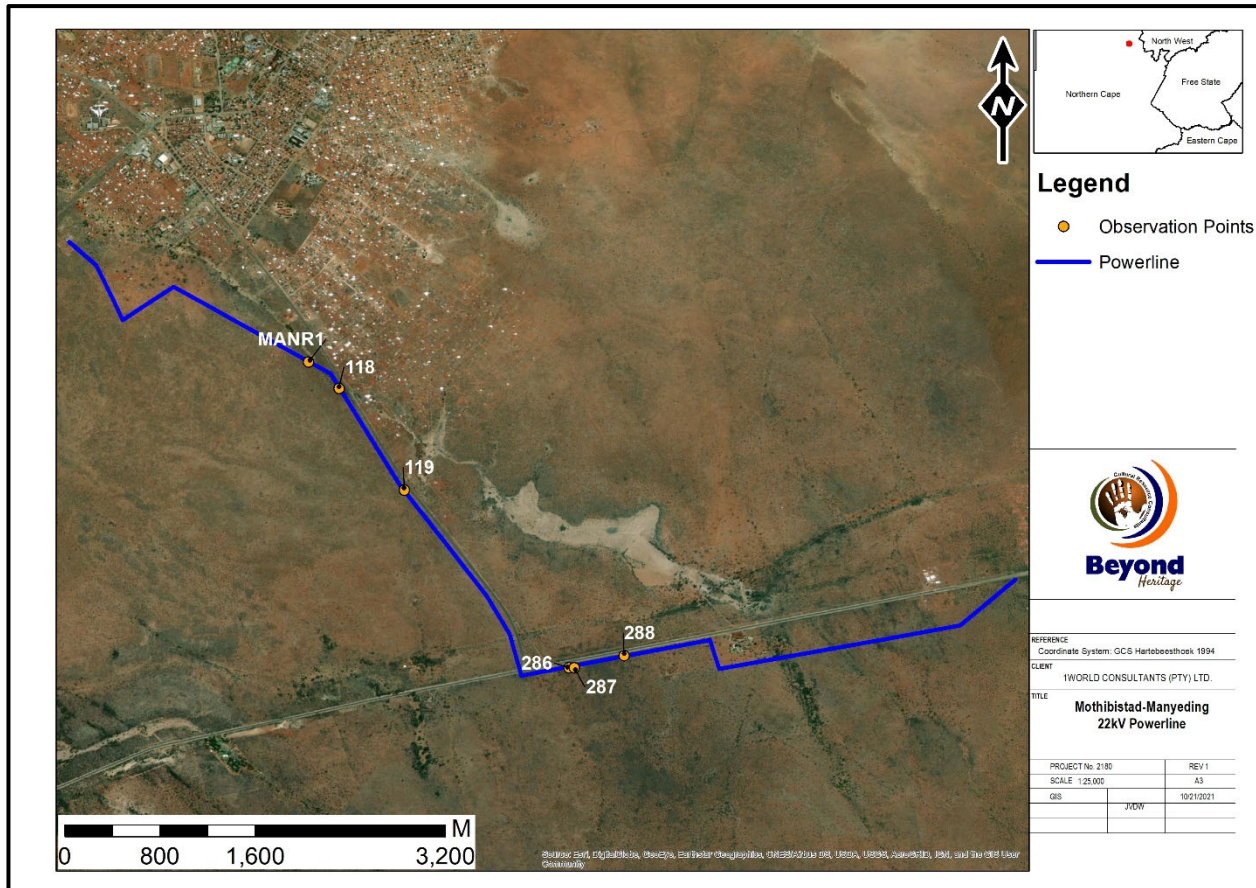


Figure 8.1. Recorded features in relation to the project.

8.1 Stone Age Artefacts

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

Table 6. Stone Age scatters recorded during the survey.

Label	Description	Coordinates	Significance
MANR 1	The site is situated near the dry stream on a rocky outcrop with exposed MSA lithic artefacts. The artefacts ratio is more than 15 artefacts per square meter and the site measures approximately 10 x 10 meters. The site has been disturbed by sheet erosion, but some of the artefacts remain <i>in situ</i> .	-27.4171849, 23.4950646	Medium significance (the site should be retained or recorded prior to destruction) Field Rating GP B
118	Lithics - Lithic artefacts located on a rocky outcrop near a dry stream.	-27.4191484, 23.4973456	Isolated find Low significance Field Rating GP C
119	Lithic Artefact -Single lithic artefact located near the existing powerline on a large open area of deep sand.	-27.4266798, 23.5024651	Isolated find Low significance Field Rating GP C



Figure 8.2. General site conditions at MANR 1 located close to existing powerline and a dry stream.



Figure 8.3. Artefacts recorded at MANR1.



Figure 8.4. Lithics recorded at Waypoint 118.



Figure 8.5. Isolated find at Waypoint 119.

8.2 Stone packed features

The features comprise packed stone features of unknown purpose and are described in Table 7. General site conditions are indicated in Figure 8.6 to 8.9. Although unlikely features like these can be associated with burial sites.

Table 7. Stone packed features

Label	Description	Coordinates	Significance
286 and 287	Stone cairns close to quarry. Purpose unknown but unlikely to be graves.	-27.4403197615, 23.51490232	Low significance Field Rating GP C However if associated with a burial site the feature is of high social significance and has a field rating of GP A and should be mitigated prior to destruction.
288	Several stone cairns were recorded that could be the remains of a demolished structure or associated with construction activities of the N14.	-27.439373, 23.518909	Poorly defined Low Significance Field Rating GP C



Figure 8.6. Stone cairn close to quarry at Waypoint 286 and 287.



Figure 8.7. General site conditions at Waypoint 286 and 287



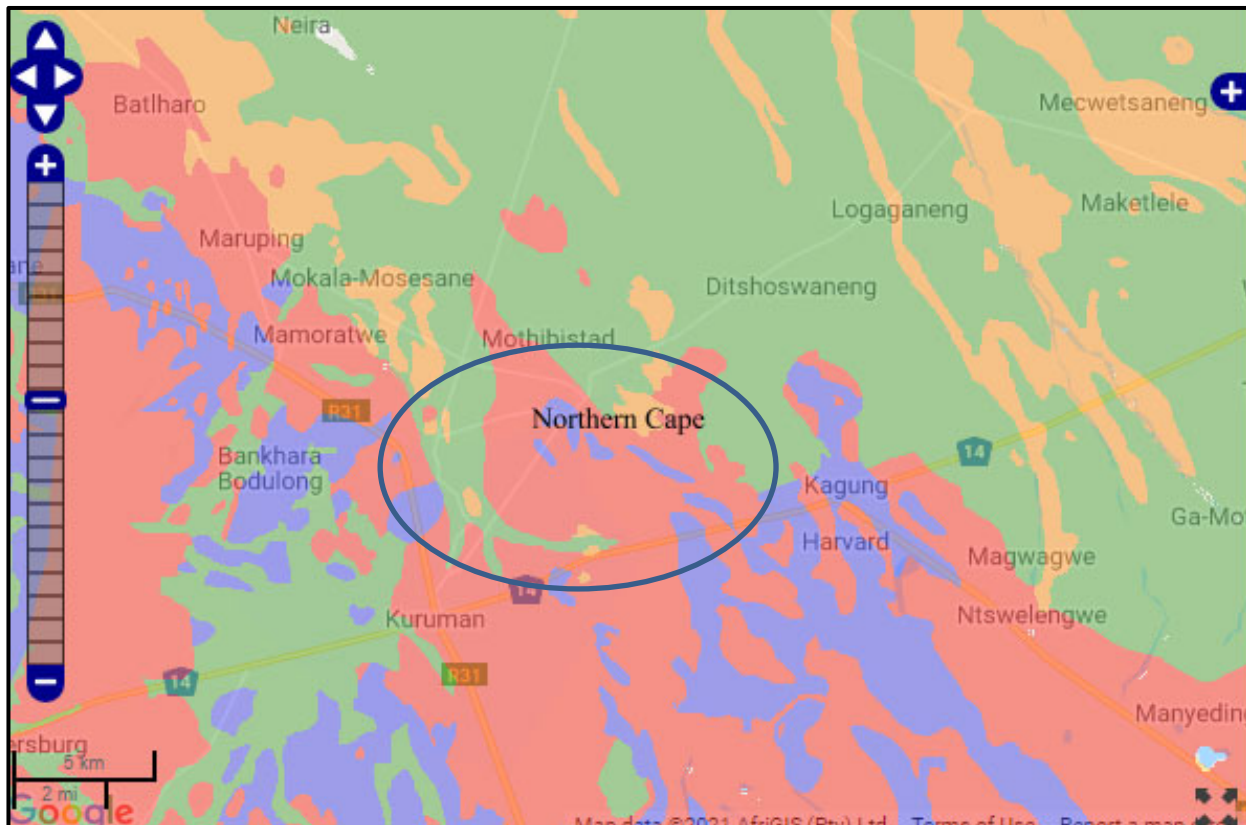
Figure 8.8. General view of stone packed features at Waypoint 288.



Figure 8.9. Stone packed features at Waypoint 288.

8.3 Paleontological Heritage

Based on the SAHRA Paleontological map the study area is of low to very high sensitivity (Figure 8.6) and an independent study was conducted by Prof Marion Bamford for this aspect. The study concluded that it is extremely unlikely that any fossils would be preserved in the loose sands of the Quaternary. No fossils were found in the proposed powerline routes. One stromatolite exposure was seen, but not on the route. There is a very small chance that fossil stromatolites might occur beneath the soils but this will not be evident until excavations for the pole foundations have commenced.



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

9 Potential Impact

The heritage value of the recorded stone packed features (Waypoint 286, 287 and 288) is low. It should be noted that although unlikely stone packed features like these can be associated with human remains and if this is the case the features would be of high social significance. Based on current pylon placement Waypoint 286, 287 and 288 will not be directly impacted on.

The Stone Age scatters range from medium (Site MANR 1) to low significance (Waypoint 118 and 119). The pylons will not directly affect the recorded Stone Age scatters at Waypoint 118, 119 and the impact on these scatters is low. Site MANR 1 will be directly impacted on by pylon excavations (Figure 9.1). The impact to the site prior to mitigation will be medium and is permanent and irreversible.

Powerlines have a relatively small impact on heritage features due to the small footprint of the pylons as shown by Sampson (1985). Therefore, possible indirect impacts can be mitigated to an acceptable level by ensuring that the areas around recorded Waypoints 286, 287 and 288 are indicated on development maps and avoided during construction and for pylon placement.

As the pylon placement will have a direct impact on Site MANR 1, mitigation will be required, either by avoidance of the site or phase 2 mitigation prior to development.

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

9.1.1 Pre-Construction phase

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

9.1.2 Construction Phase

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

9.1.3 Operation Phase

No impacts are expected during this phase.

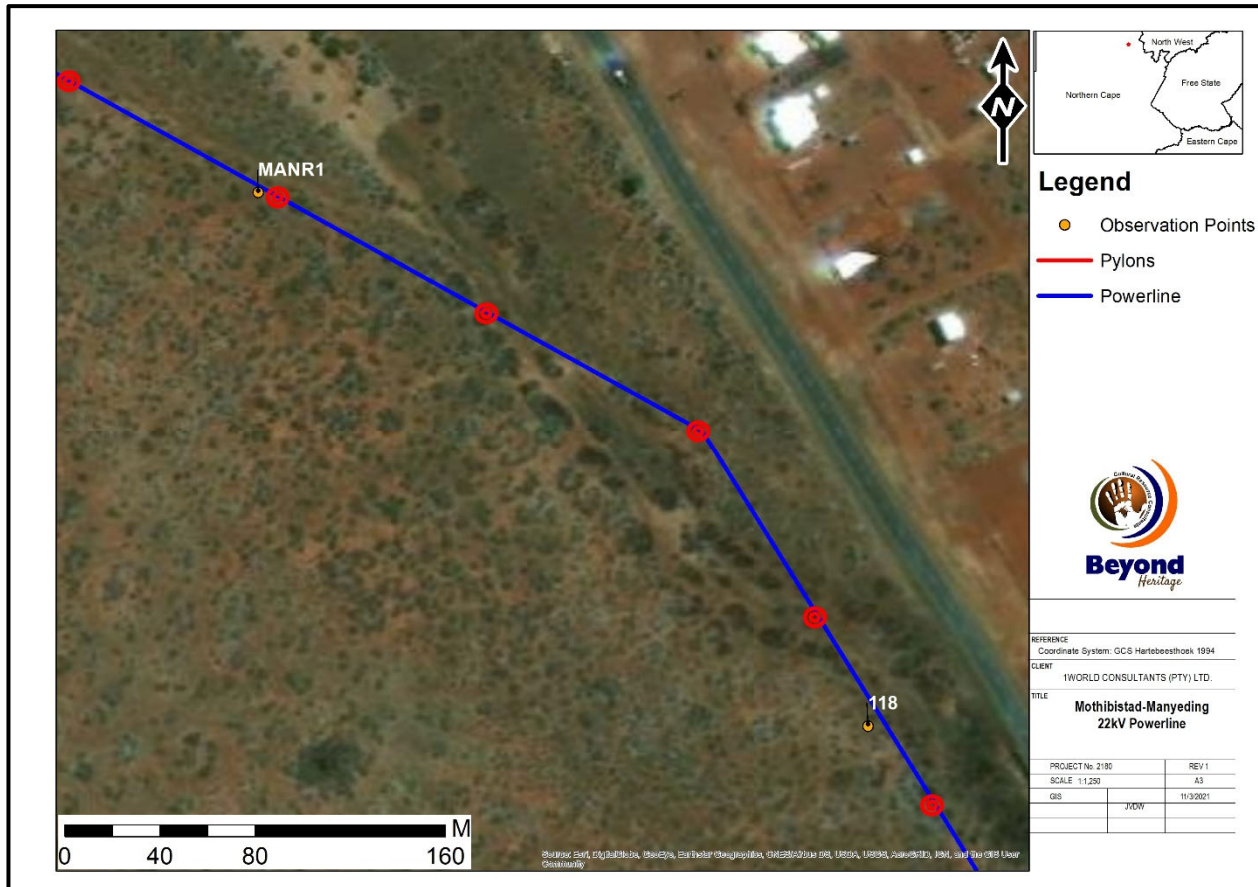


Figure 9.1. Proposed pylon positions in relation to Site MANR1 and Waypoint 118.

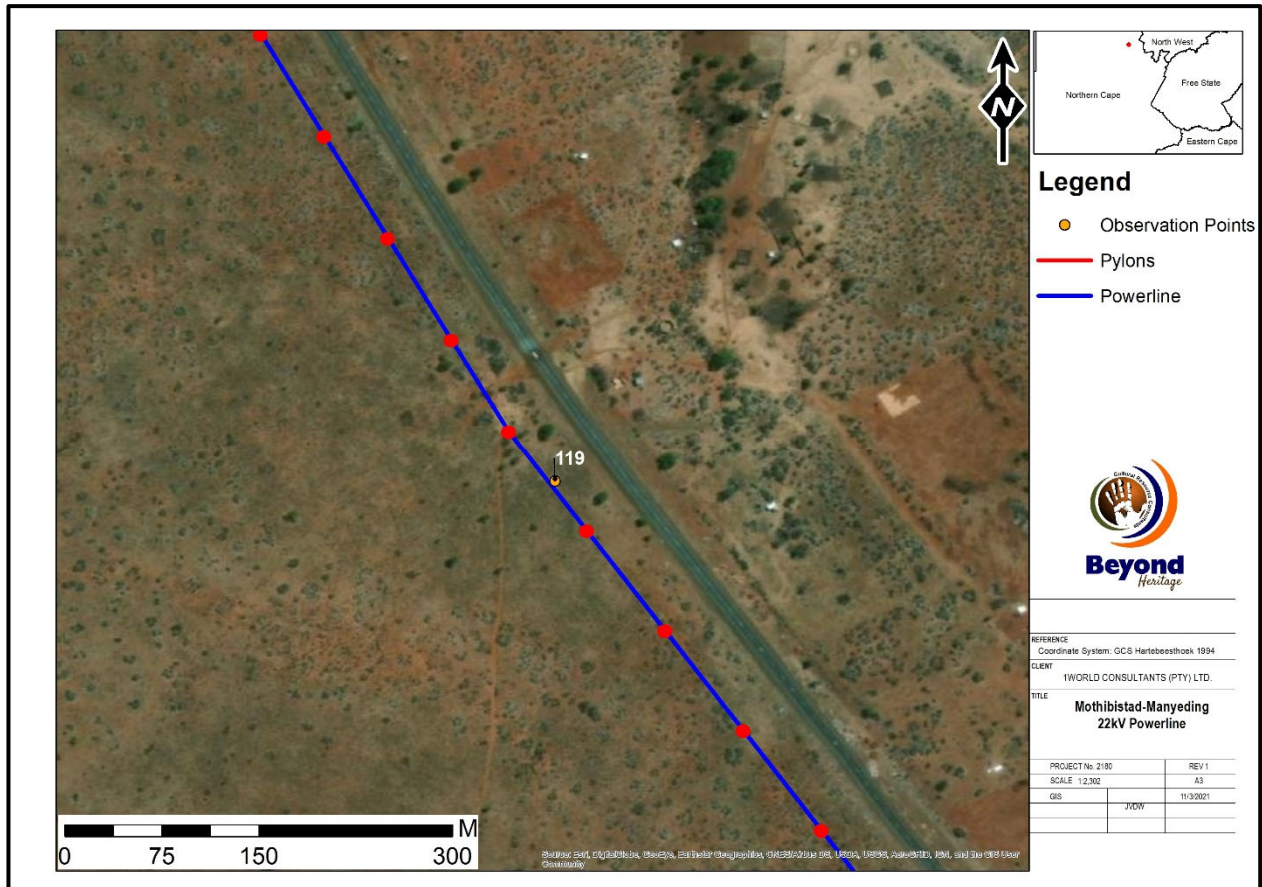


Figure 9.2. Waypoint 119 in relation to the proposed pylon positions.

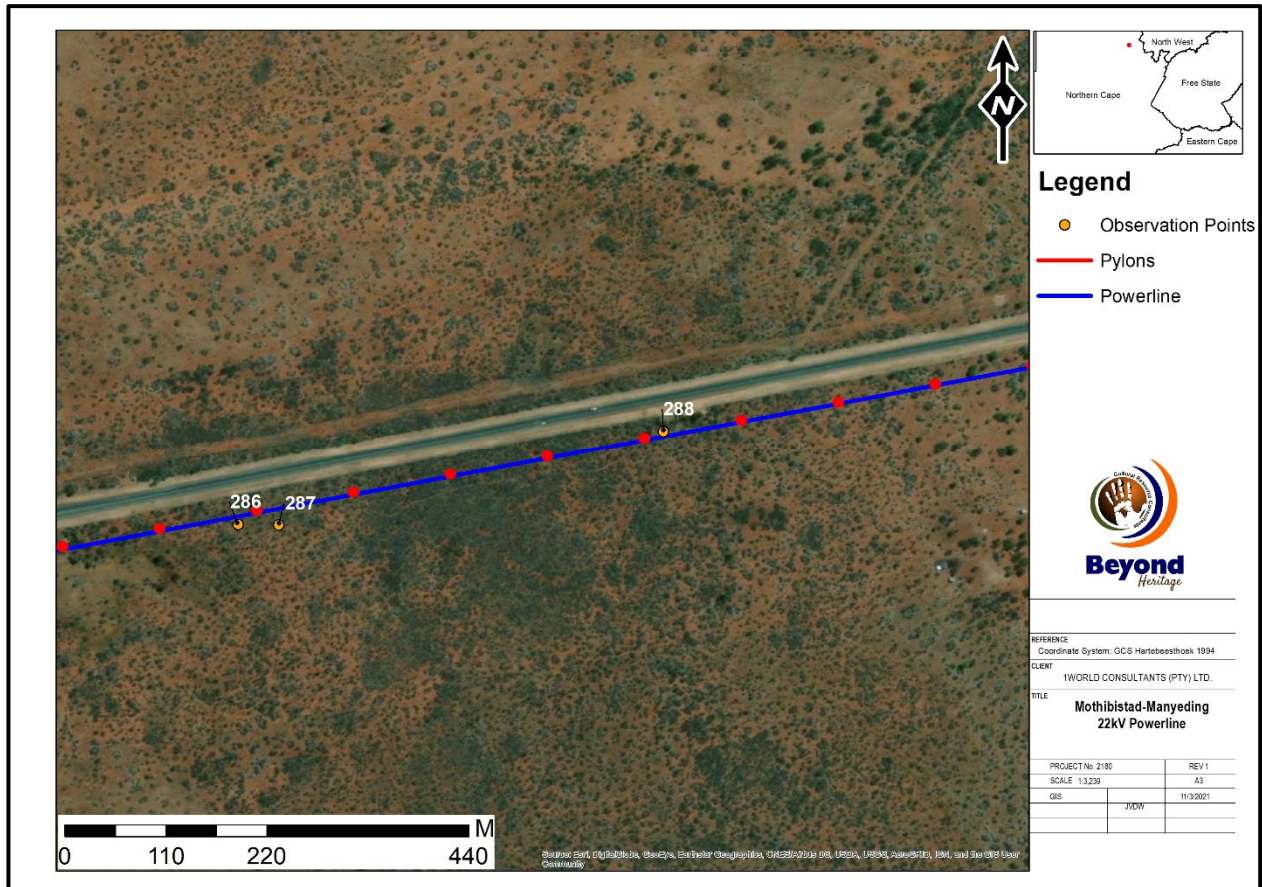


Figure 9.3. Waypoint 286, 287 and 288 in relation to the proposed pylon positions.

9.1.4 Impact Assessment for the Project

Table 8. Impact assessment of the proposed project on Waypoint 118, 119, 286, 287 and 288 (No direct impact)

Nature: 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.		
	Without mitigation	With mitigation (Preservation/ excavation of site)
Extent	Local (2)	Local (2)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (3)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	30 (Low to Medium)	18 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	NA	NA
Mitigation: Implementation of a chance find procedure for the project. Areas around Waypoint 286, 287 and 288 must be indicated on development maps and avoided for pylon placement and during construction.		
Cumulative impacts: The proposed project will have a low cumulative impact since these sites will be directly impacted.		
Residual Impacts: Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on, but this cannot be quantified.		

Table 9. Impact of the proposed project on Site MANR1 (Direct Impact)

Nature: 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.		
	Without mitigation	With mitigation (Preservation/ excavation of site)
Extent	Local (2)	Local (2)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Low (4)
Probability	Highly likely (4)	Improbable (2)
Significance	51 (Medium)	22 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	NA	NA
Mitigation: Pylon placement (of Pylon 81) should be sited to ensure that the location of MANR1 must be avoided for pylon placement. Implementation of a chance find procedure for the project.		
Cumulative impacts:		

The proposed project will have a low cumulative impact.

Residual Impacts:

Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on, but this cannot be quantified.

10 Conclusion and recommendations

The project area is situated northeast of Kuruman near the Mothibistad suburb. The proposed line traverses an informal township with various occupied stands in the northern section of the line. To the south the project area is used for cattle, goat and sheep grazing with high levels of disturbance present. The portion of the powerline along Tlhabane road follows an existing powerline as well as a dry stream with multiple rocky outcrops linking up with a section along the N14. This section along the N14 is disturbed and dominated by impenetrable blackthorn thickets. These activities altered the landscape and would have impacted on heritage features if any were present in these areas. This was confirmed during the field survey and heritage finds were limited to stone packed features of unknown purpose (Waypoint 286, 287, 288) and isolated widely scattered Stone Age lithics (Waypoint 118, 119) as well one distinct MSA site (MANR1). The heritage value of the recorded features is low to medium (Figure 9.1 to 9.3).

The study area is indicated as of moderate to very high paleontological sensitivity and an independent study was conducted by Prof Marion Bamford. The study concluded that it is extremely unlikely that any fossils would be preserved in the loose sands of the Quaternary. No fossils were found in the proposed powerline routes. One stromatolite exposure was seen, but not on the route. There is a very small chance that fossil stromatolites might occur beneath the soils, but this will not be evident until excavations for the pole foundations have commenced.

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

10.1 Recommendations for condition of authorisation

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

Recommendations:

- Implementation of a chance find procedure for the project for both the cultural heritage and paleontological components.
- If stromatolites are discovered during excavations, it is recommended that they be put aside, near their original place, and not removed from the site. Removal will require a relevant SAHRA permit. Stromatolites are of very limited interest and no institution has the space to house more stromatolites. If their occurrence is recorded on GPS, then the stromatolites can be relocated in the future should any researcher want to collect and study them. As far as the palaeontology is concerned, the project can be authorised.
- Pylons located close to Site MANR1 should be micro sited to ensure that the features are preserved with a 15 m buffer;
- Site MANR1 and Waypoints 286, 287 and 288 must be indicated on development maps and avoided for pylon placement and during construction.

10.2 Chance Find Procedures

10.2.1 Heritage Resources

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped, and a qualified archaeologist must be contacted for an assessment of the find and therefor

chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below.

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

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

10.2.2 Palaeontological resources

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

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

10.3 Reasoned Opinion

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

10.4 Potential risk

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

10.5 Monitoring Requirements

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

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

Monitoring requirements for the project is outlined in Table 8.

Table 10. Heritage monitoring required for the project.

Heritage Monitoring					
Aspect	Area	Responsible for monitoring and measuring	Frequency	Proactive or reactive measurement	Method
Clearing activities and construction	Entire project area	ECO	Bi Weekly (Pre construction and construction phase)	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.

Heritage Monitoring					
Aspect	Area	Responsible for monitoring and measuring	Frequency	Proactive or reactive measurement	Method
					<ul style="list-style-type: none"> Only recommence operations once impacts have been mitigated.
Clearing and construction	Waypoint 286/287, 288 and Site MANR 1	ECO	Bi Weekly (Pre construction and construction phase)	Proactively	<ul style="list-style-type: none"> Measure levels of subsidence and compare with recorded baseline conditions; Status quo will be recorded through photographs; and Results will be reported in the progress reporting.

10.6 Management Measures for the project.

Table 11. Heritage Management Plan for the project

Area	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Target	Performance indicators (monitoring tool)
General project area	Implement chance find procedures in case possible heritage finds are uncovered	Pre-Construction and construction	Throughout the project	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	ECO Checklist/Report
Waypoint 286, 287 and 288	Indicate on development plans and avoid area during construction	Pre-Construction and construction	Throughout the project	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35 and 38 of NHRA	ECO Checklist/Report
Site MANR1	Site pylon placement to ensure the site is retained with a 15 m buffer.	Pre-Construction and construction	Throughout the project	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35 and 38 of NHRA	ECO Checklist/Report

10.7 Knowledge Gaps

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

11 References

- Angel, J. & Fourie, W. 2016. Upgrading Of The 66kv Network To A 132kv Network In The Hotazel, Kuruman And Kathu Area, Northern Cape Province – Post Authorisation Walkdown From Mothibistad Substation To Sekgame Switching Station. Unpublished report.
- Beaumont, P.B. & Morris, D. 1990. Guide to archaeological sites in the Northern Cape. Kimberley: McGregor Museum.
- Coetzee, T. & George, L. 2013. Archaeological Impact Assessment For Assmang Limited – Black Rock Mine Operations On Erf 5529, A Portion Of Erf 01 Kuruman
- De Jong, R.C. 2010. Heritage Impact Assessment report: Proposed Manganese and Iron Ore Mining Right Application in respect of the Remainder of the farm Paling 434, Hay Registration Division, Northern Cape Province. Unpublished Report Cultmatrix Heritage Consultants Project 2010/23 May 2010 for Kai Batla
- Kusel, U., M.van der Ryst and S.Kusel. 2009. Cultural Heritage Impact Assessment of Manganese Mining Areas on the farms Belgravia 264, Santoy 230, Gloria 226 and Nchwaning 267, at Black Rock, North of Kuruman, Kgalagadi District Municipality Northern Cape Province. Unpublished Report African Heritage Consultants September 2009. For Assmang Limited.
- Magoma, M. 2013. Phase 1 Archaeological Impact Assessment Specialist Study Report For The Proposed Prospecting For Mining Of Minerals On Portions 1, 2 Remainder Extent Of The Farm 219 And Lower Kuruman 219 In Kuruman Area Within Ga-Segonyana Local Municipality, John Gaetsewe District, Northern Cape Province. Unpublished report.
- Morris, D. 2005. Report on a Phase 1 Archaeological Impact Assessment of proposed mining areas the farms Ploegfontein, Klipbankfontein, Welgevonden, Leeuwfontein, Wolhaarkop and Kapstevell, west of Postmasburg, Northern Cape. Kimberley: McGregor Museum.
- Morris, D. 2010. Heritage Impact Assessment of an area of proposed housing development and associated infrastructure in Kuruman, Northern Cape.
- Morris, D. & Beaumont, P. 2004. Archaeology in the Northern Cape: some key sites. Kimberley: McGregor Museum.
- Mucina, L. & Rutherford, M.C. 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute. Pretoria.
- National Heritage Resources Act NHRA of 1999 (Act 25 of 1999)
- Pelser, A. 2012 (a). A Report On Archaeological Impact Assessments (AIA's) For Proposed Housing Developments On Erven 83 And 2467, Kuruman, In The Northern Cape. Unpublished report.
- Pelser, A. 2012 (b). Archaeological Impact Assessment for the proposed Housing Development on Erf 675, Kuruman, in the Northern Cape. Unpublished Report.
- Pelser, A.J. & A.C.van Vollenhoven. A Report on a Heritage Impact Assessment (HIA) for a proposed new rail crossing over the Gamagara River for the Gloria Mine Operations, Assmang Black Rock, on Gloria 266, north of Hotazel, Northern Cape. Unpublished Report Archaeos cc AE1151. May 2011. For EScience Associates (Pty) Ltd.
- SAHRA Report Mapping Project Version 1.0, 2009
- Van der Walt, J. 2013. Archaeological Impact Assessment For The Proposed Prospecting Right of a Quarry On The Farm Gamohaam 438 Portion 1 In The Kuruman Magisterial District
- Van der Walt, J. 2016. Archaeological Impact Assessment Report For The Proposed Metals Industrial Cluster Near Kuruman, Northern Cape Province. Unpublished report.
- Van der Walt, J. 2017. Heritage Impact Assessment (Required Under Section 38(8) Of The Nhra (No. 25 Of 1999) For The Proposed Construction Of Kuruman Elegant Filling Station, Northern Cape Province
- SAHRIS (referenced 2021)

Electronic Sources:

www.northerncape.org.za
www.upington.com