

# Appendix D2 Heritage Impact Assessment

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 **LEGACY** | ENVIRONMENTAL  
MANAGEMENT  
CONSULTING



# HERITAGE IMPACT ASSESSMENT

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

**For the Endangered Wildlife Operational Centre on Portion 6 of Farm Ruimte-74 in the  
Dinokeng Game Reserve, Limpopo Province.**

**Type of development:**

Wildlife Centre

**Client:**

Legacy Environmental Management Consulting (Pty) Ltd. (Legacy EMC)

**Applicant:**

The Endangered Wildlife Operational Center NPC

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Project Reference:

Project number 22108

Report date:

August 2022

## APPROVAL PAGE

<b>Project Name</b>	Proposed Development of the Endangered Wildlife Operational Centre on Portion 6 of Farm Ruimte-74 in the Dinokeng Game Reserve, Limpopo Province.
<b>Report Title</b>	Heritage Impact Assessment for the Endangered Wildlife Operational Centre on Portion 6 of Farm Ruimte-74 in the Dinokeng Game Reserve, Limpopo Province.
<b>Authority Reference Number</b>	TBC
<b>Report Status</b>	Draft Report
<b>Applicant Name</b>	The Endangered Wildlife Operational Center NPC

<b>Responsibility</b>	<b>Name</b>	<b>Qualifications and Certifications</b>	<b>Date</b>
<b>Fieldwork and reporting</b>	Jaco van der Walt - Archaeologist	MA Archaeology ASAPA #159 APHP #114	August 2022
<b>Fieldwork</b>	Ruan van der Merwe - Archaeologist	BA Hons Archaeology	August 2021
<b>Palaeontological Assessment</b>	Prof Marion Bamford	PhD Paleo Botany	August 2022

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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	<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.
(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 and 10.5
(l) Conditions for inclusion in the environmental authorisation	Section 10. 1 and 10.5
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 10. 4.
(n) Reasoned opinion - (i) as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Section 10.2
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report	Section 5
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to BA report
(q) Any other information requested by the competent authority	No other information requested at this time

## Executive Summary

Legacy EMC has been appointed as the independent environmental assessment practitioner (EAP) to apply for environmental authorization for the proposed development of the Endangered Wildlife Operational Centre on Portion 6 of Farm Ruimte-74 in the Dinokeng Game Reserve, Limpopo Province. Beyond Heritage was appointed to conduct a Heritage Impact Assessment (HIA) for the Project and the study area was assessed through a desktop assessment and by a non-intrusive pedestrian field survey. Key findings of the assessment include:


- The Project area is characterised by deep sand and a flat topography with thick grass cover and shrubs. There are no major topographical features that would have attracted occupation in antiquity and no settlements or structures are indicated on historical maps or aerial photographs;
- This was confirmed during the field survey and no heritage sites of significance were noted and finds were limited to sparsely scattered, isolated Middle Stone Age lithics that are out of context and of low significance but attest to human occupation of the landscape in antiquity;
- Based on the South African Heritage Resources Information Services (SAHRIS) Palaeontological map, the area is of insignificant paleontological sensitivity and no further studies are required for this aspect.

The impact on heritage resources is considered to be low and the project can be authorised provided that the recommendations in this report are adhered to and based on the South African Heritage Resource Authority (SAHRA) 's approval.

## Recommendations:

- Implementation of Chance Find Procedure for the Project;
- Monitoring of the study area during construction by the ECO.

**Declaration of Independence**

<b>Specialist Name</b>	Jaco van der Walt
<b>Declaration of Independence</b>	<p>I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 107 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations (as amended), that I:</p> <ul style="list-style-type: none"> <li>• I act as an independent specialist in this application;</li> <li>• I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;</li> <li>• I declare that there are no circumstances that may compromise my objectivity in performing such work;</li> <li>• I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;</li> <li>• I will comply with the Act, Regulations and all other applicable legislation;</li> <li>• I have no, and will not engage in, conflicting interests in the undertaking of the activity;</li> <li>• I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;</li> <li>• All the particulars furnished by me in this form are true and correct; and</li> <li>• I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 49 A of the Act.</li> </ul>
<b>Signature</b>	
<b>Date</b>	12/08/2022

**a) Expertise of the specialist**

Jaco van der Walt has been practising as a Cultural Resource Management (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 the Association of South African Professional Archaeologists (ASAPA) (#159) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, Kwa Zulu Natal (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, Democratic Republic of the Congo (DRC) Zambia, Guinea, Afghanistan, Nigeria and Tanzania. Through this, he has a sound understanding of the International Finance Corporations (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
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 the historic period)

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 Endangered Wildlife Operational Centre on Portion 6 of Farm Ruimte-74 in the Dinokeng Game Reserve, Limpopo Province (Figure 1.1 to 1.3). The report forms part of the Basic Assessment (BA) and Environmental Management Programme (EMPr) for the development.

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

During the survey, Isolated Stone Age lithics 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 this report. The South African Heritage Resources Agency (SAHRA) as a commenting authority under section 38(8) of NHRA 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 Development of the Endangered Wildlife Operational Centre are outlined under Table 2 and 3.

**Table 2: Project Description**

<b>Farm and Magisterial District</b>	Portion 6 of Farm Ruimte-74 in the Dinokeng Game Reserve, Limpopo Province
<b>Central co-ordinate of the development</b>	25°14'57.13"S 28°21'27.56"E
<b>Topographic Map Number</b>	2528AB and AD

**Table 3: Infrastructure and project activities**

<b>Type of development</b>	Wildlife Centre
<b>Size of development</b>	30 hectares
<b>Project Components:</b> <ul style="list-style-type: none"> <li>• Staff accommodation ±528 m<sup>2</sup>;</li> <li>• A fully equipped veterinary hospital ±3783 m<sup>2</sup>;</li> <li>• Wildlife animal enclosures ±6 711 m<sup>2</sup> (this includes future animal holding areas);</li> <li>• Tourism Information Hub ±255 m<sup>2</sup>;</li> <li>• 5 m Clearance Building Platforms ±18 300 m<sup>2</sup>; and</li> <li>• Access Roads (gravel) ±5 423 m<sup>2</sup>.</li> </ul>	

## 1.3 Alternatives

No alternatives were provided for assessment. The extent of the area assessed allows for siting of the development within this area to minimize impacts to heritage resources.

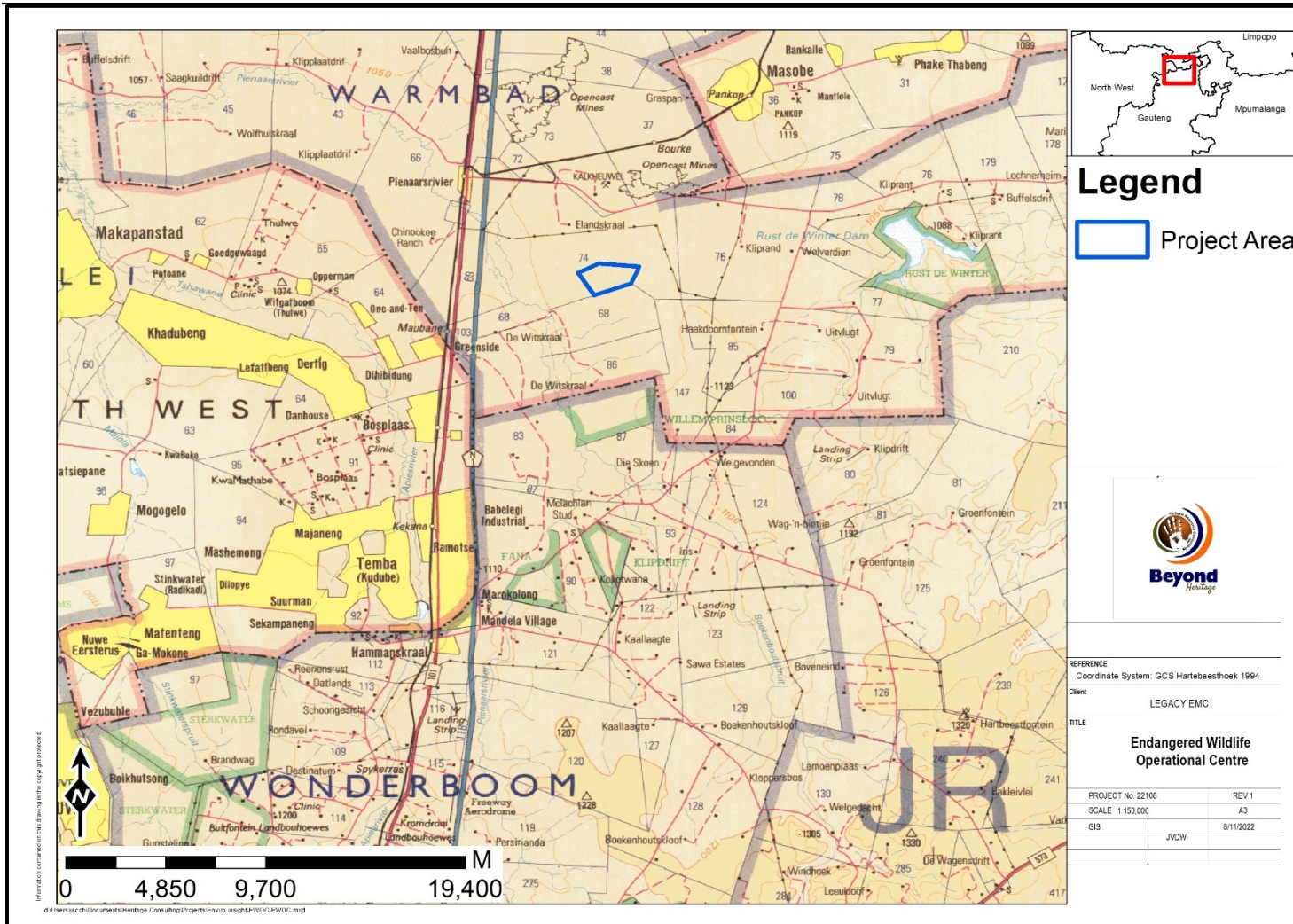
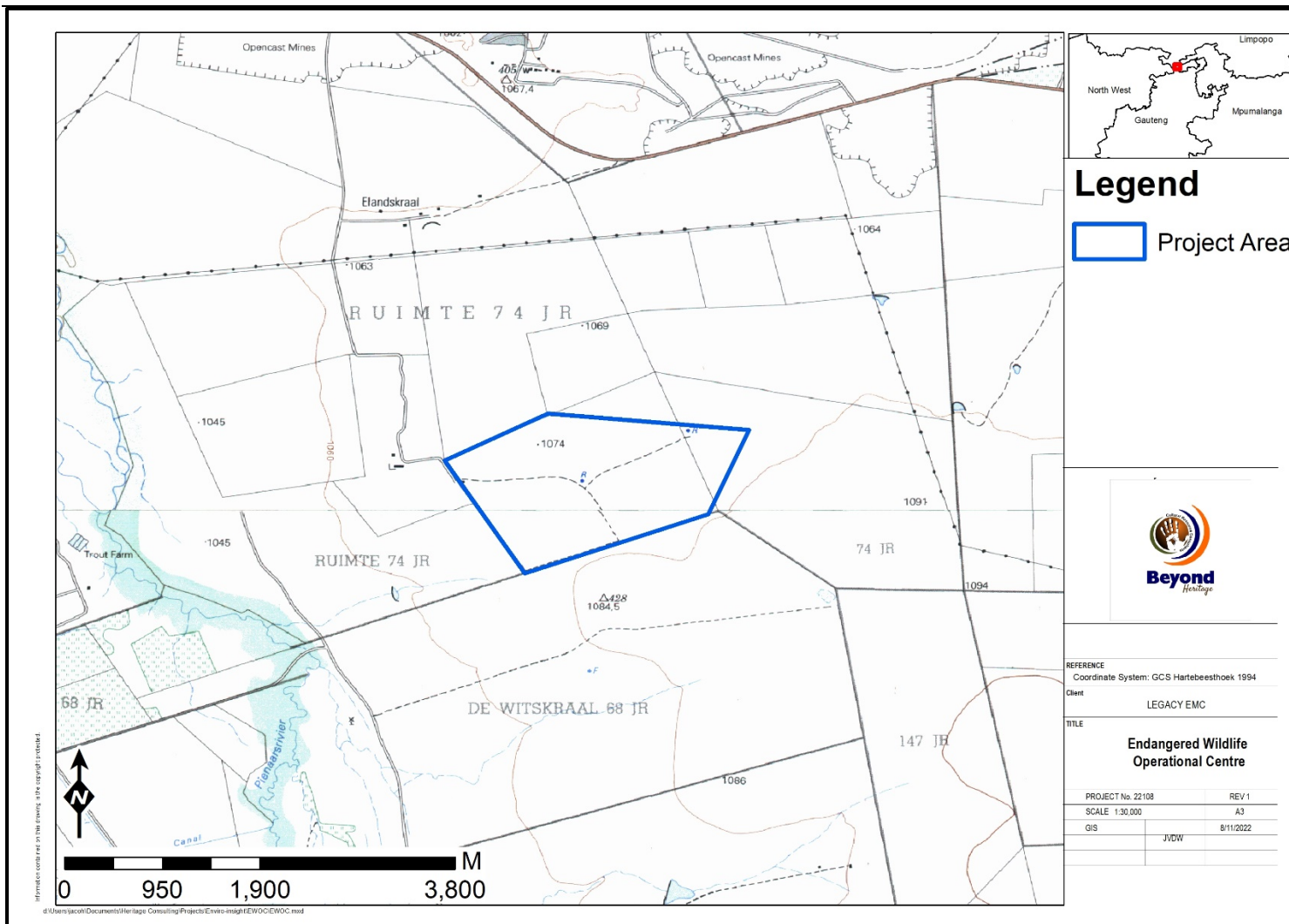


Figure 1.1. Regional setting of the Project (1: 250 000 topographical map).



**Legend**  
 Project Area



REFERENCE	
Coordinate System: GCS Hartebeeshoek 1994	
Client	
LEGACY EMC	
TITLE	
<b>Endangered Wildlife Operational Centre</b>	
PROJECT No. 22108	REV 1
SCALE 1:30,000	A3
GIS	8/11/2022
	JJDW

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



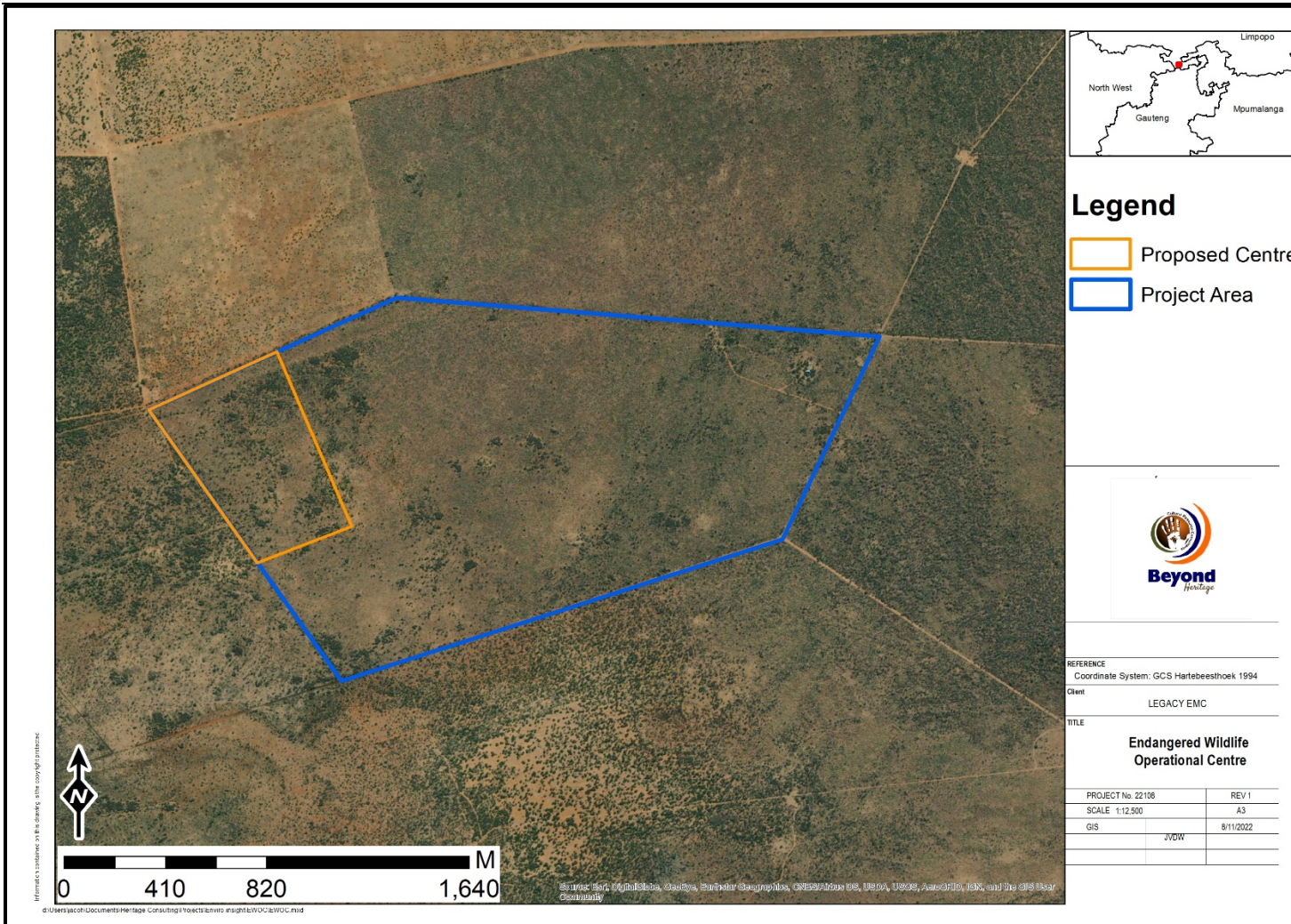


Figure 1.3. Aerial image of the Project area with the development footprint in orange.

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## 2 Legislative Requirements

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

- National Heritage Resources Act (NHRA), Act No. 25 of 1999
- National Environmental Management Act (NEMA), Act No. 107 of 1998 - Section 23(2)(b)

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

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

The HIA should be submitted, as part of the impact assessment report or 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 BA process, it involves stakeholders interested in, or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation process undertaken by the EAP 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 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	12 August 2021
Season	Winter – The time of year did influence the survey as heritage visibility was low due to thick grass cover and vegetation. The survey focussed on the project footprint and this area was sufficiently covered to record sites of significance (Figure 3.1).

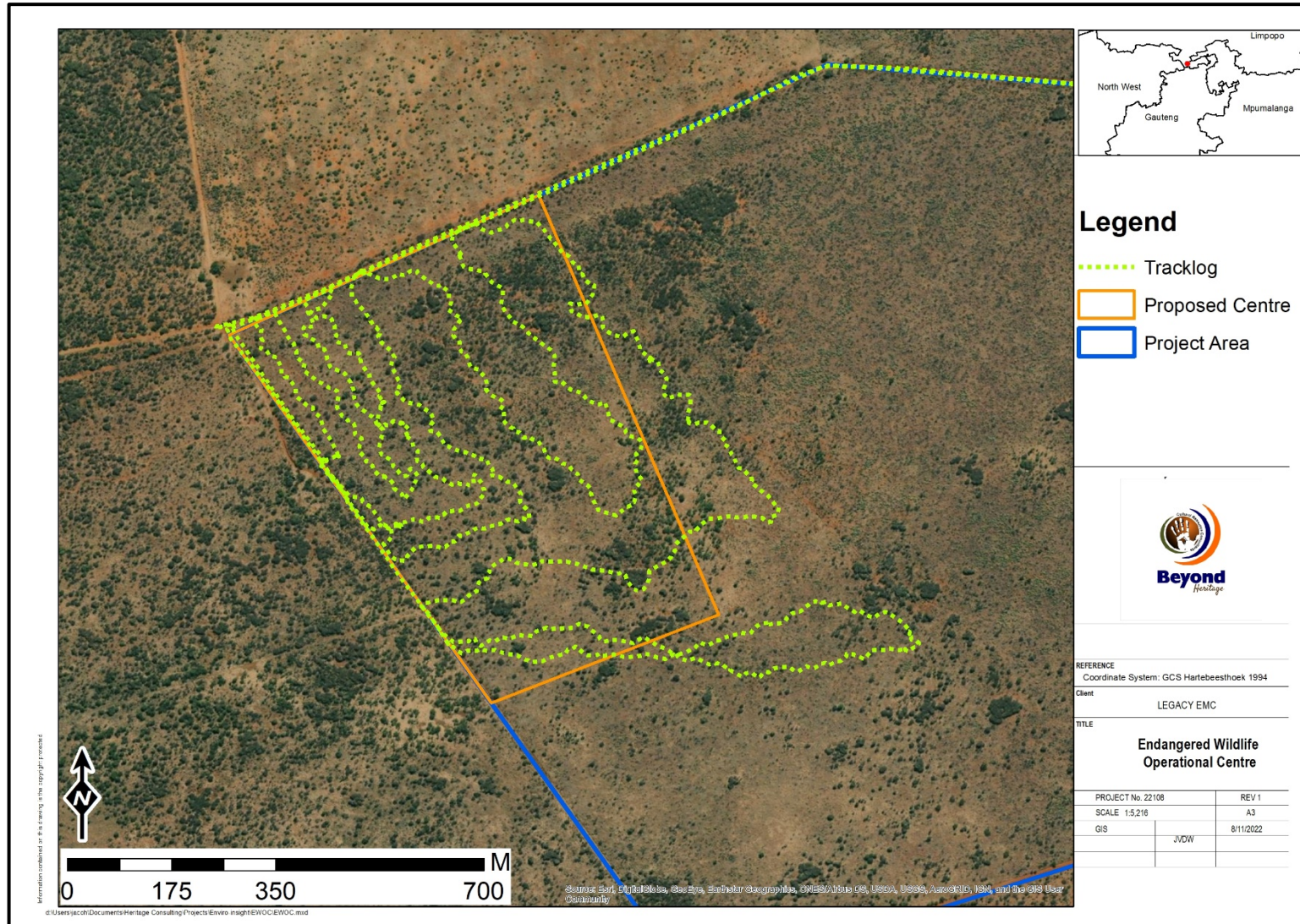


Figure 3.1. Tracklog of the survey path in green.

### 3.5 Site Significance and Field Rating

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

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

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

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

In addition to this criteria field ratings prescribed by SAHRA (2007), 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**

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

### 3.6 Impact Assessment Methodology

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

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



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

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

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

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

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

### 3.7 Limitations and Constraints of the study

The authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the 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 and monitoring of the study area by the Environmental Control Officer (ECO). 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 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 the IDP for the municipality the total size of Bela-Bela's population is currently estimated at 76 296 individuals which has increased by 14.73 % by 2016 compared to Census 2011. Total population growth rate (2011-2016) of 0.031 has been recorded within the Bela Bela Municipal area. This is based on the Census 2016 Community Survey which also estimates that there are approximately 21 354 households within Bela-Bela municipal area which is 18.9% increase from 2011. The active labour force is estimated at 36 069 in 2013 individuals, between the ages of 18 – 64. Approximately 23% of the active labour force in Bela-Bela is unemployed of which 30% is Youth. The unemployment rate in Bela-Bela Municipal Area is similar to unemployment in the province, but the labour force participation rate in the Municipality is considerably higher than that of the province. This could be the result of labour migration out of Bela-Bela in search of work in Gauteng, particularly among younger adult members of the households.

The 30% unemployment rate of Youth which is unacceptably high is corroborated by the Education figures, where the picture painted is that majority of our Youth are not adequately skilled to be able to actively participate in the job market within the Municipality.

## 5 Results of Public Consultation and Stakeholder Engagement:

### 5.1.1 Stakeholder Identification

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

## 6 Literature / Background Study:

### 6.1 Literature Review (SAHRIS)

The area under investigation was not previously assessed 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 6. Studies conducted in the greater area.**

Author	Year	Project	Findings
Van der Walt, J.	2021	Heritage impact assessment for the proposed Pienaarsrivier Filling Station.	No Sites.
Van der Walt, J.	2018	For The Proposed Welgevonden Eco-Estate Located On Portion 2 Of The Farm Welgevonden 124 Jr, City Of Tshwane Metropolitan Municipality	No sites
Pelser, A.J.	2016	Letter Of Exemption For Full HIA & Short Report: Proposed Development Of The Krosa Sand Mine On Portion 96 Of The Farm De Wagendrift 417jr, East Of Pretoria/Moloto Area, Gauteng	No heritage resources
Pistorius, J.C.C.	2013	A Phase I Heritage Impact Assessment (HIA) study for ESKOM'S proposed customer network centre (CNC) in Pienaarsrivier in the Limpopo Province	No sites
Van Schalkwyk, J.A.	2007	Heritage Impact Survey of Portions of the Farm Buffelsdrift 179 JR, Warmbad Magisterial District, Limpopo Province	Several MSA occurrences
Birkholtz, P.	2006	Phase 1 Heritage Impact Assessment On Portions Of The Farm Hartebeestspuit 235-Jr, Gauteng Province	MSA site as well as historical structures and a cemetery.
JCC Pistorius	2003	HIA for a new proposed 11Kv on the farms Boekenhoutskloof 284 JR and Kloppersbos 128 JR North East Pretoria.	Stone Age and Iron Age artefacts.
Van Vollenhoven, A.C.	2003	A report on a Cultural Resources survey done on Portion 8 of the farm Kliprand 76 JR. Limpopo Province	Stone Age artefacts and a historical site
Roodt, H.	1999	Phase 1 AIA Ruimte 74 JR Pienaarsrivier, Limpopo Province.	Stone Age Artefacts and Iron Age artefacts were identified.

### 6.1.1 Google Earth and The Genealogical Society of South Africa (Graves and burial sites)

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where archaeological and historical sites might be located. The database of the Genealogical Society of South Africa indicated no known grave sites within the study area

## 6.2 Archaeological Background

### 6.2.1 Stone Age

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 contain sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. The three main phases can be divided 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.

Stone Age sites are usually associated with stone artefacts found scattered on the surface or as part of deposits in caves and rock shelters. No previously recorded Stone Age sites are on record for the study area. No significant Stone Age sites are expected for the study area. A known heritage sites in the greater study area is the Wonderboompoort site to the south of the study area and the Tswaing Meteorite Crater to the west of Hammanskraal. The Salt Lake in the crater has been visited by Middle and Later Stone Age people.

### 6.2.2 The Iron Age (AD 400 to 1840)

Bantu-speaking people moved into Eastern and Southern Africa about 2,000 years ago (Mitchell, 2002). These people cultivated sorghum and millets, herded cattle and small stock and manufactured iron tools and copper ornaments. Because metalworking represents a new technology, archaeologists call this period the Iron Age. Characteristic ceramic styles help archaeologists to separate the sites into different groups and time periods. The first 1,000 years is called the Early Iron Age.

As mixed farmers, Iron Age people usually lived in semi-permanent settlements consisting of pole-and-daga (mud mixed with dung) houses and grain bins arranged around a central area for cattle (Huffman, 1982). Usually, these settlements with the 'Central Cattle Pattern' (CCP) were sited near water and good soils that could be cultivated with an iron hoe. For the project area, archaeological sites such as these may occur.

According to the most recent archaeological cultural distribution sequences by Huffman (2007), the study area falls within the distribution area of various cultural groupings originating out of both the Urewe Tradition (eastern stream of migration) and the Kalundu Tradition (western stream of migration). The facies that may be present are:

Urewe Tradition: Moloko Branch – Icon facies AD 1300 - 1500 (Late Iron Age)

Madikwe facies AD 1500-1700 (Late Iron Age)

Blackburn Branch- Uitkomst facies AD 1650-1820 (Late Iron Age)

Rooiberg facies AD 1650-1750 (Late Iron Age)

Kwale branch- Mzonjani facies AD 450 – 750 (Early Iron Age)

Kalunda Tradition: Benfica sub-branch – Bambata facies AD 150-650 (Early Iron Age)

Happy Rest sub-branch – Diamant facies AD 750-1000 (Early Iron Age)

Eiland facies AD 1000-1300 (Middle Iron Age)

### 6.3 Historical Information

J. S. Bergh's historical atlas of the four northern provinces of South Africa is a very useful source for the writing of local and regional histories. Interestingly, it seems that the study area is located in the vicinity of an Early Stone Age Terrain, known as the Wonderboompoort. (Bergh 1999: 4) This area was also important to Iron Age communities; the study area was located within an area where many Late Iron Age terrains were found (Bergh 1999: 7)

The Difaqane (Sotho), or Mfekane ("the crushing" in Nguni) was a time of bloody upheavals in Natal and on the Highveld, which occurred around the early 1820's until the late 1830's. (Bergh 1999: 109-115) It came about in response to heightened competition for land and trade, and caused population groups like gun-carrying Griquas and Shaka's Zulus to attack other tribes. (Bergh 1999: 14; 116-119) At the beginning of the nineteenth century, the predominant tribe in the area north of Pretoria was the Manala-Ndebele. The Kgatla were also present to the north of where Pretoria is located today. It seems that, in 1832, Shaka's Zulu tribe passed by the south of Pretoria from the southeast in a westerly direction. This was in order to attack Mzilikazi's Ndebele. This group also went on raids in various other areas in order to expand their area of influence. (Bergh 1999: 11)

During the time of the Difaqane, a northwards migration of white settlers from the Cape was also taking place. Some travellers, missionaries and adventurers had gone on expeditions to the northern areas in South Africa, some already as early as the 1720's. The Scottish travellers Robert Scoon and William McLuckie passed through the greater study area in 1829. In the same year, Robert Moffat and James Archbell also travelled through this area. (Bergh 1999: 12) In the mid 1830's, several travellers made their way from the Pretoria area into the inland. These included the travellers Robert Scoon, Dr. Andrew Smith and Captain William Cornwallis Harris. (Bergh 1999: 13)

It was however only by the late 1820's that a mass-movement of Dutch speaking people in the Cape Colony started advancing into the northern areas. This was due to feelings of mounting dissatisfaction caused by economical and other circumstances in the Cape. This movement later became known as the Great Trek. This migration resulted in a massive increase in the extent of that proportion of modern South Africa dominated by people of European descent. (Ross 2002: 39)

#### 6.3.1 Anglo-Boer War

The Anglo-Boer War was the greatest conflict that had taken place in South Africa up to date, and also affected the greater study area. A concentration camp was located at Modimolle and another to the North East of Pretoria. One battle took place at Silkaatsnek, to the northwest of Pretoria, some distance from the study area. Here, General De la Rey's Boer troops defeated the British army on 11 July 1900. (Bergh 1999: 54, 250) The Boer side however generally lost ground against the British as the war continued, and in June 1900 the Boer military leaders decided that Pretoria would have to be surrendered to the British forces. This decision was inevitable if the war was to be continued. The town was very susceptible to a siege, and its defence would have gravely endangered the lives of its inhabitants. More importantly, the defence of the town would involve such a great number of Boers that the capture of these men would have surely meant the end of the war. Pretoria was therefore occupied by British forces on Tuesday 5 June 1900. (Theron 1984: 273-279).

After the surrender of Pretoria in the Anglo-Boer War, the Republican forces adopted guerilla tactics. The British forces erected a system of blockhouses to divide the combat areas into sectors and one such fort was constructed in Bela Bela. Built by the British authorities during the Anglo-Boer War to protect the railway from destruction by the Boers, it formed a part of a line of blockhouses that extended from Noupoot right across the Orange Free State and through Johannesburg and Pretoria to Polokwane.

## 7 Description of the Physical Environment

The study area is situated north of Dinokeng in an area with no major topographical features like water sources or hills. The area is covered by a thick growth of grass and scattered trees with a dirt road providing access. General site conditions are illustrated in Figures 7.1 to 7.2.



Figure 7.1. Thick vegetation cover characterises the study area.



Figure 7.2. North-western border of the study area with gravel access road.



Figure 7.3. General site conditions at the Southern Border.



Figure 7.4. General site conditions on the eastern border of the study area showing thick grass cover.

## 8 Findings of the Survey

### 8.1 Heritage Resources

The study area is generally flat without any major topographical features like pans or rocky outcrops that would be focal points for archaeological sites and heritage finds were limited to isolated Middle Stone Age artefacts attributed to background scatter (Orton 2016) that is of low significance. The recorded observations were numbered sequentially with the prefix D for Dinokeng. General site conditions, site distribution and selected features are illustrated in Figures 8.2 – 8.15. Recorded observations are briefly described in Table 7.

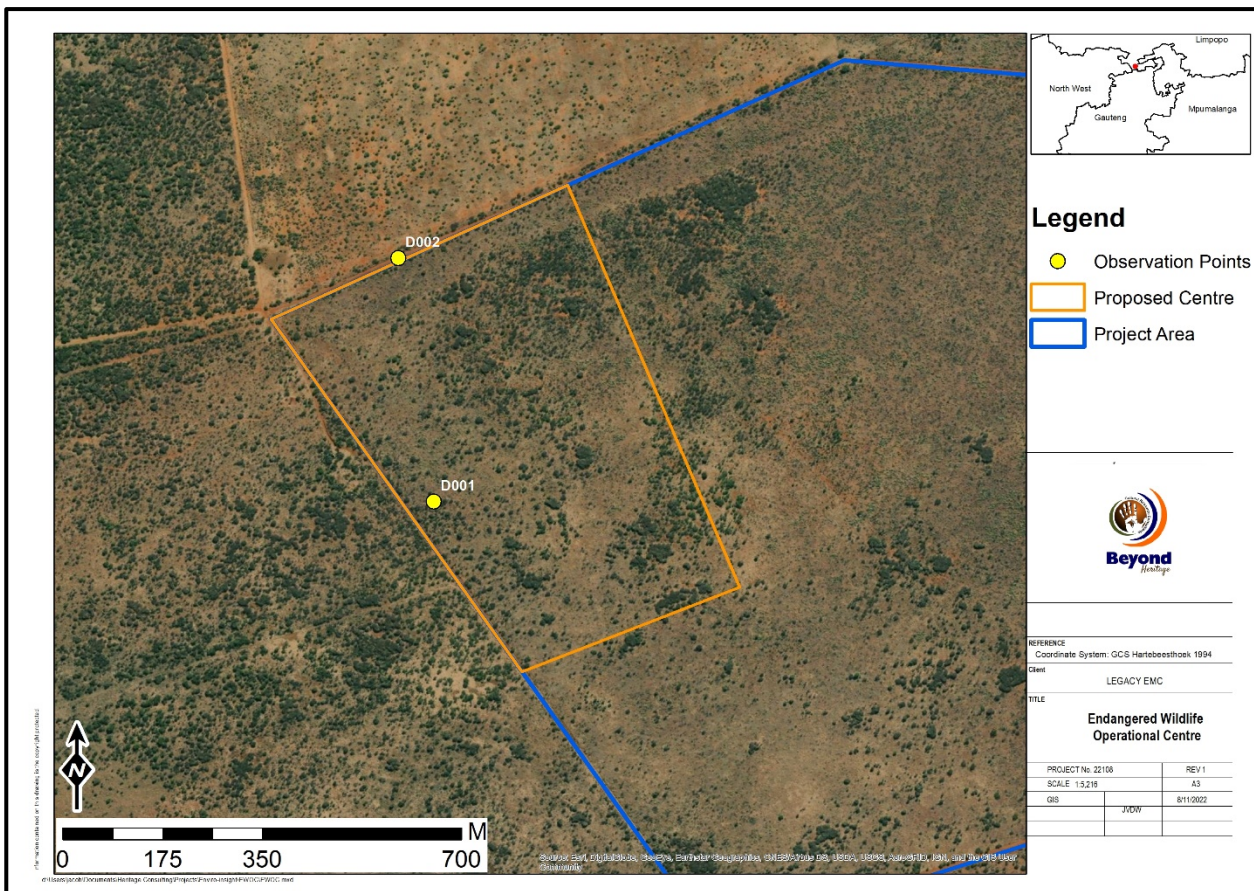


Figure 8.1. Site distribution in relation to the development footprint.

Table 7. Observations in the study area.

Label	Location	Type Site	Description	Significance and Field Rating
D001	28° 20' 48.8436" E, 25° 14' 57.0803" S	Stone Age Scatter	Isolated MSA Flake and point with faceted striking platforms, scattered over a large area marked by deep sandy soils. Raw material is from metamorphic or igneous rocks.	GP C Low Significance
D002	28° 20' 46.8240" E, 25° 14' 43.2457" S	Stone Age Scatter	Two miscellaneous flakes exposed in deep sandy soil within a road cutting. Raw material is from metamorphic or igneous rocks.	GP C Low Significance



Figure 8.2. Dorsal view of point and flake and raw material nodule at D001. Scale is in 10 cm intervals.



Figure 8.3. General site conditions at D001.



Figure 8.4 Weathered flakes noted at D002. Scale is in 10cm intervals.



Figure 8.5. Northern border road cutting where artefacts at D002 were noted. Note the deep sand cover and lack of stones or gravels.



### 8.2 Cultural Landscape

The study area is in a rural setting and is undeveloped. Historical maps indicate development to be limited to farm boundaries and internal fences (Figure 8.6 to 8.8).

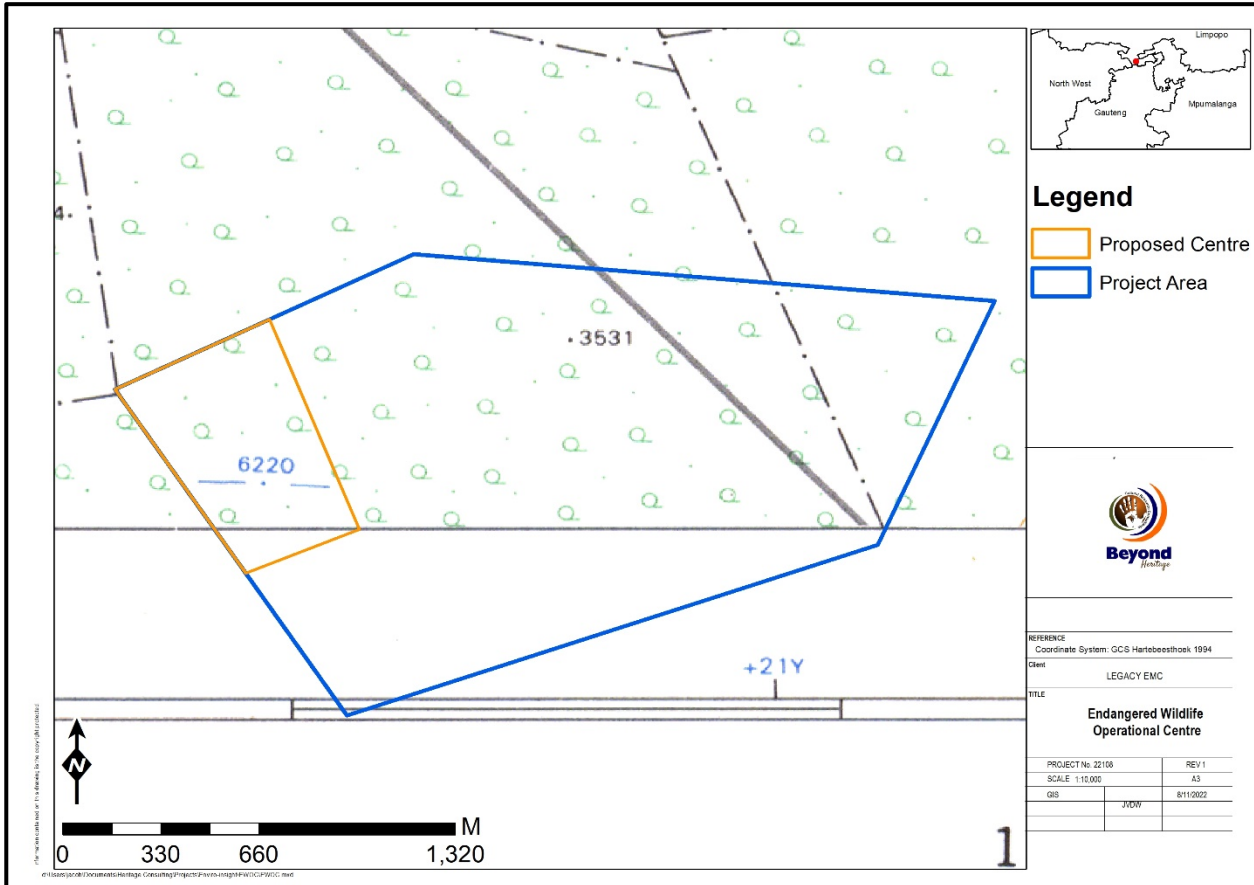


Figure 8.6. 1966 Topographic map of the area showing developments to be limited to farm boundaries and internal fences.

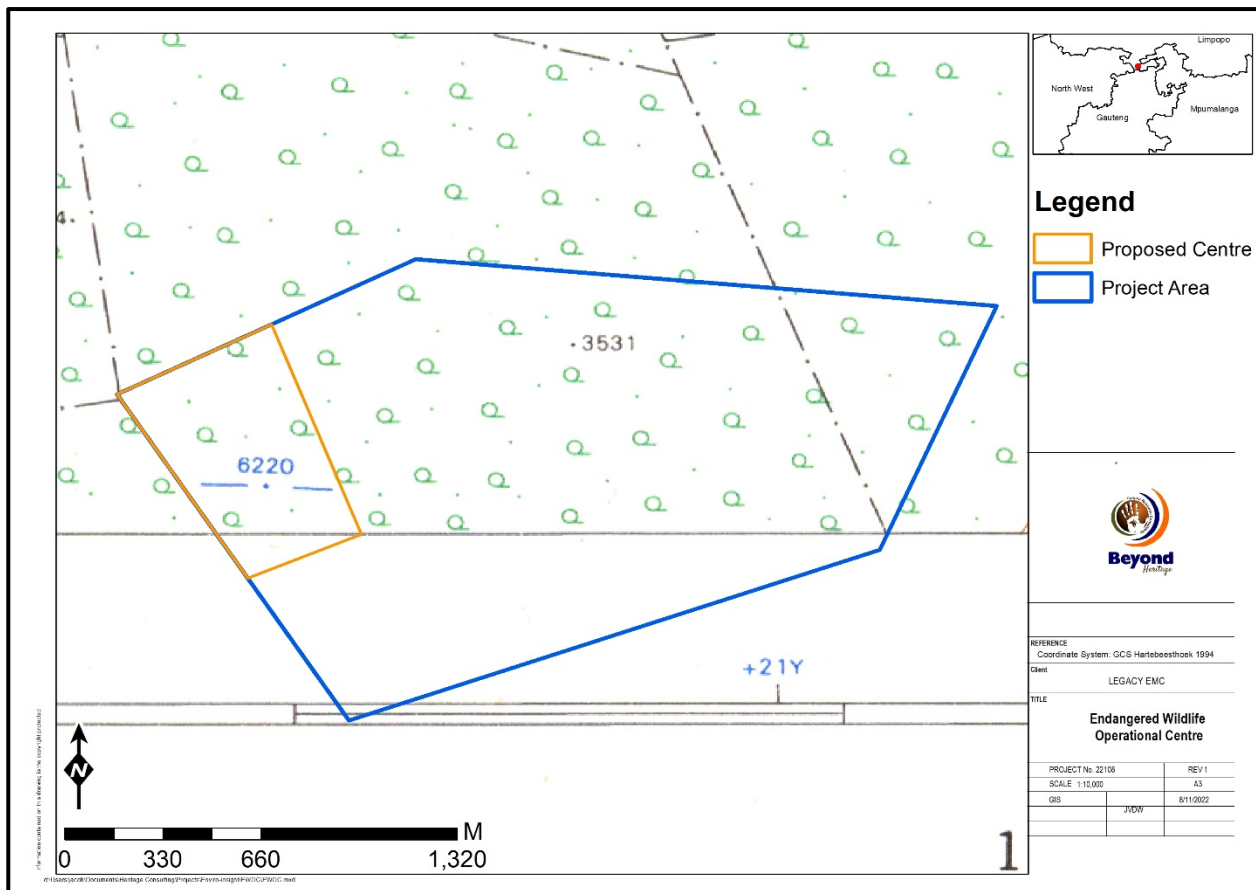


Figure 8.7.1979 Topographic map showing the farm boundaries and internal fences.

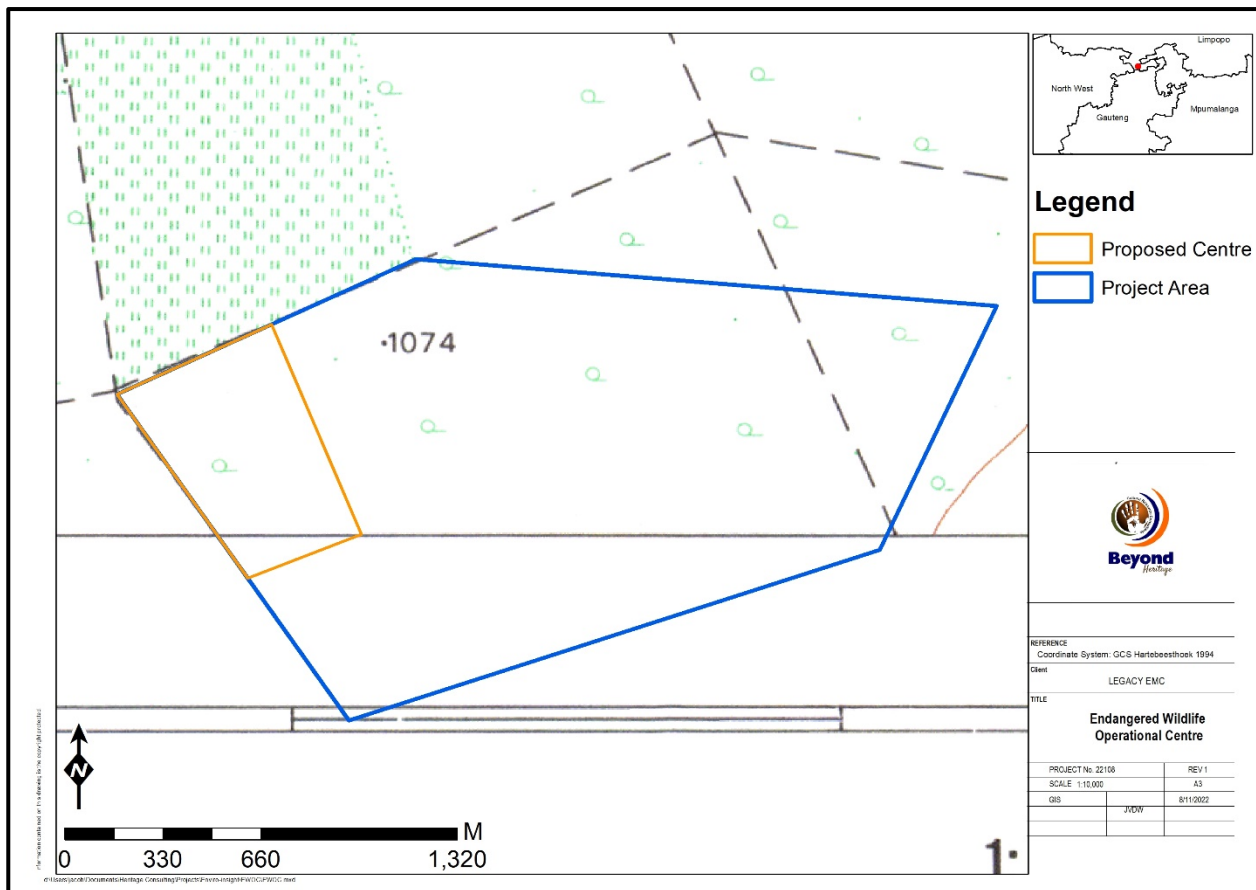
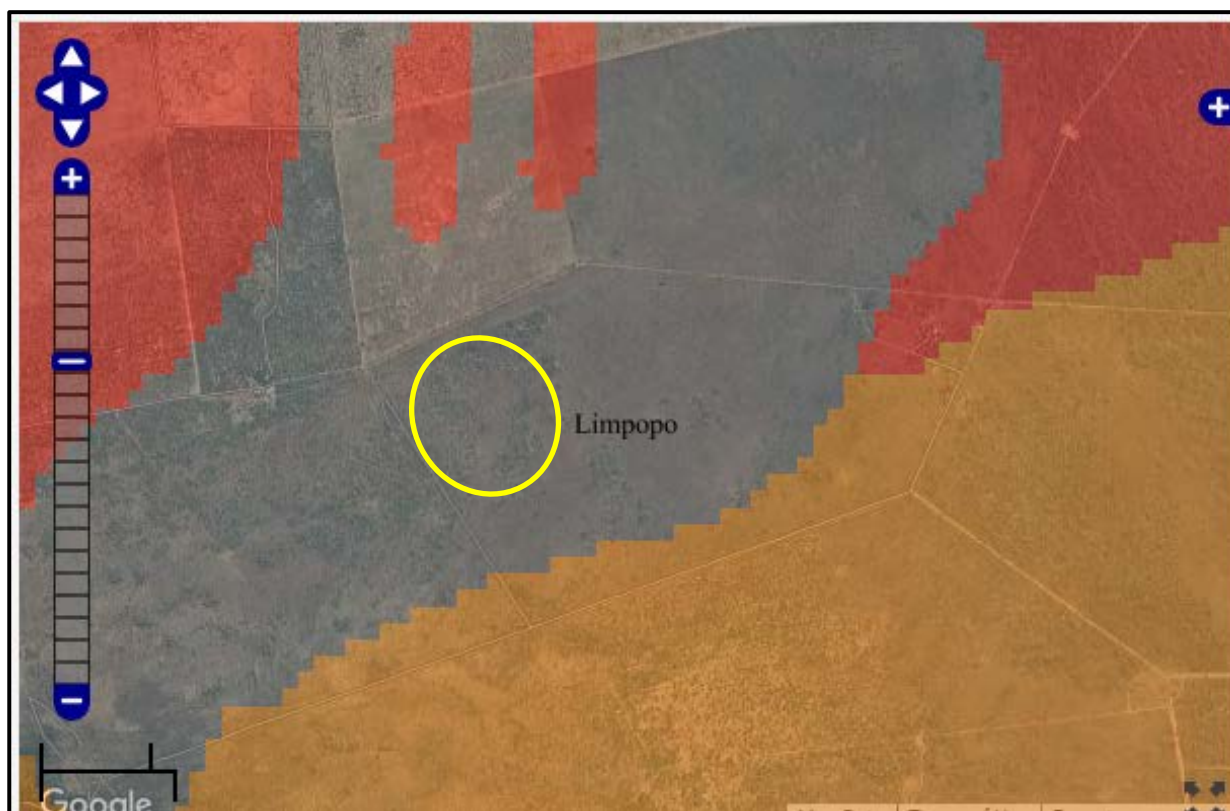


Figure 8.8. 1984 Topographic map of the study area showing cultivation to the north but no additional developments within the study area.

### 8.3 Paleontological Heritage

According to the SAHRA Paleontological map the study area is of insignificant paleontological sensitivity and no further studies are required for this aspect (Figure 8.9).



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

Impacts to heritage resources without mitigation within the project footprint will be permanent and negative and occur during the pre-construction and construction activities. The heritage significance of the recorded Stone Age lithic scatters (D001 and D002) is low as these artefacts are scattered sparsely and are out of context and no mitigation is required apart from mentioning the finds in this report.

Any additional effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure. Mitigation measures for specific sites as outlined under Table 9 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 8).

Cumulative impacts considered as an effect caused by the proposed action that results from the incremental impact of an action when added to other past, present, or reasonably foreseeable future actions. (Cornell Law School Information Institute, 2020). Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. In the case of this project, impacts can be mitigated to an acceptable level. However, this and other projects in the area can have a negative impact on heritage sites in the area where these sites have been destroyed unknowingly.

### 9.1.1 Pre-Construction phase

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

### 9.1.2 Construction Phase

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

### 9.1.3 Operation Phase

No impacts are expected during the operation phase.

#### 9.1.4 Impact Assessment for the Project

**Table 8. Impact assessment for the project.**

<b>Nature:</b> During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects.		
	<b>Without mitigation</b>	<b>With mitigation (Preservation/ excavation of site)</b>
<b>Extent</b>	Local (2)	Local (2)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	Minor (2)	Minor (2)
<b>Probability</b>	Probable (3)	Probable (3)
<b>Significance</b>	<b>27 (Low)</b>	<b>27 (Low)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Not reversible	Not reversible
<b>Irreplaceable loss of resources?</b>	Yes	Yes
<b>Can impacts be mitigated?</b>	NA	NA
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>• Implementation of a Chance Find Procedure for the project;</li> <li>• Monitoring of the study area during construction by the ECO.</li> </ul>		
<b>Cumulative impacts:</b>		
Other authorised projects (e.g., residential developments) in the area could have a cumulative impact on the heritage landscape. The impact on physical heritage is low as no sites of significance will be impacted on by the new developments.		
<b>Residual Impacts:</b>		
Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on, but this cannot be quantified.		

## 10 Conclusion and recommendations

The study area has a flat topography with no major topographic focal points that would have attracted human occupation in antiquity and is considered to be of low heritage potential. This was confirmed during the field survey and no archaeological sites of significance were noted and finds were limited to isolated Stone Age lithics that are out of context and can be attributed to background scatter (Orton 2016) that is of low heritage significance.

According to the SAHRA Paleontological sensitivity map the development footprint is of insignificant paleontological significance and no further studies are required for this aspect.

The impact to heritage resources is low and the project can be authorised provided that the recommendations in this report are adhered to and 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 the Chance Find Procedure for the project;
- Monitoring of the study area during construction by the ECO. .

## **10.2 Chance Find Procedures**

### **10.2.1 Heritage Resources**

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped, and a qualified archaeologist must be contacted for an assessment of the find and therefore chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below 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.

### **10.3 Reasoned Opinion**

The overall impact of the project is considered to be low and 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 and possible layout changes.



### 10.5 Monitoring Requirements

Day to day monitoring can be conducted by the Environmental Control Officers (ECO). The ECO or other responsible persons should be trained along the following lines:

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

**Table 9.** 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	EO & ECO	Weekly (Pre construction and construction phase)	Proactively	<ul style="list-style-type: none"> <li>• If risks are manifested (accidental discovery of heritage resources) the chance find procedure should be implemented:                             <ol style="list-style-type: none"> <li>1. Cease all works immediately;</li> <li>2. Report incident to Site Manager</li> <li>3. EPC (Engineering Procurement and Construction) Contractor to contact an archaeologist/ palaeontologist to inspect the site;</li> <li>4. Report incident to SAHRA; as advised by specialist and</li> <li>5. Employ site specific mitigation measures recommended by the specialist after assessment in accordance with the requirements of the relevant authorities.</li> </ol> </li> <li>• Only recommence operations once impacts have been mitigated.</li> </ul>

## 10.6 Management Measures for inclusion in the EMPr

**Table 10. 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 procedures in case possible heritage finds are uncovered	Pre-Construction and Construction	Throughout the project	Applicant EPC Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of the NHRA	ECO Checklist/Report
General Project areas	Monitoring of the study area during construction by the ECO.	Pre-Construction and construction	Throughout the project	Applicant/ EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35,36 and 38 of the NHRA	ECO Checklist/Report

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