HERITAGE IMPACT ASSESSMENT

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

FOR THE PROPOSED GREENGATE EXT 105 DEVELOPMENT ON PART OF PORTION 255 OF THE FARM RIETFONTEIN 189 IQ, GAUTENG

Type of development:

Business and Filling Station

Client:

Prism EMS

Developer:

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Project number 2217
Prism EMS Project Number22046
Report date:
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APPROVAL PAGE

Project Name	Greengate Ext 105
Report Title	Heritage Impact Assessment for the Proposed Greengate Ext 105 Development on Part of Portion 255 of the Farm Rietfontein 189 IQ, Gauteng
Authority Reference Number	GAUT 002/20-21/E2807
Report Status	Draft Report
Applicant Name	Falon 20 Properties (Pty) Ltd

Responsibility	Name	Qualifications and Certifications	Date
Fieldwork and reporting	Jaco van der Walt - Archaeologist	MA Archaeology ASAPA #159 APHP #114	April 2021
Fieldwork	Ruan van der Merwe - Archaeologist	BA Hons Archaeology	April 2021

DOCUMENT PROGRESS

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Amendments on Document

Date	Report Reference Number	Description of Amendment

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REPORT OUTLINE

Appendix 6 of the GNR 326 EIA Regulations published on 7 April 2017 provides the requirements for specialist reports undertaken as part of the environmental authorisation process. In line with this, Table 1 provides an overview of Appendix 6 together with information on how these requirements have been met.

Table 1. Specialist Report Requirements.

Requirement from Appendix 6 of GN 326 EIA Regulation 2017	Chapter
(a) Details of - (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae	Section a Section 12
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority	*Declaration of Independence*
(c) Indication of the scope of, and the purpose for which, the report was prepared	Section 1
(cA)an indication of the quality and age of base data used for the specialist report	Section 3.4 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	Section 6
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to BAR report
(q) Any other information requested by the competent authority	N.A

Executive Summary

Prism EMS was appointed as the Environmental Assessment Practitioner (EAP) by to undertake the required Environmental Authorisation Process for the Greengate Ext 105 development for Public Garage and Business uses. The proposed development will take place on a part of Portion 255 of the Farm Rietfontein 189 IQ, Mogale City Local Municipality, Gauteng 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 study area is used as a nursery and considered to be of low heritage potential;
- This was confirmed during the field assessment and no surface evidence of tangible heritage features of significance was identified;
- The palaeontological sensitivity of the study area is insignificant and no other heritage resources of significance were noted during the survey.

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

Recommendations:

- Implementation of a chance find procedure for the project.

Declaration of Independence

Specialist Name	Jaco van der Walt
Declaration of Independence	I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I: • 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	14/02/2022

a) Expertise of the specialist

Jaco van der Walt has been practising as a CRM archaeologist for 15 years. He obtained an MA degree in Archaeology from the University of the Witwatersrand focussing on the Iron Age in 2012 and is a PhD candidate at the University of Johannesburg focussing on Stone Age Archaeology with specific interest in the Middle Stone Age (MSA) and Later Stone Age (LSA). Jaco is an accredited member of ASAPA (#159) and 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 Greengate Ext 105 development for Public Garage and Business uses on a part of Portion 255 of the Farm Rietfontein 189 IQ, Mogale City Municipality (Figure 1-1 to 1-3). The report forms part of the Basic Assessment (BA) and Environmental Management Programme Report (EMPr) for the development.

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

During the survey, no sites of significance 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, 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 are outlined under Table 2 and 3.

Table 2: Project Description

Project area	Part of Portion 255 of the Farm Rietfontein 189 IQ
Magisterial District	Mogale City Local Municipality
Central co-ordinate of the development	26° 2'45.99"S; 27°53'12.75"E.
Topographic Map Number	2528CC.

Table 3: Infrastructure and project activities

Type of development	Public Garage and Business uses
Size of development	The proposed development totals approximately 2.6687 hectares in extent.
Project Components	The development proposal involves the development of Greengate 105, for Public Garage and Business 2 uses. Necessary roads and services (water, sewer, and stormwater) will also be put in place. **Greengate 105**: **Erf 1 | Public Garage** • Floor Area Ratio: 0.4 • Coverage: 40%: • Height: The height of the buildings shall not exceed 3 storeys excluding architectural features. **Erf 2 | Business 2** - The erf shall be used for Business purposes, Commercial uses and/ or Retail uses • Floor Area Ratio: 0.4 • Coverage: 60%: • Height: The height of the buildings shall not exceed 3 storeys excluding architectural features. • Between 80m3 and 500m3 of diesel and petrol will be stored on site. • Necessary roads and services will also be put in place and include: **Water** • Greengate 105 will be supplied by a new 200mm dia. Line. **Sewer** • A new 160mm dia. external sewer line will be constructed along the future K56 road reserve, 1.0m from the boundary, flowing in a westerly direction towards the existing municipal sewer network. This line has been authorised by GAUT 002/19-20/E2532. The connection points for Greengate 105 will connect to this authorised line. **Stormwater** The stormwater drainage of the proposed townships will be in accordance with the natural topography of the site, Stormwater pipelines between 450mm and 825mm will be put in place. Attenuation and erosion control

	will also be provided as required and will be in line with the necessary stormwater management plan. Stormwater attenuation will be provided at a rate of approximately 250 m³/ha to ensure that the pre-development runoff is not exceeded for the 1:25 year storm event. **Electricity** • The proposed development will require approximately 179.9 kVA electrical capacity. • Preliminary information suggests that the township will be supplied by Eskom from the existing 88 KV Sandpit Substation. The substation has spare capacity. • Internal services will consist of an 11KV underground cable supplying miniature substations

1.3 Alternatives

No alternatives were provided to be assessed although the extent of the area assessed allows for siting of the development to minimize impacts to heritage resources.

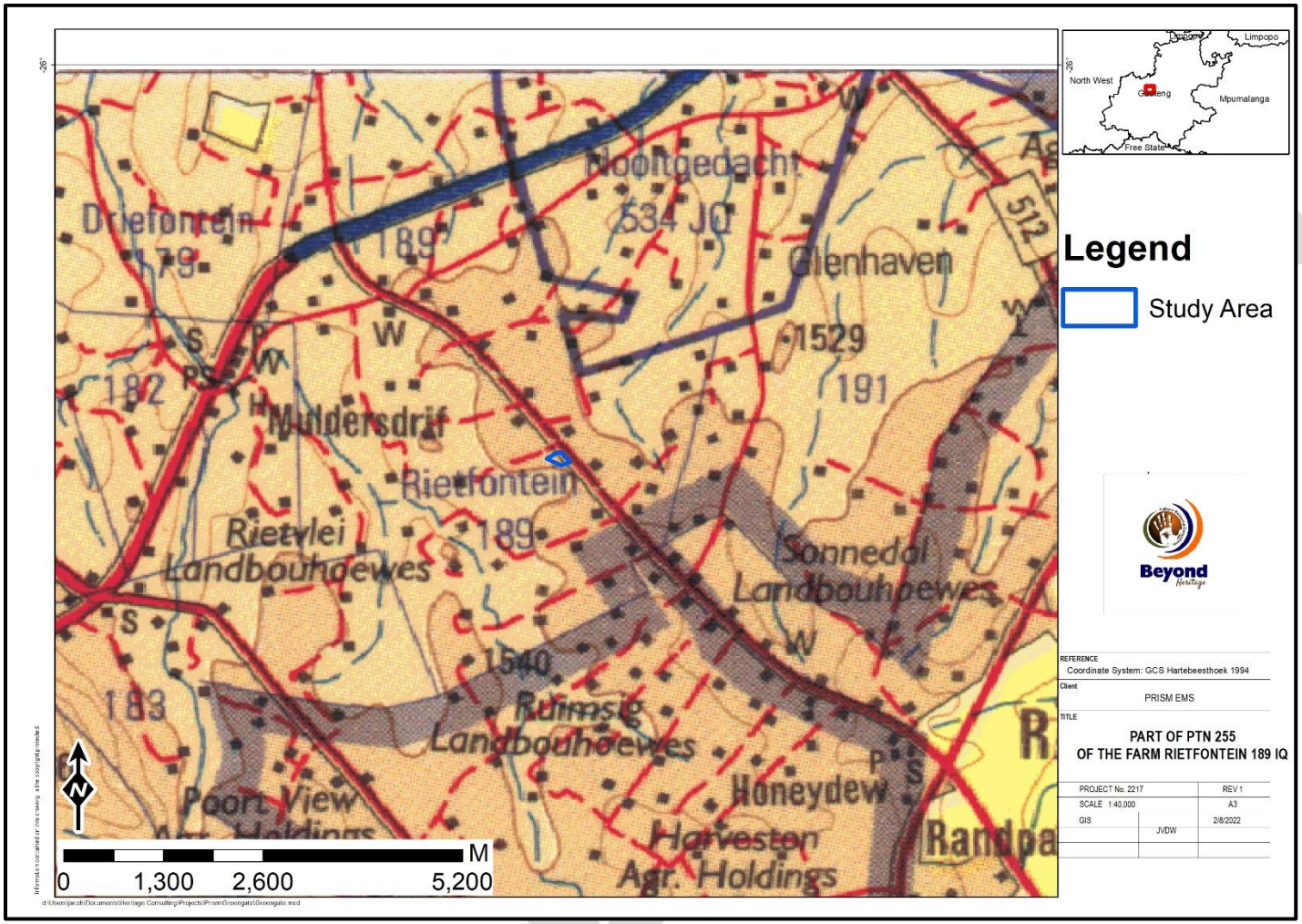


Figure 1.1. Regional setting of the project (1: 250 000 topographical map).

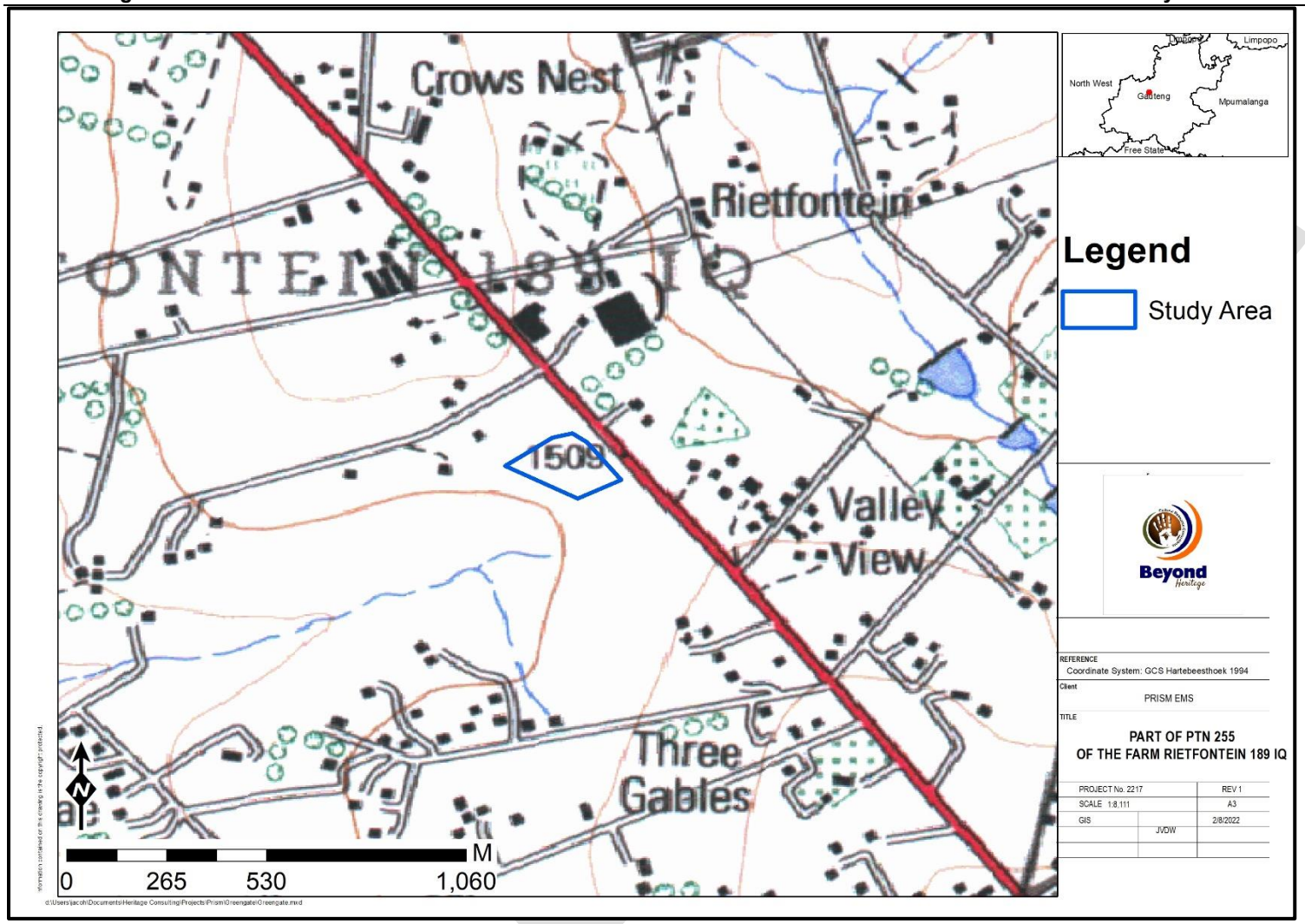


Figure 1.2. Local setting of the project (1: 50 000 topographical map).

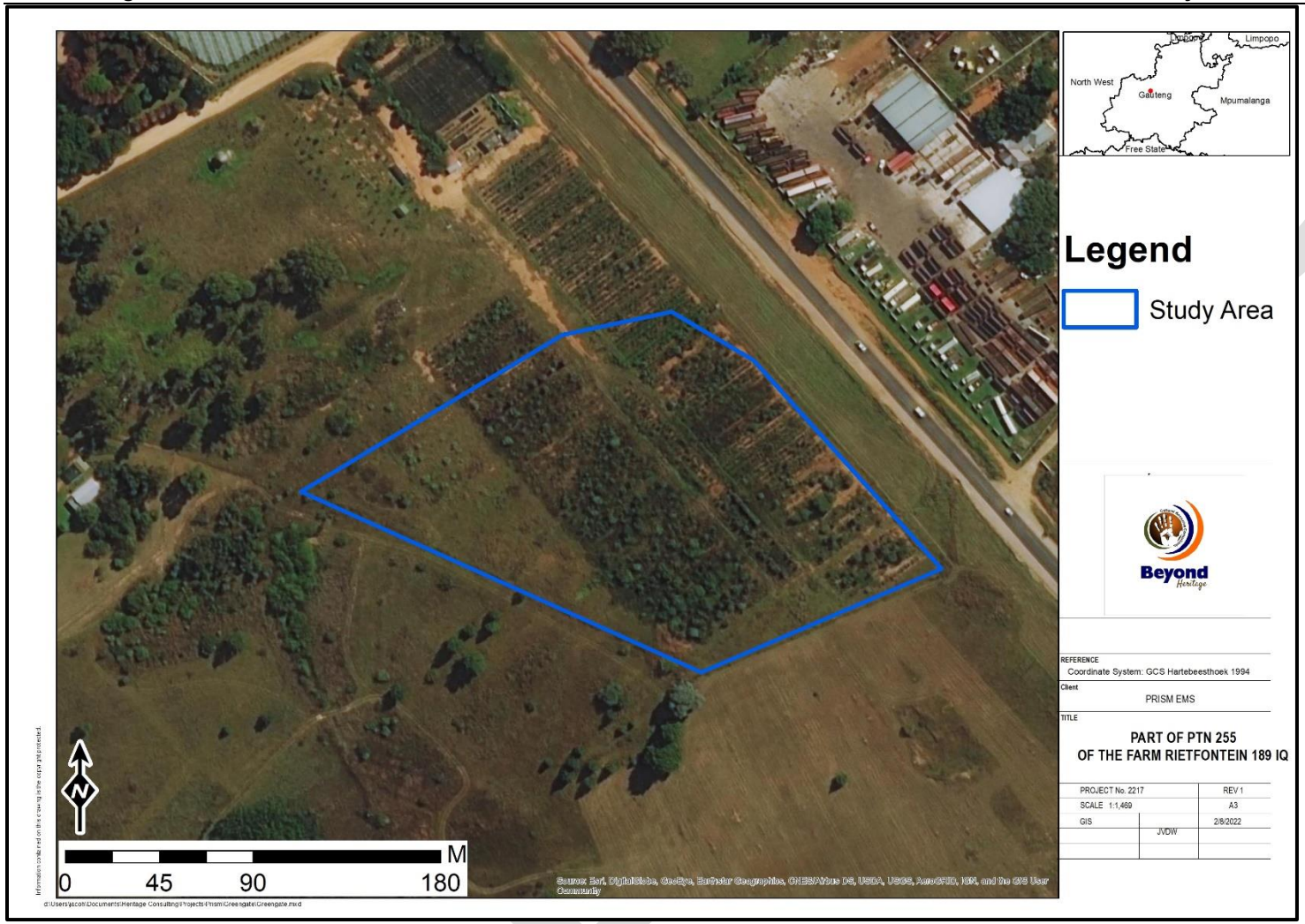


Figure 1.3. Aerial image of the study area.

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, 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 EA process, it involves stakeholders interested in, or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation process conducted by the EAP was to capture and address any issues raised by community members and other stakeholders during key stakeholder and public meetings.

3.4 Site Investigation

The aim of the site visit was to:

a) survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest;

b) record GPS points of sites/areas identified as significant areas;

c) determine the levels of significance of the various types of heritage resources recorded in the project area.

Table 4: Site Investigation Details

	Site Investigation
Date	24 April 2021
Season	Autumn - The development footprint is marked by rows of potted plants and trees limiting access, the study area was however sufficiently covered to understand the heritage character of the site (Figure 3.1).

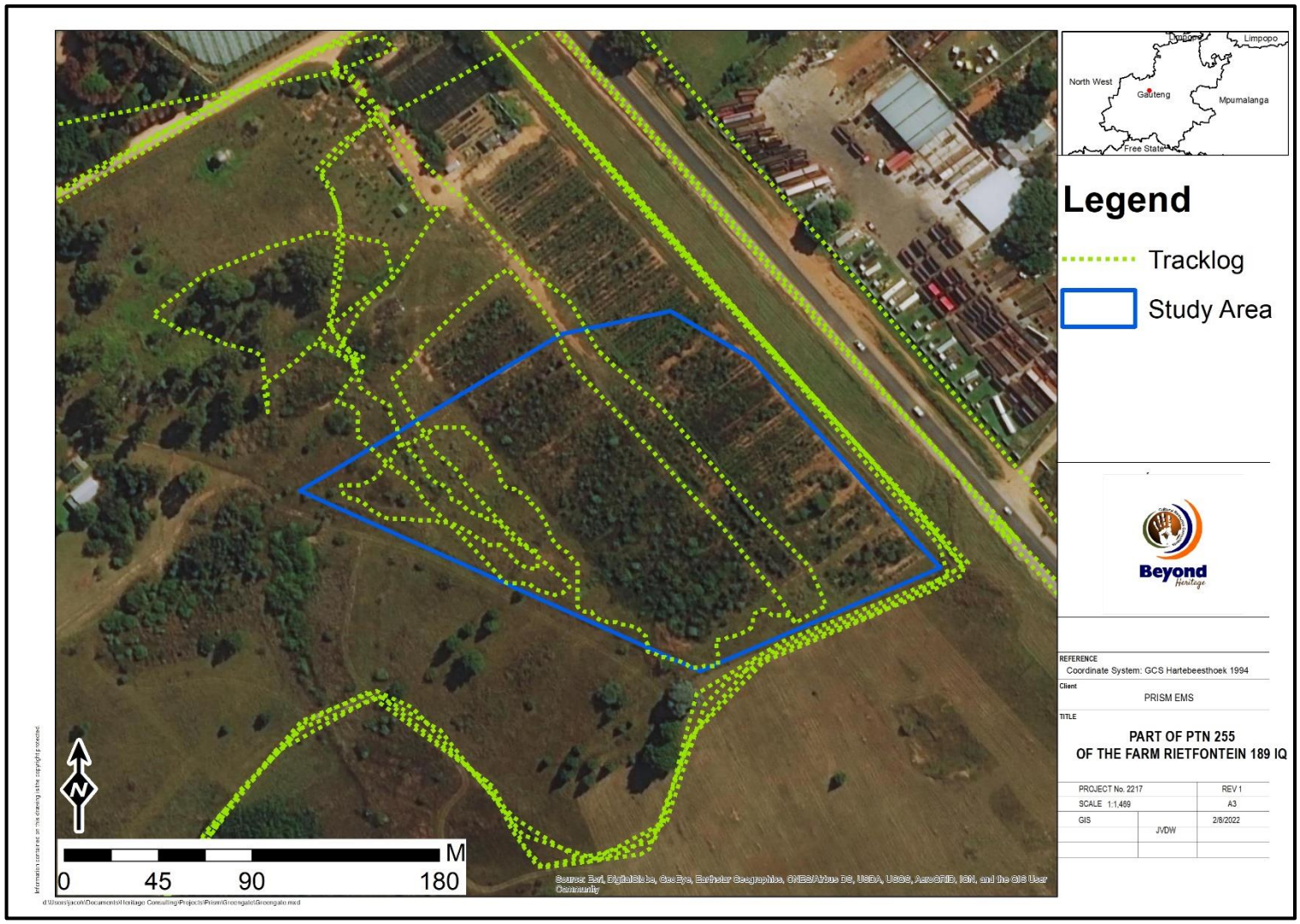


Figure 3.1. Tracklog of the survey path in green. Note the rows of plants and trees for the nursery.

3.5 Site Significance and Field Rating

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

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

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

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

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

Table 5. Heritage significance and field ratings

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

3.6 Impact Assessment Methodology

The 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 report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys that was limited by plants and trees from the nursery. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

4 Description of Socio-Economic Environment

According to Census 2011, Mogale City Local Municipality has a total population of 820 995 of people, of which 75,6% are black African, 21,0% are white, 0,8% are coloured, and 2,2% are Indian/Asian. Of those aged 20 years and older, 4,0% have completed primary school, 35,0% have some secondary education, 32,6% have completed matric, and 14,2% have some form of higher education.

134 635 people are economically active (employed or unemployed but looking for work), and of these, 24,6% are unemployed. Of the 60 706 economically active youth (15–34 years) in the area, 32,3% are unemployed.

5 Results of Public Consultation and Stakeholder Engagement:

5.1 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.

6 Literature / Background Study:

6.1 Literature Review (SAHRIS)

32 Previously recorded sites are on record for the 2627 BB 1: 50 000 sheet at the Wits database. These sites consist of Stone Age (ESA & LSA), Late Iron Age, Anglo Boer War remains, and Historic mining remains. None of these sites are located within the project area but provide a background of to the sites that can be expected.

CRM reports in the area include the following studies that were consulted for this report:

Table 6. Studies consulted for this report.

Author	Year	Project	Finding
Huffman, T.	2007	Archaeological Assessment of Van Wyks Restant, Krugersdorp	Low significance MSA site and historical structures.
Van der Walt, J	2008	Cultural heritage impact assessment on portion of portion 20 of the Farm Van Wyks Restant 182 IQ, Muldersdrift, Gauteng Province	No sites of significance
Fourie, W	2008	Heritage Scoping Proposed development for Village x9 on Portions 205 and 206 of the farm Roodekrans 183 IQ, Krugersdorp, Gauteng Province	Cemetery, no other sites of significance
Van der Walt, J.	2015	Archaeological Impact Assessment for the Village Ext 10 Residential Development. Roodekrans, Johannesburg, Gauteng Province	No sites of significance.
Van der Walt, J	2016	AIA for the proposed Greengate 70 Development	No sites of significance

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

The archaeological record for the greater study area consists of the Stone Age, Iron Age and Historical Period.

6.2.1 The 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 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.
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.

Excavations by Mason (1997) at the Boulders shopping centre provides a good platform for understanding the cultural use of the wider landscape. Remains dating to all three Stone Age Phases were identified by Mason at the Boulders shopping Centre site, MSA and LSA material was also recorded at Glenn Ferness cave. The study area is also located northwest of the Melville Koppies, which is a Middle Stone-Age site. (Bergh 1999: 4).

6.2.2 The Iron Age

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

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

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

The Melville Koppies area was also important to Iron Age communities, since these people had smelted and worked iron ore at the Melville Koppies site since the year 1060, by approximation. (Bergh 1999: 7, 87) The site was excavated by Professor Mason from the Department of Archaeology of WITS in the 1980's.

Extensive Stone walled sites are also recorded further South at Klipriviers Berg Nature reserve belonging to the Late Iron Age period. A large body of research is available on this area. These sites (Taylor's Type N, Mason's Class 2 & 5) are now collectively referred to as Klipriviersberg (Huffman 2007). These settlements are complex in that aggregated settlements are common, the outer wall sometimes includes scallops to mark back courtyards, there are more small stock kraals, and straight walls separate households in the residential zone. These sites date to the 18th and 19th centuries and was built by people in the Fokeng cluster.

In this area, the Klipriviersberg walling would have ended at about AD 1823, when Mzilikazi entered the area (Rasmussen 1978). This settlement type may have lasted longer in other areas because of the positive interaction between Fokeng and Mzilikazi.

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: 10). 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) It seems that, in 1827, Mzilikazi's Ndebele started moving through the area where Johannesburg is located today. This group went on raids to various other areas in order to expand their area of influence. (Bergh 1999: 11).

6.3 Historical Overview

The study area is located in close proximity to the towns of Roodepoort and Krugersdorp and therefore a short discussion on the origins of these towns are applicable. Roodepoort is a residential area which gets its name from the red soil that characterise the area. Roodepoort was established as a mine camp during the pioneering days of gold mining and dates back to 1884, when Fred Struben discovered the first payable gold in the area at what he called the Confidence Reef, a large rocky outcrop in the centre of Roodepoort. After the Great Trek of 1834-1840, some of the farmers who had left the Cape Colony settled in the interior of the country and the first farms in the vicinity of Roodepoort/Krugersdorp were already measured out in 1839/40. By the 1880's the area was settled by scattered Boer farmers on nine farms. This means that it is one of the first areas where white farmers settled. Four of the farms - Roodepoort, Vogelstruisfontein, Paardekraal and Wilgespruit were soon declared public diggings. The farm Paardekraal is also well known as the place where the Transvaal Boers placed a heap of stones in what is today known as the Paardekraal Monument. This was an act of unity between the Boers to fight for their freedom against Great Britain who annexed the Transvaal in April 1877.

The prospecting rights on the farm Roodepoort were secured by Jan Bantjies and the next year, gold was discovered. The farm was opened for public diggings. The diggers needed a place to pitch their tents and so the farm Roodepoort opened up its land and a shantytown sprang up. In 1857 the area formed part of the district of Pretoria as few other towns were established however four mining towns, Roodepoort, Florida, Hamberg and Maraisburg, were proclaimed between 1886 and 1888. In 1886 the main reef at Langlaagte in Johannesburg was discovered. The gold at Confidence Reef, mostly surface gold in quartz rock, soon ran out, but by then a settled community was established in Roodepoort. In 1963 the Roodepoort-Maraisburg municipality was changed to Roodepoort and city status was granted in 1977 (at which time Maraisburg was dropped from the name).

The area has a rich mining history with several large mining companies like the Klein Paardekraal Estate Gold Mining Co. Ltd, Main Reef Gold Mining Co. Ltd. and Consolidated Main Reef Mines Estate Ltd who obtained property in the area from the late 19th century. The mines used to have their own hospitals and cemeteries, especially relating to the so called native workers.

In 1934 permission was granted to Crown Mines Ltd. to establish a 'native burial ground' on the farm Vierfontein (and in 1942 permission was granted for the establishment of native cemeteries at Paardekraal to name a few examples). An unmarked cemetery associated with mine workers was exposed during development on the farm Paardekraal that stopped development in that area. During the Second World War some of the mine property was converted to be used by the Union Defence Force that included the Crown Mines hospital. It is therefore even possible that some graves in these cemeteries may belong to people who died during the war, although most probably not in active service

The Roodepoort area has several monuments. One of these is monument that commemorates the Jameson Raid of 1895. The old municipal offices in Berlandina Street, a plaster and stone building that is now used as the Roodepoort branch library was declared a national monument in 1985. Another national monument is the old Roodepoort Town School in Rex Street, on the site of the original building erected in 1894 to name but a few.

Krugersdorp was proclaimed a town in 1887 and owes its origin to two important events in the history of South Africa, namely The Transvaal War of independence (1881) and the discovery of the Witwatersrand Goldfields (1886). These two occurrences with their far-reaching political and economic consequences, were mainly instrumental in causing the establishment of two townships, originally apart, but subsequently united under the name of Krugersdorp. The one township became the business centre of the West Rand Goldfields, while the other sprang into existence by reason of the position and significance of the Paardekraal Monument.

Gold, manganese, iron, asbestos and lime are all mined in and around Krugersdorp and the area is characterised by a long mining history, which began when gold was discovered on the farm Paardekraal. Recently Krugersdorp Local Council was re-named after Chief Mogale, the young heir to the Po Chiefdom of the Batswana. The Po tribe, one of the original tribes, occupied the territory now known as Mogale City. They occupied an area that stretched from the Magaliesberg in the west to the present day Northcliff Ridge in the east, to the Vaal River in the southwest and Hartebeespoort Dam in the northwest.

Toward the end of the 1820s, the stability of the area was disrupted by the invasion of Mzilikazi ka Mashobane. Mzilikazi warriors easily overwhelmed the Po, killed their chief and took the young heir, Mogale wa Mogale, captive. Around 1830 the Voortrekkers, dissatisfied with life under British administration in the Cape Colony, began to migrate from the Cape. Mzilikazi was driven out of the area by the Voortrekkers under Paul Kruger, who named the area after himself.

The area has several significant historical sites. One of the most attractive buildings is the civic centre. The Earl of Selbourne, High Commissioner of the Transvaal and Orange Free State, unveiled the foundation stone of the original building in 1907. The JG Strijdom arch bust, designed by JH Labuschagne, was unveiled on 16 December 1966 by Susan Strijdom. It stands on gold-bearing rock. The arch was designed by T Pitout. Another interesting feature is the first stone of the cenotaph that was laid on 20 May 1922. It was unveiled by Sir Abe Bailey on 15 July 1922. The names of those who died in action during the World Wars were added in 1975.

More than 800 women and children were buried in the Concentration Camp Cemetery during the Boer War. The Memorial Avenue, which runs from Paardekraal to the hospital, commemorates those who died during the First World War. Several monuments are found in the area and include amongst others the Old Station Building, Voortrekkerpad Monument, Town Hall, Old Magistrate's Court Building, Paardekraal Monument, JG Strijdom Bust, Paul Kruger Statue, The Blockhouse, and The Concentration Camp.

7 Description of the Physical Environment

The farm Rietfontein and surrounding properties were at first commercial farms with their main focus on the production of crops and the raising of live-stock. Most of these farms were later sub-divided into small holdings which supported a wide range of businesses and activities.

The prevailing vegetation type and landscape features of the area form part of the Egoli Granite Grassland. It is described as moderately undulating plains and low hills supporting tall, usually *Hyparrhenia hirta*-grassland (Thatching grass), with some woody species on rocky outcrops or rock sheets. The rocky habitats show a high diversity of woody species, which occur in the form of scattered shrub groups or solitary small trees (Mucina & Rutherford, 2006). The site shows some little sign of the original prevailing vegetation types and is used for displaying trees and plants for the nursery. General site conditions are illustrated in Figure 7.1 to 7.4.

Figure 7.1. General site conditions in the south.

Figure 7.2. General site conditions showing saplings for sale.

Figure 7.3. General site conditions showing the existing nursery.

Figure 7.4. General site conditions

8 Findings of the Survey

The portion is characterized by multiple rows of potted and bagged plants and trees that are displayed in rows to be sold by the nursery. The rows of plants cover most of the study area with large sections of the property having been cleared for the storage of the plants being sold. A small section of open field is situated towards the south western edge. This area is overgrown with grass that seems to be the result of surface disturbance.

8.1 Heritage Resources

The study area is flat without focal points that would have attracted human occupation in antiquity and no heritage resources of significance were noted.

8.2 Cultural Landscape

The surrounding area used to be cultivated from before the 1940's (Figure 8.1 and Figure 8.2) and were mostly undeveloped until the 1970's (Figure 8.3). Currently the cultural landscape is urban in character marked by dense residential and commercial developments in the surrounding area that also impacted on the study area.

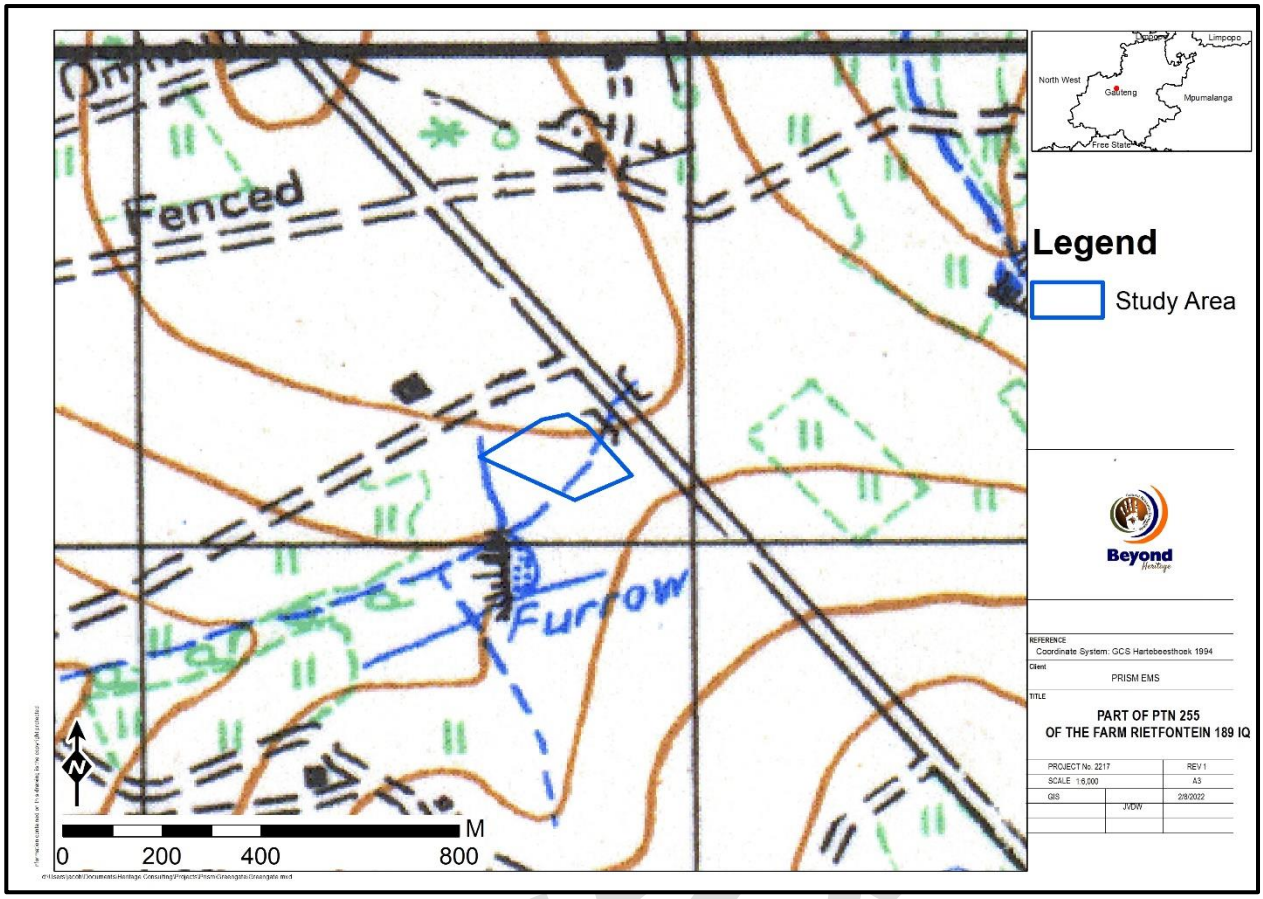


Figure 8.1. 1943 Topographic map of the study area indicating no developments in the study area.

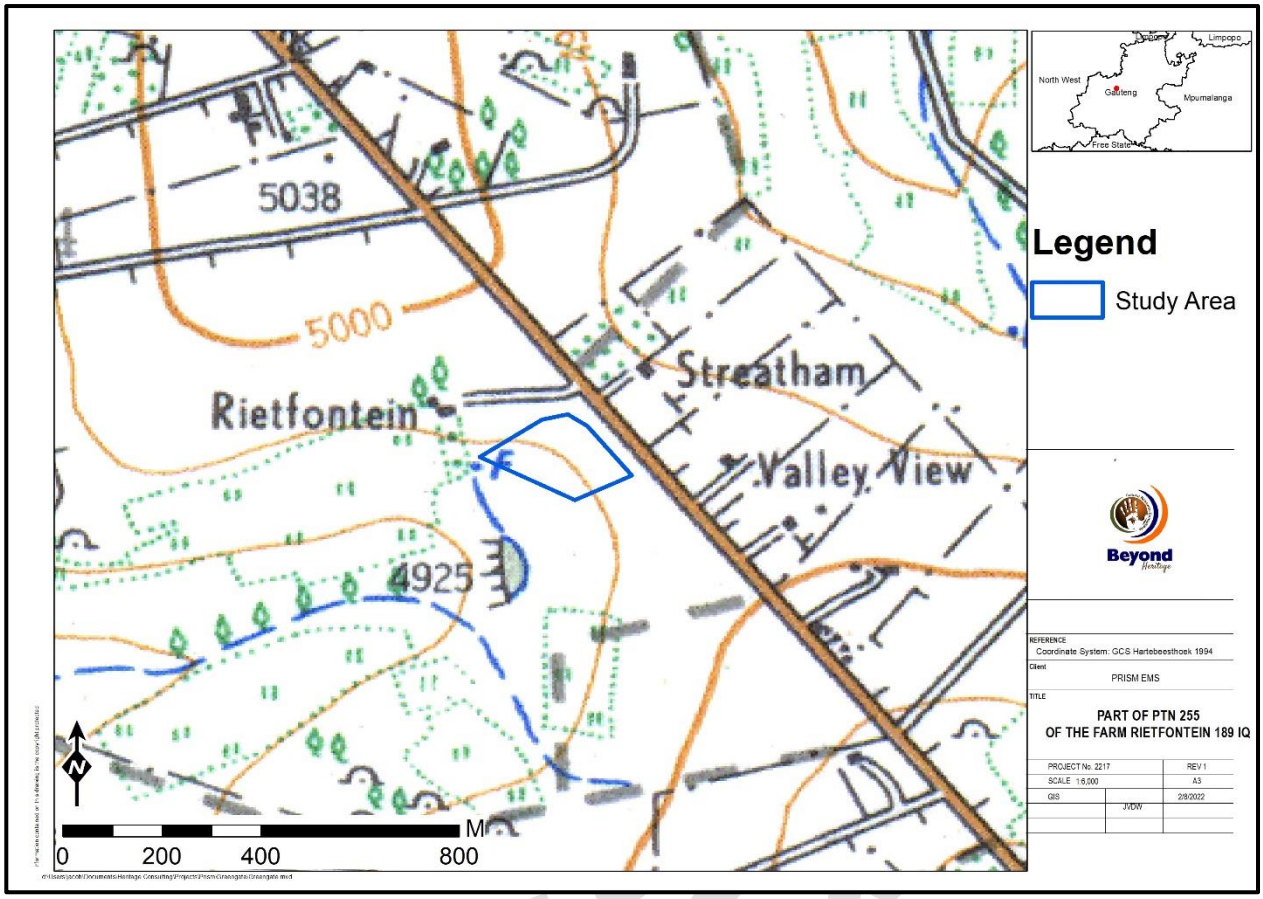


Figure 8.2. 1954 Topographic map of the study area indicating no developments in the study area.

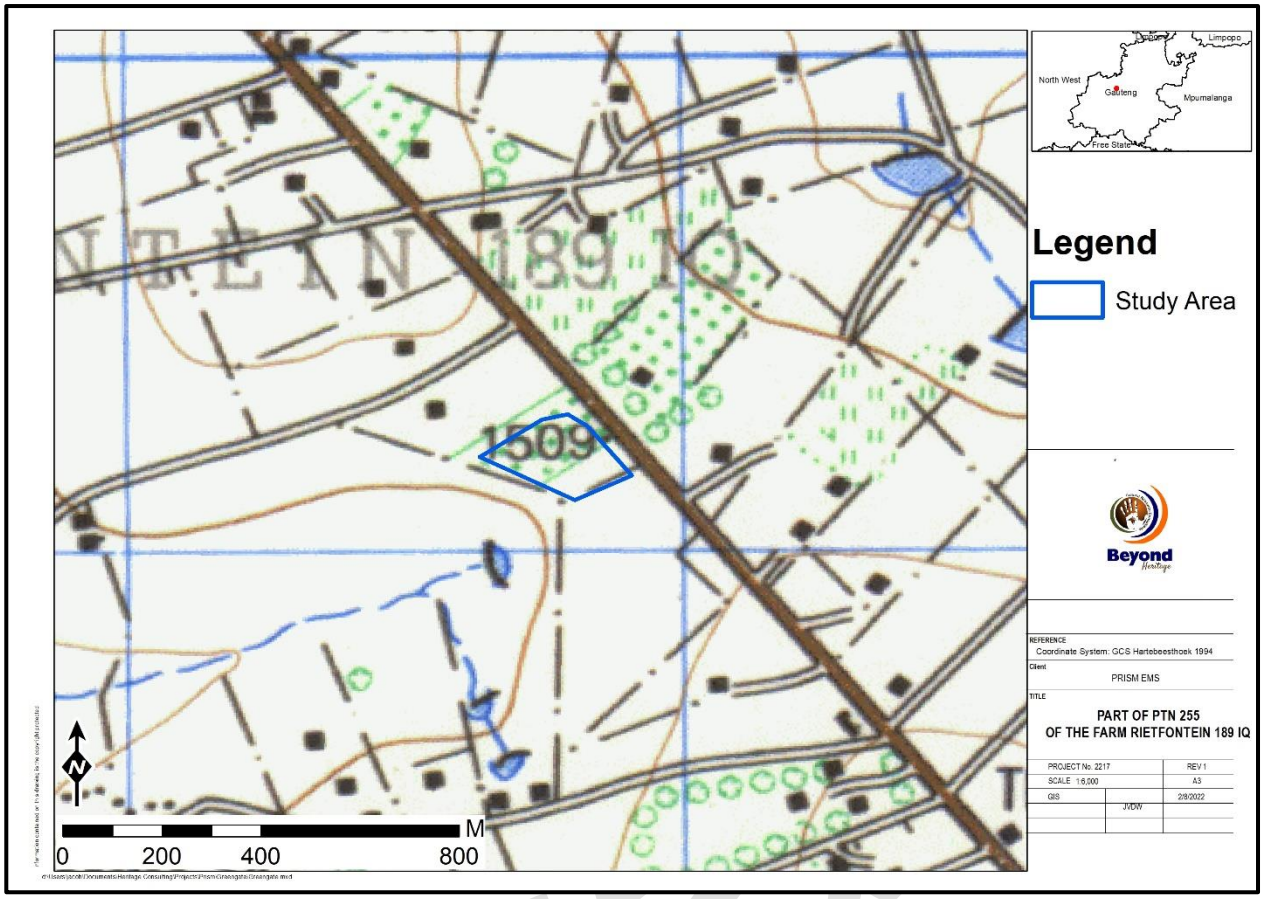
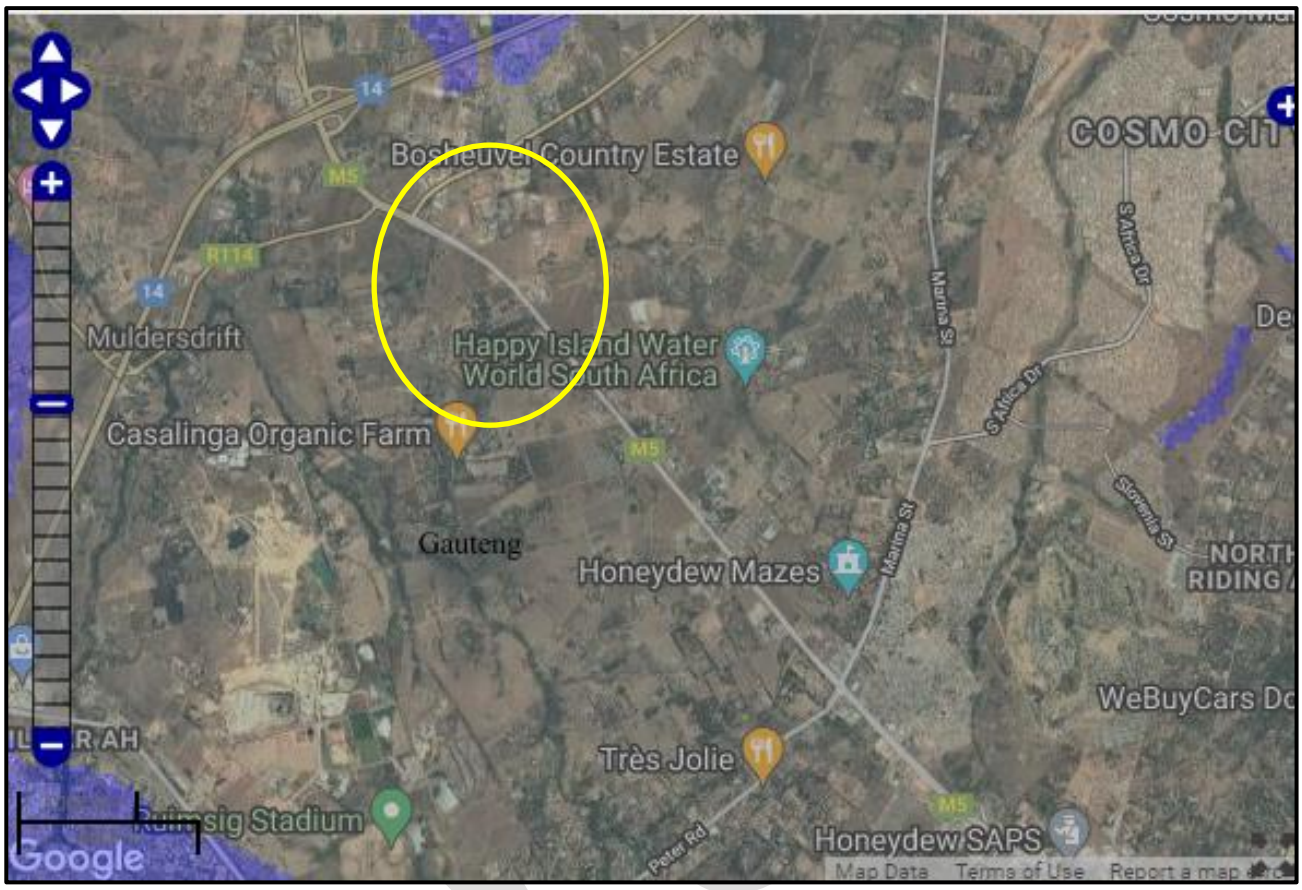


Figure 8.3. 1977 Topographic map indicating no development in the study area although utilisation of the area for agricultural purposes is evident.

8.3 Paleontological Heritage

According to the SAHRA Paleontological map the study area is of insignificant paleontological significance (Figure 8.4) and no further studies are required for this aspect.



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

9 Potential Impact

No heritage sites of significance occur within the impact area and no adverse impact to heritage resources is expected (Table 7). Any additional effects 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.

9.1 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.

9.2 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.

9.3 Operation Phase

No impacts are expected during the operation phase.

9.4 Impact Assessment for the Project

Table 7. Impact assessment of the proposed project.

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	Minor (2)	Minor (2)
Probability	Improbable (2)	Improbable (2)
Significance	**18 (Low)**	**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;		
Cumulative impacts: The proposed project will have a low cumulative impact as no known heritage resources will be adversely affected.		
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

From a heritage perspective the study area is considered to be of low heritage potential. This expectation was confirmed through a desktop study and a site visit that revealed no structures older than 60 years, grave sites, or sites of archaeological significance. No adverse impact on heritage resources is expected by the project and it is recommended that the project can commence on the condition that the following recommendations (Section 10) are implemented as part of the EMPr and based on approval from SAHRA.

10.1 Recommendations for condition of authorisation

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

Recommendations:

- Implementation of a chance find procedure for the project (as outlined in Section 10.2).

10.2 Chance Find Procedures

10.2.1 Heritage Resources

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped, and a qualified archaeologist must be contacted for an assessment of the find and therefor chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below and monitoring guidelines for this procedure are provided in Section 10.5. This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below:

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

10.3 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 are the highest risk). This can cause delays during construction, as well as additional costs involved in mitigation, as well as additional layout changes.

10.5 Monitoring Requirements

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

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

Table 8. Monitoring requirements for the project

Heritage Monitoring					
Aspect	**Area**	**Responsible for monitoring and measuring**	**Frequency**	**Proactive or reactive measurement**	**Method**
Entire site	Entire project area	ECO	Weekly (Pre construction and construction phase)	Proactively	• If risks are manifested (accidental discovery of heritage resources) the chance find procedure should be implemented: 1. Cease all works immediately; 2. Report incident to the Sustainability Manager; 3. Contact an archaeologist/ palaeontologist to inspect the site; 4. Report incident to the competent authority; and 5. Employ reasonable mitigation measures in accordance with the requirements of the relevant authorities. • Only recommence operations once impacts have been mitigated.

10.6 Management Measures for inclusion in the EMPr

Table 9. 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 Phase	Throughout the project	Applicant EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 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 and monitoring of the study area by the ECO.

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