

# HERITAGE IMPACT ASSESSMENT

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

FOR THE PROPOSED MATSOPA PROSPECTING RIGHT APPLICATION, KOPPIES,  
FREE STATE PROVINCE

**Type of development:**

Prospecting

**Client:**

Cabanga Environmental

**Developer:**

Matsopa Minerals (Pty) Ltd



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**APPROVAL PAGE**

<b>Project Name</b>	Matsopa Prospecting Application, Koppies, Free State
<b>Report Title</b>	Heritage Impact Assessment for the proposed Matsopa Prospecting Application, Koppies, Free State Province.
<b>Authority Reference Number</b>	<b>FS 30/5/1/1/3/2/1 (10631) EM</b>
<b>Report Status</b>	Final Report
<b>Applicant Name</b>	Matsopa Minerals (Pty) Ltd

<b>Responsibility</b>	<b>Name</b>	<b>Qualifications and Certifications</b>	<b>Date</b>
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**Amendments on Document**

Date	Report Reference Number	Description of Amendment
20 April 2022	2022	Addressed stakeholder comments.

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## REPORT OUTLINE

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

**Table 1. Specialist Report Requirements.**

Requirement from Appendix 6 of GN 326 EIA Regulation 2017	Chapter
(a) Details of - (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae	Section a Section 12
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority	<i>Declaration of Independence</i>
(c) Indication of the scope of, and the purpose for which, the report was prepared	Section 1
(cA) an indication of the quality and age of base data used for the specialist report	Section 3.4 and 7.1.
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	9
(d) Duration, Date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3.4
(e) Description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 3
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of site plan identifying site alternatives;	Section 8 and 9
(g) Identification of any areas to be avoided, including buffers	Section 8 and 9
(h) Map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	Section 8
(I) Description of any assumptions made and any uncertainties or gaps in knowledge	Section 3.7
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity including identified alternatives on the environment or activities;	Section 1.3
(k) Mitigation measures for inclusion in the EMPr	Section 10.1
(l) Conditions for inclusion in the environmental authorisation	Section 10. 1.
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 10. 5.
(n) Reasoned opinion - (i) as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Section 10.3
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report	Section 6
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to BAR report
(q) Any other information requested by the competent authority	N.A

### Executive Summary

Cabanga Environmental was appointed as the Environmental Assessment Practitioner (EAP) by Matsopa Minerals (Pty) Ltd to undertake the required Environmental Authorisation Process for a prospecting application approximately 12km north-northeast of the town of Koppies in the Free State Province. Prospecting activities will consist of a drilling program of  $\pm 330$  holes, with 10 m<sup>2</sup> per borehole being impacted on/disturbed by drilling activities.

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:


- Large sections of the study area are under cultivation from the 1960's to the present. These activities would have impacted on heritage features if any ever occurred in these areas;
- The assessment focused on the prospecting boreholes;
- Heritage finds were limited to demolished structures of low significance (Site 4) and cemeteries (Site 1 to 3) that are of high social significance. Only Site 1 and 4 are located within the boundaries of the study area;
- The palaeontological assessment concluded that the impact on the palaeontological heritage of the area would be very low and no further action is necessary for this aspect.

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:

- Recorded sites should be indicated on development plans and avoided with a 30-metre buffer zone;
- Existing access roads should be used as far as possible;
- The recorded sites should be monitored by the ECO during prospecting to ensure that there is no impact to these features;
- Implementation of a chance find procedure for the project .

**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 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I:</p> <ul style="list-style-type: none"> <li>• I act as the 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 24F of the Act.</li> </ul>
<b>Signature</b>	
<b>Date</b>	18/01/2022

**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 prospecting application on the farms Geluk 237 and Goudlaagte 238, located approximately 12km north-northeast of the town of Koppies in the Free State Province (Figure 1-1 to 1-4). 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 utilised 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, cemeteries and ruins 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 BA report and its appendices must be submitted to the case as well as the EMPr, once it's completed by the Environmental Assessment Practitioner (EAP).

### 1.1 Terms of Reference

#### Field study

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

#### Reporting

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

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

## 1.2 Project Description

Project components and the location of the proposed prospecting application are outlined under Table 2 and 3.

**Table 2: Project Description**

<b>Project area</b>	340.4897 Ha on Geluk 237 and Goudlaagte 238
<b>Magisterial District</b>	Ngwathe Local Municipality of the Fezile Dabi District Municipality
<b>Central co-ordinate of the development</b>	27° 8'50.49"S 27°35'40.53"E And 27° 8'16.70"S 27°36'17.04"E
<b>Topographic Map Number</b>	2727 BA

**Table 3: Infrastructure and project activities**

<b>Type of development</b>	Prospecting Application
<b>Size of development</b>	340.4897 Ha
<b>Project Components</b>	<p>The application relates to the search for commercially viable ore bodies of the following minerals:</p> <ul style="list-style-type: none"> <li>• Clay, including Bentonite Clay (CB),</li> <li>• Clay (General),</li> <li>• Shale/Brick Clay (CS), and</li> <li>• Illite-Montmorillinte Group (Clay) (CI).</li> </ul> <p>Matsopa Minerals owns and operates the Koppies Bentonite Mine located on various portions of the farms Oceaan and Blaauwboschpoort. Mining of these bentonite reserves commenced in circa. 1964, it is understood that the reserves are nearing depletion and that approximately 6 months Life of Mine (LoM) is remaining.</p> <p>The proposed Prospecting Right Area is adjacent to Matsopa's existing mining operations, and the purpose of the prospecting programme will be to identify additional reserves in the area to ensure the sustainability of the company and continued employment of the current workforce.</p> <p>Prospecting activities will include non-invasive (desktop investigations and geophysical surveys) and invasive techniques (drilling). It is currently anticipated that the proposed drilling program will consist of ±330 holes, with approx. 10 m<sup>2</sup> per borehole being impacted on/disturbed by drilling activities. A small contractor's camp consisting of a caravan and portable ablution facilities will be erected on each of the farms for the duration of the prospecting programme (location to be confirmed based on the outcome of the specialist studies). Existing farm roads and tracks will be utilised, and no new roads will be constructed. Water requirements will be minimal, water for drilling and potable use will be tanked to site.</p>

## 1.3 Alternatives

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

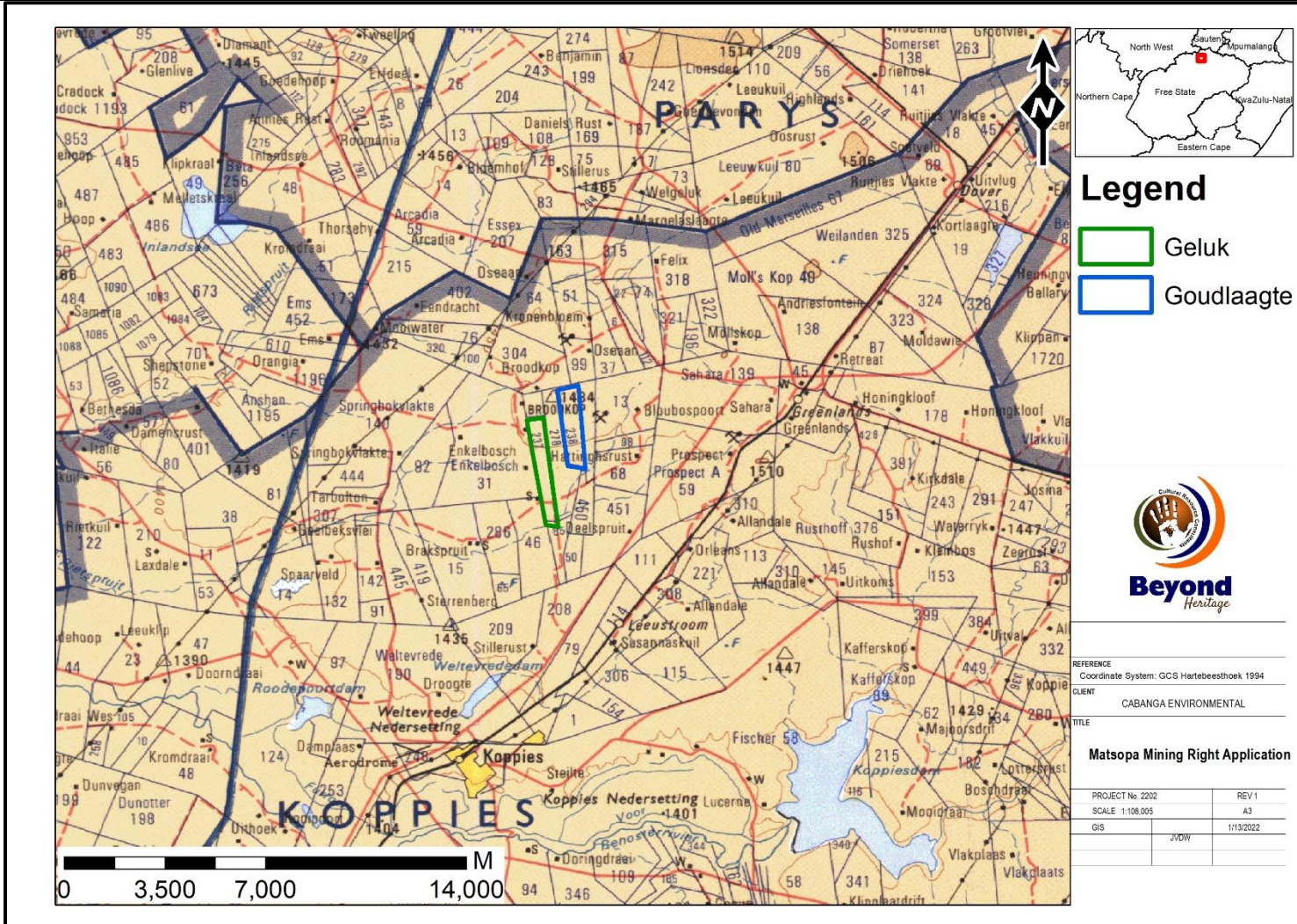


Figure 1.1. Regional setting (1: 250 000 topographical map).

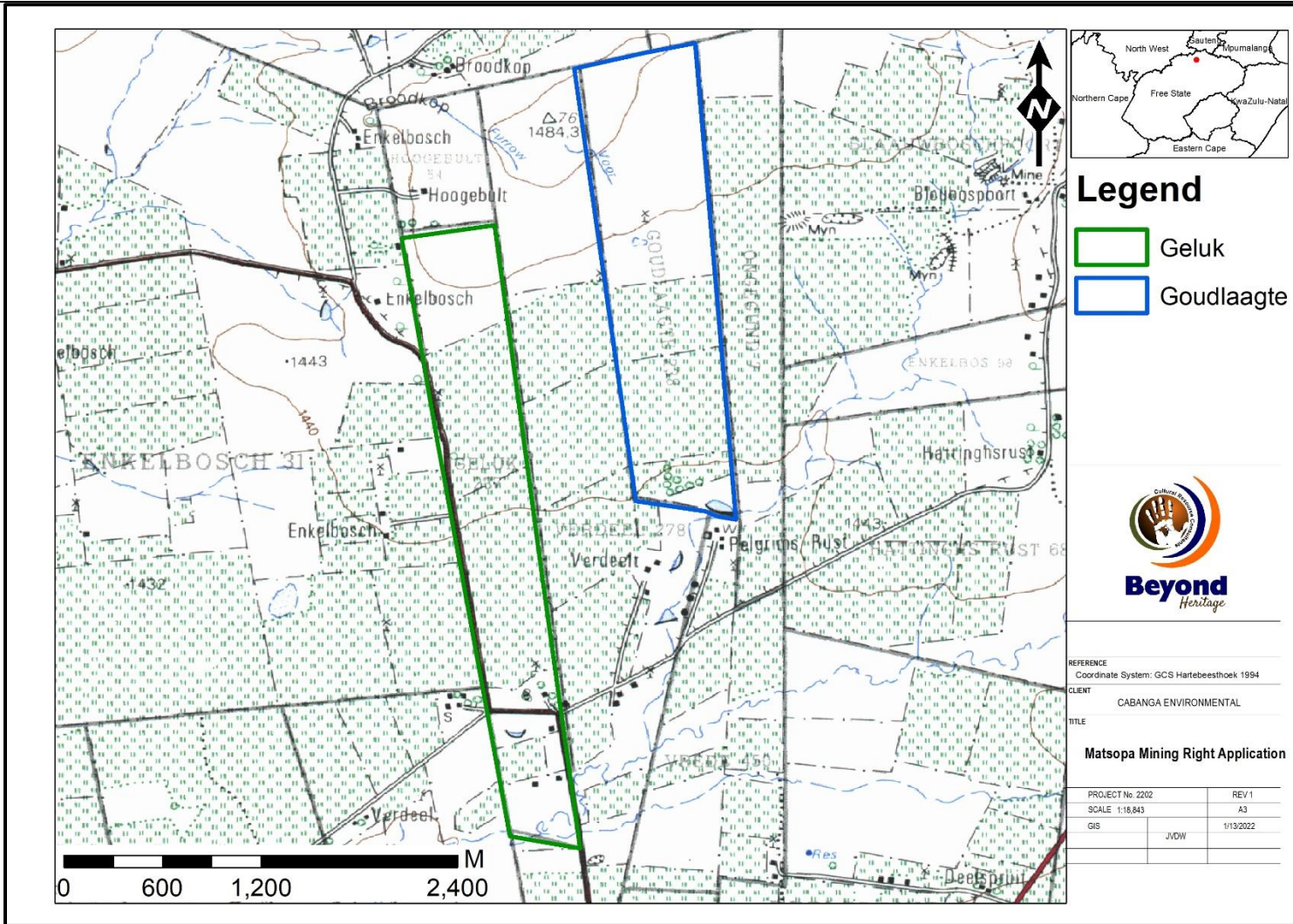


Figure 1.2. Local Setting of the project (1: 50 000 topographical map).

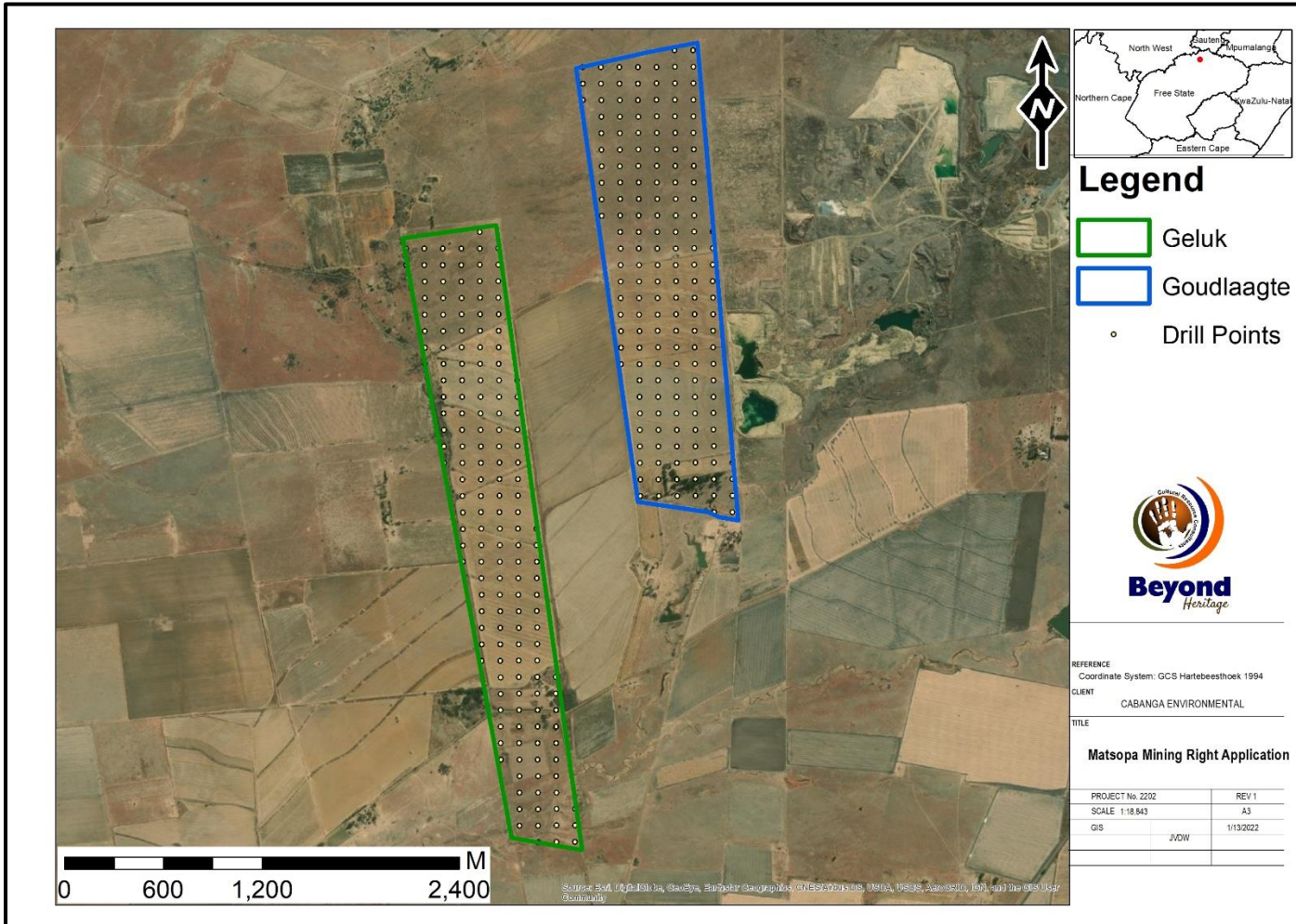


Figure 1.3. Aerial image of the drill points.



## 2 Legislative Requirements

The HIA, as a specialist sub-section of the BA, 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 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	Week of 12 January 2022
Season	Summer – The cultivated crops and dense vegetation after extremely high rainfall limited accessibility and archaeological visibility. The development footprint was however sufficiently covered to understand the heritage character of the area (Figure 3-1).

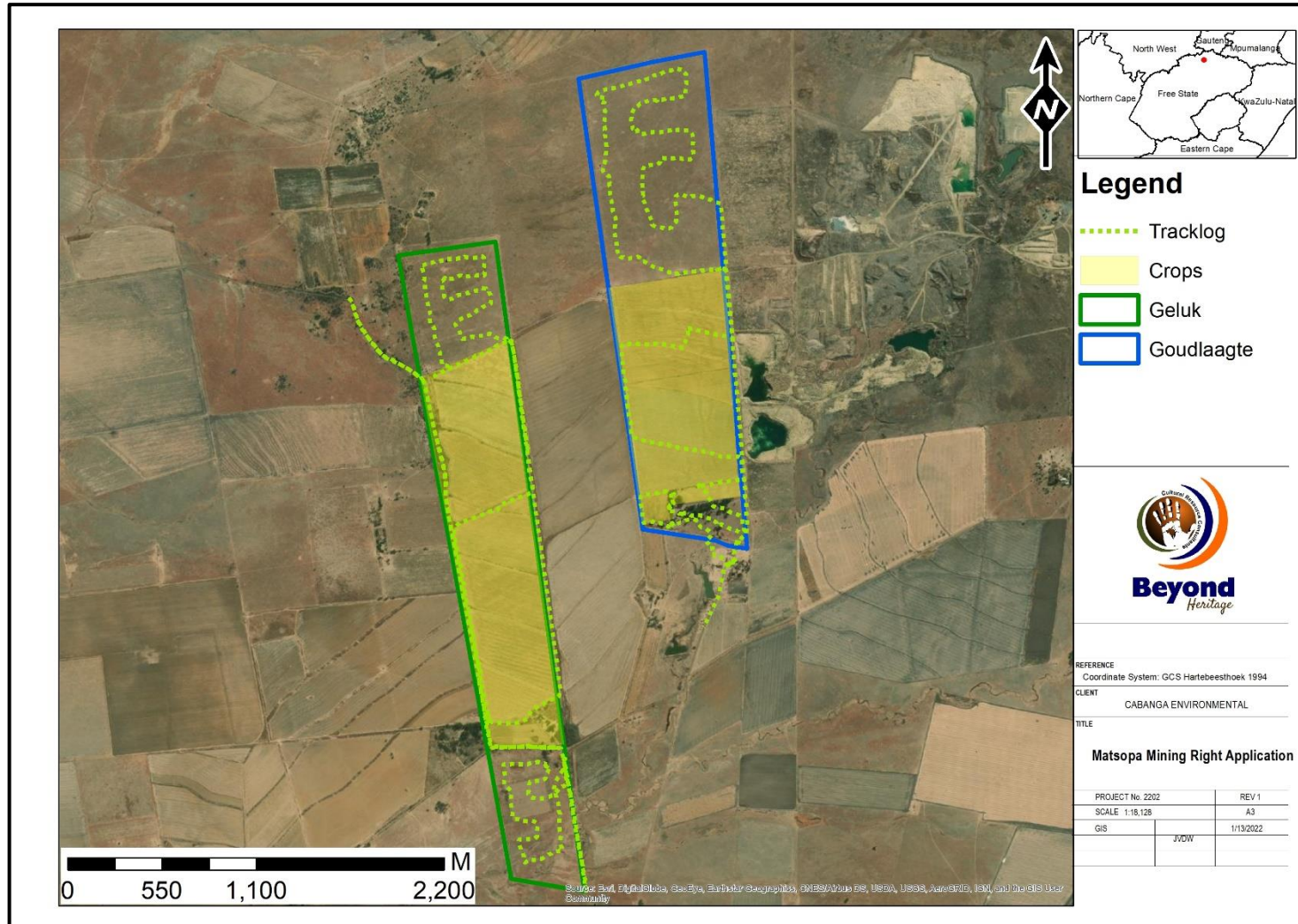


Figure 3.1. Tracklog of the survey in green.

### 3.5 Site Significance and Field Rating

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

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

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

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

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

**Table 5. Heritage significance and field ratings**

<b>FIELD RATING</b>	<b>GRADE</b>	<b>SIGNIFICANCE</b>	<b>RECOMMENDED MITIGATION</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. Also, access restrictions relating to cultivated fields resulted in that these areas were not physically walked but only assessed visually. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

## 4 Description of Socio-Economic Environment

The following information was obtained from StatsSA: According to Census 2011, Ngwathe Local Municipality has a total population of 120520 people, of which 86,5% are black African, 10,3% are white people and with the other population groups making up the remaining 3,2%. Of those aged 20 years and older, 5,4% have completed primary school, 34,7% have some secondary education, 25,9% have completed matric and 6,4% have some form of higher education. There are 39 555 economically active (employed or unemployed but looking for work) people, and of these 35,2% are unemployed. Of the 20204 economically active youth (15–35 years) in the area, 45,1% are unemployed.

## 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. Comments were received from Natasha Smalberger on behalf of various landowners and users in the Koppies District on 11 April 2022 and raised concerns regarding the omission in the HIA of the Vredefort Concentration camp and associated cemetery located more than 4,5 km to the east of the study area. No direct impact is expected to this site, and it was therefore not discussed further in the initial report. The site is mentioned in Section 6.1.1 and 6.3 of the revised heritage report. The email further expressed concerns that subsurface artefacts dating to the Anglo Boer war in the area would be lost. Any subsurface finds will be mitigated and managed through the implementation of the recommended chance find procedure as detailed in Section 10.2 of this report.

## 6 Literature / Background Study:

### 6.1 Literature Review (SAHRIS)

Through secondary source material, primary sources, maps and online sources the study area is contextualised. The SAHRA electronic database is currently offline and could not be accessed. Few studies are on record for the larger area including the studies listed in Table 7.

Table 6. Studies consulted for this project.

Author	Year	Project	Findings
Dreyer, C.	2006	First Phase Archaeological and Cultural Heritage Assessment of The Proposed Animal Breeding Station at The Farms Rietkuil 110, Dampoort 327, Winkelhaakdam 455, Mt Sinai 292, Gibson 294 & Van Vuurenskop 457, Vredefort, Free State	No sites were identified.
Dreyer, C.	2006	First Phase Archaeological and Cultural Heritage Investigation of The Proposed Residential Developments on The Farms Denoon 808, Maara 618, Aasvogelrand 249, Bergplaats 240 & Union 440, Vredefort, Free State	Structures and historical finds including mining remains and also stone packed walls.
Dreyer, C.	2008	First Phase Archaeological and Cultural Heritage Assessment of The Proposed Residential Developments at The Farm Buffelskloof 511 IQ, Vredefort Dome, Potchefstroom, North-West Province	Iron Age Sites
Van der Walt, J.	2013	Archaeological Impact Assessment For the proposed Jumanji Estate Development, Parys, Free State Province	Structures and MSA artefacts
Van der Walt, J.	2018	Heritage Impact Assessment Aasvogelrand Tented Camp, Vredefort, Free State Province,	No Sites
Van der Walt, J.	2021	Heritage Desktop Report Lengana Health SA (Pty) Ltd, Ngwathe District Municipality. Koppies	Structures



### 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, but a concentration camp memorial site is indicated approximately 5 km Southeast of the study area. Numerous cemeteries are also on record including the Rhenoster Rivier Military Cemetery as well as a Jewish Cemetery amongst others in the town of Koppies. The Vredefort Road Concentration Camp is also located in the greater area (-27.152665° 27.652622°). All that remains of the camp is a cemetery. None of these sites will be impacted on by the development and not further discussed here.

## 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.

The Vaal Gravels are known to contain Early and Middle Stone Age Artefacts (van Riet Lowe 1937, 1952; Butzer et al. 1973; Helgren 1978; Gibbon, et al. 2009). Some important ESA sites providing background to the larger study area are included below:

**Table 7. Known ESA sites**

Site Name	Period	Source
Pneil	Acheulean	Beaumont & Morris 1990
Power's Site	Acheulean	Power 1955; Beaumont & Morris 1990
Riverview Estate	Acheulean	van Riet Lowe 1945; Helgren 1978

Some Rock Engraving sites are also on record around the greater study area. Directly to the northwest of current operations, the rock engraving site of Leeuwkuil is located. Hollmann (1999) described the sites as being located on a small island in the Vaal River. Engravings are concentrated on the south-eastern part of the peninsula.

The images are dominated by Eland and other antelope, which appeared to be in the San hunter-gatherer engraving tradition (Hollmann, 1999). Pistorius (2007) discusses the Redan rock engraving site which contains up to 244 rock engravings. These engravings depict animals, geometric designs as well as San weapons (Du Piesani 2014).

### 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.

Almost no Iron Age Sites are on record close to the study area. The closest sites are towards the southeast at Heilbron where Type N walling led to Type V named after Vegkop near Heilbron (Maggs,1976). Type V consists of the standard core of cattle enclosures surrounded by beehive houses and grain bins, but outer walls are usually absent. Corbelled huts have been associated with this type. These low huts were originally occupied by herd boys but in some areas of the Free State they may have served as houses for adults.

## 6.3 Historical Overview

The first Europeans arrived in the Cape in 1652, and expansion to the north only started in the late 1820s. In 1836 on 16 October the Battle of Vechtkop (Vegkop), near present day Heilbron, FS, between the Voortrekkers and the Ndebele takes place. Kalipi attacks the laager with 6 000 warriors. 430 Ndebele and two Voortrekkers are killed. There is difference of opinion about the exact date of the attack, but it is certain that news of the campaign reached the Ndebele king at Kapain, Marico district, on 25 October.

The Great Trek of 1837, as this northern movement of white people from the Cape Colony was called, resulted in a mass migration of white people into the northern areas of South Africa. (Ross 2002:39) The discovery of diamonds and gold in the northern provinces between 1867 and 1886 had very important consequences for South Africa. After the discovery of these resources, the British, who at the time had colonised the Cape and Natal, had intentions of expanding their territory into the northern Boer republics. This eventually led to the Anglo-Boer War, which took place between 1899 and 1902, and which was one of the most turbulent times in South Africa's history. Even before the outbreak of war in October 1899 British politicians, including Sir Alfred Milner and Mr. Chamberlain, had declared that should Britain's differences with the Z.A.R. result in violence, it would mean the end of republican independence. This decision was not immediately publicised, and as a consequence republican leaders based their assessment of British intentions on the more moderate public utterances of British leaders. Consequently, in March 1900, they asked Lord Salisbury to agree to peace on the basis of the status quo ante bellum. Salisbury's reply was, however, a clear statement of British war aims. (Du Preez 1977).

Based on information obtained from Mr Herbst, the owner of Goudlaagte 238, the farm was previously owned by the Kirsch family, and home to South African Poet Olga Kirsch. She was born in the Koppies area in 1924 and holds a unique place in Afrikaans literature. As an English-speaking Jewess who chose to write and publish poetry in Afrikaans (Roth 2017)

### 6.3.1 Battles and Battlefield sites in relation to the study area

#### 6.3.1.1 Historical Battles

The only historical battle on record for the area is the battle of Vechtkop (1836) 49 km east of the study area.

The northern Free State is located within the area where some of the main operations of the Boer General, Christiaan De Wet, took place between 1899 and May 1900 when the war ended. De Wet, among the other Boer generals, realized that they could not win the war by conventional means, and spread out into small hit-and-run groups that inflicted serious casualties on the British armies. This is known as Guerrilla warfare. The British Commander-In-Chief, Lord Kitchener, consequently turned to the destruction of Boer crops and

built concentration camps where the wives and children of the Boer soldiers were interned. This “scorched earth” policy of the British finally resulted in the demoralisation of the Boers. (Readers Digest 1984: 33) Some skirmishes took place on towns in the vicinity of Koppies. Kroonstad was one of these towns. On 12 March 1900, on the eve of the occupation of Bloemfontein by Lord Roberts, President M. T. Steyn declared Kroonstad the new capital of the Free State government. It simultaneously became the organising centre for retreating Boer commandos and a depot for stores of all kinds. It was also at Kroonstad that it was decided in March 1900 to abolish wagon laagers and to employ mounted commandos instead. This heralded a new method of warfare with increased mobility, which later became known as guerrilla warfare. Kroonstad remained the Free State capital until 11 May 1900, when the British were victorious at Zand River. Kroonstad remained in British hands for the rest of the war, and housed concentration camps for both Boer civilians and black people. (Pretorius 2010: 225-226)

Lindley is another town located close to where some of the very few successful Boer sieges during the war took place here. Spagge's Battalion of 500 men reached Lindley from Kroonstad on 27 May 1900. The battalion had covered 90 miles in three days and only had rations for two days. As they approached Lindley, the battalion came under heavy rifle fire from a group of Boers. During five days of fighting the British casualties came to 468. The British finally gave in when they realized they were completely surrounded, and became the prisoners of war of General Piet de Wet. (Pretorius 2010: 244-245).

A central figure in the establishment of the town Koppies was Emily Hobhouse. Concerned about the economic and personal losses of the Boer people, throughout the Anglo Boer war, she promoted the idea of home-industry among the inhabitants of the town. Her vision and courage was manifested in the Lace school at Phillipolis.

Peace talks between the Boers and the British had started around April 1902, and culminated in the Peace of Vereeniging treaty on 31 May 1902. This event signalled the end of the Anglo-Boer War, as well as the temporary end of the Boer Republics' independence. (Geschiedenisatlas van Suid-Afrika 1999: 251)

In 1904, General C.R. de Wet established a settlement on the banks of the Renoster River for underprivileged whites. He donated his Farm "Rooipoort" in order to relieve the poverty caused by the war in the form of a few morgen irrigation land, and then a few morgen "dry" land for cultivating maize. Inhabitants were supplied with a few eggs and a paraffin lamp/hatcher for the eggs. In 1926 this settlement achieved municipal rights and became the town of Koppies.

By demand/pressure of General De Wet, the "Koppies Dam" was constructed to supply water for irrigation, and work to the local people who needed it badly. The Vredefort Concentration camp is indicated more than 4,5 km to the east of the study area and no impact is expected to this site.

### 6.3.1.2 World War I

At the start of the 1914-Rebellion (or "Armed protest" as it was called), it is decided in Koppies, OFS, that Gen. C.R. de Wet is to lead the rebels in the Free state (7 000 men), while Gen. C.F. Beyers (after whom "Oom Bey" was later named), is to lead the 3 000 rebels in the Transvaal (SA History 2013). About 2 000 would take up arms in the Cape Province. This decision was made in the old NG-church, the Minister was C.R Ferreira. After the war, he returned to minister in Koppies. He passed away in 1932 and was buried in the church grounds.

## 7 Description of the Physical Environment

The project area predominantly consists of large, cultivated crop fields and smaller camps used as grazing land. The ploughed fields cover the largest portions of the project area and are generally inaccessible. The areas that are allocated for grazing of cattle and sheep are overgrown with a thick cover of grass due to the recent heavy rainfall and the entire project area is waterlogged after the heavy rains. General site conditions area illustrated in Figure 7.1 to 7.4).



Figure 7.1. Cultivation in the study area.



Figure 7.2. Waterlogged areas occur throughout the study area.



Figure 7.3. Ploughed areas in the study area.



Figure 7.4. General site conditions – dense grass cover.

## **8 Findings of the Survey**

### **8.1 Heritage Resources**

The study area is flat without focal points like natural pans or rocky outcrops that would have attracted human occupation in antiquity. The project area consists of open veld used for grazing, characterised by dense vegetation after the recent rains and large areas that are ploughed and cultivated. Previous disturbances relating to cultivation of the study area is evident throughout the area and during the site visit heritage finds were limited to the remains of structures and cemeteries (Table 9 and Figure 8.1). General conditions at these sites are illustrated in Figure 8.2 – 8.5. Please note that the cemeteries at Site 1 & Site 2 are outside of the impact areas.

Table 8. Recorded features

Label	Longitude	Latitude	Description	Significance
Site 1	27° 36' 14.2016" E	27° 08' 39.4118" S	<p>Cemetery on the farm Goudlaagte Minimum of 8 graves, possibly 10.</p> <ul style="list-style-type: none"> <li>• 3 were marked <ul style="list-style-type: none"> <li>○ Maria Letsaba date of death 1956</li> <li>○ Lapi Letsaba date of death 1959</li> <li>○ Samson Nxamele date of death 16 August 1981</li> </ul> </li> <li>• 5 collapsed and/or unreadable concrete markers / headstones.</li> <li>• What could be 2 stoned packed graves, overgrown with weeds.</li> </ul>	GP A High Social Significance
Site 2	27° 35' 55.9575" E	27° 09' 32.7369" S	<p>Cemetery on the farm Geluk Minimum of 7 graves.</p> <ul style="list-style-type: none"> <li>• 5 marked <ul style="list-style-type: none"> <li>○ Soloman Mohau Africa date of death 1981</li> <li>○ Tsali Anna Maferka date of death 1996</li> <li>○ Motlogeloa Stephan Molefe date of death 1995</li> <li>○ Elizabeth Ntoba date of death 1983</li> <li>○ Seboka Lucas Ntoba date of death 1981</li> </ul> </li> <li>• 2 unmarked</li> </ul>	GP A High Social Significance
Site 3	27° 35' 55.9609" E	27° 09' 34.4530" S	<p>Cemetery on the farm Geluk with a minimum of 12 graves.</p> <ul style="list-style-type: none"> <li>• Mabuti Jacob Letsaba, Date of death: 12 March 1976</li> <li>• Lapi Johannes Letsaba, Date of death: 12 April 1974</li> <li>• Mojalefa Sello Letsaba, Date of death: 24 March 1972</li> <li>• Joseph Moletsane,</li> <li>• Jacob Mabuti, Date of death: 07 June 1987</li> <li>• Suzan Disebo, Date of death: 17 October 1986</li> <li>• Samuel Tshpo Letsaba, Date of death: 22 April 1985</li> <li>• P. Letshaba, Date of death: 1963</li> <li>• Makhotla Sekhosana, Date of death: 10 February 1997</li> <li>• Eliza Skosana, Date of death: 24 July 1973</li> <li>• Mmabatho Selina Sekhosana, Date of death: 1994</li> <li>• 1 unmarked</li> </ul>	GP A High Social Significance
Site 4	27° 36' 14.4381" E	27° 08' 42.2910" S	<p>Stone packed features that are extremely degraded and partially buried and overgrown. The features include several square packed stone foundations with a packed stone water reservoir in the larger area relating to agricultural</p>	GP C Low Significance

			infrastructure. The features are scattered over an area of approximately 80 square meters. These features are degraded and in disuse.	
<b>Site 5</b>	27° 35' 52.0633" E	27° 09' 21.4198" S	<p>Large, corrugated iron shed situated on the edge of an existing maize field within a thicket of trees. The shed is still in a fair condition apart from the roof that seems to be collapsing in some sections.</p> <p>The shed is overgrown and difficult to access due to the recent heavy rainfall and can only be seen from the road. This feature is likely older than 60 years.</p>	<p>GP C Low significance</p>

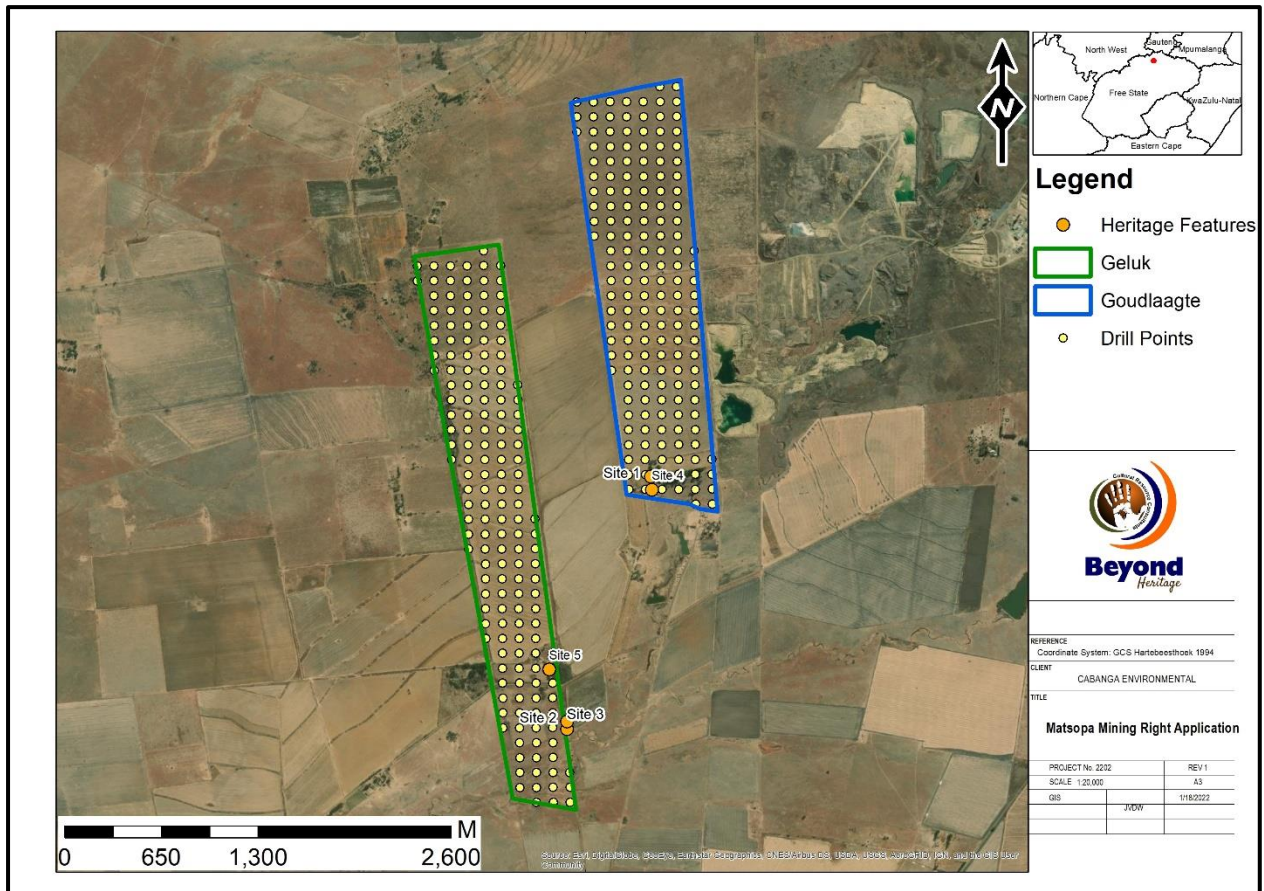


Figure 8.1. Site distribution map.





Figure 8.2. Grave at Site 1.



Figure 8.3. Grave at Site 2.



Figure 8.4. Grave at Site 3.



Figure 8.5. General site conditions at Site 4.

## 8.2 Cultural Landscape

The cultural landscape is rural in character marked by farming activities with the addition of mining that is slightly changing the overall character. Cultivation of the area occurred from the 1960's to the present with some farming related infrastructure still intact like the sheds at Site 5. (Figure 8.6 and 8.7).

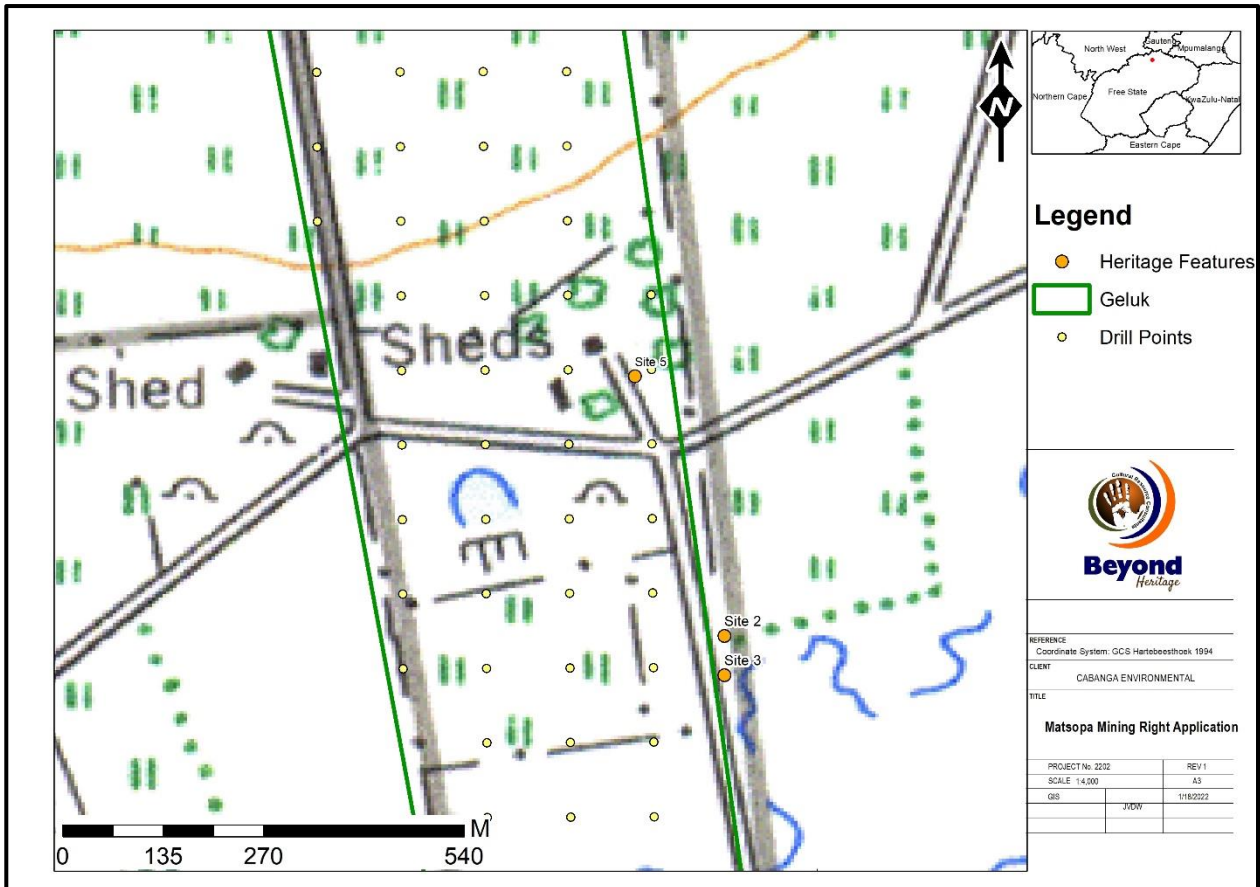


Figure 8.6. 1964 Topographic map of the study area indicating cultivation on the Farm Geluk. Most of the study area is impacted on by cultivation with limited infrastructure that has since been demolished apart from the shed at Site 5.

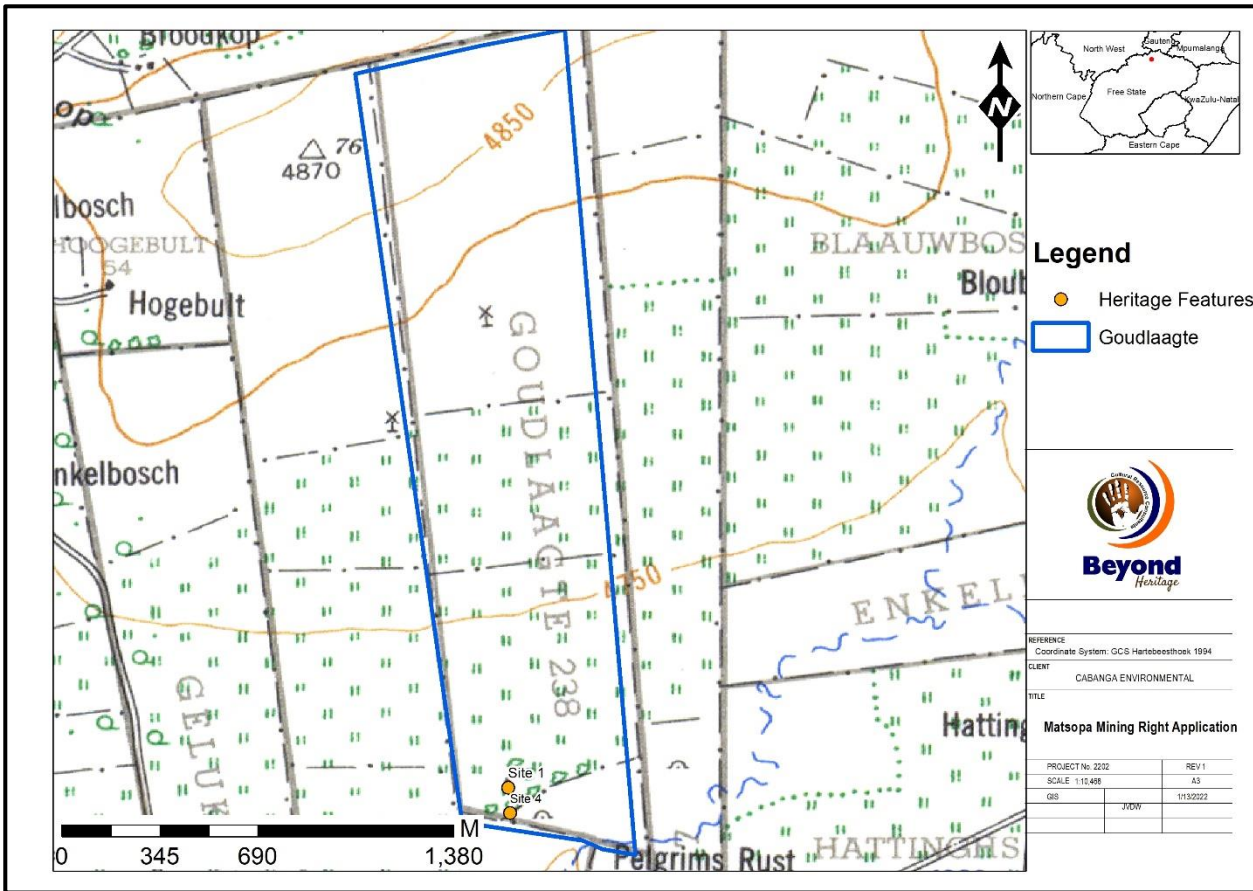
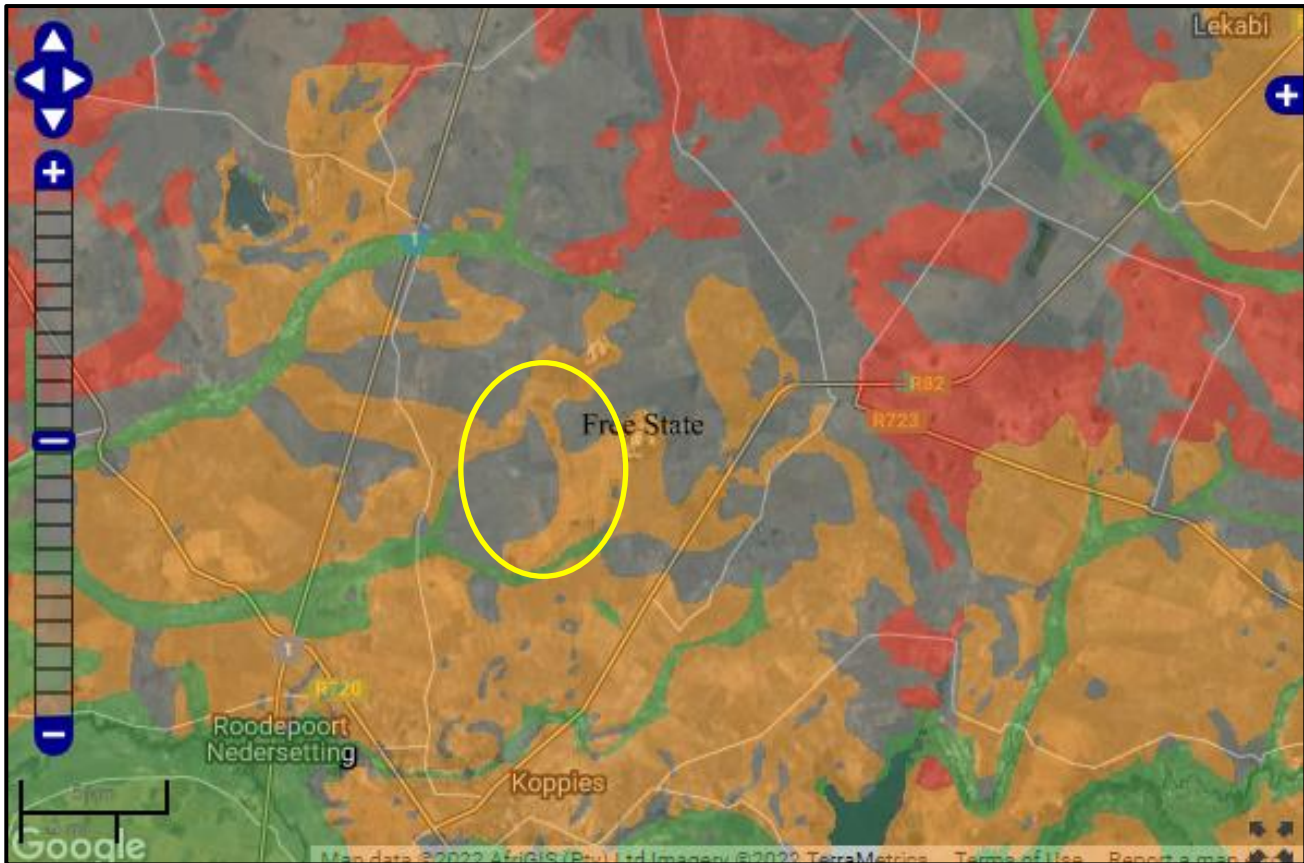


Figure 8.7. 1964 Topographic map of the study area indicating the farm Goudlaagte as cultivated with huts visible close to the recorded Site 4.

### 8.3 Paleontological Heritage

According to the SAHRA Paleontological map the study area is of both insignificant and high paleontological significance (Figure 8.1) and an independent study was conducted for this aspect. The study by Bamford concluded that it is extremely unlikely that any fossils would be preserved in the Volksrust Formation. There is a very small chance that fragmentary and transported fossils may occur in the shales of the Permian Volksrust Formation so a Fossil Chance Find Protocol should be added to the EMPr and further concluded that the impact on the palaeontological heritage would be very low.



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

Table 9. Paleontological sensitivity of the approximate study area (yellow polygon) as indicated on the SAHRA Palaeontological sensitivity map.

## 9 Potential Impact

Based on the project plan no adverse impact to heritage resources is expected with the correct mitigation in place. The cemetery at Site 1 and the demolished ruins at Site 4 is located more than 30 metres from the nearest drilling point (Figure 9.1) on the farm Goudlaagte. The two cemeteries (Site 2 & 3) on the farm Geluk is outside of the study area and the historical shed at Site 5 is more than 30 metres from any drill point and no impact is foreseen on these features (Figure 9.2).

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. Impacts of the project on heritage resources is expected to be low for all prospecting activities (Table 7).

### 9.1.1 Prospecting activities (including roads, laydown areas and drilling)

It is assumed that the prospecting activities include the removal of topsoil and vegetation as well as the establishment of infrastructure and drilling. 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.

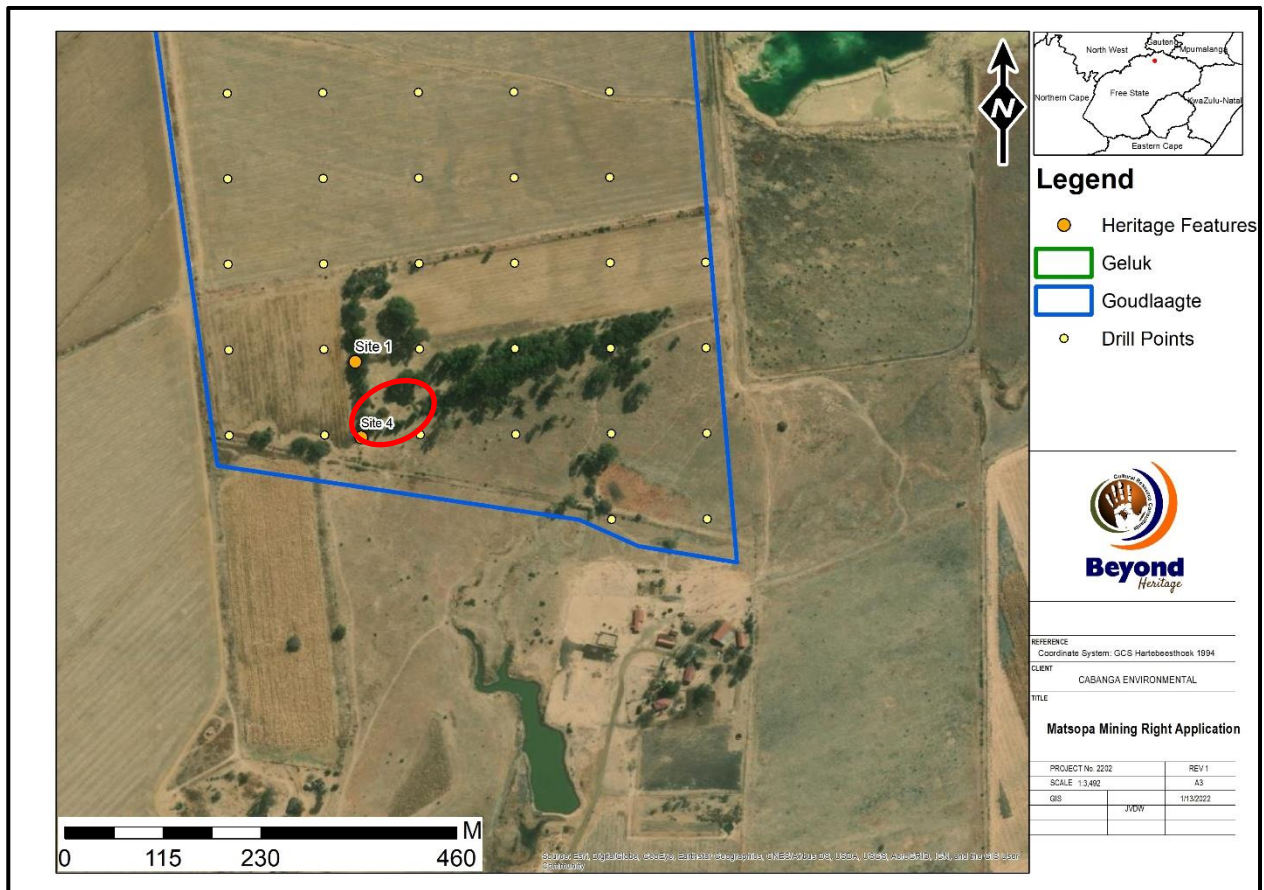


Figure 9.1. Prospecting plan in relation to recorded features with the sites extent indicated in red.

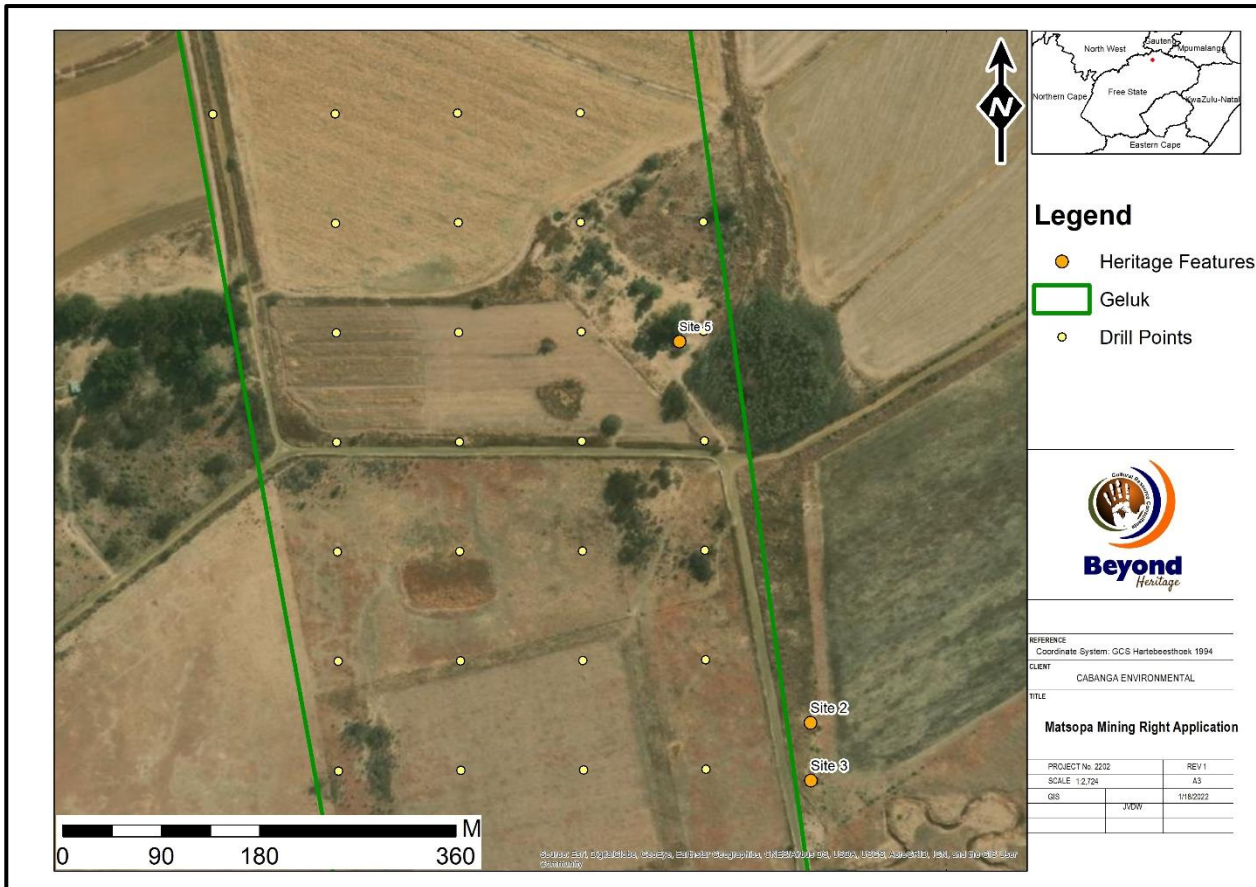


Figure 9.2. Prospecting plan in relation to Site 2,3 and 5.

### 9.1.2 Impact Assessment for the Project

Table 10. Impact assessment of the proposed project on ruins and structures (Site 4 and 5).

	Without mitigation	With mitigation (Preservation/ excavation of site)
<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>Extent</b>	Local (2)	Local (2)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	Minor (2)	Minor (2)
<b>Probability</b>	Improbable (2)	Improbable (2)
<b>Significance</b>	<b>18 (Low)</b>	<b>18 (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>Recorded features should be indicated on development plans and avoided with a 30-metre buffer zone;</li> <li>Implementation of a chance find procedure for the project;</li> <li>Existing access roads should be used as far as possible and recorded features avoided;</li> </ul>		

<ul style="list-style-type: none"> <li>The features should be monitored by the ECO during prospecting to ensure that there is no indirect impact.</li> </ul>
<p><b>Cumulative impacts:</b> The proposed project will have a low cumulative impact as no known heritage resources will be adversely affected.</p>
<p><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.</p>

Table 11. Impact assessment of the proposed project on recorded cemeteries (Site 1,2,3)

<p><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.</p>		
	<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>	Moderate (6)	Minor (2)
<b>Probability</b>	Improbable (2)	Improbable (2)
<b>Significance</b>	<b>18 (Low)</b>	<b>18 (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
<p><b>Mitigation:</b></p> <ul style="list-style-type: none"> <li>The recorded cemeteries should be indicated on development plans and avoided with a 30-metre buffer zone;</li> <li>Existing access roads should be used;</li> <li>The features should be monitored by the ECO during prospecting to ensure that there is no indirect impact;</li> <li>Implementation of a chance find procedure for the project.</li> </ul>		
<p><b>Cumulative impacts:</b> The proposed project will have a low cumulative impact with the mitigation measures no heritage resources will be adversely affected.</p>		
<p><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.</p>		

## 10 Conclusion and recommendations

From a heritage perspective the study area is altered by cultivation during from the 1960's to the present (Figure 8.2 and 8.3). Cumulatively these activities would have impacted on surface indicators of heritage resources if any ever occurred in these areas and the only features recorded included cemeteries (Site 1 - 3), the foundations of demolished structures (Site 4) and a shed (Site 5) possibly older than 60 years.

The cemetery at Site 1 and the demolished ruins at Site 4 are located more than 30 metres from the nearest drilling point (Figure 9.1) on the farm Goudlaagte. The two cemeteries (Site 2 & 3) on the farm Geluk are outside of the study area and the historical shed at Site 5 is also more than 30 metres from any drill point and no direct impact is foreseen on these features (Figure 9.2).

The ruins at Site 4 are totally demolished and only foundations remain and its potential to contribute to aesthetic, historic, scientific and social aspects are non-existent and are therefore of no heritage significance.

Based on the drill point locations no adverse impact to heritage resources is expected with the correct mitigation in place. 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:

- Recorded features should be indicated on development plans and avoided with a 30-metre buffer zone
- Existing access roads should be used.
- The features should be monitored by the ECO during prospecting to ensure that there is no indirect impact.
- 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 therefore chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below.

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

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or



service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.

- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

### **10.2.2 Chance Find Protocol for Palaeontology – to commence once the excavations / drilling activities begin.**

The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence:

1. When excavations begin the rocks and must be given a cursory inspection by the ECO or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
2. Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones (for example see Figures 5, 6). This information will be built into the EMP's training and awareness plan and procedures.
3. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
4. If there is any possible fossil material found by the contractor/ECO then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
5. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
6. If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
7. If no fossils are found and the excavations have finished then no further monitoring is required.

### **10.3 Reasoned Opinion**

The overall impact of the project is considered to be low 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 drilling activities. The ECO should monitor all such activities daily. If any heritage resources are found, the chance finds procedure must be followed as outlined above.

Table 12. Monitoring requirements for the project

Heritage Monitoring					
Aspect	Area	Responsible for monitoring and measuring	Frequency	Proactive or reactive measurement	Method
Site establishment for drill sites, laydown areas and the camp	Entire project area	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 the General Manager;</li> <li>3. Contact an archaeologist/ palaeontologist to inspect the site;</li> <li>4. Report incident to the competent authority; and</li> <li>5. Employ reasonable mitigation measures in accordance with the requirements of the relevant authorities.</li> </ol> </li> </ul>

Heritage Monitoring					
Aspect	Area	Responsible for monitoring and measuring	Frequency	Proactive or reactive measurement	Method
					<ul style="list-style-type: none"><li>• Only recommence operations once impacts have been mitigated.</li></ul>

## 10.6 Management Measures for inclusion in the EMPr

Table 13. 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	Prospecting	Throughout the project	ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	Checklist/Report
General project area	Known sites and the recorded cemetery should be indicated on development plans, demarcated during construction, and avoided.	Prospecting	Throughout the project	ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	Checklist/Report
General project area	Weekly monitoring during the pre construction and construction phase by the ECO.	Prospecting	Throughout the project	ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	Checklist/Report & Photographic Record

### **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. Also, thick grass cover and cultivated areas hampered ground visibility and although unlikely informal graves could have been undetected during the field survey. 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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