HERITAGE IMPACT ASSESSMENT

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

FOR THE PROPOSED ROODEKRANS MINING PERMIT AND STOCKPILE NEAR MORGENZON, MPUMALANGA PROVINCE

Type of development:

Mining Permit and Stockpile

Client:

Greenmined Environmental

Applicant:

Inzalo Crushing and Aggregates (Pty) Ltd

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Project Reference:
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APPROVAL PAGE

Project Name	Roodekrans Mining Permit and Stockpile
Report Title	Heritage Impact Assessment for the proposed Roodekrans Mining Permit and Stockpile near Morgenzon, Mpumalanga Province
Authority Reference Number	TBC
Report Status	Draft Report
Applicant Name	Inzalo Crushing and Aggregates (Pty) Ltd

Responsibility	Name	Qualifications and Certifications	Date
Fieldwork	Johan Smit - Archaeologist	MA Biblical Archaeology	November 2024 & January 2025
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Date	Report Reference Number	Description of Amendment

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REPORT OUTLINE

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

Table 1. Specialist Report Requirements.

Requirement from Appendix 6 of GN 326 EIA Regulation 2017	Chapter
(a) Details of - (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae.	Section a
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority.	*Declaration of Independence*
(c) Indication of the scope of, and the purpose for which, the report was prepared.	Section 1
(cA) An indication of the quality and age of base data used for the specialist report.	Section 3.4.
(cB) A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change.	Section 9
(d) Duration, Date and season of the site investigation and the relevance of the season to the outcome of the assessment.	Section 3.4
(e) Description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used.	Section 3
(f) Details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of site plan identifying site alternatives.	Section 7, 8 and 9
(g) Identification of any areas to be avoided, including buffers.	Section 7,8 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 9.1 and 9.5
(l) Conditions for inclusion in the environmental authorisation.	Section 9. 1 and 9.5
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation.	Section 9.6
(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 9.3
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report.	Section 5
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto.	Refer to the EIA report
(q) Any other information requested by the competent authority.	No other information requested at this time

Executive Summary

Inzalo Crushing and Aggregates (Pty) Ltd, is applying for a mining permit to mine 4.9ha of a portion of Portion 7 of the Farm Roodekrans 457. The Project area is situated in the Lekwa Local Municipality area and larger Gert Sibande District Municipality of the Mpumalanga Province of South Africa. Inzalo Crushing and Aggregates (Pty) Ltd, appointed Greenmined Environmental as the independent environmental assessment practitioner (EAP) to apply for Environmental Authorization for the Project. Greenmined Environmental, in turn, appointed Beyond Heritage to conduct a Heritage Impact Assessment (HIA) for the Project and the study area was assessed through a desktop assessment and by a non-intrusive pedestrian field survey. Key findings of the assessment include:

- Large sections of the Project area present high levels of surface disturbances through previous mining activities. The Project entails a Mining Permit area and a Stockpile area, alternatives were provided for both areas;
- During the two surveys, a burial site RD001 and three circular stone packed structures RD002, RD003, RD004 along a ridge were identified. Due to extremely overgrown conditions, it was not possible to determine the potential age, extent and purpose of these structures;
- Although the standard buffer zone for graves in mining sites is 100m, the Applicant has requested for a relaxation from 100m to 40m or preferably 20m, the proposed motivation thereof is outlined below, as provided by the Applicant;
- From a heritage perspective, both MP areas will require a buffer zone in order to preserve the graves at RD001. The Stockpile 2 would be preferable as no sites are present here, if however, Stockpile 1 is selected, avoidance or mitigation will be required for structure RD002, RD003, RD004;
- According to the South African Heritage Resource Authority (SAHRA) Paleontological sensitivity map the study area of insignificant/zero palaeontological sensitivity and no further palaeontological studies are required.

The impact on heritage resources can be mitigated to an acceptable level, and the Project can be authorised provided that the recommendations in this report are adhered to and based on the SAHRA's approval.

Recommendations:

The following recommendations for Environmental Authorisation apply and the Project may only proceed after receiving comment from SAHRA:

- Avoidance of the burial site RD001 with a 100m buffer zone is preferable with access provided to family members wishing to visit the graves
  - » The Applicant has requested a relaxation of the buffer zone, management measures proposed by the Applicant are outlined below;
- The structures RD002, RD003, RD004 should preferably be avoided with a 30m buffer zone
  - » If avoidance is not possible then Phase 2 archaeological mitigation will be required after which a destruction permit can be applied for;
- Development and mining activities must be confined to the approved development footprint only;
- Monitoring of the Project area by the ECO during pre-construction and construction phases for heritage chance finds, if chance finds are encountered to implement the Chance Find Procedure for the Project as outlined in Section 9;
- Development of a Heritage Site Management Plan for the recorded burial site including an access protocol for Next of Kin (NoK).

Relaxation of the Buffer zone – proposed management measures:

The following was provided by the Applicant as measures to ensure the graves stay protected with a relaxed buffer zone of 100m to 40m or 20m buffer zone, subject to the approval of SAHRA:

1) Obtaining a report from a blast expert on the effects of fly rock and Blast vibrations and possible impacts to the grave site;
2) The Blast design can be modified as mining gets closer to the grave site to minimize any blast vibrations;
3) The Applicant/ ECO can measure and monitor the blast vibrations on every blast and record results and submit regular reports to SAHRA;
4) The site will be monitored and photographs taken after each blast to see that no damage has occurred;
5) The grave area will be fenced, maintained and kept clean of excess vegetation.

Declaration of Independence

Specialist Name	Lara Lucija Kraljević
Declaration of Independence	I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 107 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations (as amended), that I: • I act as an independent specialist in this application; • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant; • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity; • I will comply with the Act, Regulations and all other applicable legislation; • I have no, and will not engage in, conflicting interests in the undertaking of the activity; • I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority; • All the particulars furnished by me in this form are true and correct; and • I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 49 A of the Act.
Signature	
Date	29/01/2025

a) Expertise of the specialist

Lara Kraljević completed her masters in archaeology at the University of Pretoria specialising in chemical and mineralogical studies of Iron Age ceramics. Lara is an accredited member of the Association of South African Professional Archaeologists (ASAPA) (#661). She has co-authored over 100 impact assessments in Gauteng, Limpopo, Mpumalanga, Northern Cape, Eastern Cape, and North West Provinces in South Africa.

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ABBREVIATIONS

ASAPA	Association of South African Professional Archaeologists
BGG	Burial Ground and Graves
CFPs	Chance Find Procedures
CMP	Conservation Management Plan
CoGHSTA	Co-operative Governance, Human Settlements and Traditional Affairs
CRR	Comments and Response Report
CRM	Cultural Resource Management
DFFE	Department of Fisheries, Forestry and Environment,
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment*
EIA	Early Iron Age*
EAP	Environmental Assessment Practitioner
EMPr	Environmental Management Programme
ESA	Early Stone Age
ESIA	Environmental and Social Impact Assessment
GIS	Geographical Information System
GPS	Global Positioning System
GRP	Grave Relocation Plan
HIA	Heritage Impact Assessment
LIA	Late Iron Age
LSA	Late Stone Age
MEC	Member of the Executive Council
MIA	Middle Iron Age
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MSA	Middle Stone Age
NCHM	National Cultural History Museum
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
Earlier Stone Age	~ 2.6 million to 250 000 years ago
Middle Stone Age	~ 250 000 to 40-25 000 years ago
Later Stone Age	~ 40-25 000, to the historic period
The Iron Age	~ AD 400 to 1840
Historic	~ AD 1840 to 1950
Historic building	Over 60 years old

1 Introduction

Greenmined Environmental, appointed Beyond Heritage to conduct a Heritage Impact Assessment (HIA) for the proposed mining permit to mine 4.9ha of a portion of Portion 7 of the Farm Roodekrans 457. The Project area is situated in the Lekwa Local Municipality area and larger Gert Sibande District Municipality of the Mpumalanga Province of South Africa (Figure 1.1 to 1.3). The report forms part of the Environmental Impact Assessment (BA) and Environmental Management Programme (EMPr) for the development.

The aim of the study was to survey the proposed development footprint to understand the cultural layering of the area, and if heritage features are found, to assess their importance within local, provincial, and national context. It further served to assess the impact of the proposed Project on non-renewable heritage resources. The study will 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. Recommendations are included to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999) (NHRA).

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, a burial site and three structures were recorded in the study area. General site conditions and features in the study area were recorded by means of photographs, GPS locations and descriptions. Possible impacts were identified, and mitigation measures are proposed in this report.

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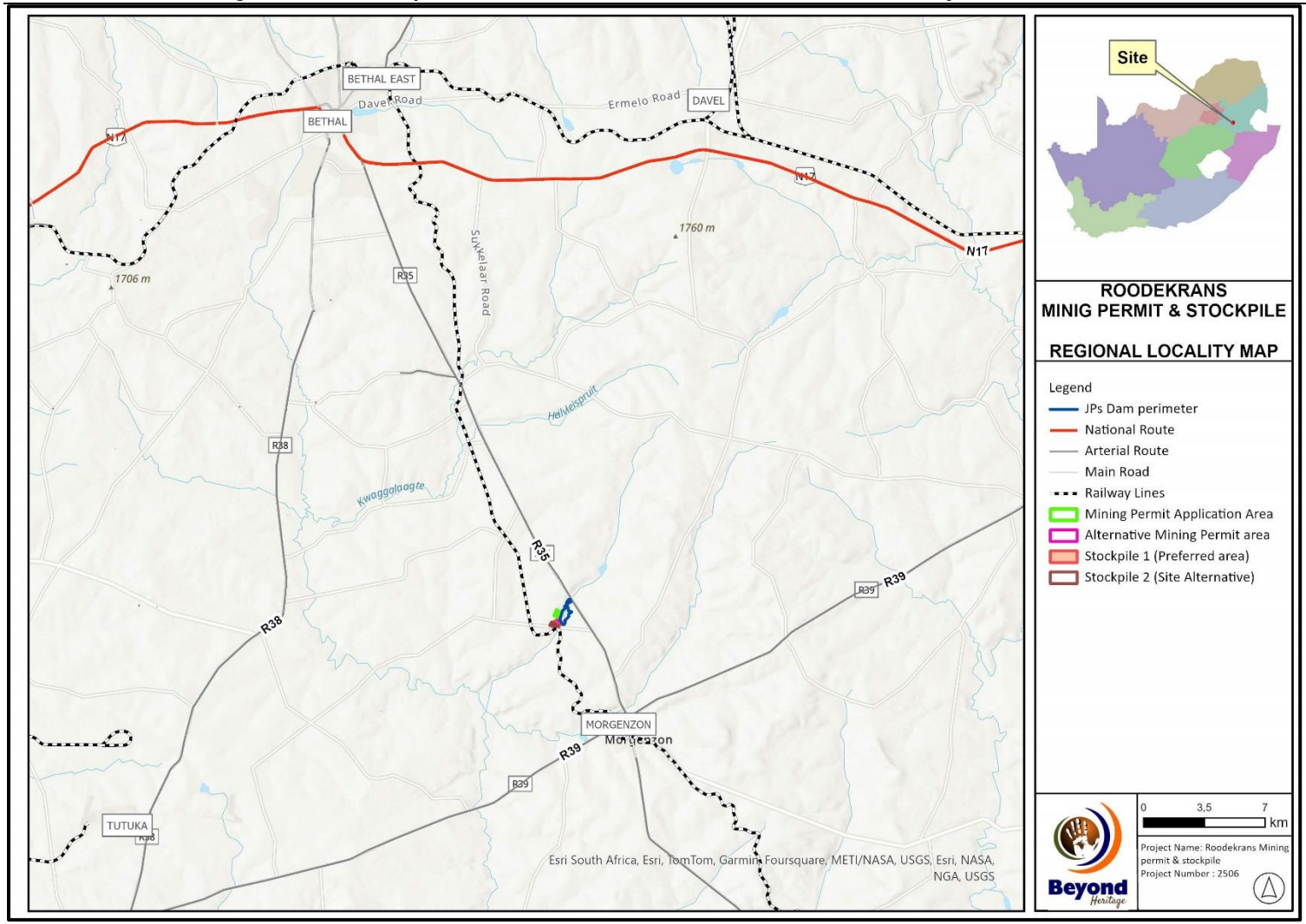


Figure 1.1. Regional setting of the Project (Extract of the 2629 1: 250 000 topographical map).

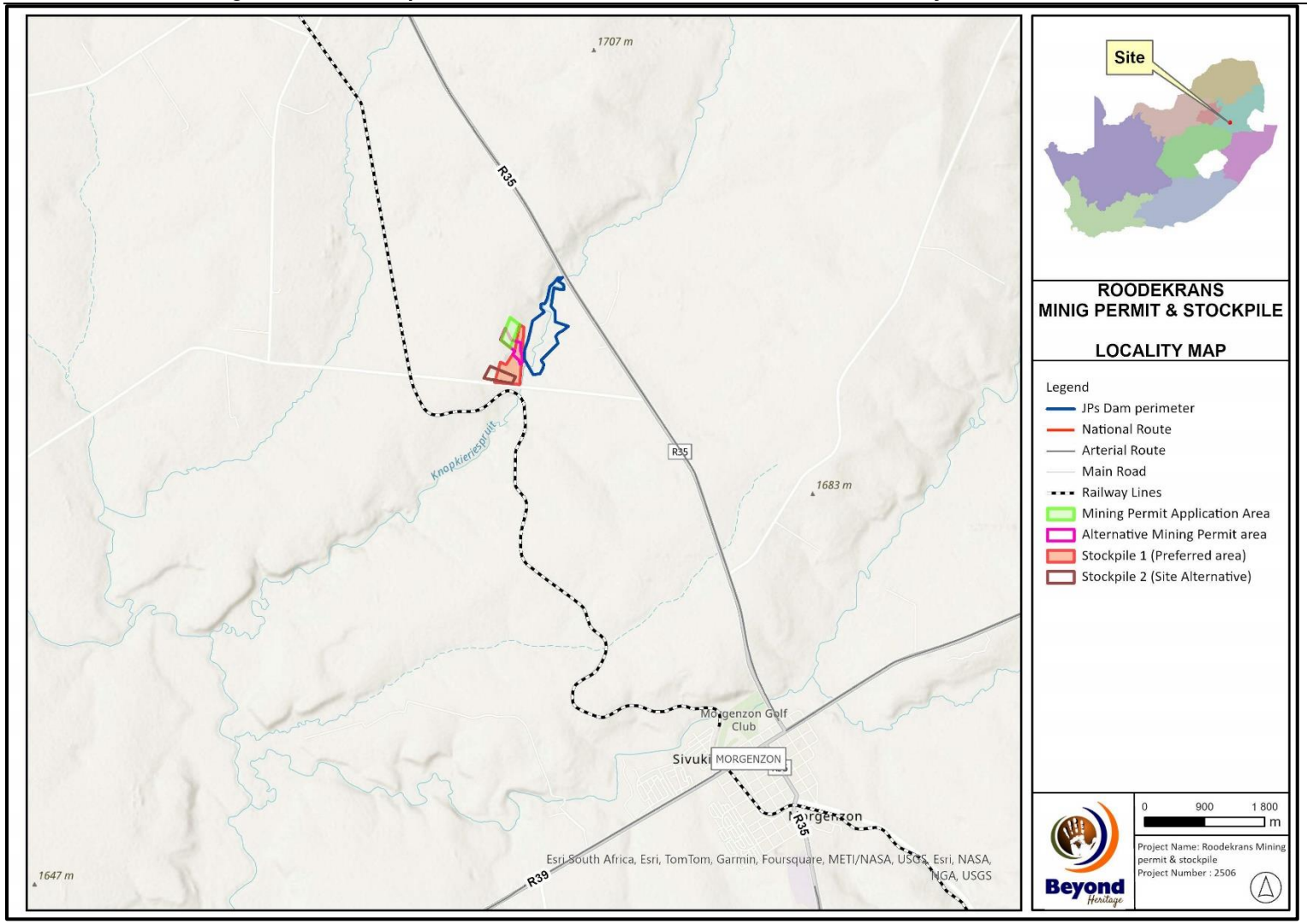


Figure 1.2. Local setting of the Project (Extract from 1:50 000 topographic map sheets 2629 DA).

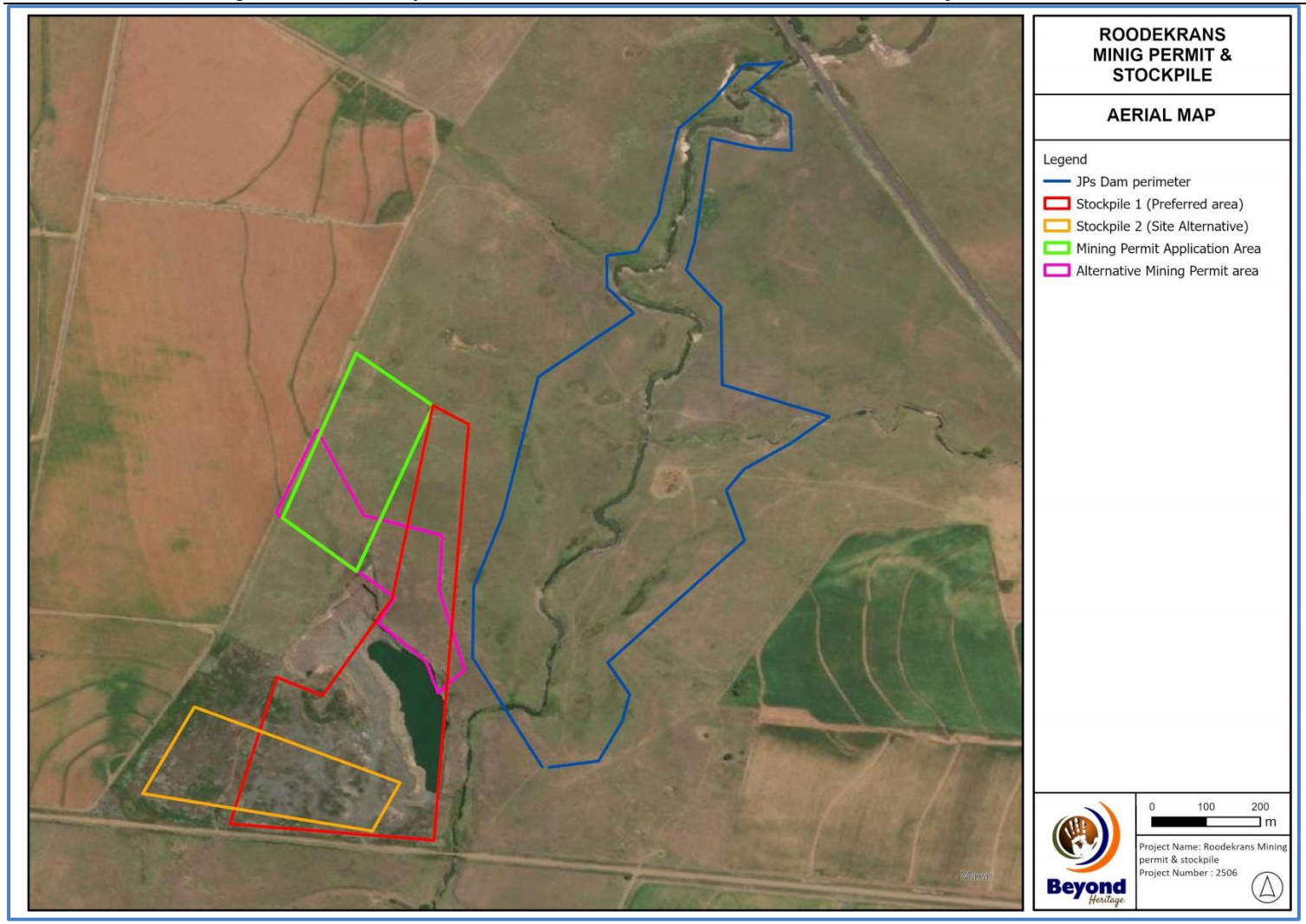


Figure 1.3. Aerial image of the Project area and surrounds.

1.1 Terms of Reference

The following Terms of Reference were adhered to in conducting this HIA.

Field study

Conduct a field study to: (a) survey the development footprint to understand the heritage character of the impact area; 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 Association of South African Professional Archaeologists (ASAPA).

Recommendations are provided 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 Roodekrans Mining Permit Project are outlined in Tables 2 and 3.

Table 2: Project Description

Magisterial District	Lekwa Local Municipality within the Gert Sibande District Municipality
Central co-ordinate of the development	26°41'0.72"S 29°34'50.98"E
1:50 000 Topographic Map Number	2629 DA

Table 3: Infrastructure and project activities

Component	**Description/ dimension**
The Applicant identified the need to apply for environmental authorisation (EA) and a mining permit (MP) on the area as mentioned. The hard rock will be loosened by blasting as part of the mining process; the material will then be loaded and transported to the crushing plant and sorted into stockpiles of different sizes. The aggregate will be stacked up until tipper trucks are brought in to remove it from the site. All mining related activities will be contained within the limits of the authorized mining permit. The applicant, intents to win material from the area for at least 2 years with a possible extension of another 3 years. The aggregate to be removed from the quarry will be used for construction industry in the vicinity. The proposed quarry will contribute to the upgrading / maintenance of road infrastructure, renewable energy projects and building contracts in and around the area. The mining activities will consist out of the following: • Stripping and stockpiling of topsoil; • Excavating; • Crushing; • Stockpiling and transporting; • Sloping and landscaping upon closure of the site; and • Replacing the topsoil and vegetation the disturbed area. The proposed mining activities will entail the following: • The 4.9 ha proposed mining location is located over an undeveloped, inactive portion of the property. • The mining method will make use of blasting to loosen the hard rock; the material will then be loaded and hauled to the crushing plant where it will be screened to various sized stockpiles. The aggregate will be stockpiled until it is transported from site using tipper trucks. All mining related activities will be contained within the approved mining permit boundaries. The aggregate will be stockpiled and transported to clients via trucks and trailers. • All activities will be contained within the boundaries of the site.	

1.3 Alternatives

Two alternative stockpile and mining areas were assessed during the survey and recommendations were made from a heritage perspective.

2 Legislative Requirements

The HIA, as a specialist study to the EIA, is required under the following legislation:

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

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

- Identify any heritage resources, which may be affected;
- Assess the nature and degree of significance of such resources;
- Assess the negative and positive impact of the development on these resources; and
- Make recommendations for the appropriate heritage management (or avoidance) of these impacts.

The HIA should be submitted, as part of the impact assessment report or EMPr, to the Provincial Heritage Resource Agency (PHRA) or to The South African Heritage Resources Agency (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.

SAHRA as a commenting authority under section 38(8) of the NHRA require all environmental documents, compiled in support of an EA application as defined by the National Environmental Management Act (NEMA) (Act No 107 of 1998) to be submitted to SAHRA for commenting. Environmental Impact Assessment (EIA) Regulations section 40 (1) and (2). The Environmental Impact Assessment (EIA) Regulations, Government Notice Regulation (GN) R.982 were published on 04 December 2014 and promulgated on 08 December 2014. Together with the EIA Regulations, the Minister also published GN R.983 (Listing Notice No. 1), GN R.984 (Listing Notice No. 2) and GN R.985 (Listing Notice No. 3) in terms of Sections 24(2) and 24D of the NEMA, as amended) 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).

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 HIAs 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 (refer to Section 3.5). Relevant conservation or mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

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

Conservation or 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 and GNR 548 as well as the SAHRA BGG Policy 2020. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 of the National Heritage Resources Act (NHRA), as well as the National Health Act of 2003 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) re-instituted by Proclamation 109 of 17 June 1994 and implemented by CoGHSTA as well as the National Health Act 2003 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. 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 the National Health Act of 2003.

3 METHODOLOGY

3.1 Literature Review and background study

A brief survey of available literature was conducted to extract data and information on the area in question to provide general heritage context into which the development would be set. This literature search included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS). Findings are included in Section 6.1 and 6.2.

3.2 Genealogical Society and Google Earth Monuments

Google Earth and 1:50 000 topographic maps of the area were utilised to identify possible places of heritage sensitivity might be located; these locations were marked and visited during the fieldwork phase. The database of the Genealogical Society of South Africa (GSSA) was consulted to collect data on any known graves in the area. Results are included in Section 6.3.

3.3 Public Consultation and Stakeholder Engagement:

Stakeholder engagement is a key component of any EIA process, it involves stakeholders interested in or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation process undertaken by the EAP was to capture and address any issues raised by community members and other stakeholders. Results are included in Section 5 and the final EA report.

3.4 Site Investigation

The aim of the site visit was to:

a) survey the proposed Project area to understand the heritage character of the area and to record, photograph and describe sites of archaeological, historical or cultural interest;

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

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

Table 4. Site Investigation Details

	Site Investigation
Date	5 November 2024 and 21 January 2025
Season	Summer – The archaeological visibility across the proposed project area was hindered through scattered shrubs and overgrown vegetation. The Project area was however sufficiently covered to understand the heritage character of the area (Figure 3.1).

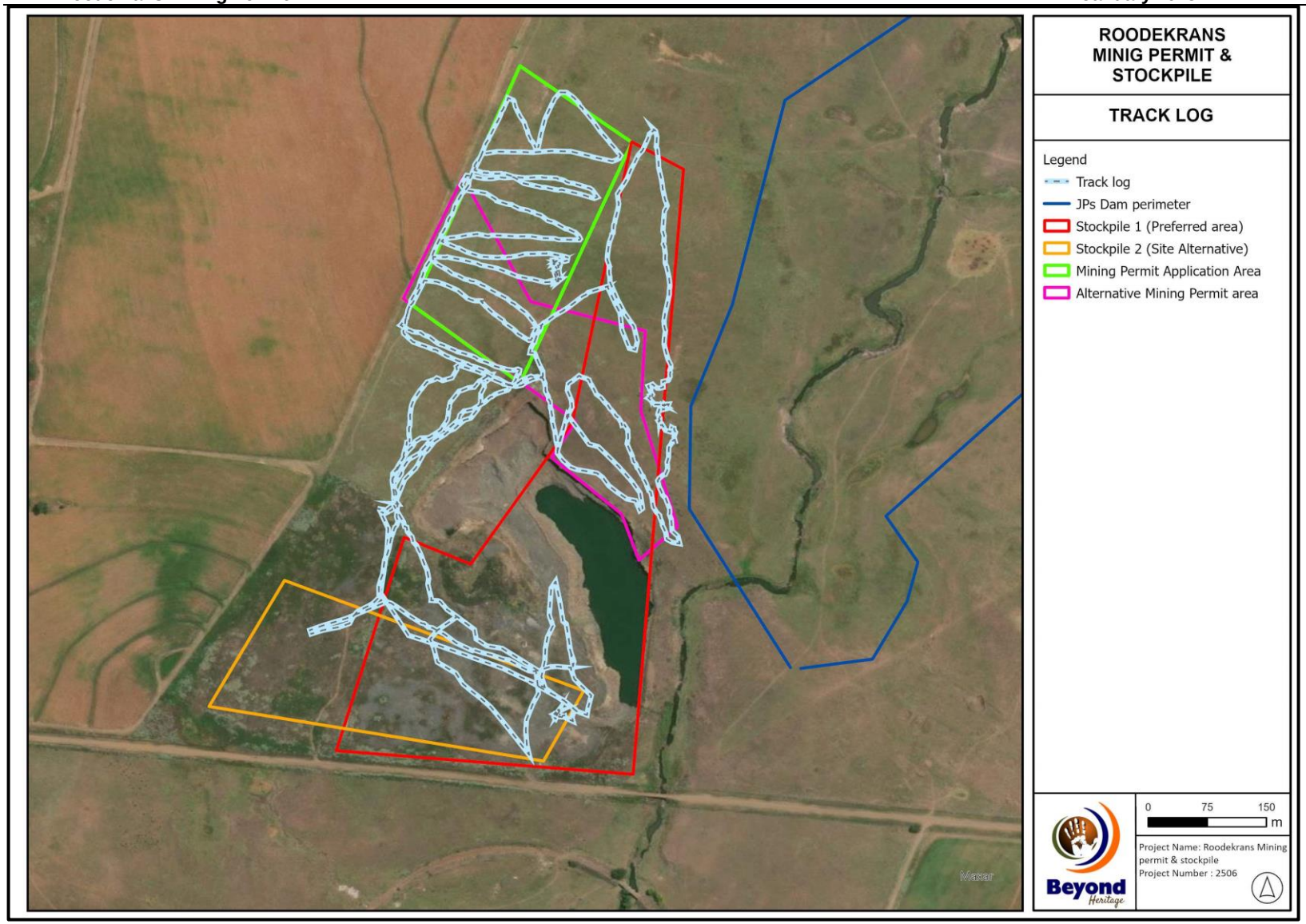


Figure 3.1. Tracklog of the survey path in green.

3.5 Site Significance and Field Rating

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 9 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 Assumptions and limitations of the study

- The authors acknowledge that the brief literature review is not exhaustive of the literature of the area.
- Due to the nature of heritage resources and pedestrian surveys, the possibility exists that some features or artefacts may not have been discovered/recorded, and the possible occurrence of graves and other cultural material cannot be excluded. This limitation is successfully mitigated with the implementation of a Chance Find Procedure (CFP) and monitoring of the study area by the Environmental Control Officer (ECO).
- This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys.
- Field data were recorded by handheld GPS and Mobile GPS applications. It must be noted that during the process of converting spatial data to final drawings and maps the accuracy of spatial data may be compromised. Printing or other forms of reproduction might also distort the spatial distribution in maps. Due care has been taken to preserve accuracy.
- This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components will be highlighted through the public consultation process if relevant. This process is facilitated by the EAP and if not done this can be considered a significant limitation and as a potential Project risk. 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, Lekwa Local Municipality has a total population of 115 662, of whom 84,2% are black African, 11,4% are white, with the other population groups making up the remaining 4,4%. Of those aged 20 years and older, 4,6% have completed primary school, 34,1% have some secondary education, 25,1% have completed matric and 10,3% have some form of higher education. 11,2% of those aged 20 years and older have no form of schooling. 46 013 people are economically active (employed or unemployed but looking for work), and of these 25,9% are unemployed. Of the 23 126 economically active youth (15 – 34 years) in the area, 35,2% are unemployed (statssa.gov.za).

5 Results of Public Consultation and Stakeholder Engagement:

In line with the NHRA, stakeholder engagement is a key component of any EA process, it involves stakeholders interested in or affected by the proposed development. At the time of writing no heritage concerns have been raised.

6 Contextualising the study area

6.1 Archaeological Background

6.1.1 Stone Age

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For (CRM) purposes it is often only expected/ possible to identify the presence of the three main phases. Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable. The three main phases can be divided as follows;

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

The MSA has not been extensively studied in Mpumalanga, but evidence of this period has been excavated at Bushman Rock Shelter, a well-known site on the farm Klipfonteinhoek in the Ohrigstad district. This cave was excavated twice in the 1960s by Louw and later by Eloff. The MSA layers show that the cave was repeatedly frequented over a long period. Lower layers have been dated to over 40 000 Before Present (BP), while the top layers date to approximately 27 000 BP (Esterhuysen and Smith 2007). MSA material is found widely across South Africa and some MSA manifestations can be expected in the study area.

The nearest known LSA sites to Standerton include a Late Stone Age site located in Ermelo and rock art sites positioned further west of Standerton (Bergh 1999: 4-5).

Welgelegen Shelter, situated southwest of Ermelo along the Vaal River, reveals evidence of co-existence between early farming and hunter-gatherer communities around AD 1200 (Bergh 1999). Findings suggest that farmers, who utilized metal tools, occupied the main shelter area, while hunter-gatherers, identified by Later Stone Age tools and pottery, settled in the adjacent overhang (Esterhuysen & Smith 2007).

6.1.2 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 humans to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living. No sites dating to the EIA or MIA have been recorded or are expected in the study area. This phase of the Iron Age (AD 1600-1800's) is represented by various tribes including Ndebele, Swazi, BaKoni, Pedi marked by extensive stonewalled settlements found throughout the Mpumalanga escarpment. In the region surrounding Bethal and Standerton, there are approximately 585 Late Iron Age sites, largely characterized by stone-walled living complexes without evidence of metalworking (Bergh 1999: 6-7).

6.1.3 Historical Background

By the start of the nineteenth century the Phuthing was prominent more north of the Project area (Bergh 1999: 10). In a few decades, the sociographic nature of the then Transvaal province would go under a radical change. The Difaqane (Sotho), or Mfecane ("the crushing" in Nguni) was a time of bloody upheavals in Natal and on the Highveld, which occurred around the early 1820's until the late 1830's (Bergh 1999: 109-115). These upheavals occurred 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). Mzilikazi and his raiders had moved from the Northern Nguni area to the area north of the Vaal River by 1821. It has been recorded that the Ndebele first attacked the Phuthing tribe, which in turn migrated to the south of the Vaal River and joined groups of Southern Sotho speakers. The Phuthing and Southern Sotho tribes moved westward and northward and started raiding Tswana communities in the surrounding area. The Phuthing were commanded first by Chief Tshane, and later Ratsebe. As the Phuthing, under Ratsebe, moved eastwards along the Vaal River, they collided with Mzilikazi's Ndebele once more. Mzilikazi's men finally took the Phuthing and other raiding groups captive in 1823 (Bergh 1999).

During the time of the Difaqane, a northwards migration of European settlers from the Cape was also taking place. Some travellers, missionaries and adventurers had gone on expeditions to the northern areas in South Africa – some as early as in the 1720's. Robert Scoon was one of the adventurers who formed part of a group of Scottish travellers and traders who had travelled the northern provinces of South Africa in the late 1820s and early 1830s. Scoon had gone on two long expeditions in the late 1820s and once again ventured eastward and northward of Pretoria in 1836. During the latter journey, Scoon passed by the area, which is now known as Witbank (Bergh 1999: 13, 116-121).

By the late 1820's, a mass-movement of Dutch speaking people in the Cape Colony started advancing into the northern areas. This was due to growing feelings of dissatisfaction caused by economical and other circumstances in the Cape. This movement later became known as the Great Trek. The first Voortrekker groups of Hans van Rensburg and Louis Tregardt also passed close to this area (Bergh 1999: 13-14). The first European farmers only settled here during the late 1850's.

The town of Morgenzon was established in 1912 on the Farm Morgenzon and has been governed by a village council since 1920 (Raper 2004). The layout of the town centered around the Marnico Hotel, built in 1912 and considered the oldest landmark in Morgenzon. Another notable feature is the Nederduits Gereformeerde Kerk church, designed by Gerard Moerdyk, the architect renowned for his work on the Voortrekker Monument.

6.1.4 Battlefields

During the Anglo-Transvaal War (1880-1881), British forces in Standerton were besieged by Boer forces (Bergh 1999: 46). The Highveld witnessed significant conflict during the Anglo-Boer War (1899-1902), with skirmishes occurring on farms such as Oshoek on the 4th of December 1901, Trigaardsfontein on the 10th of December 1901, Witbank on the 11th of January 1902, and Nelspan on the 26th of January 1902 (Bergh 1999: 51, 54). Additionally, Standerton set up concentration camps for both white and black individuals during this period (Bergh 1999). A monument was established in Standerton to honour those who perished in the concentration camps.

6.2 Literature Review (SAHRIS)

Few Cultural Resource Management (CRM) surveys are on record for the general area and the relevant results of these studies are briefly discussed below and outlined in Table 6.

Table 6. Studies consulted for the project.

Author	Year	Project	Findings
Van Schalkwyk, J.A.	1998	A Survey of Cultural Resources for the Proposed Escom Rail Line, Highveld Ridge District, Mpumalanga.	Historical farmsteads, cemeteries.
Van Schalkwyk, J.A.	2002	A Survey of Cultural Resources for the Proposed New Tutuka-Alpha Power Transmission Line, Standerton District, Mpumalanga Province.	No sites were identified.
Van Schalkwyk, J.A.	2004	Heritage Impact Assessment for the Planned Sivukile Extension 4 Township Lekwa Municipality, Mpumalanga.	No sites were identified.
Coetzee, T.	2023	Archaeological Desktop Study for the Proposed Tweefontein Coal Mine Prospecting Right near Morgenzon, Mpumalanga.	Historical ruins
Birkholtz, P.D.	2009	Phase 1 Heritage Impact Assessment For The Proposed Construction of a New Waste Water Treatment And Sewage Pipeline on Portion 32 of the Farm Morgenzon 466-IS, Lekwa Local Municipality, Mpumalanga Province.	Two homesteads.
Lavin, J.	2023a	Heritage Impact Assessment in terms of Section 38(8) of the NHRA for the Proposed development of the Tournée 1 Solar PV Park near Standerton, Mpumalanga.	Demolished farmhouse, two sites containing stone packed graves.
Lavin, J.	2023b	Heritage Impact Assessment in terms of Section 38(8) of the NHRA for the Proposed development of the Tournée 2 Solar PV Park near Standerton, Mpumalanga.	Demolished farmhouse.
Lavin, J.	2024a	Heritage Impact Assessment in terms of Section 38(8) of the NHRA for the Renewstable Kopano Hydrogen to Power Energy Facility, Mpumalanga Province.	Stone walled kraal, ruins, graves, farmstead, Voetspore heritage monument to Erasmus.
Lavin, J.	2024b	Heritage Impact Assessment in Terms of Section 38(8) of the NHRA for the Proposed Development of the Renewstable® Anzani (Dwars) Solar Energy Facility for Hydrogen De France (HDF) Near Bethal in the Mpumalanga Province.	Three cemeteries, original Dwars in die Weg werf, stone kraal, ruins.

6.3 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.

7 Heritage Baseline

7.1 Description of the Physical Environment

The vegetation of the Project area belongs to the Soweto Highveld Grassland of the Grassland Biome. It is described as gently to moderately undulating landscape on the Highveld plateau supporting short to medium-high, dense, tufted grassland dominated almost entirely by *Themeda triandra* and accompanied by a variety of other grasses such as *Elionurus muticus*, *Eragrostis racemosa*, *Heteropogon contortus* and *Tristachya leucothrix*. In places not disturbed, only scattered small wetlands, narrow stream alluvia, pans and occasional ridges or rocky outcrops interrupt the continuous grassland cover (Mucina and Rutherford 2006).

The farm area is used as grazing land for cattle. The land is largely covered with low-growing grasses and shrubs, and no trees were located within the surveyed area. The ground cover is mostly open, resulting in high visibility across most of the site.

The quarry site is characterised by extensive recent human activity. Large piles of crushed stone and gravel are evident, indicating active material extraction and processing. The terrain is visibly altered, with exposed bedrock and soil, steep artificial embankments, and areas of excavation forming water-filled depressions. The surrounding landscape includes scattered vegetation on the margins of the disturbed area, contrasting with the uniform and heavily modified quarry floor. General site conditions are indicated in (Figure 7.1 to 7.4).

Figure 7.1. General site conditions showing shrubs across the Project area.

Figure 7.2. Previously mined areas in the Project area.

Figure 7.3. Overgrown grasses in large sections of the Project area.

Figure 7.4. Ridge traversing the area.

7.2 Heritage Resources

Heritage observations within the study area included a burial site (RD001) and structures (RD002, RD003 and RD004) along the ridgeline and were recorded as waypoints. The General site distribution of the recorded observations in relation to the Project layout is spatially illustrated in Figure 7.5 and briefly described in Table 7. Selected features are illustrated in Figure 7.6. to 7.15.

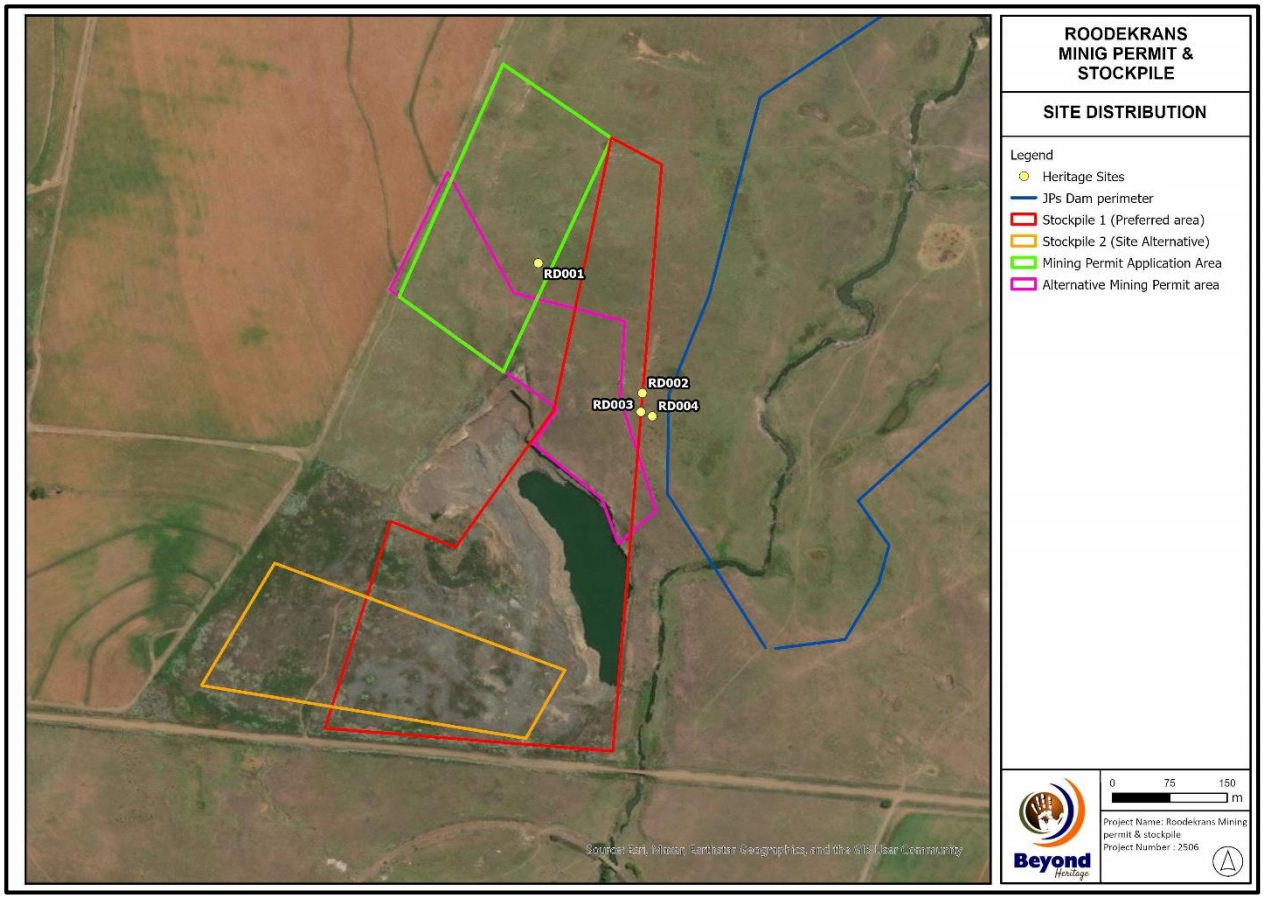


Figure 7.5. Site distribution map

Table 7. Sites recorded in the study area

Label	Longitude	Latitude	Description	Significance
RD001	29°34'52.59"E	26°41'2.32"S	Approximately 32 Graves are visible in the burial site. The burial site is approximately 32m x 12 m in size. One of the graves – dates to 1957. 31 Graves are unmarked. No grave goods were visible. The headstones are made of cement and stones. The grave dressing is made of cement and packed stones.	High Social Significance 3A
RD002	29°34'56.97"E	26°41'7.83"S	The overgrown stonewalling appears to be composed of roughly hewn, medium-sized stones, with an irregular arrangement indicative of dry-stone construction or a structure in a state of significant weathering and disrepair. The stones are partially obscured by dense vegetation, including shrubs and grasses, which have grown over and between the stones, further concealing their layout and structure. The wall seems to follow the natural contours of the surrounding landscape, potentially blending into the hillside. It is difficult to discern the original use of these structures as no additional context was found during the survey. The stone structures are circular in shape. The stonewalling for the RD002 and RD003 is approximately 60cm high and has a diameter of approximately 4 m. The third structure RD004 consists of a single layer 40 cm high and a diameter of approximately 5 m.	Medium Significance GP B
RD003	29°34'56.92"E	26°41'8.63"S		
RD004	29°34'57.40"E	26°41'8.80"S		

Figure 7.6. General view of burial site RD001.

Figure 7.7. View of graves at the burial site RD001.

Figure 7.8. View of a stone packed grave at RD001.

Figure 7.9. Grave dating to 1957 in the burial site RD001.

Figure 7.10. Overgrown structure RD002.

Figure 7.11. Packed walling at RD002.

Figure 7.12. Site overview of RD003.

Figure 7.13. Packed walling at RD003.

Figure 7.14. Overview of RD004.

Figure 7.15. Packed walling at RD004.

7.3 Cultural Landscape

The Project area is rural in character and devoid of developments. The surrounding environment has been extensively utilised for agricultural activities. The area south of the Project area has been largely disturbed through mining. The structures RD002, RD003, RD004 are not indicated on the Historical topographic maps but due to their small size they may not have appeared on these maps or may be of an older age. Vegetation clearance of the sites would be required to determine an approximate age and purpose of the structures and whether an archaeological deposit is present.

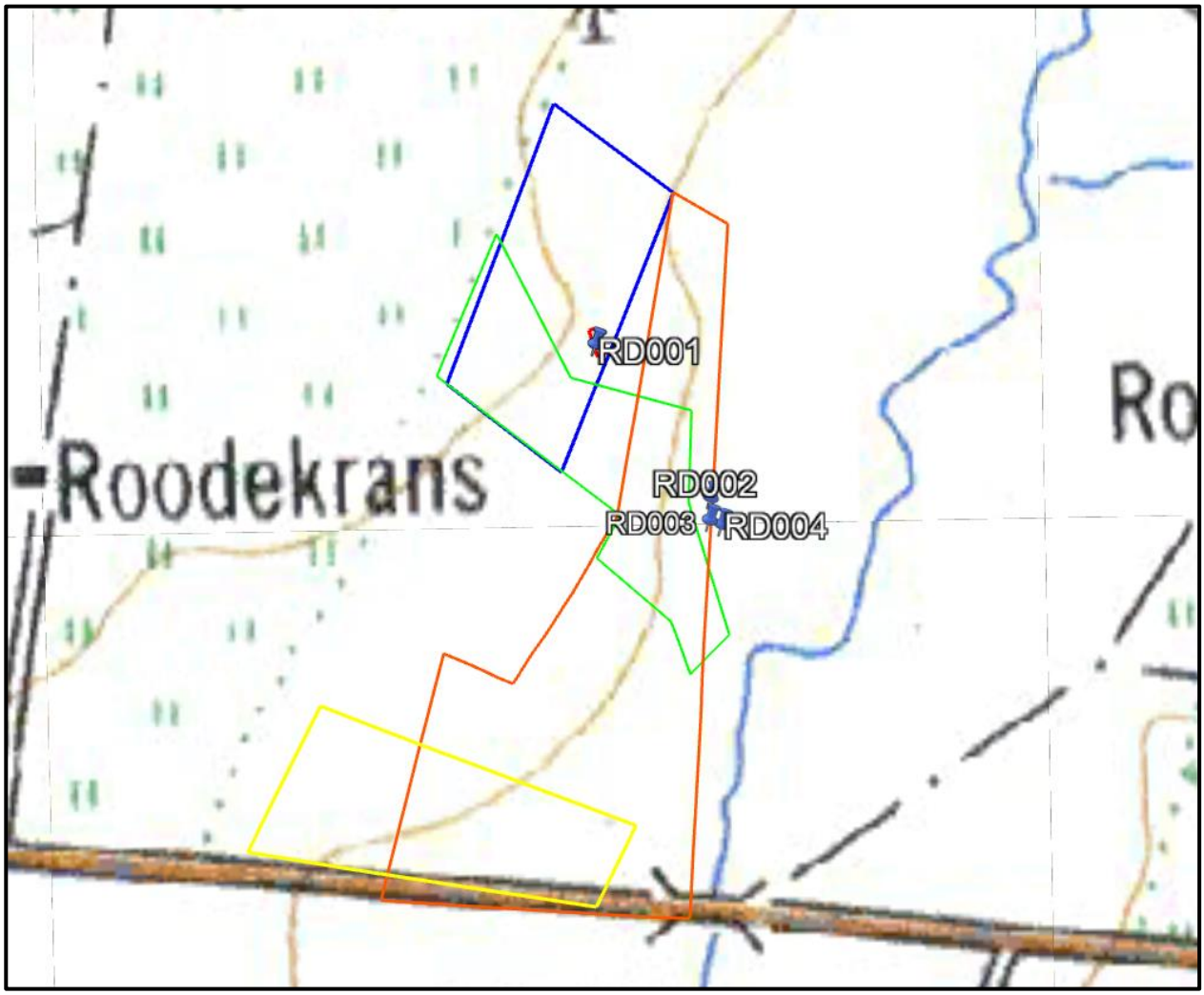


Figure 7.16. Extract of the 1962 topographic map showing no developments within the Project area.

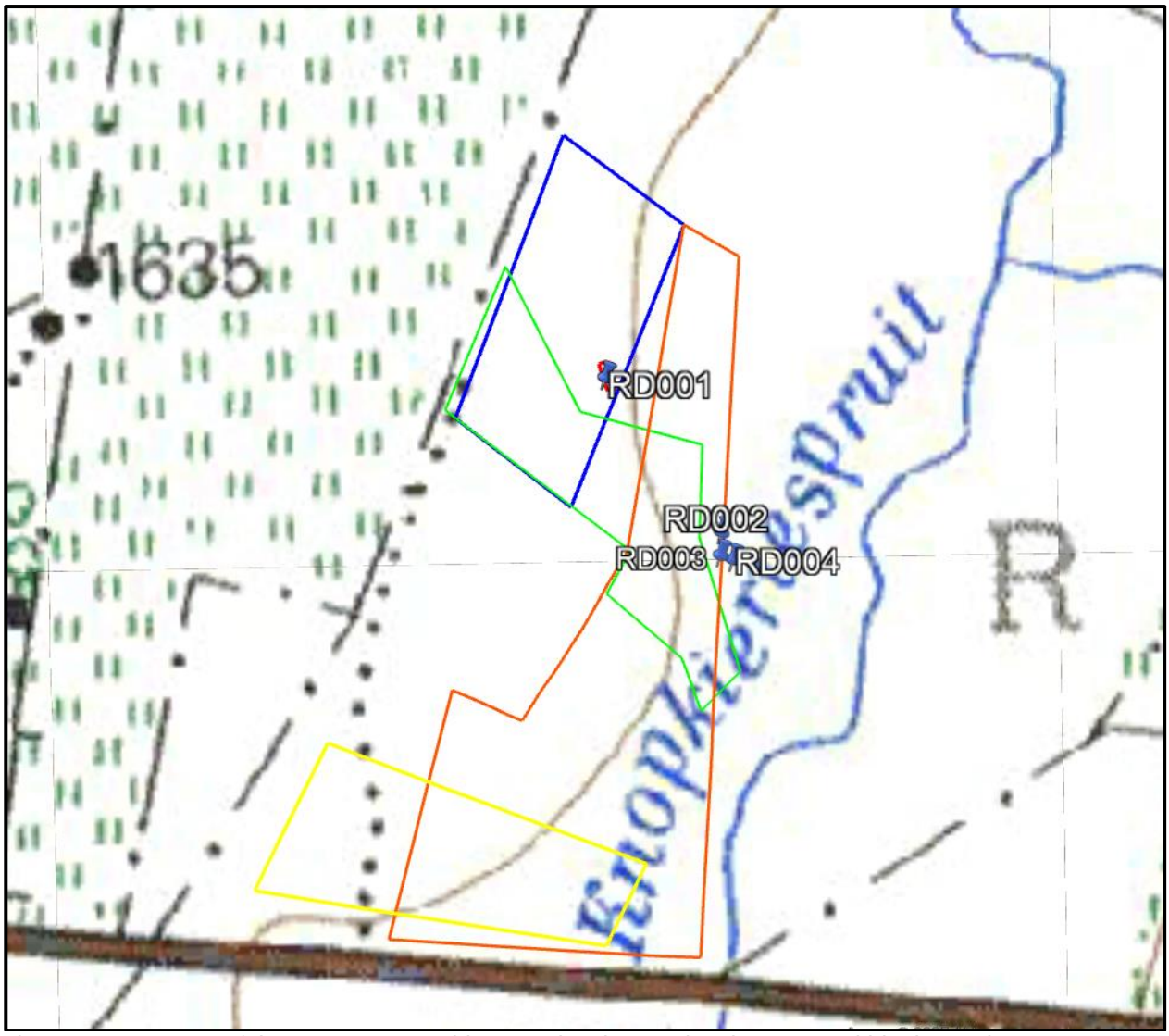


Figure 7.17. Extract of the 1973 topographic map showing no developments within the Project area.

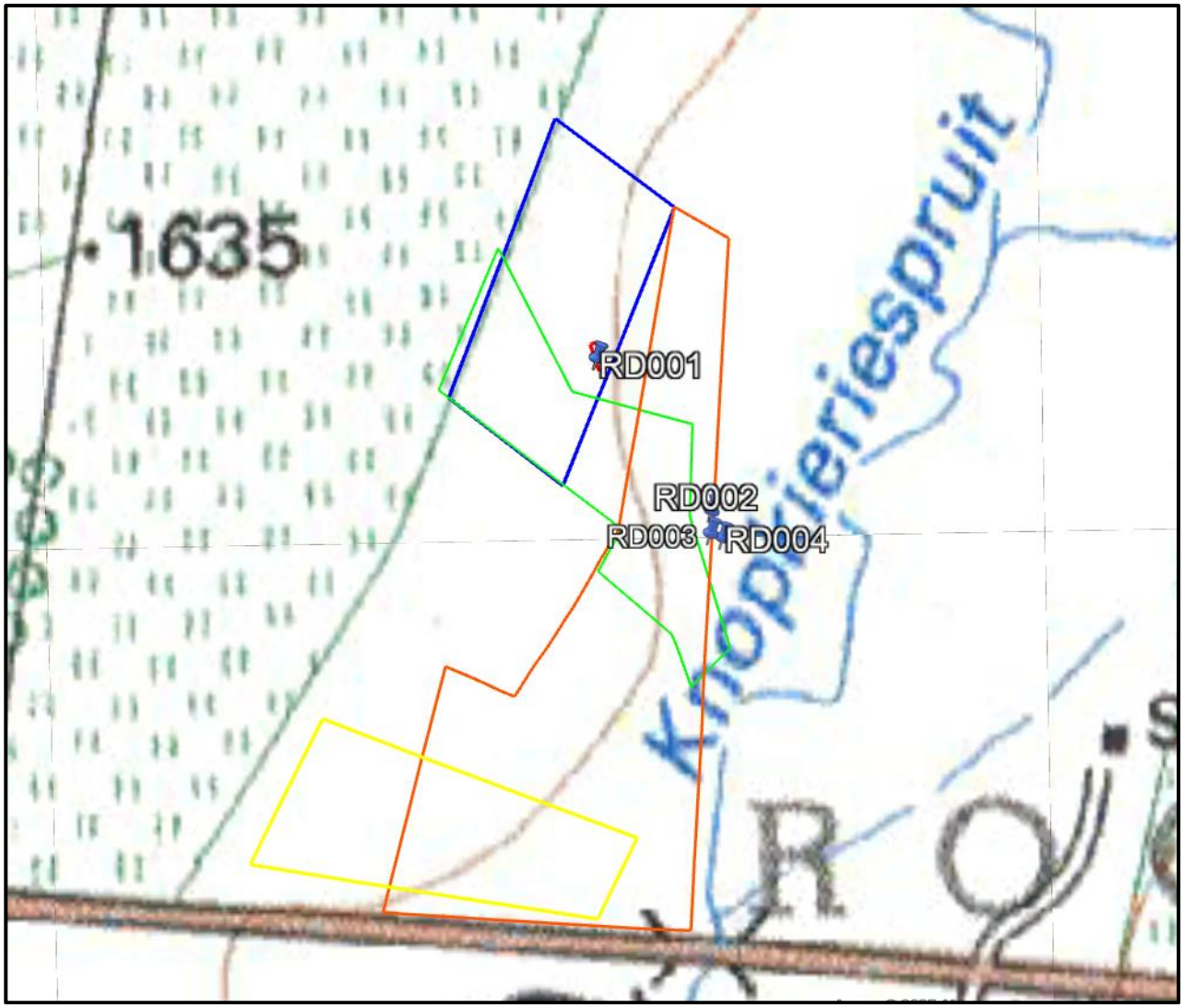
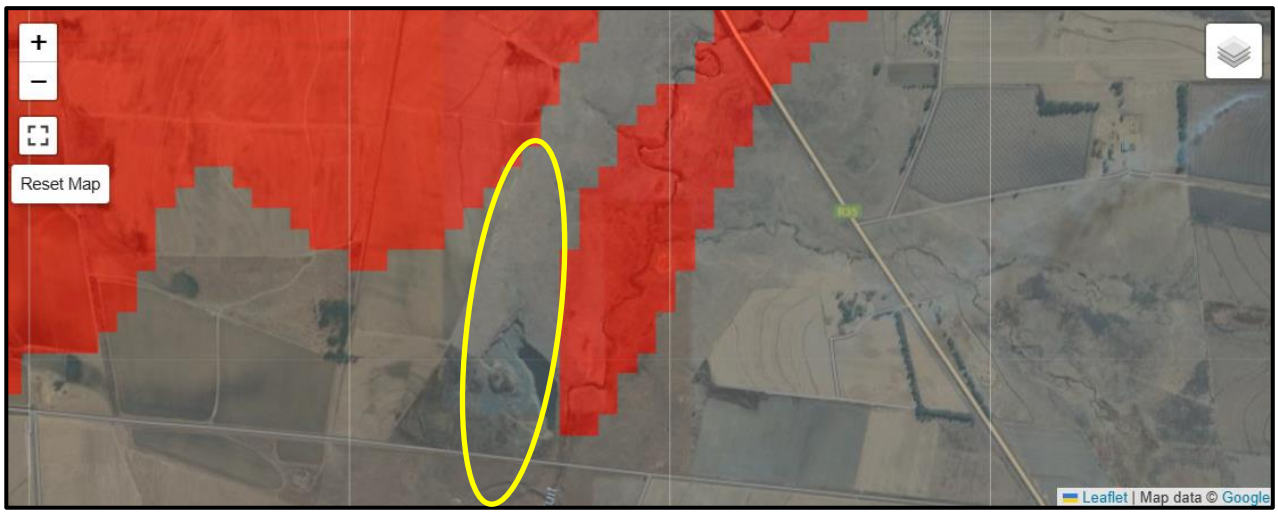


Figure 7.18. Extract of the 1996 topographic map showing no developments within the Project area.

7.4 Paleontological Heritage

According to the SAHRA palaeontological sensitivity map, the study area is indicated as insignificant/zero palaeontological sensitivity (Figure 7.19), and no palaeontological studies are required for his 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 7.19. Paleontological sensitivity of the approximate study area (yellow polygon) as indicated on the SAHRA Palaeontological sensitivity map.

8 Assessment of impacts

8.1 Impacts on tangible heritage resources.

The main cause of impacts to archaeological resources is physical disturbance of the material itself and its context during removal of topsoil and vegetation as well as the deep excavations diggings associated with mining.

The structures RD002, RD003, RD004, will be impacted by the eastern boundary of Stockpile 1 but if the boundary can be adjusted to incorporate a 30m buffer zone around this ridge with the structures, impact will be low to these sites. If the footprint of Stockpile 1 cannot be adjusted, the site will first require vegetation clearing in order to assess the required Phase 2 archaeological mitigation prior to the application of a destruction permit for these sites.

As the entire Project area is planned to be mined and utilised for a stockpile, the burial site RD001 will be impacted by the preferred MP area and the buffer zone will be encroached on by the Alternative MP area and Stockpile 2. As graves are always of high significance the site will be adversely affected. The burial site must preferably be avoided with a 100m buffer zone, or if avoidance is not possible, the graves must be moved with the necessary permits if avoidance is not possible. The Applicant has however requested a relaxation of the buffer zone to 40m or preferably 20m. The following was provided by the Applicant as measures to ensure the graves stay protected with a reduced buffer zone together with a grave management plan, the decision is however subject to the approval of SAHRA:

1) Obtaining a report from a blast expert on the effects of fly rock and Blast vibrations and possible impacts to the grave site;
2) The Blast design can be modified as mining gets closer to the grave site to minimize any blast vibrations.
3) The Applicant/ ECO can measure and monitor the blast vibrations on every blast and record results and submit regular reports to SAHRA;
4) The site will be monitored and photographs taken after each blast to see that no damage has occurred;
5) The grave area will be fenced, maintained and kept clean of excess vegetation.

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 during all phases of the development if mitigation measures are followed.

8.1.1 Cumulative impacts

Cumulative impacts in the Project area will be medium but can be mitigated to an acceptable level through implementation of the required mitigation measures.

8.2 Impact Assessment Tables

Table 8. Impact assessment for the burial site RD001

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 (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Moderate (6)
Probability	Highly Probable (4)	Improbable (2)
Significance	**48 (Medium to High)**	**24 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	Yes
Mitigation: • The burial sites must be avoided with a 100m buffer zone (or reduced buffer zone subject to approval from SAHRA); • Implementation of a chance find procedure for the project.		
Residual Impacts: Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on, but this cannot be quantified.		

Table 9. Impact assessment for the structures RD002, RD003, RD004.

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 (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (4)	Moderate (6)
Probability	Probable (3)	Improbable (2)
Significance	**30 (Medium)**	**20 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	Yes
Mitigation: • The structures should be avoided with a 30m buffer zone; • Implementation of a chance find procedure for the project.		
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.		

9 Conclusion and recommendations

The Project area is characterised by extensive surface disturbances across large portions which have been previously used as a quarry and processing site. The Project consists of a Mining Permit Area and Stockpile area, both of which Alternative locations have been provided and surveyed in order to assess the heritage significance.

During the survey, a burial site (RD001), and three structures along the ridgeline (RD002, RD003, RD004) were identified. Due to mining activities, the burial site should be avoided with a 30m buffer zone but the Applicant has requested for a relaxation on the buffer zone with an outline of potential ways to still ensure the graves be protected (see below).

The structures RD002, RD003, RD004 along the ridgeline are extremely overgrown and it was not possible to determine the full extent and purpose of the structures nor if an archaeological deposit is present at these sites. If Stockpile 1 is selected, these sites will be impacted and should be avoided with a 30m buffer zone. If avoidance is not possible, vegetation clearance will first be required in order to determine the extent of required recording process in a Phase 2 archaeological mitigation of the sites. Only after a Phase 2 mitigation is complete can a destruction permit be applied for.

From a heritage perspective, both MP areas will require a buffer zone in order to preserve the graves at RD001. The Stockpile 2 would be preferable as no sites are present here, if however Stockpile 1 is selected, avoidance or mitigation will be required for structure RD002, RD003, RD004.

According to the South African Heritage Resource Authority (SAHRA) Paleontological sensitivity map the study area of insignificant/zero palaeontological sensitivity, and no further studies are required for this aspect.

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

Ways of reducing the buffer zone around the grave site as proposed by the Applicant:

The following was provided by the Applicant as measures to ensure the graves stay protected with a relaxed buffer zone of 100m to 40m or 20m buffer zone, the decision is however subject to the approval of SAHRA:

1) Obtaining a report from a blast expert on the effects of fly rock and Blast vibrations and possible impacts to the grave site;
2) The Blast design can be modified as mining gets closer to the grave site to minimize any blast vibrations.
3) The Applicant can measure and monitor the blast vibrations on every blast and record results;
4) The site will be monitored and photographs taken after each blast to see that no damage has occurred;
5) The grave area will be fenced, maintained and kept clean of excess vegetation.

9.1 Recommendations for condition of authorisation

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

- Avoidance of the burial site RD001 with a 100m buffer zone is preferable with access provided to family members wishing to visit the graves
    - » The Applicant has requested a relaxation of the buffer zone, management plans presented by the Applicant are outlined above;
- The structures RD002, RD003, RD004 should preferably be avoided with a 30m buffer zone
    - » If avoidance is not possible then Phase 2 archaeological mitigation will be required with vegetation clearance to determine the extent of the sites in order to determine the level of mitigation required for the site;
- Development activities must be confined to the approved development footprint only;
- Monitoring of the Project area by the ECO during pre-construction and construction phases for heritage chance finds, if chance finds are encountered to implement the Chance Find Procedure for the Project as outlined in Section 9.
- Development of a Heritage Site Management Plan for the recorded burial site including an access protocol for Next of Kin (NoK).

9.2 Chance Find Procedure

9.2.1 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 applicable to the Chance Find procedure is discussed below and monitoring guidelines for this procedure are provided in Section 9.5.

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.

9.3 Reasoned Opinion

The overall impact of the Project with the recommended mitigation measures is acceptable 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.

9.4 Potential risk

Potential risks to the proposed Project are the occurrence of intangible features and unrecorded cultural resources (of which graves, and subsurface cultural material are the highest risk). This can cause delays during construction, as well as additional costs involved in mitigation and possible layout changes. The stakeholder engagement process will assess intangible heritage resources further if this is listed as a concern.

9.5 Monitoring Requirements

Day to day monitoring can be conducted by the 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.
  - Staff should also receive training on the CFP.
- *Site monitoring and watching brief*: As most heritage resources occur below surface, all earth-moving activities need to be routinely monitored in case of accidental discoveries. The greatest potential impacts are from pre-construction and construction activities. The ECO should monitor all such activities. If any heritage resources are found, the chance finds procedure must be followed as outlined above.

Table 10. Monitoring requirements for the Project

Heritage Monitoring					
Aspect	**Area**	**Responsible for monitoring and measuring**	**Frequency**	**Proactive or reactive measurement**	**Method**
Cultural Heritage Resource Chance Find	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 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.

9.6 Management Measures for inclusion in the EMPr

Table 11. Heritage Management Plan for EMPr implementation

Area	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Target	Performance indicators (Monitoring tool)
General Project area	Monitoring of the Project area by the ECO during pre-construction and construction phases for chance finds, if chance finds are encountered to implement the Chance Find Procedure for the project	Pre-Construction & Construction	Weekly	Applicant Construction Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34, 35, 36 and 38 of NHRA	ECO Checklist/Report
General Project Area	Development activities must be confined to the approved development footprint only.	Construction	Construction	Applicant Construction Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	ECO Checklist/Report
RD001	Avoidance of the burial site is preferable with a 100m buffer zone (or a relaxed buffer zone of 40m or 20m which will be subject to approval from SAHRA) and demarcation of the feature. An access protocol should be compiled for Next of Kin (NoK) who might want to visit the site as well as a grave management plan to ensure the site is protected.	Throughout the Project	Throughout the Project	Applicant Construction Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	ECO Checklist/Report
RD002, RD003, RD004	Avoidance of the site with a 30m buffer zone is preferable to preserve the site in-situ. If avoidance is not possible, the sites will first require vegetation clearance to determine the extent of Phase 2 archaeological mitigation which will be required for the structures.	Throughout the Project	Throughout the Project	Applicant Construction Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	ECO Checklist/Report

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