HERITAGE IMPACT ASSESSMENT

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

FOR THE PROPOSED MINING OF OVER 4.71 HA OF A PORTION OF THE REMAINING EXTENT OF THE FARM ELANDS SPRUIT NO 5523, KWAZULU NATAL

Type of development:

Mining

Client:

Greenmined Environmental

Applicant:

Raubex Construction (Pty) Ltd

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Project Reference:
Project number 24231
Report date:
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APPROVAL PAGE

Project Name	Ladysmith Quarry
Report Title	Heritage Impact Assessment for the proposed Mining of over 4.71 ha of a Portion of the Remaining Extent of the Farm Elands Spruit No 5523, KwaZulu Natal
Authority Reference Number	TBC
Report Status	Final Report
Applicant Name	Raubex Construction (Pty) Ltd

Responsibility	Name	Qualifications and Certifications	Date
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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 BA report
(q) Any other information requested by the competent authority.	No other information requested at this time

Executive Summary

Raubex Construction (Pty) Ltd, is applying for environmental authorisation (EA) and a mining permit (MP) over 4.91 ha of a portion of the Remaining Extent of the farm Elands Spruit No 5523. The Project area is situated within the Alfred Duma Local Municipality within the uThukela District Municipality of the KwaZulu Natal Province. Raubex Construction (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:

- The Project area is situated north of an existing quarry and mining activities which spread into the Project area. The southern portion of the Project area is already much disturbed through mining activities. During the survey, a possible packed stone wall (LS001) and stone cairn of unknown purpose (LS002) were identified;
- The possible remains of a stone packed wall at LS001 are too degraded to hold any heritage value and as the site is of low significance, impact to the feature will be low;
- Although the stone cairns of LS002 are situated outside the Project area, they face potential impact from debris from the blasting of rocks. As stone cairns can often be graves, the site holds potential to be of high significance. A previous survey of that area was done in 2017 and no stone cairns were recorded (van der Walt and Hutten 2017). The preferable action is to avoid the stone cairns with a 100m buffer zone to avoid impact. If the site cannot be avoided, further investigation will be required to confirm the nature of the stone cairns. This can be done through social consultation and test excavations. If confirmed as graves, a grave management plan should be compiled. The graves can also be moved with the relevant permits;
- According to the South African Heritage Resource Authority (SAHRA) Paleontological sensitivity map the study area is of insignificant/zero palaeontological sensitivity and no further palaeontological studies will be required for this aspect.

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 and AMAFA's approval.

Recommendations:

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

- Avoidance of the potential graves (Stone Cairns) at LS002 is preferable with a 100m buffer zone. If this is not be possible;
  - » It is recommended that further investigation must be done to confirm whether the feature represents graves. This can be done through social consultation and test excavations;
  - » If the site is confirmed as graves, a grave management plan should be compiled;
  - » Alternatively, the grave can be relocated with the relevant permits.
- Mining activities must be confined to the approved development footprint only;
- Monitoring of the Project area by the ECO during all phases for heritage chance finds, if chance finds are encountered to implement the Chance Find Procedure for the Project as outlined in Section 9.

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	29/04/2024

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 application for environmental authorisation (EA) and a mining permit (MP) over 4.91 ha of a portion of the Remaining Extent of the farm Elands Spruit No 5523. The Project area is situated within the Alfred Duma Local Municipality within the uThukela District Municipality of the KwaZulu Natal Province of South Africa (Figure 1.1 to 1.3). The report forms part of the Environmental Impact Assessment (EIA) 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) and Kwazulu-Natal Heritage Act, No. 4 of 2008.

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 possible stone packed wall was recorded in the study area and stone cairns of unknown purpose were identified outside of 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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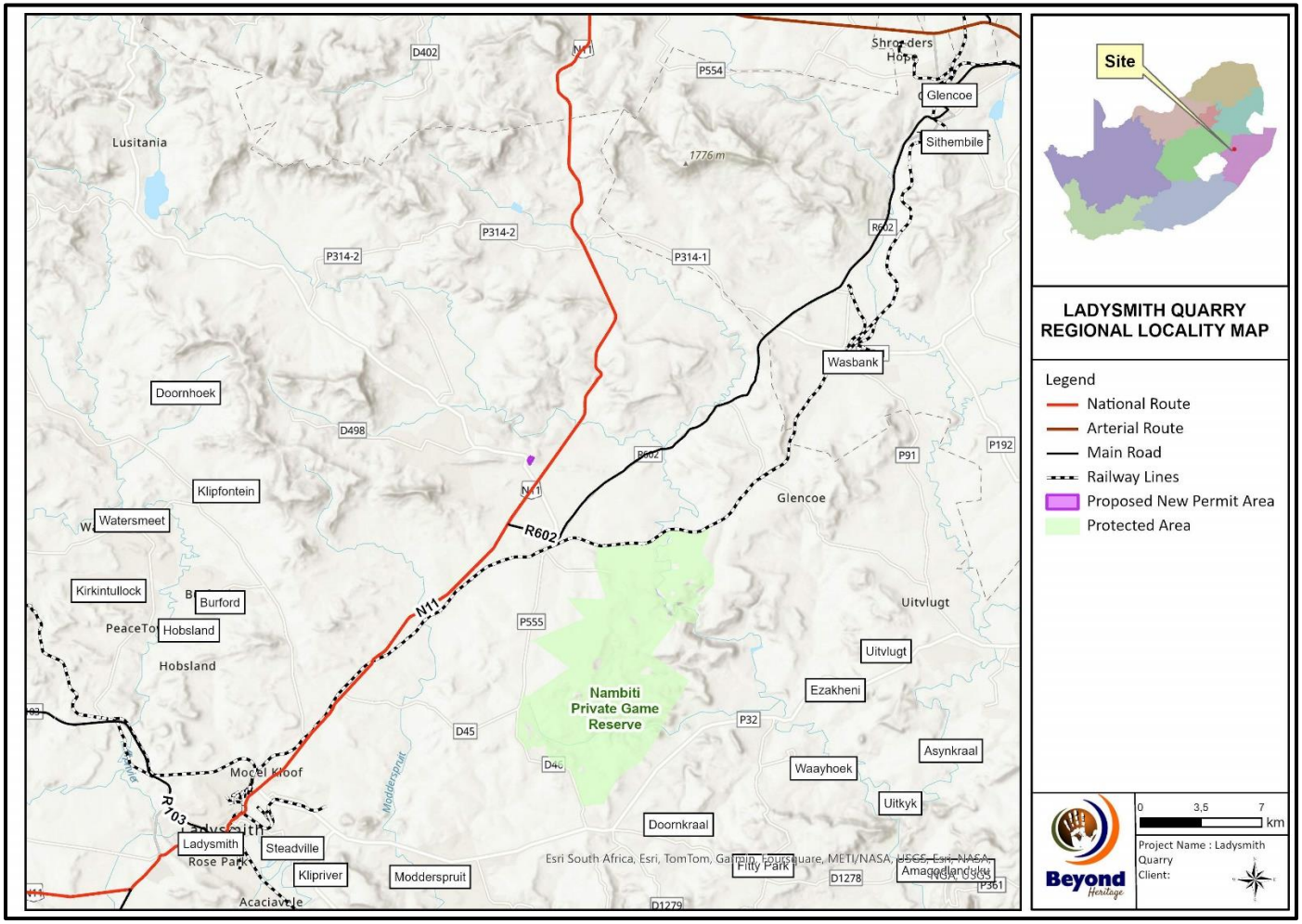


Figure 1.1. Regional setting of the Project.

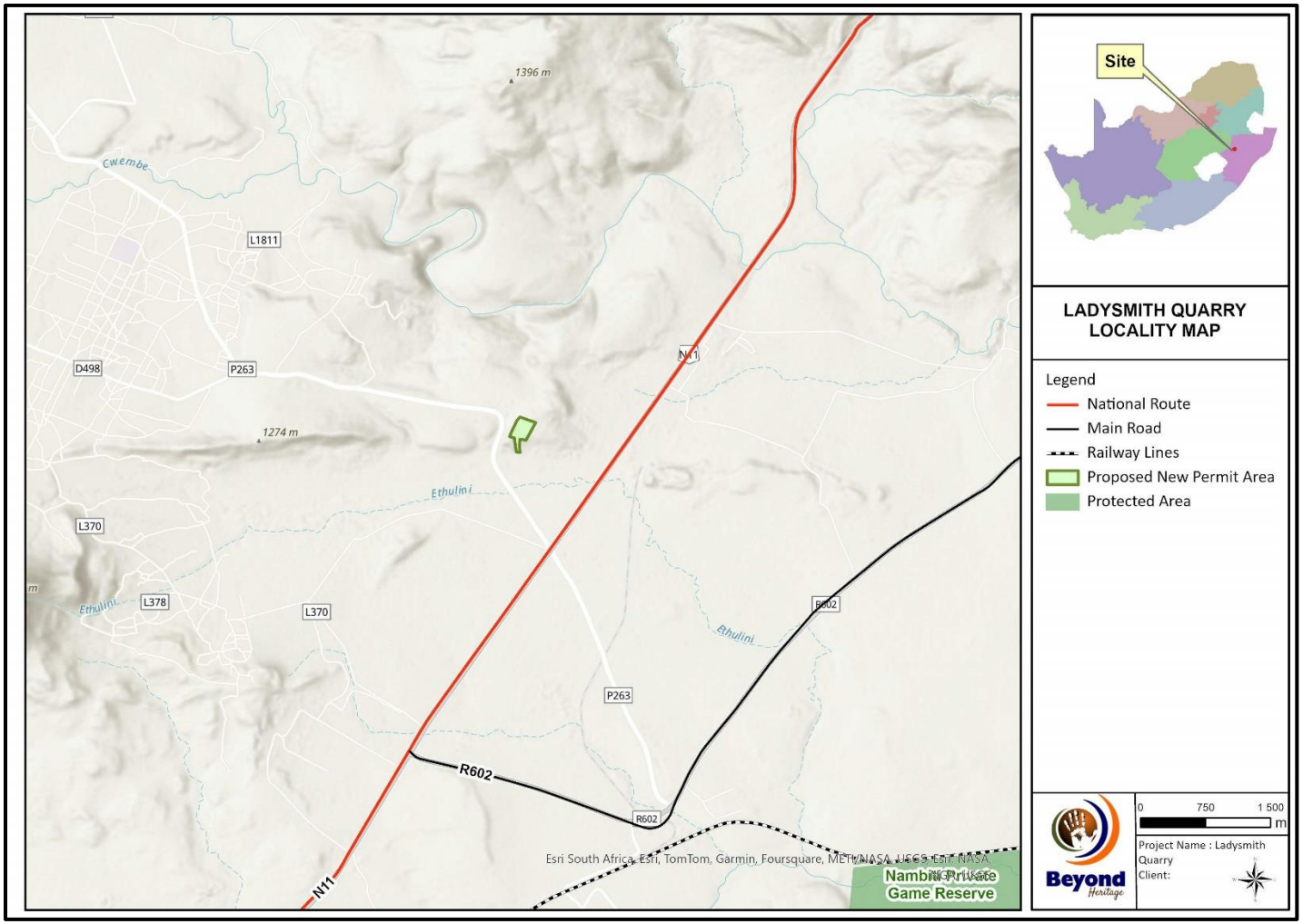


Figure 1.2. Local setting of the Project.

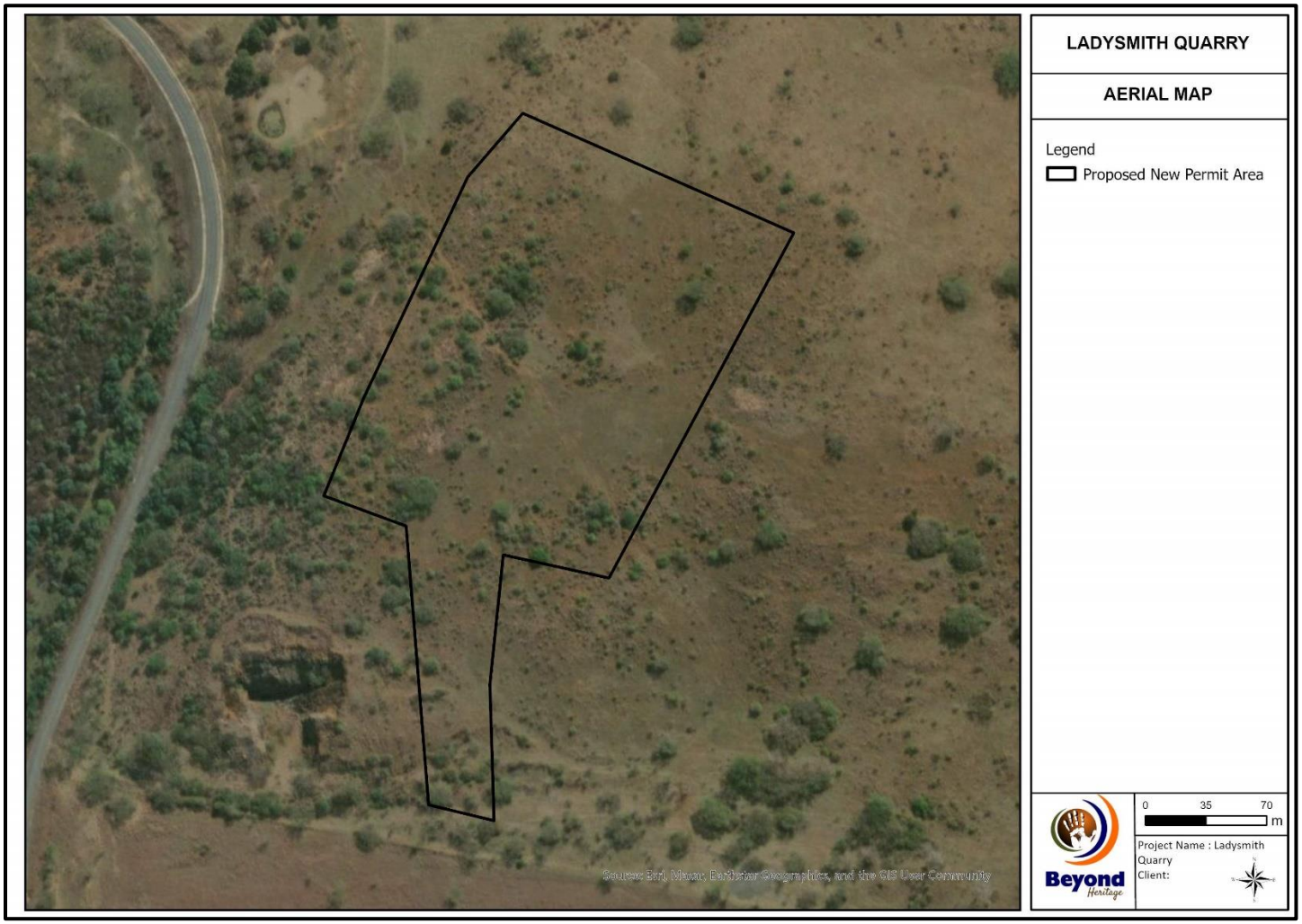


Figure 1.3. Aerial image of the Project area and surrounds.

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 & AMAFA 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 Ladysmith Quarry Project are outlined in Tables 2 and 3.

Table 2: Project Description

Magisterial District	Alfred Duma Local Municipality within the uthukela District Municipality
Central co-ordinate of the development	28°21'58.46"S 29°56'30.63"E
1:50 000 Topographic Map Number	2829 BD

Table 3: Infrastructure and project activities

Type of development	Mining
Project Details: The proposed mining footprint will be 4.91 ha and will be developed over a greenfield area of the farm. The earmarked mining area directly borders an existing quarry, and the Applicant therefore wishes to secure the resource and proposes to mine the quarry through the open-cast mining method. The mining method will make use of blasting to loosen the hard rock; the material will then be loaded and hauled out of the excavation to the mobile crushing plant where it will be screened to various sized stockpiles. The stone aggregate, gravel will be stockpiled until it is transported from site using tipper trucks. The permit holder will be responsible for the rehabilitation of the entire area upon closure. The infrastructure will be of temporary nature as a mining permit can only be valid for a maximum of 5 years. The farm track will be improved to allow movement of the project related vehicles. No water will be abstracted from the site, and the plant will be powered with generators. Chemical toilets will be used, and the project will appoint ±8 local employees.	

1.3 Alternatives

No alternatives were provided, but the area assessed allows for siting of the development to avoid impacts to heritage resources.

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)
- Kwazulu-Natal Heritage Act, No. 4 of 2008
- 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;
- 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 Basic Assessment (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).

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

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	10 April 2024
Season	Autumn – A large part of the project area along the southern boundary was inaccessible due to existing and on-going mining activities which show a high level of surface disturbances. A portion of the proposed project area has been mined. Some of the thickets of trees within the project area were too dense to access. The general archaeological visibility throughout the proposed project area was low due to the overgrown surface vegetation and high levels of surface disturbances. The Project area was however sufficiently covered to understand the heritage character of the area (Figure 3.1).

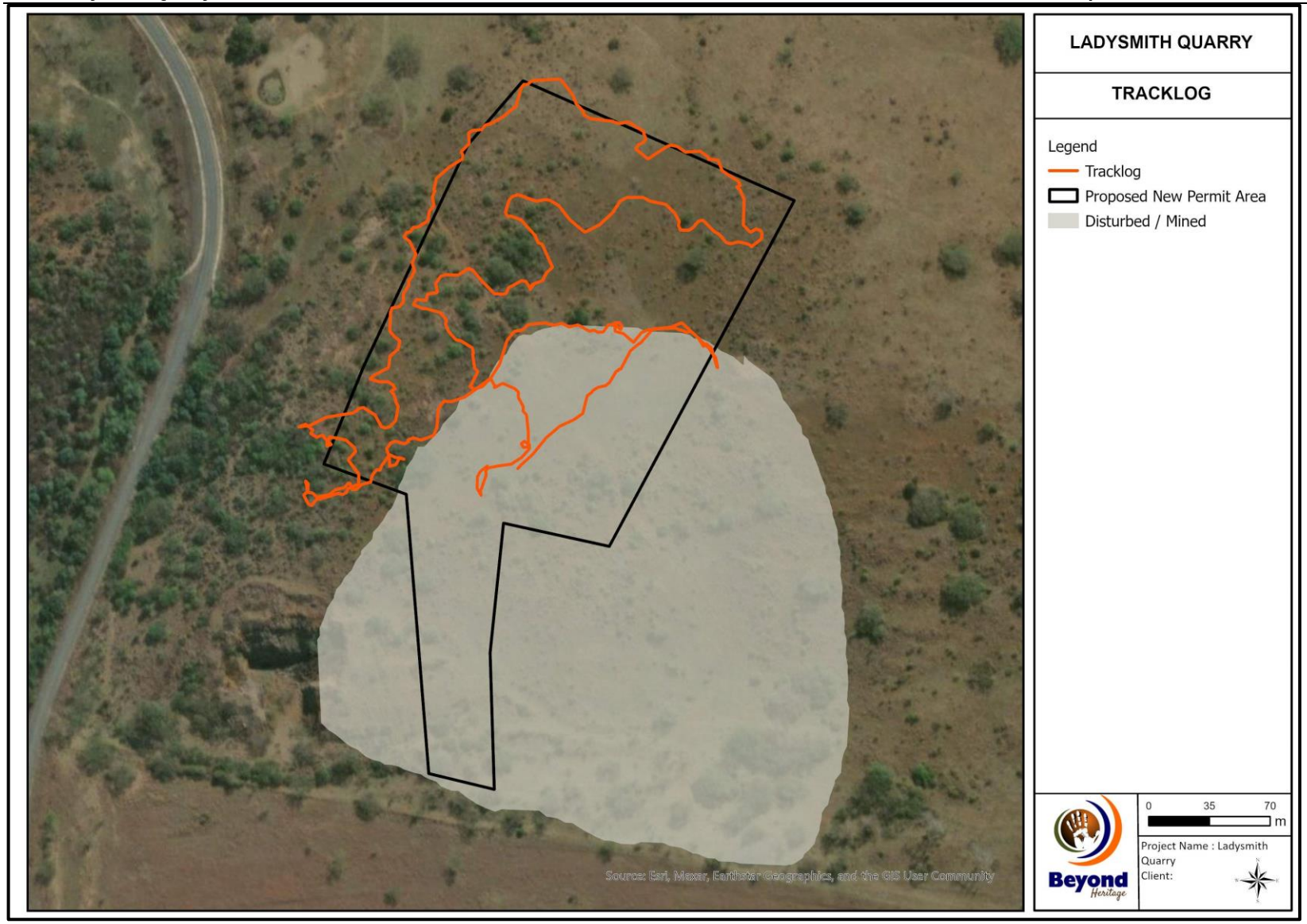


Figure 3.1. Tracklog of the survey path in green.

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

"*Census (2011) indicates that the population for the former Emnamabithi/Ladysmith municipality has risen from a total of 225 459 people in 2001 to 237 437 in (2011) with an average growth of 0.52% which is much less than in 2001 where the growth rate was 4.67% while with former Indaka Municipality Census (2011) decreased from 113,644 people in 2001 to 103,116 people. Thus indicates a population decline of 10.2% over 10 years. The current population then for Alfred Duma Local Municipality is 340 116 as per statistics obtained through Census 2011 for Indaka and Emanambithi/Ladysmith Municipalities. One of the reasons that has led to decrease in the population is that the youth migrate to other cities like Durban, Pietermaritzburg and Gauteng looking for jobs and tertiary institutions."* (alfredduma.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 LSA is well represented in KwaZulu-Natal with an abundance of rock art, like the rock paintings at Giants Castle and Kamberg in the Drakensburg Mountains (Vinnicombe 1976). Rock art sites have also been documented in the areas around Estcourt, Mooi River and Dundee. Several caves in KZN contain significant archaeological deposits like the well-known MSA site of Sibudu Cave on the coast of KwaZulu-Natal, which shows evidence for early forms of cognitive human behavioural patterns (Wadley 2005). Another well-known cave called Border Cave at the Ingodini Border Cave Museum Complex was first investigated by Raymond Dart in 1934; here excavations exposed a thick deposit of archaeological material dating from the Iron Age overlaying MSA artefacts. Several sites dating to the Early, Middle and Later Stone Age are on record for the larger area in the data base of the KwaZulu-Natal Museum.

6.1.2 Iron Age

Bantu-speaking people moved into Eastern and Southern Africa about 2,000 years ago (Mitchell 2002). These people cultivated sorghum and millets, herded cattle and small stock and manufactured iron tools and copper ornaments. Because metalworking represents a new technology, archaeologists call this period the Iron Age. Characteristic ceramic styles help archaeologists to separate the sites into different groups and time periods. The 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 (EIA): Most of the first millennium AD.
- The Middle Iron Age (MIA): 10th to 13th centuries AD.
- The Late Iron Age (LSA): 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. In terms of the Iron Age the earliest known type of stonewalling characterising the Central Cattle Pattern (CCP) settlement layout in the region is known as Moor Park, which dates from the 14th to 16th Centuries AD (Huffman 2007). This type of stonewalling can be found in defensive positions on hilltops in the Midlands of KZN (Huffman 2007). The function of these structures was to serve mainly as defensive outposts. In addition to these stone walled settlements several Iron Age sites dating to the Early and Late Iron Age are found in the study area and the ceramic facies represented date from AD 450 – AD 1820 (Beater and Maud 1963, Whitelaw 1994, Huffman 2007).

6.1.3 Historical Background

The British Colony of Natal grew from a coastal settlement, Port Natal, which was already well established by 1824 with the permission of Shaka, Chief of the Zulu nation. In the mid-1830s Piet Retief arrived at Port Natal with his Voortrekker companions and was murdered when he attempted to negotiate for a grant of land with the new Zulu chief, Dingane. This, and the consequent slaughter of many whites in the province, led to Port Natal being abandoned (Evans 2000: 193). After the Boers triumphed against the Zulu nation at the Battle of Blood River in December 1837, the Republic of Natalia came into being, and had its capital in Pietermaritzburg. Britain's interest in having an additional port en route to India moved the British to reoccupy Port Natal in 1843. Late in the 19th century, gold was discovered at Elandslaagte, Dundee and Newcastle, and this further increased Britain's economic and commercial interest in maintaining control of this area. Natal was therefore seen as a secure British base for operations against the Boers by the time that the Anglo-Boer War (1899-1902) broke out (Evans 2000: 193, Pretorius 2009: 297-298).

6.1.4 Anglo-Boer War

The Anglo-Boer War (1899-1902) played an important part in shaping South Africa's history, and this was especially true for the Natal Colony. Events of importance in the vicinity of the area under investigation for this report include the Battle of Elandslaagte (1899) and the Battle of Nicholson's Nek (1899). These skirmishes will be discussed briefly.

The site of the Elandslaagte battle (21 October 1899) is located about 7 km to the southeast of the Project area. The Boers occupied the railway Station on the 20th of October and early the following morning a British mounted patrol with artillery shelled them. The Boers withdrew, took up a position on high ground overlooking the railway line and their guns forced the British to withdraw. Reinforcements were dispatched from Ladysmith and the British subsequently executed a classic conventional attack that resulted in a staggering defeat of Gen. Jan Kock's Boer force (Battlefields Route Kwazulu Natal 2013).

Figure 6.1. Aftermath of the Battle of Elandslaagte. (NASA TAB, Photographs: 14284)

The Battle of Nicholson's Nek was one of two British defeats around Ladysmith that came to be known as "Mournful Monday", or the battle of Ladysmith. The British army in Natal had concentrated in Ladysmith by 25 October. Lieutenant-general Sir George White, the British commander in Natal, decided to launch a pre-emptive strike on Boer columns that were converging on the town. He also dispatched a force to Nicholson's Nek, north of Ladysmith, either to prevent another Boer column from interfering in the main fight around Ladysmith, or to block one possible route a defeated Boer army might take from Ladysmith (Rickard 2007).

The British Lieutenant Colonel Frank Carleton led the force to Nicholson's Nek, and camped at Tchrengula Hill on the way. The Boers became alerted to the British presence and at dawn 30th October 1899 opened fire on the British position. The British suffered heavy losses, with 38 dead and 105 wounded. The Boers reported only four deaths and five wounded. The British were forced to surrender. Close to one thousand British soldiers entered captivity after the battle. The defeat at Nicholson's Nek and the failure of White's main attack at Lombard's Kop ended any chance of avoiding a siege (Rickard 2007).

Figure 6.2. The site of the Battle of Nicholson's Nek, where 12000 were taken captive. (NASA TAB, Photographs: 16467)

6.1.5 Historical Overview of Farm Ownership

Van der Walt and Hutten conducted research of documents kept at the Natal Archives in Pietermaritzburg (van der Walt and Hutten 2017).

By 1886 one John Truscott of Ladysmith was in the process of purchasing the property Elands Spruit, and was unable to pay the fourth installment. He requested an extension until January 1887. Truscott was still in the process of purchasing the farm by 1892, when he asked for another extension of time. (NAB, SGO: III/1/56 SG743/1886; NAB, SGO: III/1/86 SG2862/1892).

IN 1895 T. F. Carted applied for the title to the farm Elands Spruit, and it seems that the farm was granted to him in 1896. (NAB, SGO: III/1/104 SG4060/1895; NAB, SGO: III/1/112 SG3120/1896)

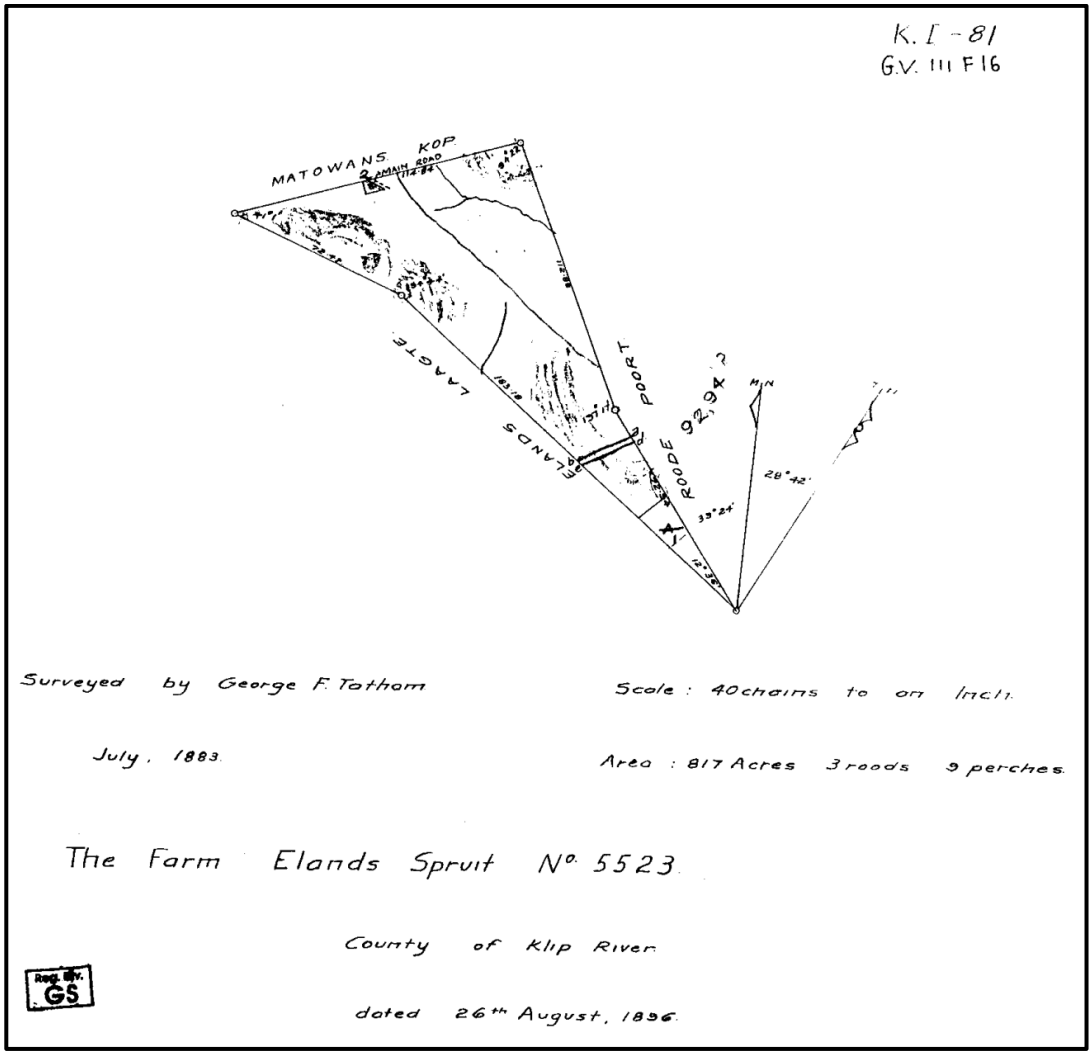


Figure 6.3. 1896 Surveyor General's diagram of the farm Elands Spruit No. 5523, in the County of Klip River. The farm measured 817 acres 3roods and 9 perches. (Surveyor General's Office 1896)

Unfortunately, no information could be obtained regarding the landowners of Elands Spruit for the period 1897-1967. The following details regarding historical landowners could be traced on the Windeed Search Engine:

Date	Portion	Transferred from	Transferred to	Purchase price
1967	RE (1/4)	-	Koch Jan Gysbert	Unknown
1967	RE (1/4)	-	Oosthuizen WillemTobias	Unknown
1967	RE (1/4)	-	Rheeder Jacob Salomon	Unknown
1967	RE	-	Oosthuizen Pieter Francois	Unkown
1985	RE	-	Oosthuizen Pieter, Francois	R45 000
2007	RE	-	Oosthuizen Pieter, Francois	R280 000

History of Land Use:

In 1909 it was reported by the District Veterinary surgeon Hutchinson of Dundee that one Malamba had moved four head of cattle from the farm Uitkop to the farm Elands Spruit in the Klip River division. (NAB, SNA: I/1/453 4145/1909).

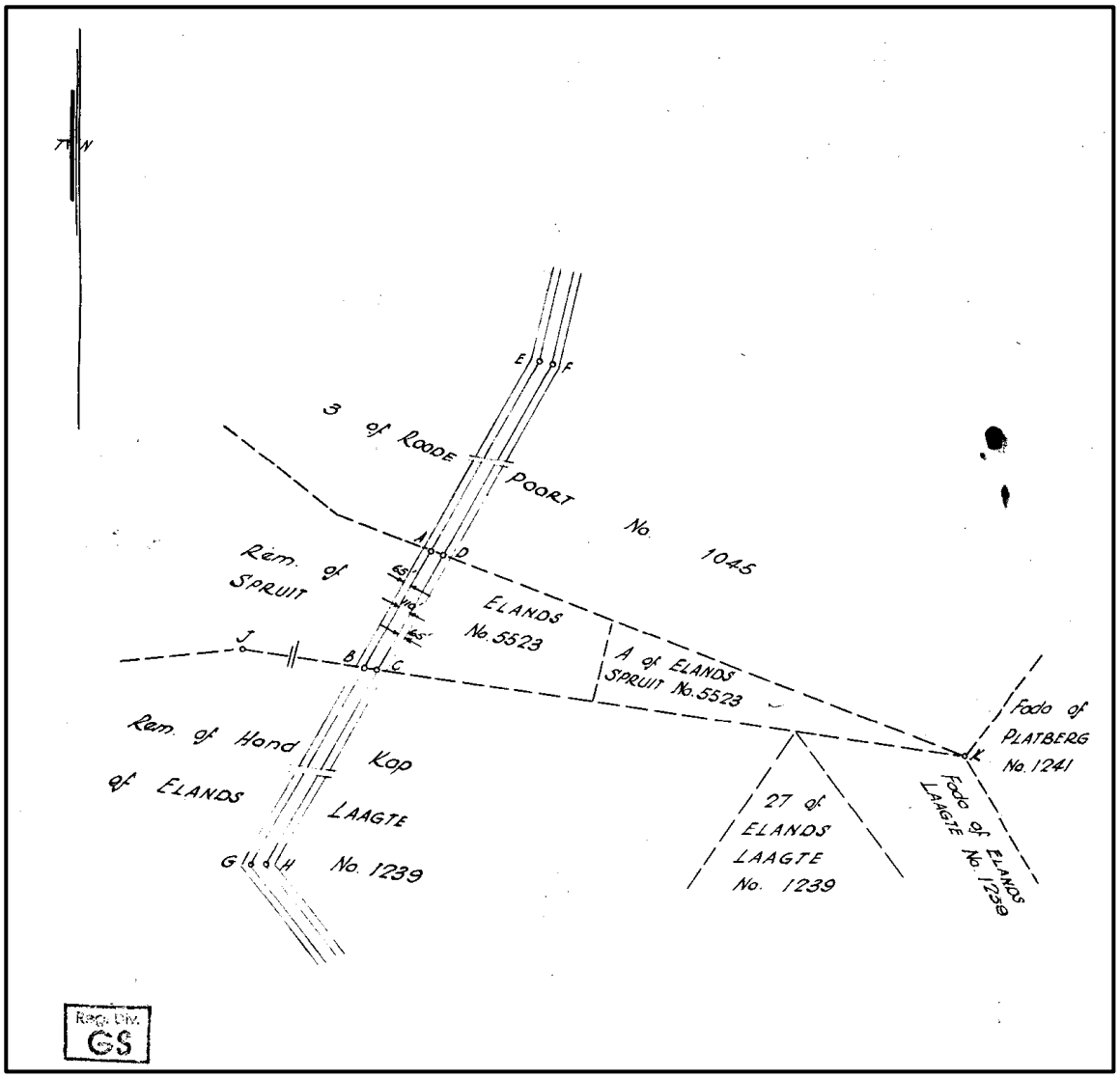


Figure 6.4. 1953 Surveyor General's diagram of the farm Elands Spruit No. 5523, in the County of Klip River. The lines A. B. and D. C. represent the centre lines of electric power transmission lines over the Remainder of the farm Elands Spruit NO. 5523. (Surveyor General's Office 1953)

6.2 Literature Review (SAHRIS)

Several 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. The area immediately south of the Project was previously surveyed in 2017 (van der Walt and Hutten 2017). The survey identified no heritage resources.

Table 6. Studies consulted for the project.

Author	Year	Project	Findings
Van der Walt, J., Hutten, M.	2017	Heritage Impact Assessment for the proposed Elands Spruit Quarry, Ladysmith, KwaZulu Natal Province.	No sites were identified.
Prins, F.E., Hall, S.M.	2013	Cultural Heritage Impact Assessment of the Proposed Driefontein Pipeline Development Phase 2 Including the Recently Identified Alternative Route, Emnambithi/Ladysmith Local Municipality	5 sites were recorded including cemeteries and stone built structures.
Prins, F.E., Hall, S.M.	2015	First Phase Cultural Heritage Impact Assessment of the Proposed Rehabilitation of National Route 11 Section 2, Ladysmith, Emnambithi-Ladysmith Local Municipality, Kwazulu-Natal.	Twenty-one cultural heritage sites situated adjacent to the N11. Including Later Iron Age sites, Anglo-Boer War period sites, homesteads and farmsteads older than sixty years of age, public buildings over sixty years of age, one memorial, and two contemporary places of worship (mosques).
Prins, F.E.	2018	First Phase Cultural Heritage Impact Assessment of the Proposed Construction of a Single Lane Low-Level Vehicle River Bridge at The Crossing Point Between the Cwembe River and the Local Road L1292, Alfred Duma Local Municipality, Kwazulu-Natal.	No sites were identified.
Birkholtz, P.D., van der Walt, J.	2006	Phase 1 Heritage Impact Assessment for the Construction and Upgrading of the Proposed Access Roads to the Braamhoek Pumped Storage Scheme.	Stone structures, stonewall, Iron Age sites, Historical kraal, the old Bramhoek farmstead, possible graves, isolated lithic, stone foundations, Historical bridges, cemeteries, Historical structure,
Becker, E.	2008	Environmental Impact Assessment for the Proposed: Majuba-Venus 765 kV Transmission Power Lines (EIA: 12/12/20/1157), Turn-in at the Majuba Sub-station (EIA: 12/12/20/1161), Extension of the Majuba Sub-station (EIA: 12/12/20/1161), Turn-in at the Venus Sub (EIA 12/12/20/1158) Extension of the Majuba Sub-station (EIA 12/12/20/1161) Heritage Resources	Anglo-Boer War sites were identified in Ladysmith and the surrounding area.
Van Schalkwyk, J.A.	1998	A Survey of Cultural Resources for the Proposed Braamhoek Pumped Storage Scheme, Free State/Kwazulu-Natal Border Area.	Circular stone structures, cemetery, a single grave.
Seliane, M.	2008	Proposed Upgrading of P263 And Bridge Construction in Matiwane, Ladysmith Local Municipality Phase I Cultural Heritage Impact Assessment.	No sites were identified.

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 Northern KwaZulu-Natal Moist Grassland of the Grassland Biome. It is described as hilly and rolling landscapes supporting tall tussock grassland usually dominated by *Themeda triandra* and *Hyparrhenia hirta.* Open *Acacia sieberiana* var. *woodie* savannoid woodlands encroach up the valleys, usually on disturbed (strongly eroded) sites (Mucina and Rutherford 2006).

The project area is situated about 5km east of Matiwane and about 27km northeast of Ladysmith, KwaZulu Natal. The project area consists of a small portion situated on a rocky hill near the N11 and the Elandslaagte Truck stop. The affected hill is covered in thick grass as well as small thickets of trees and scattered aloes. A large portion of the project area has been disturbed by current mining activities along the southern boundary of the proposed portion. A small powerline was noted near the north-eastern corner of the project area. General site conditions are indicated in (Figure 7.1 to 7.4).

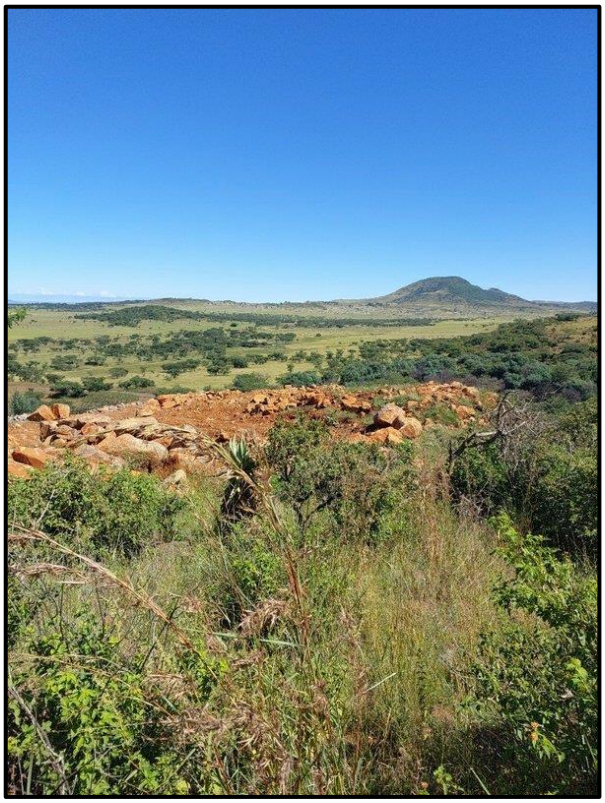


Figure 7.1. General view of the surrounding landscape - Image showing the disturbed mining area.

Figure 7.2. Image showing scattered Aloes across the rocky hill.

Figure 7.3. General view of the thickets of trees situated on top of the hill.

Figure 7.4. General view of the mined area along the southern section of the project area.

7.2 Heritage Resources

Heritage observations within the study area included a possible stone packed feature, and stone cairns that were recorded as waypoints. 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 7.10.

The possible graves at LS002 (stone cairns) were difficult to define due to overgrown vegetation. In a previous survey of the Farm, no graves were found (van der Walt and Hutten 2017). During the survey, Denzhe (the onsite contact person) relayed that one of the excavator operators had noticed the stone packed cairns.

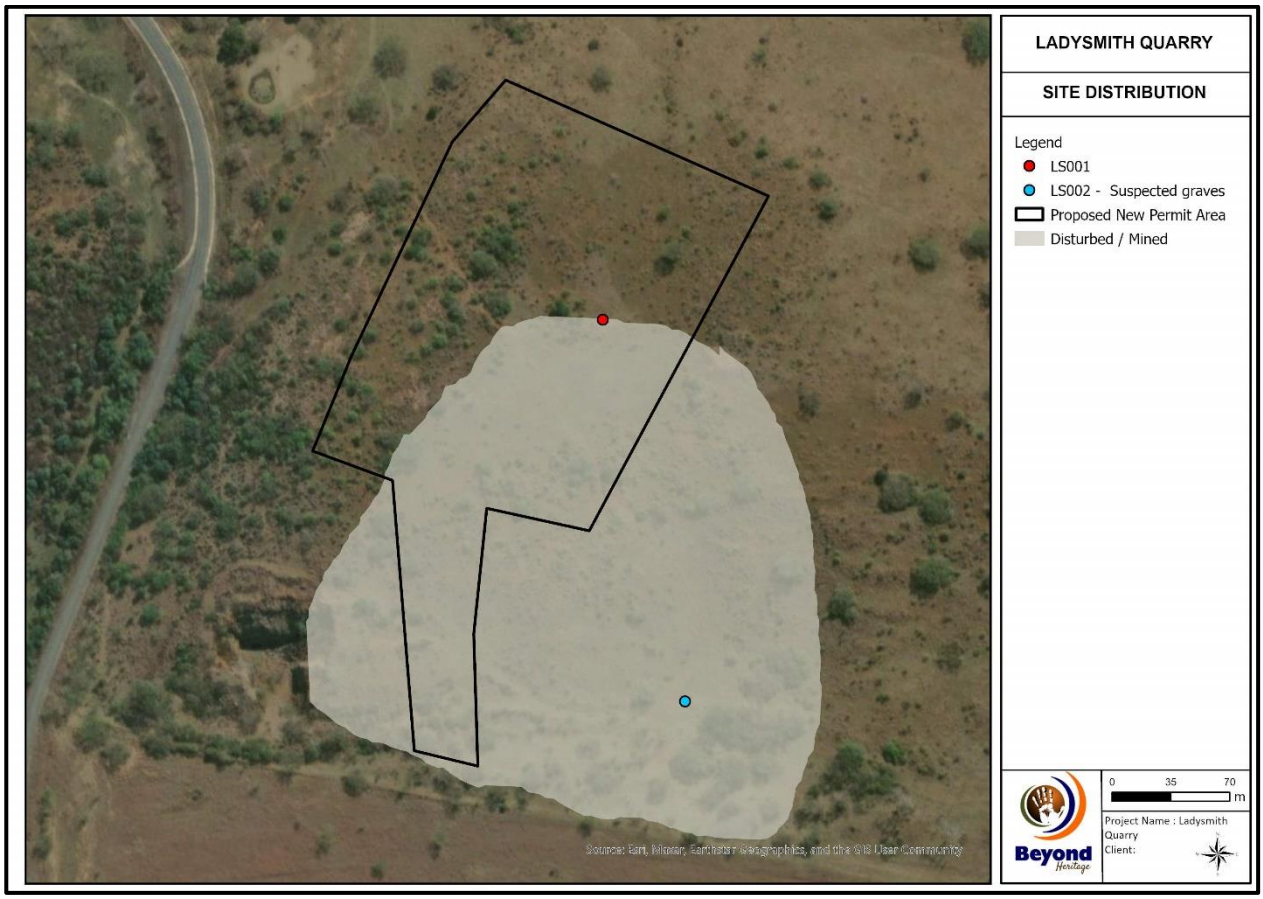


Figure 7.5. Site distribution map

Table 7. Sites recorded in the study area

Label	Longitude	Latitude	Description	Significance
LS001	29°56'32.25"E	28°21'57.88"S	Small 2 m section of possible packed stone walling situated in the tall grass on top of a rocky hill. The site is too degraded to hold any historical value.	Low Significance GP C
LS002	29°56'34.40"E	28°22'5.16"S	Possible graves (stone cairns) situated along the eastern boundary of the project area. The possible graves are located directly next to a new gravel mining road that has been made for the existing mine. The site is extremely overgrown making it difficult to assess the feature, but two cairns were noted. The feature has been marked with a construction barrier.	Low Significance GP C if confirmed graves then High Significance 3A

Figure 7.6. Current site conditions surrounding the feature at LS002.

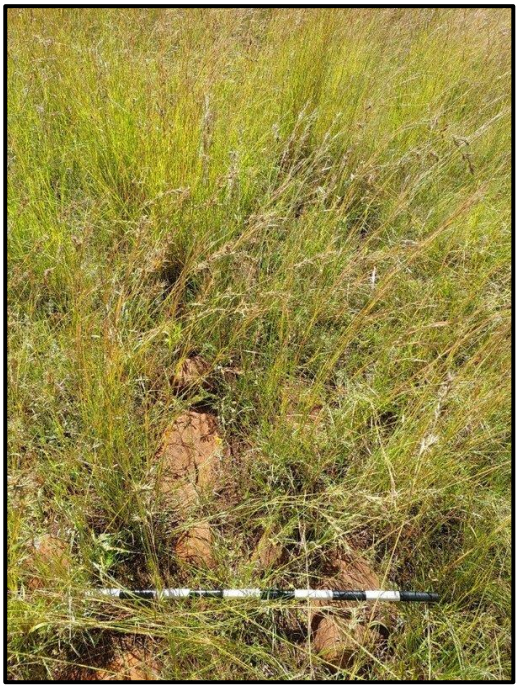


Figure 7.7. General view of the small section of possible packed stone walling at LS001.

Figure 7.8. General site conditions at LS001 illustrating the vegetation.

Figure 7.9. Older site conditions at LS002. Image provided by the contact person at the mine from a few months ago illustrating the feature and vegetation at the time.

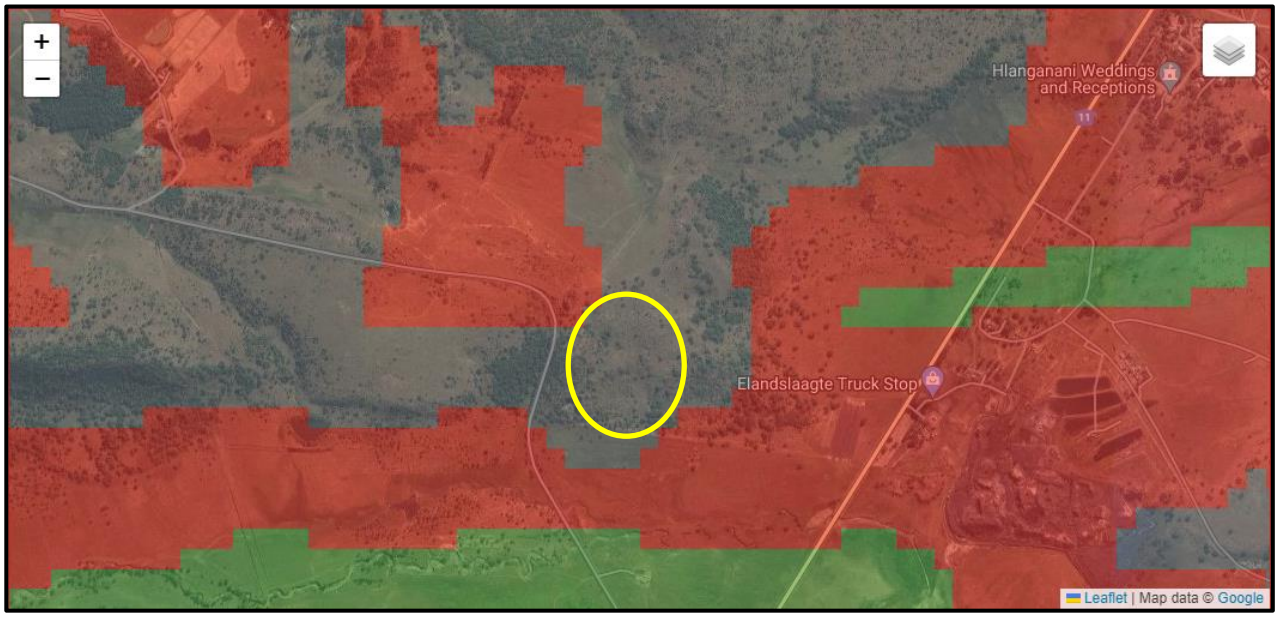
Figure 7.10. Older site conditions at LS002. Image provided by the contact person at the mine from a few months ago.

7.3 Cultural Landscape

The Project area is rural in character and situated in a largely undeveloped area. Developments in the surrounding area include mining activities, road developments as well as some industrial developments. A quarry is situated within the Project area. The proposed project is in line with the land use in the surrounding area.

7.4 Paleontological Heritage

According to the SAHRA palaeontological sensitivity map, the study area is indicated as insignificant/zero palaeontological sensitivity (Figure 7.14), and no further palaeontological studies are required for this aspect.



Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map

Figure 7.11. 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.

Due to the nature of the project, which will involve blasting of hard rock, both sites identified will be impacted. Due to the low significance of the packed stone feature at LS001, impact to the site will be low as the site is too degraded to hold heritage value.

The stone cairns of unidentified purpose will be directly impacted on. If the features do not represent graves the impact will be low and if confirmed to be graves the features are of high social significance and the impact will be high.

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 can be mitigated to an acceptable level through the implementation of the correct mitigation measures.

8.2 Impact Assessment Tables

Table 8. Impact assessment for possible packed stone wall LS001

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	Minor (2)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	**24 (Low)**	**16 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	NA	NA
Mitigation: • Monitoring of the Project area by the ECO during all phases for heritage chance finds, if chance finds are encountered to implement the Chance Find Procedure for the Project as outlined in Section 9.		
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 possible graves LS002.

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	Probable (3)	Improbable (2)
Significance	**36 (Medium)**	**24 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	NA	NA

Mitigation:
• Avoidance of the potential graves at LS002 is preferable with a 100m buffer zone. If this is not possible;
  ○ It is recommended that further investigation must be done to confirm whether the feature represent graves. This can be done through social consultation and test excavations;
  ○ If the site is confirmed as graves, a grave management plan should be compiled;
  ○ Alternatively, the graves can be relocated with the relevant permits.
• Mining activities must be confined to the approved development footprint only;
• Monitoring of the Project area by the ECO during all phases for heritage chance finds, if chance finds are encountered to implement the Chance Find Procedure for the Project as outlined in Section 9.		

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 situated north of an existing quarry and mining activities which encroach into the Project area. The southern portion of the Project area is already very disturbed through mining activities. During the survey, a possible packed stone wall (LS001) and stone cairns of unknown purpose (LS002) were identified.

The possible remnants of a stone packed wall at LS001 are too degraded to hold any heritage value and as the site is of low significance, impact to the feature will be low. Although the stone cairns of LS002 are situated outside the Project area, it can be potentially impacted by debris from blasting of rocks. As stone cairns can represent graves, the site holds potential to be of high significance. During the survey, Denzhe relayed that one of the excavator operators had noticed the stone packed features. The preferable action is to avoid the stone cairns with a 100m buffer zone to avoid impact. If the site cannot be avoided, further investigation will be required to confirm the nature of the stone cairns. This can be done through social consultation and test excavations. If confirmed to be graves, a grave management plan should be compiled. The graves can also be relocated with the relevant permits.

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

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 and AMAFA's approval.

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 and AMAFA:

- Avoidance of the potential graves at LS002 is preferable with a 100m buffer zone. If this is not be possible;
    - It is recommended that further investigation must be done to confirm whether the feature represent graves. This can be done through social consultation and test excavations;
    - If the site is confirmed as graves, a grave management plan should be compiled;
    - Alternatively, the graves can be relocated with the relevant permits.
- Mining activities must be confined to the approved development footprint only;
- Monitoring of the Project area by the ECO during all phases for heritage chance finds, if chance finds are encountered to implement the Chance Find Procedure for the Project as outlined in Section 9.

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 mining for chance finds, if chance finds are encountered to implement the Chance Find Procedure for the project	Throughout the Project	Throughout the Project	Applicant Construction Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34, 35, 36 and 38 of NHRA and Kwazulu-Natal Heritage Act, No. 4 of 2008	ECO Checklist/Report
General Project Area	Mining activities must be confined to the approved development footprint only.	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 and Kwazulu-Natal Heritage Act, No. 4 of 2008	ECO Checklist/Report
LS002	Avoidance of the potential graves at LS002 with a 100m buffer zone regulated for blasting zones would be preferable. If this is not possible within the Project area, it is recommended that further investigation be done to confirm whether the feature are graves. This can be done through social consultation and test excavations. If the site is confirmed as graves, a grave management plan must be compiled. Alternatively, graves can be moved with the relevant permits.	Pre-Mining	Pre-Mining	Applicant Construction Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA and Kwazulu-Natal Heritage Act, No. 4 of 2008	ECO Checklist/Report

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