HERITAGE IMPACT ASSESSMENT

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

FOR THE PROPOSED MINING PERMIT OVER A PORTION OF THE FARM STEINKOPF NO 22 IN THE NAMA KHOI MUNICIPAL AREA OF THE NORTHERN-CAPE PROVINCE

Type of development:

Mining permit application

Client:

Greenmined Environmental (Pty) Ltd

Applicant:

Namli Exploration and Mining (Pty) Ltd

Report prepared by:

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Project Reference:
Project number 2281
Report date:
May 2022
Revised July 2022

APPROVAL PAGE

Project Name	Steinkopf No 22 Mining Permit
Report Title	Heritage Impact Assessment for the Proposed Mining Permit over a Portion of the Farm Steinkopf No 22 In the Nama Khoi Municipal Area of the Northern-Cape Province
Authority Reference Number	TBC
Report Status	Final Report
Applicant Name	Namli Exploration and Mining (Pty) Ltd

Responsibility	Name	Qualifications and Certifications	Date
Fieldwork and reporting	Jaco van der Walt - Archaeologist	MA Archaeology ASAPA #159 APHP #114	May 2022

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Amendments on Document

Date	Report Reference Number	Description of Amendment
6 July 2022	2281	Inclusion of paleontological findings as per SAHRA Interim Comment.

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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;	9
(d) Duration, Date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3.4
(e) Description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 3
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of site plan identifying site alternatives;	Section 8 and 9
(g) Identification of any areas to be avoided, including buffers	Section 8 and 9
(h) Map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	Section 8
(I) Description of any assumptions made and any uncertainties or gaps in knowledge	Section 3.7
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity including identified alternatives on the environment or activities;	Section 1.3
(k) Mitigation measures for inclusion in the EMPr	Section 10.1
(I) Conditions for inclusion in the environmental authorisation	Section 10. 1.
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 10. 5.
(n) Reasoned opinion - (i) as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Section 10.3
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report	Section 6
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to BA report
(q) Any other information requested by the competent authority	N.A

Executive Summary

Greenmined Environmental (Pty) Ltd was appointed as the Environmental Assessment Practitioner (EAP) by Namli Exploration and Mining (Pty) Ltd to undertake the required Environmental Authorisation Process for a mining permit over a 5-ha portion of the farm Steinkopf No 22 in the Nama Khoi municipal area of the Northern-Cape Province. Beyond Heritage was appointed to conduct a Heritage Impact Assessment (HIA) for the Project and the study area was assessed on desktop level and by a non-intrusive pedestrian field survey. Key findings of the assessment include:

- The Project is located on the southern side of a ridge with outcrops that were previously mined and marked by extensive excavations and tailings known as Norrabees 1 and 2;
- The tailings of Norrabees 1 will be processed first, and actual mining will not be necessary during the initial phases of the project;
- The ridges of intrusive gneisses (granodioritic) do not seem to have been conducive to the formation of rock shelters, and no rock art or archaeological sites of significance were recorded in the study area;
- Finds were limited to stone-built structures associated with the initial mining activities that predate 1961 at Norrabees 1 and could be older than 60 years;
- An independent study is included for the paleontological aspect of the project. Bamford (2022) concluded that the proposed site lies on the non-fossiliferous volcanic rocks of the Vuurdood Subsuite (Vioolsdrift Suite) and the Orange River Suite (Richtersveld Subprovince). These granites and reworked volcaniclastic sediments were emplaced about 2 000 to 1 900 million years ago so are the wrong type and too old to preserve any fossils. No fossils have been recorded from this area and the closest riverine alluvium with transported rocks occurs on the north side of the Orange River or far south. A Fossil Chance Find Protocol is of limited use because it is not known what types of fossils could even be looked for, but one has been added for Quaternary sands. Since the impact will be extremely low, as far as the palaeontology is concerned, the project should be authorised and mining permit granted.

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

Recommendations:

- Documentation (scaled mapping) of the mining-related structures at Norrabees 1 and 2;
- The enclosures recorded as Feature 3 are just outside of the development footprint and it is recommended that these features should be avoided and preserved *in situ* with 30 meter buffer zone;
- After documentation of the features a destruction permit can be applied for the sites that will be impacted on (for Feature 1 and 2) from Ngwao-Boswa Jwa Kapa Bokone (Northern Cape PHRA) prior to mining activities starting;
- Feature 4 is located outside of the impact area and should be demarcated and avoided during mining activities;
- Implementation of a Chance Find Procedure for the project (as outlined under Section 10.2);
- Monitoring of the project by the ECO.

Declaration of Independence

Specialist Name	Jaco van der Walt
Declaration of Independence	I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I: • I act as the independent specialist in this application; • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant; • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity; • I will comply with the Act, Regulations and all other applicable legislation; • I have no, and will not engage in, conflicting interests in the undertaking of the activity; • I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority; • All the particulars furnished by me in this form are true and correct; and • I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.
Signature	
Date	24/05/2022

a) Expertise of the specialist

Jaco van der Walt has been practising as a CRM archaeologist for 15 years. He obtained an MA degree in Archaeology from the University of the Witwatersrand focussing on the Iron Age in 2012 and is a PhD candidate at the University of Johannesburg focussing on Stone Age Archaeology with specific interest in the Middle Stone Age (MSA) and Later Stone Age (LSA). Jaco is an accredited member of ASAPA (#159) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, KZN as well as he Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, DRC Zambia, Guinea, Nigeria and Tanzania. Through this, he has a sound understanding of the IFC Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
BIA: Basic Impact Assessment
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DEA: Department of Environmental Affairs
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMPr: Environmental Management Programme
ESA: Early Stone Age
ESIA: Environmental and Social Impact Assessment
GIS Geographical Information System
GPS: Global Positioning System
GRP Grave Relocation Plan
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MSA: Middle Stone Age
NEMA National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID Notification of Intent to Develop
NoK Next-of-Kin
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

GLOSSARY

Archaeological site (remains of human activity over 100 years old)
Early Stone Age (~ 2.6 million to 250 000 years ago)
Middle Stone Age (~ 250 000 to 40-25 000 years ago)
Later Stone Age (~ 40-25 000, to recently, 100 years ago)
The Iron Age (~ AD 400 to 1840)
Historic (~ AD 1840 to 1950)
Historic building (over 60 years old)

1 Introduction and Terms of Reference:

Beyond Heritage was appointed to conduct a HIA for a mining permit over a 5 ha portion of the farm Steinkopf No 22 in the Nama Khoi municipal area of the Northern-Cape Province (Figure 1-1 to 1-4). The report forms part of the Basic Assessment and Environmental Management Programme Report (EMPr) for the development.

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

During the survey, remains of previous mining related structures were recorded. General site conditions and features on sites were recorded by means of photographs, GPS locations and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report. SAHRA as a commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) require all environmental documents, compiled in support of an Environmental Authorisation application as defined by NEMA EIA Regulations section 40 (1) and (2), to be submitted to SAHRA for commenting. Upon submission to SAHRA the project will be automatically given a case number as reference. As such the EIA report and its appendices must be submitted to the case as well as the EMPr, once it's completed by the Environmental Assessment Practitioner (EAP).

1.1 Terms of Reference

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

Reporting
Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with the relevant legislation, SAHRA minimum standards and the code of ethics and guidelines of ASAPA.
To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999).

1.2 Project Description

Project components and the location of the proposed mining permit are outlined under Table 2 and 3.

Table 2: Project Description

Magisterial District	Nama Khoi municipal area
Central co-ordinate of the development	28°57'0.40"S; 17°58'48.53"E
Topographic Map Number	2817 DD

Table 3: Infrastructure and project activities

Type of development	Mining Permit
Size of development	5 hectares
Project Components	The objective of the project is the extraction of minerals containing the elements Ta, Li and Nb (Niobium) from two deposits currently known as Norrabees 1 and 2 on the abovementioned property. The deposits are closely spaced (450 m) and were both mined previously with extensive excavations on both the outcropping areas of Norrabees 1 and 2. The tailings of Norrabees 1 will be processed first, and actual mining will not be necessary during the initial phases of the project. The tailings at Norrabees 1 will be adequate to support the operation for a 6-month period, after which blasting and extraction of in-situ material from the existing mining areas will become necessary. The company will bring in mobile crushers to process the material that will be stockpiled before future processing. Continuous crushing will not be necessary on site, as crushers will be brought to site at ±6-month intervals. Partial processing, primarily to produce a lithium and tantalum concentrate, will take place on site. The concentrate will then be transported to a more convenient locality (Steinkopf/Springbok) for the production of final saleable products. The proposed processing of the material represents mechanical, gravity based, recovery processes with water being the only consumable. A material for producing density, namely ferrisilicon (FeSi) will be used by the processing plant. FeSi is environmentally friendly and is magnetically recovered and continuously recycled during the process. A borehole with constant water supply is present near the mining operation. Water to be used at the processing plant will be extensively recycled. No new roads will be constructed as the existing roads will be used and upgraded where needed. The operations will be powered with generators when electricity is needed.

1.3 Alternatives

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

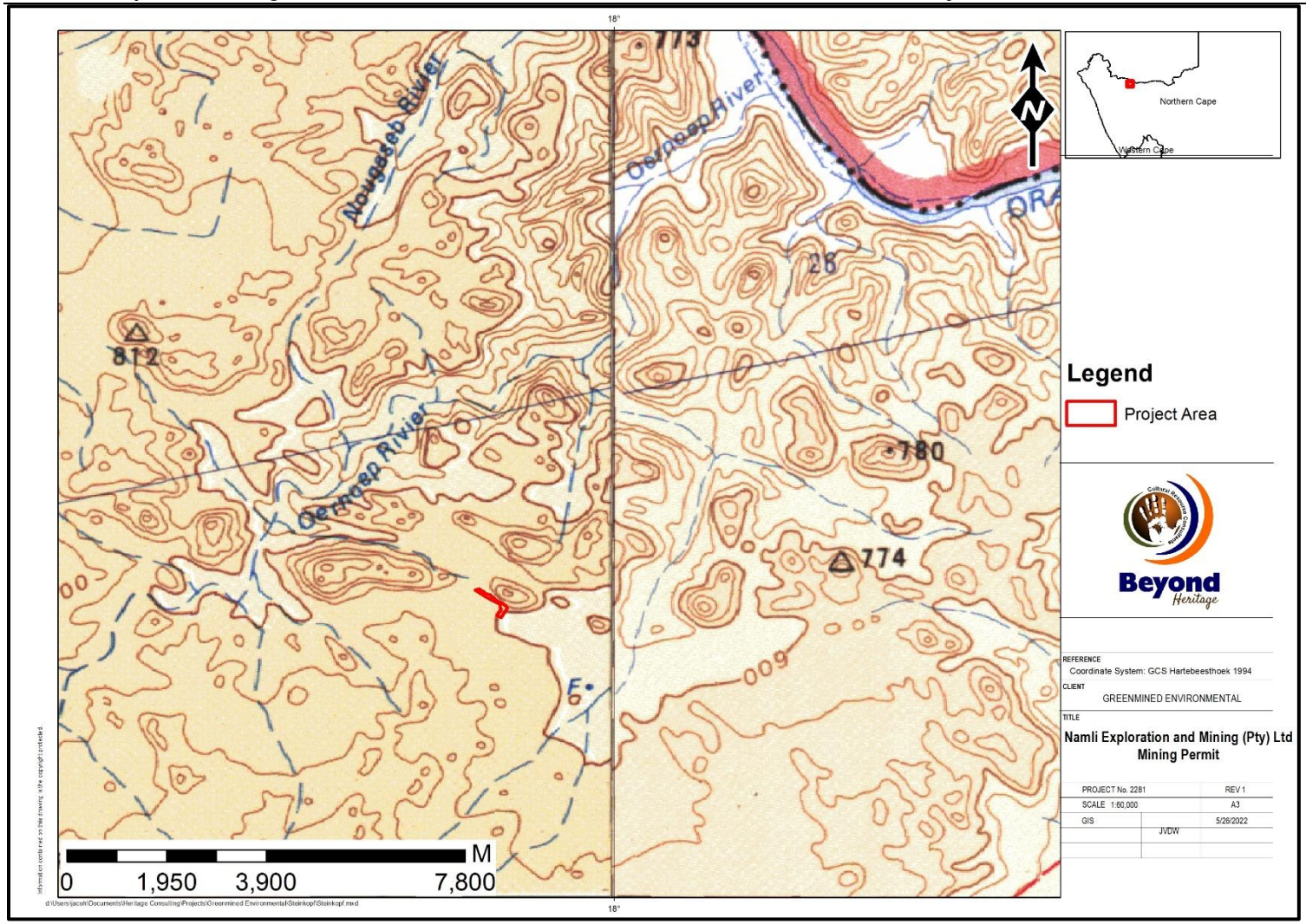


Figure 1.1. Regional setting of the Project (1: 250 000 topographical map).

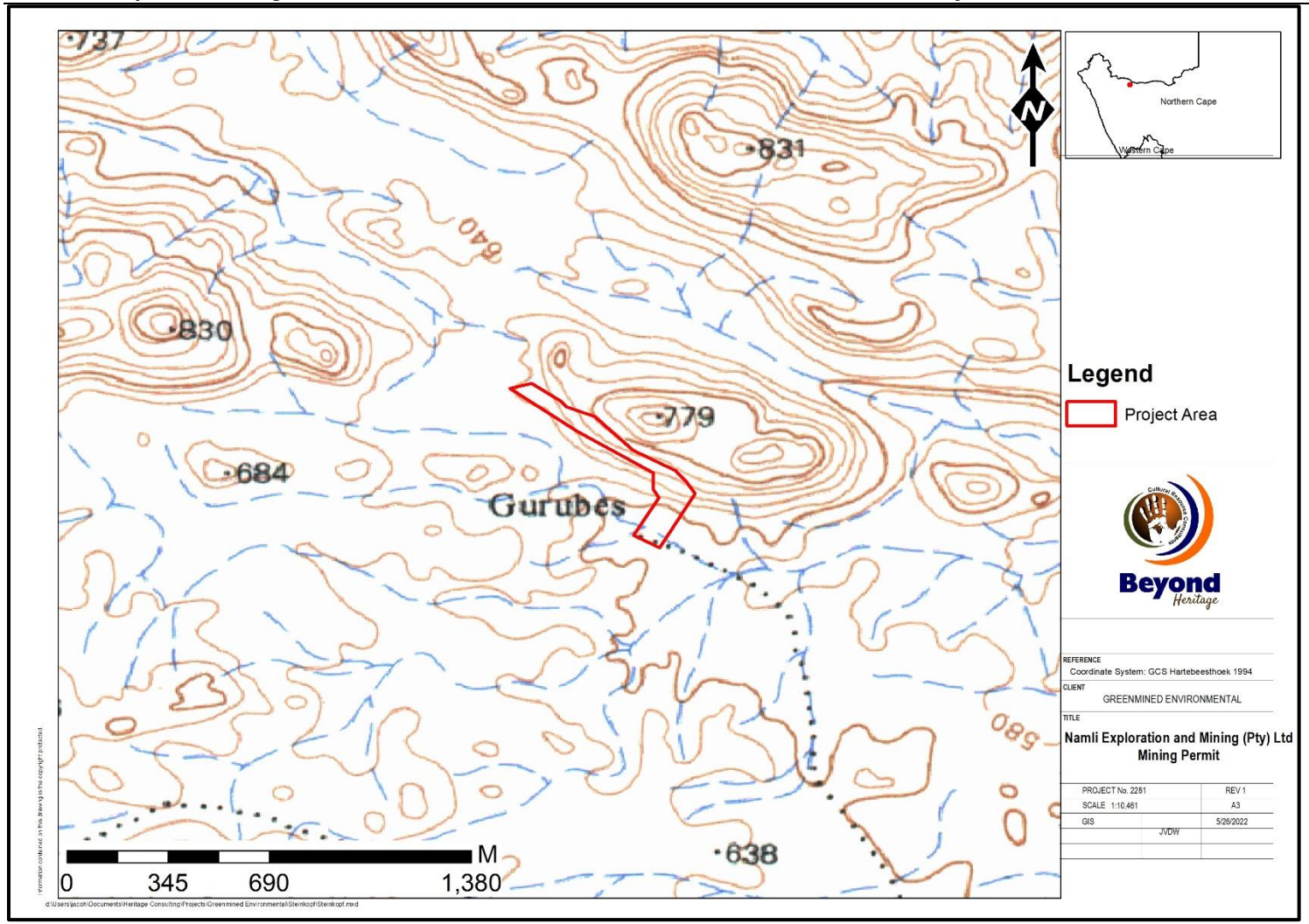


Figure 1.2. Local setting of the Project (1: 50 000 topographical map).

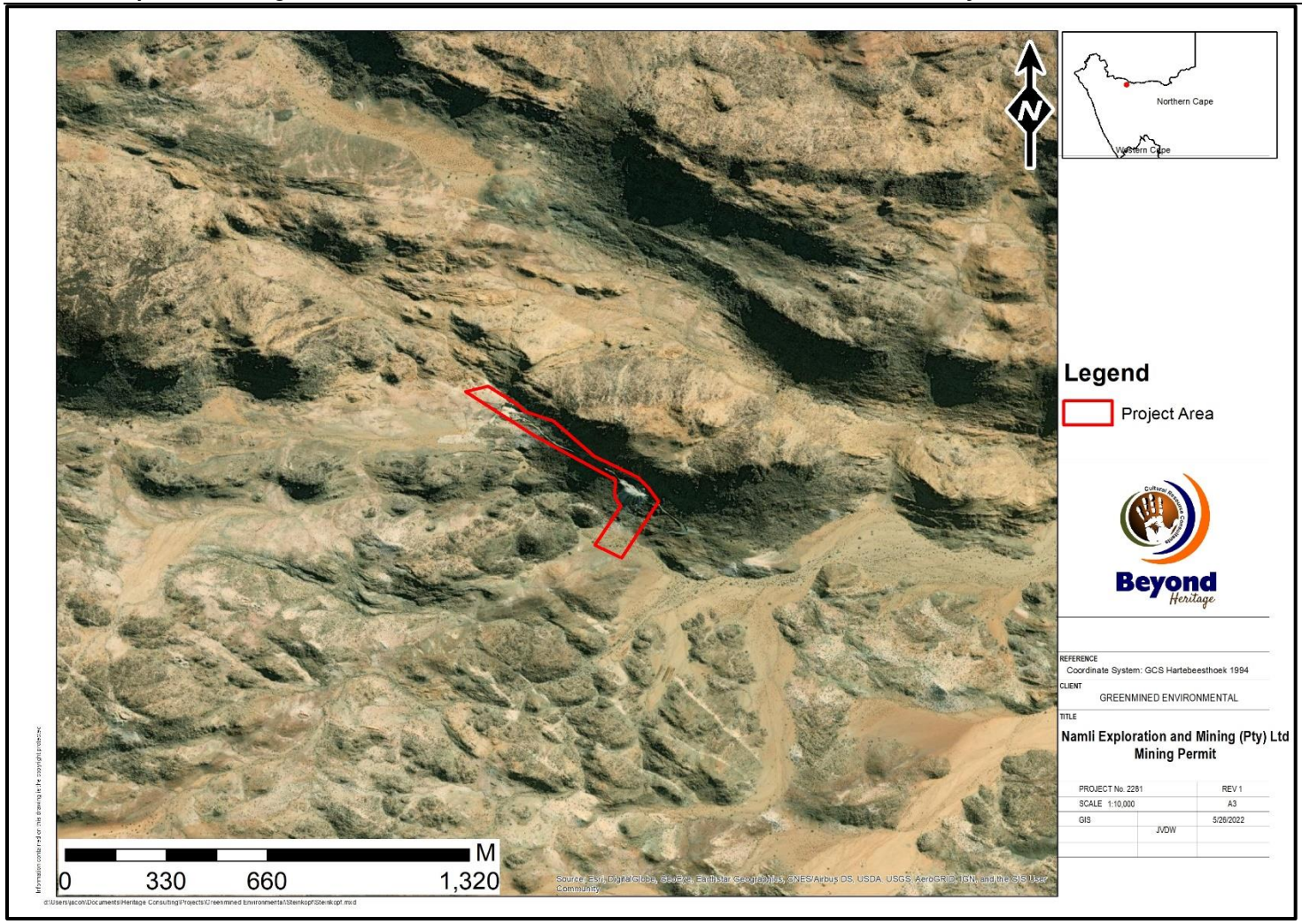


Figure 1.3. Aerial image of the study area.

2 Legislative Requirements

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

- National Heritage Resources Act (NHRA), Act No. 25 of 1999)
- National Environmental Management Act (NEMA), Act No. 107 of 1998 - Section 23(2)(b)
- Mineral and Petroleum Resources Development Act (MPRDA), Act No. 28 of 2002 - Section 39(3)(b)(iii)

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

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

The HIA should be submitted, as part of the impact assessment report or EMPr, to the PHRA if established in the province or to SAHRA. SAHRA will ultimately be responsible for the evaluation of Phase 1 HIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 HIA reports and additional development information, as per the impact assessment report and/or EMPr, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 HIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level). Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 HIA's are primarily concerned with the location and identification of heritage sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision-making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for with SAHRA by the applicant before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare. Authorisation for exhumation and reinternment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

3 METHODOLOGY

3.1 Literature Review

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

3.2 Genealogical Society and Google Earth Monuments

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located; these locations were marked and visited during the fieldwork phase. The database of the Genealogical Society was consulted to collect data on any known graves in the area.

3.3 Public Consultation and Stakeholder Engagement:

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

3.4 Site Investigation

The aim of the site visit was to:

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

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

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

Table 4: Site Investigation Details

	Site Investigation
Date	12 May 2022
Season	Autumn – The time of year and vegetation cover did not have any influence on the survey and the development footprint was sufficiently covered to understand the heritage character of the area (Figure 3.1).

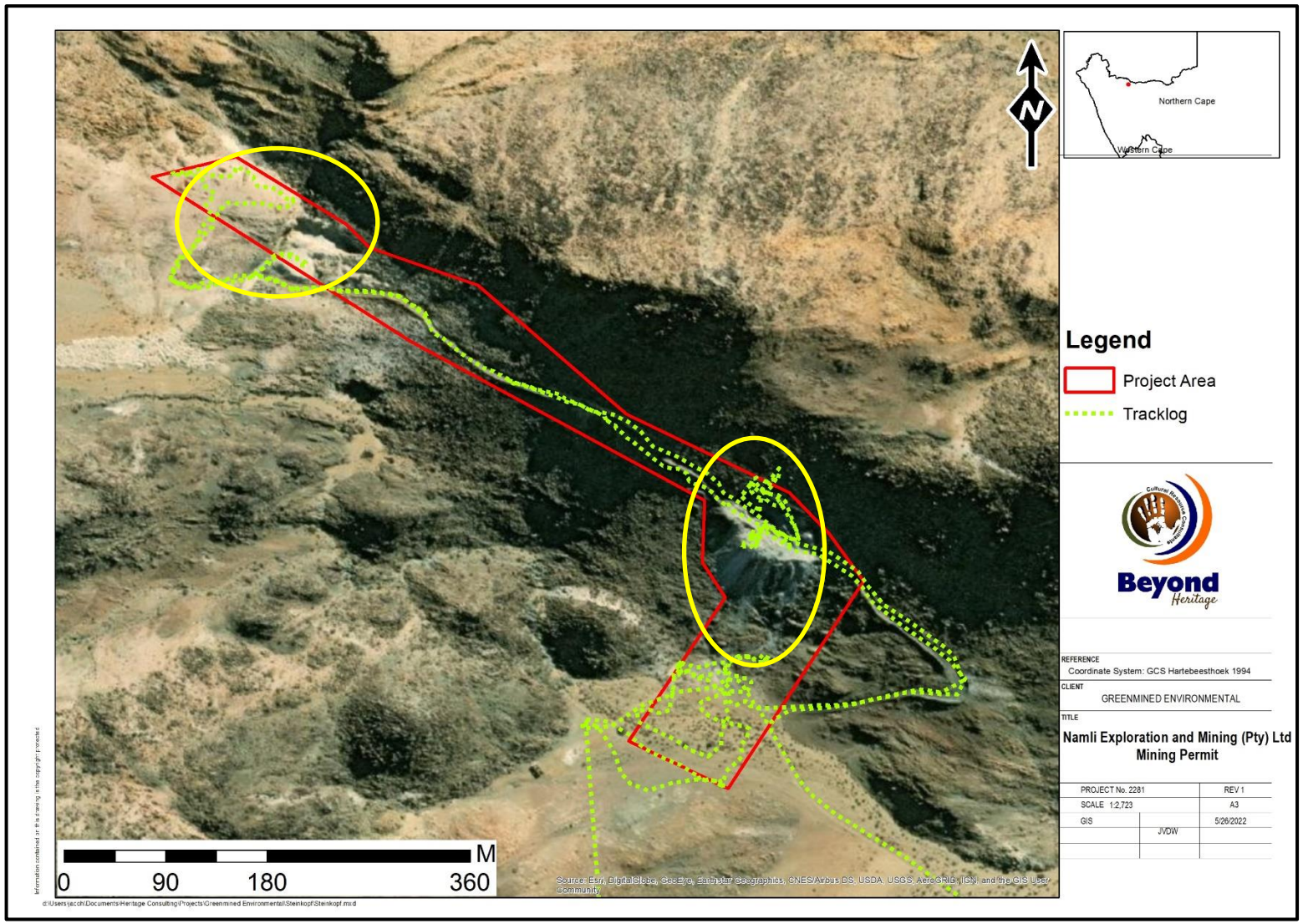


Figure 3.1. Tracklog of the survey path in green. Historical mining indicated by yellow polygons.

3.5 Site Significance and Field Rating

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

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

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

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

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

Table 5. Heritage significance and field ratings

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

3.6 Impact Assessment Methodology

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

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

The **significance** is calculated by combining the criteria in the following formula:
S=(E+D+M) P
S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

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

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

3.7 Limitations and Constraints of the study

The authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the nature of heritage resources and pedestrian surveys, the possibility exists that some features or artefacts may not have been discovered/recorded and the possible occurrence of graves and other cultural material cannot be excluded. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

4 Description of Socio-Economic Environment

According to the 2011 Census, Nama Khoi Municipality has a total population of 47 041 people of which 88,1% is coloured people ,6,6% white people, 4,2% black African, 0,5 % Indian/Asian and other consisting of 0,8%.Of those aged 20 years and older 20,0% have completed Grade 12, 7,9% has higher education, 43,6% has some secondary education, 10,6% completed primary, 15,7 has some primary and 2,2% of Nama Khoi has no schooling. Of the 16 016 economically active (employed or unemployed but looking for work) population in the municipality, 22,9% are unemployed. Of the 7 216 economically active youth (15 – 34 years) in the municipality, 30,1% are unemployed.

5 Results of Public Consultation and Stakeholder Engagement:

5.1.1 Stakeholder Identification

The Daft Basic Assessment Report (DBAR) with Environmental Management Programme (EMPR), will be available for public comment from 06 June 2022. Interested and Affected Parties (I&AP's) are invited to provide written comments before the closing date of 07 July 2022. Heritage related comments will be addressed in the final report if any are received.

6 Literature / Background Study:

6.1 Literature Review (SAHRIS)

Reports conducted in the wider area consulted for this study is listed below:

Author	Year	Project	Findings
Webley, L.	2012	Desktop Heritage Impact Assessment: Proposed 1.5 Ha Extension of Gravel Mine, Portion 2 Of the Farm Aroams 57, Near Aggeneys, Northern Cape Province	No sites
Webley, L. & Halkett, D.	2012	Heritage Impact Assessment: Proposed Aggeneys Photo-Voltaic Solar Power Plant on Portion 1 Of the Farm Aroams 57, Northern Cape Province	Stone Age artefacts
Pether J.	2012	Note in Support of Exemption from Desktop Palaeontological Impact Assessment Environmental Management Plan for The Proposed Extension of Existing Raumix Aggregates (Pty) Ltd. Quarry Near Aggeneys, Northern Cape Portion of Portion 2 Of the Farm Aroams 57, Namaqualand	No Sites
Rossouw, L.	2013	Phase 1 Heritage Impact Assessment for proposed prospecting drilling on Portion 2 of Rozynbosch No.41 and Remaining Extent & Portion 1 of Wortel No. 42, Namaqualand District, NC Province	No sites
Morris, D	2017	Amendment of the Final Heritage Impact Assessment for the proposed AGGENEIS – PAULPUTS 400kV Transmission Powerline and Substations Upgrade, Northern Cape	Stone age sites (artefacts and grinding hollows) as well as historical structures.
Webley, L. & Halkett, D.	2017	Heritage Impact Assessment: Proposed Construction of The Letsoai Csp 1 Solar Facility on The Remaining Extent of The Farm Hartebeest Vlei 86, Near Aggeneys, As Well As Waterpipeline To the Orange River, Northern Cape	Stone Age sites and artefacts
Van Ryneveld, K.	2017	Phase 1 Archaeological & Cultural Heritage Impact Assessment – Koa Valley Prospecting Right Application (without Bulk Sampling), Portions of the Farms Haramoep 53, Oonab-Noord 609, Amam 46 and Nooisabes 51, near Springbok / Aggeneys, Namakwa District Municipality, Northern Cape	MSA and LSA Scatters as well as a homestead.
Halkett, D. & Gribble, J.	2018	Archaeological/Heritage Report For The Expansion Of The Current Granite Mining At Oeranoep And Ghaams, Northern Cape Province.	Stone Age scatters, Shelters and historical features.

Van der Walt, J.	2019a	Heritage Impact Assessment Van Zyl Sillimanite Mining Permit, Unpublished report for Greenmined Environmental.	No sites of significance were identified.
Van der Walt, J.	2019b	Heritage Impact Assessment Van Zyl Prospecting right application, Unpublished report for Greenmined Environmental.	No sites of significance were identified.
Van der Walt, J & Orton, J.	2019c	Heritage Impact Assessment Lime Sales Mining Right Application, Aroams, Northern Cape.	No sites but isolated artefacts were noted.
Pelser, A	2020	Phase 1 HIA Report for proposed township establishment on the Remaining Extent Of Erf 2048, Steinkopf Nama Khoi Local Municipality, Northern Cape Province	No sites
Van der Walt, J.	2020	Letter of Recommendation for Exemption of a Heritage Impact Assessment (HIA) for the Pella Bulk Water Pipeline Project, Northern Cape	Stone Age Scatters

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

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

6.2 Background

6.2.1 Archaeological Context of the area

Beaumont *et al.* (1995) have noted that there is a low-density background scatter of artefacts throughout Bushmanland. In the greater study area, however, this scatter tends to be quite ephemeral. Several other surveys in the region support this distribution of archaeological materials (Halkett 2010; Morris 2011a, 2011b, 2013; Orton 2015, 2016; Webley & Halkett 2012). Within the Gamsberg inselberg, however, scatters of Early Stone Age (ESA) artefacts have been recorded in open, often eroding areas (Morris 2010; Orton 2014). Archaeological sites in the area tend to be focused on three types of landscape features:

1. Places where water can be obtained – generally after rain storms. These include pans and low, flat bedrock outcrops that have hollows and crevices that trap water;
2. The bases of rocky hills and outcrops. These areas frequently reveal low stone-walled structures, either at the base of the hills or, less frequently, on the rocky hills; and
3. On and along sand dunes

A assessment to the east of the study area by (Halkett and Gribble 2018) concurs with the findings in the greater area and recorded evidence of a human presence in the surrounding area going back to the Earlier/Middle Stone Age. The MSA material identified consists of low density, ephemeral, unstratified, surface finds with no associated non-lithic material of low heritage significance. The study also recorded Later Stone Age material in a handful of small overhangs around the base of granite kopjes. These sites all contained some deposit and scattered archaeological material on the adjacent talus slopes and are an important local information resource about the LSA of the area.

6.2.2 Historical Information

Because it lies so far from the original Cape Colony (i.e., Cape Town), northern Bushmanland was colonised quite late with most farms only surveyed and granted in the very late 19th or even early 20th

centuries. As a result, very few historical structures and features exist on the landscape. The majority of buildings date to the early-mid-20th century and tend to be of low or no heritage significance. A number of surveys in the Bushmanland area have recorded possible isolated graves represented by unusual rocks (either isolated standing rocks or unnatural clusters). These could be related to early '*trekboers'* passing through the area. Because they lived a very nomadic lifestyle, the physical traces of these early European stock farmers are extremely ephemeral. The ruins of small stone structures that are occasionally found alongside rock outcrops in Bushmanland are likely to represent huts and small livestock enclosures built either by 19th century '*trekboers*' or by early 20th century shepherds. They may have been covered with sticks and skins or by tarpaulins. Halkett and Gribble (2018) recorded evidence of more recent, historical period occupation of the area including the remains of built structures, ash heaps and possible graves. Van Ryneveld (2020) recorded a homestead.

7 Description of the Physical Environment

The proposed mining area is located on a 5 ha portion of the farm Steinkopf No 22 and is situated approximately 42.17km north east of Pella, 40km south east of Vioolsdrift, and 97.61km north west of Aggeneys, Northern Cape Province. Regionally the Project area is situated at the merger of three distinct areas namely the Richtersveld to the west (the Richtersveld proper lies to the west of the Neint Nababeep Plateau), the Bushmanland to the east (Henkries is already situated within northern Bushmanland), and Namaqualand to the south (Steinkopf is situated in Namaqualand). Geologically Moore (1989) classifies the Springbok-Steinkopf-Pofadder area) as the Bushmanland Group, which comprises basal leucocratic gneisses and overlying quartzites and mica-sillimanite schists.

The area earmarked for the proposed mining falls on a section of the farm that was previously used for mining on the southern slope of a Granodiorite ridge. The study area is situated within a Desert Biome, and the vegetation consists of Eastern Gariep Plains and Eastern Gariep Rocky vegetation types (Mucina and Rutherford 2006). The area is characterised by intrusive gneisses (granodioritic) hills often marked by stockpiles, excavations and roads from previous mining activities. General site conditions are illustrated in Figures 7.1 to 7.2.

Figure 7.1. Norrabees 1 excavations and spoil heap.

Figure 7.2. Norrabees 2 excavations and spoil heap.

Figure 7.3. General site conditions at Norrabees 1 showing existing excavations.

Figure 7.4. Project area viewed from the south.

8 Findings of the Survey

8.1 Heritage Resources

It is important to note that only the proposed mining area was surveyed, as indicated in Figure 1.1 to 1.3 and not the entire farm. Existing roads will be used, and no additional impact is foreseen from this aspect and is therefore not a listed activity. The study area has been impacted on by previous mining and associated activities characterise the study area. Much of the study area is located on a steep slope without shelters or overhangs and not suitable for human settlement and no archaeological sites or artefacts of significance were recorded. Finds were limited to stone-built structures and an adit associated with the initial mining activities at Norrabees 1. According to the diggings.com online source the site was first discovered in 1955 and from aerial photographs the site was already mined by 1961 (Figure 8.4). This means that the recorded features could all be older than 60 years and therefore protected by the NHRA. The features were numbered numerically and are described in Table 6 and illustrated in Figure 8.1 to 8.3.

Table 6. Recorded features

Label	Longitude	Latitude	Description	Significance
Feature 1	17° 58' 49.4077" E	28° 56' 59.7521" S	Small addit on the side of the hill with various stone packed terraces leading to the valley below.	Low to Medium
Feature 2	17° 58' 46.6958" E	28° 57' 00.9920" S	Rectangular stone platform capped with a cement layer measuring approximately 14 m in length and 6 m wide.	Low
Feature 3	17° 58' 47.7888" E	28° 57' 04.4575" S	Three circular enclosures, one bilobial enclosure and one rectangular enclosure with two divisions. All enclosures are distributed linearly at the base of a hill opposite to the proposed mining area. Entrances are marked by upstanding monoliths facing the historic mining activities. The enclosures measure approximately 2,2 m in diameter and no archaeological artefacts (such as Stone Age lithics, ostrich eggshell beads or ceramics) were noted in and around the enclosures. Historical artefacts were noted including cans scattered in and around the features.	Low to Medium
Feature 4	17° 58' 32.4463" E	28° 56' 48.2748" S	Rectangular stone packed structure measuring approximately 2x 2 m of unknown purpose at Norabees 2 outside of the impact area.	Low to Medium

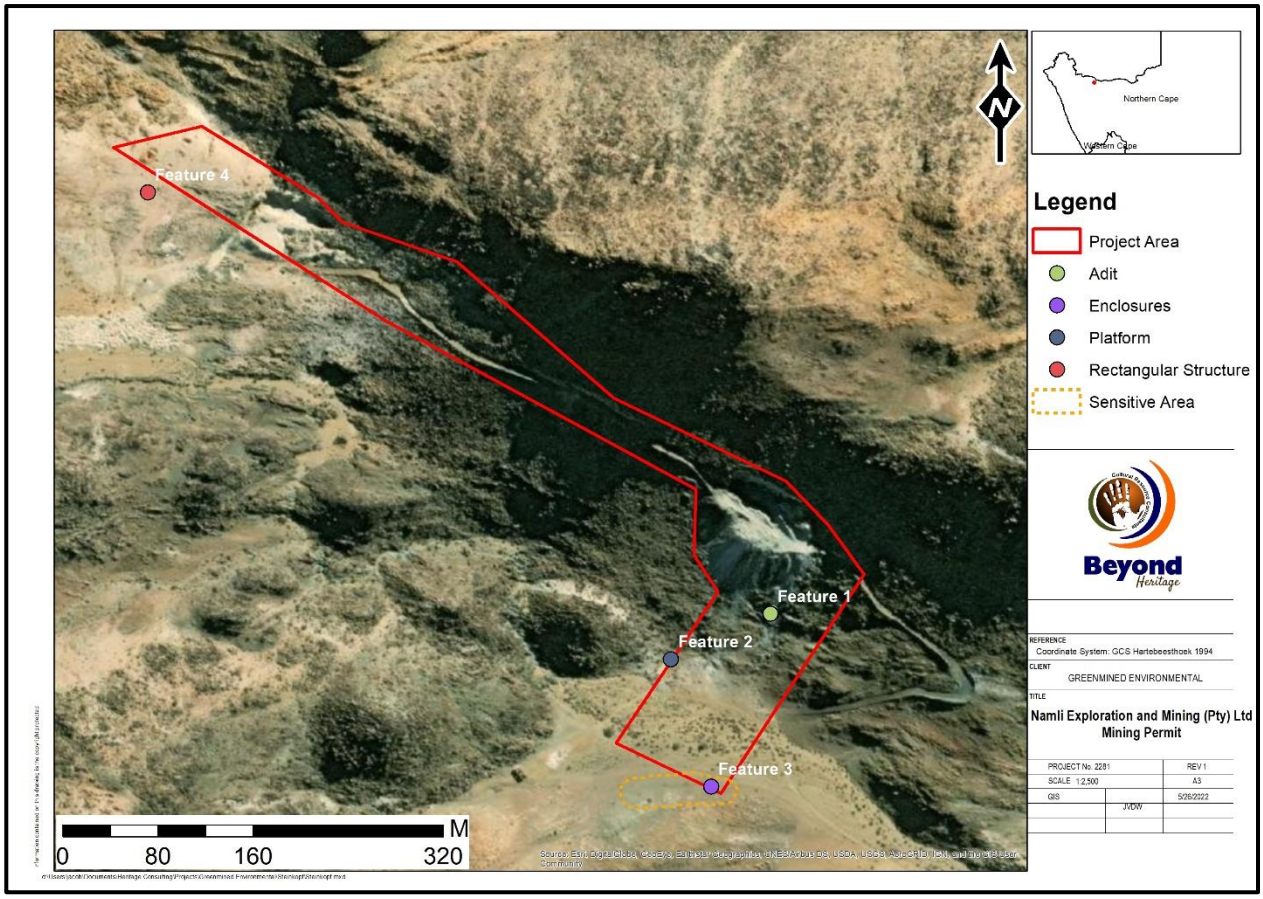


Figure 8.1. Distribution of observations in relation to the mining area.

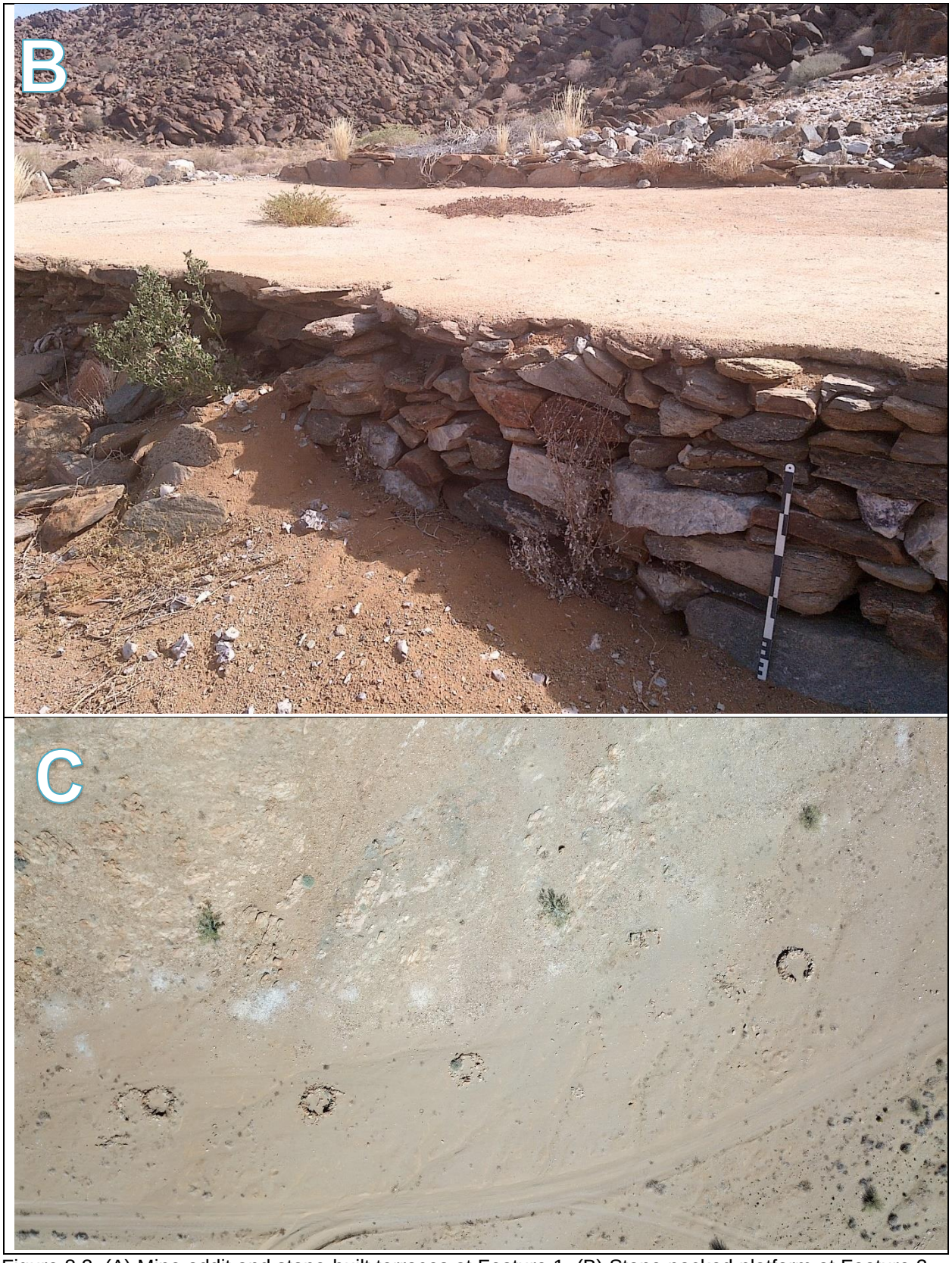


Figure 8.2. (A) Mine addit and stone-built terraces at Feature 1. (B) Stone packed platform at Feature 2. (C) Aerial image of various circular and rectangular stone-built shelters.

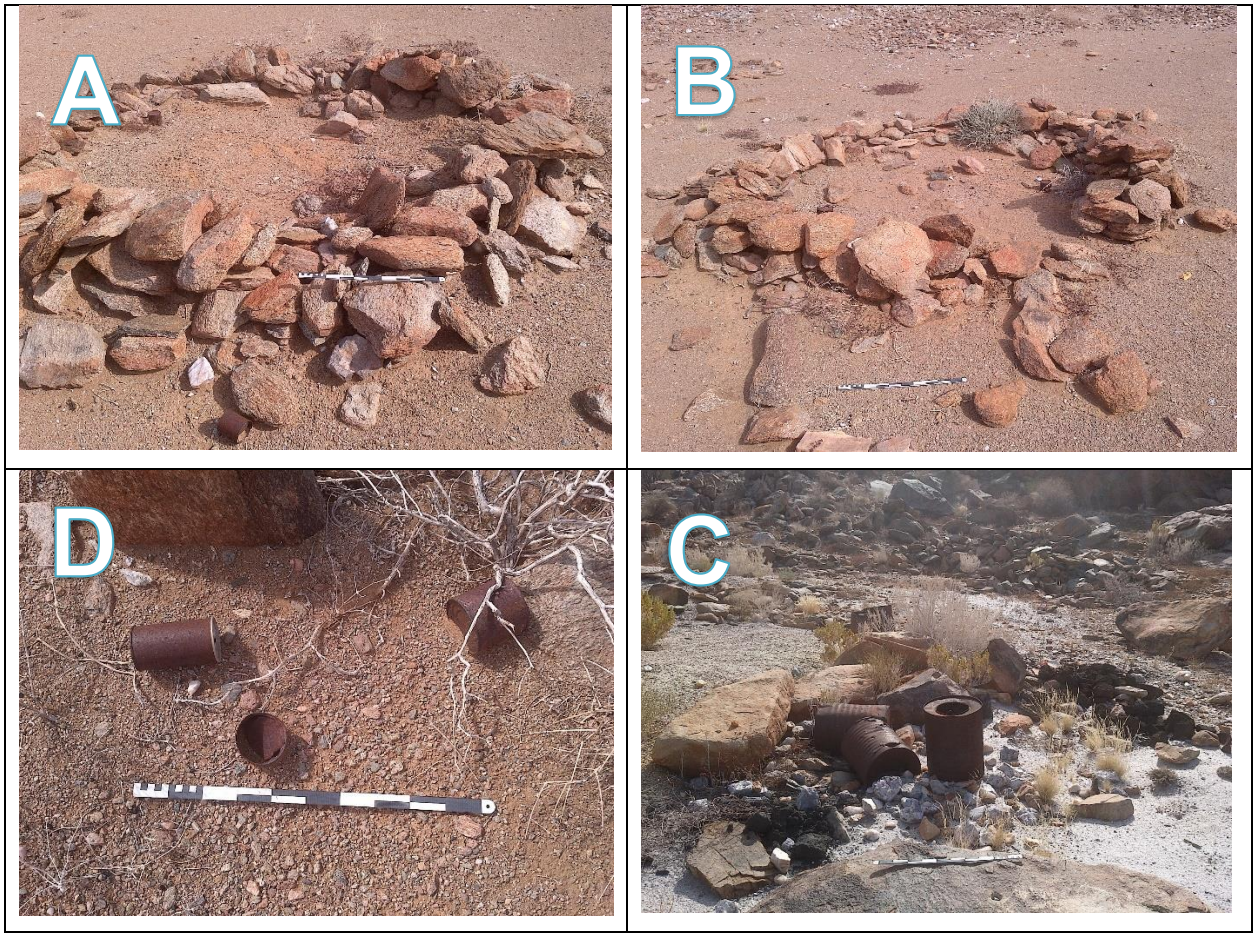


Figure 8.3. (A&B) Ground level photograph of shelters at Feature 3. (D&C) Industrial and modern debris associated with the structures at Feature 3.

8.2 Cultural Landscape

Historical land use and the cultural landscape are linked since the cultural landscape is shaped to some extent by the history of the area. Although the farm seems to have been fallow in recent years, some sort of agricultural activity no doubt took place and is evident by fences and watering holes. This is largely related to small stock but has not left much trace. The major historic aspect that left the most visible remains on the landscape is the previous mining activities that predates 1961 (Figure 8.4 & 8.6).

Figure 8.4. 1961 Aerial image showing opencast mining activities at Norrabees 1 marked by a yellow polygon.

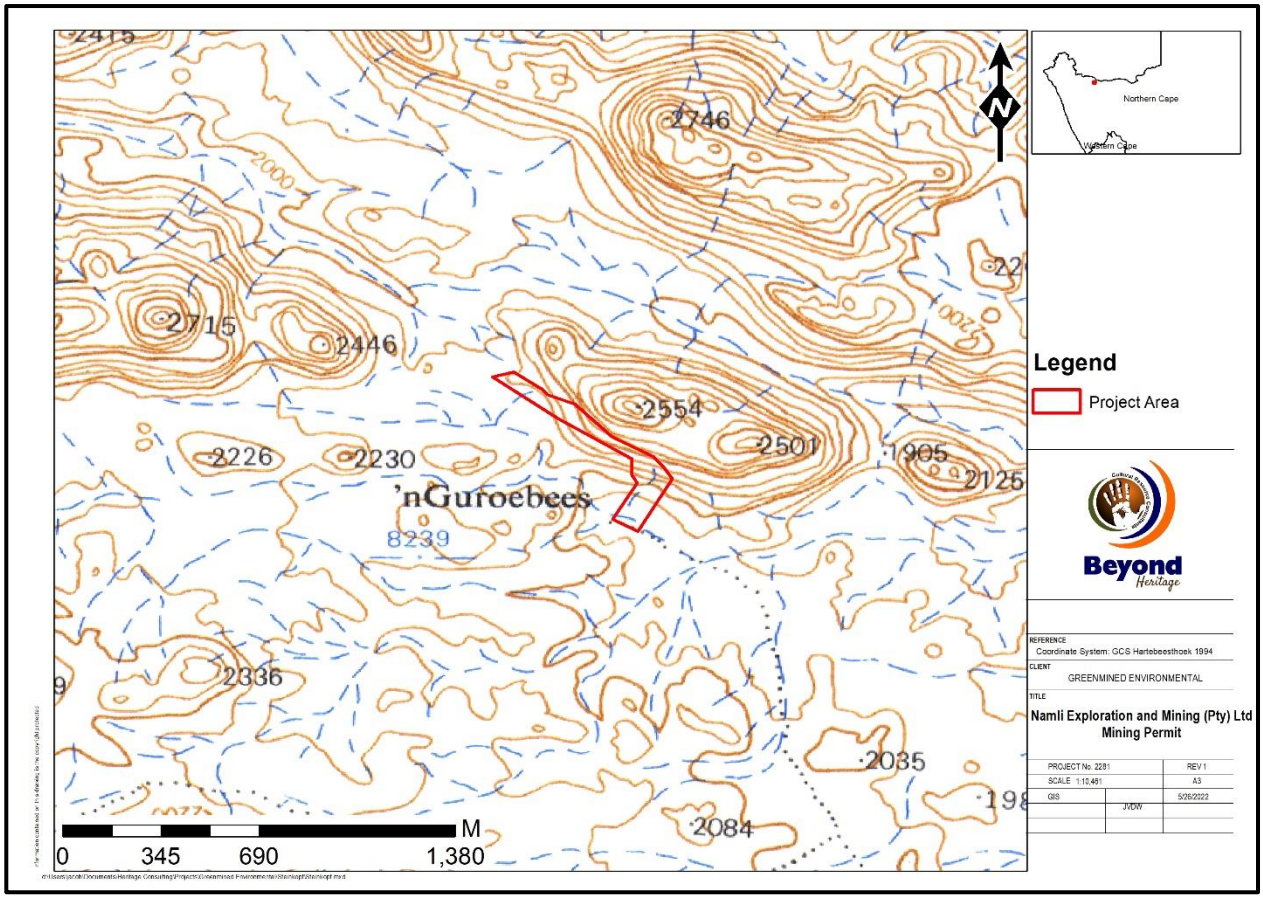


Figure 8.5. 1969 topographic map of the project area showing no development apart from a dirt track to Norrabees 1.

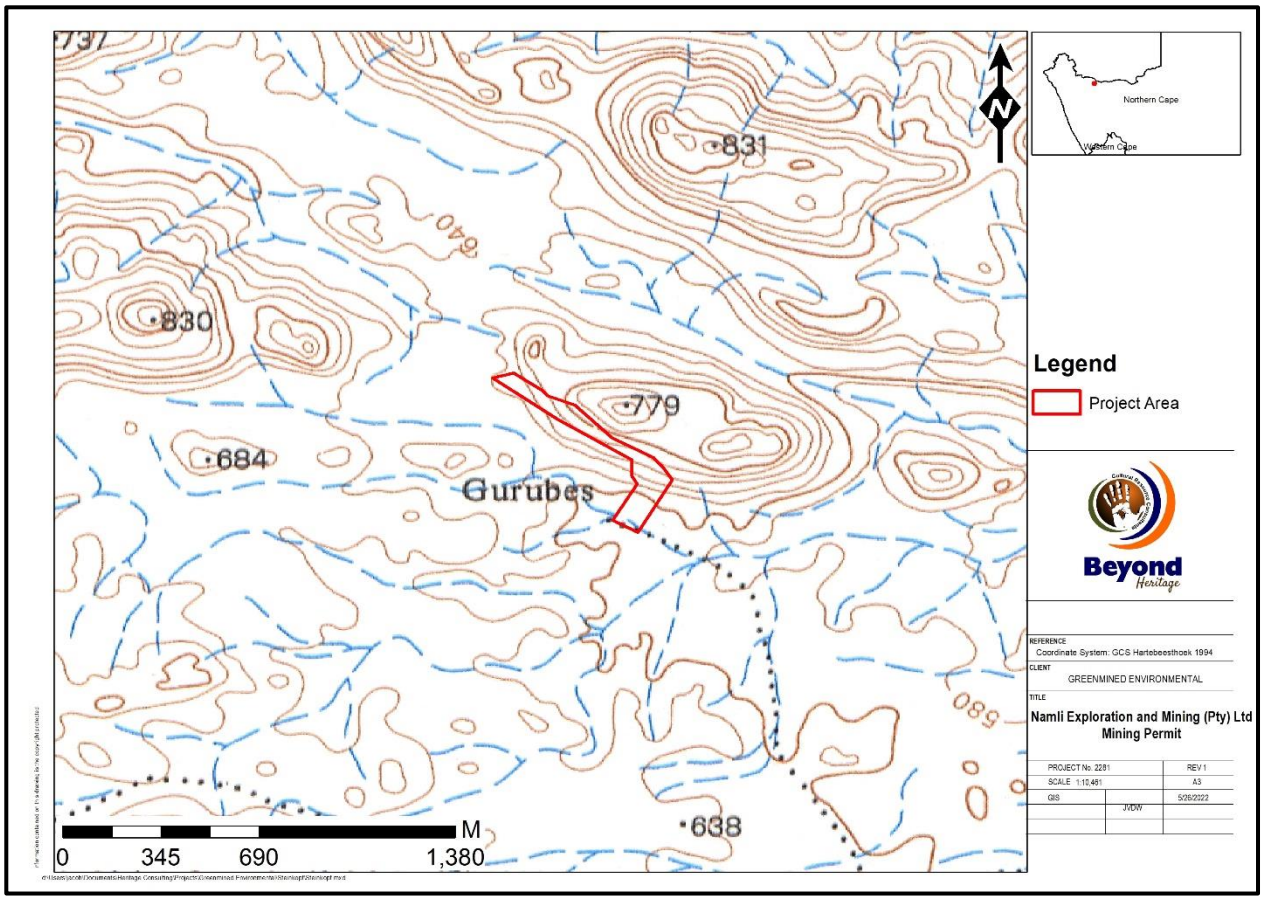
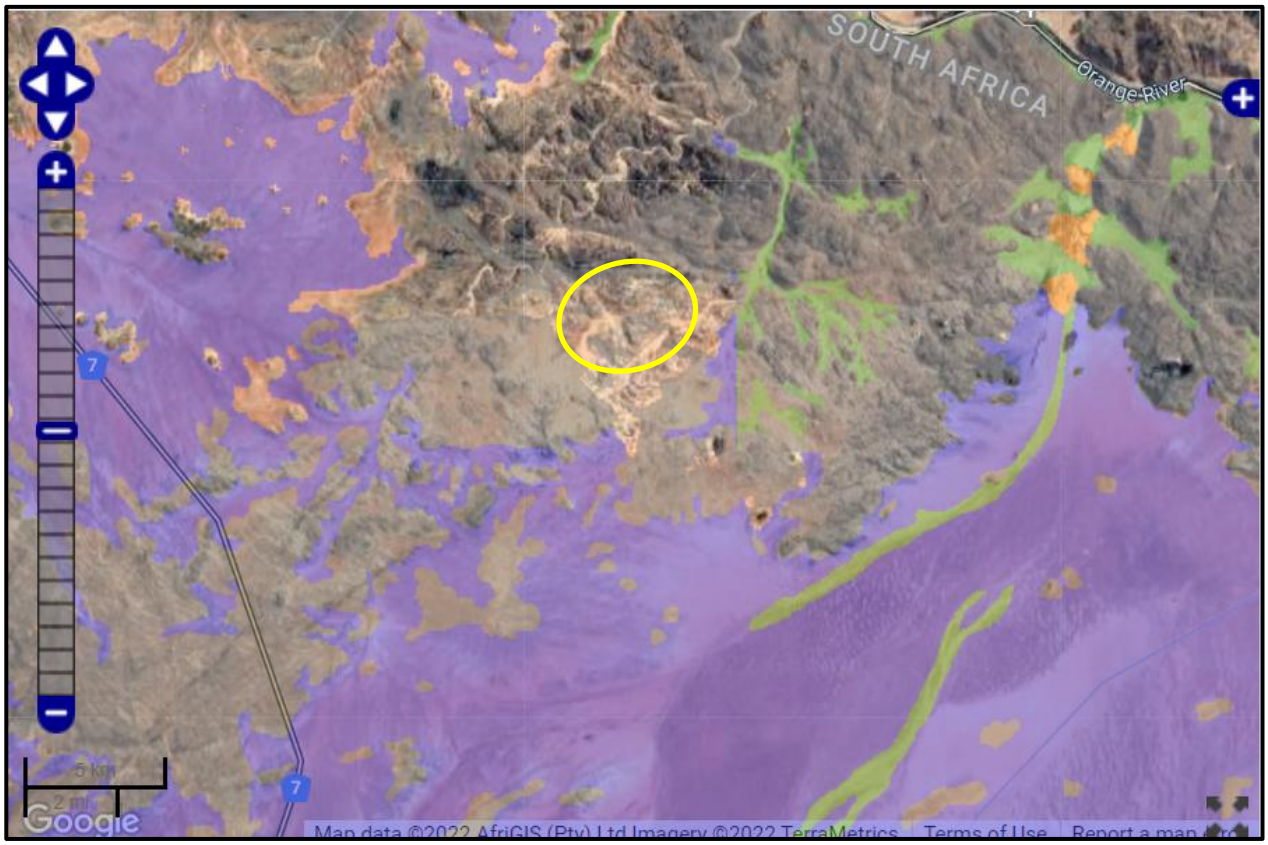


Figure 8.6. 1978 topographic map of the project area showing no development in the study area.

8.3 Paleontological Heritage

In terms of the paleontological component an independent study was conducted based on SAHRA interim comments (Case ID 18734) with relevance to the areas of unknown paleontological significance (Figure 8.7). Bamford (2022) determined that the site for mining is in the non-fossiliferous volcanic and metamorphosed volcanic rocks of the Orange River Suite and the Vuurdood Subsuite, respectively. Volcanic rocks do not preserve any fossils because they are from the molten magma that moved to the surface of the crust, with plutons reaching the surface and batholiths not reaching the surface.

The only sedimentary rocks that could transport or bury fossils are the Quaternary sands and alluvium and they are not in the project footprint. Therefore, there is no chance of fossils being found in the project area. If access roads are crossing sands and river gravels, there might be fossils, so a fossil chance find protocol is added for that eventuality.



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

Figure 8.7. Paleontological sensitivity of the approximate study area (yellow polygon) as indicated on the SAHRA Palaeontological sensitivity map.

9 Potential Impact

Based on the current lay out the project will directly impact on Feature 1 and 2 and have a possible indirect impact on Feature 3 and 4. Collectively these features are of low to medium significance and based on the assumption that these features are 60 years old or approaching the 60 year threshold and falls under the ambit of the NHRA.

Any additional effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure. Mitigation measures for specific sites as outlined under Table 7 and additional recommendations in this report should be implemented during all phases of the project. With the implementation of the recommended mitigation measures impacts of the project on heritage resources is acceptable.

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

9.1.1 Pre-Construction phase

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

9.1.2 Construction Phase

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

9.1.3 Operation Phase

No impacts are expected during the operation phase.

9.1.4 Impact Assessment for the Project

Table 7. Impact assessment of the proposed project.

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological and paleontological material or objects.		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Local (2)	Site (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (5)	Low (4)
Probability	Definite (5)	Probable (3)
Significance	**60 (Medium)**	**30 (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:

- Documentation (scaled mapping) of the mining-related structures at Norrabees 1 and 2;
- The enclosures recorded as Feature 3 are just outside of the development footprint and it is recommended that these features should be avoided and preserved *in situ* with 30 meter buffer zone;
- After documentation of the features a destruction permit can be applied for the sites that will be impacted on (for Feature 1 and 2) from Ngwao-Boswa Jwa Kapa Bokone (Northern Cape PHRA) prior to mining activities starting;
- Feature 4 is located outside of the impact area and should be demarcated and avoided during mining activities;
- Implementation of a Chance Find Procedure for the project (as outlined under Section 10.2);
- Monitoring of the project by the ECO.

Cumulative impacts:

The proposed project will have a low to medium cumulative impact taking cognisance of the various mining related applications in the area, this can be mitigated to an acceptable level by adhering to the recommendations in this report.

Residual Impacts:

Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on, but this cannot be quantified.

10 Conclusion and recommendations

The study area has been impacted on by previous mining and associated activities characterise the study area. Much of the study area is located on a steep slope without shelters or overhangs and not suitable for human settlement and no archaeological sites or artefacts of significance were recorded. Finds were limited to stone-built structures and an addit associated with the initial mining activities at Norrabees 1. According to the diggings.com online source the site was first discovered in 1955 and from aerial photographs the site was already mined by 1961 (Figure 8.4). This means that the recorded features could all be older than 60 years and therefore protected by the NHRA.

An independent study is included for the paleontological aspect of the project. Bamford (2022) concluded that the proposed site lies on the non-fossiliferous volcanic rocks of the Vuurdood Subsuite (Vioolsdrift Suite) and the Orange River Suite (Richtersveld Subprovince). These granites and reworked volcaniclastic sediments were emplaced about 2 000 to 1 900 million years ago so are the wrong type and too old to preserve any fossils. No fossils have been recorded from this area and the closest riverine alluvium with transported rocks occurs on the north side of the Orange River or far south. A Fossil Chance Find Protocol is of limited use because it is not known what types of fossils could even be looked for, but one has been added for Quaternary sands. Since the impact will be extremely low, as far as the palaeontology is concerned, the project should be authorised and mining permit granted.

The cultural landscape (marked by mining and farming activities) is generally arid and open without significant cultural landscape elements of concern and impacts are deemed to be of low significance. The impact of the proposed project on heritage resources can be mitigated to an acceptable level, and it is recommended that the proposed project can commence on the condition that the following recommendations are implemented and based on approval from SAHRA.

10.1 Recommendations for condition of authorisation

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

Recommendations:

- Documentation (scaled mapping) of the mining-related structures at Norrabees 1 and 2;
- The enclosures recorded as Feature 3 are just outside of the development footprint and it is recommended that these features should be avoided and preserved *in situ* with 30 meter buffer zone;
- After documentation of the features a destruction permit can be applied for the sites that will be impacted on (for Feature 1 and 2) from Ngwao-Boswa Jwa Kapa Bokone (Northern Cape PHRA) prior to mining activities starting;
- Feature 4 is located outside of the impact area and should be demarcated and avoided during mining activities;
- Implementation of a Chance Find Procedure for the project (as outlined under Section 10.2);
- Monitoring of the project by the ECO.

10.2 Chance Find Procedures

10.2.1 Heritage Resources

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped, and a qualified archaeologist must be contacted for an assessment of the find and therefor chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below and monitoring guidelines for this procedure are provided in Section 10.5.

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

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

10.3 Reasoned Opinion

The overall impact of the project is considered to be low and residual impacts can be managed to an acceptable level through implementation of the recommendations made in this report. The socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project.

10.4 Potential risk

Potential risks to the proposed project are the occurrence of intangible features and unrecorded cultural resources (of which graves are the highest risk). This can cause delays during construction, as well as additional costs involved in mitigation, as well as additional layout changes.

10.5 Monitoring Requirements

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

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

Table 8. Monitoring requirements for the project

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

Heritage Monitoring					
Aspect	**Area**	**Responsible for monitoring and measuring**	**Frequency**	**Proactive or reactive measurement**	**Method**
					• Only recommence operations once impacts have been mitigated.

10.6 Management Measures for inclusion in the EMPr

Table 9. Heritage Management Plan for EMPr implementation

Area	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Target	Performance indicators (Monitoring tool)
General project area	Implement chance find procedures in case possible heritage finds are uncovered	Mining	Throughout the project	Applicant EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	ECO Checklist/Report
Feature 1 -4	Mapping of the mining-related structures (individually and collectively) at Norrabees 1 and 2 (Feature 1 – 4) before a destruction permit can be applied for (for Feature 1 and 2) from the PHRA prior to mining activities starting	Prior to mining	Prior to mining	Applicant EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	ECO Checklist/Report
Feature 3	The stone-built structures at Feature 3 should be avoided and maintained *in situ* if possible	Throughout the project	Throughout the project	Applicant EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34 and 38 of NHRA	ECO Checklist/Report
Feature 4	Feature 4 is located outside of the impact area and should be demarcated and avoided during mining activities;	Throughout the project	Throughout the project	Applicant EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34 and 38 of NHRA	ECO Checklist/Report
	Monitoring of the project by the ECO	Throughout the project	Throughout the project	Applicant EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	ECO Checklist/Report

11 References

Bamford, M. K. 2022. Palaeontological Impact Assessment for the proposed Mining Right on a Portion of the Farm Steinkopf No 22, Nama Khoi Municipal area, Northern-Cape Province

Beaumont, P.B., Smith, A.B., & Vogel, J.C. 1995. Before the Einiqua: the archaeology of the frontier zone. In A. B. Smith (ed.) Einiqualand: studies of the Orange River frontier. Cape Town: UCT Press.

Halkett, D. 2010. An assessment of impact on archaeological heritage resulting from replacement of a section of the existing bulkwater supply pipeline from Pella to Pofadder, Northern Cape. Unpublished report prepared for Van Zyl Environmental. St James: ACO Associates cc.

Halkett, D. & Gribble, J. 2018. Archaeological/Heritage Report For The Expansion Of The Current Granite Mining At Oeranoep And Ghaams, Northern Cape Province.

Morris, D. 2010. Cultural Heritage Assessment Gamsberg: supplementary observations to a previous specialist report on archaeological resources. Unpublished report. Kimberley: McGregor Museum.

Morris, D. 2011a. A Phase 1 Heritage Impact Assessment for the proposed Aggeneis – Paulputs 220kV transmission line. Unpublished report for SSI Engineers and Environmental Consultants. Kimberley: McGregor Museum.

Morris, D. 2011b. Black Mountain Concentrated Solar Power Facility Development at Aggeneys, Northern Cape: Heritage Impact Assessment. Unpublished report for SRK Consulting. Kimberley: McGregor Museum.

Morris, D. 2013. Heritage Impact Assessment: proposed Aggeneys Photovoltaic Solar Energy Facility at Bloemhoek near Aggeneys, Northern Cape Province. Unpublished report prepared for Solar Capital (Pty) Ltd. Kimberley: McGregor Museum.

Morris, D. 2017. Amendment of the Final Heritage Impact Assessment for the proposed AGGENEIS – PAULPUTS 400kV Transmission Powerline and Substations Upgrade, Northern Cape

Orton, J. 2013. Geometric rock art in western South Africa and its implications for the spread of early herding. South African Archaeological Bulletin 68: 27-40.

Orton, J. 2014. Final archaeological mitigation report for the Gamsberg Zinc Mine, Aggeneys, Northern Cape. Unpublished report prepared for ERM Southern Africa (Pty) Ltd. Diep River: ACO Associates cc.

Orton, J. 2015. Final archaeological survey for the proposed Aggeneys Solar Energy Facility, Namakwaland Magisterial District, Northern Cape. Unpublished report prepared for Savannah Environmental (Pty) Ltd. Muizenberg: ASHA Consulting (Pty) Ltd.

Orton, J. 2015. Heritage Impact Assessment for The Proposed Cultivation Of New Lands At Klein Pella, Namakwaland Magisterial District, Western Cape

Orton, J. 2016. Heritage Impact Assessment for the proposed Sol Invictus 1 PV Facility, Namakwaland Magisterial District, Northern Cape. Unpublished report prepared for Savannah Environmental (Pty) Ltd. Muizenberg: ASHA Consulting (Pty) Ltd.

Pether J. 2012. Note in Support of Exemption from Desktop Palaeontological Impact Assessment Environmental Management Plan for The Proposed Extension of Existing Raumix Aggregates (Pty) Ltd. Quarry Near Aggeneys, Northern Cape Portion of Portion 2 Of the Farm Aroams 57, Namaqualand

Raper, P.E. Dictionary of Southern African Place Names. n.d. Onomastic Research Centre, Human Sciences research Council. Accessed online at https://archive.org/stream/DictionaryOfSouthernAfricanPlaceNames/SaPlaceNames_djvu.txt on 19 June 2015.

Rossouw, L. 2013. Phase 1 Heritage Impact Assessment for proposed prospecting drilling on Portion 2 of Rozynbosch No.41 and Remaining Extent & Portion 1 of Wortel No. 42, Namaqualand District, NC Province.

Van der Walt, J & Orton, J. 2019. Heritage Impact Assessment Lime Sales Mining Right Application, Aroams, Northern Cape.

Van der Walt, J. 2019a. Heritage Impact Assessment Van Zyl Sillimanite Mining Permit, Unpublished report for Greenmined Environmental.

Van der Walt, J. 2019b. Heritage Impact Assessment Van Zyl Prospecting right application, Unpublished report for Greenmined Environmental.

Van Ryneveld, K. 2017. Koa Valley Prospecting Right Application (without Bulk Sampling), Portions of the Farms Haramoep 53, Oonab-Noord 609, Amam 46 and Nooisabes 51, near Springbok / Aggeneys, Namakwa District Municipality, Northern Cape

Webley, L. 2012. Desktop Heritage Impact Assessment: Proposed 1.5 Ha Extension of Gravel Mine, Portion 2 Of the Farm Aroams 57, Near Aggeneys, Northern Cape Province

Webley, L. & Halkett, D. 2012. Heritage impact assessment: proposed Aggeneys Photo-Voltaic Solar Power Plant on Portion 1 of the farm Aroams 57, Northern Cape Province. Unpublished report prepared for Digby Wells Environmental. St James: ACO Associates.

Electronic Sources:

Google Earth. 2022. [Online]. [Cited 2022].
www.statssa.gov.za