HERITAGE IMPACT ASSESSMENT

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

FOR THE PROPOSED PROSPECTING APPLICATION ON 21 217.1756 HECTARES NEAR STEINKOPF IN THE NORTHERN CAPE

Type of development:

Prospecting Application

Client:

Greenmined Environmental (Pty) Ltd

Applicant:

Strata Energy Minerals & Resources (Pty) Ltd

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Project Reference:
Project number 2533

Report date:
April 2025
Revised August 2025

APPROVAL PAGE

Project Name	Prospecting Application Steinkopf
Report Title	Heritage Impact Assessment for the Prospecting Application on 21 217.1756 Hectares near Steinkopf in the Northern Cape
Authority Reference Number	TBC
Report Status	Final Report
Applicant Name	Strata Energy Minerals & Resources (Pty) Ltd

Responsibility	Name	Qualifications and Certifications	Date
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Report writing and archaeological support	Lara Kraljević - Archaeologist	MA Archaeology ASAPA #661	April 2025 August 2025

DOCUMENT PROGRESS

Distribution List

Date	Report Reference Number	Document Distribution	Number of Copies
11 April 2025	2533	Greenmined Environmental (Pty) Ltd	Electronic Copy
21 August 2025	2533	Greenmined Environmental (Pty) Ltd	Electronic Copy

Amendments on Document

Date	Report Reference Number	Description of Amendment
21 August 2025	2533	Update of the report to include site visit details.

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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.	Sections 7, 8 and 9
(g) Identification of any areas to be avoided, including buffers.	Sections 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.	Sections 9.1 and 9.5
(l) Conditions for inclusion in the environmental authorisation.	Sections 9.1 and 9.5
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation.	Section 9.6
(n) Reasoned opinion - (i) As to whether the proposed activity, activities or portions thereof should be authorised; (iA) Regarding the acceptability of the proposed activity or activities; and (ii) If the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan.	Section 9.3
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report.	Section 5
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto.	Refer to the EIA report
(q) Any other information requested by the competent authority.	No other information requested at this time

Executive Summary

The proposed prospecting application is located on Farm Tusschen-In No 143, Portion 1 and the Remaining Extent of the Farm Aardvark No 164, the Farm Steenbok No 165, and Farm No 166 (Gifkop). The Project areas are situated in Richtersveld Local Municipality and Nama Khoi Local Municipality within the Namakwa District Municipality, Northern Cape. Greenmined Environmental has been appointed as the independent environmental assessment practitioner (EAP) to apply for the environmental authorisation for the Project. Beyond Heritage was appointed to conduct a Heritage Impact Assessment (HIA) for the project and the study area was assessed through a desktop and by a non-intrusive pedestrian field survey of targeted areas. Key findings of the assessment include:

- The scope of work is to conduct a heritage assessment for a large prospecting right area comprising approximately 21 217.1756 ha;
- It was deemed not feasible to conduct fieldwork across the entire proposed Project area at this stage of the process due to the following reasons
    - The extensive geographical size of the exploration application and the fact that the exact locations of drill sites or number of drillholes to be dug is not available at this point;
    - No intrusive activities will occur at this point of the application;
- As such, targeted areas within each farm were selected for surveying in order to sample the farms for their heritage character, which proved to be in line with the desktop studies;
- During the survey of the targeted areas, heritage resources recorded included graves, a low-density lithic scatter, a historical well, a historical dipping trench, ruins of a historical road, a historical house, a historical water reservoir, and a degraded modern house;
    - Once the final drilling spots have been selected, a Heritage Walk-Down will be conducted of the impact areas;
- This desktop study is informed by available data for the area derived from several heritage surveys conducted for mining projects and developments in the larger area, and the archaeological character of the region is well described (e.g., Engelbrecht and Fivaz 2019, Orton and Halkett 2007, van der Walt 2023, Orton 2019; 2020, Chauke 2014, Kaplan 2010a; 2010b; 2016, van Ryneveld 2017);
- Stone Age artefacts can be expected across the landscape ranging from low-density scatters to significant sites which are more focal to topographical features such as rocky outcrops, hills, drainage lines, pans, and confluences;
- According to the SAHRA Paleontological sensitivity map the study areas are of insignificant and low palaeontological sensitivity and no further studies are required for this aspect however a protocol for finds is required.

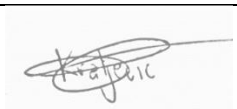
The impact on heritage resources at this stage of the study is expected to be low, and the Project can be authorised provided that the recommendations in this report are adhered to and based on the SAHRA's approval.

Recommendations:

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

- Avoidance of the medium significance recorded sites (AV004) and high significance grave sites (AV002, TC004) for consideration of drilling sites;
- Once the drill sites have been confirmed these areas have to be subjected to a heritage walk down, this should be conducted prior to the commencement of prospecting activities;
- Drill sites must be kept as close as possible to existing roads in order to minimise the impact on the landscape;
- Focal points on the landscape like rocky outcrops or pans must be avoided as far as possible as these areas could be sensitive from a heritage point of view;
- Monitoring of the Project area by the ECO during the exploration phase for heritage and palaeontology chance finds, if chance finds are encountered to implement the Chance Find Procedure for the Project as outlined in Section 9.2.

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	10/04/2025

a) Expertise of the specialist

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

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ABBREVIATIONS

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

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

GLOSSARY

Archaeological site	Remains of human activity over 100 years old
Earlier Stone Age	~ 2.6 million to 250 000 years ago
Middle Stone Age	~ 250 000 to 40-25 000 years ago
Later Stone Age	~ 40-25 000, to the historic period
The Iron Age	~ AD 400 to 1840
Historic	~ AD 1840 to 1950
Historic building	Over 60 years old

1 Introduction

Beyond Heritage was appointed to conduct a Heritage Impact Assessment (HIA) for the proposed prospecting application that is located on the Farm Tusschen-In No 143, Portion 1 and the Remaining Extent of the Farm Aardvark No 164, the Farm Steenbok No 165, and Farm No 166 (Gifkop). The Project areas are situated in Richtersveld Local Municipality and Nama Khoi Local Municipality within the Namakwa District Municipality, Northern Cape (Figure 1.1 to 1.3). The report forms part of the Basic Assessment environmental authorisation process for the project.

The aim of the study is to assess the proposed development footprint on a desktop level as well as a targeted survey to understand the cultural layering of the study area. It serves to assess the potential impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures required. It is also conducted to protect such resources within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999) (NHRA). The report outlines the approach and methodology utilized, which includes review of relevant literature; desktop assessment of the study area; reporting the outcome of the study.

At this stage of the project, it is impossible to define the exact locations of drill sites or number of drillholes to be dug, and a high-level site visit was conducted in targeted areas of the Project. Within these surveyed areas, heritage resources recorded included graves, a low-density lithic scatter, a historical well, a historical dipping trench, ruins of a historical road, a historical house, a historical water reservoir, and a degraded modern house and were recorded. A heritage walkdown can be conducted once the exact locations of drill sites or number of drillholes to be dug is confirmed. Possible impacts were identified, and mitigation measures are proposed in this report. The South African Heritage Resources Agency (SAHRA) as a commenting authority under section 38(8) of NHRA requires all environmental documents, compiled in support of an Environmental Authorisation application as defined by National Environmental Management Act (NEMA) Environmental Impact Assessment (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).

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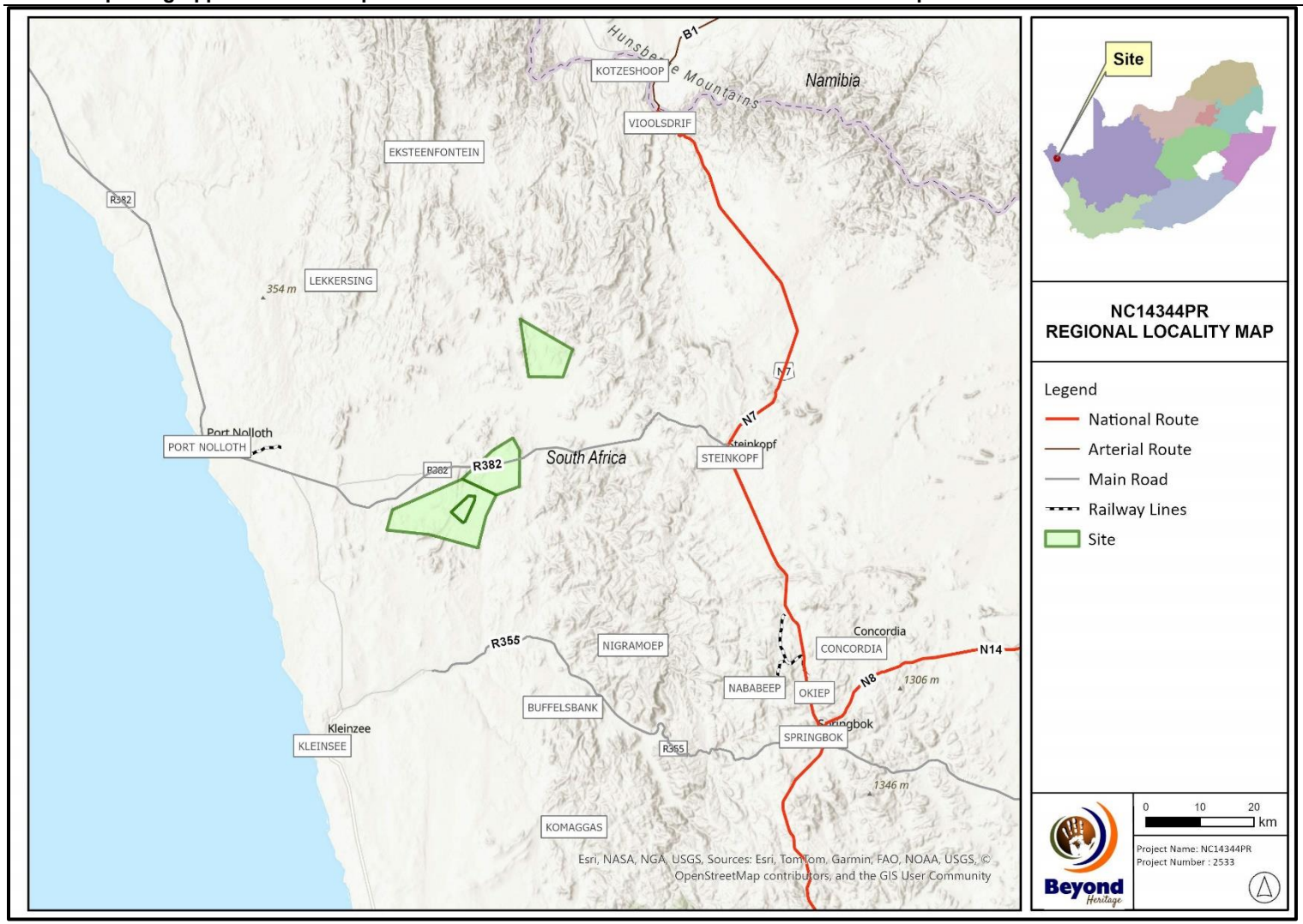


Figure 1.1. Regional setting of the Project (Extract of the 2917 1: 250 000 topographical map).

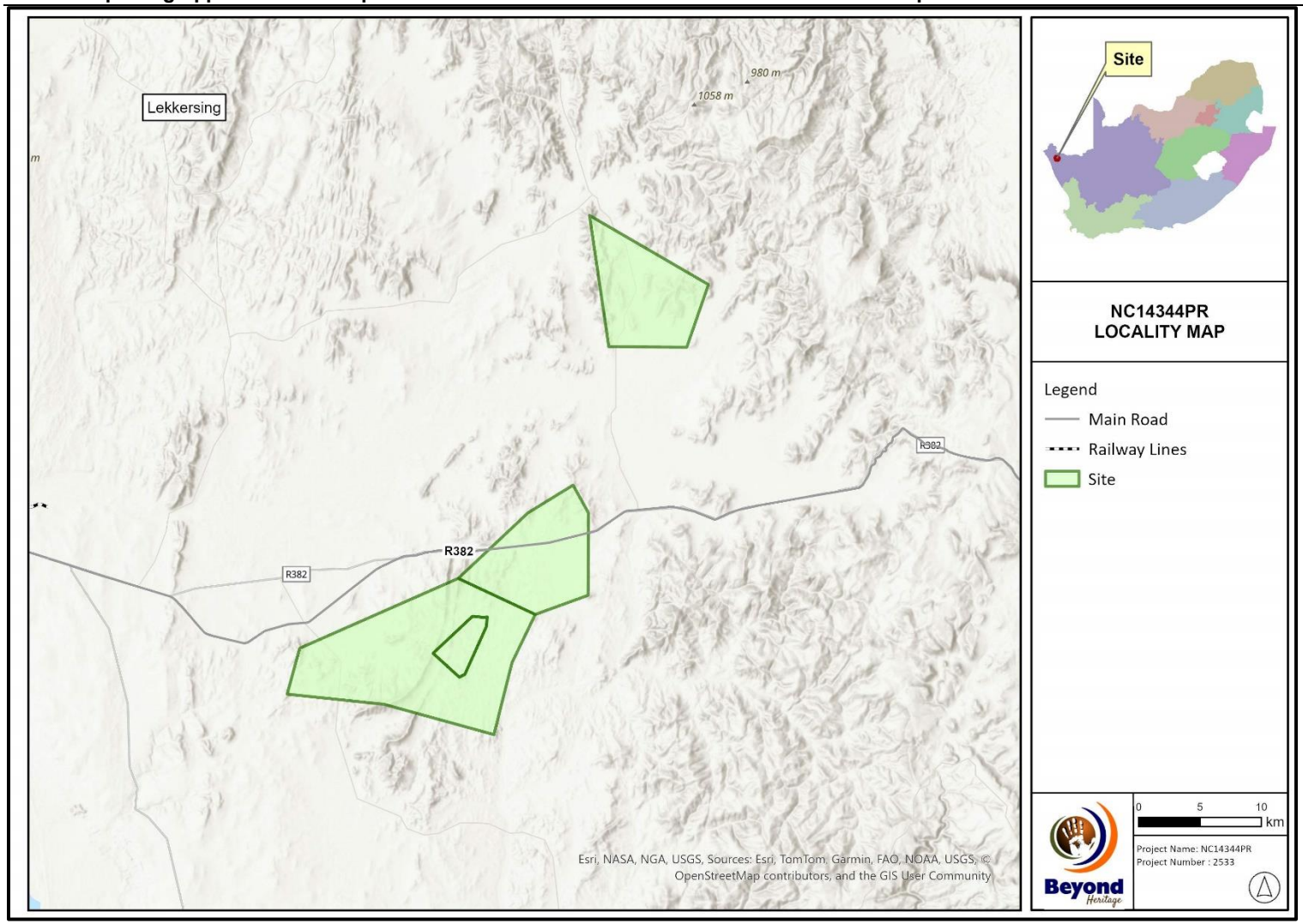


Figure 1.2. Local setting of the Project (Extract of the 2917 AB & AD 1:50 000 topographic map sheets).

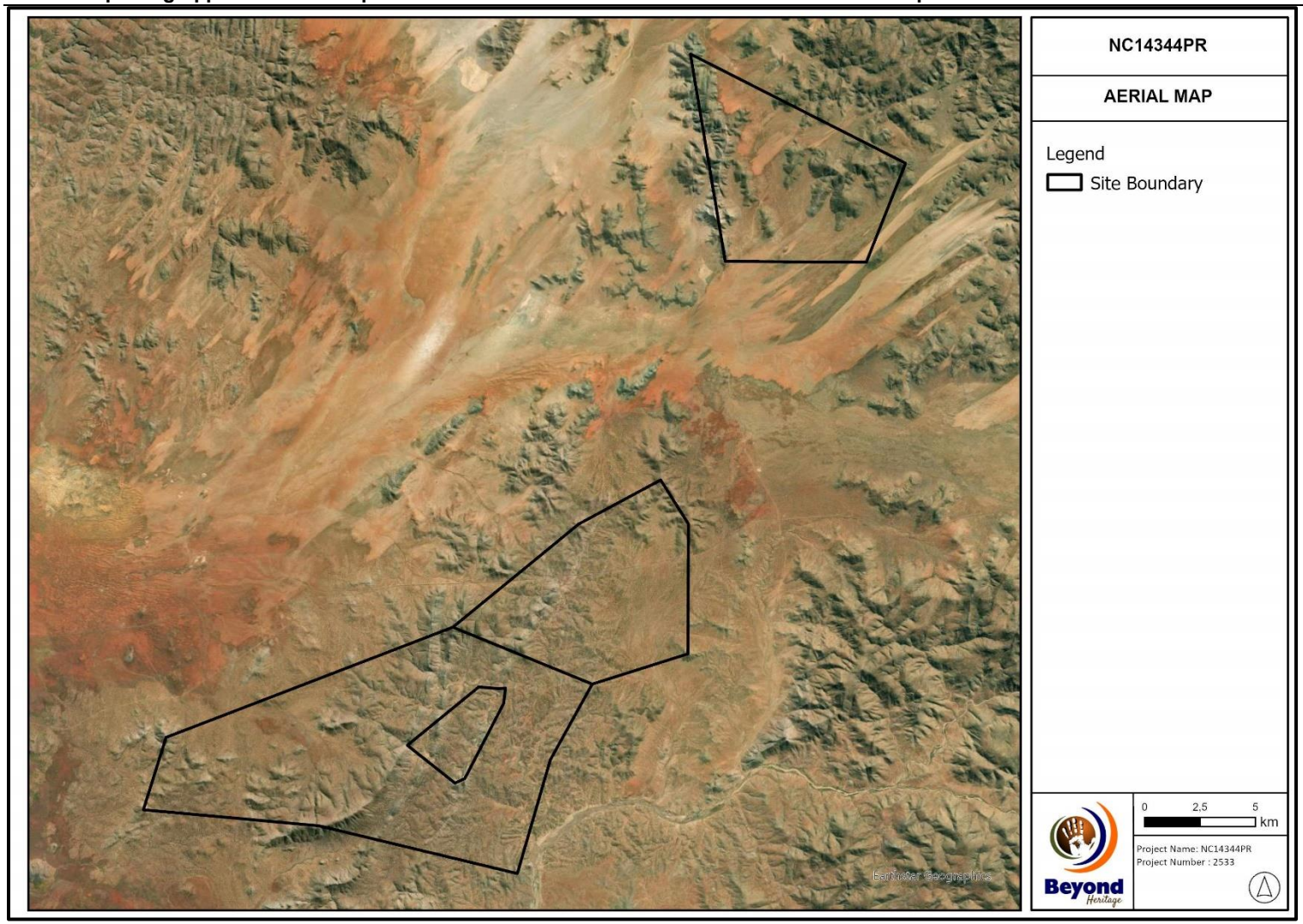


Figure 1.3. Aerial image of the Project area and surrounds.

1.1 Terms of Reference

The main aim of this desktop report is to determine if any known heritage resources occur within the project site. The objectives of the desktop report were to:

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.

- Conduct a desktop study:
  - Review available literature, previous heritage studies and other relevant information sources to obtain a thorough understanding of the archaeological and cultural heritage conditions of the area;
  - Identify known and recorded archaeological and cultural sites; and
  - Determine whether the area is renowned for any cultural and heritage resources, such as Stone Age sites, informal graveyards or historical homesteads.
- Compile a specialist Heritage Desktop Report in line with the requirements of the EIA Regulations, 2014, as amended on 07 April 2017.

The reporting is based on the results and findings of a desktop study and a non-intrusive site visit, wherein potential issues associated with the proposed project will be identified. Reporting will aim to identify the anticipated impacts, as well as cumulative impacts, of the operational units of the proposed project activity on the identified heritage resources for all 3 development stages of the project, i.e. construction, operation and decommissioning. Reporting will also consider alternatives should any significant sites be impacted on by the proposed project. This is done to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve and develop them within the framework provided by Heritage Legislation.

When the localities of the invasive prospecting activities are fixed, the following terms will apply:

Field study (Walkdown)

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 phases of the project, i.e., non-invasive prospecting, invasive prospecting 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 Project are outlined in Tables 2 and 3.

Table 2: Project Description

Magisterial Districts	Richtersveld Local Municipality and Nama Khoi Local Municipality within the Namakwa District Municipality
Central co-ordinates of the development	29° 7'29.84"S 17°26'15.97"E 29°17'35.67"S 17°21'28.32"E 29°21'3.82"S 17°18'1.96"E
1:50 000 Topographic Map Number	2917 AB & AD

Table 3: Infrastructure and project activities

Type of development	Prospecting Application
Farm Name:	1. Tusschen-In No 143 2. Portion 1 of the farm Aardvark No 164 3. Remaining Extent of the farm Aardvark No 164 4. Steenbok No 165 5. Farm No 166 (Gifkop)
Application area (Ha)	21 217.1756 ha
Magisterial district:	Namakwa
Distance and direction from nearest town	The farm Tusschen-In No 143 is ±46 km north-west of Steinkopf. When travelling west along the R382, turn right (north) from the main road after ±34 km. Farms Aardvark No 164, Steenbok No 165, and Gifkop No 166 are ±40 km west to south-west of Steinkopf, and ±47 km east to south-east from Port Nolloth when travelling along the R382.
21 digit Surveyor General Code for each farm portion	1. C05300000000014300000 2. C05300000000016400000 3. C05300000000016400001 4. C05300000000016500000 5. C05300000000016600000
Description of the overall activity	Strata Energy Minerals & Resources (Pty) Ltd (the “Applicant”) applies for environmental authorisation and a prospecting right (without bulk sampling) for Copper (Cu), Zinc (Zn), Lead (Pb), Silver (Ag), Lithium (Li), Baryte (BaSO4), Sillimanite-corundum (Al2SiO5), Wolframite (W) /Tungsten, and Feldspar (Fsp) over 21 217.1756 ha of the above mentioned properties. Should the relevant authorisations be granted, and the project commence the principal prospecting activities will entail the following:

❖ Non-Invasive Prospecting:

- Desktop geological studies (Phase 1),
- Geological field mapping (Phase 2),
- Ground geophysical survey and ground magnetic survey (Phase 3),
- Feasibility studies and target selection (Phase 5),
- Metallurgical testing and analysis (Phase 5),
- Analytical desktop pre-feasibility study (Phase 7).

❖ Invasive Prospecting:

- Exploration boreholes (Phase 4 & 6),
- Sloping, landscaping, and rehabilitation the affected areas (Phase 4 & 6).

Once the target areas were identified (during non-invasive prospecting) and the invasive prospecting commences (phase 4 & 6), site establishment will entail discussions with the landowners regarding access to the properties, the clearance of vegetation (where necessary) from the areas to be prospected, the stripping and stockpiling of the topsoil, and the introduction of the prospecting equipment.

The prospecting activities does not entail bulk sampling and do not require the use of any permanent equipment/infrastructure. A central site camp will be established at an area agreed to by the landowner where mobile containers will be used as office space and for storage. Chemical ablutions will be established, and the site camp will be fenced to control access. All chemicals/hydrocarbons will be kept in the storage containers or bunded areas with impermeable surfaces.

Drilling:

The targeting of all drilling activities will be dependent on the results obtained during the preceding phases of prospecting, namely the geological mapping and geophysical surveying and as such it is currently not possible to include a finalized surface plan showing the intended location, extent, and depth of boreholes to be completed.

Diamond drilling will be of the standard BQ (60 mm outside diameter) or NQ (75.7 mm outside diameter) size. Down hole surveys will be done every 50 m in each hole. Core will be marked, logged, photographed, and sampled according to the standard of the applicant's logging and sampling procedures. Down the hole geophysical surveying will take place upon completion of the exploratory boreholes along with Ground EM surveys to determine positions of conductors.

Rehabilitation of drill sites will be done according to an approved Environmental Management Plan.

Percussion Rotary Air Blast (RAB) or Reverse Circulation (RC) drilling may be carried out for pre-collaring of diamond drill boreholes or for obtaining samples if significant depth of cover is encountered over particular targets.

	Assaying: Rock chip / soil samples will be sent to an off-site laboratory to be crushed, split, pulverized, and assayed. **Metallurgical Test Work:** Metallurgical test work will start during Phase 5 of the prospecting activities. These tests will be done off-site by and in consultation with an accredited Laboratory. **Electricity Need:** The prospecting activities does not require electricity as all equipment will be powered with generators. **Water Use:** Water will also be used for drilling, and dust suppression at the prospecting sites and access roads. Potable water will daily be transported to site, while the process water will be bought from a local registered sources (to be identified) in the vicinity of the prospecting activities. **Waste Handling:** The general waste generated at the prospecting sites will be transported to the site camp where it will be contained in refuse bins. Once full the refuse bins will be emptied, and the waste will be disposed of at a registered landfill site in the vicinity of the project. Hazardous waste will be contained in designated hazardous waste containers to be removed daily to the hazardous waste storage area at the site camp. A registered contractor will be appointed to collect and dispose of the hazardous waste at a registered hazardous waste handling facility and the site will file the proof of safe disposal for auditing purposes. The chemical toilets will weekly be serviced by an appropriately qualified sewerage handling contractor who will furnish the site with proof of safe disposal. **Servicing and Maintenance:** No workshop, wash bay or service areas will be established at the prospecting sites and/or site camp. When needed maintenance/servicing of the equipment will be performed at the contractor's off-site workshop.

1.3 Alternatives

Presently, the project proposal entails the prospecting of 21 217.1756 ha area over the above listed properties. The proposed footprint was based on the available geological information which is of interest to the minerals applied for.

2 Legislative Requirements

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

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

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

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

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

SAHRA as a commenting authority under section 38(8) of the NHRA require all environmental documents, compiled in support of an EA application as defined by the National Environmental Management Act (NEMA) (Act No 107 of 1998) to be submitted to SAHRA for commenting. Environmental Impact Assessment (EIA) Regulations section 40 (1) and (2). The Environmental Impact Assessment (EIA) Regulations, Government Notice Regulation (GN) R.982 were published on 04 December 2014 and promulgated on 08 December 2014. Together with the EIA Regulations, the Minister also published GN R.983 (Listing Notice No. 1), GN R.984 (Listing Notice No. 2) and GN R.985 (Listing Notice No. 3) in terms of Sections 24(2) and 24D of the NEMA, as amended) Upon submission to SAHRA the project will be automatically given a case number as reference. As such the EIA report and its appendices must be submitted to the case as well as the EMPr, once it’s completed by the Environmental Assessment Practitioner (EAP).

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

Phase 1 HIAs are primarily concerned with the location and identification of heritage sites situated within a proposed development area. Identified sites should be assessed according to their significance (refer to Section 3.5). Relevant conservation or mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

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

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

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

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

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement. After mitigation of a site, a destruction permit must be applied for with SAHRA by the applicant before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36 and GNR 548 as well as the SAHRA BGG Policy 2020. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 of the National Heritage Resources Act (NHRA), as well as the National Health Act of 2003 and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925) re-instituted by Proclamation 109 of 17 June 1994 and implemented by CoGHSTA as well as the National Health Act 2003 and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. Authorisation for exhumation and reinternment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under the National Health Act of 2003.

3 METHODOLOGY

3.1 Literature Review and background study

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

3.2 Genealogical Society and Google Earth Monuments

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

3.3 Public Consultation and Stakeholder Engagement:

Stakeholder engagement is a key component of any 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 BA report.

3.4 Site Investigation

The aim of the site visit was to:
a) survey the proposed Project area to understand the heritage character of the area and to record, photograph and describe sites of archaeological, historical or cultural interest;
b) record GPS points of sites/areas identified as significant areas;
c) determine the levels of significance of the various types of heritage resources recorded in the Project area.

Table 4. Site Investigation Details

	Site Investigation
Date	Week of 4 August 2025
Season	Winter - Large portions of the farm Steenbok was difficult to access due to the degraded nature of the farm. The farm is state owned and is not being used for any agricultural purposes. The farm roads are degraded and, in some cases, completely overgrown and in complete disrepair. The general visibility across the landscape was good due to the lack of any tall growing vegetation. Some areas did however show overgrown ground vegetation because of the recent rainfall. Only targeted areas in each farm were surveyed at this stage of the study (Figure 3.1). A Heritage Walk-Down will be conducted once drilling sites have been selected.

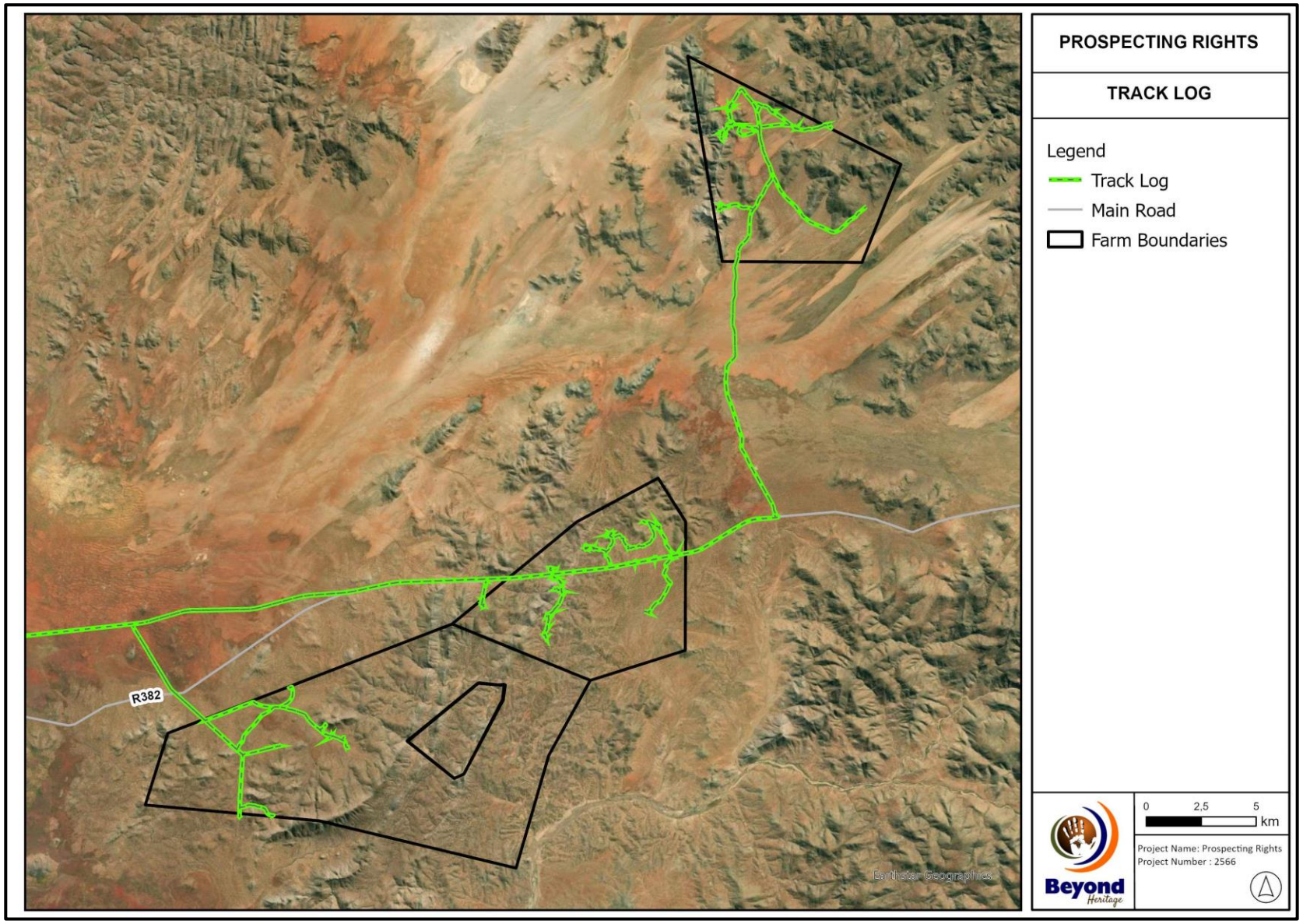


Figure 3.1. Tracklog of the survey path in green.

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 following assumptions and limitations apply to this study:

- The authors acknowledge that the brief literature review is not exhaustive on the literature of the area;
- The study area was subjected to a field survey only within targeted areas at this stage in the environmental process, it is recommended that a Heritage Walk-Down will be conducted when the actual exploration (invasive prospecting activities) localities are fixed;
- It is assumed that information obtained for the wider area is applicable to the study area.
- 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, Richtersveld Municipality has a total population of 11 982 of which 76,6% are coloured people, 13,1% are black African, 8,5% white people 0.5% Indian/Asian and the other racial groups constitute of 1,4% of the population.

Of those 20 years and older 18,9% has completed grade 12, 7,3% have higher education, 13,7% completed primary education, 15,1% have some primary, 42,7% some secondary and 2,5 % has no schooling. Of the 5 687 economically active (employed or unemployed but looking for work) people in the municipality, 18,6% (1 060) are unemployed. Amongst the 2 547 youth (aged 15 – 34) in the area, 22,4% (571) are unemployed.

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 (statssa.gov.za).

5 Results of Public Consultation and Stakeholder Engagement:

In line with the NHRA, stakeholder engagement is a key component of any BA process, it involves stakeholders interested in or affected by the proposed development. During the initial public participation process the stakeholders and I&AP's will be informed of the project by means of notification letters that will either be delivered by hand or sent directly to the contact persons. Advertisements will be placed in relevant newspaper/s (such as the Gemsbok), and on-site notices will be placed at conspicuous places.

The I&AP's and stakeholders will be informed of the availability of the draft Basic Assessment Report (DBAR) for their perusal. 30 days commenting period will be allowed. The comments received on the DBAR will be incorporated into the final BAR to be submitted to the DMRE for decision making.

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.

Each of the abovementioned phases are characterised by industrial complexes that may also include regional variations. Such variations are caused by several factors, for example, cognitive abilities, changing hunting practices and different modes of subsistence through time. For the purposes of Cultural Resources Management (CRM) it is often only expected and/or possible to identify the presence of the three main phases. Depending on the archaeological context, the recognition of cultural groups, affinities, or trends in technology and/or subsistence practices, as represented by industrial complexes, may be possible (e.g., Mitchell 2002, Orton 2012, Webley 2007). Stone tools were made from a variety of rock types such as chert, chalcedony, jasper, quartz, silcrete, hornfels, basalt, quartzite and cryptocrystalline silicates (Lombard *et al*. 2012). Cryptocrystalline silicates (CCS) are a generic term used to indicate a wide range of fine-grained rock types (e.g., Orton 2012).

Archaeological research in Namaqualand is concentrated within certain areas, such as the coast (Dewar 2007, Orton 2012), the Kamiesberg mountains (Webley 1992), the Richtersveld, and along the Orange River (Robertshaw 1978; Beaumont *et al*. 1995, Webley 2007, Orton & Halkett 2010). Archaeological occurrences in these areas are varied and range from the ESA to the LSA (e.g., Beaumont *et al*. 1995, Dewar 2007, Orton 2012), with the LSA being the most prevalent. Although chronological frameworks have been established for certain areas, there have been no academic studies in the Springbok area (Kaplan 2016, Orton 2021).

Although unexcavated rock shelters/overhangs are present, which may have richer deposits, ESA, MSA, and LSA lithics are currently represented by surface scatters within the study area. These assemblages are made from predominantly quartz and some of silcrete (Orton & Halkett 2007, Kaplan 2010a; b; 2016, Orton 2019). Prior to the introduction of livestock by herder groups (Khoi) *ca* 2000 years ago, the area would have been inhabited by hunter-gatherer (San) communities. Hunter-gatherers occupied rock shelters, practiced a nomadic lifestyle, while utilising the landscape for food resources (e.g., Webley 1992, Dewar 2007, Orton 2012).

The Northern and Western Cape are currently the most extensive researched areas with regards to pastoral archaeology, based on historical evidence the areas are known to have been inhabited by Khoisan communities (e.g., Webley 1992, Orton 2012). Consequent to the introduction of caprines, hunter-gatherers are apparently recognised by relatively high percentages of formal lithics, especially backed blades (Swartkop industry), as well as small ostrich eggshell beads s and thin-walled undecorated, grass-tempered ceramics, while herders are characterised by lower percentages of formal lithics (Doornfontein industry), larger ostrich eggshell beads, as well as thin-walled and grit-tempered ceramics (e.g., Beaumont *et al*. 1995, Parsons 2000).

Even though hunter-gatherer and herders are separate linguistic groups with different socio-economic and -political organisation, distinguishing different archaeological signatures for the two modes of subsistence have proved to be ambiguous in practice (Webley 1992; Parsons 2000; Sadr 2008; Orton 2012, Veldman 2014).

The presence of stone walling, cairns and stone circles in the study area, are thus associated with both hunter-gatherers and herders based on material culture and ethnographic accounts (Parsons 2004, Sampson 2009, Veldman *et al*. 2017). Circles vary in building style. Stone circle settlement typically dates from the last 2000 years to 100 years ago (Veldman 2014). The most common styles include:
a) stones stacked to form a walled rampart,
b) simple stone stacking against each other,
c) stones stacked upright as plates forming semi-circles,
d) mixed styles,
e) storage cairn,
f) stones packed in layers,
g) scattered stones forming a circle,
h) round stones laid flat on a sand surface
The forms of the stone circles vary from one simple cellular structure with an opening, to complex multi-cellular structures (Speich 2010).

Rock art (paintings and engravings) is predominantly a characteristic of the LSA. Kaplan (2010) reported a faded rock art site on the overhanging face of a large boulder. This is the only known painted site known from the vicinity of Okiep and Concordia. Rock art is generally rare though a few painted sites are on record (Orton 2013, 2019), whereas engravings might be more numerous in Namaqualand, due to geology and topography. In general, paintings occur within shelters/overhangs situated in escarpments and folded belts, while and the engravings are present on outcrops and loose standing boulders on the relatively featureless inland plateau (e.g., Morris 1988, Deacon 1997).

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.

There is no archaeological evidence for Iron Age settlements in the general area, as the migration of Bantu-speaking farmers did not extend so far south-west. Iron Age farmers subsistence is based on livestock and agriculture; therefore, the arid Namaqualand environment is unsuitable for such intensive mixed farming practices. However, based on historical accounts it is safe to say that Tswana-speaking groups had trade relations with Khoisan communities near the Orange River since the 1700s to the 1820s (Humphreys 1976).

6.1.3 Historical Background

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. Most of the buildings date to the early-mid-20th century and tend to be of low or no heritage significance. Several 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.

The town of Steinkopf was originally called Kookfontein and began as a mission station established by the London Missionary Society. Control of the mission was later transferred to the Rhenish Mission. The town was eventually named Steinkopf, in honor of Reverend Dr. Steinkopf, who traveled to England in 1842 (Raper 2004).

6.1.4 Copper Mining History

Copper mining has taken place in Namaqualand prior to the onset of the Dutch East India colonial era of the mid to late 17th century. Several exploration parties were sent out by the Dutch commanders of the Cape to search for mineral wealth However, it was only during 1681, when Khoekhoen-speakers visited the Fort of Good Hope with pieces of copper that the Commander, Simon van der Stel, sent out Olaf Bergh in 1682 and 1683 to find the source of the copper ore. Bergh was unsuccessful in finding the ores.

Izaq Schrijver and three miners then attempted to find the ore in 1684, their efforts were not entirely in vain, they did not find the ores but did manage to barter a satchel of copper ore from the locals (Smalberger 1969, Cairncross 2004).

Simon van der Stel (then commander of the garrison at the Fort of Good Hope) decided to search for the elusive copper mountains himself. He and his men did find the Copper Mountains and sunk three shafts, extracting a small quantity of copper ore. However, the samples they sent to the Netherlands to evaluate were of low-grade. This, together with the distance from the Cape, the difficulty of transporting the ore to the coast, and the difficulty of processing it locally due to a lack of fuel and water, resulted in the venture being abandoned. Then in 1761 Hendrik Hop's expedition were despatched to Namaqualand. They concluded that the Copper Mountains where van der Stel was, only had small quantities of copper ore. Instead, they wanted to mine Little Copper Mountain, which was close by. Yet, again, the difficulties of extracting, transporting and processing the ore would cost them their profits and the idea was abandoned (Smalberger 1969).

In the meantime, the first British occupation of the Cape took place in 1795, and all Dutch East India Company property were transferred to the British Crown. Thereafter, for a few short years the Cape was under Batavian Dutch rule, only to be British again in 1807 (van Niekerk 2005, Samkin 2010). The Cape remained under British colonial rule, until challenged during the Anglo-Boer War of 1899-1902.

Intensive copper mining at Nababeep only started during the 1840s. The first company to be registered was the South African Mining Company formed by Thomas Fannin in 1846. Namaqualand was also annexed by Sir Harry Smith in 1847 and was as such now part of the British Colonial Government. The South African Mining Company seemed to simply fade out of existence after a few years without being formally dissolved. The value of shares for Joint Stock Companies in the Shipping and Mercantile Gazette of 1848 does not include the South African Mining Company. The absence of the company in the Gazette may suggest that shares no longer had market value and became worthless (Smalberger 1969).

After the disastrous expedition of the South African Mining Company a German by the name of Von Schlicht went up to Namaqualand, and found, not only van der Stel's mine, but more importantly, a farm named Springbokfontein also known as Melkboschuil and Koperberg. Von Schlicht returned to Cape Town with the hopes of interesting capitalists and merchants in mining, but he was unsuccessful in attaining capital investments given the failure of the South African Mining Company. Instead, Jencken who was an acquaintance of Von Schlict, got himself into financial difficulties with Phillips and King (a mercantile firm). To repay Phillips and King, Jencken proposed to open a general store in Namaqualand and simultaneously investigate the prospects of copper mining based on Von Schlict's findings. Although Springbok fell within the sphere of the Cape Government, no mineral rights were retained by the Government, because they were at the time indifferent to rich mineral deposits. In 1850, the Cloete's occupied the farm known as Springbokfontein, upon discovering the rich copper ores in the area, Phillips and King bought the farm from Cloete, as such Phillips and King obtained the mineral rights to the entire farm. Nababeep was purchased by Phillips and King in 1852 (Smalberger 1969).

By 1854, Phillips and King had sole mining rights to Brakfontein, Melkboschkuil and Nababeep. By 1855 the copper mining boom was no longer lucrative for some companies, but the mines of Phillips and King remained profitable. Transport was still problematic; copper was transported by wagon to Hondeklip Bay and Port Nolloth. Phillips and King systematically bought up almost all the farms on route to Hondeklip Bay to ensure the transport of their ores and to secure a monopoly over the area where they could eliminate smaller companies, except for their principal rival - the Namaqua Mining Company. The Namaqua Mining Company obtained temporary encampment rights on the farm Kookfontein that enabled them to get their ores to the coast.

These mining companies started to pressurise the government to construct a railway line to transport the material to the coast but to no avail. Government officials were unwilling to build a railway to Hondeklip Bay, as the railway would become defunct once the dominant companies cease to exist, which did eventually happen. In 1862, Phillips and King had to sell all their properties to the Cape of Good Hope Copper Mining Company Ltd due to the death of two of the partners in the firm (Smalberger 1969).

Thus, when the Cape Copper Mining Company Ltd were granted permission to construct a railway, it ran directly to Port Nolloth since 1869. The first line was a tramway for animal-drawn traffic, and was completed in stages, reaching Okiep in 1876. Up to 1876 the entire line was operated by animal drawn traffic. The light rails were replaced with steel rails to replace the animal drawn tram with a steam train, and the rail was extended to Okiep in 1893.The 12km branch line from Garracoup Junction (on the main line) to Nababeep was constructed in 1899. Although the main railway line between Port Nolloth and Okiep survived until 1945 when its new owners sold most of the line as scrap, the section between Nababeep and Okiep via Garracoup Junction remained in service until the construction and permanent surfacing of the Nababeep to Okiep road in 1950, when this section was decommissioned and the rails uplifted (Smalberger 1969, Webley 2016).

The Namaqua Mining Company became defunct due to mismanagement and excessive transport costs. They were replaced by the Concordia Copper Company in 1875. However, the construction of the railway brought new opportunity, reduction of shipping costs in 1881 led to the reopening of the Springbokfontein mine, which enabled the Concordia Copper Company to send some ore away. Although mining had been commenced by them in 1875, they had until 1881 been unable to get their ores to the market, due to low grade of ore, depressed prices and the enormous transport costs. In 1886 the Concordia Copper Company was formed into the Namaqua United Company, but this company became bankrupt in 1888 and became the Namaqua Copper Company. In the same year, the Cape of Good Hope Copper Mining Company Ltd, changed its name to the Cape Copper Company Ltd (Smalberger 1969).

The Anglo-Boer War of 1899-1902 disrupted mining operations, especially with sporadic attacks on the mining towns, but by 1902, Nababeep was recognised as the second most important producing mine of the Cape Copper Company (Smalberger 1969). World War I (1914-1918) and World War II (1939-1945) brought prosperity to the mines. In war time the largest use of copper is for cartridge brass for ammunition, rotating bands, bullet jackets, bearings, springs, detonators, fuse parts, and primer cups (e.g., Dikshit & Henry 1973). However, the crash in prices that followed in peace time, closed down the mines, especially the Great Depression post-war era.

The mines in the area were taken over in 1937 by the Okiep Copper Company Ltd. Okiep and Nababeep mines were pumped out and re-opened in 1938 to mine the low-grade ore, which the proceeding owners had abandoned as unprofitable, during the 1940s to the 1960s sporadic mining took place but the mines closed permanently in the 1970s and 1980s (Cairncross 2004, Orton 2021, van der Walt pers. obs. 13 September 2021).

6.1.5 Anglo-Boer War

In 1901, Colonel Shelton was appointed Commandant of Namaqualand to defend the key copper mining towns of Okiep, Concordia, and Nababeep from Boer forces under General Smuts. He established his base in Okiep, reinforcing it with thirteen blockhouses, including one near the railway from Steinkopf. As Smuts advanced, he cut telegraph lines, leaving the railway to Port Nolloth as Okiep's sole communication and supply route. Shelton fortified the town, particularly to protect the railway, which was essential for water transport and dynamite storage (Burke 1995).

General Smuts captured Springbok on 1 April 1902, and Concordia soon after. Okiep came under siege on 4 April, with the last train arriving that day. The Ratelpoort Blockhouse was also attacked. British reinforcements landed at Port Nolloth on 12 April, advancing inland and reclaiming blockhouses. After Smuts left for peace talks on 26 April, General Maritz attempted to bomb Okiep using a dynamite-laden train, but it derailed and failed to explode. The siege ended on 4 May 1902, with the railway playing a critical role throughout.

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 5. A small section of the Farm Aardvark 164 was surveyed (Orton 2016), whereby a quartz flake, stone cairns, and a small stone wall were recorded.

Table 6. Studies consulted for the project.

Author	Year	Project	Findings
Orton, J., Halkett, D.	2007	Archaeological Impact Assessment of New Mining Areas Along the Buffels River, Namaqualand, Namakwaland Magisterial District, Northern Cape	Predominantly surface scatters of LSA and MSA sites. Two ESA hand axes. Also present some ostrich eggshell and bone.
Van der Walt, J.	2023	Heritage Impact Assessment for the proposed Flat Mines Project, Northern Cape.	Background scatter of MSA and LSA lithic material, the remnants of previous mining infrastructure, and a cemetery.
Pelser, A.J.	2020	Phase 1 HIA Report for Proposed Township Establishment on the Remaining Extent of Erf 2048, Steinkopf Nama Khoi Local Municipality, Northern Cape Province.	Modern ruins
Orton, J.	2019	Heritage Impact Assessment: proposed reopening of three copper mines at Concordia, Namakwaland Magisterial District, Northern Cape	MSA and LSA quartz chunks, cores, bipolar cores, flakes and blades, occurring as ephemeral scatter of quartz artefacts between rock outcrops in front of rock shelters. Soapstone fragments. Lower grindstones. LSA/Historical era stone walling for kraals, walling, stone circles, and cairns. Rectangular and circular in form. Historical era porcelain and earthenware, glass, tin, horseshoe, wires, metal. Stone structures related to the Anglo-Boer War/old railway line. Railway bridge ruins, railway culverts over watercourses. A long, low granite block and gravel berm that seems likely to have held a railway to the mine. Base of an old water tower Threshing floors Abandoned houses/cottages and stockposts, built from stone, mudbricks. Stone and cement ruins. A small granite quarry to source building stone. Ash and rubbish dumps containing mostly 20th century materials (including plastic, bone, glass, ceramics, one marine shell) but there do appear to be a few older (19th century) items. There was also a granite upper grindstone / hammer stone A small stone cairn that may be a grave. A Roman Catholic graveyard with probably about 100 graves in it. It is identified by four stone-built corner posts. Another large cluster of about 150 graves located outside the enclosed Roman Catholic cemetery.
Orton, J.	2021	Heritage Impact Assessment: Proposed Borrow Pit on Portion 1 of the Farm Aardvark 164, Namakwa Magisterial District, Northern Cape.	A quartz flake, stone cairns, a small stone wall.
Chauke, C.	2014	Heritage Impact Assessment Studies for the Proposed Gromis Oranjemund Reconductoring, Namaqualand Region, Richtersveld Local Municipality, Northern Cape.	A single grave.

Kaplan, J.	2007	Request: Exemption from Having to Undertake a Phase 1 Archaeological Impact Assessment of the Proposed Upgrading of the Vioolsdrift Border Post, Northern Cape Province.	No sites were identified.
Kaplan, J.	2010a	Archaeological Scoping Study of two proposed wind farm sites (Nama East and Nama West) near Springbok Northern Cape Province	MSA quartzite flakes, quartz chunk. Later Stone Age silcrete adze and one silcrete flake. Three graves (one unidentified) were located alongside the gravel road to Nababeep. The collapsed remains of a modern, built with dolerite, small shepherds hut. Modern fragments of glass from a beer bottle, and the neck of a half jack brandy bottle.
Kaplan, J.	2010b	Archaeological Impact Assessment of a proposed wind energy facility near Springbok, Northern Cape. Unpublished report for DJ Environmental Consultants.	Two quartzite flakes. One Middle Stone Age quartzite flake. One large boulder `shelter', with a few Middle and Later Stone Age artefacts and some very faded rock art. A Christian grave was found about 75 m west of the boulder shelter. A possible grave. The ruined, circular remains of a modern building/structure/holding kraal.
Kaplan, J.	2016	Heritage Impact Assessment: Namaqualand Regional Water Supply Scheme – upgrade of the water supply pipeline from Okiep to Concordia and Carolusberg, Northern Cape Province. Unpublished report for Enviroafrica	Stone kraal. Graves. Stone farm boundary (historical). Abandoned stone farm house. Concrete drinking trough, water channel & storage pit. MSA quartzite flake in large wind exposed patch of ground. Silcrete flake. Kraal, with associated scatter of LSA tools. Tools comprise quartz, silcrete and quartzite flakes, quartz bipolar core, and pecked anvil. No pottery, bone or ostrich eggshell. Remains of dwelling floor. Grave/alternatively stone cairns marking old prospecting site. Ruins and rubble of farm house
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, Historical farmstead.
Engelbrecht, J., Fivaz, H.	2019	Phase 1 AIA Field Report Proposed Development of Eskom Gromis-Nama-Aggeneis 400kv IPP Integration, Northern Cape Province	Informal cemetery, fenced with at least 50 graves. Stone combined with cement foundation built with vertical packed stones similar to Sotho-Tswana huts. Stone and cement square house foundation, with prominent midden Stone and daub house ruin with foundation. Round stone-walled shelters on the mountain slope. Most probably Khoi provenance. Cemetery near Springbok informal settlement (Bergsig). Formal cemetery (municipal. Mud-brick square house ruin. The contextual artefacts date the 1870s. Stone-walled livestock byre/kraal. House foundation younger than 60 years. Combination of foundation and dung patches where livestock kraals were present. Historical stone walls and foundation ruins with artefacts in context. Nigramoep settlement ca. 1904. Nigramoep closed/abandoned copper mine. Nababeep closed historical copper mine. Historical period ceramics, glass, tin cans, metal sheeting. Historic steam locomotive known as Clara
Webley, L.	2016	Historical obervations on The Copper Railway Line Between Rooiwinkel and Nababeep, Northern Cape	Railway tracks and sleepers have been removed; the position of the line is still indicated by a raised earthen packed ridge. Sections of the raised bed of the railway line are still intact although large sections, which run in proximity to the N7 highway, have been destroyed by road development. The raised bed of the old tracks, the stone bridges and culverts, the water tanks for the steam trains

Morris, D., Henderson, A.	2018	Heritage Impact Assessment Report for the proposed mining extensions on farm Nababeep 134, Namaqualand, Northern Cape	Ceramic, porcelain and glass fragments, and cement platforms and pegs associated with historical copper mining

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 areas.

7 Heritage Baseline

7.1 Description of the Physical Environment

The Project area traverses various vegetation types including Kuruman Vaalbosveld, Kuruman Thornveld, Ghaap Plateau Vaalbosveld, Olifantshoek Plains Thornveld, and Northern Upper Karoo.

The the Southern Richtersveld Scorpionstailveld is described as flat basin landscape with several inselbergs embedded. Generally, the low vegetation is dominated by the flat cushions of *Brownanthus pseudoschilichtianus.* Towards the west, a strong admixture of grasses, or mosaic elements of grassland, accompanying the (flat) transition to Oograbies Plains Sandy Grassland. Towards the escarpment, increasing rainfall and grazing pressure result in increasing importance of *Zygophyllum retrofractum.* In degraded areas *Lebeckia multiflora* and/or *Euphorbia ephedroides* are important.

The Kosiesberg Succulent Shrubland is described as escarpment that includes the steep slope between the high plateau in the east and the lower plateau in the west as well as several ranges of mountains and hills at the upper and lower level. Due to the incision of deep valley systems, the area is deeply dissected into number of thinly connected fragments. A number of the plant communities found in the Central Richtersveld Mountain Shrubland also occur here.

The Namaqualand Heuweltjieveld is described as undulating plains leading up to the Escarpment with a mosaic of communities on heuweltjies (slightly raised, rounded termite mounds up to 10 m in diameter) and in between the heuweltjies. Low shrubland (canopy cover 20-45%) dominated by leaf-succulent shrubs (Mucina and Rutherford 2006).

The farms on which the non-invasive prospecting will take place is dominated by deep red loamy soils on granites with various drainage lines running through the farms The various farms which will undergo non-invasive prospecting covers an area of 21 217.1756 hectares.

The proposed project area consists of three large farms, Tusschen-in, Aardvark and Steenbok situated about 50km east of Port Nolleth in the Northern Cape. The three farms collectively cover about 21000ha of landscape throughout the Richtersveld region.

The larger landscape is dominated by large mountainous hills with extremely steep slopes surrounded by sandy valley floors or large open areas of sandy and gravely soil.

The natural vegetation across this semi-desert landscape consists mainly of small shrubs and fine tufts of grass. Recent rainfall in the region has however causes a boom in vegetation with the landscape showing very green conditions as well as some areas covered in fields of tall grasses.

The large mountainous hills are the focus points for the proposed project. The hills are rich in quartz and a very soft flaky layered stone that resembles mica.

Large portions of the various farms were difficult to access due to deteriorated gravel roads that are not being used as often. The historical elements of the farms such as homesteads/farmsteads and historical structures are very few and spread far apart. This is possibly due to the difficulty is using this landscape for agricultural purposes. Very view heritage resources were identified across the larger landscape.

Across the three farms evidence can be seen of prospecting activities. According to the farm owners these boreholes were made by Anglo American. Multiple boreholes are scattered throughout the mountainous regions of Tusschen-In and Aardvark. General site conditions across the farms are indicated in (Figure 7.1 to 7.4).

Figure 7.1. Mountainous conditions in the farm Tusschen-In.

Figure 7.2. Open areas of sandy soil within the farm Aardvark.

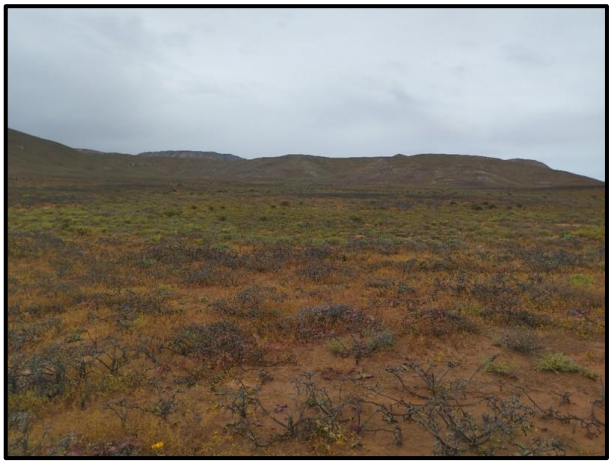


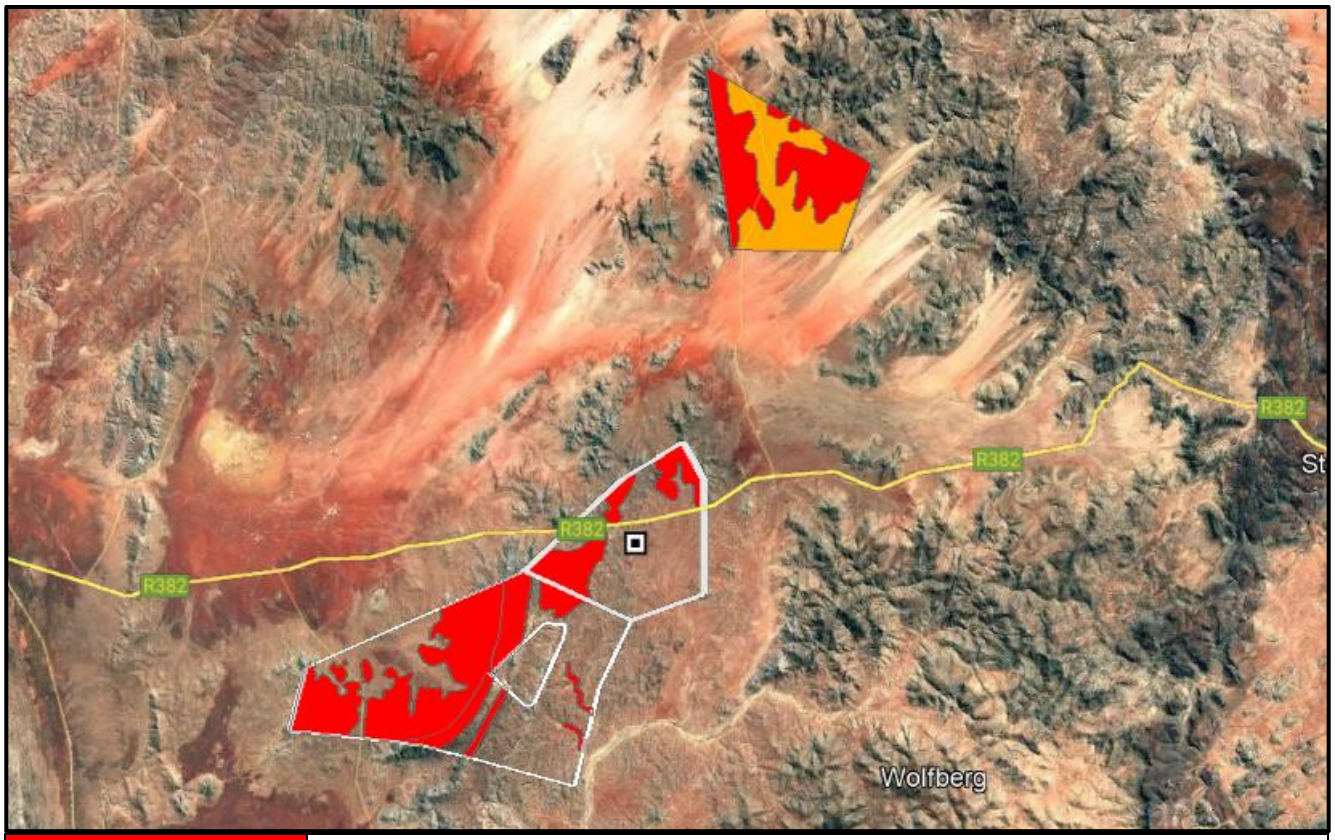
Figure 7.3. Sections of open, fairly flat conditions within the Steenbok.

Figure 7.4. Rocky outcrops are present scattered across the landscape.

7.2 Heritage Resources

The various farms earmarked for prospecting are situated within a larger sphere of significant archaeological sites. Stone Age sites and artefacts can be expected across the entirety of the landscape with more significant sites clustered expected on rocky outcrops, hills, and watercourses. Low density scatters relating to the ESA, MSA, and MSA can also be expected in flat plains. Site sensitivity of the Project areas is illustrated in Figure 7.5.

Targeted areas within each farm were selected for a site visit as no final layout is available at the time of writing. Within these target areas heritage resources recorded included graves, a low-density lithic scatter, a historical well, a historical dipping trench, ruins of a historical road, a historical house, an historical water reservoir, and a degraded modern house and were recorded as waypoints. Waypoints were labelled numerically according to the farm in which they were recorded. Recorded heritage resources are briefly described in Table 7 and illustrated in Figure 7.6. Selected features are illustrated in Figure 7.7. to 7.15.



High	Rocky outcrops and granite outcrops
High	Pans, seasonal water holes or fissures that hold water after the rains
Medium	Red sand dunes
Medium	Mixed calcrete and quartz flats
Low	Flat grassy plains with red sandy soils

Figure 7.5. Site sensitivity of the Project areas.

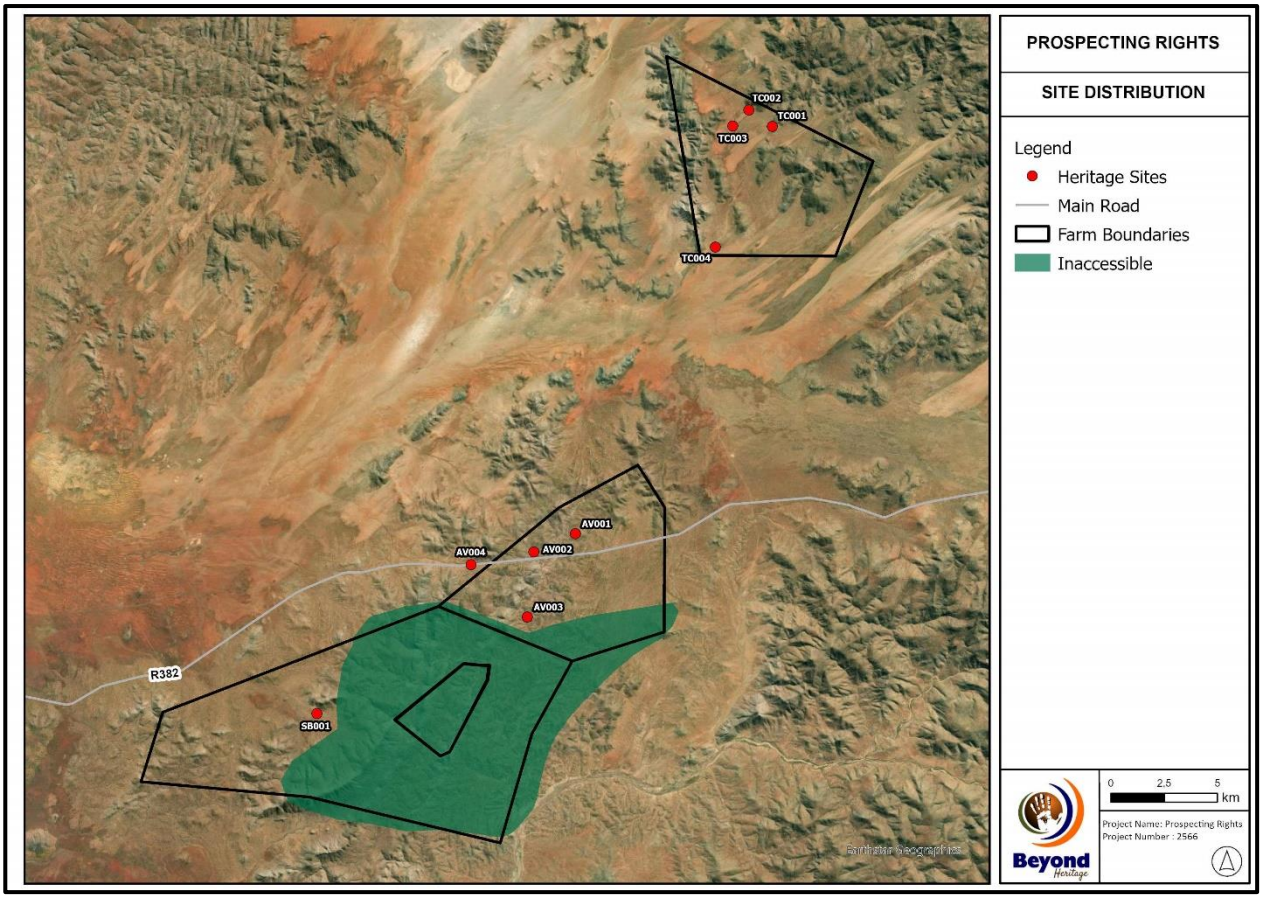


Figure 7.6. Site distribution if the Project area.

Table 7. Sites recorded in the study area

LABEL	LONGITUDE	LATITUDE	DESCRIPTION	SIGNIFICANCE
AV001	17°21'27.62"E	29°16'25.66"S	Historical well or prospecting pit	Low – Medium Significance GP B
AV002	17°20'24.42"E	29°16'53.13"S	Small degraded historical grave	High Significance 3A
AV003	17°20'14.69"E	29°18'32.16"S	Historical dipping trench	Low Significance GP C
AV004	17°18'49.23"E	29°17'12.76"S	Historical road and railway running between Steinkopf and Port Nolleth	Low – Medium Significance GP B
SB001	17°14'55.35"E	29°20'58.73"S	Degraded farmstead of modern origin.	Low Significance GP C
TC001	17°26'26.71"E	29° 6'7.22"S	Historical Farmhouse that is degraded but still intact.	Medium Significance GP B
TC002	17°25'51.06"E	29° 5'42.21"S	Historical Water reservoir that is square shaped.	Low Significance GP C
TC003	17°25'26.92"E	29° 6'6.45"S	Low density MSA and LSA scatter.	Low Significance GP C
TC004	17°25'0.49"E	29° 9'10.71"S	Small monument or burial site with the inscription Basson Maansie en Kitte 19 Mei 2002.	High Significance 3A

Figure 7.7. Historical well or prospecting pit at AV001.

Figure 7.8. View of degraded grave at AV002.

Figure 7.9. Historical dipping trench at AV003.

Figure 7.10. Historical road and railway at AV004.

Figure 7.11. Modern farmstead ruins at SB001.

Figure 7.12. General view of the Historical farmstead at TC001.

Figure 7.13. Historical water reservoir at TC002.

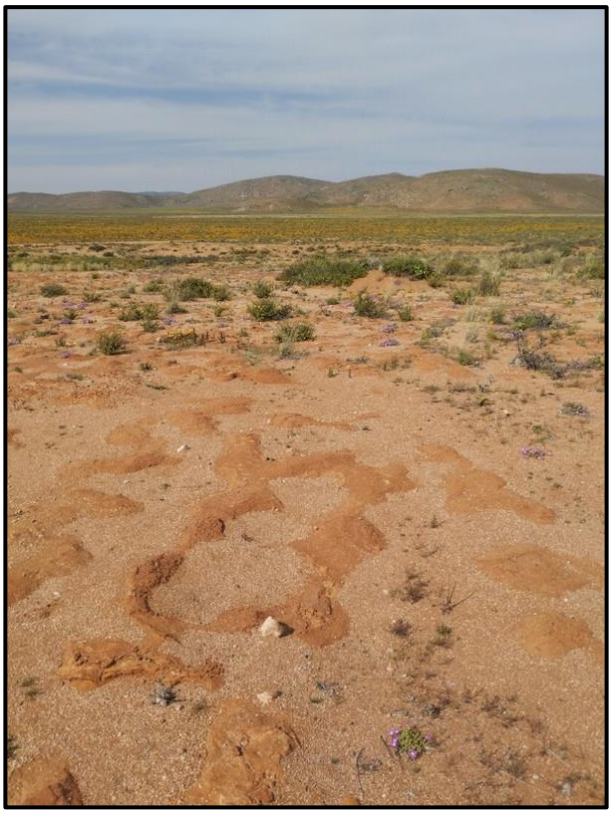


Figure 7.14. Low density MSA and LSA scatter at TC003.

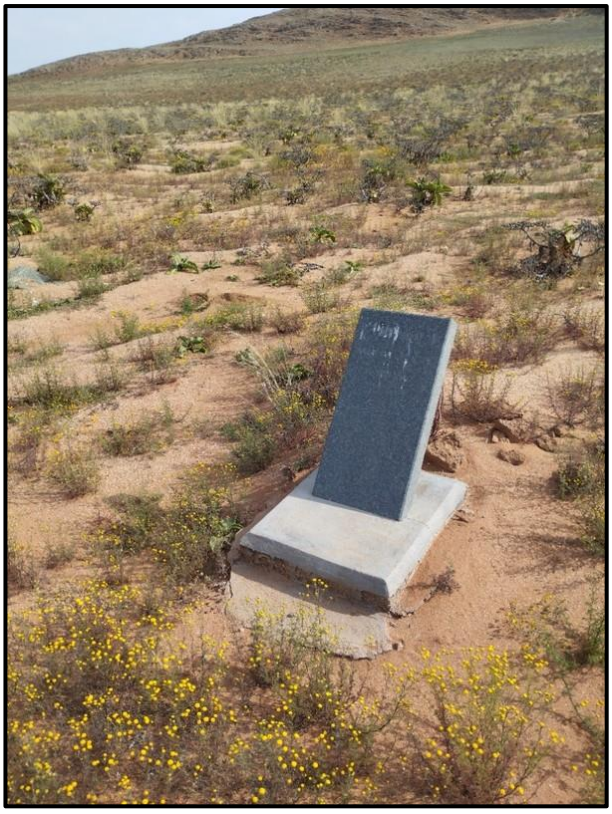


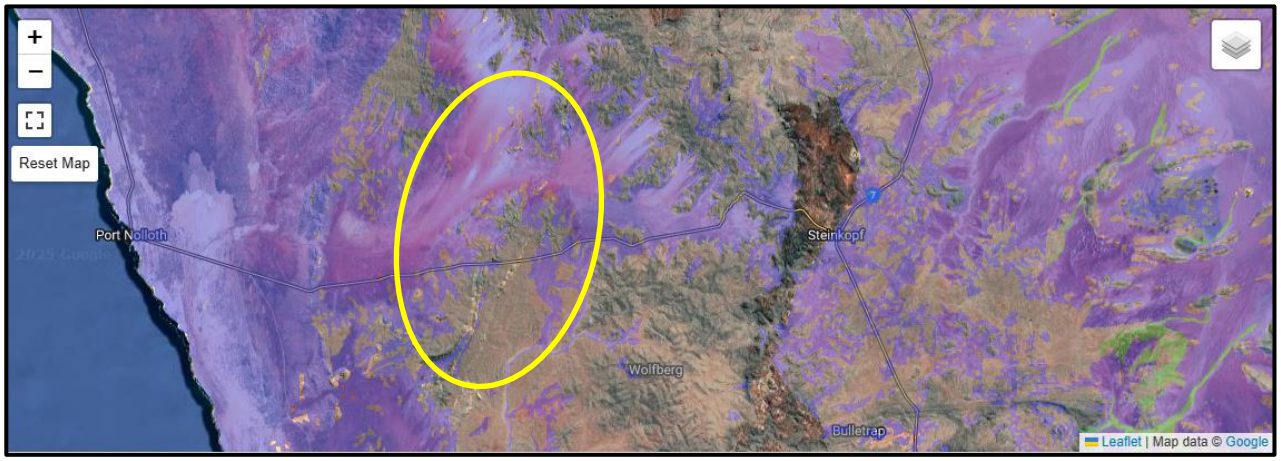
Figure 7.15. Grave/memorial at TC004.

7.3 Cultural Landscape

The Project areas are situated within a landscape which is known for its extensive cultural layering spanning from the Early Stone Age to the Historic Period. The landscape has also been subject to copper mining from the mid to late 17th century with further mining taking place in recent decades of other minerals. The region is mineralogically rich, and mining is a great driving force in the economic sector.

7.4 Paleontological Heritage

According to the SAHRA palaeontological sensitivity map, the various study areas are indicated as of insignificant/zero and low palaeontological sensitivity (Figure 7.16), and no further studies are required for this aspect however a protocol for finds is required.



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 7.16. 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.

Non-Invasive Prospecting is proposed to include:

- Desktop geological studies (Phase 1),
- Geological field mapping (Phase 2), Ground geophysical survey and ground magnetic survey (Phase 3),
- Feasibility studies and target selection (Phase 5),
- Metallurgical testing and analysis (Phase 5),
- Analytical desktop pre-feasibility study (Phase 7).

These activities will not impact on heritage resources in the Project area as they are non-intrusive.

To avoid potential impacts during invasive activities of the Project, the graves at AV002 and TC004 and the Historical house AV004 should be avoided for potential drill sites.

It is assumed that the invasive prospecting activities (Exploration boreholes and Sloping, landscaping, and rehabilitation of the affected areas (Phase 4 & 6).) involves the removal of topsoil and vegetation for drilling activities and creating new roads to get to the drill points as well as a camp. These activities can result in impacts that include destruction or partial destruction of previously unknown and non-renewable heritage resources.

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 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, when this project proceeds to actual mining this and other projects in the area can have a negative impact on heritage sites, the cultural landscape and the sense of place.

8.2 Impact Assessment Tables

Table 8. Impact assessment for non-invasive activities of the 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 material or objects.		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Site specific (1)	Site specific (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (3)	Low (3)
Probability	Probable (3)	Improbable (2)
Significance	**27 (Low)**	**18 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	yes	Yes
Can impacts be mitigated?	Yes	Yes
Mitigation: • Avoidance of the medium significance recorded sites (AV004) and graves (AV002, TC004) for consideration of drilling sites; • Once the drill sites have been confirmed these areas have to be subjected to a heritage walk down, this should be conducted prior to the commencement of invasive prospecting activities; • Drill sites must be kept as close as possible to existing roads in order to minimise the impact on the landscape; • Focal points on the landscape like rocky outcrops or pans must be avoided as far as possible as these areas could be sensitive from a heritage point of view; • Monitoring of the project area by the ECO during the exploration phase for heritage chance finds, and if chance finds are encountered to implement the Chance Find Procedure for the project.		
Residual Impacts: If sites are destroyed this results in the depletion of archaeological record of the area and even though surface features can be avoided or mitigated, there is a chance that completely buried sites would still be impacted but this cannot be quantified.		

9 Conclusion and recommendations

The scope of work comprises a heritage desktop report for a large prospecting right area comprising approximately 21 217.1756 ha across various farms. Several large-scale heritage surveys were conducted for mining projects and developments in the area, and the archaeological character of the area is now well described (e.g., Engelbrecht and Fivaz 2019, Orton and Halkett 2007, van der Walt 2023, Orton 2019; 2020, Chauke 2014, Kaplan 2010a; 2010b; 2016, van Ryneveld 2017). This provides the opportunity to establish potential heritage resources that could be affected in the area.

Due to the geographical size of the exploration application and the fact that no intrusive activities will occur at this point of the application, it was deemed not feasible to conduct fieldwork across the entire proposed Project area and the high level survey focused on target areas within each farm to establish the heritage potential which proved to be in line with what similar studies of the landscape have yielded. During the survey of the targeted areas, heritage resources recorded included graves, a low-density lithic scatter, a historical well, a historical dipping trench, ruins of a historical road, a historical house, a historical water reservoir, and a degraded modern house.

As the drill sites have not yet been finalised, the full extent of the impact to heritage resources cannot be fully determined until the final layout has been established and a Heritage Walk-Down is conducted. The adherence of the recommendations within this report will however ensure potential impacts to significant heritage resources are minimal. As the first stage of prospecting will consist of non-invasive activities, no impacts will occur at this point of the application and the potential impact on heritage resources is expected to be very low.

It is clear from the studies conducted that the general landscape is archaeologically rich with a cultural layering dating back to the Stone Age with scatters and sites dating to the ESA, MSA and LSA. Sites and artefacts dating to these periods are scattered over the landscape with MSA and LSA sites centred on rocky outcrops, pans and watercourses and similar sites are expected to occur in the project areas. Due to the great archaeological significance of the landscape, especially relating to the Stone Age, rocky outcrops, hills, and watercourses such as drainage lines and pans should be avoided as significant Middle and Late Stone Age sites are more likely to be found within these topographical features.

According to the South African Heritage Resource Authority (SAHRA) Paleontological sensitivity map the study areas are of insignificant and low palaeontological sensitivity and no further studies are required for this aspect however a protocol for finds is required.

The impact to heritage resources is expected to be low provided that the recommendations in this report are adhered to, based on the South African Heritage Resource Authority (SAHRA) ’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:

- Avoidance of the medium significance recorded sites (AV004) and graves (AV002, TC004) for consideration of drilling sites;
- Once the drill sites have been confirmed these areas have to be subjected to a heritage walk down, this should be conducted prior to the commencement of prospecting activities;
- Drill sites must be kept as close as possible to existing roads in order to minimise the impact on the landscape;
- Focal points on the landscape like rocky outcrops or pans must be avoided as far as possible as these areas could be sensitive from a heritage point of view;
- Monitoring of the Project area by the ECO during the exploration phase for heritage and palaeontology chance finds, if chance finds are encountered to implement the Chance Find Procedure for the Project as outlined in Section 9.2.

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.

9.2.2 Monitoring Programme for Palaeontology – to commence once the invasive prospecting activities/ drilling activities begin.

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

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 9. 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.

9.7 Management Measures for inclusion in the EMPr

Table 10. Heritage Management Plan for EMPr implementation

Area	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Target	Performance indicators (Monitoring tool)
General project area	• Once the drill sites have been confirmed these areas have to be subjected to a heritage walk down, this should be conducted prior to the commencement of invasive prospecting activities; • Drill sites must be kept as close as possible to existing roads in order to minimise the impact on the landscape; • Focal points on the landscape like rocky outcrops or pans must be avoided as far as possible as these areas could be sensitive from a heritage point of view;	Prior to exploration	Once off	Project Archaeologist Applicant EPC Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Sections 35, 36 and 38 of NHRA	General project area
General project area	Monitoring of the project area by the ECO during pre-construction and construction phases for chance finds, if chance finds are encountered to implement the Chance Find Procedure for the project	During any invasive activities	Weekly	Applicant EPC Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Sections 35, 36 and 38 of NHRA	General project area

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