



KMG

Environmental
Solutions Services

Phase I Archaeological and Cultural Heritage Impact Assessment (HIA)

Proposed Aggregate Mining Permit – Farm 94

Prepared For

GREENMINED ENVIRONMENTAL (PTY) LTD



APRIL 1, 2026

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DOCUMENT INFORMATION

Item	Description
Project Title	Phase I Archaeological and Cultural Heritage Impact Assessment for the Proposed Aggregate Mining Permit Application on Portion 0 of Farm 94
Project Name	Proposed Aggregate Mining Permit – Farm 94
Study Type	Phase I Archaeological and Cultural Heritage Impact Assessment (HIA)
Location	Dr Beyers Naudé Local Municipality, Sarah Baartman District Municipality, Eastern Cape Province
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DISCLAIMER AND INDEMNITY

This report has been prepared by KMG Environmental Solutions Services (Pty) Ltd with due skill, care, and diligence in accordance with generally accepted professional standards and practices applicable at the time of undertaking the study. The findings, interpretations, and conclusions presented herein are based on available information, site observations, and data obtained during the course of the assessment.

The assessment is subject to inherent limitations associated with the scope of work, time constraints, site accessibility, and the availability and reliability of data. Heritage resources, including archaeological material, graves, and other cultural features, may be concealed beneath the surface and therefore may not be identified during field surveys. As such, the absence of identified heritage resources during the study does not guarantee that such resources do not exist within the project area.

All conclusions and recommendations are provided in good faith and are considered appropriate based on the information available at the time of compilation. Should additional information become available or site conditions change, KMG Environmental Solutions Services (Pty) Ltd reserves the right to review, modify, or update the findings and recommendations contained in this report.

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All recommendations provided in this report are subject to approval by the relevant competent authorities, including the South African Heritage Resources Agency (SAHRA) and/or the Eastern Cape Provincial Heritage Resources Authority (ECPHRA), and must be implemented in accordance with applicable legislation, guidelines, and best practice standards.

SPECIALIST DECLARATION OF INDEPENDENCE

I, **Alvord Nhundu**, hereby declare that:

- I am an independent specialist with the necessary qualifications and experience to undertake the Archaeological and Cultural Heritage Impact Assessment for the proposed Aggregate Mining Permit Application on Portion 0 of Farm 94, Eastern Cape Province.
- I have no financial or personal interest in the proposed development other than fair remuneration for professional services rendered.
- I have no vested interest in the outcome of this assessment and will not be influenced by any party in the execution of my duties.
- I will perform the work relating to the proposed development in an objective manner, even if this results in findings that are not favourable to the client.
- I declare that there are no circumstances that may compromise my objectivity in performing such work.
- I have the required expertise and experience to undertake this specialist study and will comply with all relevant legislation, including the National Heritage Resources Act, 1999 (Act No. 25 of 1999), as well as applicable guidelines issued by the South African Heritage Resources Agency (SAHRA) and the Eastern Cape Provincial Heritage Resources Authority (ECPHRA).
- I have not, and will not, engage in any conflicting interests in the undertaking of this activity.
- I undertake to disclose to the applicant and the competent authority all material information in my possession that may influence any decision regarding the application or affect the objectivity of this report.
- All information provided in this report is, to the best of my knowledge, true, accurate, and complete.
- I acknowledge that I may be held liable for any misrepresentation of facts or failure to comply with applicable legislation and professional standards.
- I confirm that this report complies with the requirements of Appendix 6 of the Environmental Impact Assessment Regulations, 2014 (as amended).

Specialist Name: Alvord Nhundu

Qualifications: BSc (Hons) Archaeology (Wits), MSc Archaeology (UP)

Professional Registration: ASAPA (No. 338)



Signature: _____

Date: _____ 22/04/2026 _____

ABILITY TO CONDUCT THE PROJECT

The specialist responsible for this study, Alvord Nhundu, is a qualified and experienced professional archaeologist with extensive expertise in Cultural Resource Management (CRM) within South Africa.

He holds a Bachelor of Science (Honours) degree in Archaeology from the University of the Witwatersrand and a Master's degree in Archaeology from the University of Pretoria. His academic and research interests include Southern African archaeology, palaeoenvironmental studies, archaeological theory, Later Stone Age, Iron Age societies, rock art, and indigenous knowledge systems.

Alvord Nhundu is a registered member of the Association of Southern African Professional Archaeologists (ASAPA)(Membership No. 338), where he holds Field Director status in both Iron Age and Stone Age archaeology, as well as Field Supervisor status in Grave Relocation and Rock Art. He is also affiliated with the Society of South Africanist Archaeologists (SAfA) and the International Council for Archaeozoology (ICAZ).

He has over 10 years of professional experience in the field of archaeology and has successfully completed more than 100 Archaeological and Heritage Impact Assessments across multiple provinces in South Africa, including Limpopo, Mpumalanga, North West, Eastern Cape, Free State, Northern Cape, and KwaZulu-Natal.

His project experience includes a wide range of developments such as:

- Mining and prospecting projects
- Infrastructure developments (roads, powerlines, substations)
- Residential and commercial developments
- Renewable energy projects
- Grave relocation and heritage management projects

This extensive experience, combined with his academic background and professional accreditation, ensures that the study has been conducted in accordance with SAHRA Minimum Standards, applicable legislation, and accepted scientific and professional methodologies.

ACRONYMS

Acronym	Description
AIA	Archaeological Impact Assessment
ASAPA	Association of Southern African Professional Archaeologists
BA	Basic Assessment
BAR	Basic Assessment Report
CBA	Critical Biodiversity Area
CRM	Cultural Resource Management
DEA	Department of Environmental Affairs (now DFFE)
DFFE	Department of Forestry, Fisheries and the Environment
DMRE	Department of Mineral Resources and Energy
ECO	Environmental Control Officer
ECPHRA	Eastern Cape Provincial Heritage Resources Authority
EIA	Environmental Impact Assessment
EIA Regulations	Environmental Impact Assessment Regulations, 2014 (as amended)
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
GIS	Geographic Information System
GN	Government Notice
GNR	Government Notice Regulation
GPS	Global Positioning System
ha	Hectare
HIA	Heritage Impact Assessment
HMP	Heritage Management Plan
ICAZ	International Council for Archaeozoology
I&APs	Interested and Affected Parties
KMG	KMG Environmental Solutions Services (Pty) Ltd
km	Kilometre
LIA	Late Iron Age
MIA	Middle Iron Age
EIA	Early Iron Age
m	Metre
m ²	Square Metre
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NEMPAA	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)
SAfA	Society of South Africanist Archaeologists
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SANS	South African National Standards
ToR	Terms of Reference
WULA	Water Use Licence Application
WUL	Water Use Licence
ZoI	Zone of Influence
ESA	Earlier Stone Age
MSA	Middle Stone Age
LSA	Later Stone Age
Artefact	Any object made or modified by humans
Cultural Resource	Physical or intangible heritage of cultural significance
Heritage Resource	Any place or object of cultural, historical, archaeological, or scientific value
In situ	Material found in its original position
Lithics	Stone tools or fragments produced by human activity

Palaeontology	Study of fossil remains
Site	A location where evidence of past human activity is preserved
Stratigraphy	Study of soil and rock layers
Taphonomy	Study of processes affecting remains after deposition

TERMS AND DEFINITIONS

Activity

Any action, operation, or development that may result in impacts on the environment and/or heritage resources.

Archaeological Material

Any remains resulting from human activity which are in a state of disuse and are in or on land and are older than 100 years, including artefacts, structures, features, and deposits.

Archaeological Site

A spatial concentration of artefacts, features, or other evidence of past human activity preserved in the landscape.

Artefact

Any portable object that has been intentionally modified, manufactured, or used by humans, including tools, pottery, and ornaments.

Assemblage

A group of artefacts found together within a specific context, representing a particular period or activity.

Baseline Environment

The current environmental and heritage conditions of the study area prior to the commencement of the proposed development.

Burial Ground / Grave

A place where human remains are interred, including associated features such as headstones, markers, and grave goods.

Chance Find

Archaeological, palaeontological, or cultural material discovered unexpectedly during construction or excavation activities that was not identified during pre-construction assessments.

Conservation

All processes aimed at maintaining and managing heritage resources to retain their cultural significance, including preservation, restoration, and protection.

Context

The original position and association of an artefact or feature within the ground, providing important information about its age and use.

Cultural Heritage Resources

Places, objects, and practices of cultural significance, including archaeological sites, historical structures, landscapes, graves, oral traditions, and intangible heritage.

Cultural Landscape

A geographical area shaped by the interaction between humans and the natural environment, reflecting cultural values and historical processes.

Cultural Resource Management (CRM)

The process of identifying, assessing, managing, and conserving heritage resources in the context of development.

Cumulative Impact

The combined effect of multiple activities over time on heritage resources and the surrounding environment.

Development Footprint

The area within which all construction and operational activities will take place, including associated infrastructure.

Disturbance

Any activity that alters the physical condition of a site, including excavation, construction, or natural processes such as erosion.

Environment

The surroundings within which humans exist, including land, water, atmosphere, and cultural and natural resources.

Environmental Impact

Any change to the environment, whether adverse or beneficial, resulting from a proposed activity.

Environmental Management Programme (EMPr)

A structured plan that outlines mitigation measures, monitoring requirements, and responsibilities for managing environmental and heritage impacts.

Excavation

The systematic removal of soil to expose and record archaeological or palaeontological material.

Feature

A non-portable archaeological remain, such as a hearth, wall, or burial.

Fossil

The preserved remains, impression, or trace of a once-living organism from a past geological age.

Heritage Impact Assessment (HIA)

A specialist study conducted to identify, assess, and mitigate impacts on heritage resources resulting from a proposed development.

Heritage Resource

Any place or object of cultural significance, including archaeological, historical, architectural, or palaeontological elements, as defined by the NHRA.

Historic Period

The time period associated with written records, typically within the last few hundred years in the South African context.

Historic Structure

Any building or structure older than 60 years that may have cultural or historical value.

In situ

Refers to artefacts or features that remain in their original position and context.

Indigenous Knowledge Systems

Traditional knowledge, practices, and beliefs developed by local communities and passed down through generations.

Impact

Any change to heritage resources or the environment caused by a proposed activity.

Impact Significance

The importance of an impact, determined by factors such as magnitude, duration, extent, and probability.

Intangible Heritage

Non-physical aspects of heritage, including traditions, rituals, oral histories, and cultural practices.

Lithics

Stone tools or fragments produced by human activity, commonly found in Stone Age contexts.

Mitigation Measures

Actions taken to avoid, reduce, or offset negative impacts on heritage resources.

Monitoring

The systematic observation and recording of site conditions to ensure compliance with mitigation measures.

Palaeontology

The scientific study of fossilised remains of organisms from past geological periods.

Permit

Official authorisation issued by a competent authority (e.g., SAHRA or ECPHRA) allowing specific activities affecting heritage resources.

Public Participation Process (PPP)

A formal process through which Interested and Affected Parties (I&APs) are informed and consulted regarding a proposed development.

Recording

The documentation of archaeological or heritage resources through notes, photographs, drawings, and mapping.

Rehabilitation

The process of restoring disturbed land to a stable and acceptable condition.

Residual Impact

The impact remaining after mitigation measures have been implemented.

Sensitive Area

An area that is vulnerable to disturbance due to the presence of important environmental or heritage resources.

Significance

The value or importance of a heritage resource, assessed based on historical, scientific, social, or aesthetic criteria.

Site

A location where evidence of past human activity or natural processes is preserved.

Stratigraphy

The study of layered deposits and their chronological relationships.

Stone Age

A prehistoric period characterised by the use of stone tools, divided into the Earlier Stone Age (ESA), Middle Stone Age (MSA), and Later Stone Age (LSA).

Study Area

The broader geographic area considered during the assessment, including the development footprint and surrounding environment.

Subsurface Material

Archaeological or heritage material located below ground level and not visible during surface surveys.

Survey

A systematic examination of an area to identify and record heritage resources.

Taphonomy

The study of processes affecting organic remains from death to preservation.

Zone of Influence (Zoi)

The area within which the proposed development may directly or indirectly affect heritage resources.

ACKNOWLEDGEMENTS

The author wishes to express sincere appreciation to Greenmined Environmental (Pty) Ltd for the appointment and coordination of this Heritage Impact Assessment as part of the broader environmental assessment process.

Gratitude is extended to Power Construction (Pty) Ltd, the project proponent, for providing the necessary project information, site access arrangements, and logistical support required to successfully undertake both the desktop and field components of this study.

The author acknowledges the role of the South African Heritage Resources Agency (SAHRA) and the Eastern Cape Provincial Heritage Resources Authority (ECPHRA) for providing the legislative framework and guidelines that inform the execution of heritage impact assessments in South Africa.

Appreciation is also extended to the developers and custodians of the South African Heritage Resources Information System (SAHRIS), which served as a key platform for accessing previous heritage studies and background information relevant to the study area.

The use of geospatial and mapping tools, including Google Earth, NGI Geospatial data, and other publicly available spatial datasets, is gratefully acknowledged for supporting site verification, mapping, and analysis.

The author further acknowledges all individuals who contributed to the field survey and data collection process, including site personnel and supporting staff, whose assistance facilitated the efficient completion of the study.

Finally, appreciation is extended to the broader scientific and academic community whose published and unpublished works have informed this assessment and contributed to a deeper understanding of the archaeological and cultural heritage context of the region.

EXECUTIVE SUMMARY

KMG Environmental Solutions Services (Pty) Ltd was appointed by Greenmined Environmental (Pty) Ltd to undertake a Phase I Archaeological and Cultural Heritage Impact Assessment (HIA) for the proposed aggregate mining permit application on Portion 0 of Farm 94, located within the Dr Beyers Naudé Local Municipality, Sarah Baartman District Municipality, Eastern Cape Province.

The assessment was conducted in accordance with the requirements of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) and the guidelines of the South African Heritage Resources Agency (SAHRA). The primary objective of the study was to identify and assess archaeological sites, cultural heritage resources, burial grounds, and any features of historical significance that may be impacted by the proposed mining development, and to recommend appropriate mitigation measures.

The proposed development involves the extraction of aggregate material over an approximate area of 5 hectares using conventional mining methods, including drilling, blasting, excavation, crushing, and transportation. Supporting infrastructure will include access roads, stockpiling areas, and operational facilities. The project is expected to operate for approximately two years, with potential for extension.

A combination of desktop analysis and field survey was undertaken. The desktop study included a review of previous heritage studies via the South African Heritage Resources Information System (SAHRIS) and other relevant literature. The field survey was conducted on 08 April 2026, during which the study area was systematically inspected on foot to identify any visible heritage resources.

The findings of the assessment indicate that the study area contains archaeological material of significance, specifically a site identified as PST01, located at approximately **32°28'15.20"S, 23°49'6.48"E**. This site comprises a concentration of Early Stone Age (ESA) and Middle Stone Age (MSA) lithic material, including cores, flakes, and formal tools. These materials are considered to be of scientific and cultural importance and represent evidence of past human activity in the region.

No historical structures older than 60 years were identified within the proposed development footprint, and no burial sites or graves were observed during the survey. However, as with all heritage assessments, the potential for subsurface heritage material cannot be excluded.

The study area is noted to be partially disturbed due to previous agricultural and land-use activities, which may have affected the integrity of some heritage resources. Despite this, the identified archaeological site remains significant and requires appropriate management.

The impact assessment indicates that the proposed mining activities may result in moderate impacts on heritage resources, primarily through:

- Direct disturbance or destruction of archaeological material during excavation and blasting
- Damage caused by heavy machinery movement

With the implementation of mitigation measures, including controlled monitoring and adherence to a Chance Find Procedure, the significance of impacts can be reduced to moderate to low levels.

The following key recommendations are made:

- The report should be submitted to and endorsed by SAHRA/ECPHRA in terms of Section 38(8) of the NHRA
- The proposed development may proceed, subject to approval by the relevant heritage authority
- The identified archaeological site PST01 must be protected, and any activities affecting the site must be monitored by a qualified archaeologist
- A Chance Find Procedure must be implemented during all phases of development
- Construction personnel must be inducted on heritage awareness and reporting procedures

- Ongoing stakeholder engagement must ensure that any additional heritage concerns are identified and addressed

Based on the findings of this study and provided that the recommended mitigation measures are implemented, there are no fatal heritage-related constraints to the proposed development.

It is therefore concluded that the proposed mining project may be supported from a heritage perspective, subject to compliance with applicable legislation and adherence to the recommendations outlined in this report.

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1. INTRODUCTION

At the request of Greenmined Environmental (Pty) Ltd, KMG Environmental Solutions Services (Pty) Ltd conducted a Phase I Archaeological and Cultural Heritage Impact Assessment (HIA) for the proposed aggregate mining permit application on Portion 0 of Farm 94, located within the Dr Beyers Naudé Local Municipality, Sarah Baartman District Municipality, Eastern Cape Province.

The assessment was undertaken in accordance with the South African Heritage Resources Agency (SAHRA) Minimum Standards for Archaeological and Palaeontological Studies. These standards prescribe the required scope, methodology, and reporting structure for specialist studies of this nature.

The purpose of this study is to identify, document, and assess archaeological and cultural heritage resources that may be affected by the proposed development. These resources include archaeological sites, historical structures, burial grounds, cultural landscapes, and sites associated with oral history and living heritage.

The findings of this assessment are intended to inform the decision-making process by ensuring that appropriate conservation measures are implemented in line with the requirements of the National Heritage Resources Act, 1999 (Act No. 25 of 1999).

2. SITE LOCATION AND DESCRIPTION

Power Construction (Pty) Ltd intends to apply for a Mining Permit to mine aggregate from an area of approximately 5 ha, located on Portion 0 of Farm 94, within the Dr Beyers Naudé Local Municipality, Sarah Baartman District Municipality, Eastern Cape Province.

The proposed mining area will be developed over land that is currently used intermittently for grazing purposes. The proposed laydown area and access road are planned over an area previously utilised for similar activities.

The mining method will involve drilling and blasting to loosen hard rock material. The material will then be excavated, loaded, and hauled to a crushing plant where it will be screened into various sizes and stockpiled within the designated mining area. The aggregate will be transported off-site using tipper trucks. All mining-related activities will be confined within the approved mining permit boundaries.

The mining operation will cover an extent of approximately 5 hectares and is expected to operate for a period of at least two years, with the possibility of a further three-year extension subject to permit renewal. The aggregate material will support local demand, including supply for planned wind farm developments as well as the broader construction industry in and around the Aberdeen area.

The mining activities will consist of the following:

- Stripping and stockpiling of topsoil
- Drilling
- Blasting
- Excavation
- Crushing, screening, stockpiling, and transportation of material
- Replacement of topsoil and re-establishment of vegetation upon closure

The mining site will include the following infrastructure and equipment:

- Drilling equipment
- Excavating equipment
- Earthmoving equipment
- Static crushing and screening plants
- Access roads
- Site offices (containers)
- Site vehicles

- Parking areas for visitors and site vehicles
- Vehicle service area
- Wash bay
- Workshop (containers)
- Salvage yard
- Bunded diesel and oil storage facilities
- Generator located on a bunded area
- Ablution facilities (chemical toilets)
- Weighbridge
- Demarcated general and hazardous waste areas

The proposed project will not require additional electricity connections, as power requirements will be met through on-site generators and/or solar power. Access to the proposed mining area will be via an existing gravel road branching from the R61. A short entrance road and internal haul roads will be constructed to provide access to the mining footprint. Haul roads will be progressively extended as mining advances and will be rehabilitated during closure, unless otherwise requested by the landowner. Trucks transporting aggregate will utilise the R61 provincial road.

Table 1: Summary of project location details.

Parameter	Description
Province	Eastern Cape
District Municipality	Sarah Baartman District Municipality
Local Municipality	Dr Beyers Naudé Local Municipality
Property Description	Portion 0 of Farm 94
Project Type	Aggregate Mining Permit Application
Development Footprint	Approximately 5 hectares
Land Use	Grazing land (partially disturbed)
Nearest Town	Aberdeen
Access	Existing gravel road branching from the R61

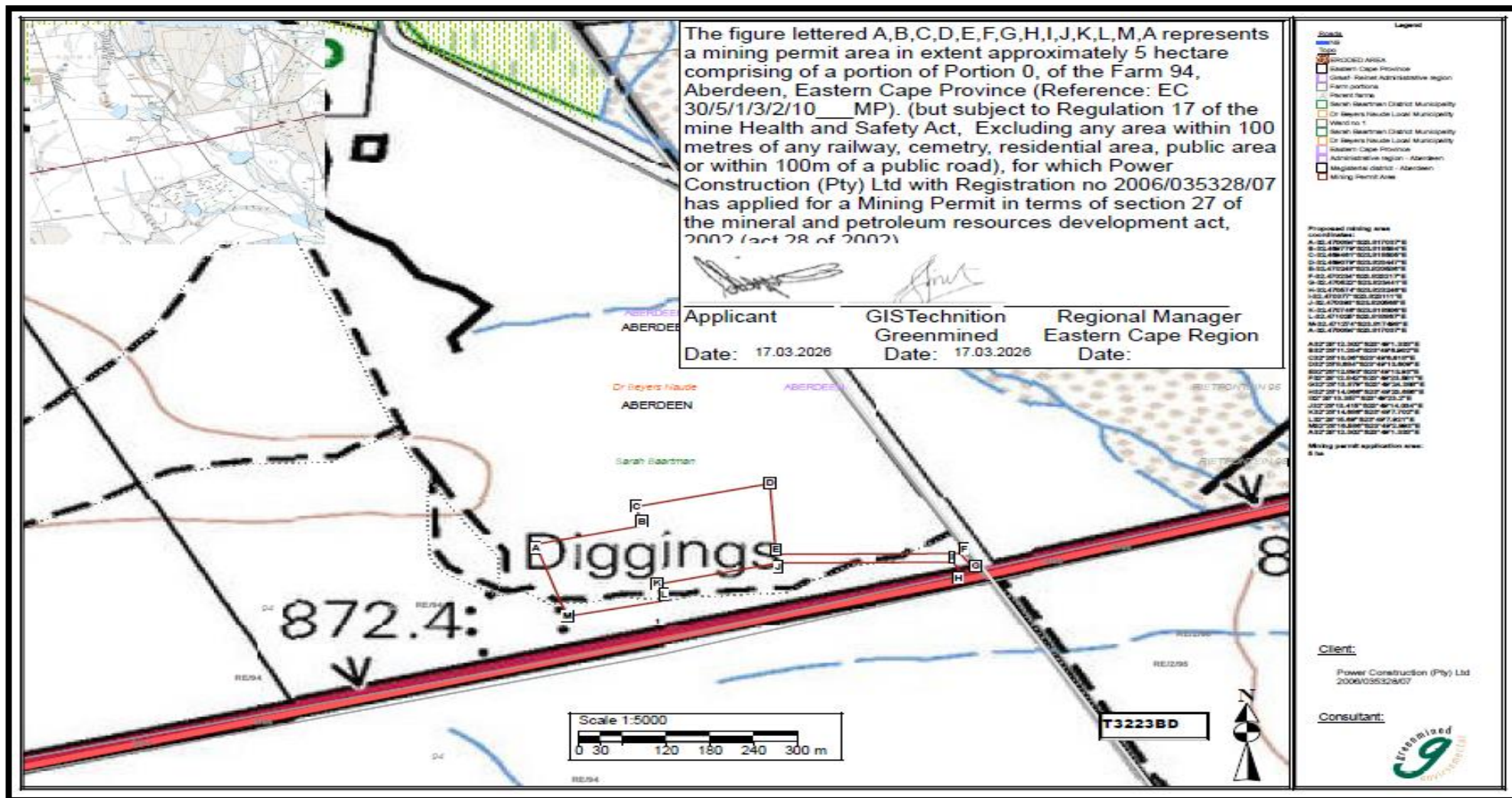


Figure 1: Topographic map of the study area (Greenmined 2026).

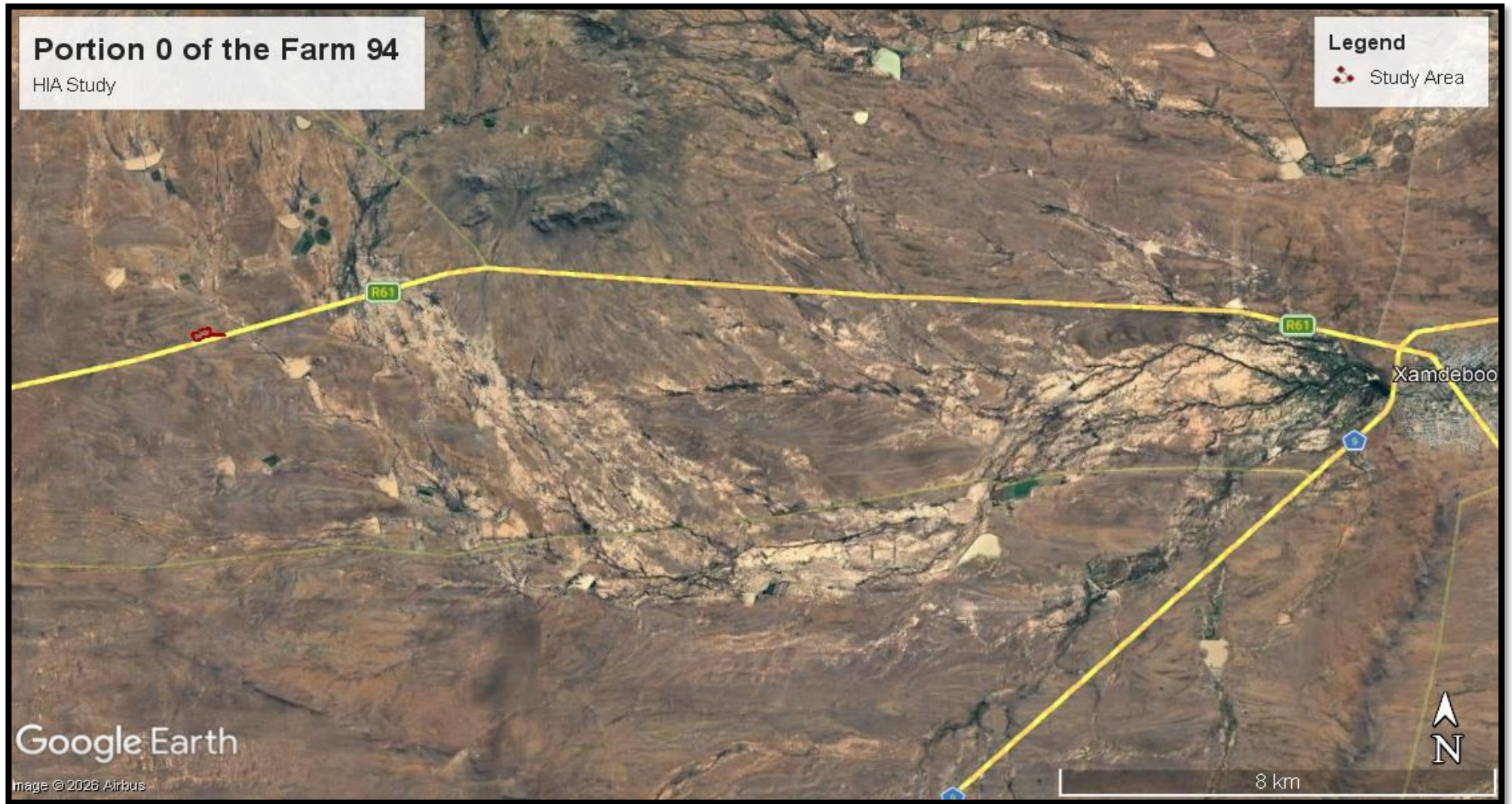


Figure 2: A locality view of the site proposed for the development (Author 2026).



Figure 3: Google Earth view of the site proposed for the development (Author 2026).



Figure 4: Identified Heritage site within the proposed development area (Author 2026).



Figure 5: Showing Survey tracks within the proposed development site (Author 2026).



Figure 6: Historical (1964) satellite image showing the proposed development area (NGIGEOPORTAL 2026).

PHOTOGRAPHS OF THE STUDY AREA



Figure 7: General view of the site proposed for the development.



Figure 8: Showing typical vegetation within the proposed development site.



Figure 9: Showing the proposed study area is a rocky terrain.



Figure 10: Showing access roads that exist within the area proposed for mining.



Figure 11: Showing heavily disturbed section within the proposed development site.



Figure 12: View of the study area.



Figure 13: View of a section of the study area.



Figure 14: View of a section of the study area.

3. PURPOSE OF THE CULTURAL HERITAGE STUDY

The purpose of this Archaeological and Cultural Heritage Impact Assessment is to identify, document, and evaluate heritage resources that may be affected by the proposed aggregate mining development on Portion 0 of Farm 94. These resources include archaeological sites, historical structures, burial grounds, cultural landscapes, sites associated with oral history, and any other tangible or intangible heritage features of significance.

This study is undertaken in accordance with the requirements of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) and relevant guidelines issued by the South African Heritage Resources Agency. The assessment forms part of the broader Environmental Impact Assessment process and contributes to informed decision-making by identifying potential heritage constraints and recommending appropriate management measures.

The study seeks to ensure that development activities are undertaken in a manner that avoids, minimises, or mitigates impacts on heritage resources, while promoting the conservation of South Africa's cultural heritage for present and future generations. It also aims to ensure compliance with statutory requirements and to support the responsible management of heritage resources within the project area.

In achieving this purpose, the study includes the following key objectives:

- Identification and recording of archaeological, historical, and cultural heritage resources within the study area
- Assessment of the significance of identified heritage resources in terms of scientific, cultural, social, and historical value
- Evaluation of the potential impacts of the proposed development on these resources
- Identification of areas of sensitivity that may require avoidance or special management
- Development of appropriate mitigation measures to reduce or manage potential impacts
- Provision of recommendations to inform project planning, environmental authorisation, and heritage management

The assessment further considers both direct and indirect impacts, as well as cumulative impacts that may arise from the proposed development and other activities within the surrounding area. Where necessary, mitigation strategies such as monitoring, controlled excavation, documentation, or avoidance are recommended.

Overall, this study aims to balance development objectives with heritage conservation requirements by ensuring that any impacts on cultural heritage resources are properly identified, assessed, and managed in line with best practice and legislative requirements.

4. METHODOLOGY AND APPROACH

The methods utilised in this study are informed by the 2012 SAHRA Policy Guidelines for impact assessment. To achieve the purpose and objectives of the study, a combination of desktop and field-based approaches was applied, supported by documentation and consultation processes.

Literature Review

Relevant literature was consulted through the South African Heritage Resources Information System (SAHRIS) with the intention of reviewing previous Cultural Heritage Impact Assessments conducted in and around the proposed development area. Additional archaeological and historical sources, including published and unpublished material, were also used to inform the study and provide context for the assessment.

Field Survey

The field survey was undertaken by the specialist on 08 April 2026. Access to the site was achieved by vehicle, and the study area was systematically surveyed on foot. The survey covered the entire extent of the proposed development footprint, with the aim of identifying any visible archaeological or cultural heritage material.

Public Participation

A Public Participation Process will be undertaken by the Environmental Assessment Practitioner to identify and incorporate issues and concerns raised by Interested and Affected Parties, including local communities and relevant authorities. This process includes stakeholder engagement, public meetings, and communication of project-related information. Any heritage-related issues identified during this process will be incorporated into the Environmental Impact Assessment and Environmental Management Programme, where applicable.

Documentation

In accordance with applicable legislation and professional standards, all identified heritage resources were documented through field notes, photographic recording, and spatial referencing. Photographs were captured using a digital camera, and the locations of identified features were recorded using a handheld Global Positioning System device.

Restrictions and Assumptions

As with all heritage assessments, there are inherent limitations associated with the identification of subsurface material. Heritage resources that are buried or otherwise obscured may not be visible during a surface survey. Should any such material be exposed during construction or mining activities, a qualified heritage specialist must be consulted to assess and manage the find in accordance with legislative requirements.

Table 2 : Summary of Methodology and Approach

Method	Description	Purpose
Literature Review	Review of SAHRIS database, previous studies, and published/unpublished literature	To establish background heritage context and identify known resources
Field Survey	Site inspection conducted on foot on 08 April 2026	To identify and record visible heritage resources within the study area
Public Participation	Engagement with Interested and Affected Parties through EAP process	To capture heritage-related concerns and local knowledge
Documentation	Photographic recording, GPS mapping, and field notes	To accurately record and spatially reference identified heritage resources
Restrictions & Assumptions	Consideration of limitations such as subsurface material	To acknowledge uncertainties and guide mitigation measures

5. APPLICABLE HERITAGE LEGISLATION

Several pieces of legislation provide the legal framework for the protection, conservation, and management of cultural heritage resources in South Africa. The most relevant legislation applicable to this study includes the National Environmental Management Act, 1998 (Act No. 107 of 1998), the Tourism Act, 2014 (Act No. 3 of 2014), the Cultural Institutions Act, 1998 (Act No. 119 of 1998), and most importantly, the National Heritage Resources Act, 1999 (Act No. 25 of 1999).

The National Heritage Resources Act is the primary legislation governing heritage resources in South Africa. Section 38(1) of the Act requires that a Heritage Impact Assessment be undertaken where certain development thresholds are triggered. These include:

- The construction of a road, wall, powerline, pipeline, canal, or similar linear development exceeding 300 metres in length
- The construction of a bridge or similar structure exceeding 50 metres in length
- Any development or activity that will change the character of a site exceeding 5 000 m² in extent
- Developments involving three or more existing erven or subdivisions
- Developments involving the consolidation of three or more subdivisions within the past five years
- Developments exceeding a cost threshold as determined by SAHRA
- The rezoning of a site exceeding 10 000 m²
- Any other category of development identified by SAHRA or a Provincial Heritage Resources Authority

In terms of Section 3 of the National Heritage Resources Act, a wide range of heritage resources are protected as part of the national estate. These include:

- Places, buildings, structures, and equipment of cultural significance
- Sites associated with oral traditions or living heritage
- Historical settlements and townscapes
- Cultural landscapes and natural features of cultural importance
- Geological sites of scientific or cultural value
- Archaeological and palaeontological sites
- Graves and burial grounds, including ancestral graves and historical cemeteries
- Sites relating to the history of slavery
- Movable objects such as artefacts, ethnographic material, and records

The Act also outlines criteria used to determine the significance of heritage resources, including historical, scientific, aesthetic, social, and cultural value.

In addition to Section 3, the following sections of the Act are particularly relevant to this study:

Section 34(1) states that no person may alter or demolish any structure older than 60 years without a permit issued by the relevant heritage authority.

Section 35(4) states that no person may, without a permit issued by the responsible heritage authority, destroy, damage, excavate, alter, or otherwise disturb any archaeological or palaeontological site.

Section 36(3) states that no person may, without a permit, destroy, damage, alter, exhume, or remove any grave or burial ground older than 60 years, or use equipment for excavation or recovery of such material.

In terms of Section 38(8), where an Environmental Impact Assessment is required under NEMA, the Heritage Impact Assessment must be integrated into the environmental assessment process, and the relevant heritage authority must be notified and consulted.

The legislation therefore requires that all heritage resources identified within the study area be appropriately assessed and managed, and that mitigation measures be implemented where necessary to ensure their protection.

Table 3 : Summary of Applicable Heritage Legislation

Legislation	Key Requirement	Relevance to Project
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	Protection and management of heritage resources	Primary legislation governing this HIA
Section 3 of NHRA	Defines heritage resources and national estate	Identifies resources to be assessed
Section 34 of NHRA	Protection of structures older than 60 years	No alteration without permit
Section 35 of NHRA	Protection of archaeological and palaeontological sites	Prohibits disturbance without permit
Section 36 of NHRA	Protection of graves and burial grounds	Requires permit for any disturbance
Section 38 of NHRA	Requirement for Heritage Impact Assessment	Triggered by proposed mining activity
NEMA, 1998 (Act No. 107 of 1998)	Environmental management principles	Integrates HIA into EIA process
Tourism Act, 2014	Protection of heritage-related tourism resources	Indirect relevance to heritage value
Cultural Institutions Act, 1998	Management of cultural institutions and heritage	Supports heritage conservation framework

6. ARCHAEOLOGY AND HISTORY OF THE AREA

The archaeology of southern Africa is broadly divided into the Stone Age, Iron Age, and Historical Period. The study area and its surrounding region fall within this well-established cultural sequence and contain evidence of human occupation spanning several hundred thousand years.

6.1 The Stone Age

The Stone Age represents the earliest period of human occupation and is characterised by the use of stone tools. In southern Africa, it is divided into three phases: the Earlier Stone Age (ESA), Middle Stone Age (MSA), and Later Stone Age (LSA).

The Earlier Stone Age dates from approximately 2 million to 150 000 years ago and is associated with early human ancestors such as *Homo habilis* and *Homo erectus*. This period is characterised by tool industries such as the Oldowan and Acheulian. Oldowan tools are generally simple and unrefined, while Acheulian tools include more advanced implements such as handaxes and cleavers.

The Middle Stone Age dates from approximately 150 000 to 30 000 years ago and is associated with early modern humans. This period is marked by more sophisticated stone tool technology, including points, blades, and scrapers, as well as evidence of behavioural advancements such as the controlled use of fire.

The Later Stone Age extends from approximately 40 000 years ago to recent historical times and is associated with hunter-gatherer groups such as the San. This period is characterised by smaller, finely crafted tools and the development of symbolic behaviour, including rock art and burial practices.

In the broader Eastern Cape region, archaeological evidence of Stone Age occupation is well documented. Sites such as Amanzi Springs and Klasies River Mouth have yielded important artefacts and fossil material, providing insight into early human activity. Stone tool scatters, including ESA and MSA material, are commonly found in the region, particularly in areas with exposed sedimentary deposits.

6.2 The Iron Age

The Iron Age marks the introduction of metalworking and farming communities into southern Africa. It is generally divided into the Early Iron Age, Middle Iron Age, and Late Iron Age.

The Early Iron Age dates from approximately 250 to 900 AD and is associated with the arrival of Bantu-speaking communities who practised agriculture and animal husbandry. These communities produced distinctive pottery and utilised iron tools.

The Middle Iron Age, dating from approximately 900 to 1300 AD, is associated with the development of more complex societies, including early trade networks and social hierarchies.

The Late Iron Age, from approximately 1300 to 1840 AD, is characterised by increased settlement density, economic development, and social complexity.

In the Eastern Cape, Iron Age occupation is less prominent than in other parts of South Africa, but evidence of early farming communities has been identified in areas such as the Kei River Valley and near East London. These sites provide insight into the spread of agricultural practices and settlement patterns.

6.3 Historical Period

The Historical Period in the Eastern Cape is associated with the development of indigenous societies and later European settlement. The region is historically linked to the Xhosa people, whose expansion and settlement patterns shaped much of the cultural landscape.

From the 18th century onwards, the region experienced significant interaction between indigenous communities and European settlers, leading to a series of frontier conflicts. The establishment of mission stations and colonial settlements further influenced the cultural and historical development of the area.

The town of Aberdeen, located near the study area, was established in the mid-19th century and developed primarily as an agricultural service centre. Unlike many towns in South Africa, its development was not driven by mining but rather by farming activities, particularly sheep and wool production.

6.4 Brief History of Mining in the Area

The study area lies within the broader Karoo geological region, which is known to contain uranium-bearing formations. Although large-scale mining has not historically defined the development of Aberdeen, exploration activities have been conducted in the region.

Uranium deposits associated with the Karoo Basin were identified during exploration activities in the 20th century. These deposits are typically found within sandstone units of the Beaufort Group. While early exploration efforts did not result in sustained mining operations, more recent studies have identified potential mineral resources within the region.

Despite this, the immediate study area remains largely characterised by agricultural land use, with limited historical mining activity. The proposed development therefore represents a new phase of land use that has the potential to impact heritage resources within the area.

7. PREVIOUS HERITAGE IMPACT STUDIES

A number of Cultural Resource Management studies have been conducted within the broader project area and surrounding region. These studies provide valuable insight into the nature, distribution, and significance of heritage resources within the landscape. While most of these studies were conducted within a radius of approximately 20 km from the project site, some have been included from the wider region to provide additional context.

The findings of previous studies indicate that the area contains a range of heritage resources, including archaeological material, historical features, and cultural landscapes. These studies also highlight recurring themes such as the presence of Stone Age artefacts, historic farmsteads, and landscape features of cultural importance.

Table 4 :Summary of Previous Heritage Studies in the Vicinity of the Project Area

Author / Year	Local Municipality	Study Area	Key Findings
Lavin (2024)	Dr Beyers Naudé	Farm RE/140 and RE/139	Identified topographic features such as Wolwekop peak, watercourses, planting patterns, and scenic/historic routes
Lavin (2023)	Dr Beyers Naudé	Multiple farms including Doornpoort 93, Kraai Rivier 149, Kraanvogelkuil 155	Identified topographic features, watercourses, scenic routes, and farmsteads with heritage grading (Grade IIIB and IIIC)
Lavin (2022)	Dr Beyers Naudé	Doornpoort 93, Sambokdoorns 92, Kraanvogel Kuil 155	Identified Wolwekop peak, watercourses, and the town of Aberdeen with Grade IIIA significance
de Kock (2008)	Dr Beyers Naudé	Various farms	Recorded historic buildings, labourers' cottages, and ESA stone tools within valley areas
Van Schalkwyk (2007)	Multi-provincial (EC, NC, WC)	Regional study	Identified archaeological sites, graves, traditional structures, and landscape features

The review of previous studies indicates that the broader region has a moderate to high heritage sensitivity, particularly in relation to archaeological material from the Stone Age. The presence of ESA and MSA artefacts is a recurring finding, suggesting that the landscape has been occupied and utilised by early human populations over extended periods.

In addition to archaeological resources, the region also contains historical features such as farmsteads, settlement patterns, and landscape elements that contribute to its cultural significance. While some areas have been disturbed by agricultural activities, many heritage resources remain preserved within the landscape.

The findings of previous studies support the results of the current assessment, particularly the identification of archaeological material within the study area. These studies reinforce the importance of implementing appropriate mitigation measures and monitoring procedures during development activities.

8. DEGREE OF SIGNIFICANCE

The assessment of the significance of identified heritage resources is a critical component of this study, as it informs the level of protection, management, and mitigation required. Significance is determined based on the criteria outlined in the National Heritage Resources Act, 1999 (Act No. 25 of 1999), which considers the historical, scientific, social, aesthetic, and cultural value of a resource.

The grading system categorises heritage resources according to their level of importance at national, provincial, or local scale. This classification assists in determining the appropriate management response, including conservation, mitigation, or recording prior to disturbance.

Table 5: Grading of Heritage Resources in Terms of the NHRA

Level	Significance	Management Action
Grade I	National significance	Declared a national heritage site; managed by SAHRA
Grade II	Provincial significance	Declared a provincial heritage site; managed by Provincial Heritage Authority
Grade IIIA	High local significance	Should be conserved and retained as a heritage site
Grade IIIB	Moderate local significance	Should be mitigated and partially conserved

General Protection A	High to medium significance	Mitigation required before disturbance
General Protection B	Medium significance	Recording required before disturbance
General Protection C	Low significance	No formal mitigation required prior to disturbance

Significance Criteria

Heritage resources are evaluated based on the following key criteria:

- Historical value, including association with significant events, individuals, or patterns of development
- Scientific value, including the potential to provide information about past human activity or environmental conditions
- Social value, including cultural, spiritual, or community importance
- Aesthetic value, including visual or landscape significance
- Rarity, including the presence of uncommon or endangered heritage features
- Representivity, including the ability to demonstrate characteristics typical of a particular class of heritage resource

Application to the Study Area

Based on the findings of this study, the identified archaeological material (ESA and MSA lithics) is considered to have scientific significance, as it contributes to the understanding of early human occupation in the region. The concentration of material at site PST01 suggests that the site may represent an area of repeated or sustained human activity.

While the site has been partially disturbed by previous land use, the presence of identifiable artefacts indicates that it retains research value and should therefore be managed appropriately. The site is likely to fall within the General Protection A or B category, requiring mitigation and/or recording prior to disturbance.

The determination of significance informs the mitigation measures recommended in subsequent sections, including monitoring, documentation, and potential test excavation where necessary.

9. SURVEY FINDINGS

9.1 Archaeological

The Phase I Cultural-Heritage Impact Assessment study for the proposed development identified the Archaeological material described in the table below

Table 6: Identified Archaeological Material

Site ID	GPS Coordinates	Description	Image reference
PST01	32°28'15.20"S, 23°49'6.48"E	The study identified a varied collection of ESA and MSA Stone tools. The study noted that the area has a heavy concentration of distinctive stone tools which must be preserved.	See Figure 15-25



Figure 15: View of a core found on the site proposed for the development.



Figure 16: View of a sharp MSA tool within the study area.



Figure 17: View of a formal tool within the study area.



Figure 18: View of a pick found within the study area.



Figure 19: View of MSA points found in the study area.



Figure 20: View of partially weathered MSA tools in the study area.



Figure 21: View of ESA and MSA tools within the study area.



Figure 22: View of an MSA blade found in the study area.



Figure 23: Showing an MSA blade found on the site proposed for the development.



Figure 24: View of MSA lithics within the study area.

9.2 Historical Buildings and Structures

The study noted that the proposed development is within an area that is heavily disturbed by previous and ongoing agricultural and mining activities. The author noted that no buildings or structures older than sixty years exist within the proposed development area.

9.3 Burial sites and Graves

Human remains and burial sites are commonly found close to archaeological sites; they may be found in abandoned and neglected burial sites, or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface. Archaeological and historical burials are usually identified when they are exposed through erosion and earth moving activities for infrastructure developments such as powerlines and roads. In some instances, packed stones or stones may indicate the presence of informal pre-colonial burials. The study noted no graves or burial sites exist within the study area

9.4 Palaeontological sensitivity

The SAHRIS Palaeo Maps shows that the proposed development site as Very High (Red) palaeontological sensitivity. A palaeontological field study is therefore required.

9.5 Public Monuments and Memorials

None exist within the study area.

10. IMPACT ASSESSMENT

An impact is defined as any change to the archaeological and cultural heritage environment resulting from the proposed development. Impacts may be direct or indirect and can occur during the pre-construction, construction, operational, and decommissioning phases of the project.

The assessment of impacts follows a structured approach based on the evaluation of magnitude, spatial extent, duration, reversibility, and probability. The significance of an impact is derived from the combination of these factors and is used to guide appropriate mitigation measures.

10.1 Impact Assessment Methodology

The impact assessment is based on a risk-based approach, where:

- $\text{Consequence} = \text{Magnitude} + \text{Extent} + \text{Duration} + \text{Reversibility}$
- $\text{Significance} = \text{Consequence} \times \text{Probability}$

The rating system is summarised in the tables below.

Table 7: Impact Assessment Rating Criteria

Parameter	Description	Score Range
Magnitude	Degree of change to heritage resource	1 (Very Low) to 5 (High)
Extent	Spatial scale of impact	1 (Footprint) to 5 (National)
Duration	Time period over which impact occurs	1 (Short-term) to 5 (Permanent)
Reversibility	Ability to restore affected resource	1 (Reversible) to 5 (Irreversible)
Probability	Likelihood of occurrence	1 (Unlikely) to 5 (Definite)

Table 8: Impact Significance Rating

Score	Significance Level
1 – 20	Low
21 – 40	Moderate to Low
41 – 60	Moderate
61 – 80	Moderate to High
81 – 100	High

10.2 Pre-Construction and Construction Phase Impacts

The primary impacts during the mining phase are associated with land clearing, excavation, drilling, and blasting activities. These activities may result in the disturbance or destruction of archaeological material, particularly at the identified site PST01.

Description of Impact

- Destruction of archaeological material during vegetation clearance and excavation
- Damage to artefacts due to movement of heavy machinery
- Loss of contextual information where artefacts are removed from their original position

Table 9: Impact Assessment – Construction Phase

Parameter	Without Mitigation	With Mitigation
Magnitude	Moderate (4)	Very Low (2)
Extent	Local (3)	Local (3)
Duration	Short-term (2)	Short-term (2)
Reversibility	Irreversible (5)	Irreversible (5)
Probability	Probable (3)	Possible (2)
Significance	Moderate (42)	Moderate to Low (22)

Mitigation Measures

- Use existing access routes to minimise disturbance
- Conduct heritage awareness training for all site personnel
- Implement a Chance Find Procedure for unexpected discoveries
- Ensure archaeological monitoring where necessary, particularly in sensitive areas

10.3 Decommissioning Phase Impacts

Impacts during the decommissioning phase are generally limited but may occur due to the removal of infrastructure and continued use of heavy machinery.

Description of Impact

- Potential disturbance of archaeological material during removal of infrastructure
- Damage caused by vehicle movement within the site

Table 10: Impact Assessment – Decommissioning Phase

Parameter	Without Mitigation	With Mitigation
Magnitude	Moderate (4)	Very Low (2)
Extent	Local (3)	Local (3)
Duration	Short-term (2)	Short-term (2)
Reversibility	Irreversible (5)	Irreversible (5)
Probability	Probable (3)	Possible (2)
Significance	Moderate (42)	Moderate to Low (22)

Mitigation Measures

- Use existing roads and tracks for equipment removal
- Apply Chance Find Procedure for any exposed heritage material
- Limit unnecessary disturbance during site closure

The overall impact of the proposed development on heritage resources is assessed as moderate prior to mitigation. With the implementation of recommended mitigation measures, including monitoring and the application of a Chance Find Procedure, the impact can be reduced to moderate to low significance.

The presence of archaeological material within the study area highlights the importance of careful management during all phases of the project to ensure compliance with heritage legislation and to minimise loss of cultural resources.

11. RECOMMENDATIONS AND CONCLUSIONS

At the request of Greenmined Environmental (Pty) Ltd, KMG Environmental Solutions Services (Pty) Ltd conducted a Phase I Archaeological and Cultural Heritage Impact Assessment for the proposed aggregate mining permit application on Portion 0 of Farm 94, located within the Dr Beyers Naudé Local Municipality, Sarah Baartman District Municipality, Eastern Cape Province.

The study identified archaeological material within the proposed development area, specifically site PST01, which contains Early Stone Age and Middle Stone Age lithic artefacts. These materials are considered to have scientific value and contribute to the understanding of prehistoric human occupation in the region. No graves, burial sites, or historical structures older than 60 years were identified within the study area.

Based on the findings of this assessment, the following recommendations are made:

- It is recommended that the report be submitted to and endorsed by SAHRA and/or the Eastern Cape Provincial Heritage Resources Authority as having satisfied the requirements of Section 38(8) of the National Heritage Resources Act.
- It is recommended that the relevant heritage authority issue a decision in terms of Section 38(4) of the National Heritage Resources Act to approve the proposed mining permit application, subject to the implementation of the mitigation measures outlined in this report.
- The identified archaeological site PST01 must be treated as a sensitive area. Should any construction, excavation, or mining activities affect this site, a qualified professional archaeologist must be appointed to monitor such activities, with provision for test excavation if required.
- All construction personnel and contractors must be inducted on heritage awareness, including the identification of archaeological material and procedures to follow in the event of chance finds.
- A Chance Find Procedure must be implemented throughout all phases of the project to ensure that any previously unidentified heritage resources are appropriately managed.
- The Public Participation Process must ensure that any heritage-related concerns raised by Interested and Affected Parties are documented and communicated to the relevant heritage authority.
- Development activities must remain within the defined footprint assessed in this report, and any expansion beyond this area must be subject to additional heritage assessment.

From a heritage perspective, and based on the findings of this study, the proposed development is supported, provided that the above recommendations and mitigation measures are fully implemented.

A comprehensive desktop study and field survey were conducted in accordance with SAHRA guidelines and relevant legislation. The study confirmed the presence of archaeological material within the development area but did not identify any fatal flaws that would prevent the project from proceeding.

With the implementation of appropriate mitigation measures, the potential impacts on heritage resources can be reduced to acceptable levels. The project may therefore proceed, subject to approval by the relevant heritage authorities and adherence to all recommended management measures.

12. CONCLUSION

A comprehensive Archaeological and Cultural Heritage Impact Assessment was conducted for the proposed aggregate mining permit application on Portion 0 of Farm 94, located within the Dr Beyers Naudé Local Municipality, Sarah Baartman District Municipality, Eastern Cape Province.

The study included both a detailed desktop review and a systematic field survey undertaken in accordance with SAHRA guidelines and the requirements of the National Heritage Resources Act, 1999 (Act No. 25 of 1999). The objective was to identify and assess heritage resources that may be affected by the proposed development.

The assessment identified the presence of archaeological material within the study area, specifically at site PST01, which comprises Early Stone Age and Middle Stone Age lithic artefacts. These materials are of scientific importance and contribute to the broader understanding of prehistoric human occupation in the region. No graves, burial sites, or historical structures older than 60 years were identified within the development footprint.

The proposed mining activities have the potential to impact archaeological resources, primarily through excavation, blasting, and movement of heavy machinery. These impacts are considered to be of moderate significance prior to mitigation. However, with the implementation of appropriate mitigation measures, including archaeological monitoring and the application of a Chance Find Procedure, the residual impact is expected to be reduced to moderate to low significance.

The study concludes that there are no fatal heritage constraints that would preclude the proposed development from proceeding. From a heritage perspective, the project is considered acceptable, provided that all recommended mitigation measures are implemented and that compliance with applicable heritage legislation is maintained.

It is therefore recommended that the proposed development be supported, subject to approval by the relevant heritage authorities and adherence to the conditions outlined in this report.

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APPENDIXES

APPENDIX 1: SITE SIGNIFICANCE

The following guidelines for determining site significance were developed by SAHRA (2003). It must be noted that these aspects are not mutually exclusive, and the evaluation of any site may consider a combination of these criteria.

(a) Historic value

- Importance in the community or pattern of South Africa's history
- Association with the life or work of a person, group, or organisation of importance
- Significance relating to the history of slavery

(b) Aesthetic value

- Importance in exhibiting particular aesthetic characteristics valued by a community or cultural group

(c) Scientific value

- Potential to yield information that contributes to understanding natural or cultural heritage
- Importance in demonstrating a high degree of creative or technical achievement at a particular period

(d) Social value

- Strong or special association with a particular community or cultural group for social, cultural, or spiritual reasons

(e) Rarity

- Possession of uncommon, rare, or endangered aspects of natural or cultural heritage

(f) Representivity

- Importance in demonstrating the principal characteristics of a particular class of natural or cultural places or objects
- Representation of a range of landscapes or environments characteristic of its class
- Representation of human activities such as land use, traditions, or cultural practices within a specific context

APPENDIX 2: CHANCE FIND PROCEDURE

The following procedure must be followed in the event that archaeological or heritage material is discovered during construction or mining activities:

- All construction or excavation activities in the immediate vicinity of the find must cease immediately to prevent further disturbance.
- The nature of the find should be briefly recorded, including type of material and approximate location.
- The discovery must be reported to the site supervisor or Environmental Control Officer without delay.
- The Environmental Control Officer must notify the Site Manager, who will inform the appointed archaeologist and the relevant heritage authority (SAHRA or ECPHRA).
- The find area must be clearly demarcated and a buffer zone of at least 25 metres established.
- The location of the find should be recorded using GPS where possible.
- The area must be secured to prevent damage, theft, or removal of material.
- Photographic documentation of the find should be undertaken, preferably including a scale reference.
- The appointed archaeologist will inspect the site and determine the significance of the find and appropriate mitigation measures.

Finds rescue strategy:

- All excavation of archaeological material must be conducted manually under the supervision of a qualified archaeologist.
- Recovered artefacts, samples, and remains must be properly documented and curated in accordance with heritage legislation.
- Where required, permits must be obtained from SAHRA or the relevant authority prior to removal of material.

In the case of human remains:

- The SAHRA Burial Grounds Unit must be contacted immediately.
- All procedures relating to the treatment of human remains must be strictly followed.
- A qualified specialist must assess the remains and provide guidance on further actions.

Construction activities may only resume once clearance has been granted by the relevant heritage authority.