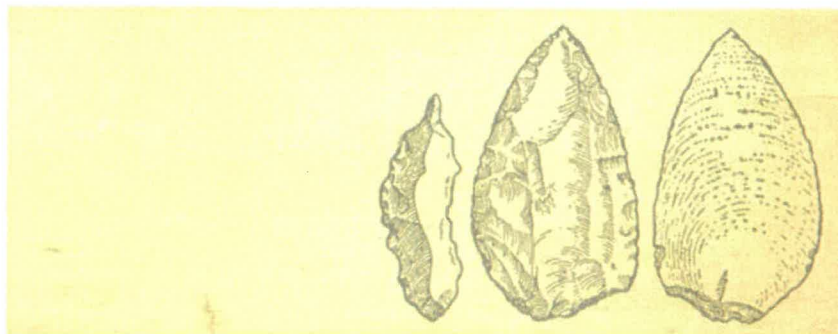


Appendix J

Heritage Impact Assessment Report



PHASE 1 HIA AGGREGATE QUARRY ALHEIT FARM PLOT
2372 KAKAMAS NORTHERN CAPE

PHASE 1 HIA FOR A PROPOSED AGGREGATE QUARRY ON ALHEIT FARM PLOT 2372
NEAR KAKAMAS WITHIN THE KAI !GARIB LOCAL MUNICIPALITY,
ZF MCGAWU DISTRICT MUNICIPALITY, NORTHERN CAPE.

PREPARED FOR:
ENVIROAFRICA CC

PREPARED BY:
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UBIQUE HERITAGE CONSULTANTS

25 AUGUST 2022

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Declaration of independence:

UBIQUE Heritage Consultants hereby confirm our independence as heritage specialists and declare that:

- We are suitably qualified and accredited to act as independent specialists in this application;
- we do not have any vested interests (either business, financial, personal or other) in the proposed development project other than remuneration for the heritage assessment and heritage management services performed;
- the work was conducted in an objective and ethical manner, in accordance with a professional code of conduct and within the framework of South African heritage legislation.



Signed:

J.A.C. Engelbrecht, H. Fivaz & S. Fairhurst
UBIQUE Heritage Consultants

Date: 2022-08-25

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SUMMARY OF SPECIALIST EXPERTISE

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ARCHAEOLOGIST

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HEIDI FIVAZ

CRM ARCHAEOLOGIST & OBJECT CONSERVATOR

Heidi Fivaz has been a part of UBIQUE Heritage Consultants since 2016 and took over ownership in 2018. She is responsible for project management, surveys, research and report compilation. She holds a B.Tech. Fine Arts degree (2000) from Tshwane University of Technology, a BA Culture and Arts Historical Studies degree (2012) from UNISA and received her BA (Hons) Archaeology in 2015 (UNISA). She has received extensive training in object conservation from the South African Institute of Object Conservation and specialises in glass and ceramics conservation. She is also a skilled artefact and archaeological illustrator. Ms Fivaz was awarded her MA in Archaeology (with distinction) in 2021 by the University of South Africa (UNISA), focusing on historical and industrial archaeology. She is a professional member of the Association of South African Archaeologists and has worked on numerous archaeological excavation and surveying projects over the past twelve years.

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EXECUTIVE SUMMARY

Project description

UBIQUE Heritage Consultants were appointed by EnviroAfrica CC as independent heritage specialists in accordance with Section 38 of the NHRA and the National Environmental Management Act 107 of 1998 (NEMA) to conduct a cultural heritage assessment to determine the impact of the proposed aggregate quarry on the farm Alheit Plot 2372 near Kakamas, within the Kai !Garib Local Municipality, in the ZF Mcgawu District Municipality Northern Cape, on any sites, features, or objects of cultural heritage significance.

Findings and Impact on Heritage Resources

One occurrence of a low-density surface scatter of MSA/Early LSA (AP-004) was recorded within the development footprint. The sample size is small, without context, and of low significance; the impact is negligible.

A rocky outcrop was recorded (AP-001), and an occurrence of Stone Age material (AP-003) near the outcrop. These are outside of the development footprint. However, the outcrop and material may have possible archaeological context. This outcrop should be avoided during any mining activities.

An occurrence of a mid-20th century metal tin can (AP-002) was recorded outside of the development footprint. It is considered to be of low significance, and developmental impact is considered negligible. Therefore, no further mitigation is recommended.

The proposed development area is primarily underlain by Putsies Gneiss of the Vyfbeker Metamorphic Suite that is igneous in origin. This Suite is thus unfossiliferous. (Butler 2022 Appendix A).

Recommendations

Based on the assessment of the potential impact of the development on the identified heritage, the following recommendations are made, taking into consideration any existing or potential sustainable social and economic benefits:

1. The MSA/LSA lithic occurrences (AP-003 and AP-004) recorded on the eastern portion of the development footprint and northwest (outside) of the development footprint are of low significance and will not be affected by the development.

2. The rocky outcrop and the material surrounding the outcrop have possible archaeological context and significance. Although it is situated outside the development area, this outcrop should be avoided during mining activities. Therefore a 50m buffer zone is recommended around the outcrop and treated as a No Go Area.

3. The one occurrence of a mid-20th century metal tin can (AP-002) recorded outside the north western border of the development footprint is considered low significance and will not be impacted by development. Therefore, no further mitigation is recommended.

4. The proposed aggregate development on Alheit Plot 2372 is underlain by Putsies Gneiss of the Vyfbeker Metamorphic Suite. This Suite is igneous in origin and thus unfossiliferous. The development footprint is considered to have low palaeontological sensitivity. Therefore, the proposed development will not lead to a negative impact on the palaeontological reserves of the area. Since the development footprint is not considered sensitive regarding palaeontological resources, the development's construction may be authorised to its whole extent (Butler 2022).

5. Although all possible care has been taken to identify sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the assessment. If during construction, any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be alerted as per section 35(3) of the NHRA. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Mimi Seetelo 012 320 8490) must be alerted immediately as per section 36(6) of the NHRA. Depending on the nature of the finds, a professional archaeologist or palaeontologist must be contacted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required, subject to permits issued by SAHRA. UBIQUE Heritage Consultants and its personnel will not be held liable for such oversights or costs incurred due to such oversights.



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ABBREVIATIONS

AIA:	Archaeological Impact Assessment
ASAPA:	Association of South African Professional Archaeologists
CRM:	Cultural Resource Management
EIA:	Early Iron Age
EMP:	Environmental Management Plan
ESA:	Earlier Stone Age
GPS:	Global Positioning System
HIA:	Heritage Impact Assessment
HWC:	Heritage Western Cape
IA:	Iron Age
IMP:	Integrated Management Plan
LSA:	Later Stone Age
MIA:	Middle Iron Age
MSA:	Middle Stone Age
NBKB:	Ngwao-Boswa Jwa Kapa Bokone (Northern Cape PHRA)
NHRA:	National Heritage Resources Act
PHRA:	Provincial Heritage Resource Agency
SADC:	Southern African Development Community
SAHRA:	South African Heritage Resources Agency
SAHRIS:	South African Heritage Resources Information System

GLOSSARY

Archaeological:	Material remains resulting from human activity in a state of disuse, older than 100 years, including artefacts, human and hominid remains and artificial features and structures.
Historic building:	Structures 60 years and older.
Heritage:	That which is inherited and forms part of the National Estate (historic places, objects, fossils as defined by the National Heritage Resources Act 25 of 1999).
Heritage resources:	Valuable, finite, non-renewable and irreplaceable resources that provide evidence of the origins of South African society
Mitigation:	Anticipating and preventing adverse impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.
'Public monuments:	All monuments and memorials, erected on land belonging to any branch of central, provincial or local government, or on land belonging to any organisation funded by or established in terms of the legislation of such a branch of government; or – which were paid for by public subscription, government funds, or a public-spirited or military organisation and are on land belonging to any private individual.
'Structures':	Any building, works, device or other facility made by people, and which are fixed to land, and include any fixtures, fittings and equipment associated therewith.

1. INTRODUCTION

1.1 Scope of study

The project involves the proposed development of a 5ha site for an aggregate quarry on the farm Alheit, Plot 2372 near Kakamas in the ZF Mgwawu District Municipality and within the Kai !Garib Local Municipality, Northern Cape. UBIQUE Heritage Consultants were appointed by EnviroAfrica cc as independent heritage specialists in accordance with the National Environmental Management Act 107 of 1998 (NEMA) and in compliance with Section 38 of the National Heritage Resources Act 25 of 1999 (NHRA) to conduct a cultural heritage assessment (AIA/HIA) of the development area.

The assessment aims to identify and report any heritage resources that may fall within the development footprint; to determine the impact of the proposed development on any sites, features, or objects of cultural heritage significance; to assess the significance of any identified resources; and to assist the developer in managing the documented heritage resources in an accountable manner, within the framework provided by the National Heritage Resources Act (Act 25 of 1999) (NHRA).

South Africa's heritage resources are rich and widely diverse, encompassing sites from all periods of human history. Resources may be tangible, such as buildings and archaeological artefacts, or intangible, such as landscapes and living heritage. Their significance is based on their aesthetic, architectural, historical, scientific, social, spiritual, linguistic, economic or technological values; their representation of a time or group; their rarity; and sphere of influence.

Natural (e.g. erosion) and human (e.g. development) activities can jeopardise the integrity and significance of heritage resources. In the case of human activities, a range of legislation exists to ensure the timely and accurate identification and effective management of heritage resources for present and future generations.

The result of this investigation is presented within this heritage impact assessment report. It comprises the recording of heritage resources present/ absent and offers recommendations for managing these resources within the context of the proposed development.

Depending on SAHRA's acceptance of this report, the developer will receive permission to proceed with the proposed development, considering any proposed mitigation measures.

1.2 Assumptions and limitations

It is assumed that the description of the proposed project, as provided by the client, is accurate. Furthermore, it is assumed that the public consultation process undertaken as part of the Environmental Impact Assessment (EIA) is comprehensive and does not have to be repeated as part of the heritage impact assessment.

The significance of the sites, structures and artefacts is determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. The various aspects are not mutually exclusive, and the evaluation of any site is done with reference to any number of these aspects. Cultural significance is site-specific and relates to the content and context of the site.

The comprehensive field survey and intensive desktop study have taken all possible care to identify sites of cultural importance within the development areas. However, it is essential to note that some heritage sites may have been missed due to their subterranean nature or dense vegetation cover. No subsurface investigation (i.e. excavations or sampling) was undertaken since a SAHRA permit is required for such activities. Therefore, should any heritage features and/or objects such as architectural features, stone tool scatters, artefacts, human remains, or fossils be uncovered or observed during construction, operations must be stopped, and a qualified archaeologist contacted for an assessment of the find. Observed or located heritage features and/or objects may not be disturbed or removed until the heritage specialist has been able to assess the significance of the site (or material) in question.



2. TERMS OF REFERENCE

2.1 Statutory Requirements

2.1.1 General

The principle is that the environment should be protected for present and future generations by preventing pollution, promoting conservation and practising ecologically sustainable development. With regard to spatial planning and related legislation at national and provincial levels, the following legislation may be relevant:

- Physical Planning Act 125 of 1991
- Municipal Structures Act 117 of 1998
- Municipal Systems Act 32 of 2000
- Development Facilitation Act 67 of 1995 (DFA)

The identification, evaluation and management of heritage resources in South Africa are required and governed by the following legislation:

- National Environmental Management Act 107 of 1998 (NEMA)
- KwaZulu-Natal Heritage Act 4 of 2008 (KZNHA)
- National Heritage Resources Act 25 of 1999 (NHRA)
- Minerals and Petroleum Resources Development Act 28 of 2002 (MPRDA)

2.1.2 National Heritage Resources Act 25 of 1999

The NHRA established the South African Heritage Resources Agency (SAHRA) together with its Council to fulfil the following functions:

- coordinate and promote the management of heritage resources at the national level;
- set norms and maintain essential national standards for the management of heritage resources in the Republic and to protect heritage resources of national significance;
- control the export of nationally significant heritage objects and the import into the Republic of cultural property illegally exported from foreign countries;
- enable the provinces to establish heritage authorities which must adopt powers to protect and manage certain categories of heritage resources; and
- provide for local authorities' protection and management of conservation-worthy places and areas.

2.1.3 Heritage Impact Assessments/Archaeological Impact Assessments

Section 38(1) of the NHRA of 1999 requires **the responsible heritage resources authority to notify the person who intends to undertake a development that fulfils the following criteria to submit an impact assessment report if there is reason to believe that heritage resources will be affected by such event:**

- the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- the construction of a bridge or similar structure exceeding 50m in length;
- any development or other activity that will change the character of a site—
 - exceeding 5000m² in extent; or
 - involving three or more existing erven or subdivisions thereof; or
 - involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- the rezoning of a site exceeding 10 000m² in extent; or
- any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.

2.1.5 Management of Graves and Burial Grounds

- **Graves younger than 60 years** are protected in terms of Section 2(1) of the Removal of Graves and Dead Bodies Ordinance 7 of 1925 as well as the Human Tissues Act 65 of 1983.
- **Graves older than 60 years, situated outside a formal cemetery administered by a local Authority** are protected in terms of Section 36 of the NHRA as well as the Human Tissues Act of 1983. Accordingly, such graves are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36(5) of NHRA) is applicable to graves older than 60 years that are situated outside a formal cemetery administered by a local authority. Graves in the category located inside a formal cemetery administered by a local authority will also require the same authorisation as set out for graves younger than 60 years over and above SAHRA authorisation.

The protocol for the management of graves older than 60 years situated outside a formal cemetery administered by a local authority is detailed in Section 36 of the NHRA:

(3) (a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—

- (a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
- (b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
- (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

(4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation

and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.

(5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection (3)(b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority—

- (a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and
- (b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.

(6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in cooperation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority—

- (a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and
- (b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.



3. STUDY APPROACH AND METHODOLOGY

3.1 Desktop study

The first step in the methodology was to conduct a desktop study of the heritage background of the area and the proposed development site. This entailed scoping and scanning historical texts/records, previous heritage studies, and research around the study area.

The study area is contextualised by incorporating data from previous CRM reports in the area and an archival search. The objective is to extract data and information on the area in question, looking at archaeological sites, historical sites and graves.

No archaeological site data was available for the project area. A concise account of the archaeology and history of the broader study area was compiled (sources listed in the bibliography).

3.1.1 Literature review

A literature survey was undertaken to obtain background information regarding the area. Through researching the SAHRA APM Report Mapping Project records and the SAHRIS online database (<http://www.sahra.org.za/sahris>), it was determined that several other archaeological or historical studies had been performed within the broader vicinity of the study area. Sources consulted in this regard are indicated in the bibliography.

3.2 Field study

Phase 1 (AIA/HIA) requires the completion of a field study to establish and ensure the following:

3.2.1 Systematic survey

A systematic survey of the proposed project area was completed to locate, identify, record, photograph, and describe archaeological, historical or cultural interest sites.

UBIQUE Heritage Consultants inspected the proposed development and surrounding areas on the 7th of July 2022 and completed a controlled-exclusive, pre-planned pedestrian and vehicular survey. We inspected the ground's surface, wherever the surface was visible. This was done with no substantial attempt to clear brush, sand, deadfall, leaves or other material that may cover the surface. In addition, without looking beneath the surface beyond inspecting rodent burrows, cut banks and other exposures were fortuitously observed.

The survey was tracked with a handheld Garmin global positioning unit (Garmin eTrex 10).

3.2.2 Recording significant areas

GPS points of identified significant areas were recorded with a handheld Garmin global positioning unit (Garmin eTrex 10). Photographs were taken with a Canon IXUS 185 20-megapixel camera. Detailed field notes were taken to describe observations. The layout of the area and plotted GPS points, tracks and coordinates were transferred to Google Earth, and QGIS and maps were created.

3.2.3 Definitions of heritage resources

The NHRA defines a heritage resource as any place or object of cultural significance, i.e., aesthetic, architectural, historical, scientific, social, spiritual, linguistic, or technological value or significance. These include, but are not limited to, the following wide range of places and objects:

- living heritage as defined in the National Heritage Council Act No 11 of 1999 (cultural tradition; oral history; performance; ritual; popular memory; skills and techniques; indigenous knowledge systems; and the holistic approach to nature, society and social relationships);
- Ecofacts (non-artefactual organic or environmental remains that may reveal aspects of past human activity; definition used in KwaZulu-Natal Heritage Act 2008);
- places, buildings, structures and equipment;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds;
- public monuments and memorials;
- sites of significance relating to the history of slavery in South Africa;
- movable objects, but excluding any object made by a living person; and
- battlefields.

3.3 Determining significance

Heritage resources are considered of value if the following criteria apply:

- a. It is important in the community or pattern of South Africa's history;
- b. It has uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- c. It has the potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;

- d. It is vital in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- e. It exhibits particular aesthetic characteristics valued by a community or cultural group;
- f. It is essential in demonstrating a high degree of creative or technical achievement at a particular period;
- g. It has a strong or unique association with a particular community or cultural group for social, cultural or spiritual reasons;
- h. It has a strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;
- i. It is of significance relating to the history of slavery in South Africa.

Levels of significance of the various types of heritage resources observed and recorded are determined by the following criteria:

CULTURAL & HERITAGE SIGNIFICANCE	
LOW	A cultural object found out of context, not part of a site or without any related feature/structure in its surroundings.
MEDIUM	Any site, structure or feature is regarded as less important due to several factors, such as date, frequency and uniqueness. Likewise, any important object found out of context.
HIGH	Any site, structure or feature is regarded as important because of its age or uniqueness. Graves are always categorised as of a high importance. Likewise, any important object found within a specific context.

Field Ratings or Gradings are assigned to indicate the level of protection required and who is responsible for national, provincial, or local protection.

FIELD RATINGS & GRADINGS	
National Grade I	Heritage resources with exceptional qualities to the extent that they are of national significance and should therefore be managed as part of the national estate.
Provincial Grade II	Heritage resources with qualities provincial or regional importance, although it may form part of the national estate, it should be managed as part of the provincial estate.
Local Grade IIIA	Heritage resources are of local importance and worthy of conservation. Therefore, it should be included in the heritage register and not be mitigated (high significance).

FIELD RATINGS & GRADINGS	
Local Grade IIIB	Heritage resources are of local importance and worthy of conservation. Therefore, it should be included in the heritage register and mitigated (high/ medium significance).
General Protection Grade IVA	The site/resource should be mitigated before destruction (high/ medium significance).
General protection Grade IVB	The site/resource should be recorded before destruction (medium significance).
General protection Grade IVC	Phase 1 is considered as sufficient recording, and it may be demolished (low significance).

3.3.1 Assessment of development impacts

A heritage resource impact may be defined broadly as the net change, either beneficial or adverse, between the integrity of a heritage site with and without the proposed development. Beneficial impacts occur wherever a proposed development protects, preserves, or enhances a heritage resource by minimising natural site erosion or facilitating non-destructive public use. More commonly, development impacts are of an adverse nature and can include:

- destruction or alteration of all or part of a heritage site;
- isolation of a site from its natural setting; and / or
- introduction of physical, chemical or visual elements out of character with the heritage resource and its setting.

Beneficial and adverse impacts can be direct or indirect and cumulative, as implied by the examples. Although indirect impacts may be more difficult to foresee, assess and quantify, they must form part of the assessment process. Therefore, the following assessment criteria have been used to assess the impacts of the proposed development on possible identified heritage resources:

CRITERIA	RATING SCALES	NOTES
Nature	POSITIVE	An evaluation of the type of effect the construction, operation and management of the proposed development would have on the heritage resource.
	NEGATIVE	
	NEUTRAL	
Extent	LOW	Site-specific affects only the development footprint.

CRITERIA	RATING SCALES	NOTES
	MEDIUM	Local (limited to the site and its immediate surroundings, including the surrounding towns and settlements within a 10 km radius);
	HIGH	Regional (beyond a 10 km radius) to national.
Duration	LOW	0-4 years (i.e. duration of construction phase).
	MEDIUM	5-10 years.
	HIGH	More than 10 years to permanent.
Intensity	LOW	Where the impact affects the heritage resource in such a way that its significance and value are minimally affected.
	MEDIUM	Where the heritage resource is altered, and its significance and value are measurably reduced.
	HIGH	Where the heritage resource is altered or destroyed to the extent that its significance and value cease to exist.
Potential for impact on irreplaceable resources	LOW	No irreplaceable resources will be impacted.
	MEDIUM	Resources that will be impacted can be replaced, with effort.
	HIGH	There is no potential for replacing a particular vulnerable resource that will be impacted.
Consequence	LOW	A combination of any of the following: <ul style="list-style-type: none"> • Intensity, duration, extent and impact on irreplaceable resources are all rated low. • Intensity is low and up to two of the other criteria are rated medium. • - Intensity is medium, and all three other criteria are rated low.
	MEDIUM	Intensity is medium, and at least two of the other criteria are rated medium.
	HIGH	Intensity and impact on irreplaceable resources are rated high, with any combination of extent and duration. Intensity is rated high, with all the other criteria being rated medium or higher.
Probability (the likelihood of the impact occurring)	LOW	It is highly unlikely or less than 50 % likely that an impact will occur.
	MEDIUM	It is between 50 and 70 % certain that the impact will occur.
	HIGH	It is more than 75 % certain that the impact will occur, or it is definite that the impact will occur.
Significance (all impacts including potential)	LOW	Low consequence and low probability. Low consequence and medium probability. Low consequence and high probability.

CRITERIA	RATING SCALES	NOTES
cumulative impacts)	MEDIUM	Medium consequence and low probability. Medium consequence and medium probability. Medium consequence and high probability. High consequence and low probability.
	HIGH	High consequence and medium probability. High consequence and high probability.

3.4 Report

The desktop research and field survey results are compiled in this report. The identified heritage resources and anticipated direct, indirect, and cumulative impacts of the proposed project's development on the identified heritage resources will be presented objectively. Should any significant sites be impacted adversely by the proposed project, alternatives are offered. All efforts will be made to ensure that all studies, assessments, and results comply with the relevant legislation and the code of ethics and guidelines of the Association of South African Professional Archaeologists (ASAPA). The report aims to assist the developer in managing the documented heritage resources in a responsible manner and protecting, preserving, and developing them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).



4. PROJECT OVERVIEW

UBIQUE Heritage Consultants were appointed by EnviroAfrica cc as independent heritage specialists in accordance with Section 38 of the NHRA and the National Environmental Management Act 107 of 1998 (NEMA) to conduct a cultural heritage assessment to determine the impact of the proposed development of a 5ha site for an aggregate quarry on Alheit Plot 2372 near Kakamas in the Northern Cape.

The proposed project will entail the utilisation of approximately 5 ha of land of an aggregate quarry for the extraction of raw material for use in construction works.

4.1 Technical information

PROJECT DESCRIPTION	
Project name	Phase1 HIA Aggregate quarry on Alheit Farm Plot 2372 near Kakamas, Northern Cape.
Description	Phase 1 HIA for a 5ha site for a proposed aggregate quarry on the farm Alheit near Kakamas in the Kai !Garib Local Municipality, ZF Mcgawu District Municipality, Northern Cape.
DEVELOPER	
Mr. C.A. Bruwer	
Development type	Mining
LANDOWNER	
Mr. C.A. Bruwer	
CONSULTANTS	
Environmental	EnviroAfrica CC
Heritage and archaeological	UBIQUE Heritage Consultants
Palaeontological	Banzai Environmental
PROPERTY DETAILS	
Province	Northern Cape
District municipality	ZF Mcgawu
Local municipality	Kai !Garib
Topo-cadastral map	1:50 000 2821DC
Farm name	Alheit Plot 2372
Closest town	Kakamas
GPS Co-ordinates	28° 48' 20.41" S 20° 32' 29.50" E
PROPERTY SIZE	50000 ha

DEVELOPMENT FOOTPRINT SIZE	5 ha	
LAND USE		
Previous	Agriculture	
Current	Agriculture	
Rezoning required	No	
Sub-division of land	No	
DEVELOPMENT CRITERIA IN TERMS OF SECTION 38(1) NHRA		YES/NO
Construction of a road, wall, power line, pipeline, canal or other linear forms of development or barrier exceeding 300m in length.		No
Construction of bridge or similar structure exceeding 50m in length.		No
Construction exceeding 5000m ² .		Yes
Development involving three or more existing erven or subdivisions.		No
Development involving three or more erven or divisions that have been consolidated within the past five years.		No
Rezoning of site exceeding 10 000m ² .		No
Any other development category, public open space, squares, parks, recreation grounds.		No

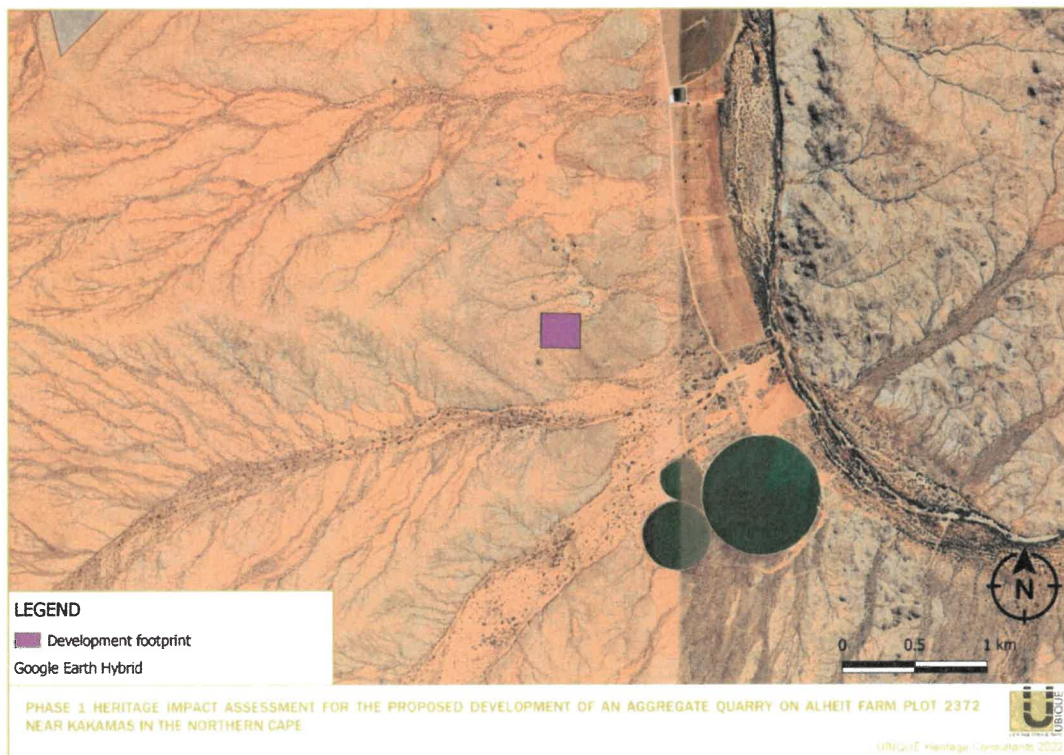


Figure 1 Regional locality of the development footprint, indicated on Google Earth Satellite imagery.

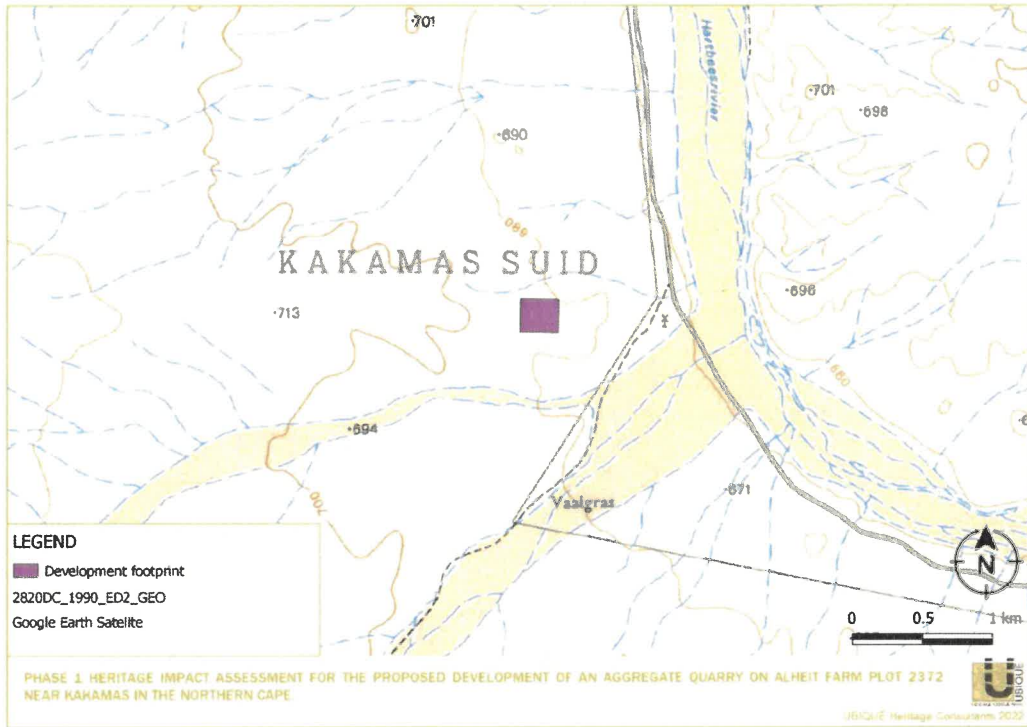


Figure 2 Locality of the development footprint, indicated on 1: 50 000 2821DC map.

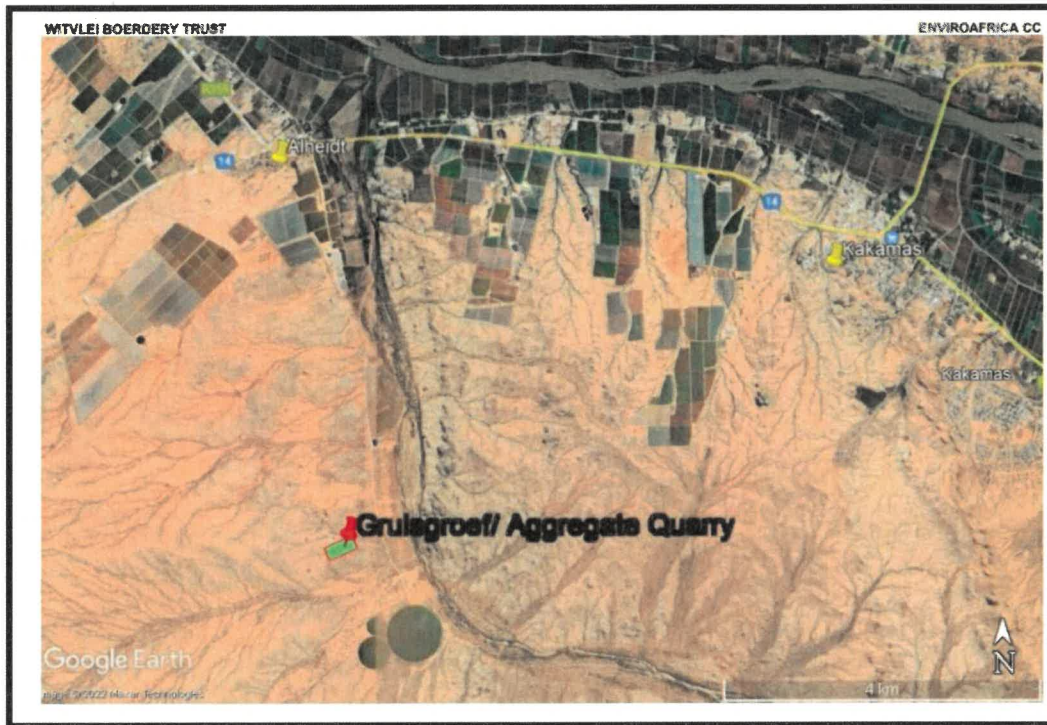


Figure 3 Development area. Image provided by the client.



5. HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

5.1 Region: Northern Cape

South Africa has a long and varied history of human occupation (Deacon & Deacon 1999). This occupation dates to approximately 2mya (million years ago) (Mitchell 2002). Briefly, the archaeology of South Africa can be divided into three “major” periods: the Stone Age, the Iron Age and the Historical period. In addition, various archaeological and historical sites have been identified and documented throughout South Africa, including the Northern Cape province.

5.1.1 Stone Age

The history of the Northern Cape is reflected in a rich archaeological landscape, with a wealth of pre-colonial archaeological sites. Numerous sites have been identified and documented across the region. These sites have been dated to the Early, Middle and Later Stone Ages.

In southern Africa, the Stone Age can be divided into three periods. It is, however, critical to note that dates are relative and only provide a broad framework for interpretation. The division of the Stone Age, according to Lombard et al. (2012), is as follows:

- Earlier Stone Age (ESA): >2 000 000 - >200 000 years ago
- Middle Stone Age (MSA): <300 000 - >20 000 years ago
- Later Stone Age (LSA): <40 000 - until the historical period

In short, the Stone Age refers to humans that mainly utilised stone as their technological marker. Each sub-division is formed by industries where the assemblages share attributes or common traditions (Lombard et al. 2012). The ESA is characterised by flakes produced from pebbles, cobbles and percussive tools, as well as objects created later during this period, such as large hand axes, cleavers and other bifacial tools (Klein 2000). The MSA is associated with small flakes, blades and points. The aforementioned is generally suggested to have been made and utilised for hunting activities and had numerous functions (Wurz 2013).

Furthermore, the LSA is characterised by microlithic stone tools, scrapers and flakes (Binneman 1995; Lombard et al. 2012). The LSA is also associated with rock art. Numerous LSA rock art sites, mainly rock engravings and paintings, have been identified in the Northern Cape (Beaumont 2008c; Kruger 2018; Morris 1988). These sites are commonly found on slopes, hilltops, rocky outcrops and occasionally in river beds (Kruger 2018). Banded ironstone occurs on several sites throughout the Northern Cape. It would appear to have been a favoured raw material for making stone tools due to its superior flaking qualities (Kaplan 2012b). Beaumont et al. (1995) state, regarding the LSA, that “virtually all the ‘Bushmanland’ sites so far located appear to be ephemeral occupation by small groups in the hinterland on both sides of the [Orange] river”. This contrasts sharply with the substantial herder encampments along the Orange River floodplain (Morris

2013a, b, c, d, e, & f). It has been noted by Beaumont et al. (1995:240-241) that a widespread low density of stone artefacts scatters from the Pleistocene age appears across areas of 'Bushmanland' to the south. Here, raw materials, mainly quartzite cobbles, were derived from the Dwyka glacial (Morris 2013a, b, c, d, e, & f). Morris (2013b & c) states that substantial MSA sites are relatively uncommon in Bushmanland. However, several sites have been recorded but yielded small samples.

Although humans sparsely populated the Northern Cape region in the past (Kruger 2015a and b), the archaeological sites in this landscape are not scattered randomly (Kruger 2018). Previously conducted surveys have revealed signs of human occupation "mainly in the shelter of granite inselbergs (koppies) on red dunes which provided clean sand for sleeping, or around the seasonal pans" (Beaumont et al. 1995:264). Archaeological sites and MSA and LSA scatters and quarries frequently occur in low-lying areas on plains between dune straights and outcrops along the Orange River; in other words, near water. They can likewise be found close to local sources of highly-prized raw materials such as banded iron formations (BIF), jaspilite, and specularite (Morris 2012; Kruger 2015; 2018).

Beaumont et al. (1995) state that thousands of square kilometres of Bushmanland are covered by low-density lithic scatters. Most studies and surveys conducted throughout the Northern Cape have recorded Stone Age sites and surface scatters of Stone Age artefacts (ranging from the ESA, MSA and LSA) throughout the Northern Cape. These include the districts of Groblershoop, Griekwastad, Hotazel, Kenhardt, Pofadder, Marydale, and Upington (Dreyer 2006, 2008a, 2012; Engelbrecht & Fivaz 2019; Kaplan 2008, 2012, 2013 a & b; Kruger 2015; Morris 2012, 2013; Rossouw 2013; Van Ryneveld 2007; Van Vollenhoven 2014 and Webley 2013). Large rubbing stones, Acheulean hand axes (with secondary retouch) and scatters of core flakes have been found during previous investigations throughout the broader region (Dreyer 2008b, 2013 Revised, 2014). Van Ryneveld (2007) documented low densities of MSA artefact scatters at several Quartz outcrops on the farm Bokspuits 118. An ancient specularite working site was recorded on the eastern side of Postmasburg, Doornfontein (Van Vollenhoven 2014). Associated Ceramic Later Stone Age material and older transitional ESA/MSA Fauresmith sites were documented at Lyly Feld, King, Mashwening, Demaneng, Rus & Vrede, Gloucester, Paling and Mount Huxley (Engelbrecht & Fivaz 2019). Moreover, MSA and LSA tools, along with rock engraving were found at Putsonderwater, Beeshoek and Bruce (Engelbrecht & Fivaz 2019). In addition, numerous Stone Age sites have been identified, documented and excavated in the surrounding areas near Kathu, the Doornlaagte ESA site, and the Wonderwerk Caves (Van Vollenhoven 2014; Dreyer 2015). The Stone Age sites and artefacts found and documented near the Kathu pans represent one of the most extended preserved Stone Age sequences in South Africa. They yield artefacts and sites from the ESA, MSA and LSA with evidence of 500 000-year-old hafted stone points (Engelbrecht & Fivaz 2019).

5.1.2 Iron Age

The Iron Age (IA) is characterised by the use of metal (Coertze & Coertze 1996: 346). There is some controversy about the periods within the IA. Van der Ryst & Meyer (1999) have suggested that there are two phases within the IA, namely:

- Early Iron Age (EIA) 200 – 1000 A.D
- Late Iron Age (LIA) 1000 – 1850 A.D

However, Huffman (2007) suggests instead that there are three periods within the Iron Age these periods are:

- Early Iron Age (EIA) 250 – 900 A.D
- Middle Iron Age (MIA) 900 – 1300 A.D
- Late Iron Age (LIA) 1300 – 1840 A.D

Thomas Huffman believes that the Middle Iron Age should be included within this period; his dates have been widely accepted in the IA field of archaeology.

The South African Iron Age is generally characterised by farming communities with domesticated animals, cultivated plants, manufactured and made use of ceramics and beads, and smelted iron for weapons and manufactured tools (Hall 1987). Iron Age people were often mixed farmers/agropastoralists. These agropastoralists generally chose to live in areas with sufficient water for domestic use and arable soil that could be cultivated with an iron hoe. Most Iron Age (IA) settlements built by agropastoralists were permanent settlements (with a few exceptions, of course). They comprised houses, raised grain bins, storage pits and animal kraals/byres, contrasting with pastoralists' and hunter-gatherers' temporary camps (Huffman 2007). It is evident in the archaeological record that IA groups had migrated with their material culture (Huffman 2002).

Most IA groups in southern Africa preferred to occupy southern African central, and eastern parts from about 200 AD. The San and Khoi remained in the western and southern parts (Huffman 2007; Van Vollenhoven 2014); it is, thus, very rare, but not uncommon, to find IA sites in the Northern Cape.

The expansion of early farmers/agropastoralists occurred in this region between 400 AD and 1100 AD. These early farmers settled in semi-permanent settlements (De Jong 2010). De Jong (2010) states that the EIA continued in the Lowveld until the 15th century. However, it ended by 1100 AD on the escarpment. The Highveld became active again from the 15th century onwards because of the gradually warmer and wetter climate. This later phase (the LIA) was accompanied by extensive stone-walled settlements, such as the Thlaping capital Dithakong, approximately 40 km north of Kuruman (De Jong 2010). The Sotho-Tswana and Nguni-speaking societies are the descendants

of the LIA mixed farming communities. They found that the region was already sparsely inhabited by LSA Khoisan groups (the “first people”). De Jong (2010) comments that many of them were eventually assimilated by LIA communities. Only a few had managed to survive. Some of the surviving groups included the Korana and the Griqua. However, it should be mentioned that this contact period has often been referred to as the Ceramic LSA. It is often represented by sites such as the earlier mentioned Blinkklipkop specularite mine near Postmasburg and found cultural material at the Kathu Pan (De Jong 2010).

IA sites have been recorded in the northeastern part of the province. However, according to Kruger (2018), environmental factors delegated that the spread of IA farming westwards from the 17th century was constrained mainly to the areas east of the Langeberg Mountains. Nevertheless, there has been evidence of an IA presence as far as the Upington area in the 18th century (Kruger 2018). LIA people had briefly utilised the area close to the Orange River, as they had mined copper in the Northern Cape (Van Vollenhoven 2014).

5.1.3 Historical period

The Historical/Colonial period generally refers to the last 500 years when European settlers and colonialism entered southern Africa (Binneman et al., 2011). During the colonial frontier period, place names started becoming fixed on maps and farm names, specifically in a cadastral sense. Numerous names have Khoekhoegowab origin and, as Morris (2017a) states, encapsulate vestiges of pre-colonial/indigenous social geography. Interestingly, Morris (2017a) also states that genocide against the indigenous people is documented in the wider area. Certain mountainous areas (e.g. Gamsberg near Aggeneys and Namies) are likely to be massacre sites (Morris 2017a).

The development of a rich colonial frontier can be seen in the archaeological record (Kruger 2018). However, it was not until relatively recently (because of its distance from the Cape Colony) that this arid part of South Africa’s interior was colonised. The Historical period of the Northern Cape coincides with the incursion of white traders, hunters, explorers, and missionaries into the interior of South Africa (Engelbrecht & Fivaz 2019). The historical period started with the first recorded oral histories (Van Vollenhoven 2014). The documented records of this region dating from the 18th- and 19th-centuries mainly pertain to areas south of and along the Orange River (Morris 2018a, b & c). Hendrick Wikar and Robert Gordon, who, according to Morris (2018a, b & c) and Morris & Beaumont (1991), were two of the earliest travellers, had followed the river as far as and even beyond the region during the 1770s. Wikar and Gordon provided descriptions of the terrain and the communities living along the river (Morris 2018a, b & c; Morris & Beaumont 1991). Some other early travellers, traders, and missionaries, who arrived in the region during the 19th century, include PJ Truter, William Somerville, Cowan, Donovan, Burchell and Campbell (De Jong 2010). The London Mission Society (LMS) station near Kuruman was established in 1817 by James Read (De Jong 2010; Van Vollenhoven 2014). Various buildings and structures that have been documented and recorded can be associated with early travellers, traders, and missionaries. There is also evidence of the settlements of the first white farmers and towns in the Northern Cape. These historical buildings and structures have been captured on the SAHRIS database in areas such as Kakamas, Kenhardt, Keimoes and Upington.

The surveying, division and transference of Government-owned land to farmers mark the initial distribution of land to colonial farmers from the 1880s onward (De Jong 2010). It is believed that most farms were still government farms and were leased to farmers in 1875. The farms were only later sold to individuals (Van Vollenhoven 2014). During the late 1920s, more permanent and large-scale settlements and possibly some of the first farmsteads started to appear in the region.

The region has been the backdrop to various incidents of conflict. Numerous factors such as population growth, increasing pressure on natural resources, the emergence of power blocs, attempts to control trade and the emergence of the Griquas, and penetration of the Korana and early white communities from the southwest resulted in a period of instability in South Africa. Furthermore, with the introduction of loan farms, in the second half of the 18th century, an influx of newcomers such as trekboers, European game hunters and livestock thieves contributed to the volatility and sociocultural stress and transformation in the region (Mlilo 2019).

The period known as the Difaqane/Mfecane began in the late 18th century and effectively ended with the settlement of white farmers in the interior (De Jong 2010; Mlilo 2019). The Difaqane/Mfecane period also affected the Northern Cape Province around the 1820s, relatively later than the rest of southern Africa (De Jong 2010). This period was prompted by the incursion of displaced refugees associated with the Fokeng, Tlokwa, Hlakwana and Phuting groups (De Jong 2010).

Moreover, during the 1830s, the Voortrekkers started migrating northwards from the Cape Colony. This migration was due to their dissatisfaction with British rule (Eldredge 1987). The Voortrekkers' migration is known as the "Groot Trek" (Great Trek). The Voortrekkers had conflict with Tswana and missionary groups who had settled near Bechuanaland and Griqualand West (Van Vollenhoven 2014). A series of wars and battles between the Voortrekkers, Zulu and Sotho-Tswana communities eventually arose due to the migrations (De Bruyn 2019).

Between 1879-1880 the region was also caught up in the Koranna War. Further military activity in the area included the rise of the 'rebels' during the Anglo-Boer War and again in 1915 with the incursion of German troops (Morris 2018a, b & c). Numerous graves can be linked to the battles fought during the 1914 Rebellion (Engelbrecht & Fivaz 2019). It is believed that any military settlement related to the Koranna Wars would have been closer to the Orange River (Webley & Halkett 2014).

It is known that San hunter-gatherers utilised the landscape for thousands of years, and Khoi herders moved into South Africa with their cattle and sheep approximately 2000 years ago. With the arrival of the Dutch settlers in the Cape in the mid-17th century, clashes between the Europeans and Khoi tribes in the Cape Peninsula resulted in the Goringhaiqua and Goraxouqua migrating north towards the Gariep/Orange River in 1680. These tribes became known as the Korannas, living as small tribal entities in separate areas (Penn 2005).

Bushmanland was one of the last regions of the Cape Province to be settled by early European farmers. This was because the region was very arid and situated quite far from Cape Town and the produce markets. Many of the farms in the Bushmanland area were only allocated after the introduction of the windpump to South Africa in the 1870s. In other words, the windpump made the arid lands accessible and suitable for grazing (Webley & Halkett 2012). Historical literature also confirms that San hunter-gatherers occupied Bushmanland during the early part of the 19th century. During the 19th century, Basters of mixed descent lived around the salt pans in Bushmanland. They were, however, driven away from the land as the farms were surveyed and made available to European farmers (Webley & Halkett 2012). In the late 18th and early 19th centuries, with the introduction and implementation of the commando system, the Karoo 'Bushmen' were eventually destroyed or indentured into farm labour (ACRM 2015).

Several finds have been recorded at sites in the Northern Cape region. These include but are not limited to 20th-century glass bottles and a rusted enamel basin (Orton 2015a); some colonial-era stonewalling (Morris 2013b); glass and porcelain fragments (Beaumont 2007; Morris 2013a & b); colonial farmsteads (Morris 2013; Van Ryneveld 2017a and b); heavily soldered Anglo-Boer War (1899-1902) food containers (Dreyer 2006; Beaumont 2007) and fired rifle cartridge shells (Dreyer 2014; Beaumont 2007); and numerous man-moved and stacked boulders (possibly representative of Boer positions during the Siege of Kimberly (Beaumont 2007).

Apart from a few exceptions, archaeology along the Orange River has mainly focused on the Middle Orange River and the Richtersveld (Orton & Webley 2012). The Middle Orange River was densely inhabited pre- and proto-colonial times (Mlilo 2019). The area is made up of several islands. Herders often chose to live on these islands for their natural protection from stock thieves and wild animals. Small-stock farmers mainly occupied the vicinity along the Orange River. It was during the 1930s that the first great influx of people started. These people had developed an extensive network of irrigation channels that supplied water for the development of vineyards and other cash crops (e.g. grain crops), cultivated in a narrow band along the Orange River leading to the region known as the Green Kalahari. Van Schalkwyk (2019) comments that this had resulted in numerous smaller hamlets and villages. These hamlets/villages had churches, cemeteries and shops.

According to Ross (1975), the first descriptions of the population of the Middle Orange River can be credited to the Swedish traveller Hendrick Wikar. Wikar started his long journey from Cape Town and eventually reached the middle and lower reaches of the Orange River. Wikar is believed to have been a deserter from the service of the Dutch East India Company. Thus, Wikar remained within the area for several years and compiled a report of his experiences in exchange for a pardon (Ross 1975). He recorded his encounters with the Khoisan groups who called themselves Einiqua or River People. The Einiqua were divided into three "kraals", namely the Namnykoa near the Augrabies Falls, the Aukokoa of Kanoneiland and the Kaukoa on islands west of Keimoes and other islands to the east (Engelbrecht & Fivaz 2020). Their kraals consisted of numerous sheep and cattle. The Einiqua had also hunted game, gathered plants, and cultivated dagga, but according to Wikar, no other crops (Ross 1975). The Anoe eis people, whom Wikar characterised as "Bushmen", were among the pastoralist groups living on the islands. As they had no domestic stock, these people subsisted on fishing, game-trapping, hunting, and gathering plant foods (Morris & Beaumont 1991). However, Colonel Robert Jacob Gordon, who visited the region in 1779,

remarked that they were Einiqua who had lost their cattle because of an argument with the Namneiqua village (Morris & Beaumont 1991). The region's San and Khoekhoe hunter-gatherers had reached stability by the early 18th century (Mlilo 2019). However, the area west of the Langeberg and east of Upington was occupied by IA groups such as the BaTlaping. Their influence had reached as far down the river as Upington (Morris 1992).

De Jong (2010) classifies the cultural landscape along the Gariep/Orange River as predominantly historic farmland. From the 1880s onwards, irrigation of the Orange River played a central role in the economy of the area in the vicinity of Upington (Legassick 1996). Hunter-gatherers shared the river's resources (Morris 1992). The beginning of irrigation in this area has been attributed to the Basters. By the 18th century, the Basters had focused on the Orange River (and Namaqualand) as a sanctuary from colonial rule (Mlilo 2019; Van der Walt 2015). They were regarded as "primitive pastoral people" who had "crude" ways to divert the river to their "little gardens" (Van der Walt 2015). The term "Basters" characterises a group of people of mixed percentage (white and Khoekhoe or slave and Khoekhoe). According to Van der Walt (2015), the term also implies an economic category that implies possessing property and being culturally European.

The construction and development of canal systems were vital for the irrigation of extensive vineyards and orchards and the expansion of major agricultural enterprises in the region (Engelbrecht & Fivaz 2018). The credit for formalising and extending the irrigation system belongs to Reverend C.H.W. Schröder, a Dutch Reformed Church (DRC) missionary and Special Magistrate for the Northern Border John H. Scott. By the time Schröder came to Upington in July 1883, there were people already living in the area of Keimoes who had planted fields and utilised irrigation. The irrigation scheme of the Basters can be attributed to Abraham September's innovation. Abraham September was born in slavery and became part of the Baster people of South Africa. Interestingly, Schröder and Scott had begun the canal from where Abraham September had selected. Legassick (1996) commented that "the small, white-painted, stone house where Abraham September lived when he undertook this work survives to this day, though the house and the land upon which it stands have long passed from the hands of the September family".

In 1882, the first 81 farms to be given out to the north of the Orange River from Kheis (opposite the present Groblershoop) to the Augrabies Falls were allocated almost exclusively to Basters (Morris 1992). The further division of these farms commenced when the irrigation canal was completed. These farms were divided into "water-erven" for irrigation and "dry-erven" for establishing buildings (Van der Walt 2015). More white settlers moved to the Gordonia region in the late 19th century. By the turn of the century, approximately 13 Afrikaner families had settled at Keimoes (De Beer 1992; Van der Walt 2015). Many farmers moved to new areas due to the aftermath of the scorched earth policy of the Anglo-Boer War. These farmers searched for greener pastures. Settlements next to the Gariep/Orange River provided adequate irrigation for crops (Engelbrecht & Fivaz 2020).

Portuguese sailors referred to the Gariep/Orange River as the St Antonio, and on the maps from 1685, Simon van der Stel marked it as the Vigiti Magna. In 1760, Jacobus Coetzee, the elephant hunter, named the river: "de Groote Rivier" (the Great River). In 1761, land surveyor Carel Brink

noted that the river is known to the local island inhabitants as the Tyen Gariep (Our River). The London Missionary Society's (LMS) John Campbell spoke of the Gariep, Gareeb, and Garib as the name the Korannas used. The river's contemporary name (Orange River) can be accredited to Robert Gordon. Gordon took his rowboat out to the middle of the river on the evening of the 17th of August, 1779. He raised and toasted the Netherland's flag and proclaimed the river in the name of Prince van Oranje. From this day forward, the river was known (and indicated on maps) as the Orange River. However, the river is often referred to as the Gariep or Grootrivier (Engelbrecht & Fivaz 2020).

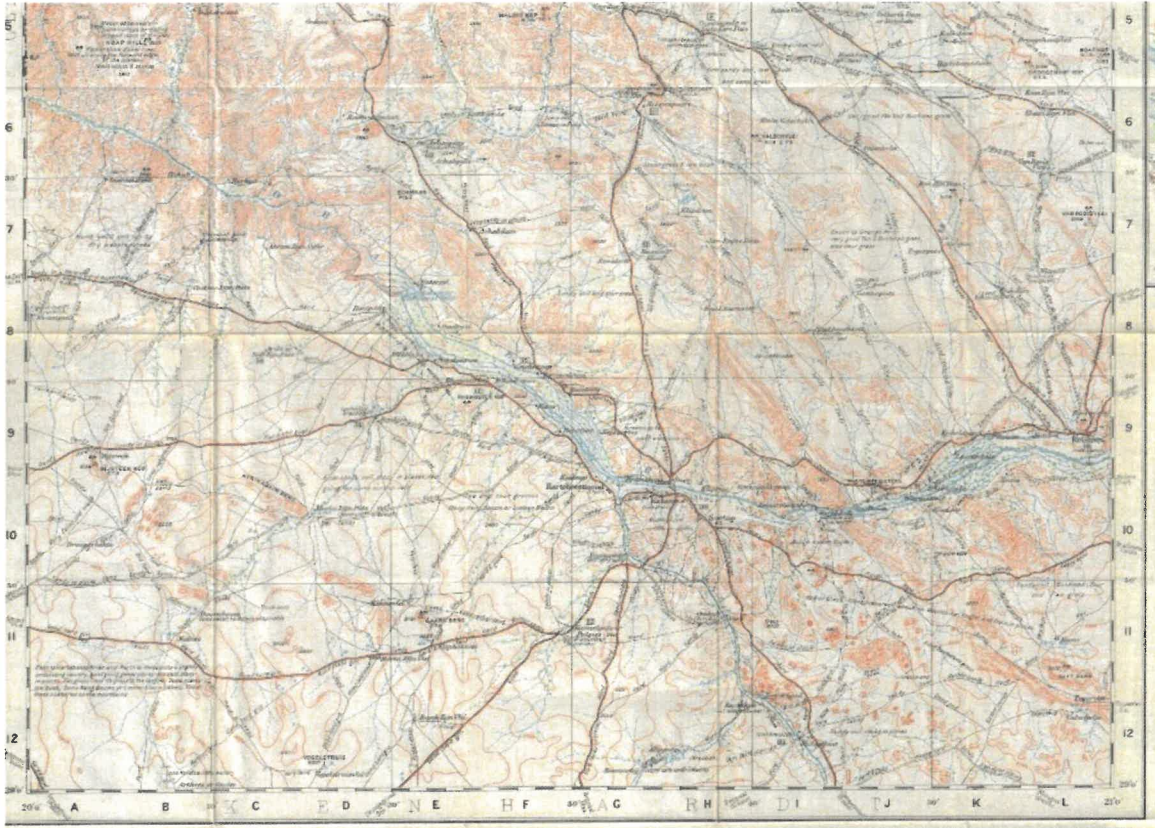


Figure 4 Imperial Map of Kakamas and surrounds. Image from UCT digital collections, <https://digitalcollections.lib.uct.ac.za/>

5.2 Local: Alheit, Plot 2372 and surrounds

Unfortunately, little is known about the early history of the farm Alheit 2372. However, the history of Kakamas may provide some insight into the area's history.

The town of Kakamas was laid out in 1931 and attained full municipal status in 1964 (Van Schalkwyk 2013). The name Kakamas originated with the Einiqua. However, there are several theories about the meaning of the word:

- *Bad Grazing*: before the canals and irrigation schemes were developed, the area was notorious for its poor grazing pastures.
- *Angry/Charging Cow/Chasing Cows*: this may derive from the Korana word kagamas, which could have become associated with the place because the river banks nearby had sloping banks making it an easy crossing place for cattle herds. Most herds were reluctant to enter the river and would turn on their herders.
- *Thakemas, meaning drink place*. This would refer to the ease with which livestock could be herded to the area to drink
- *Swimming water*: Possibly the San word given to the place because it was possible to swim across the river at this point (De Jong 2010).

The Kakamas area's water-related infrastructure was essential for agricultural development. Several water wheels, excavated tunnels and irrigation furrows have been declared Provincial Heritage Sites. The hand-dug tunnels were remarkable engineering feats of the early 20th century (Orton 2012). The town of Kakamas originated out of an irrigation scheme established by the community in 1898 for farmers that were left destitute by severe drought (1895-1897). Led by Rev. Schroder, the irrigation scheme included canals dug by hand, beginning at the upper end of Neus Island (Hopkins 1978; Van Vuuren 2011). The development of canal systems played an essential role in irrigating extensive vineyards and orchards within the region and developing substantial agricultural initiatives.

The Kakamas settlement is also known for its pioneering development of a hydroelectric power generator, brought into operation in 1924 (Hopkins 1978). The building, which housed the old transformer in Voortrekker Street, was earmarked as a museum (SAHRA database).

De Jong (2010) classifies the cultural landscape of Kakamas as predominantly historic farmland. The affected area comprises working (operating) irrigation and grazing farms in a typical Lower Orange River environment. These farms display heritage features typically occurring in the district, such as the large size, irrigation furrows and pipelines, fences, tracks, farmsteads, and irrigated fields. In addition, farmsteads are clustered close to rivers and primary roads (De Jong 2010). According to De Jong (2010), this landscape class is of relatively low heritage sensitivity because it can absorb the adverse effects of new development through some mitigation.



6. HERITAGE SENSITIVITY

The Heritage Screening tool (<https://screening.environment.gov.za/>) shows low to medium significance with locations of high sensitivity towards the east, north and northeast of the proposed project area.

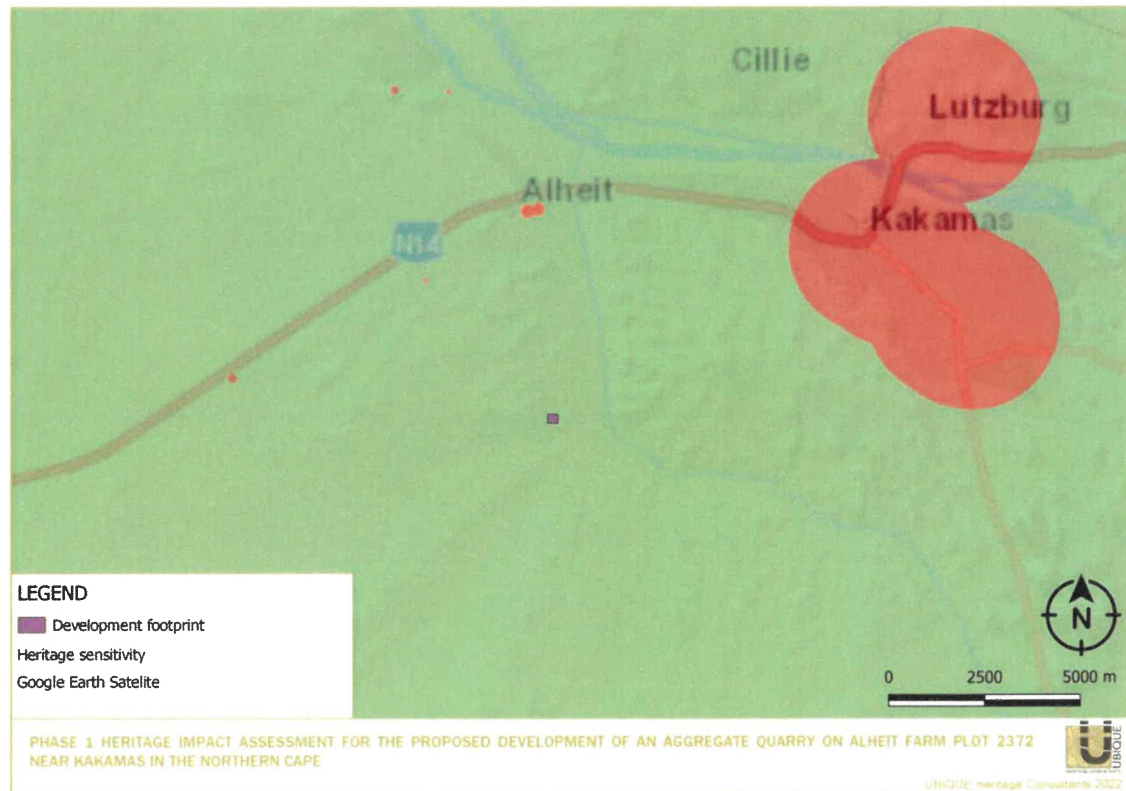


Figure 5 The Project area indicated on the Heritage Screening tool (<https://screening.environment.gov.za/>)

6.1 Summary of Local Heritage Resources: Spes Bona 2355 and surrounds

The desktop study revealed that Impact Assessments had been done on 2372 and in the Kakamas region. Some of the assessments reported on cultural material and features relating to the Stone Age and the Historical/Colonial era (e.g. ACRM 2016; 2017; Beaumont 2008a & b; Engelbrecht & Fivaz 2018; 2019a; Fivaz & Engelbrecht 2019; 2021a & b; Kaplan 2012a; 2016; 2017; Morris 2010; 2017b; Orton 2013; Rossouw 2021; Van Schalkwyk 2011; 2013; 2014).

6.1.1 Stone Age

Numerous reports in and around the current study area have reported on lithics, dating from the ESA, MSA and LSA.

STONE AGE RESOURCES RECORDED IN A 50 KM RADIUS			
HIA/AIA	SITE	COORDINATES	HERITAGE RESOURCES
		PROXIMITY TO STUDY AREA	
Engelbrecht & Fivaz 2019 a	Plot 2372: 1	28° 47.770' S 20° 32.435' E Approx. 1km N	ESA/MSA Chunks
Engelbrecht & Fivaz 2019 a	Plot 2372: 2	28° 47.852' S 20° 32.286' E Approx. 900m NW	ESA/MSA Flake and chunk
Engelbrecht & Fivaz 2019 a	Plot 2372: 3	28° 48.072' S 20° 32.500' E Approx. 420 m N	ESA/MSA Chunk
Engelbrecht & Fivaz 2019 a	Plot 1763: 6	28° 49.037' S 20° 33.761' E 2.4km SE	MSA/Early LSA/LSA: Chunk/Debris
Engelbrecht & Fivaz 2019 a	Plot 1763: 7	28° 49.026' S 20° 33.699' E 2.3km SE	LSA: Local ceramic sherd.
Engelbrecht & Fivaz 2019 a	Plot 1763: 8	28° 49.029' S 20° 33.690' E 2.3km SE	ESA to early LSA: Debris, scraper, chunks, cores, chips and flakes.
Engelbrecht & Fivaz 2019 a	Plot 1763: 9	28° 49.015' S 20° 33.688' E 2.3km SE	LSA/Historical: Stone kraal feature.
Engelbrecht & Fivaz 2019 a	Plot 1763: 10	28° 48.985' S 20° 33.687' E 2.2km SE	MSA/ Early LSA: Scrapers, cores, blades, chips and flakes.
Engelbrecht & Fivaz 2019 a	Plot 1763: 11	28° 49.011' S	LSA: Local ceramic sherd.

STONE AGE RESOURCES RECORDED IN A 50 KM RADIUS

HIA/AIA	SITE	COORDINATES		HERITAGE RESOURCES
		PROXIMITY TO STUDY AREA		
		20° 33.743' E	2.4km SE	
Morris 2017b	1	-28°49'16.4"	5.5km SE	Quartz & jaspilite flakes, potsherd
		20°35'40.9"		
Morris 2017b	2	-28° 49'16.4"	5.5km SE	Quartz & jaspilite flakes, potsherd
		20 ° 35'40.5"		
Morris 2017b	3	-28° 49'16.6"	5.4km SE	Shelter inside of cliff with OES, quartz flakes
		20 ° 35'40.7"		
Morris 2017b	4	-28° 49'11.5"	5.2km SE	Jaspilite flakes near sheltering rock
		20 ° 35'29.7"		
Morris 2017b	5	-28° 49'11.9"	2.17km SE	Quartz and jaspilite flakes near sheltering rocks
		20 ° 35'31.2"		
Van Schaikwyk 2014	1	-28° 44'18.53"S	7.9km NNW	MSA Cores, flakes and unspecific tools (probably all scrapers) were identified.
		20° 31'1.60"E		
Beaumont 2008b	Portions on Farm Alheit	Approx. 28° 45'49.60"S	5.3km NW	Undiagnostic irregular flakes and cores, a handaxe, and a blade, two smaller irregular flakes LSA
		20° 31'5.00"E		
Van Schaikwyk 2011		Approx. 28° 45'41.44"S	6.4km NE	Low density of MSA stone tools
		20° 35'0.06"E		
Van Schaikwyk 2013	1 and; 2	-28.67743 20.43248; -28.67964		MSA stone tools: Cores, flakes and unspecific tools (probably all scrapers) were identified

STONE AGE RESOURCES RECORDED IN A 50 KM RADIUS

HIA/AIA	SITE	COORDINATES		HERITAGE RESOURCES
		PROXIMITY TO STUDY AREA		
		20.43486		
		Approx. 17.7km NW		
	Zwartbooisberg farm	Approx. 28.76720° S		MSA tools and flakes
Morris 2010		20.73694° E;		
		28.76684° S		
		20.73851° E;		
		28.76804° S		
		20.74179° E		
		Approx. 20km ENE		
Kaplan 2012a	001	S28 47.127		Round quartz core
		E20 36.484		
		6.8km NE		
Kaplan 2012a	002	S28 47.094		Indurated shale blade (MSA)
		E20 36.437		
		6.8km NE		
Kaplan 2012a	003	S28 47.025		Pink quartz chunk
		E20 36.437		
		6.8km NE		
Kaplan 2012a	004	S28 47.095		Snapped/broken utilized chunk & weathered
		E20 36.428		flake
		6.8km NE		
Kaplan 2012a	005	S28 47.101		Large round quartzite hammerstone
		E20 36.438		
		6.8km NE		
Kaplan 2012a	006	S28 47.123		Weathered retouched and utilized MSA
		E20 36.436		flake
		6.7km NE		blade
Kaplan 2012a	007	S28 47.131		Utilized, retouched cortex chunk/min core



STONE AGE RESOURCES RECORDED IN A 50 KM RADIUS

HIA/AIA	SITE	COORDINATES		HERITAGE RESOURCES
		PROXIMITY TO STUDY AREA		
		E20 36.423		
		6.7km NE		
Kaplan 2012a	008	S28 47.159		MRP/scrapper?
		E20 36.430		
		6.7km NE		
Kaplan 2012a	009	S28 47.172		Quartz chunk
		E20 36.426		
		6.7km NE		
Kaplan 2012a	010	S28 47.160		Weathered indurated shale chunk
		E20 36.436		
		6.7km NE		
Kaplan 2012a	011	S28 47.397		Round core
		E20 36.425		
		6.6km NE		
Kaplan 2012a	012	S28 47.240		Flat pink quartz (convex?) scrapper
		E20 36.431		
		6.7km NE		
Kaplan 2012a	013	S28 47.311		Butt end of broken flake
		E20 36.424		
		6.6km NE		
Kaplan 2012a	014	S28 47.314		Weathered flaked chunk
		E20 36.426		
		6.6km NE		
Kaplan 2012a	015	S28 47.404		Weathered cobble chunk/cortex
		E20 36.426		
		6.6km NE		
Kaplan 2012a	016	S28 47 441		Cobble core
		E20 36.427		
		6.5km NE		

STONE AGE RESOURCES RECORDED IN A 50 KM RADIUS

HIA/AIA	SITE	COORDINATES		HERITAGE RESOURCES
		PROXIMITY TO STUDY AREA		
Kaplan 2012a	017	S28 47.251 E20 36.402	6.6km NE	Large flake and weathered indurated shale core
Kaplan 2012a	018	S28 47.179 E20 36.371	6.6km NE	Utilised & misc. retouched flake
Kaplan 2012a	019	S28 47.233 E20 36.388	6.6km NE	MSA flake
Kaplan 2012a	020	S28 47.295 E20 36.411	6.6km NE	Snapped quartzite flake blade (MSA?)
Kaplan 2012a	021	S28 47.300 E20 36.419	6.6km NE	Parallel flaked chunk/core
Kaplan 2012a	022	S28 47.318 E20 36.410	6.6km NE	Pink quartz (core?)
Kaplan 2012a	023	S28 47.360 E20 36.405	6.6km NE	Chunk
Kaplan 2012a	024	S28 47.405 E20 36.413	6.6km NE	Chunky silcrete MSA flake
Kaplan 2012a	025	S28 47.383 E20 36.360	6.5km NE	Weathered cobble/chunk
Kaplan 2012a	026	S28 47.335 E20 36.346		Burnished side scraper

STONE AGE RESOURCES RECORDED IN A 50 KM RADIUS

HIA/AIA	SITE	COORDINATES		HERITAGE RESOURCES
		PROXIMITY TO STUDY AREA		
		6.5km NE		
Kaplan 2012a	027	S28 47.334	E20 36.342	Large quartz chunk
		6.5km NE		
Kaplan 2012a	028	S28 47.333	E20 36.318	Weathered cobble
		6.4km NE		
Kaplan 2012a	029	S28 47.348	E20 36.312	Pointed side retouched MSA flake
		6.4km NE		
Kaplan 2012a	030	S28 47.427	E20 36.336	Flat retouched/utilized flake
		6.4km NE		
Kaplan 2012a	031	S28 47.404	E20 36.304	Retouched flake & chunk/min core
		6.4km NE		
Kaplan 2012a	032	S28 47.324	E20 36.316	Snapped MSA double sided retouched quartzite flake
		6.4km NE		
Kaplan 2012a	033	S28 47.242	E20 36.364	Chunky silcrete MSA flake
		6.6km NE		
Kaplan 2012a	034	S28 47.307	E20 36.361	Large round quartz core
		6.5km NE		
Kaplan 2012a	035	S28 47.326	E20 36.298	Large chunky MSA quartzite flake/blade
		6.4km NE		
Kaplan 2012a	036	S28 47.385		Large silcrete chunk

STONE AGE RESOURCES RECORDED IN A 50 KM RADIUS

HIA/AIA	SITE	COORDINATES		HERITAGE RESOURCES
		PROXIMITY TO STUDY AREA		
		E20 36.292		
		6.4km NE		
Kaplan 2012a	037	S28 47.327		Weathered and chunky quartzite MSA flake
		E20 36.290		
		6.4km NE		
Kaplan 2012a	038	S28 47.318		MSA flake
		E20 36.270		
		6.4km NE		
Kaplan 2012a	039	S28 47.344		Split quartzite cobble flake
		E20 36.218		
		6.3km NE		
Kaplan 2012a	040	S28 47.283		Triangular shaped MSA pointed flake with retouched tip
		E20 36.251		
		6.4km NE		
Kaplan 2012a	041	S28 47.232		Cobble core
		E20 36.425		
		6.7km NE		
Morris 2011		28.79607° S,		MSA artefacts
		20.71797° E		
		17.3km E		
Fivaz & Engelbrecht 2019	RZB004	29° 03' 02.3" S		LSA flakes/debris
		20° 49'48.9" E		
		40km SE		
Fivaz & Engelbrecht 2019	RZB005	29° 02' 58.2" S		LSA chips and debris
		20° 49'54.4" E		
		39km SE		
Fivaz & Engelbrecht 2019	RZB001	29° 03' 14.4" S		MSA scraper
		20° 50' 16.0" E		
		40km SE		

STONE AGE RESOURCES RECORDED IN A 50 KM RADIUS

HIA/AIA	SITE	COORDINATES	HERITAGE RESOURCES
		PROXIMITY TO STUDY AREA	
Fivaz & Engelbrecht 2019	RZB002	29° 03' 16.5" S 20° 50' 11.8" E 40km SE	LSA scraper
Fivaz & Engelbrecht 2019	RZB003	29° 03' 12.4" S 20° 50' 07.5" E 39.8km SE	LSA Flake
Fivaz & Engelbrecht 2019	RZB011	29° 04' 06.9" S 20° 51'19.6" E 42.5km SE	LSA Bladelet
Fivaz & Engelbrecht 2019	RZB009	29° 04' 37.8" S 20° 50'57.5" E 42.7km SE	LSA Chips and scraper
Fivaz & Engelbrecht 2019	RZB010	29° 04' 40.0" S 20° 50'54.8" E 42.5km SE	LSA Notched scrapers
ACRM 2017	6691-7711	General area: S28° 41.445' E20° 26.729' 15.9km NW	Various MSA and LSA tools and flakes recorded
ACRM 2016	Renosterkop 1726 815-1007	General area: S28° 40.881' E20° 27.249' 16.2km NW	Stone Age and MSA material recorded in the general area
ACRM 2016	888 896	S28° 40.795' E20° 27.336'; S28° 40.726' E20° 27.130' Approx. 16.5km NW	OES fragments



STONE AGE RESOURCES RECORDED IN A 50 KM RADIUS

HIA/AIA	SITE	COORDINATES		HERITAGE RESOURCES
		PROXIMITY TO STUDY AREA		
Fivaz & Engelbrecht 2021 a	BKR001	28° 37' 18.6" S		MSA/Early LSA: Chunks, chips, one bladelet and possible scrapers.
	Plot 106	20° 27' 49.5" E		
		21km NW		
Fivaz & Engelbrecht 2021 b	PT337/001	28° 37' 41.7" S		MSA/Early LSA: Core/chunk and possible bladelet
	Plot 337	20° 27' 16.1" E		
		21km NW		
Fivaz & Engelbrecht 2021 b	PT337/002	28° 37' 30.6" S		MSA/Early LSA Core/chunk
	Plot 337	20° 27' 40.2" E		
		21km NW		
Fivaz & Engelbrecht 2021 b	PT337/003	28° 37' 21.8" S		MSA/Early LSA Chips, chunks, points and flakes
	Plot 337	20° 27' 32.5" E		
		21.5km NW		
Fivaz & Engelbrecht 2021 b	PT337/004	28° 37' 17.8" S		MSA/Early LSA Upper grinder
	Plot 337	20° 27' 41.5" E		
		21km NW		
Fivaz & Engelbrecht 2021 b	PT396/007	28° 36' 48.5" S		MSA/Early LSA Small core/chunk
	Plot 396	20° 26' 30.7" E		
		23km NW		
Fivaz & Engelbrecht 2021 b	PT396/009	28° 37' 04.2" S		MSA/Early LSA Core/chunk, upper grinder and possible chisel/ hammer
	Plot 396	20° 26' 07.8" E		
		22.9km NW		
Fivaz & Engelbrecht 2021 b	PT396/010	28° 37' 01.3" S		MSA/Early LSA Flakes, chips and possible points
	Plot 396	20° 26' 28.4" E		
		22.6km NW		
Orton 2013	001	S 28 45 55.5		Scatter of about twelve stone artefacts on banded ironstone. These included a few cores and one blade.
		E 20 44 02.3		
		19.4km NE		
Orton 2013	002	S 28 45 54.9		Occasional quartz artefacts within a dense scatter of natural quartz.
		E 20 44 02.9		

STONE AGE RESOURCES RECORDED IN A 50 KM RADIUS

HIA/AIA	SITE	COORDINATES		HERITAGE RESOURCES
		PROXIMITY TO STUDY AREA		
			19.3km NE	
Orton 2013	003	S 28 45 52.8 E 20 44 04.1		An MSA core and blade on banded ironstone were also found on one of the spoil heaps.
			19.3km NE	
Orton 2013	004	S 28 45 52.3 E 20 44 03.1		Possible/probable upper grindstone fragment.
			19.3km NE	
Van Schaikwyk 2010	Farm Kakamas North	Approx. -28.62096 20.43494		Stone tools, flakes and cores
			23km NW	
Engelbrecht & Fivaz 2018	1	28° 46' 02.4" S 20° 35' 12.4" E		LSA/MSA Two possible retouched flakes. Two lithics in a 0.5 m ² area were found in dry riverine.
			6km NE	
Engelbrecht & Fivaz 2018	2	28° 45' 59.7" S 20° 35' 15.4" E		LSA/MSA Banded ironstone core. One lithic in 0.5 m ² area, found in dry riverine.
			6.1km NE	
Engelbrecht & Fivaz 2018	3	28° 45' 47.4" S 20° 35' 13.0" E		LSA/MSA Possible retouched flake. One lithic in 0.5 m ² area, found in dry riverine close to the northern border of the study area.
			6.4km NE	
Engelbrecht & Fivaz 2018	4	28° 45' 58.9" S 20° 35' 15.1" E		LSA/MSA Lithics with scraper. Three lithics in 0.5 m ² area, found in dry riverine close to dolerite outcrop.
			6.1km NE	
Engelbrecht & Fivaz 2018	5	28° 46' 00.5" S 20° 35' 14.1" E		LSA/MSA Flake. One lithic in 0.5 m ² area, found in dry riverine.
			6.1km NE	
Engelbrecht & Fivaz 2018	6	28° 46' 00.9" S 20° 35' 14.7" E		LSA/MSA Possible banded ironstone concave side scraper. One lithic in 0.5 m ² area, found in dry riverine.
Engelbrecht & Fivaz 2018	7	28° 45' 58.7" S		

STONE AGE RESOURCES RECORDED IN A 50 KM RADIUS

HIA/AIA	SITE	COORDINATES	HERITAGE RESOURCES
		PROXIMITY TO STUDY AREA	
		20° 35' 14.8" E 6km NNE	LSA/MSA Collection of lithics collected in an area of approximately 100 m ² area in close proximity to dolerite outcrop.
Engelbrecht & Fivaz 2018	8	28° 45' 58.1" S 20° 35' 14.7" E 6.2km NNE	LSA/MSA Possible retouched banded ironstone flake. One lithic in 0.5 m ² area near dolerite outcrop.

6.1.2 Rock Art

Several rock art sites have been documented on the SAHRA Database in the Northern Cape Province. No sites have, however, been recorded in the Kakamas region. Instead, rock art sites have been recorded at Augrabies. The closest rock art sites are located (approximately 45km) northwest of the proposed development area.

HERITAGE SITES IN AND AROUND BLOEMFONTEIN DOCUMENTED ON THE SAHRA DATABASE:

Site/Object Name	Coordinates	Site type	Site Reference	Site ID
Augrabies sites RVM19 historical engravings	-28.464711, 20.287494	Rock Art	RVM19	93896
Augrabies sites RVM3 LSA engravings	-28.395425, 20.386838	Rock Art	RVM3	93893

6.1.3 Iron Age

No Iron Age Sites were reported in the consulted HIA/AIAs

6.1.4 Historical/Colonial period

Very few impact assessments were reported on cultural material and sites associated with the Historical/Colonial Period. This is because the cultural landscape of Kakamas is predominantly historic farmland.

HISTORICAL PERIOD RESOURCES RECORDED IN 50 KM RADIUS

HIA/AIA	SITE	COORDINATES		HERITAGE RESOURCES
		PROXIMITY TO STUDY AREA		
Engelbrecht & Fivaz 2019 a	Plot 2372: 4	28° 48.236' S	1850 – 1920: Surface scatter Hole-in-cap tin lid with lead solder	
		20° 32.957' E		
		700m ENE		
Engelbrecht & Fivaz 2019 a	Plot 2372: 5	28° 47.781' S	1850 – 1920: Surface scatter: Tin can with folded/ crimped hand soldered seam (1850-1880s) and cast-iron pot sherds, one piece with leg.	
		20° 32.440' E		
		900m N		
Engelbrecht & Fivaz 2019 a	Plot 1763: 12	28° 49.031' S	Historical: Surface scatter Cast iron pot sherd.	
		20° 33.759' E		
		2.4km SE		
Engelbrecht & Fivaz 2019 a	Plot 1763: 13	28° 49.026' S	Surface scatter: Broken horse shoe, green and weathered clear glass, white ware ceramics, tin can with folded/ crimped hand soldered seam (1850-1880s).	
		20° 33.699' E		
		2.3km SE		
Engelbrecht & Fivaz 2019 a	Plot 1763: 14	28° 49.055' S	Undetermined: High density surface scatter. Glass, green and weathered clear	
		20° 33.776' E		
		2.4km SE		
Kaplan 2017	Erf 1731: 3901	S28° 46.642'	Retouched quartzite flake/chunk	
		E20° 30.718'		
		4.3km NW		
Kaplan 2017	Erf 1731: 3921	S28° 46.609'	Banded ironstone misc. retouched/utilized MSA flake	
		E20° 30.700'		
		4.3km NW		
Kaplan 2017	Erf 1731: 3931	S28° 46.541'	Edge retouched quartzite chunk (cortex)	
		E20° 30.737'		
		4.4km NW		
Kaplan 2017	Erf 1731: 3991	S28° 46.657'	Banded ironstone utilized side struck cortex blade – tip broken	
		E20° 30.744'		
		4.2km NW		
Kaplan 2016	Erf 1612	S28° 46.731'	One banded ironstone core/chunk	
		E20° 36.725'		

HISTORICAL PERIOD RESOURCES RECORDED IN 50 KM RADIUS

HIA/AIA	SITE	COORDINATES		HERITAGE RESOURCES
		PROXIMITY TO STUDY AREA		
			7.4km NE	
Kaplan 2016	Erf 1612	S28° 46.731'	E20° 36.778'	Weathered jasperlite flake
			7.5km NE	
Morris 2010	Zwartbooisberg farm	28.76717° S	20.73735° E,	Earlier twentieth century glass
		28.76691° S	20.73866° E	
			19.6km ENE	
Morris 2010	Zwartbooisberg farm			Cement and packed stone strengthening of the old canal. At one point the initials and date "AJK 19-2-1941" are inscribed in the cement.
Morris 2010	Zwartbooisberg farm	General area:		a foundation of cement, either relating to the canal itself or some farming activity, estimated to be of mid-twentieth-century age.
		28.77057° S	20.72835° E	
			18.6km NE	Material found near a midden such as metal and bone
Fivaz & Engelbrecht 2019	RZB006	29° 03' 44.8" S	20° 50'46.7" E	1905-1920 Interlocking machine soldered tin with trademarks (Bourneville Cadbury's England)
			41km SE	
Fivaz & Engelbrecht 2019	RZB007	29° 03' 43.9" S	20° 50'44.5" E	ca. early 1900s
			41km SE	Historical fuel/oil tin with machine soldered seems with trademarks
Fivaz & Engelbrecht 2019	RZB008	29° 03' 43.7" S	20° 50'44.3" E	ca 1860-1900s
			41km SE	Historical green liquor bottle, partial base of bottle
Fivaz & Engelbrecht 2019	RZB012	29° 03' 43.7" S	20° 50'44.3" E	ca. 1880>
			41km SE	Historical fired shotgun cartridge, metal casing 12 BR.

HISTORICAL PERIOD RESOURCES RECORDED IN 50 KM RADIUS				
HIA/AIA	SITE	COORDINATES		HERITAGE RESOURCES
		PROXIMITY TO STUDY AREA		
Orton 2013	003	S 28 45 52.8		Small-scale quarry into bedrock of unknown (but almost certainly 20th century) age. One part has an informal drystone wall to hold up the sediments and several piles of river pebbles occur around the excavations.
		E 20 44 04.1		
		19.4km NE		

Just outside the town of Kakamas North on Lot 189 is a monument commemorating First World War German troops killed in a battle against South African Union forces on the 4th of February 1915 on this site. Union troops assembled near Upington to launch an attack on German South West Africa, while the German forces prepared an attack on Kakamas. A heavy battle ensued between two unevenly matched forces at Kakamas, resulting in seven dead, six wounded and sixteen prisoners of war amongst the Germans. The memorial was erected by the 'Volksbund Deutschen Kriegs-graberflrsorge' (SAHRA database).

The Kakamas area has numerous National and provincial Monuments, ranging from buildings, battlefields, monuments, memorials, and burial grounds, all of which are listed in this table below, which can also be found on the SAHRA Database:

HERITAGE SITES IN AND AROUND KAKAMAAS DOCUMENTED ON THE SAHRA DATABASE:						
Site/Object Name	Coordinates	Archive Status	Declaration Type	Site type	Site Reference	Site ID
North Furrow, Kakamas, Gordonia District	-28.785592 20.639647	National monument	Provincial Heritage Site	Building	9/2/032/0005	28797
Battlefield, Kakamas, Gordonia District	-28.742640 20.635730	National monument	Provincial Heritage Site	Battlefield	9/2/032/0006	28798
Water wheel, near DR Church Parsonage, South Furrow, Kakamas	-28.772950 20.622203	National monument	Provincial Heritage Site	Building	9/2/032/0008	28799
Water wheel No. 2, Plot 103, South Furrow, Kakamas	-28.783353 20.635208	National monument	Provincial Heritage Site	Building	9/2/032/0009/ 001	28793
Water Wheel No. 1, Plot 103, South Furrow, Kakamas	-28.783504 20.635524	National monument	Provincial Heritage Site	Building	9/2/032/0009/ 004	28794
Water wheel, Plot 1057, North Furrow, Kakamas	-28.785597 20.640039	National monument	Provincial Heritage Site	Building	9/2/032/0009/ 005	28792

HERITAGE SITES IN AND AROUND KAKAMAAS DOCUMENTED ON THE SAHRA DATABASE:

Site/Object Name	Coordinates	Archive Status	Declaration Type	Site type	Site Reference	Site ID
Water wheel, Plot 68, North Furrow, Kakamas	-28.785335 20.638437	National monument	Provincial Heritage Site	Building	9/2/032/0009/006	28791
Water Wheel, Plot 1467, South Furrow, Kakamas	-28.783988 20.636358	National monument	Provincial Heritage Site	Building	9/2/032/0009/009	28788
Kakamas Museum, Voortrekker Street, Kakamas	-28.770215 20.617134	National monument	Provincial Heritage Site	Building	9/2/032/0010	28789
Kakamas Memorial, Kakamas Battlefield, Kakamas	-28.743329, 20.635730			Monuments & Memorials, Burial Grounds & Graves	DC8/NAMM/0010	137912
Kakamas Perskeboom Monument, Kakamas Library, Kakamas	-28.773816, 20.622187			Monuments & Memorials	DC8/NAMM/0011	136310
Kakamas Suid 01	-28.762890, 20.535580			Burial Grounds & Graves	KAKA01	44550
Kakamas Suid 02	-28.762510, 20.538010			Burial Grounds & Graves	KAKA02	44551

6.1.5 Graves/Burials

Several graves were recorded in the area around the development footprint.

GRAVES/BURIALS RECORDED IN 10 KM RADIUS

HIA/AIA	SITE	COORDINATES		HERITAGE RESOURCES	
		PROXIMITY TO STUDY AREA			
Van Schaikwyk 2013a	Kakamas Suid 28	28° 45'46.40"S	20° 32'8.09"E	Two large community cemeteries	
		28° 45'45.04"S	20° 32'16.84"E		
	Lutzburg cemetery	4.8km N	28° 44'36.31"S	20° 38'8.55"E	Small military graveyard and declared heritage site: commemorates several German soldiers who were killed in a battle against a force of the Union of South Africa, which took place here on the 4th February 1915
		11.5km NE	28° 30' 21.5" S,	20° 10' 45.9" E	
Rossouw 2021					
Beaumont 2008a				Graveyard with approximately 50-60 burials	

GRAVES/BURIALS RECORDED IN 10 KM RADIUS

HIA/AIA	SITE	COORDINATES		HERITAGE RESOURCES
		PROXIMITY TO STUDY AREA		
		48.5km NW		
	891	S28° 40.726'		Grave
ACRM 2016		E20° 27.130'		
		16.6km NW		



7. IDENTIFIED RESOURCES AND HERITAGE ASSESSMENT

7.1 Surveyed area

The area surveyed for the impact assessment was dictated by the Google Earth map of the development footprints provided by the client. The proposed development area was surveyed by vehicle and on foot. The pedestrian survey was conducted in predominantly 30-50 m transects.

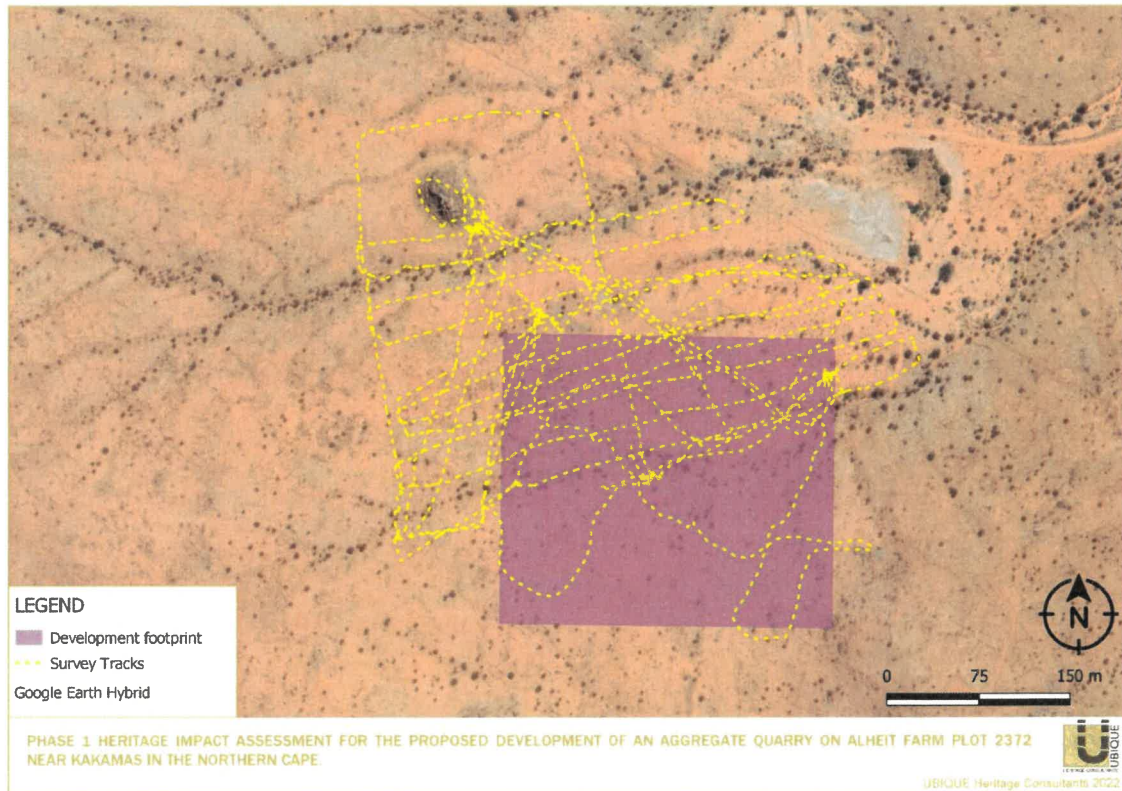


Figure 6 Survey tracks across the development footprint.

7.2 Description of the affected environment

The development area falls within the Bushmanland Arid Grassland vegetation type, with Lower Gariep Broken Veld and Lower Gariep Alluvial Vegetation. Irregular plains characterise the Bushmanland Arid Grassland with slightly sloping plateaus that are sparsely vegetated by grassland dominated by white grasses (*Stipagrostis* species). This gives the vegetation type the appearance of a semidesert steppe. The vegetation structure is also often altered in places where low shrubs of *Salsola* are present (Mucina & Rutherford 2006).

According to Mucina and Rutherford (2006), Bushmanland Aris Grassland's soils are mainly red-yellow apedal soils, and the geology is characterised by recent (quaternary) Alluvium and calcrete, which makes up a third of the area. Superficial deposits of the Kalahari Group can also be found in the east. The terrain can be characterised by klipveld with rocky outcrops, with a slight fall in elevation towards the east (Downhill). Granite, Quartzite, Quartz and Calcrete are present. The vegetation noted includes *Acacia erioloba* (Camelthorn), *Acacia mellifera* (Black thorn acacia), *Aizoon schellenbergii* (Skaapbossie), *Aloe argenteicauda*, *Boscia albitrunca* (Grootwitgatboom), *Boscia foetida* (Stinkwitgat), *Enneapogon cenchroides* (Vaalsuurgras), *Rhigozum trichotomum* (Three-thorn), *Stipagrostis ciliate* (Tall bushman grass), *Stipagrostis namaquensis* (River bushman grass), *Eragrostis chloromelas* (Curly leaf).

A dry riverine flows from the west to the east, almost centrally through the site. Although some minor natural erosion is present, the dry riverine caused a shallow furrow/riverbed through the site from west to east. In addition, the very rocky surface prevented the natural displacement of topsoil.



Figure 7 Indication of the vegetation types in and around the study area (namely Lower Gariiep Broken Veld, Lower Gariiep Alluvial Vegetation; Kalahari Karroid Shrubland; *Gordonia* Duneveld; and Bushmanland arid Grassland).

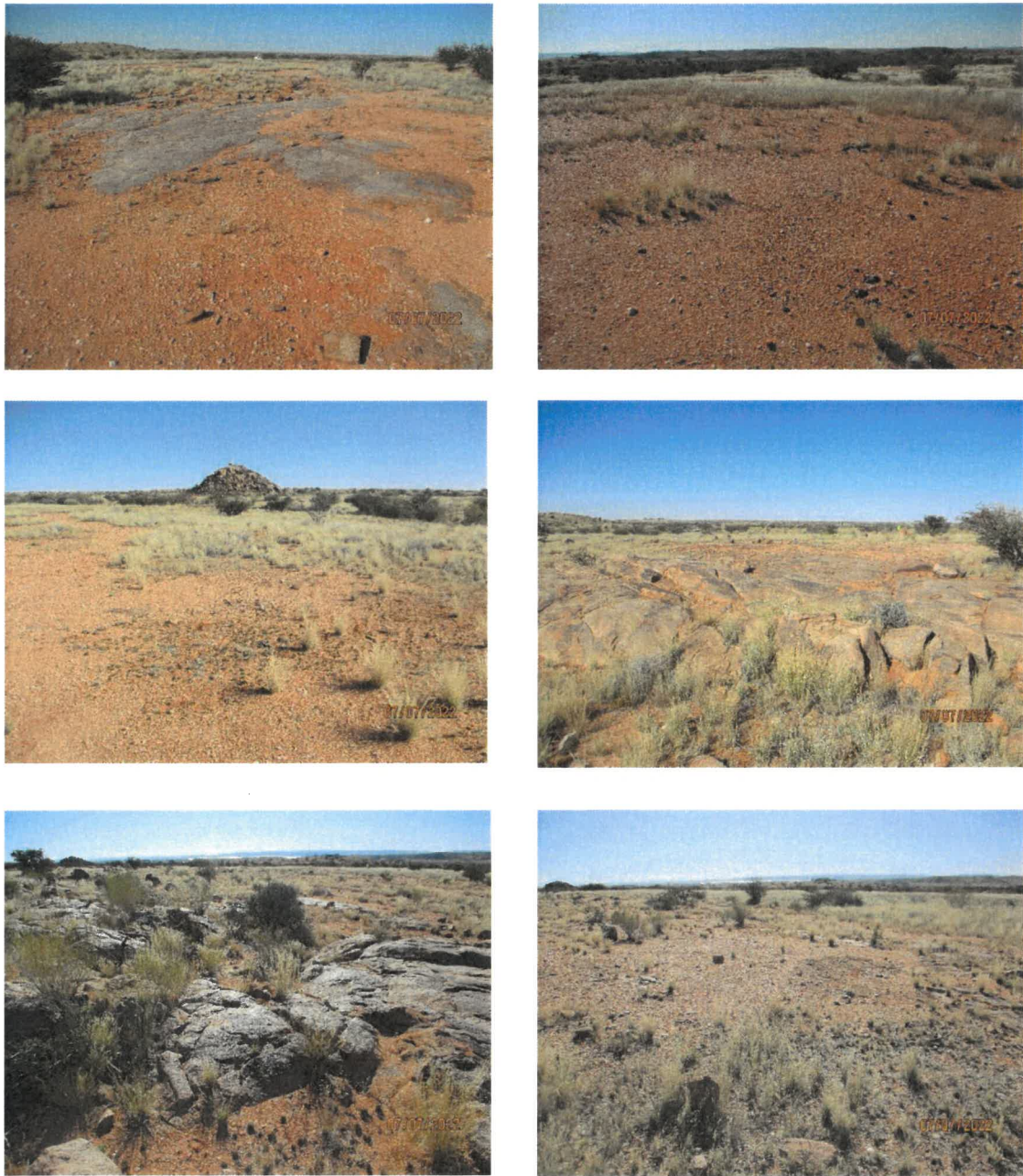


Figure 8 Views of the affected development area.

7.3 Identified heritage resources

7.3.1. Stone Age Identified

STONE AGE RESOURCES IDENTIFIED					
SITE ID #	DESCRIPTION		PERIOD	LOCATION	FIELD RATING/ SIGNIFICANCE/ RECOMMENDED MITIGATION
AP-003	Type lithic/s	Flakes, chips, chunks and blade	MSA/ Early LSA	28° 48' 14.5" S 20° 32' 25.0" E	Field Rating IV C
	Raw material	BIF			Low significance
	N in m ² .	8/20m ²			No Mitigation Required
	Context	Surface scatter in context with outcrop			
	Additional	Outcrop possible temporary occupation location where knapping took place.			
AP-004	Type lithic/s	Chips, flakes and chunks	MSA/ Early LSA	28° 48' 17.9" S 20° 32' 34.3" E	Field Rating IV C
	Raw material	BIF			Low significance
	N in m ² .	12/50m ²			No Mitigation
	Context	Surface scatter. No context			
	Additional	Possible alluvial displacement from outcrop to current location.			

7.3.2. Historical/Recent resources Identified

HISTORICAL/RECENT RESOURCES IDENTIFIED					
SITE ID #	DESCRIPTION		PERIOD	LOCATION	FIELD RATING/ SIGNIFICANCE/ RECOMMENDED MITIGATION
AP-002	Type of feature	Tin Can	Mid 20th century	28° 48' 16.7" S 20° 32' 26.6" E	Field Rating IV C
	Material	Tin can/metal			Low significance
	N in m ² .	1/5000m ²			No Mitigation Required
	Context	No context. Random surface find			
	Additional	Canned food			

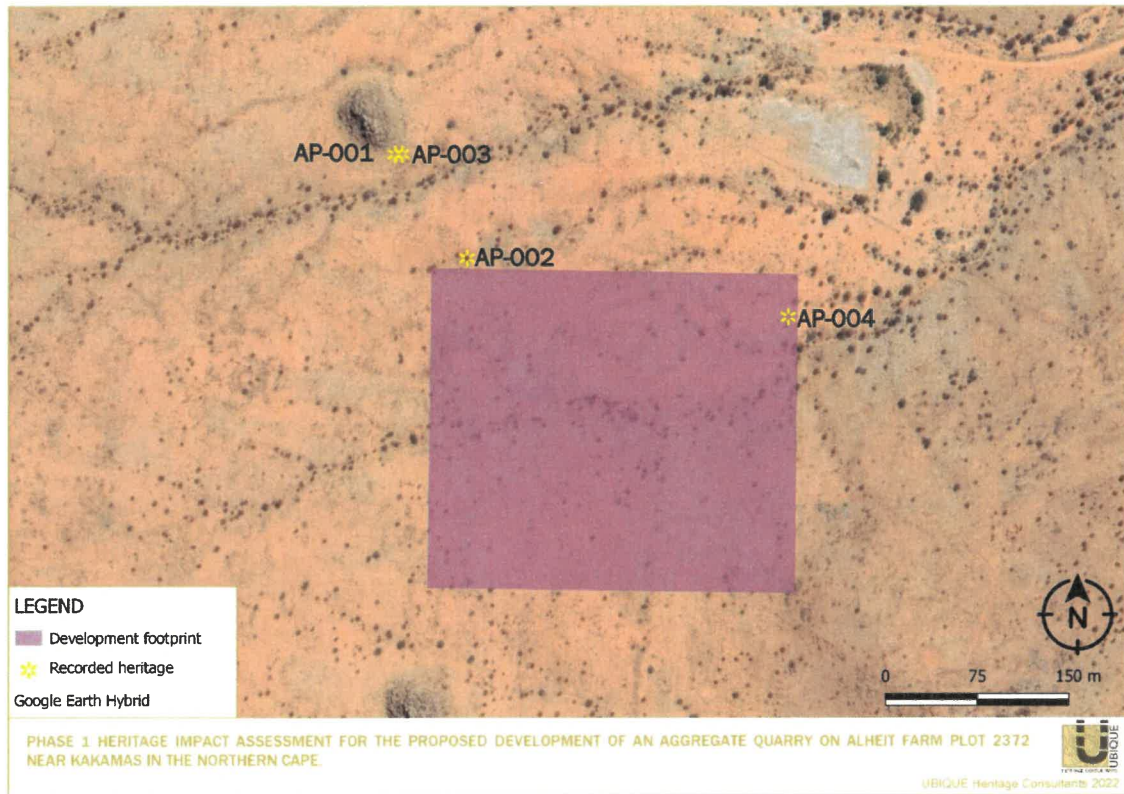


Figure 9 Distribution of identified heritage resources, at Alheit, Plot 2372

7.4 Discussion

7.4.1. Archaeological features

7.4.1.1. Prehistorical

Two occurrences of Stone age material were recorded, one (AP-004) of which was situated inside the development footprint and one (AP-003) outside of the development footprint by a rocky outcrop (AP-001). The low-density surface scatter included blades, chips, chunks and a blade.

The lithic material shows various degrees of weathering and is without substantial archaeological context or matrix and is therefore deemed of minor scientific importance and not conservation worthy (NCW).

The material is given a ‘General’ Protection C (Field Rating IV C). This means that it has been sufficiently recorded (in Phase 1). Therefore, it requires no further action.

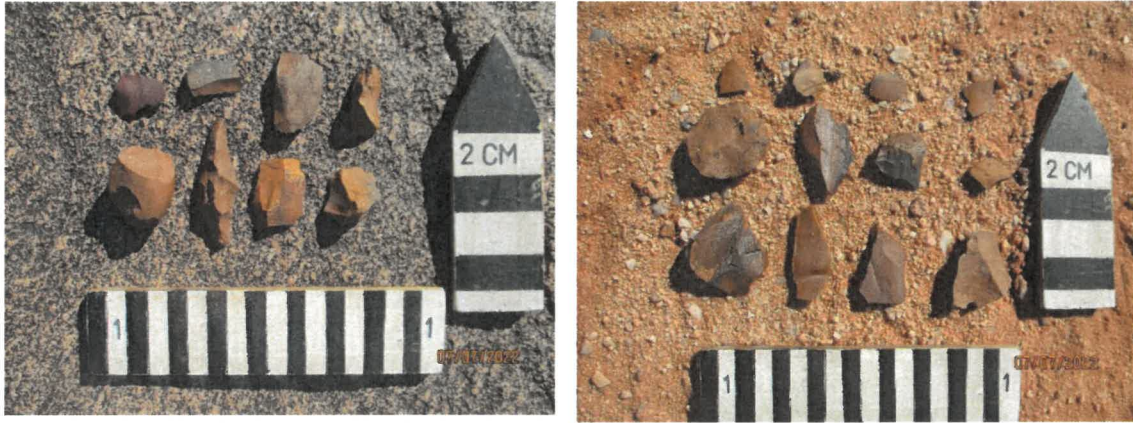


Figure 10 The lithic material (and metal) recorded Alheit, Plot 2372

7.4.1.2. Historical

One 20th-century metal tin can (AP-002) occurrence was recorded outside the development area. No other structures, materials or features relating to the historical period were noted.

The material is given a General Protection C (Field Rating IV C). This means that the material has been sufficiently recorded (in Phase 1).

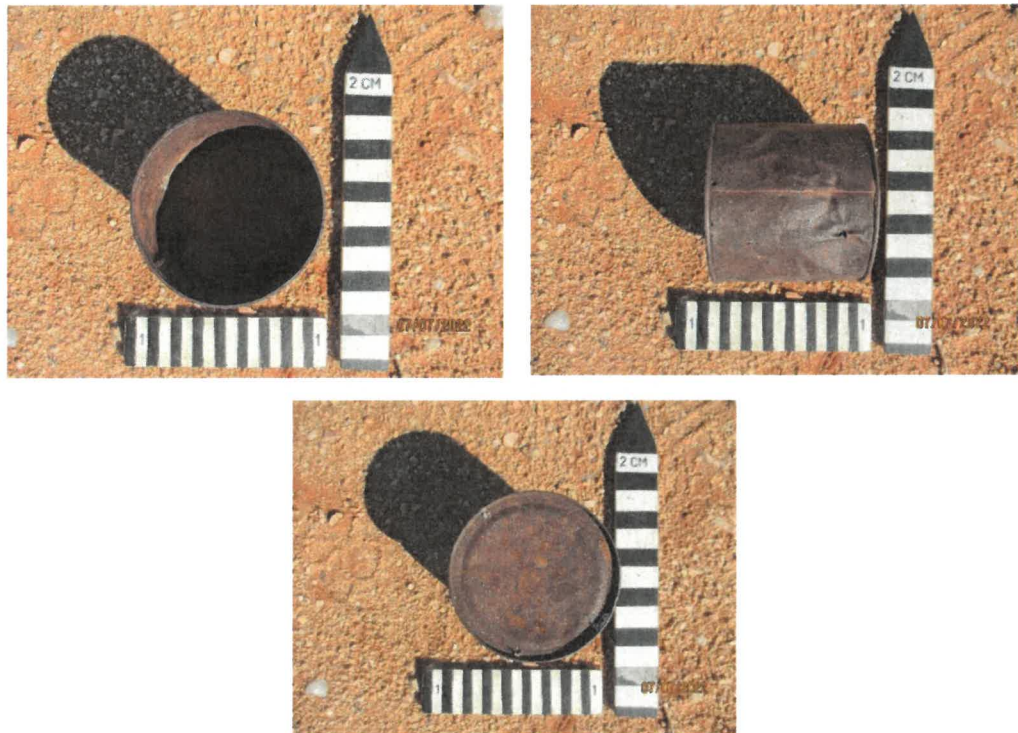


Figure 11 Historical material recorded at recorded Alheit, Plot 2372

7.4.2. Palaeontological resources

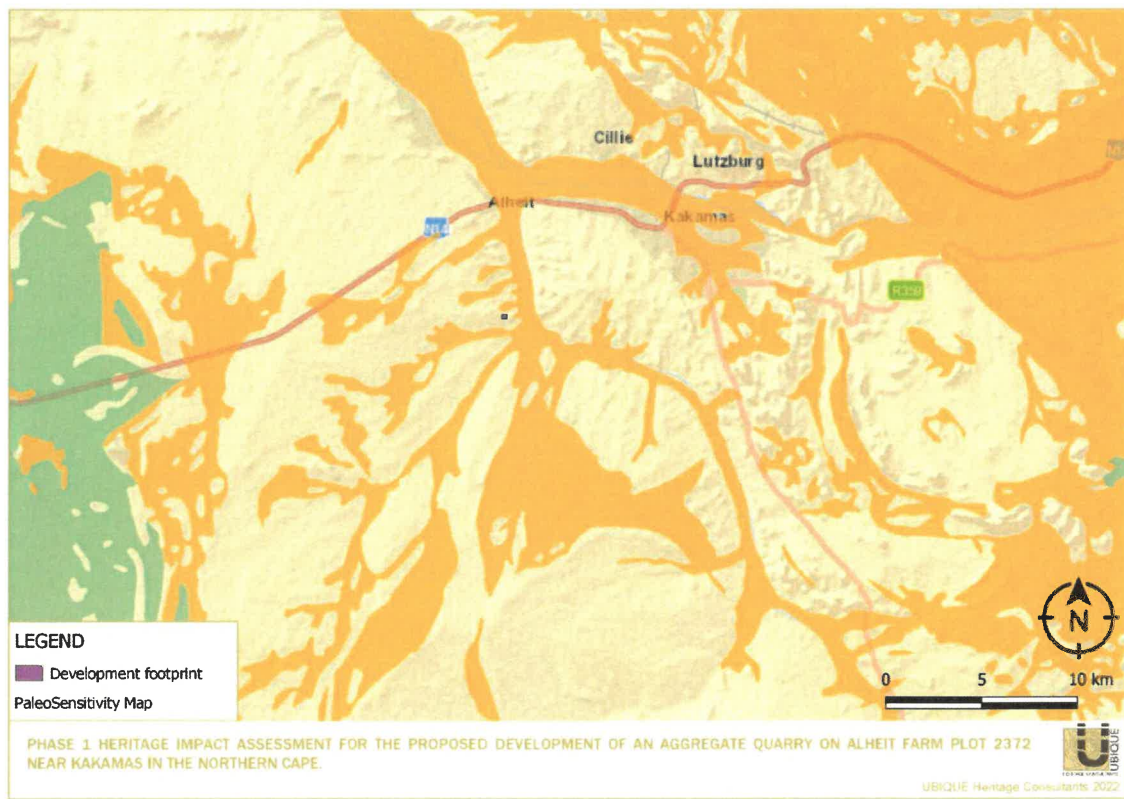


Figure 12 The Heritage Paleo screening tool and SAHRIS PalaeoSensitivity Map, indicating Medium (yellow), and Low (green) palaeontological significance in the study area, (<https://screening.environment.gov.za/>; <https://sahrissahra.org.za/map/palaeo>).

Elize Butler from Banzai Environmental conducted a palaeontological field assessment for the development footprint (see Appendix A). The proposed development area is primarily underlain by Putsies Gneiss of the Vyfbeker Metamorphic Suite that is igneous in origin. This Suite is thus unfossiliferous. (Butler 2022 Appendix A). Consequently, an overall low palaeontological sensitivity is allocated to the development footprint.



8. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

Description	Development Impact		Mitigation	Field rating/ Significance
Archaeological				
1. Occurrence of MSA/Early LSA materials: Flakes, chips, chunks and blade (AP-003).	Nature	Neutral	No mitigation required.	Field Rating IV C Low significance
	Extent	Low		
	Duration	Low		
	Intensity	Low		
	Potential of impact on irreplaceable resource	Low		
	Consequence	Low		
	Probability of impact	Low		
	Significance	Low		
2. Occurrence of MSA/Early LSA materials: chips flakes and, chunks (AP-004).	Nature	Neutral	No mitigation required.	Field Rating IV C Low significance
	Extent	Low		
	Duration	Low		
	Intensity	Low		
	Potential of impact on irreplaceable resource	Low		
	Consequence	Low		
	Probability of impact	Low		
	Significance	Low		
3. Mid-20 th century tin can/metal occurrence (AP-002).	Nature	Neutral	No mitigation required.	Field Rating IV C Low significance
	Extent	Low		
	Duration	Low		
	Intensity	Low		
	Potential of impact on irreplaceable resource	Low		
	Consequence	Low		
	Probability of impact	Low		
	Significance	Low		
Palaeontological				
4. The Palaeontological Sensitivity of the Putsies Gneiss of the Vyfbeker Metamorphic Suite. This Suite is igneous in origin and thus unfossiliferous. Consequently, an overall low palaeontological sensitivity is allocated to the development footprint.	Nature	Neutral	No mitigation required.	N/A
	Extent	Low		
	Duration	Low		
	Intensity	Low		
	Potential of impact on irreplaceable resource	Low		
	Consequence	Low		
	Probability of impact	Low		
	Significance	Low		

The impact on the lithic material recorded at sites AP 004 and AP 003 is not conservation worthy, and therefore, the impact is negligible. Likewise, the impact on the metal tin can (AP 002) is not conservation-worthy; therefore, the impact is considered negligible.

Regarding the impact on palaeontological resources, the Suite is igneous in origin. Furthermore, it is unfossiliferous, indicating that the impact of the development footprint will be low significance in palaeontological terms. Therefore, it is considered that the proposed development is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological reserves of the area (Butler, 2022).



9. RECOMMENDATIONS

Based on the assessment of the potential impact of the development on the identified heritage, the following recommendations are made, taking into consideration any existing or potential sustainable social and economic benefits:

1. The MSA/LSA lithic occurrences (AP-003 and AP-004) recorded on the eastern portion of the development footprint and northwest (outside) of the development footprint are of low significance and will not be affected by the development.
2. The rocky outcrop and the material surrounding the outcrop have possible archaeological context. Although it is situated outside the development area, this outcrop should be avoided during mining activities. Therefore a 50m buffer zone is recommended around the outcrop and considered a NO-GO area.
3. The one occurrence of a Mid-20th century metal tin can (AP-002) recorded outside the development footprint's northwestern border is considered low significance and will not be impacted by development. Therefore, no further mitigation is recommended.
4. The proposed aggregate development on Alheit Plot 2372 is underlain by Putsies Gneiss of the Vyfbeker Metamorphic Suite. This Suite is igneous in origin and thus unfossiliferous. The development footprint is considered to have low palaeontological sensitivity. Therefore, the proposed development will not lead to a negative impact on the palaeontological reserves of the area. Since the development footprint is not considered sensitive regarding palaeontological resources, the development's construction may be authorised to its whole extent (Butler, 2022).
5. Although all possible care has been taken to identify sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the assessment. If during construction, any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be alerted as per section 35(3) of the NHRA. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Mimi Seetelo 012 320 8490) must be alerted immediately as per section 36(6) of the NHRA. Depending on the nature of the finds, a professional archaeologist or palaeontologist must be contacted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required, subject to permits issued by

SAHRA. UBIQUE Heritage Consultants and its personnel will not be held liable for such oversights or costs incurred due to such oversights.

10. CONCLUSION

This HIA has identified no significant heritage resources on Plot 2372, farm Alheit, Kakamas, Kai !Garib Municipality, Mgcawu District Municipality, Northern Cape will be negatively impacted by the proposed development.



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APPENDIX A

PROPOSED AGGREGATE QUARRY, ALHEIT, KAKAMAS (PLOT 2372, KAKAMAS SOUTH, KAI! GARIB LOCAL MUNICIPALITY, KENHARDT DISTRICT).



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PROPOSED AGGREGATE QUARRY, ALHEIT, KAKAMAS (Plot 2372, Kakamas South, Kai! Garib Local Municipality, Kenhardt District)

1 BACKGROUND

**Information Provided by EnviroAfrica*

Witvlei Boerdery Trust plans to develop an Aggregate Quarry on Plot 2372 near Kakamas in the Northern Cape Province. EnviroAfrica CC has been appointed to undertake the EIA application process under NEMA for the above-proposed project. Ubique Heritage Consultants conducted the Archaeological Impact Assessment, and Banzai Environmental conducted the Palaeontological Assessment as part of the Heritage Impact Assessment.

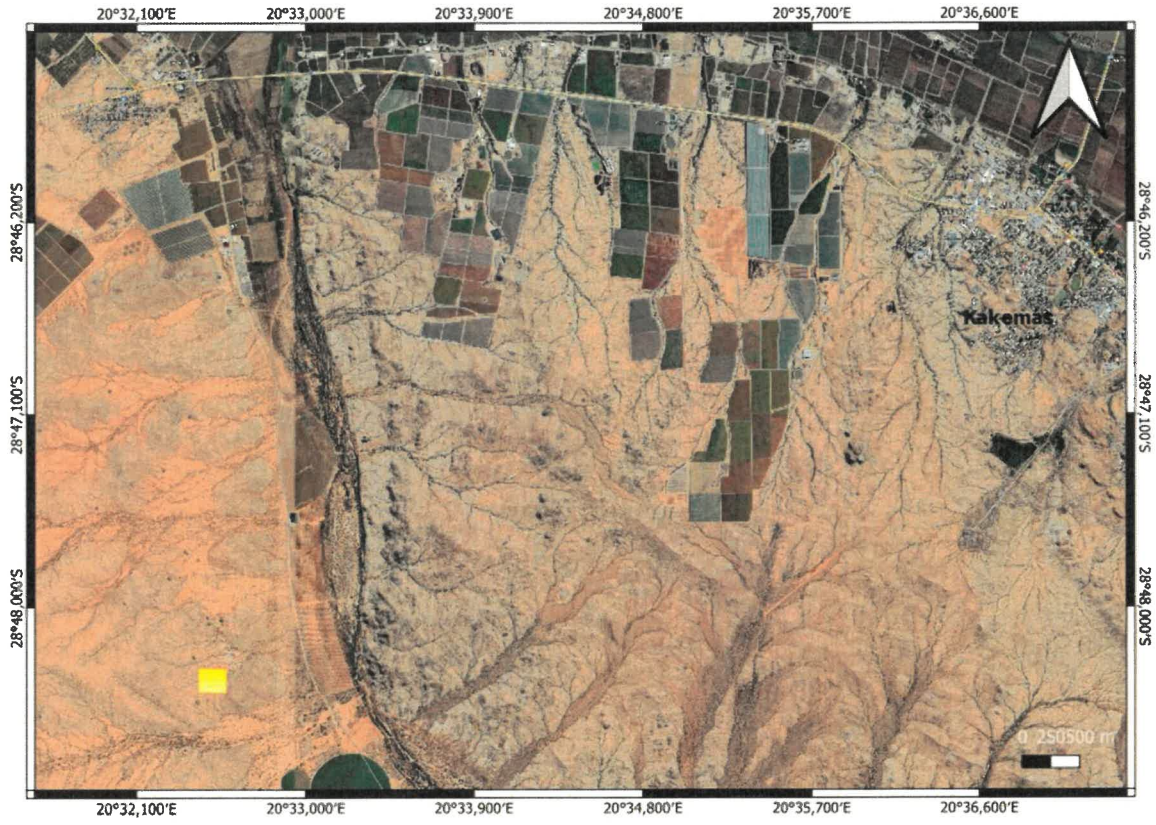


Figure 1. Layout map for proposed Aggregate Quarry on Plot 2372 near Kakamas in the Northern Cape Province.

2 PROJECT DESCRIPTION

**Information Provided by EnviroAfrica*

The proposed development site is located on Plot 2372, Alheit, about 15 km southwest of Kakamas in the Northern Cape Province and will not exceed 5 ha.

Table 1: GPS coordinates of the proposed aggregate development.

	Latitude	Longitude
Plot 2372, Alheit, Kakamas	28°48'16.92"S	20°32'25.74"E
	28°48'17.13"S	20°32'34.48"E
	28°48'23.77"S	20°32'34.42"E
	28°48'23.67"S	20°32'25.63"E

Description of Alternatives:

Alternative site locations do not exist. However, alternative localities for the workings of the quarry include *inter alia* layout options, and the option of not proceeding with the proposed development at all (the No-Go option) does exist*.

3 QUALIFICATIONS AND EXPERIENCE OF THE AUTHOR

Mrs Elize Butler has conducted approximately 300 palaeontological impact assessments for developments in the Free State, KwaZulu-Natal, Eastern, Central, and Northern Cape, Northwest, Gauteng, Limpopo, and Mpumalanga. She has an MSc in Zoology (*cum laude*) (specializing in Palaeontology) from the University of the Free State, South Africa and has been working in Palaeontology for more than twenty-nine years. She has experience in locating, collecting and curating fossils. She has been a member of the Palaeontological Society of South Africa (PSSA) since 2006 and has been conducting PIAs since 2014.

4 GEOLOGY AND PALAEOLOGY

The proposed aggregate development near Kakamas is depicted on the 1:250 000 Upington 2820 (1988) Geological Map, Council for Geosciences, Pretoria). According to this map, the proposed development is underlain by Putsies Gneiss of the Vyfbeker Metamorphic Suite that is igneous in origin. This Suite is thus unfossiliferous.

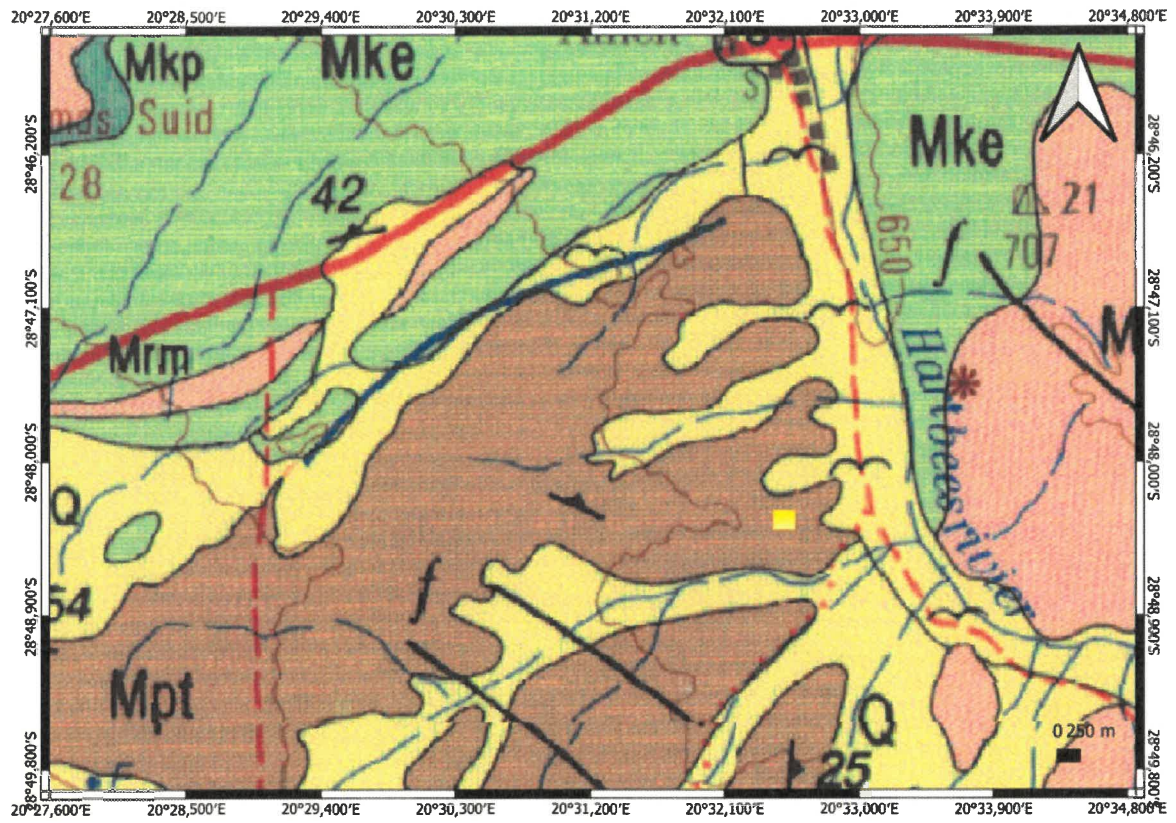
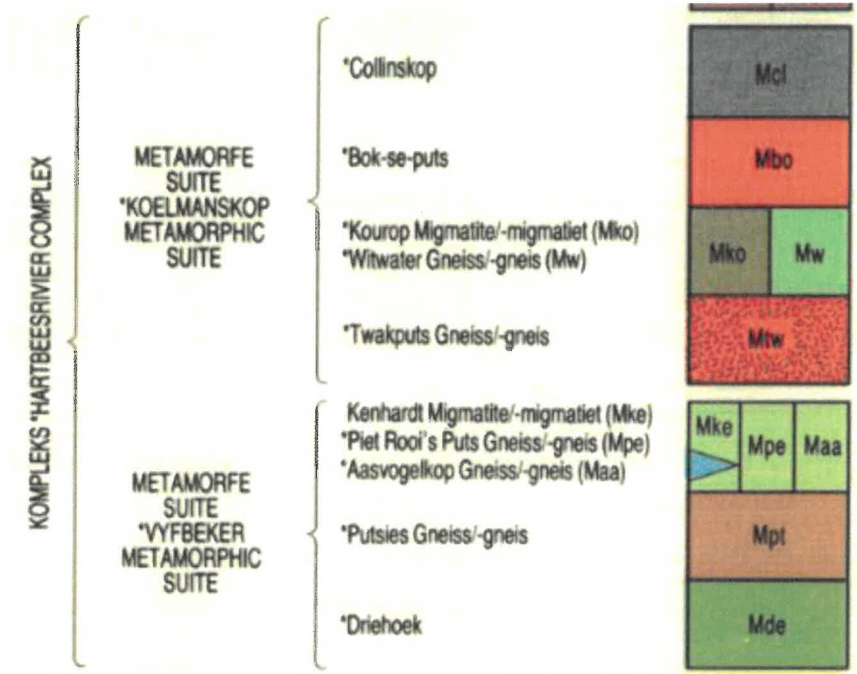


Figure 2: Extract of the 1:250 000 Upington 2820 Geological Map (1988), Council for Geoscience, Pretoria). The proposed development is underlain by Putsies Gneiss of the Vyfbeker Metamorphic Suite (Mpt, brown).

Table 2: Legend of the 1:250 000 Upington 2820 (1988) Geological Map, Council for Geosciences, Pretoria)



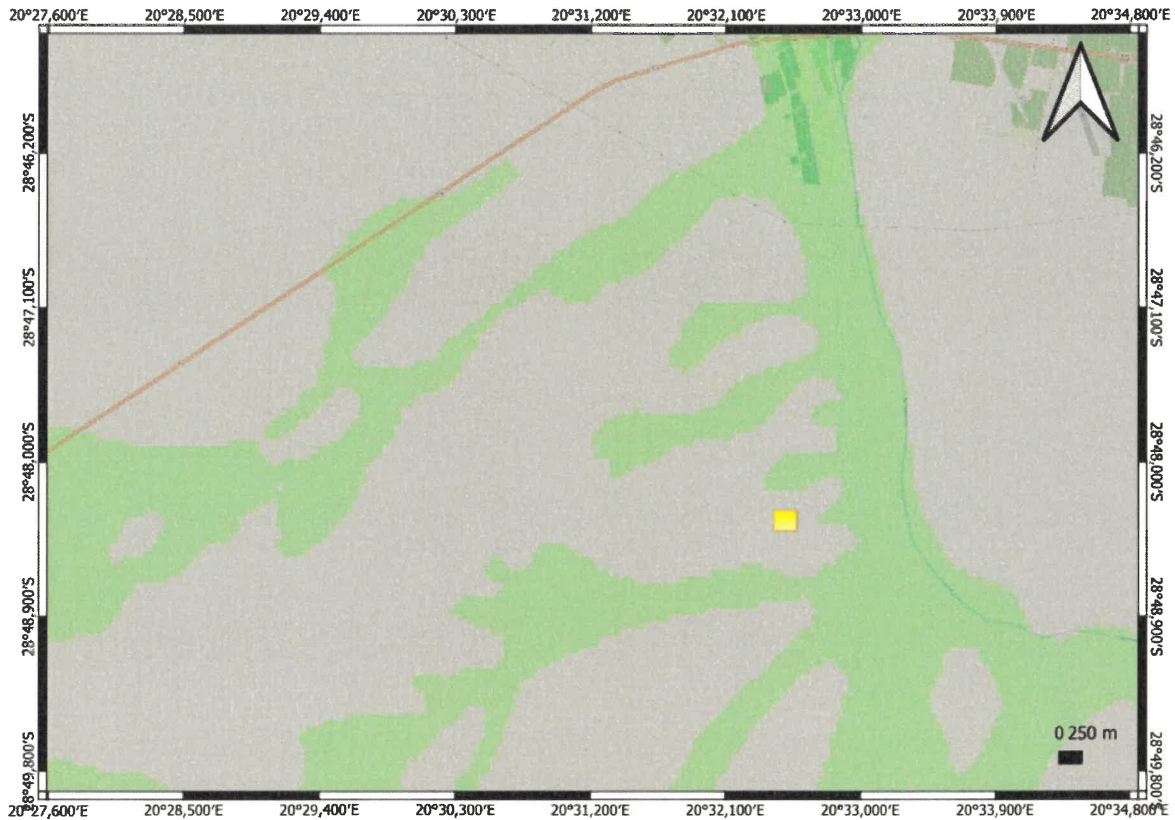


Figure 3: Extract of the 1 in 250 000 SAHRIS PalaeoMap map (Council of Geosciences) indicating the development in yellow.

According to the SAHRIS Palaeosensitivity map (**Figure 3**) the development is underlain by sediments with a Zero (grey) Palaeontological Significance.

Table 3: Palaeontological Sensitivity according to the SAHRIS PalaeoMap (Almond et al., 2013; SAHRIS website)

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.

The colors on the PalaeoMap indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero.

4.1 National Heritage Resources Act (25 of 1999) (NHRA)

Cultural Heritage in South Africa, includes all heritage resources, is protected by the National Heritage Resources Act (Act 25 of 1999) (NHRA). Heritage resources as defined in Section 3 of the Act include **“all objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens”**.

Palaeontological heritage is unique and non-renewable and is protected by the NHRA. Palaeontological resources may not be unearthed, broken moved, or destroyed by any development without prior assessment and without a permit from the relevant heritage resources authority as per section 35 of the NHRA.

This Palaeontological Impact Assessment was undertaken as part of this proposed amendment and adheres to the conditions of the Act. According to **Section 38 (1)** of the NHRA, a HIA is required to assess any potential impacts to palaeontological heritage within the development footprint where:

- the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- the construction of a bridge or similar structure exceeding 50m in length;
- any development or other activity which will change the character of a site—
 - a. exceeding 5 000 m² in extent; or
 - b. involving three or more existing erven or subdivisions thereof; or
 - c. involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - d. the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority
 - e. the re-zoning of a site exceeding 10 000m² in extent.
- or any other category of development provided for in regulations by SAHRA or a Provincial heritage resources authority.

5 CONCLUSION

The proposed aggregate development on Plot 2372, Kakamas South, Kail Garib Local Municipality, Kenhardt District) is underlain by Putsies Gneiss of the Vyfbeker Metamorphic Suite. This Suite is igneous in origin and thus unfossiliferous. For this reason, an overall low palaeontological sensitivity is allocated

to the development footprint. It is therefore concluded that the proposed development will not lead to a negative impact on the palaeontological reserves of the area. Thus, the construction of the development may be authorised to its whole extent, as the development footprint is not considered sensitive regarding palaeontological resources.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Elize Butler'.

Elize Butler