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LW CONSULTANTS: THE PROPOSED FARM 431 MRA PROJECT, ZF MGCAWU DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE

HERITAGE SCOPING STUDY

Submitted subject to Section 38(3) and Section 38(8) of the NHRA

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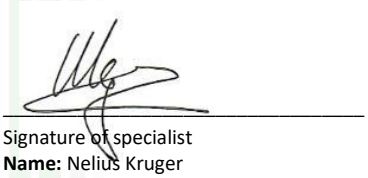
HERITAGE SCOPING STUDY (HS) OF DEMARACTED AREAS ON FARM 431 FOR THE PROPOSED FARM 431 MRA PROJECT IN THE ZF MGCAWU DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE

SPECIALIST DECLARATION OF INDEPENDENCE

I, Nelius Kruger, declare that –

- I act as the independent specialist;
- I am conducting any work and activity relating to the proposed Farm 431 MRA Project in an objective manner, even if this results in views and findings that are not favourable to the client;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have the required expertise in conducting the specialist report and I will comply with legislation, including the relevant Heritage Legislation (National Heritage Resources Act no. 25 of 1999, Human Tissue Act 65 of 1983 as amended, Removal of Graves and Dead Bodies Ordinance no. 7 of 1925, Excavations Ordinance no. 12 of 1980), the Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment (SAHRA, EC-PHRA and the CRM section of ASAPA), regulations and any guidelines that have relevance to the proposed activity;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this declaration are true and correct.



Signature of specialist
Name: Nelius Kruger
Date: 20 February 2022

The Heritage Consultant promotes the conservation of sensitive archaeological and heritage resources and uncompromisingly adheres to relevant Heritage Legislation (National Heritage Resources Act no. 25 of 1999, Human Tissue Act 65 of 1983 as amended, Removal of Graves and Dead Bodies Ordinance no. 7 of 1925, Excavations Ordinance no. 12 of 1980). In order to ensure best practices and ethics in the examination, conservation and mitigation of archaeological and heritage resources, The Heritage Consultant follows the Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment as set out by the South African Heritage Resources Agency (SAHRA) and the CRM section of the Association for South African Professional Archaeologists (ASAPA).

EXECUTIVE SUMMARY

This report details the results of a Heritage Scoping Study (HS) for the proposed Farm 431 MRA Project on Farm 431 in the ZF Mgcawu District Municipality, Northern Cape Province. The project entails the mining for manganese and iron ore within the boundaries of the project area which totals **1558ha** in surface extent. The report includes background information on the area's archaeology, its representation in Southern Africa, and the history of the larger area under investigation. The HS considers sites such as archaeological and historical sites and features, graves and places of religious and cultural significance and considerations are made with regards to potential impact of the proposed project on heritage resources.

Project Title	Farm 431 MRA Project
Project Type / Scope	Mining
Project Impact Footprint/s Area	**Mining Area: 1558ha**
Project Location	S28.248558° E23.156478°
1:50 000 Map Sheet	2822BB & 2822BD
Farm Portion / Parcel	The Farm 431
Magisterial District / Municipal Area	ZF Mgcawu District Municipality
Province	Northern Cape Province

The Northern Cape Province at large encompasses a significant heritage legacy. Numerous sites, documenting Earlier, Middle and Later Stone Age habitation occur across the province, mostly in open air locales or in sediments alongside rivers or pans. Specifically, the Kathu Archaeological Complex approximately 70km north of Postmasburg with sites such as Kathu Pan, Kathu Townlands and Bestwood has yielded material of international scientific importance, documenting Earlier, Middle and Later Stone Age industries, habitation and settlement patterns. In addition, a wealth of Later Stone Age rock art sites, most of which are in the form of rock engravings are to be found in the larger landscape. These sites occur on hilltops, slopes, rock outcrops and occasionally in river beds. Sites dating to the Iron Age occur in the north eastern part of the Province but environmental factors delegated that the spread of Iron Age farming westwards from the 17th century was constrained mainly to the area east of the Langeberg Mountains. However, evidence of an Iron Age presence as far as the Upington area in the eighteenth century occurs in this area. Moving into recent times, the archaeological record reflects the development of a rich colonial frontier, characterised by, amongst others, a complex industrial archaeological landscape such as mining developments at Kimberley, which herald the modern era in South African history. Locally, previous research in the Postmasburg area focused on the history of prehistoric specularite mining and more recently, Culture Resources Management studies have confirmed the distribution of Middle and Later Stone age artefacts in calcrete deposits around pans and springs. In terms of heritage resources, the landscape around Farm 431 is primarily well known for the occurrence of Stone Age and Colonial Period heritage. Portions of the property seem to have been transformed by historical and recent mining risking the sterilization of these zones of heritage remains. In terms of the probability of site impact on the Farm 431 farm portions, the following should be noted:

- In this area, deep Hutton Sands rest on decomposing dolerite and calcrete formations where Stone Age artefacts are known to occur in these dolerite and occasional calcrete patches. These geomorphological exposures might prove sensitive in terms of the occurrence of stone artefacts and Earlier, Middle and Later Stone Age material. Similarly, Stone Age manufacturing sites are known to occur along ridges near sources of stone suitable for stone tool making and such areas could contain remnants of Stone Age

manufacturing sites. Stone Age material might also occur along water sources along drainage lines in the project area. Later Stone Age shelters and rock art might be encountered along hilltops slopes and ridges.

- Later Iron Age farmers preferred protective mountain slopes close to areas fit for cattle grazing as settlement areas and single hills and rock outcrops. Iron Age settlements are relatively scarce in this part of the Northern Cape Province and, cognizant of the nature of the landscape there is generally a low probability of impact to Iron Age occurrences.
- European farmers, settling in the area since the middle of the 19th century, divided up the landscape into a number of farms which form the framework for agricultural, residential and other forms of development in present day. A probable Farmstead occurs on Farm 431 and historical aerial photos indicate that the site is older than 60 years and they are generally protected under the National Heritage Resource Act (NHRA 1999). As such, the site might be sensitive in terms of the heritage landscape. It is possible that the farmstead was converted into mining infrastructure in later years as the site is located near mining activities.
- As family cemeteries often occur around farmsteads in rural areas of the Northern Cape, areas where the Farm 431 farmsteads are situated might prove sensitive in terms of the possible existence of burial sites.
- It is evident that a portion of the project area have been subjected to mining and quarrying in past years and it is possible that sites and structures derived from early mining might occur in the project area and, if older than 60 years, such features are protected under the National Heritage Resource Act (NHRA 1999).

As a general guideline and to reduce impacts on heritage resources to a minimum, the following recommendations should be considered in the planning, implementation and management phases of the Project:

- The project area falls within a moderate to low paleontologically sensitive zone and a Palaeontological Desktop Assessment (PDA) was commissioned for the proposed project. Cognisance should be taken of further recommendations included in the PDA Report.
- The term “Living Heritage” can broadly refer to a place of cultural heritage and sacred nature; with cultural attributions that are not generally physically manifested. Ritual and symbolic spaces and practices, and the material residues thereof convey an intangible cultural significance beyond the physical site or artefact, where the meaning of the ritual area speaks directly of a sense of place and lived experience. Such sites might occur on the Farm 431 properties or its surroundings and due cognisance should be taken of these sites of “Living Heritage” in the cultural landscape.
- It is recommended that all graves and cemeteries that might occur in the project area be conserved and excluded from impact emanating from the development. Where impact on such resources would prove to be inevitable, the correct human remains repatriation procedures should be observed at all times. These procedures should include public notification of intent to relocate the remains, consultation with descendant communities, close liaison with - and approval from local futurities, adherence to any local laws and / bylaws, and correct grave relocation methodologies.
- It is possible that groups, farmers and locals living in the area have occupied the region for many generations and have expressed long-term cultural associations with the region. Therefore, it is important to ascertain from these respondents whether there are any further undetected sites of cultural significance in the area to which they relate and / or attach cultural meaning.
- Ultimately, it is recommended that the archaeological and cultural heritage of this part of the Northern Cape Province be respected. The management of heritage resources, as stipulated by National and International Heritage resources agencies (e.g. SAHRA) should be aligned with any future activity by

means of cultural mitigation and / or management plans developed in conjunction with heritage authorities and specialists.

It should be noted that this HS and site sensitivity included above are solely based on off-site desktop findings and the heritage sensitivity of the Farm 431 property remain tentative pending further detailed site inspection as part of the Heritage Impact Assessment (HIA) process, subject to section 38 of the National Heritage Resources Act (NHRA - Act 25 of 1999).

NOTATIONS AND TERMS/TERMINOLOGY

Absolute dating: Absolute dating provides specific dates or range of dates expressed in years.

Archaeological record: The archaeological record minimally includes all the material remains documented by archaeologists. More comprehensive definitions also include the record of culture history and everything written about the past by archaeologists.

Artefact: Entities whose characteristics result or partially result from human activity. The shape and other characteristics of the artefact are not altered by removal of the surroundings in which they are discovered. In the Southern African context examples of artefacts include potsherds, iron objects, stone tools, beads and hut remains.

Assemblage: A group of artefacts recurring together at a particular time and place, and representing the sum of human activities.

Context: An artefact's context usually consists of its immediate *matrix*, its *provenience* and its *association* with other artefacts. When found in *primary context*, the original artefact or structure was undisturbed by natural or human factors until excavation and if in *secondary context,* disturbance or displacement by later ecological action or human activities occurred.

Cultural Heritage Resource: The broad generic term *Cultural Heritage Resources* refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of palaeontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

Cultural landscape: A cultural landscape refers to a distinctive geographic area with cultural significance.

Cultural Resource Management (CRM): A system of measures for safeguarding the archaeological heritage of a given area, generally applied within the framework of legislation designed to safeguard the past.

Feature: Non-portable artefacts, in other words artefacts that cannot be removed from their surroundings without destroying or altering their original form. Hearths, roads, and storage pits are examples of archaeological features

Impact: A description of the effect of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.

Lithic: Stone tools or waste from stone tool manufacturing found on archaeological sites.

Matrix: The material in which an artefact is situated (sediments such as sand, ashy soil, mud, water, etcetera). The matrix may be of natural origin or human-made.

Midden: Refuse that accumulates in a concentrated heap.

Microlith: A small stone tool, typically knapped of flint or chert, usually about three centimetres long or less.

Monolith: A geological feature such as a large rock, consisting of a single massive stone or rock, or a single piece of rock placed as, or within, a monument or site.

Phase 1 CRM Assessment: An Impact Assessment which identifies archaeological and heritage sites, assesses their significance and comments on the impact of a given development on the sites. Recommendations for site mitigation or conservation are also made during this phase.

Phase 2 CRM Study: In-depth studies which could include major archaeological excavations, detailed site surveys and mapping / plans of sites, including historical / architectural structures and features. Alternatively, the sampling of sites by collecting material, small test pit excavations or auger sampling is required. Mitigation / Rescue involves planning the protection of significant sites or sampling through excavation or collection (in terms of a permit) at sites that may be lost as a result of a given development.

Phase 3 CRM Measure: A Heritage Site Management Plan (for heritage conservation), is required in rare cases where the site is so important that development will not be allowed and sometimes developers are encouraged to enhance the value of the sites retained on their properties with appropriate interpretive material or displays.

Provenience: Provenience is the three-dimensional (horizontal and vertical) position in which artefacts are found. Fundamental to ascertaining the provenience of an artefact is *association,* the co-occurrence of an artefact with other archaeological remains; and *superposition,* the principle whereby artefacts in lower levels of a matrix were deposited before the artefacts found in the layers above them, and are therefore older.

Random Sampling: A probabilistic sampling strategy whereby randomly selected sample blocks in an area are surveyed. These are fixed by drawing coordinates of the sample blocks from a table of random numbers.

Scoping Assessment: The process of determining the spatial and temporal boundaries (i.e. extent) and key issues to be addressed in an impact assessment. The main purpose is to focus the impact assessment on a manageable number of important questions on which decision making is expected to focus and to ensure that only key issues and reasonable alternatives are examined. The outcome of the scoping process is a Scoping Report that includes issues raised during the scoping process, appropriate responses and, where required, terms of reference for specialist involvement.

Site (Archaeological): A distinct spatial clustering of artefacts, features, structures, and organic and environmental remains, as the residue of human activity. These include surface sites, caves and rock shelters, larger open-air sites, sealed sites (deposits) and river deposits. Common functions of archaeological sites include living or habitation sites, kill sites, ceremonial sites, burial sites, trading, quarry, and art sites,

Stratigraphy: This principle examines and describes the observable layers of sediments and the arrangement of strata in deposits

Systematic Sampling: A probabilistic sampling strategy whereby a grid of sample blocks is set up over the survey area and each of these blocks is equally spaced and searched.

Trigger: A particular characteristic of either the receiving environment or the proposed project which indicates that there is likely to be an *issue* and/or potentially significant *impact* associated with that proposed development that may require specialist input. Legal requirements of existing and future legislation may also trigger the need for specialist involvement.

LIST OF ABBREVIATIONS

Abbreviation	Description
ASAPA	Association for South African Professional Archaeologists
AIA	Archaeological Impact Assessment
BP	Before Present
BCE	Before Common Era
BGG	Burial Grounds and Graves
CRM	Culture Resources Management
EIA	Early Iron Age (also Early Farmer Period)
EIA	Environmental Impact Assessment
EFP	Early Farmer Period (also Early Iron Age)
ESA	Earlier Stone Age
GIS	Geographic Information Systems
HIA	Heritage Impact Assessment
ICOMOS	International Council on Monuments and Sites
K2/Map	K2/Mapungubwe Period
LFP	Later Farmer Period (also Later Iron Age)
LIA	Later Iron Age (also Later Farmer Period)
LSA	Later Stone Age
MIA	Middle Iron Age (also Early later Farmer Period)
MRA	Mining Right Area
MSA	Middle Stone Age
NHRA	National Heritage Resources Act No.25 of 1999, Section 35
PFS	Pre-Feasibility Study
PHRA	Provincial Heritage Resources Authorities
SAFA	Society for Africanist Archaeologists
SAHRA	South African Heritage Resources Association
YCE	Years before Common Era (Present)

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1 BACKGROUND

1.1 Scope and Project Brief

LW Consultants, on behalf of MR Tshenolo Iron Ore Investments requested a Heritage Scoping Study (HS) study for the proposed Farm 431 MRA Project in the Northern Cape Province. MR Tshenolo Iron Ore Investments intends to embark on manganese and iron ore mining activities on Farm 431 in the Northern Cape Province. The project boundary extends over an area which totals **1558ha** in surface extent (refer to Figure 1-1).

The rationale of this HS is to determine the presence of heritage resources such as archaeological and historical sites and features, graves and places of religious and cultural significance on a desktop level; to consider the impact of the proposed project on such heritage resources, and to submit initial recommendations with regard to the cultural resources management measures that may be required at affected sites / features. Ultimately, the process aims to identify significant heritage issues or constraints which may be encountered during project development. In addition, the study identifies relevant heritage mitigation and management actions in order to inform time frames, infrastructure options and possible "show stoppers".

1.2 Project Direction

Mr Neels Kruger acts as field director for the project; responsible for the assimilation of all information, the compilation of the final consolidated AIA report and recommendations in terms of heritage resources on the demarcated project areas. Mr Kruger is an accredited archaeologist and Culture Resources Management (CRM) practitioner with the Association of South African Professional Archaeologists (ASAPA), a member of the Society for Africanist Archaeologists (SAFA) and the Pan African Archaeological Association (PAA).

1.3 Project Terms of Reference

Heritage specialist input into the Environmental Impact Assessment (EIA) process is essential to ensure that, through the management of change, developments still conserve our heritage resources. It is also a legal requirement for certain development categories which may have an impact on heritage resources. Thus, EIAs should always include an assessment of heritage resources. The heritage component of the EIA is provided for in the **National Environmental Management Act, (Act 107 of 1998)** and endorsed by section 38 of the **National Heritage Resources Act (NHRA - Act 25 of 1999)**. In addition, the NHRA protects all structures and features older than 60 years, archaeological sites and material and graves as well as burial sites. The objective of this legislation is to ensure that developers implement measures to limit the potentially negative effects that the development could have on heritage resources.

Based hereon, this project **terms of reference for** heritage specialist input area**:**

- Provide a description of the heritage landscape of the project area in terms of cultural context and provenience by means of a detailed desktop background study;
- Provide a description of known and documented historical archaeological artefacts, structures (including graves) and settlements – if present - in the project area by means of a detailed desktop study;
- Compile the above into a broad heritage baseline for the project area and discuss the nature and degree of significance of this heritage bassline landscape;
- Provide a level of probability of site distribution and occurrence in the project area.
- Estimate the extent and severity of potential developmental impacts on the heritage landscape as a result of the planned development and associated actions;
- Drawing on findings from this desktop assent, guide the project planning in terms of potential

heritage impact.

- Recommend further heritage assessment requirements for the project based on the heritage landscape and its estimated sensitivity.
- Provide an integrated Heritage Scoping Report complying to SAHRA's minimum standards for Heritage Impact Assessment Studies and Reporting and the National Heritage Resources Act, 1999.
- Provide a PDA Report, complying to SAHRA's minimum standards for Heritage Desktop Study Studies and Reporting and the National Heritage Resources Act, 1999.
- Liaise and consult with the relevant Heritage Resources Authority (Northern Cape-PHRA) with regards to the initial NID, the HIA process and review comments from the authority

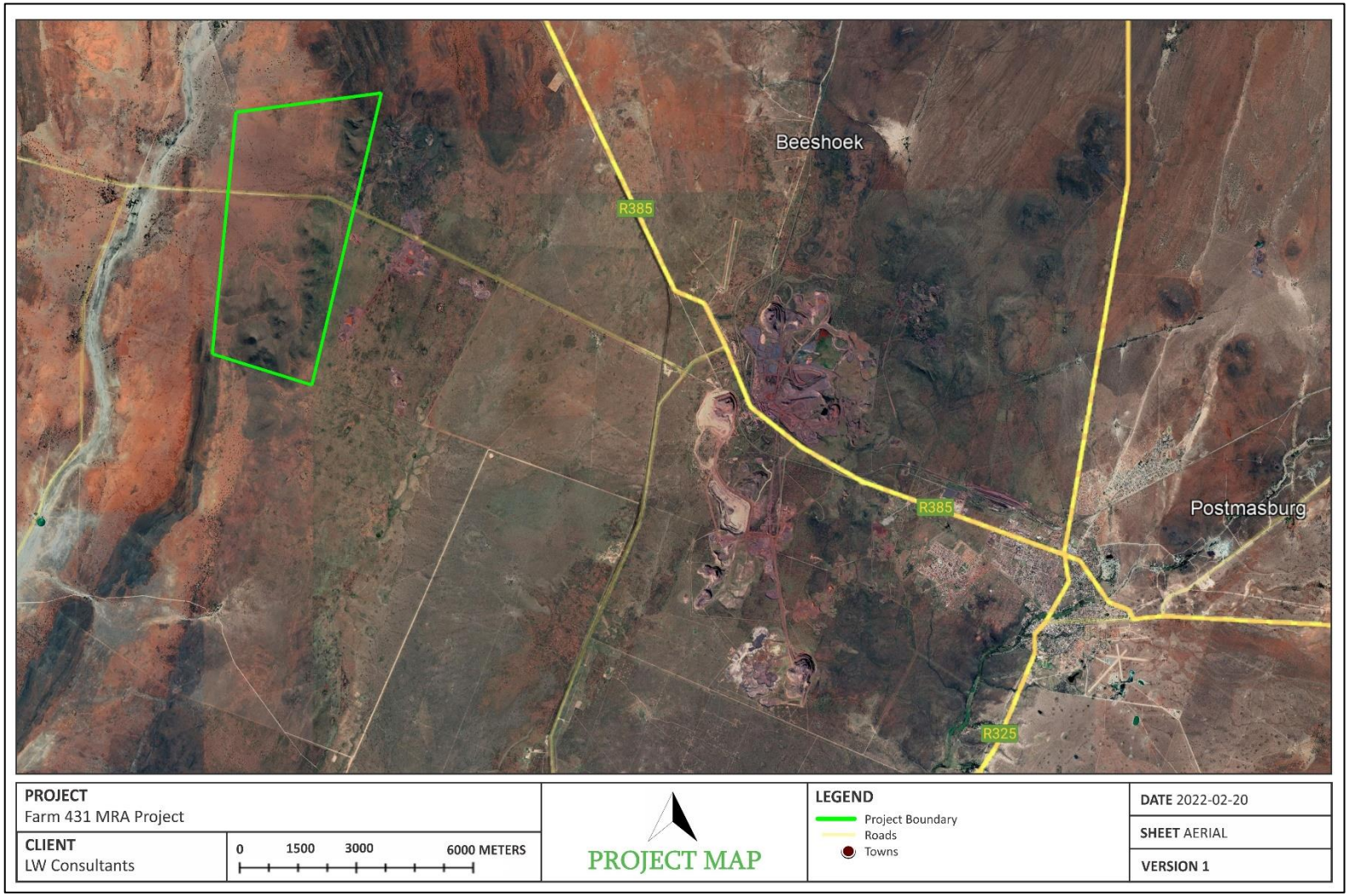


Figure 1-1: Aerial map indicating the project locality (green outline) subject to the Farm 431 MRA Project.

2 LEGISLATIVE FRAMEWORK

2.1 CRM: Legislation, Conservation and Heritage Management

The broad generic term *Cultural Heritage Resources* refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of palaeontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

2.1.1 Legislation regarding archaeology and heritage sites

The South African Heritage Resources Agency (SAHRA) and its provincial offices aim to conserve and control the management, research, alteration and destruction of cultural resources of South Africa. It is therefore vitally important to adhere to heritage resource legislation at all times.

a. National Heritage Resources Act No 25 of 1999, section 35

According to the National Heritage Resources Act No 25 of 1999 (section 35) the following features are protected as cultural heritage resources:

a. Archaeological artefacts, structures and sites older than 100 years
b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography
c. Objects of decorative and visual arts
d. Military objects, structures and sites older than 75 years
e. Historical objects, structures and sites older than 60 years
f. Proclaimed heritage sites
g. Grave yards and graves older than 60 years
h. Meteorites and fossils
i. Objects, structures and sites of scientific or technological value.

In addition, the national estate includes the following:

a. Places, buildings, structures and equipment of cultural significance
b. Places to which oral traditions are attached or which are associated with living heritage
c. Historical settlements and townscapes
d. Landscapes and features of cultural significance
e. Geological sites of scientific or cultural importance
f. Archaeological and paleontological sites
g. Graves and burial grounds
h. Sites of significance relating to the history of slavery
i. Movable objects (e.g. archaeological, paleontological, meteorites, geological specimens, military, ethnographic, books etc.)

With regards to activities and work on archaeological and heritage sites this Act states that:

"No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit by the relevant provincial heritage resources authority." (34. [1] 1999:58)

and

"No person may, without a permit issued by the responsible heritage resources authority-

(a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;

(b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;

(c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or

(d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites. (35. [4] 1999:58)."

and

"No person may, without a permit issued by SAHRA or a provincial heritage resources agency-

(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;

(c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) and excavation equipment, or any equipment which assists in the detection or recovery of metals (36. [3] 1999:60)."

b. Human Tissue Act of 1983 and Ordinance on the Removal of Graves and Dead Bodies of 1925

Graves and burial grounds are commonly divided into the following subsets:

a. ancestral graves
b. royal graves and graves of traditional leaders
c. graves of victims of conflict
d. graves designated by the Minister
e. historical graves and cemeteries
f. human remains

Graves 60 years or older are heritage resources and fall under the jurisdiction of both the National Heritage Resources Act and the Human Tissues Act of 1983. However, graves younger than 60 years are specifically protected by the Human Tissues Act (Act 65 of 1983) and Ordinance on Excavations (Ordinance no. 12 of 1980) as well as any local and regional provisions, laws and by-laws. Such burial places also fall under the jurisdiction of the National Department of Health and the Provincial Health Departments.

c. National Heritage Resources Act No 25 of 1999, Section 35

This act (Act 107 of 1998) states that a survey and evaluation of cultural resources must be done in areas where development projects, that will change the face of the environment, will be undertaken. The impact of the development on these resources should be determined and proposals for the mitigation thereof are made. Environmental management should also take the cultural and social needs of people into account. Any disturbance of landscapes and sites that constitute the nation's cultural heritage should be avoided as far as possible and where this is not possible the disturbance should be minimized and remedied.

2.1.2 Background to HIA and AIA Studies

South Africa's unique and non-renewable archaeological and palaeontological heritage sites are 'generally' protected in terms of the National Heritage Resources Act (Act No 25 of 1999, section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority. Heritage sites are frequently threatened by development projects and both the environmental and heritage legislation require impact

assessments (HIAs & AIAs) that identify all heritage resources in areas to be developed. Particularly, these assessments are required to make recommendations for protection or mitigation of the impact of the sites. HIAs and AIAs should be done by qualified professionals with adequate knowledge to (a) identify all heritage resources including archaeological and palaeontological sites that might occur in areas of developed and (b) make recommendations for protection or mitigation of the impact on the sites.

A detailed guideline of statutory terms and requirements is supplied in Addendum 1.

2.2 Rating of significance

The National Heritage Resources Act (Act no 25 of 1999) also stipulates the assessment criteria and grading of archaeological sites. The following categories are distinguished in Section 7 of the Act:

- *Grade I:* Heritage resources with qualities so exceptional that they are of special national significance;
- *Grade II:* Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region;
- *Grade III:* Other heritage resources worthy of conservation, and which prescribes heritage resources assessment criteria, as set out in section 3(3) of the act.

Significance is influenced by the context and state of the archaeological site. Six criteria were considered following Kruger (2019):

- Site integrity (i.e. primary vs. secondary context),
- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Density of scatter (dispersed scatter),
- Social value,
- Uniqueness, and
- Potential to answer current and future research questions.

The categories of significance were based on the above criteria the above and the grading system outlined in NHRA and summarised below:

Significance	Rating Action
No significance: sites that do not require mitigation.	None
Low significance: sites, which may require mitigation.	2a. Recording and documentation (Phase 1) of site; no further action required 2b. Controlled sampling (shovel test pits, auguring), mapping and documentation (Phase 2 investigation); permit required for sampling and destruction
Medium significance: sites, which require mitigation.	3. Excavation of representative sample, C14 dating, mapping and documentation (Phase 2 investigation); permit required for sampling and destruction [including 2a & 2b]
High significance: sites, where disturbance should be avoided.	4a. Nomination for listing on Heritage Register (National, Provincial or Local) (Phase 2 & 3 investigation); site management plan; permit required if utilised for education or tourism
High significance: Graves and burial places	4b. Locate demonstrable descendants through social consulting; obtain permits from applicable legislation, ordinances and regional by-laws; exhumation and reinternment [including 2a, 2b & 3]

3 REGIONAL CONTEXT

3.1 Area Location

The proposed Farm 431 MRA Project occurs on Farm 431 in the Tsantsabane Local Municipality and the ZF Mgcawu District Municipality of the Northern Cape Province. The site is situated more or less 20km northwest of the town of Postmasburg and the Sishen Mining Complex occurs approximately 70km north of the study area. The R385 provincial road routes east and a local road bisects the study area and the Kolomela Manganese Mine occurs south of the study area and Postmasburg. The region lies approximately 180km east of the Northern Cape town of Upington.

The study areas appear on 1:50000 map sheet 2822BB & 2822BD (see Figure 3-1), generally at the following coordinate:

Farm 431: S28.253235° E22.894600°

3.2 Area Description: Receiving Environment

The Northern Cape area around Postmasburg receives around 200-400 mm of rain in the summer months. The local vegetation is classified as Karroid Bushveld where a transition occurs between trees in a mixed grassveld, typical to the Bushveld complex, to a Karoo landscape with more open grasslands and succulents (Acocks 1988). The geology of the region is underlain by rocks older than 1000 million years and the overburden consists mainly of geologically recent Kalahari sand, which in turn is un-fossiliferous. Some quartzites also occur on area on the landscape. Previous studies in the area indicated that the area is underlain more specifically by Proterozoic-aged rocks belonging to the Asbestos Hills Subgroup of the Transvaal Supergroup (Beaumont 2009). A number of small natural pans are scattered across the landscape. The semi-arid area around Postmasburg supports a scrub cover, largely vaalbos (Tarchonanthus canphoratus), interspersed with sparse, mainly thorn-bearing bush which includes swarthaak (Acacia detinens), kameeldoring (Acacia giraffae), soetdoring (Acacia karroo), witgatboom (Boschia albitrunca) and kareeboom (Rhus lancea).

3.3 Site Description

The project area on Farm 431 seems largely untransformed with evidence of human settlement and mining visible in a small section to the north-east. The southern portion of the farm is mountainous with a numbr fo drainage lines scattered across this area. The current land-use is mainly grazing by livestock and game, although the area closer to Postmasburg is vacant land. Neighboring farms are being used for livestock grazing and game farming, with mining to the west and south of the project at the Kolomela Manganese Mine. The major land use of the study area as classified by the Environmental Potential Atlas of South Africa (2000) is vacant / unspecified land.

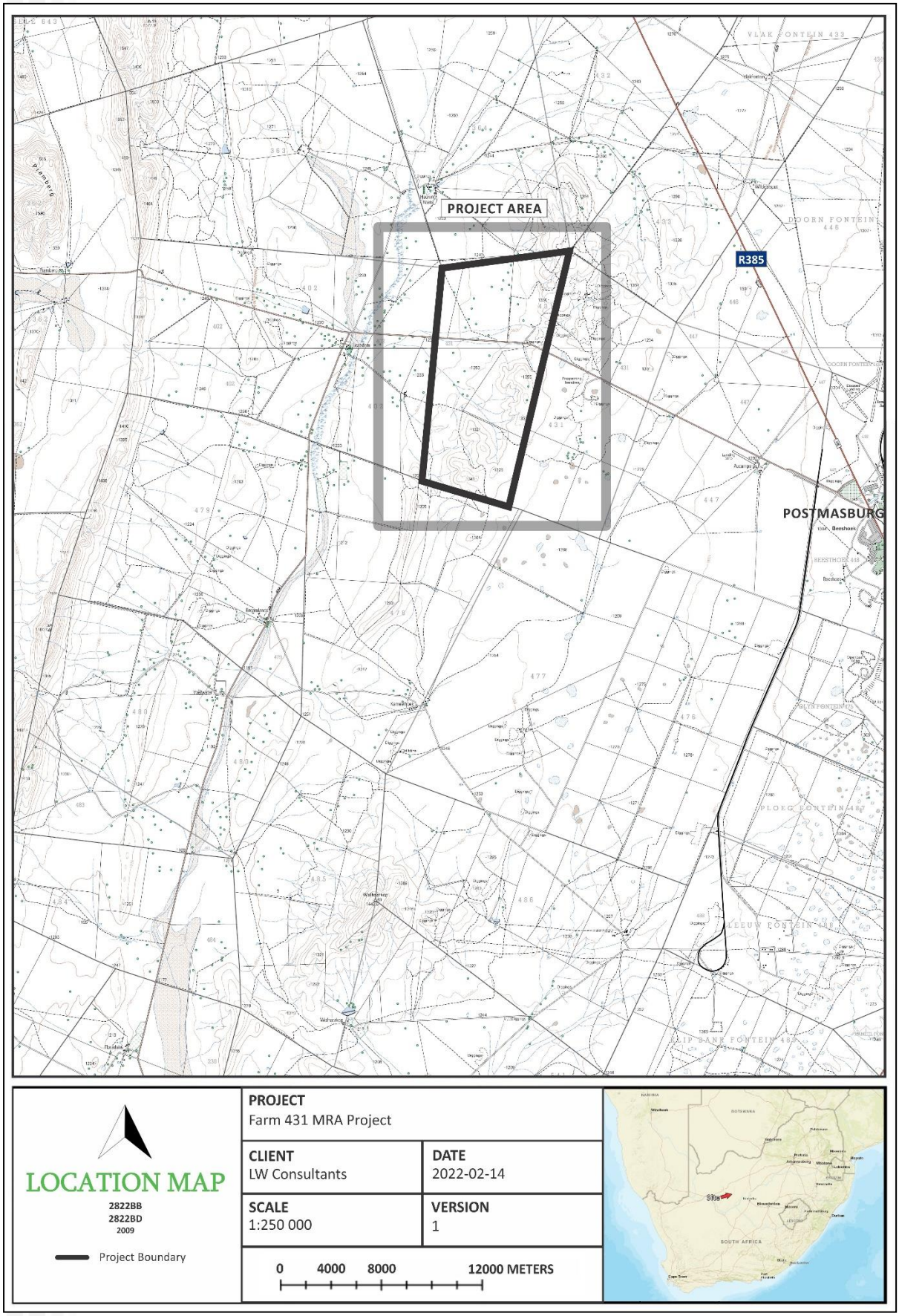


Figure 3-1: 1:250 00 Map representation of the location of the proposed Farm 431 MRA Project (sheet 2822BB & 2822BD).

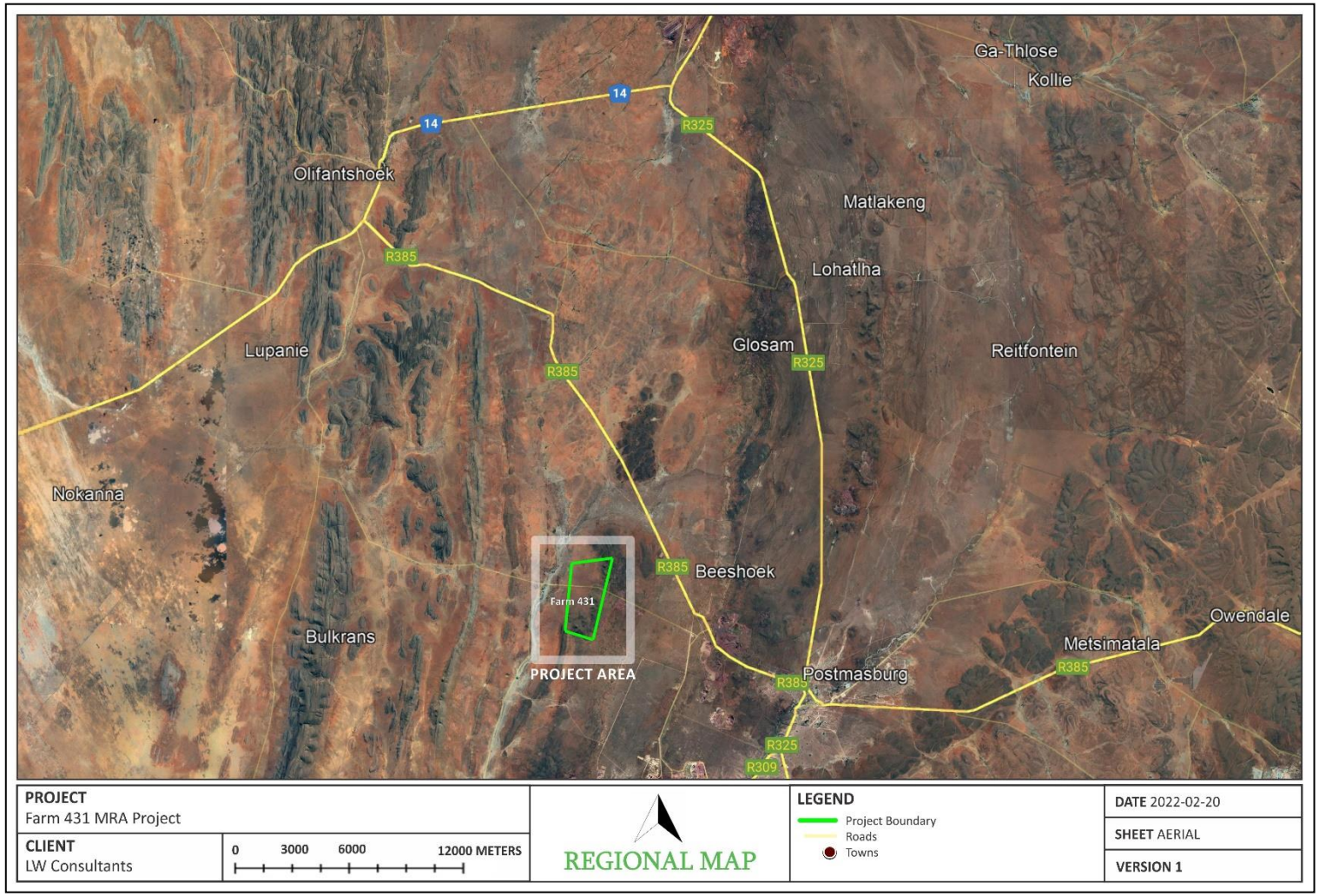


Figure 3-2: Aerial map providing a regional context for the proposed Farm 431 MRA Project area.

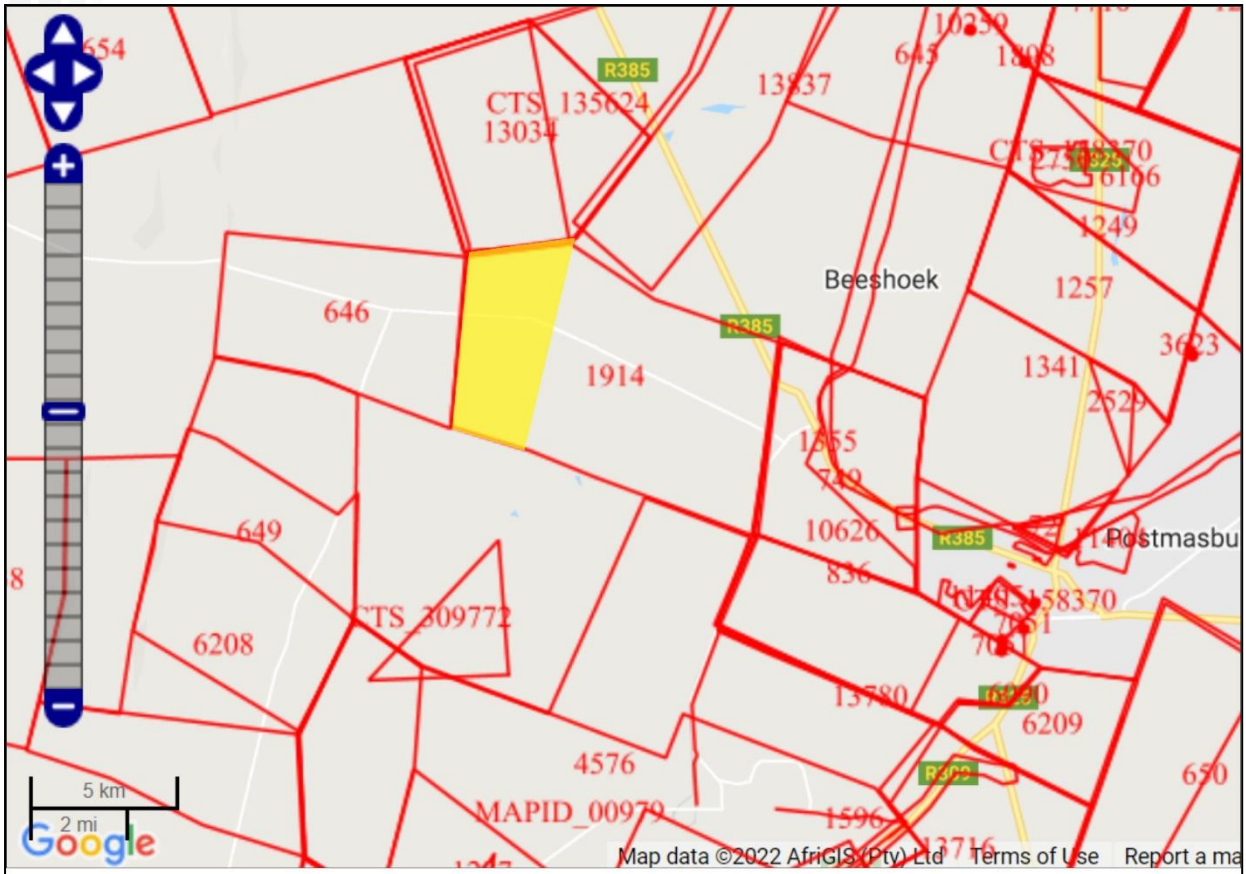
4 METHOD OF ENQUIRY

4.1 Sources of Information

Data from detailed desktop, aerial and field studies were employed in order to sample surface areas systematically and to ensure a high probability of heritage site recording.

4.1.1 Desktop Study

The larger landscape around Postmasburg has been relatively well documented in terms of its archaeology and history. A desktop study was prepared in order to contextualize the proposed project within a larger historical milieu. The study focused on relevant previous studies, archaeological and archival sources, aerial photographs, historical maps and local histories, all pertaining to the project area and the larger landscape of this section of the Northern Cape Province.



1914: CONSULTATION IN TERMS OF SECTION 40 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT 2002, (ACT 28 OF 2002) IN RESPECT OF MANGANESE AND IRON ORE ON REMAINDER OF THE PORTION OF FARM NO.431, PORTION 1 OF THE FARM DOOMFONTEIN NO.446 AND THE REMAINDER PORTION OF THE FARM NO.447, SITUATED IN THE MAGISTERIAL DISTRICT OF HAY, NORTHERN CAPE REGION.
646: CONSULTATION IN TERMS OF SECTION 40 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT 2002, (ACT 28 OF 2002) FOR THE APPROVAL OF AN ENVIRONMENTAL MANAGEMENT PLAN FOR PROSPECTING RIGHT IN RESPECT OF MANGANESE AND IRON ORE ON THE FARM LUCAS DAM 402, SITUATED IN THE MAGISTERIAL DISTRICT OF POSTMASBURG, NORTHERN CAPE
13034: MINING RIGHT ON THE FARM 364 (HEUNINGKRANZ) AND FARM 432 (LANGVERWACHT), PORTION 1 LOCATED NEAR POSTMASBURG, DISTRICT HAY, IN THE NORTHERN CAPE.
649: CONSULTATION IN TERMS OF SECTION 40 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT 2002, (ACT 28 OF 2002) FOR THE APPROVAL OF AN ENVIRONMENTAL MANAGEMENT PLAN FOR PROSPECTING RIGHT IN RESPECT OF MANGANESE AND IRON ORE ON THE FARM BROOMLANDS NO.479 AND VOELWATER NO.480, SITUATED IN THE MAGISTERIAL DISTRICT OF POSTMASBURG, NORTHERN CAPE.
4576: ENVIRONMENTAL ASSESSMENT PROCESSES FOR THE KOLOMELA EXPANSION PROJECT AT THE KOLOMELA MINE, NEAR POSTMASBURG, NORTHERN CAPE PROVINCE.
6208: CONSULTATION IN TERMS OF SECTION 40 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT 2002, (ACT 28 OF 2002) FOR THE APPROVAL OF AN ENVIRONMENTAL MANAGEMENT PLAN FOR PROSPECTING RIGHT ON PORTION 1 AND REM. EXTENT OF FARM 479, REM. EXTENT OF FARM 483, REMAINING EXTENT OF FARM 480, REM. EXTENT OF FARM 483 AND REM. EXTENT OF THE FARM 484 SITUATED IN THE MAGISTRIAL DISTRICT OF HAY, NORTHERN CAPE REGION.

Figure 4-1: SAHRIS Map of the project area indicating current commercial projects and environmental applications lodged in the project area.

A number of Cultural Resources Management (CRM) projects have been conducted in the Postmasburg area. Many of the studies, captured on the South African Heritage Resources Information System (SAHRIS), were

conducted for prospecting and mining right applications. Some of the studies include:

- Morris, D. & Beaumont, P.B. 1994. Ouplaas 2 Rock Engravings, Danielskuil. An unpublished report by the McGregor Museum.
- Morris, D. 1999. Proposed mining areas and properties at Ulco, Northern Cape, Including the vicinities of Gorrokop and Groot Kloof. An unpublished report by the McGregor Museum.
- Beaumont, P.B. 2000. Archaeological Impact Assessment: Archaeological Scoping Survey for the purpose of an EMPR for the Sishen Iron Ore Mine. An unpublished report by the McGregor Museum.
- Beaumont, P.B. 2004. Heritage EIA of two areas at Sishen Iron Ore Mine. An unpublished report by the McGregor Museum.
- Morris, D. 2005. Report on a Phase 1 Archaeological Assessment of Proposed Mining Areas of the Farms Bruce, King, Mokaning and Parson, Between Postmasburg and Kathu, Northern Cape. An unpublished report by the McGregor Museum.
- Beaumont, P.B. 2006a. Phase 1 Heritage Impact Assessment Report on Erf 1439, Remainder of Erf 2974, Remainder of Portion 1 of the Farm Uitkoms 463, and Farms Kathu 465 and Sims 462 at and near Kathu in the Northern Cape Province. An unpublished report by the McGregor Museum.
- Beaumont, P.B. 2006b. Phase 1 Heritage Impact Assessment Report on Portions A and B of the Farm Sims 462, Kgalagadi District, Northern Cape Province. An unpublished report by the McGregor Museum.
- Beaumont, P.B., 2006c. Phase 1 Heritage Impact Assessment Report on Portion 48 and the remaining Portion of Portion 4 of the Farm Bestwood 459, Kgalagadi District, Northern Cape Province. An Archaeological Impact Assessment report by the Archaeology Department, McGregor Museum.
- Beaumont, P.B. 2007. Supplementary Archaeological Impact Assessment report on sites near or on the Farm Hartnolls 458, Kgalagadi District Municipality, Northern Cape Province.
- Beaumont, P.B. 2008a. Phase 1 Archaeological Impact Assessment Report on Portion 459/49 of the farm Bestwood 459 at Kathu, Kgalagadi District Municipality, Northern Cape Province.
- Beaumont, P.B. 2008b. Phase 1 Heritage Impact Assessment Report on a portion of the remainder of the farm Sekgame 461, Kathu, Gamagara Municipality, Northern Cape Province.
- Dreyer, C. 2007. First Phase Archaeological and Cultural Heritage Assessment of the Proposed Garona Mercury Transmission Power Line, Northern Cape, North-West Province & Free State. An unpublished report by Pr. Archaeologist/Heritage Specialist.
- Dreyer, C. 2008a. First Phase Archaeological and Cultural Heritage Assessment of the proposed residential developments at a portion of the remainder of the farm Bestwood 459 Rd, Kathu, Northern Cape. An unpublished report by Pr. Archaeologist/Heritage Specialist.
- Dreyer, C. 2008b. First Phase Archaeological and Cultural Heritage Assessment of the proposed Bourke project, ballast site and crushing plant at Bruce Mine, Dingleton, near Kathu, Northern Cape. An unpublished report by Pr. Archaeologist/Heritage Specialist.
- Kaplan, J.M. 2008. Phase 1 Archaeological Impact Assessment: proposed housing development, Erf 5168, Kathu, Northern Cape Province. An unpublished report by the Agency for Cultural Resources Management.
- Morris, D. 2008. Archaeological and Heritage Phase 1 Impact Assessment for proposed upgrading of Sishen Mine diesel depot storage capacity at Kathu, Northern Cape. An unpublished report by the McGregor Museum.
- Van der Ryst, MM & Küsel, SU. 2011. Specialist report on the Stone Age and other heritage resources at Kolomela, Postmasburg, Northern Cape.
- Kaplan, J. Heritage Impact Assessment proposed mixed use development in Kathu, Northern Cape Province. Remainder & Portion 1 of the Farm Sims 462, Kuruman RD. Prepared for: Enviroafrica.
- Morris, D. 2014. Rectification and/or regularisation of activities relating to the Bestwood township development near Kathu, Northern Cape: Phase 1 Archaeological Impact Assessment.

Walker S.J.H., Chazan M., Lukich V. & Morris D. 2013. A second Phase 2 archaeological data recovery at the site of Kathu Townlands for Erf 5116: Kathu, Northern Cape Province.
- Walker, S.J., Chazan, M & Morris, D. 2013. Kathu Pan: location and significance. A report requested by SAHRA for the purpose of nomination.
- Webley, L & Halkett, D. 2010. Baseline archaeological survey of the farm Driehoekspan 435, between Olifantshoek and Postmasburg in the Northern Cape Province. UCT: Archaeology Contracts Office.

4.1.2 Remote Sensing

Aerial photography is often employed to locate and study archaeological sites, particularly where larger scale area surveys are performed. The site assessment of the project area relied heavily on this method to assist the challenging foot site survey. Here, depressions, variation in vegetation, soil marks and landmarks were examined and specific attention was given to shadow sites (shadows of walls or earthworks which are visible early or late in the day), crop mark sites (crop mark sites are visible because disturbances beneath crops cause variations in their height, vigour and type) and soil marks (e.g. differently coloured or textured soil (soil marks) might indicate ploughed-out burial mounds). Attention was also given to moisture differences, as prolonged dampening of soil as a result of precipitation frequently occurs over walls or embankments. In addition, historical aerial photos obtained during the archival search were scrutinized and features that were regarded as important in terms of heritage value were identified. By superimposing high frequency aerial photographs with images generated with Google Earth as well as historical aerial imagery, potential sensitive areas were subsequently identified and geo-referenced.

4.1.3 Map Data

Similar to the aerial survey, the assessment of the project area relied heavily on archive and more recent map renderings of the Postmasburg area to assist in the potential identification of heritage sites, where historical and current maps of the project area were examined. By merging data obtained from the desktop study and the aerial survey, sites and areas of possible heritage potential were plotted on these maps of the larger Postmasburg area using GIS software. These maps were then superimposed on high-definition aerial representations in order to graphically demonstrate the geographical locations and distribution of potentially sensitive landscapes.

4.2 Limitations

The main limitation of this Scoping Study is the fact that it was undertaken at a desktop level, employing secondary information and data generated through off-site methods (e.g. aerial survey, literature review). As such, the study merely infers a level of probability of the presence of cultural, historical, or archaeological sites of significance. In this instance, detailed field assessments would have to be required once impact areas have been established in order to confirm the presence of sites of significance.

As this study was conducted on desktop level only, it should be noted that the findings are not a complete representation of the heritage landscape of the project area as the possibility exists that individual sites could be missed due to the sometimes inaccurate and often subjective nature of desktop data. The subterranean nature of some archaeological sites, dense vegetation cover and visibility constraints sometimes distort heritage representations and any additional heritage resources located during development phases must be reported to the Heritage Resources Authority or an archaeological specialist.

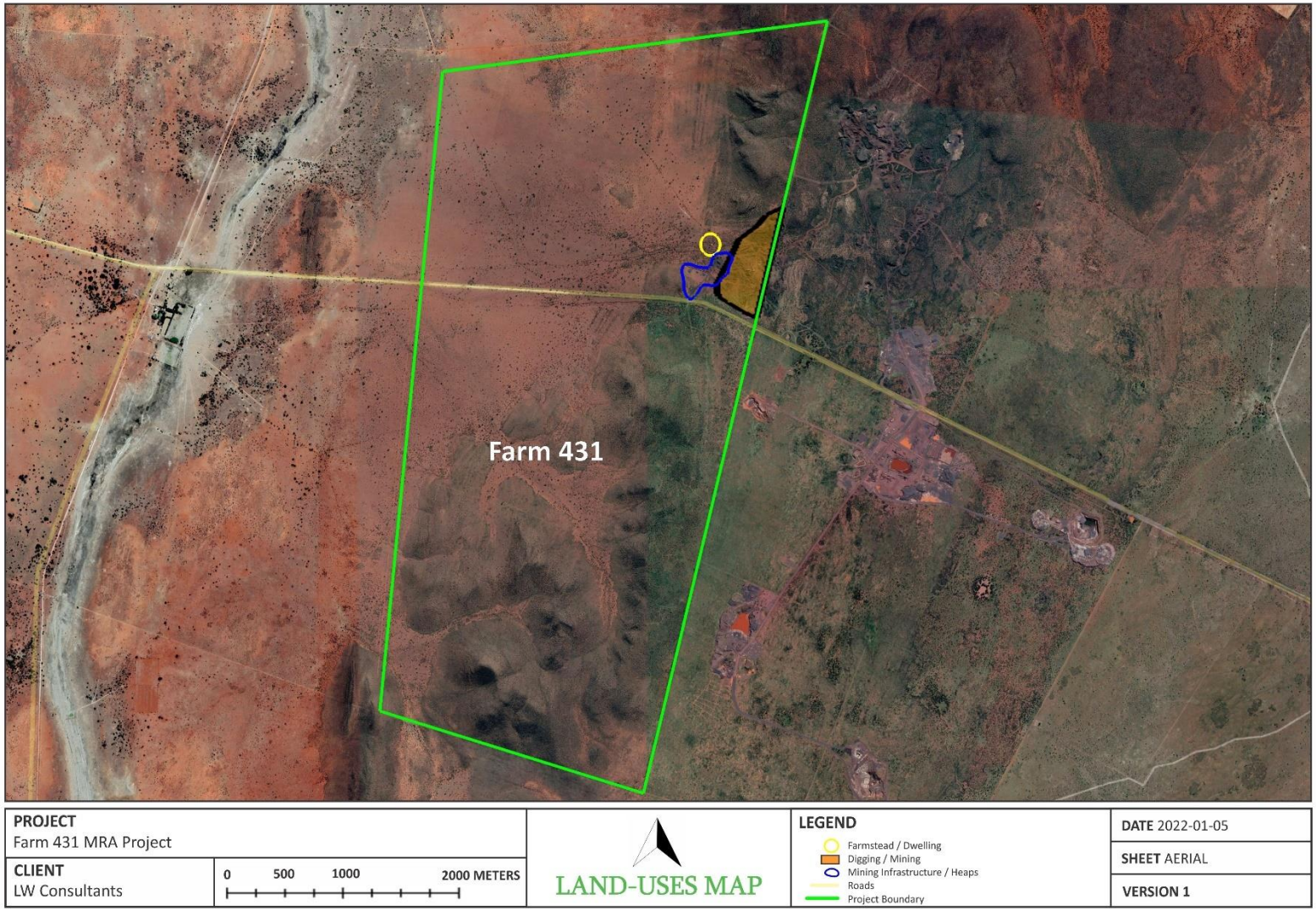


Figure 4-2: Aerial image indicating existing land uses identified on the image, for the Farm 431 property.

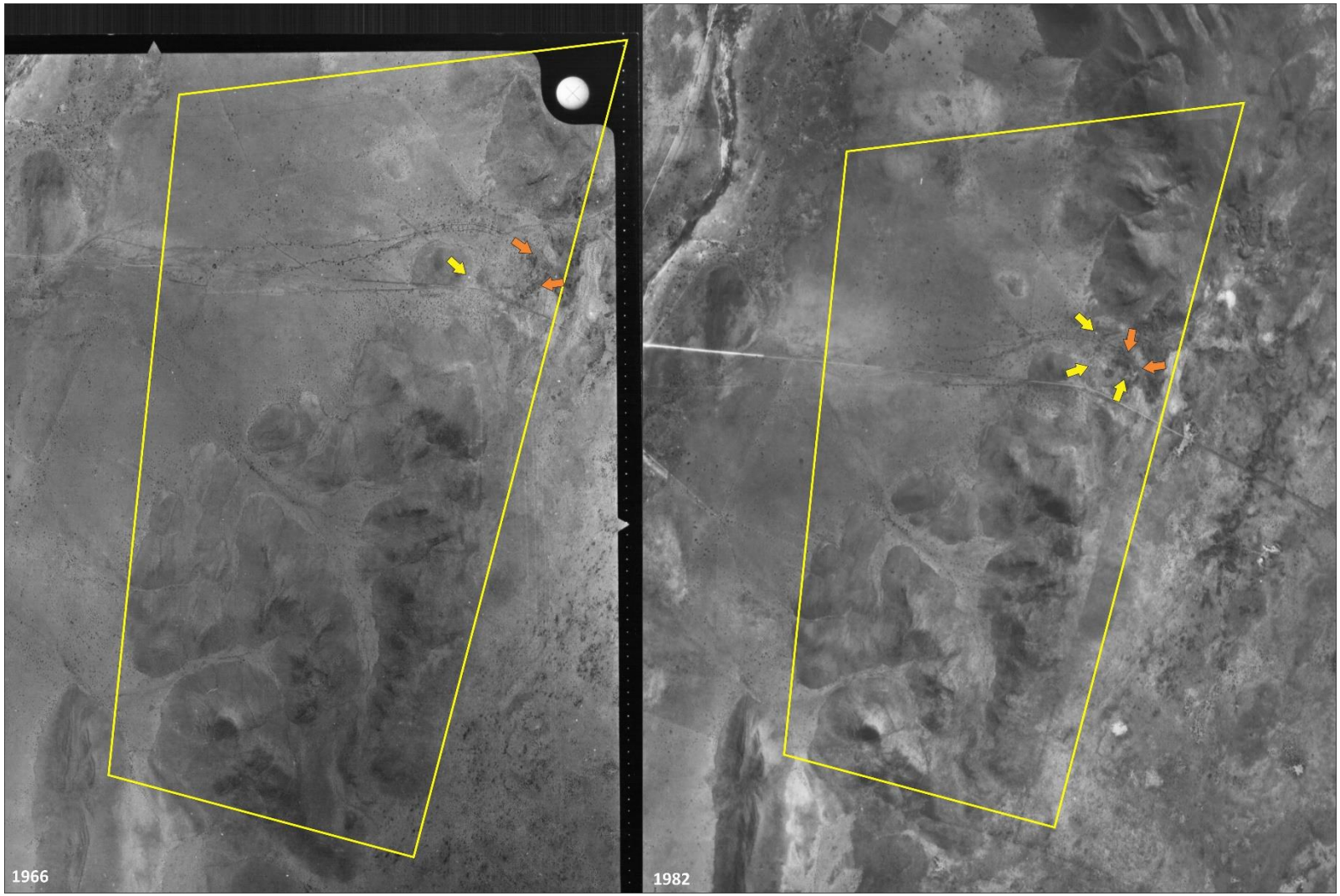


Figure 4-3: Historical aerial imagery indicating the MRA (yellow outline) within the historical landscape over the past century. Farmsteads and potential man-made structures are indicated with tallow arrows and orange arrows indicate mining / quarrying activities.

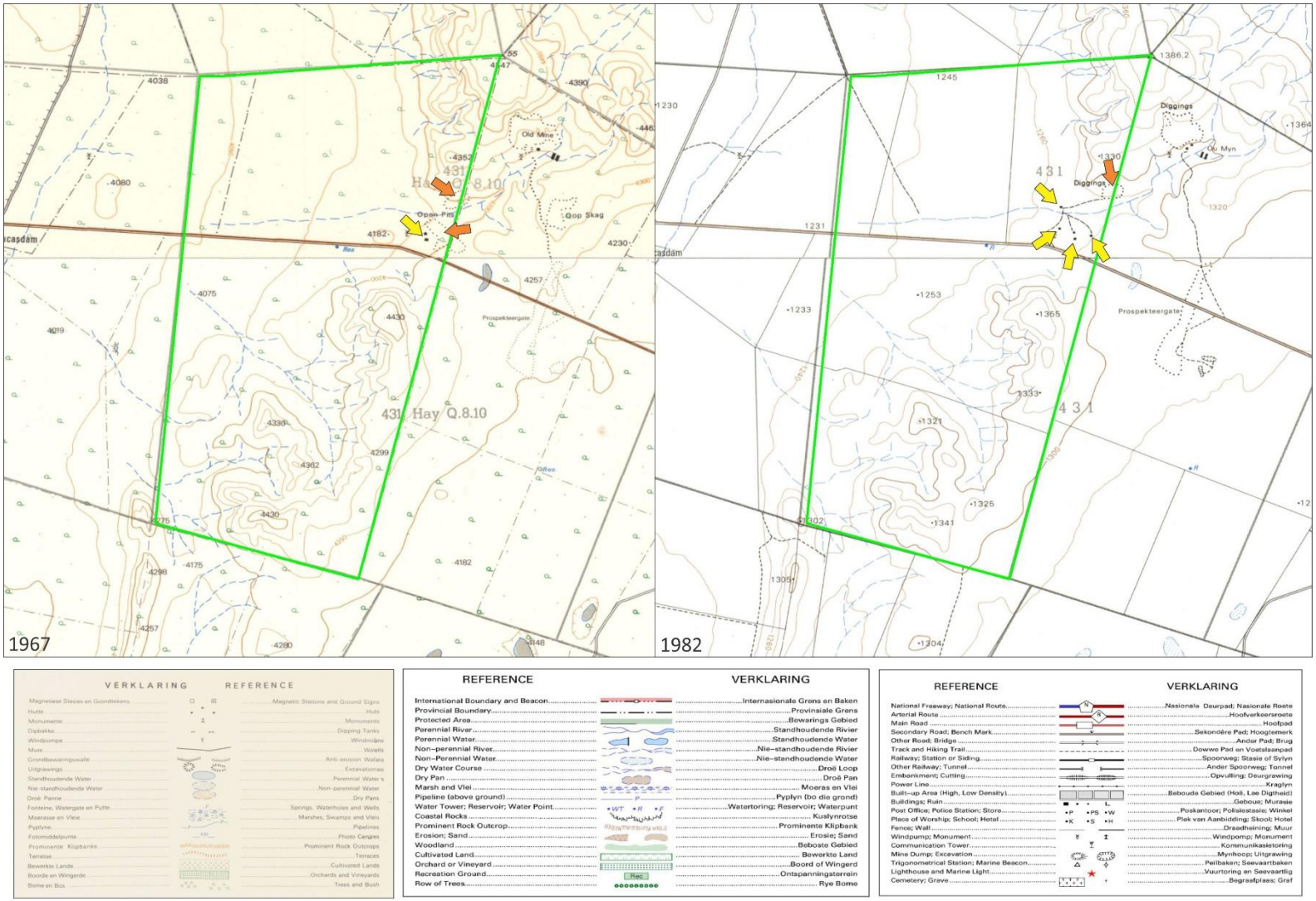


Figure 4-4: Historical topographic maps indicating the prospecting area (green outline) within the historical landscape. Farmsteads and potential man-made structures are indicated with tallow arrows and orange arrows indicate mining / quarrying activities.

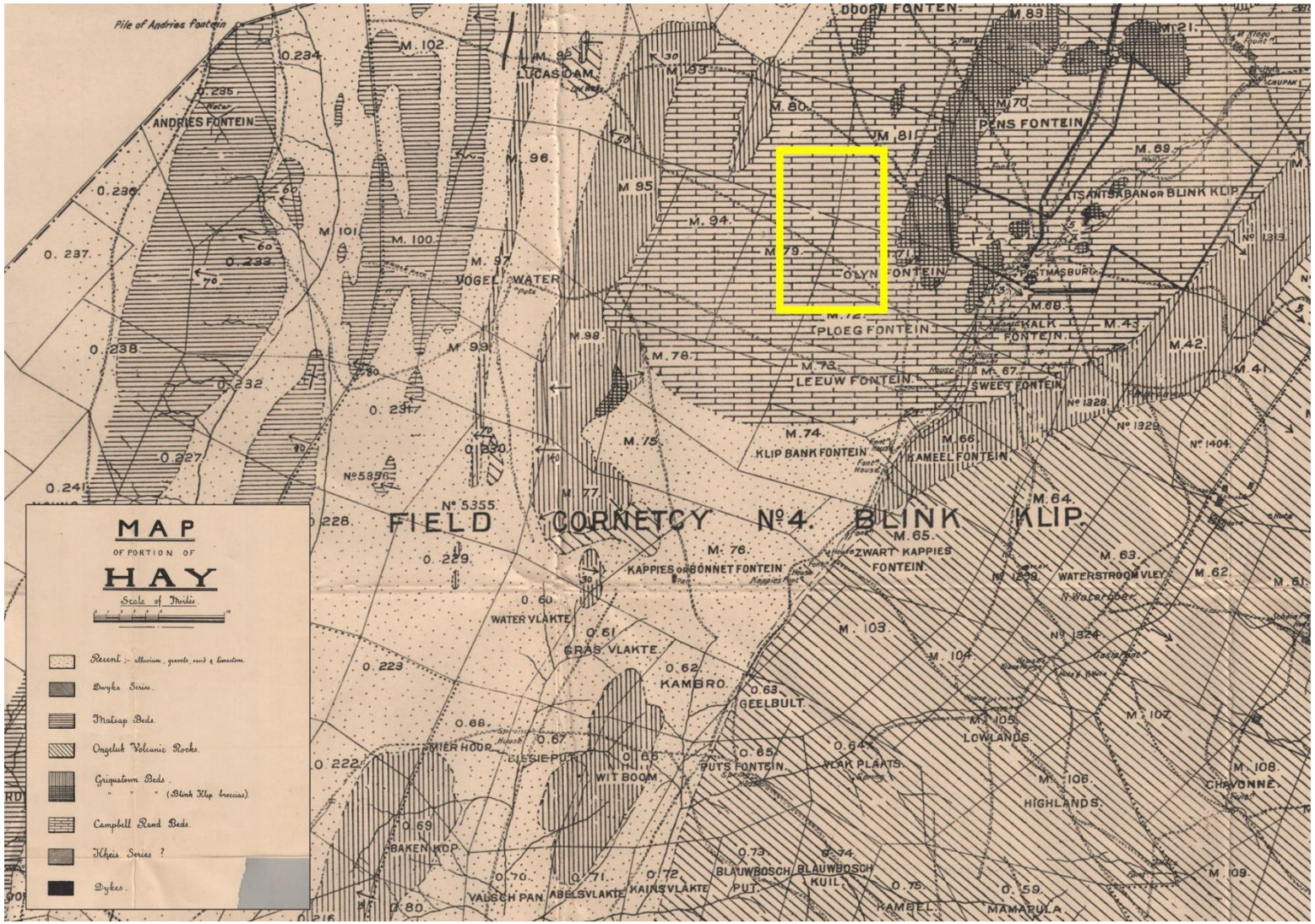


Figure 4-5: A historical "Map of portion of Hay" compiled by the University of Cape Town Libraries in 1905. Note that the project area indicated with the yellow block falls within the so-called "Campbell Rand Beds".

5 ARCHAEO-HISTORICAL CONTEXT

5.1 The archaeology of Southern Africa

Archaeology in Southern Africa is typically divided into two main fields of study, the **Stone Age** and the **Iron Age** or **Farmer Period**. The following table provides a concise outline of the chronological sequence of periods, events, cultural groups and material expressions in Southern African pre-history and history.

Table 1 Chronological Periods across Southern Africa

Period	Epoch	Associated cultural groups	Typical Material Expressions
Early Stone Age 2.5m – 250 000 YCE	Pleistocene	Early Hominins: *Australopithecines* *Homo habilis* *Homo erectus*	Typically large stone tools such as hand axes, choppers and cleavers.
Middle Stone Age 250 000 – 25 000 YCE	Pleistocene	First *Homo sapiens* species	Typically smaller stone tools such as scrapers, blades and points.
Late Stone Age 20 000 BC – present	Pleistocene / Holocene	*Homo sapiens sapiens* including San people	Typically small to minute stone tools such as arrow heads, points and bladelets.
Early Iron Age / Early Farmer Period 300 – 900 AD **(commonly restricted to the interior and north-east coastal areas of Southern Africa)**	Holocene	First Bantu-speaking groups	Typically distinct ceramics, bead ware, iron objects, grinding stones.
Middle Iron Age (Mapungubwe / K2) / early Later Farmer Period 900 – 1350 AD **(commonly restricted to the interior and north-east coastal areas of Southern Africa)**	Holocene	Bantu-speaking groups, ancestors of present-day groups	Typically distinct ceramics, bead ware and iron / gold / copper objects, trade goods and grinding stones.
Late Iron Age / Later Farmer Period 1400 AD -1850 AD **(commonly restricted to the interior and north-east coastal areas of Southern Africa)**	Holocene	Various Bantu-speaking groups including Venda, Thonga, Sotho-Tswana and Zulu	Distinct ceramics, grinding stones, iron objects, trade objects, remains of iron smelting activities including iron smelting furnace, iron slag and residue as well as iron ore.
Historical / Colonial Period ±1850 AD – present	Holocene	Various Bantu-speaking groups as well as European farmers, settlers and explorers	Remains of historical structures e.g. homesteads, missionary schools etc. as well as, glass, porcelain, metal and ceramics.

5.2 Discussion: The Postmasburg, Kuruman, Kathu Heritage Landscape

The history of the Northern Cape Province is reflected in a rich archaeological landscape, mostly dominated by Stone Age occurrences. Numerous sites, documenting Earlier, Middle and Later Stone Age habitation occur across the province, mostly in open air locales or in sediments alongside rivers or pans. In addition, a wealth of Later Stone Age rock art sites, most of which are in the form of rock engravings are to be found in the larger landscape. These sites occur on hilltops, slopes, rock outcrops and occasionally in river beds. Sites

dating to the Iron Age occur in the north eastern part of the Province but environmental factors delegated that the spread of Iron Age farming westwards from the 17th century was constrained mainly to the area east of the Langeberg Mountains. However, evidence of an Iron Age presence as far as the Upington area in the eighteenth century occurs in this area. Moving into recent times, the archaeological record reflects the development of a rich colonial frontier, characterised by, amongst others, a complex industrial archaeological landscape such as mining developments at Kimberley, which herald the modern era in South African history.

5.2.1 Palaeontology & Early History

Palaeontological assessments on areas around Kuruman note that the area is underlain by rocks older than 1000 million years, which makes them too old to contain hard-bodied fossils (e.g Beaumont 2009). This overburden consists mainly of un-fossiliferous Kalahari sand, which is relatively recent in geological age. An indurated calcareous layer frequently occurs at the interface of the sandy overburden and the rock beneath. This layer may contain fossil remains in more suitable localities, although none have been reported from such contexts in this area.

5.2.2 Early History and the Stone Ages

According to archaeological research, the earliest ancestors of modern humans emerged some two to three million years ago. The remains of Australopithecine and *Homo habilis* have been found in dolomite caves and underground dwellings in the Riverton Area at places such as Sterkfontein and Swartkrans near Krugersdorp. Homo habilis, one of the Early Stone Age hominids, is associated with Oldowan artefacts, which include crude implements manufactured from large pebbles. The Acheulian industrial complex replaced the Oldowan industrial complex during the Early Stone Age. This phase of human existence was widely distributed across South Africa and is associated with *Homo erectus*, who manufactured hand axes and cleavers from as early as one and a half million years ago. Middle Stone Age sites dating from as early as two hundred thousand years ago have been found all over South Africa. Middle Stone Age hunter-gatherer bands also lived and hunted in the Orange and Vaal River valleys. These people, who probably looked like modern humans, occupied campsites near water but also used caves as dwellings. They manufactured a wide range of stone tools, including blades and point s that may have had long wooden sticks as hafts and were used as spears. The Stone Age archaeological wealth of the Northern Cape is unequalled by any of the other provinces in South Africa. Stone Age sites are not randomly scattered within the landscape and they occur either near water sources or close to local sources of two highly-prized raw materials, specularite and jaspilite. As such, tools dating to all phases of the Stone Age are mostly found in the vicinity of larger watercourses.

Figure 5-1: Early Stone Age (Acheulian) handaxe from the Kathu Pan site (http://www.museumsnc.co.za).

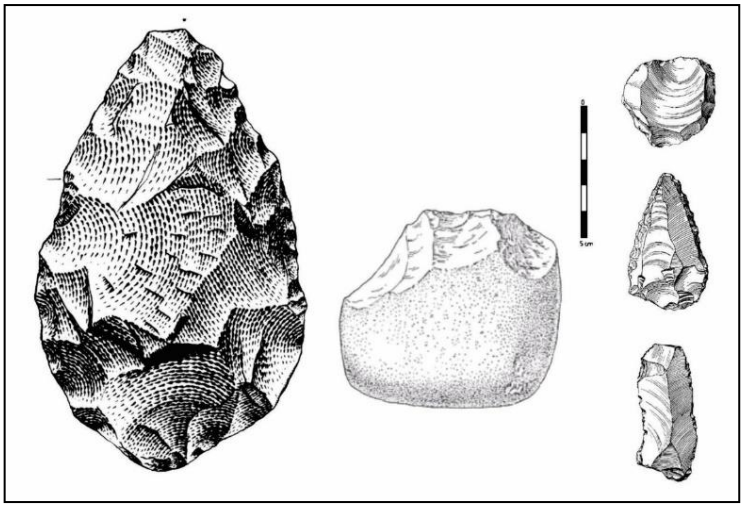


Figure 5-2: Typical ESA handaxe (left) and cleaver (center). To the right is a MSA scraper (right, top), point (right, middle) and blade (right, bottom).

The Northern Cape has a wealth of pre-colonial archaeological sites (Beaumont & Morris 1990; Morris & Beaumont 2004). Archaeological sites in this landscape are not randomly scattered within the landscape and they occur either near water or close to local source of highly-prized raw materials, banded iron formation (BIF), specularite and jaspilite. The landscape around the town of Kathu, 70km north of Postmasburg, is vastly rich in archaeological material dating to Earlier and Middle Stone Ages. These are subject to on-going archaeological research. The Kathu Complex sites contain important ESA Acheulian and transitional ESA/MSA Fauresmith assemblages (Beaumont, 1990, 2004, 2013; Herries, 2011; Chazan et al, 2012; Wilkins & Chazan, 2012, Walker et al, 2014). Walker et al (2014) suggest that the intensive occupation of the Kathu region can be linked to the availability of water resources. Current research projects are yielding important data on typologies, lithic technologies, technological innovations, complex spatial organization and also dates for the ESA Acheulian and for the MSA assemblages. North-east of Kathu several newly-found ESA sites with LCT's and an associated range of tools occur in sand quarries and on a hilltop at Uitkoms Farm and the Bestwood locality (Chazan et al, 2012). In addition, a large amount of Middle and Later Stone Age sites have been documented across the landscape on calcrete lined pans and road cuttings.

More specifically, most of the studies conducted in this landscape located surface scatters of Stone Age artefacts of limited significance (e.g. Dreyer 2008a, 2008b; Kaplan 2008) if not actual Stone Age sites. Many studies referred to the Kathu Pan site, an ancient limestone sinkhole formation as well as the Uitkoms 1 site on Kathu Hill with its high number of Stone Age artefacts (e.g. SAHRIS case number 4785). A survey for the expansion of the Sishen Mine immediately to the south of the current study area Beaumont (2000) recorded surface LSA lithics which he stated were not associated with living sites. This study also listed a large number of Stone Age artefacts as well as two Iron Age collections from the near vicinity of the study area and accessioned in the McGregor Museum. Partially overlapping and to the south of the study area Beaumont (2004) recorded only surface scatters of possible Acheulian lithics while later studies in approximately the same area located no heritage resources (Beaumont 2005a, 2005b) or, again, a few scattered stone tools of MSA appearance (Morris 2008). Morris (2001) undertook a survey near Postmasburg locating surface scatters of stone artefacts, but noting that the area between Postmasburg and Kathu is known for specularite workings and that any development should take cognisance of this.

It is important to note a concern raised by Morris (2014: unpaged) that a "consistent issue in the assessment of the presence or absence of archaeological deposits in and around Kathu … is the fact that the landscape

is often capped by (1) calcrete (not uniformly ancient – Walker et al 2013) and (2) younger Gordonia Formation Aeolian sands (Almond 2014)". That subsurface archaeological remains may occur under overlying soils and calcretes should be taken into account when archaeological and heritage surveys are undertaken

5.2.3 Pastoralism and the last 2000 years

Until 2000 years ago, hunter-gatherer communities traded, exchanged goods, encountered and interacted with other hunter-gatherer communities. From about 2000 years ago the social dynamics of the Southern African landscape started changing with the immigration of two 'other' groups of people, different in physique, political, economic and social systems, beliefs and rituals. One of these groups, the Khoekhoen pastoralists or herders entered Southern Africa with domestic animals, namely fat-tailed sheep and goats, travelling through the south towards the coast. They also introduced thin-walled pottery common in the interior and along the coastal regions of Southern Africa. Their economic systems were directed by the accumulation of wealth in domestic stock numbers and their political make-up was more hierarchical than that of the hunter-gatherers.

5.2.4 A Landscape of Rock Markings

Rock engravings are mostly found in the interior plateau of South Africa for example in Kimberley and the Karoo. Evidence exists of rock art paintings occurring in caves and shelters at the Wonderwerk Caves, Kuruman Hills, Ghaap Escarpment and scattered sites in the Karoo. Rock engravings have also been identified at Driekopseiland that is positioned in the close vicinity of Kimberley Town. Driekopseiland is evident of more than ninety percent of geometric engraving sites (Morris 1988). Geometrics have been identified at the Kuruman valley and the middle Orange area (Morris 1988). Engravings tend to be found at rock walls, low outcrops, or clusters of surface stone. The Wildebeest Kuil 1 Rock Art site, a declared ProFarm 431al Heritage Site (2008), is characterized by a fairly prominent hill surrounded by a number of 'kuils' or non-perennial water holes and wetlands. The hill itself is host to more than 400 petroglyphs, including both naturalistic and abstract engravings, in fine-line and pecked technique. LSA deposits are scattered about the immediate terrain with deposits closer to the hill indicative of residential outlines and activity or knapping areas. Extensive LSA use of the landscape is evidenced by even more engravings on the glacial pavements of the farm Nooitgedacht, just north of Platfontein. Further afield the Driekopseiland site, one of the most prolific engraving sites in the country is host to more than 3,600 images, engraved into the glaciated andesite of the Riet River's banks (Morris 1990a). Closer to the Vaal River, at the Bushmans' Fountain site, Klipfontein, more than 4,500 engravings have been recorded across the approximate 9ha site (Morris 1990b). The many petroglyph sites across the Northern Cape signal an aesthetic and spiritual expression of a modern LSA cognition. The LSA archaeological record is directly associated with San history, dating conservatively back to around 40-27kya, whilst the Khoe is reported to have entered the country around 2kya (Mitchell 2002). Both groups are known to have traded with Later Iron Age communities and Colonial settlers. Rock engravings are mostly situated in the semi-arid plateau with most of these engravings situated at the Orange – Vaal basin, Karoo and Namibia. The upper Vaal, Limpopo basin and eastern Free State regions have a small quantity of rock engravings as well. Generally, rock paintings exist at cave areas and rock engravings at open surface areas. The Cape interior consists of a technical, formal and thematic variation between and within sites (Morris 1988). Two major techniques existed namely the incised and pecked engravings. Morris (1988) indicated technical and formal characteristics through space and a sharp contrast exists between engravings positioned north of the Orange River that are mostly pecked and those in the Karoo where scraping was mostly used. According to Morris (1988) hairline engravings occur at the North and the South, but they are rare at the Vryburg region. Finger painting techniques mostly occur at the Kuruman Hills, Asbestos Mountains, Ghaap Escarpment, Langeberg, Koranaberg ranges, scattered sites at the Karoo and the Kareeberge (Morris 1988). The development petroglyphs (i.e. carving or line drawing on rock) were associated with three different types of techniques, namely incised fine lines, pecked engravings and scraped engravings. According to Peter Beaumont the

pecked and scraped engravings at the Upper Karoo are coeval (i.e. having the same age or date of origin) (Beaumont P B et al. 1989). Dating of rock art includes the use of carbonate fraction dating of ostrich eggshell pieces, dating of charcoal and ostrich eggshell at various rock art shelters. Unifacial points, double segments and thin – walled sherds may indicate the presence of the Khoikhoi at the Northern Cape during 2500 BP (years Before the Present) (Beaumont 1989).

Figure 5-3: Rock engravings at the Wildebeest Kuil Rock Art Site.

5.2.5 Iron Age / Farmer Period

The beginnings of the Iron Age (Farmer Period) in southern Africa are associated with the arrival of a new Bantu speaking population group at around the third century AD. These newcomers introduced a new way of life into areas that were occupied by Later Stone Age hunter-gatherers and Khoekhoe herders. Distinctive features of the Iron Age are a settled village life, food production (agriculture and animal husbandry), metallurgy (the mining, smelting and working of iron, copper and gold) and the manufacture of pottery. The Tlharo seems to have been the first Tswana group to enter the Kuruman area. They originated from the Hurutshe further to the north-east, and after splitting from this group during the end of the 17th century, moved in a southern direction down the Molopo River. Their early settlements included Khuis, Madibeng, Heuningvlei, Langeberg and Tsineng (Snyman, 1992). As mentioned earlier, the town of Tsineng (Tsenin) is located in the general vicinity of the present study area. The second important Tswana group from the wider area is the Tlhaping. They originated from the Rolong and during the mid-1700s moved southward along the Harts and Vaal Rivers to the vicinity of Campbell from where they traveled westwards into the area falling between Tsantsabane and Majeng on the edge of the Kalahari Desert. The Tlhaping established a capital on a perennial river known as Nokaneng. Their ruler during this time was king Maswe. Although the exact locality of Nokaneng is not known, one possibility is that the present non-perennial river Ga-Mogara used to be the Nokaneng River. This possibility was supported by the missionary John Campbell who in 1820 referred to the Ga-Mogara River as the Nokaneng (Snyman, 1992). Interestingly, Robert Moffat indicated Nokaneng to have been situated to the east of the Langeberg. This said, it is important to note that Breutz (1992) stresses the point that the actual capital Nokaneng was in fact located in the direct vicinity of Postmasburg. During the reign of Molehabangwe, who had succeeded his father Maswe in 1775, a confederation was formed which consisted of a stratified society comprised of the Tlhaping, Rolong, Tlharo, Kgalagadi and San. While the Tlhaping was seen as the ruler class, the Kgalagadi and San were viewed as vassals (Snyman, 1992). The Tlhaping conducted extensive trading activities with the Korana to the south and the Tswana to the north. During 1770 some of the Korana groups crossed the Orange River and came to the land of the Tlhaping. Although the initial contact was peaceful, conflict soon erupted. The better-armed Korana managed to force the Tlhaping out of the area in approximately 1790. This move was further augmented by

the fact that the Nokaneng River had dried up. The Tlhaping first moved to Kathu and then to Ga-Mopedi on the Kuruman River. The Tlhaping eventually established themselves at Dithakong on the Moshaweng River (Snyman, 1992).

5.2.6 Prehistoric Mining and Metallurgy

Surface occurrence of specularite (i.e. a variety of hematite) and prehistoric specularite workings are known to occur in the Northern Cape. One of these historic mines occurs at Doornfontein near Postmasburg, which dates to 1200 BP (Thackeray 1983). Specularite used to be transported in ostrich eggshells and pottery containers (Thackeray 1983). Various oral accounts indicate that Skeyfontein was visited by Khoi Herding people, Iron Age Tswana and San hunter – gatherers. More recently, asbestos mines were operated north-west of Kuruman on the farms Riries and Mt Vera during the 20th century. The archaeological excavations undertaken by Beaumont and Bashier (1974) and Thackeray et al (1983) have revealed that the mining of specularite at Doornfontein and Tsantsabane/Blinkklipkop commenced during this time. Blinkklipkop for example is located 66.7km south of the study area. During this initial period the mining activities would have been undertaken by San hunter-gatherers and Kora pastoralists. Only after the 17th century were such mining activities likely also undertaken by the Iron Age Tswana groups.

5.2.7 Later History: Reorganization, Colonial Contact and living heritage.

Between the period of 1786 – 1795 a German deserter by the name of Jan Bloem established himself at Tsantsabane (Blinkklip) (Legassick, 2010). This place is located 5km north-east of the present-day town of Postmasburg. The settlement of Jan Bloem at the specularite mine may have been a way in which to control the valuable site and any trading activities associated with it. The first known visit to this area by European explorers (i.e. excluding European renegades and fugitives such as Jan Bloem) took place in 1801. The journey was undertaken by P.J. Truter and Dr. W. Somerville. They crossed over the Orange River in the vicinity of Prieska, and passed Blinkklip on their way to present-day Kuruman (Bergh, 1999). Although their exact route is not known, it is possible that their journey from present-day Postmasburg to Kuruman would have passed some distance to the east of the present study area. William Anderson and Cornelius Kramer, both of the London Missionary Society, established a mission station at a place called Leeuwenkuil between 1802 to 1813. The focus of their work was a group known as the Bastards. This group could be described as a cultural conglomeration descending not only from relationships between different cultures and races (i.e. European and Khoi), but also comprised remnants of Khoi and San groups as well as freed slaves. The particular group later became known as the Griqua. Due to the problems caused by the presence of lions at Leeuwenkuil, the mission station was moved in 1805 to Klaarwater. On 7 August 1813 the name of the settlement which had sprung up here was renamed Griquatown. This came about as a result of a number of proposals made by Reverend John Campbell, the Director of the London Missionary Society who was visiting the mission stations from this area at the time. He suggested that "...*the Bastards change their name to 'Griqua' and that Klaarwater became Griquatown. This was because 'on consulting among themselves they found a majority were descended from a person of the name Griqua'*..." (Legassick, 2010). Griquatown is located 129km south of the present study area. Later, the German explorer Martin Hinrich Carl Lichtenstein travelled through the general vicinity of the study area. After crossing the Orange River in the vicinity of present-day Prieska, Lichtenstein's party visited present-day Danielskuil, and by June 1805 they were at Blinkklip (Postmasburg), a well-known source for obtaining specular haematite. Archaeological investigations at Blinkklipkop (also known as Nauga) established a date of AD 800 for the utilization of this particular rich source (Thackeray, et al 1983). From here they travelled further north and reached the Kuruman River where they met Tswana-speaking people. They followed the river downstream for three days, after which they followed a tributary to reach Lattakoe. From here they turned south and reached the Orange River on 11 July 1805. While on his way to the Kuruman River (and to the south thereof), Lichtenstein visited a small settlement consisting of "*…about thirty flat spherical huts.*" Although the people staying here were herdsmen who looked after the

cattle of richer people living on the Kuruman River, they indicated that San (Bushmen) were also present in the area (Lichtenstein, 1930). Although Lichtenstein was certainly not the first European explorer to travel through this area (the Truter & Somerville expedition had for example passed through this area in 1801), or for that matter the last (Burchell travelled through the area in 1811 followed by John Campbell in 1813) (Bergh, 1999), Lichtenstein did leave behind a written record of this journey providing a valuable glimpse into the early history of the general surroundings of the study area. What is also significant about the visit of Lichtenstein is that his journey took him from present-day Postmasburg to a place known as Tsenin which is located north-west of Kuruman. As a result he would have passed in close proximity to the present study area.

During 1813 John Campbell of the London Missionary Society also visited the general vicinity of the study area. He arrived at Klaarwater on 9 June 1813, where he rested for a few days before continuing in a northern direction toward present-day Kuruman, passing through Blinkklip on the way (Bergh, 1999). Robert Moffat of the London Missionary Society established the mission station at Kuruman in 1824 (Erasmus, 2004). In 1885, the area between the Molopo River and the northern boundary of Griqualand West was proclaimed as the Crown Colony of British Bechuanaland by Sir Charles Warren proclaims. Its western boundary was defined by the Molopo River and its eastern extremity reached as far as Mafeking. The proclamation followed on a military operation under Warren's command to occupy the Boer Republics of Stellaland and Goosen. As a result the Crown Colony of British Bechuanaland included the lands of the two republics as well as the land of various Tswana groups. At the time the study area was located near the southern boundary of this newly proclaimed territory. A number of so-called "native reserves" were established in this area in 1886 as a result of the work of a commission appointed by the British rulers of the Crown Colony of British Bechuanaland. These included Deben (19.1km north-west of the study area), Gatlhose (11.5km east of the study area), Maremane (27.9km south-east of the study area), Langberg (directly south-west of the farm Sekgame) as well as Kathu (directly west of the farm Sekgame) (Snyman, 1986). The establishment of so many "native reserves" in close proximity to the study area clearly support the suggestion made earlier that the study area was centrally located in the historic and prehistoric territories of Tswana groups such as the Thlaro and Thlaping. In the same year a trader by the name of John Ryan established a shop on the farm Bishop's Wood. This farm is located 12.1km west of the study area. Areas south of Kathu and Kuruman played a strategic role during the Anglo-Boer and towns such as Postmasburg, situated about 100km south of Kuruman, acted as an important link between the Boer forces from Transvaal to the Cape Colony south of the Orange River, providing ammunition and horses (Snyman 1985). The oral and written history of the Northern Cape pertaining to the last centuries is relatively abundant resulting from an assimilation of local folklore and Historical sources such as missionary accounts. The Historical period commenced when pioneers (in most cases, missionaries) arrived between the nineteenth century and early twentieth century, depending on the region. Later, larger populations established villages in the area, some of which are often still occupied today. During the 1930's some of the Tswana communities consisted of a wealth of cattle that could be used to gain capital and purchase additional land. The Khoisan and Khoikhoi communities were not so lucky, because they were mostly used as labourers at various Tswana and European households (Wylie 1989).

The area known as Griqualand West was first 'roughly' surveyed by F. Orpen and W. Stow in 1872. During the Webley et al. (2010) survey of 20 farms to the west of Macarthy it was discovered that they were all surveyed and beaconed between the years 1904 – 1911. This is very late when compared to the rest of the country. Many of the farm buildings are made of calcrete blocks and a fair percentage of farms have family graveyards. In 1907 a number of trekboers from the southern Free State arrived in the general vicinity of the present study area (Erasmus, 2004) and the so-called "Native Locations" of Skeyfontein and Groenwater were established by Proclamation 131 of 1913 (Breutz, 1963). The town of Dibeng was laid out in 1914 on the banks of the Ga-Mogara River. This followed on the establishment of the Dibeng Dutch Reformed Church

parish in 1909 (Erasmus, 2004). In 1927, the Gamagara Manganese Corporation Ltd and Central Manganese Ltd obtained options on farms in the vicinity of Lomoteng and Sishen (Snyman, 1988). An extension of the railway line from Koopmansfontein to Postmasburg was officially opened by the Minister of Railways, C.W. Malan in 1930. This meant that Postmasburg was now one of the few towns in the Northern Cape which boasted a direct rail link. While the extension of the railway line to Beeshoek was built by the Manganese Corporation further extensions to Lohatla and Manganore (1936), Sishen (1953) and Hotazel (1961) were undertaken by the South African Railways (Snyman, 1983). During 1930 an Englishman by the name of Pringle-Smith was appointed by S.A. Manganese to devise and execute a "...*thorough prospecting programme of S.A. Manganese's properties*..." (S.A. Manganese, 1977:46). This meant that the prospecting work undertaken in 1927 and which had been halted due to the poor financial climate and the lack of a railway link could now be proceeded with. Within a relatively short spate of time Pringle-Smith started opening up the beds on the farms Kapstewel and Doornput. However, the company did not have the market which for example the Manganese Corporation possessed at the time, and as a result the ore was stockpiled at these two farms. Pringle- Smith left the Postmasburg area in 1932 after the financial implications of the Great Depression worsened the situation for S.A. Manganese to such an extent that he was asked to agree to a much lower salary (S.A. Manganese, 1977). Due to the financial impacts of the Great Depression, a number of smaller manganese mining companies were closed down in the early 1930s. A period of amalgamation followed which resulted in the South African Manganese Limited as well as the Associated Manganese Miners of South Africa Limited becoming the leaders in the manganese mining industry (Snyman, 1983).

A geological assessment of the minerals and ore deposits of the Postmasburg District was undertaken by the South African Geological Survey between 1932 and 1937. One member of the geological team was Dr Leslie Gray Boardman. His responsibility was to work on manganese and haematite deposits in the district. Apart from the manganese deposits near Postmasburg, Dr Boardman also identified large deposits of iron ore deposits on farms along the northern end of their area of study including Sishen, Bruce and King (S.A. Manganese, 1977). These three farms are located 3.4km, 3.5km and 12.9km south of the present study area. After the willingness of the South African Railways Administration to extend the railway line from Postmasburg to Kapstewel and Lohatla became known, the entire manganese industry north of Postmasburg changed for the better. An example of this was that S.A. Manganese stepped up operations on the farm Kapstewel. The work here was overseen by Captain T.L.H. Shone (S.A. Manganese, 1977). The promise of railway extensions to this area also resulted in other mining activities such as the establishment of a mining company by the name of Gloucester Manganese. This company was established to mine the manganese deposits on the farm Gloucester. Shortly thereafter an amalgamation took place between Gloucester Manganese and the Manganese Corporation which resulted in the formation of the Associated Manganese Mines of South Africa Limited (Ammosal). Ammosal re-erected the old ore handling plant from Beeshoek on the farm Gloucester and the operations here represented a large portion of the total manganese production of 250,000 tons (S.A. Manganese, 1977). During the late 1940s the decision was made by two of the bigger role players in the manganese mining industry around Postmasburg for the mining of haematite iron ore to commence in earnest. S.A. Manganese in conjunction with the African Metals Corporation (Amcor) established a new company known as Manganore Iron Mining Ltd. to work on the iron ore deposits owned by them. These deposits were *inter alia* located on the farms Klipfontein, Kapstewel and Doornput (S.A. Manganese, 1977). All three these farms are located roughly 45km south of Sishen. At around 1950, Dr. L.G. Boardman was assessing the ore reserves at Manganore and Lohathla as well as the farm Lilyveld for S.A. Manganese. He found that the latter farm contained large quantities of haematite iron ore and persuaded the directors of S.A. Manganese to acquire the farm (S.A. Manganese, 1977). In 1953 Iscor commenced iron production at Sishen (Snyman, 1983). In the same year the railway line from Postmasburg to Sishen was extended to haul ore to Iscor's plants in Pretoria, Vanderbijlpark and Newcastle (Erasmus, 2004). In 1973 a

a second mine was opened at Sishen to supply export iron ore to Saldanha Bay. During the same year the town of Kathu was established to accommodate employees for the new mine (Erasmus, 2004). The 860km long Sishen-Saldanha railway line was completed in 1977 and the town of Kathu received municipal status in 1980 (Erasmus, 2004). The Northern Cape was subjected to a resettlement program during the apartheid years. Tswana families were divided into the men who had to live in a compound and the women who were sent to a relocation centre (Hallett 1984). Between 1960 and 1962 it was estimated that an average of 834,000 people were affected by the Group Areas Act (Hallett 1984). Farm 431 as well as surrounding farms were surveyed at around 1883 as part of the larger farmland around Postmasburg.

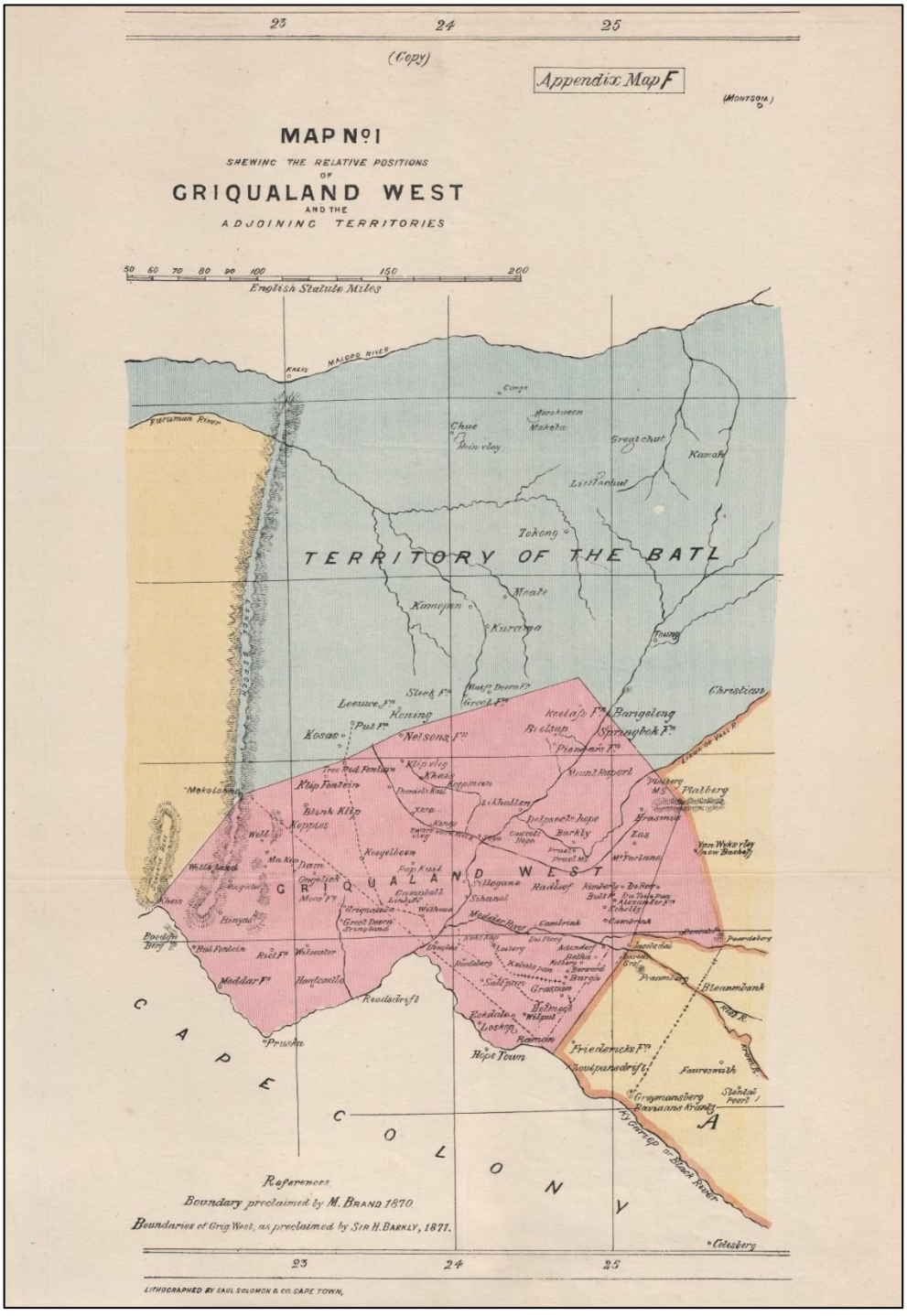


Figure 5-5: Map no. 1 shewing the relative positions of Griqualand West and the adjoining territories.

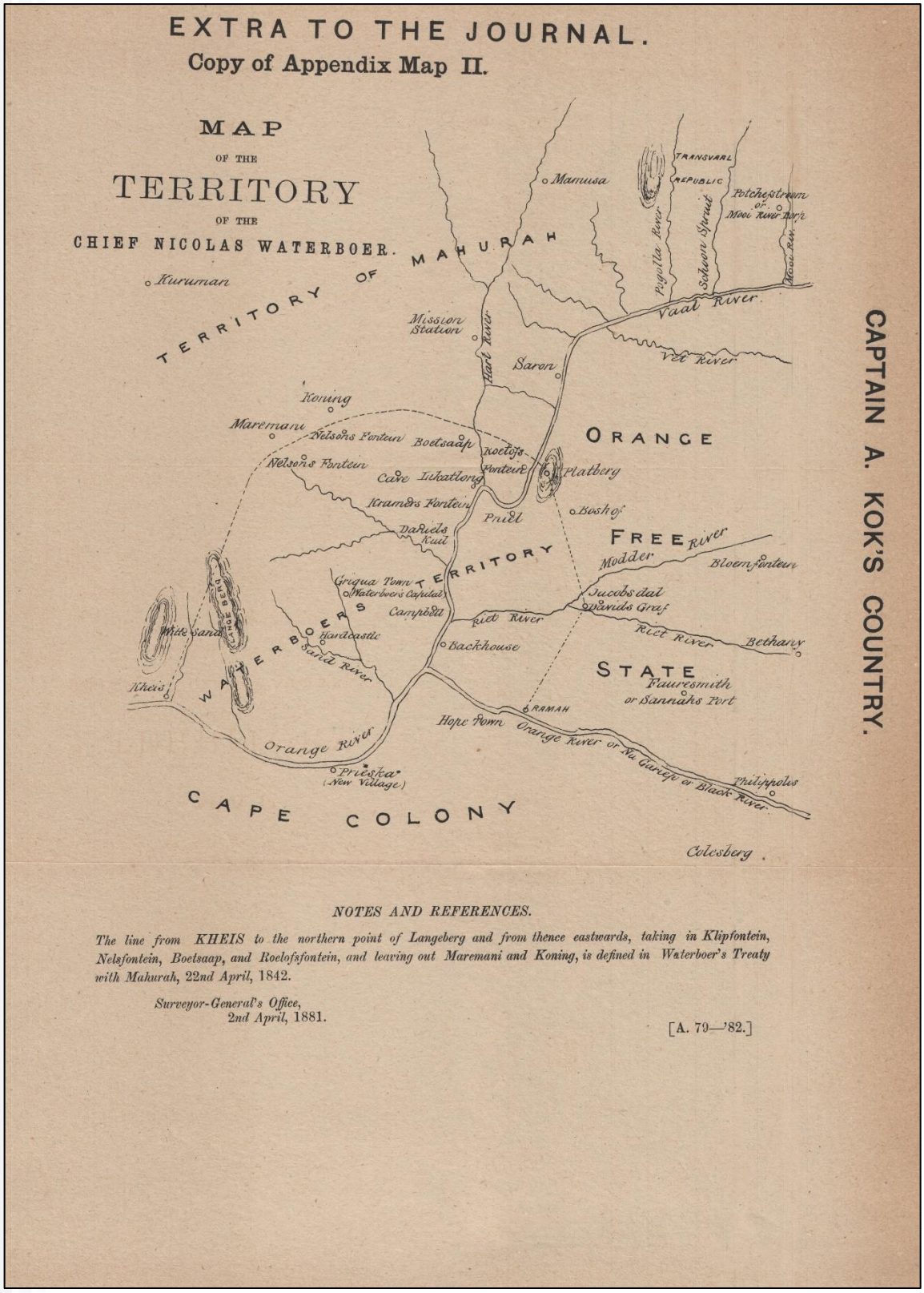


Figure 5-6: Map of the Territory of the Chief Nicolas Waterboer Cape of Good Hope (Colony). Surveyor-General's Office 1881.

5.2.8 Significant Heritage Sites in this section of the Northern Cape Province

The Northern Cape has a wealth of pre-colonial archaeological sites (Beaumont & Morris 1990; Morris & Beaumont 2004). Archaeological sites in this landscape are often not randomly scattered within the landscape and they occur either near water or close to local source of two highly-prized raw materials, specularite and jaspilite. Besides the Gamagara River, another regional water source occurs below superficial sands on the bedrock plains around Kathu, where water was contained at times that gradually filled up with stratified sediments often containing massive calcretes of Tertiary age. Large tracts are far more widespread, where archaeological traces are almost non-existent with very occasional specimens of the Later Stone Age on the sand surface and thin scatters of specimens from the Early Stone Age on calcrete below. Rock engravings previously occurred on the farms Bruce and Sishen, but as these were located in land that was to be mined, personnel of the McGregor Museum removed them prior to mining developments. At least two archaeological sites of note occur in the general landscape around the town of Kathu. As noted earlier, significant Stone Age sites occur in and around Kathu and on adjacent farms. These are subject to on-going archaeological research, primarily by Jayne Wilkins from the University of Toronto in Ontario, who has suggested the earliest stone-tipped spears yet found occur in the Kathu area.

Archaeological sites of note occur in the general landscape, including:

- *Kathu Pan*

This site, situated near the town of Kathu, is a shallow water pan about 30ha in extent. The site was extensively studied from 1974 to 1990 by Humpreys and Beaumont, amongst others. Kathu Pan is an extremely significant site as it represents the major industries of the Stone Age, more specifically two phases of the Earlier Stone Age, two phases of the Middle Stone Age, and more or less the entire Later Stone Age (Beaumont 1990). The site yielded large amounts of hand axes and faunal remains, including the concentrated remains of large mammal remains. More recently, research by Jayne Wilkins revealed a hoard of stone points, each between 4 and 9 centimeters long, that they think belonged to the earliest stone-tipped spears yet found. The stone points are the right shape and size for the job, and some have fractured tips that suggest they were used as weapons. Since stone points used on spears had been found only at sites that date back no more than 300 000 years, these discoveries in the 500 000-year-old deposits at Kathu is greatly significant. The abundance of Stone Age material at Kathu Pan can probably be attributed to the presence of a permanent water source at the pan.

- *Wonderwerk Cave*

One of the most important archaeological sites in the region is the world renowned long-sequence Wonderwerk Cave, formed originally as an ancient solution cavity in Dolomite rocks of the Kuruman Hills. The cave, situated between Danielskuil and Kuruman, contains up to 6 m depth of archaeological deposits reflecting human and environmental history through the Earlier, Middle and Later Stone Ages to the present. Rock art occurs in the form of parietal paintings within the first 40 metres from the entrance, possibly all less than 1000 years old, and small engraved stones found within the deposit, mainly from the Later Stone Age sequence where they date back some 10 500 years. The associations of older engraved or striated pieces have yet to be substantiated form of parietal paintings within the first 40 metres from the entrance, possibly all less than 1000 years old, and small engraved stones found within the deposit, mainly from the Later Stone Age sequence where they date back some 10 500 years. The associations of older engraved or striated pieces have yet to be substantiated.

- *Dithakong*

Important farmer period Iron Age remnants occur at the major Tswana town and pre-colonial stone-walled settlements of Dithakong. Local BaTlhaping communities claimed not to have known who had made or lived in this earlier town but archaeological investigations have established Tswana affinities in the earlier settlement which includes features indicative of frontier complexity at this south-western edge of Tswana expansion. Early traveller accounts refer to an impressively large town consisting of mud houses, traces of which have yet to be located archaeologically.

- *Moffat Mission Station and the Kuruman Mission*

Historically, Kuruman boasts one of the longest trajectories of African-colonial interaction centred on the nearly two-century old Moffat Mission. The Kuruman Mission was established by the London Missionary Society (LMS) in 1816 at Maruping near Kuruman where a town of about 10 000 Batswana were resident. Robert Moffat (1795-1887) arrived in Kuruman from Scotland in 1820, and soon organised permission from Chief Mothibi to relocate it to the present position at Seodin in the valley of the Kuruman River. From here he preached Christianity to the local people. Moffat laboured at the mission for 50 years, and his period is considered the “golden age” of missionary work amongst the Batswana. He was a man of considerable talents and oversaw the building of staff houses, a school house, store rooms, and the “cathedral of the Kalahari”, the great Moffat Church (1838) which can seat 800 people. The mission is also well-known as the first African home of Dr. David Livingstone. He arrived as an LMS missionary in 1841, and remained in contact with the mission due to his marriage to Moffat’s eldest daughter Mary.

- *Kathu Townlands*

This Provincial Heritage Site, covering an estimated area of 250 000 m2 is located away from the Kathu pan on the outskirts of the town of Kathu. The site, excavated in 1982 and 1990, primary displays a large Earlier Stone Age horizon in deposits up to a metre below surface. This deposit dates to the Acheul phase of the Earlier Stone Age. It is estimated that in total, the site holds more than 2 billion artefacts. This abundance of lithic debris could be ascribed to the protracted use of the high-grade banded ironstone outcrop in the area, as a raw material source (Beaumont 1990).

6 FARM 431: HERITAGE SENSTIVITY AND SITE PROBABILITY

In terms of heritage resources, the landscape around Farm 431 is primarily well known for the occurrence of Stone Age and Colonial Period heritage remains. Small portions of the project subject property have been transformed in places by historical and recent mining and digging risking the sterilization of these zones of heritage remains.

6.1 Heritage Potential and Site Probability

6.1.1 Palaeontology

As noted in previous sections, fossiliferous formations occur in a major fossil-bearing complex of karstic deposits in the escarpment of the Ghaap Plateau and numerous sites of palaeontological significance occur here. However, the project area falls within a moderate to low paleontologically sensitive zone and a Palaeontological Desktop Assessment (PDA) was commissioned for the proposed project. Cognisance should be taken of further recommendations included in the PDA Report.

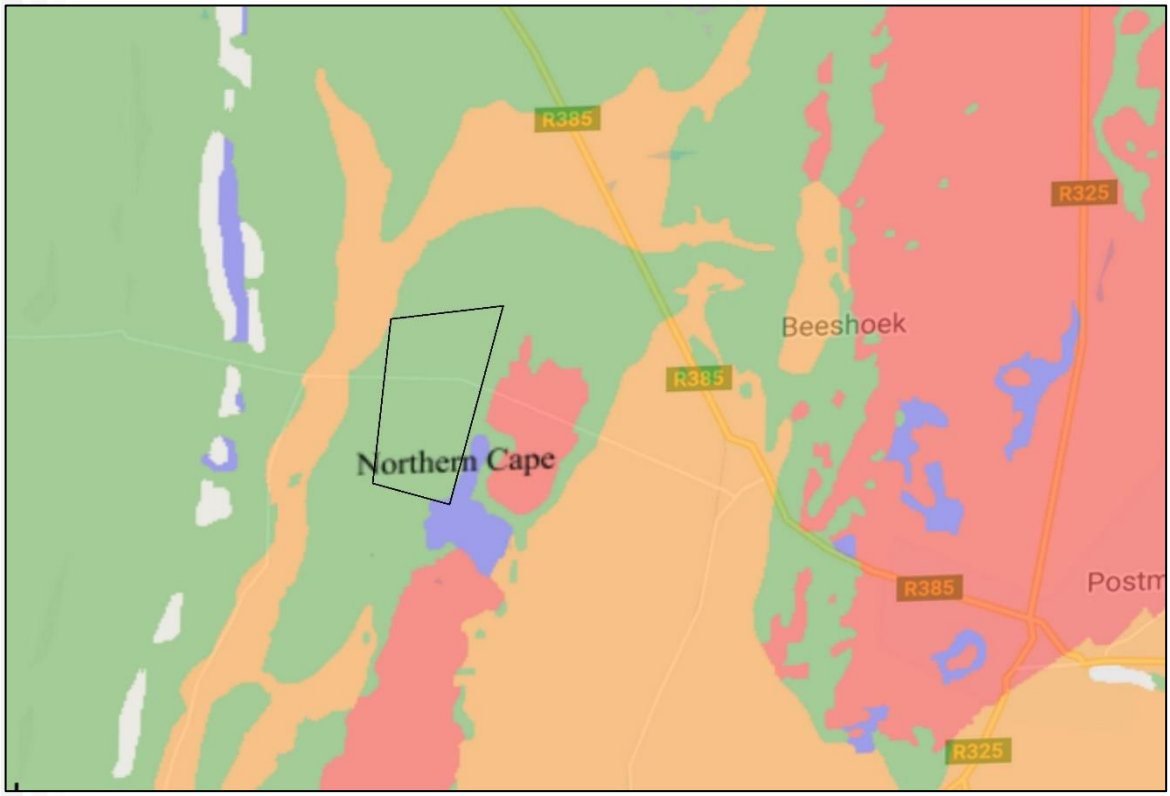


Figure 6-1: SAHRIS Paleontological sensitivity map of the project area, indicating a moderate to low fossil sensitivity for the project area (green shade).

6.1.2 The Stone Age

Material from the earlier, middle and later Stone Age occur widely across the Northern Cape Province and local archaeological research has indicated how Stone Age material often occurs along drainage lines, in rock shelters, along ridges, the rims of pans and in cave sites. In this area, deep Hutton Sands rest on decomposing dolerite and calcrete formations where Stone Age artefacts are known to occur in these dolerite and occasional calcrete patches. These geomorphological exposures might prove sensitive in terms of the occurrence of stone artefacts and Earlier, Middle and Later Stone Age material. Similarly, Stone Age manufacturing sites are known to occur along ridges near sources of stone suitable for stone tool making and such areas could contain remnants of Stone Age manufacturing sites. Stone Age occurrences are also

known to occur along the eroded banks of rivers and drainage lines in this landscape Later Stone Age shelters and rock art might be encountered along hilltops slopes and ridges.

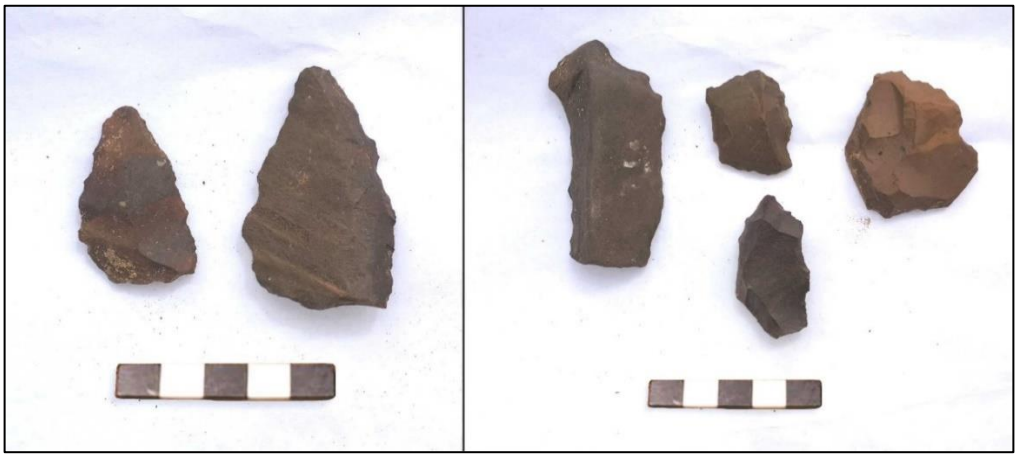


Figure 6-2: Examples of MSA points (left) and blades and scrapers (right) from the Kuruman River in the larger project landscape.

Figure 6-3: MSA Lithics on fine grained jasperlite from the Kuruman River in the larger project landscape.

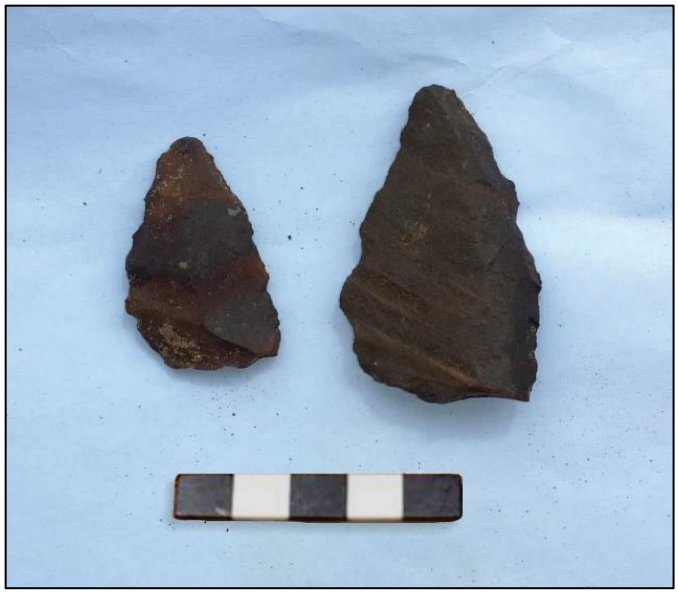


Figure 6-4: Examples of MSA points from the Kuruman River in the larger project landscape.

6.1.3 The Iron Age (Farmer Period)

Later Iron Age farmers preferred protective mountain slopes close to areas fit for cattle grazing as settlement areas and single hills and rock outcrops. Iron Age settlements are relatively scarce in this part of the Northern Cape Province and, cognizant of the nature of the landscape there is generally a low probability of impact to Iron Age occurrences.

6.1.4 Colonial Period and recent times

The Northern Cape has a long and extensive Colonial Period settlement history. From around the first half of the 19th century, the area was frequented by explorers, missionaries and farmers who all contributed to a recent history of contact and conflict. An analysis of historical aerial photographs and topographic maps indicate that a farmstead and other buildings occur on Farm 431. It is possible that the farmstead was converted into mining infrastructure in later years as the site is located near mining activities. These sites are older than 60 years and the features are generally protected under the National Heritage Resource Act (NHRA 1999).

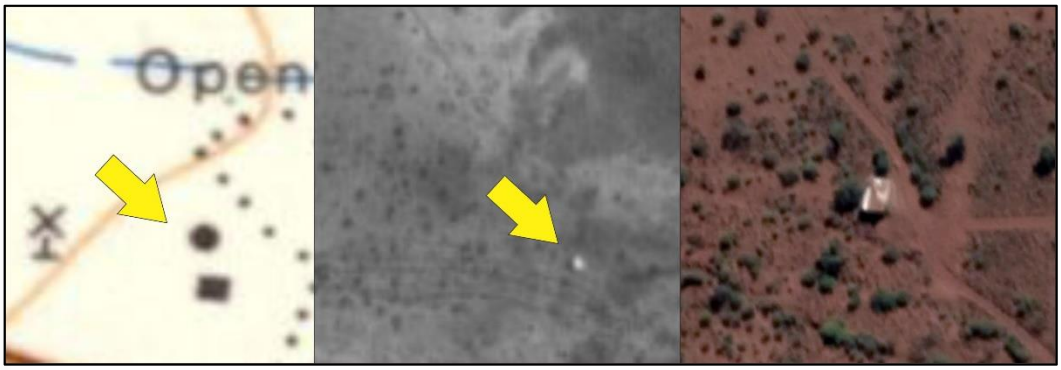


Figure 6-5: A topographic map (1967), left and an aerial image (1966), middle) as well as a current aerial image and indicating the presence of the Farm 431 homestead in the landscape.

6.1.5 Graves

In the rural areas of the Northern Cape Province graves and cemeteries sometimes occur within settlements or around farmsteads but they are also randomly scattered around archaeological and historical settlements. The probability of human burials encountered around areas where the Farm 431 farmstead are situated, should thus be considered. In addition, human remains and burials are commonly found close to archaeological sites; they may be found in "lost" graveyards, or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface. Human remains are usually observed when they are exposed through erosion. In some instances packed stones or rocks may indicate the presence of informal pre-colonial burials. If any human bones are found during the course of construction work then they should be reported to an archaeologist and work in the immediate vicinity should cease until the appropriate actions have been carried out by the archaeologist. Where human remains are part of a burial they would need to be exhumed under a permit from SAHRA (for pre-colonial burials as well as burials later than about AD 1500). Should any unmarked human burials/remains be found during the course of construction, work in the immediate vicinity should cease and the find must immediately be reported to the archaeologist, or the South African Heritage Resources Agency (SAHRA). Under no circumstances may burials be disturbed or removed until such time as necessary statutory procedures required for grave relocation have been met.

6.1.6 Other Sites / Features

Mining and quarrying activities are is indicated on a topographic map of Farm 431 and special historical, cultural or social associations for the site needs to be established. It should be noted that sites and structures derived from early mining older than 60 years, are protected under the National Heritage Resource Act (NHRA 1999).

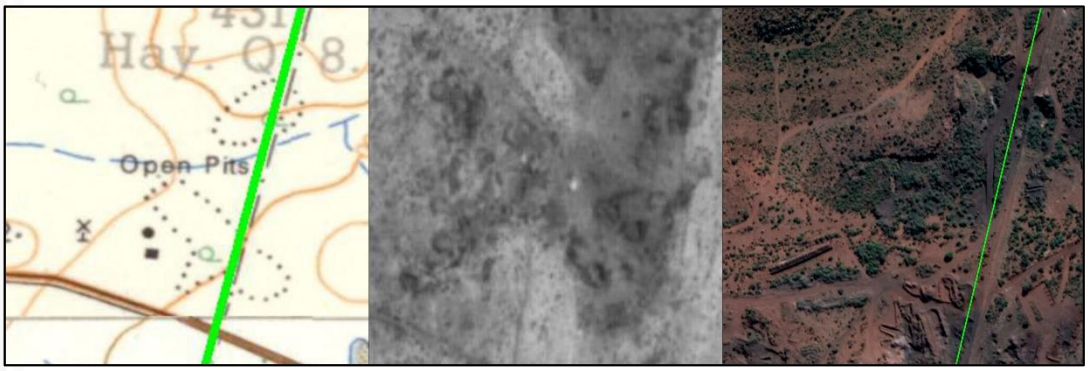


Figure 6-5: A topographic map (1967), left and an aerial image (1966, middle) as well as a current aerial image and indicating the presence of mining and quarrying in the landscape.

6.2 Site Probability

The synthesis of data in this report suggests a landscape which holds cultural heritage resources and a further medium probability of the occurrence of cultural heritage sites could be expected in the Farm 431 MRA Project area. The following table provides a n estimate as to archaeological remains to be expected within the study area based on the wealth of archaeological evidence in these regions:

Time Period	Sites Examples	Characteristic Material Culture	Archaeological Footprint	Probability of site occurrence
Palaeontology and Fossils	Ghaap Plateau	Fossilized faunal and botanical remain.	Such resources are typically found in specific geographical areas, e.g. the Karoo and are embedded in ancient rock and limestone/calcrete formations. Exposed by road cuttings and quarry excavation.	Medium – Low
Earlier Stone Age	Tshipise Mapungubwe Bosbokpoort	Large hand axes, cleavers, cores and residue material.	Buried unless disturbed.	Medium Probability
Middle Stone Age	Uitenpast Maremani Tshipse Ha-Dowe Mapungubwe	Specialised formal stone tools such as points, blades and scrapers. Cores and residue.	Surface scatters, found in erosion gullies, dongas and open scatters.	Medium Probability
Later Stone Age	Mapungubwe Machete Ratho	Specialised formal microlithic stone tools such as points, blades and scrapers as well as cores and residue. Rock Art.	Usually associated with rock shelters. Artefacts occur in buried deposits or surface scatters.	Medium Probability
Early Iron Age	Broederstroom	Potsherds, iron objects, house remains, glass beads, ostrich egg shell beads, middens, fauna.	Generally buried with few ceramics on surface.	Improbable
Middle Iron Age	Mapungubwe	Potsherds, iron objects,	Sites are primarily open, visible	Improbable

	Pontdrif Kromdraai	house remains, glass beads, ostrich egg shell beads, middens, trade goods such as porcelain, some stone walling.	kraals, grain bin foundations and ceramic scatters.	
Later Iron Age	Magaliesberg Kaditswene Molokwane	Potsherds, iron objects, house remains, glass beads, ostrich egg shell beads, middens, trade goods such as porcelain, extensive stone walling.	Khami/Venda sites specifically have a high visibility due to the stone walling and visible ceramic scatters kraal.	Medium – Low Probability
Mining / Metallurgy	Rooiberg Verdun	Residues associated with metallurgy including slag, ore, metal objects, and hammer stones.	Sites are primarily open, visible stone enclosures in secluded areas.	High Probability
Rock Art and Markings	Waterberg Olieboomspoort	Fine line and finger paintings, grooves, cupules, engravings.	Usually associated with rock shelters and outcrops.	Medium Probability
Colonial Period: Structures	Schoemansdal Valdezia Mission Makapansgat	Foundation structures, house remains.	Colonial period sites generally have a high visibility due to preservation and visible material remains scatters.	High Probability
Colonial Period: Middens / Dumps	Schoemansdal Valdezia Mission Makapansgat	Glass, porcelain, potsherds, metal objects such as tin cans.	Colonial period sites generally have a high visibility due to preservation and visible material remains scatters.	High Probability
Battle and military sites	Fort Westfort Wonderboom Fort	Artefacts associated with conflict including spears, arrow heads, ammunition, rifles.	It is sometimes hard to identify sites of conflict as a result of the short duration and limited impact that such events incur.	Medium Probability
Burials over 100 years	Schoemansdal Makapansgat Maremani	Stone cairns, circles and ovals.	Prehistoric burials are sometimes hard to identify as they frequently occur in cattle kraals or as parts of stone wall structures.	High Probability
Burials younger than 60 years	Ga -Rankuwa	Marble head stones	More recent burials can be identified by headstones and grave dressings frequently present on these structures.	High Probability

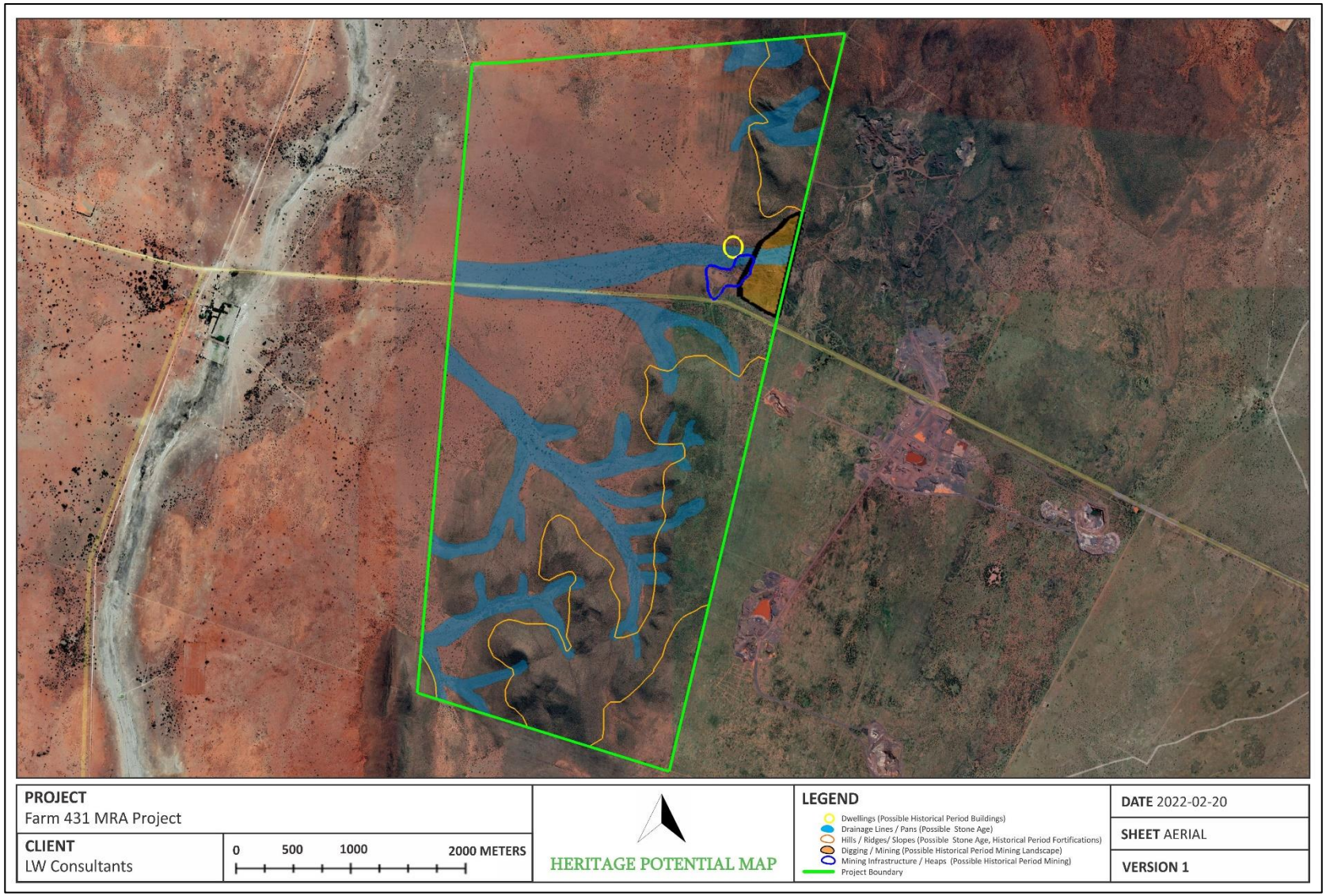


Figure 6-6: Aerial map indicating areas of heritage potential and possible heritage impacts.

7 SITE SIGNIFICANCE AND POTENTIAL IMPACTS

The following section provides a background to the identification and assessment of possible impacts and alternatives, as well as a range of risk situations and scenarios commonly associated with heritage resources management. A guideline for the rating of impacts and recommendation of management actions for areas of heritage potential within the study area is supplied in Section 10.2 of Addendum 3.

7.1 General assessment of impacts on resources[1]

Generally, the value and significance of archaeological and other heritage sites might be impacted on by any activity that would result immediately or in the future in the destruction, damage, excavation, alteration, removal or collection from its original position, of any archaeological material or object (as indicated in the National Heritage Resources Act (No 25 of 1999)). Thus, the destructive impacts that are possible in terms of heritage resources would tend to be direct, once-off events occurring during the initial construction period. However, in the long run, the proximity of operations in any given area could result in secondary indirect impacts. The EIA process therefore specifies impact assessment criteria which can be utilised from the perspective of a heritage specialist study which elucidates the overall extent of impacts.

7.1.1 Direct, indirect and cumulative effects

Direct or primary effects on heritage resources occur at the same time and in the same space as the activity, e.g. loss of historical fabric through demolition work. **Indirect effects or secondary effects** on heritage resources occur later in time or at a different place from the causal activity, or as a result of a complex pathway, e.g. restriction of access to a heritage resource resulting in the gradual erosion of its significance, which is dependent on ritual patterns of access (refer to Section 10.3 in the Addendum for an outline of the relationship between the significance of a heritage context, the intensity of development and the significance of heritage impacts to be expected).

7.2 Impact Rating Criteria

7.2.1 Extent

Local	extend only as far as the footprint of the proposed activity/development
Site	Impact extends beyond the site footprint to immediate surrounds
Regional	within which development takes place, i.e. farm, suburb, town, community
National	Impact is on a national level

7.2.2 Duration

Short term	The impact will disappear with through mitigation or through natural processes
Medium term	The impact will last up to the end of the phases, where after it will be negated
Long term	impact will persist indefinitely, possibly beyond the operational life of the activity, either because of natural processes or by human intervention
Permanent	Permanent where mitigation either by natural process of by human intervention will not occur in such a way or in such a time span that the impact can be considered transient

7.2.3 Magnitude severity

Low	where the impact affects the resource in such a way that its heritage value is not affected
Medium	where the affected resource is altered but its heritage value continues to exist albeit in a modified way
High	where heritage value is altered to the extent that it will temporarily or permanently be damaged or destroyed

7.2.4 Probability

Improbable	where the possibility of the impact to materialize is very low either because of design or historic experience;

[1] Based on: W inter, S. & Baumann, N. 2005. *Guideline for involving heritage specialists in EIA processes: Edition 1.*

Probable	where there is a distinct possibility that the impact will occur
Highly	probable, where it is most likely that the impact will occur; or
Definite	where the impact will definitely occur regardless of any mitigation measures.

7.2.5 Impact Significance

Low	negligible effect on heritage – no effect on decision
Medium	where it would have a moderate effect on heritage and – influences the decision
High	high risk of, a big effect on heritage. Impacts of high significance should have a major influence on the decision
Very high	high risk of, an irreversible and possibly irreplaceable impact on heritage – central factor in decision-making

7.3 Evaluation of Impact: The Farm 431 MRA Project

7.3.1 Archaeology

It is probable that archaeological remains might be impacted in the project area. Here, Stone Age material might occur on decomposing dolerite and occasional calcrete patches in deep red sands. In addition, Stone Age material might occur in exposures around drainage lines and along ridges and hills.

7.3.2 Built Environment

The Farm 431 farmstead and other man-made features remain on the properties and these sites are be protected under the NHRA. As for the rest of the project area, the general landscape holds significance in terms of the built environment as the area comprises historical farming remnants and relatively newly established residential zones, settlements and townlands. A portion of the project area have been subjected to mining and quarrying in past years and it is possible that sites and structures derived from early mining might occur in the project area and, if older than 60 years, such features are protected under the National Heritage Resource Act (NHRA 1999).

7.3.3 Cultural Landscape

Generally, the proposed project area and its surrounds are characterised by vast farmlands around Farm 431 and Postmasburg and surface mining towards the south. The cultural landscape of the study area revolves strongly around dryland agriculture and livestock grazing. Further away from the project area, the surroundings display undulating hills with flatter plains in the landscape.

7.3.4 Graves / Human Burials Sites

In the rural areas of the Northern Cape Province graves and cemeteries sometimes occur within settlements or around farmsteads but they are also randomly scattered around archaeological and historical settlements. The probability of human burials encountered around the Farm 431 farmsteads should thus be considered. In addition, human remains and burials are commonly found close to archaeological sites; they may be found in "lost" graveyards, or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface.

8 RECOMMENDATIONS

The cultural landscape of the Northern Cape encompasses a period of time that spans millions of years, covering human cultural development from the Stone Ages up to recent times. It depicts the interaction between the first humans and their adaptation and utilization to the environment, the migration of people, technological advances, warfare and contact and conflict. In terms of heritage resources, the landscape around Farm 431 is primarily well known for the occurrence of Stone Age and Colonial Period heritage. Portions of the property have been transformed by historical and recent mining risking the sterilization of these zones of heritage remains. In terms of the probability of site impact on the Farm 431 farm portions, the following should be noted:

8.1 Farm 431 Heritage Sensitivity

- In this area, deep Hutton Sands rest on decomposing dolerite and calcrete formations where Stone Age artefacts are known to occur in these dolerite and occasional calcrete patches. These geomorphological exposures might prove sensitive in terms of the occurrence of stone artefacts and Earlier, Middle and Later Stone Age material. Similarly, Stone Age manufacturing sites are known to occur along ridges near sources of stone suitable for stone tool making and such areas could contain remnants of Stone Age manufacturing sites. Stone Age material might also occur along water sources along drainage lines in the project area. Later Stone Age shelters and rock art might be encountered along hilltops slopes and ridges.
- Later Iron Age farmers preferred protective mountain slopes close to areas fit for cattle grazing as settlement areas and single hills and rock outcrops. Iron Age settlements are relatively scarce in this part of the Northern Cape Province and, cognizant of the nature of the landscape there is generally a low probability of impact to Iron Age occurrences.
- European farmers, settling in the area since the middle of the 19th century, divided up the landscape into a number of farms which form the framework for agricultural, residential and other forms of development in present day. A probable Farmstead occurs on Farm 431 and historical aerial photos indicate that the site is older than 60 years and they are generally protected under the National Heritage Resource Act (NHRA 1999). As such, the site might be sensitive in terms of the heritage landscape. It is possible that the farmstead was converted into mining infrastructure in later years as the site is located near mining activities.
- As family cemeteries often occur around farmsteads in rural areas of the Northern Cape, areas where the Farm 431 farmsteads are situated might prove sensitive in terms of the possible existence of burial sites.
- It is evident that a portion of the project area have been subjected to mining and quarrying in past years and it is possible that sites and structures derived from early mining might occur in the project area and, if older than 60 years, such features are protected under the National Heritage Resource Act (NHRA 1999.

8.2 Evaluation of Impact: The Project

As a general guideline and to reduce impacts on heritage resources to a minimum, the following recommendations should be considered in the planning, implementation and management phases of the Project:

- The project area falls within a moderate to low paleontologically sensitive zone and a Palaeontological Desktop Assessment (PDA) was commissioned for the proposed project. Cognisance should be taken of further recommendations included in the PDA Report.
- The term “Living Heritage” can broadly refer to a place of cultural heritage and sacred nature; with cultural attributions that are not generally physically manifested. Ritual and symbolic spaces and practices, and the material residues thereof convey an intangible cultural significance beyond the physical site or artefact, where the meaning of the ritual area speaks directly of a sense of place and lived experience. Such sites might occur on the Farm 431 properties or its surroundings and due

cognisance should be taken of these sites of "Living Heritage" in the cultural landscape.

- It is recommended that all graves and cemeteries that might occur in the project area be conserved and excluded from impact emanating from the development. Where impact on such resources would prove to be inevitable, the correct human remains repatriation procedures should be observed at all times. These procedures should include public notification of intent to relocate the remains, consultation with descendant communities, close liaison with - and approval from local futurities, adherence to any local laws and / bylaws and correct grave relocation methodologies.
- It is possible that groups, farmers and locals living in the area have occupied the region for many generations and have expressed long-term cultural associations with the region. Therefore, it is important to ascertain from these respondents whether there are any further undetected sites of cultural significance in the area to which they relate and / or attach cultural meaning.

Ultimately, it is recommended that the archaeological and cultural heritage of this part of the Northern Cape Province be respected. The management of heritage resources, as stipulated by National and International Heritage resources agencies (e.g. SAHRA) should be aligned with any future activity by means of cultural mitigation and / or management plans developed in conjunction with heritage authorities and specialists.

8.3 Further Terms of Reference

It should be noted that this HS and site sensitivity included above are solely based on off-site desktop findings and the heritage sensitivity of the Farm 431 properties remain tentative pending further detailed site inspection as part of the Heritage Impact Assessment (HIA) process, subject to section 38 of the National Heritage Resources Act (NHRA - Act 25 of 1999).

The following terms of reference for the HIA as part of the Environmental Authorisation Process, are required specifically for the Farm 431 MRA Project terms of proposed operations:

- Provide a detailed description of all archaeological and heritage artefacts, structures, graves and settlements by means of the field inspection of all surface areas to be impacted by the planned exploration activities.
- Closely liaise with local communities and farm owners in order to identify additional archaeological, heritage and living heritage sites in the Project area.
- Contextualize any heritage resources and archaeological sites within the larger historical landscape by means of a detailed desktop-based background study.
- Estimate the level of significance/importance of the archaeological remains within the area.
- Assess any possible impact on the archaeological and historical remains within the area emanating from the proposed development activities.
- If necessitated by the development, propose possible mitigation measures for heritage resources, subject to a mandate from local authorities and according to international standards for best practise in Cultural Resources Management (CRM).
- Develop protection procedures for sacred sites and any other heritage features excluded from mitigation in conjunction with traditional guardians and elders and the local community.
- Liaise and consult with the relevant heritage resources management authorities (South African Heritage Resources Agency, Stakeholders).

It must be emphasised that the conclusions and recommendations expressed in this heritage scoping and sensitivity investigation are primarily based on desktop study findings and is thus not representative of the Project area's complete archaeological an historical legacy. Many sites/features may be covered by soil and vegetation and might only be located during sub-surface investigations. If subsurface archaeological deposits, artefacts or skeletal material were to be recovered in the area during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately.

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10 ADDENDUM 1: HERITAGE LEGISLATION BACKGROUND

10.1 CRM: Legislation, Conservation and Heritage Management

The broad generic term Cultural Heritage Resources refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of palaeontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

10.1.1 Legislation regarding archaeology and heritage sites

The South African Heritage Resources Agency (SAHRA) and their provincial offices aim to conserve and control the management, research, alteration and destruction of cultural resources of South Africa. It is therefore vitally important to adhere to heritage resource legislation at all times.

d. National Heritage Resources Act No 25 of 1999, section 35

According to the National Heritage Resources Act of 1999 a historical site is any identifiable building or part thereof, marker, milestone, gravestone, landmark or tell older than 60 years. This clause is commonly known as the "60-years clause". Buildings are amongst the most enduring features of human occupation, and this definition therefore includes all buildings older than 60 years, modern architecture as well as ruins, fortifications and Iron Age settlements. "Tell" refers to the evidence of human existence which is no longer above ground level, such as building foundations and buried remains of settlements (including artefacts).

The Act identifies heritage objects as:

- objects recovered from the soil or waters of South Africa including archaeological and palaeontological objects, meteorites and rare geological specimens
- visual art objects
- military objects
- numismatic objects
- objects of cultural and historical significance
- objects to which oral traditions are attached and which are associated with living heritage
- objects of scientific or technological interest
- any other prescribed category

With regards to activities and work on archaeological and heritage sites this Act states that:

"No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit by the relevant provincial heritage resources authority." (34. [1] 1999:58)

and

"No person may, without a permit issued by the responsible heritage resources authority-

(d) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;

(e) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;

(f) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or

(g) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites. (35. [4] 1999:58)."

and

"No person may, without a permit issued by SAHRA or a provincial heritage resources agency-

(h) 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;

(i) 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;

(j) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) and excavation equipment, or any equipment which assists in the detection or recovery of metals (36. [3] 1999:60)."

e. Human Tissue Act of 1983 and Ordinance on the Removal of Graves and Dead Bodies of 1925

Graves 60 years or older are heritage resources and fall under the jurisdiction of both the National Heritage Resources Act and the Human Tissues Act of 1983. However, graves younger than 60 years are specifically protected by the Human Tissues Act (Act 65 of 1983) and the Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925) as well as any local and regional provisions, laws and by-laws. Such burial places also fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial must be obtained from the relevant Provincial MEC as well as the relevant Local Authorities.

10.1.2 Background to HIA and AIA Studies

South Africa's unique and non-renewable archaeological and palaeontological heritage sites are 'generally' protected in terms of the National Heritage Resources Act (Act No 25 of 1999, section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority. Heritage sites are frequently threatened by development projects and both the environmental and heritage legislation require impact assessments (HIAs & AIAs) that identify all heritage resources in areas to be developed. Particularly, these assessments are required to make recommendations for protection or mitigation of the impact of the sites. HIAs and AIAs should be done by qualified professionals with adequate knowledge to (a) identify all heritage resources including archaeological and palaeontological sites that might occur in areas of developed and (b) make recommendations for protection or mitigation of the impact on the sites.

The National Heritage Resources Act (Act No. 25 of 1999, section 38) provides guidelines for Cultural Resources Management and prospective developments:

"38. *(1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as:*

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

(b) the construction of a bridge or similar structure exceeding 50m in length;

(c) any development or other activity which will change the character of a site:

(i) exceeding 5 000 m^2 in extent; or

(ii) involving three or more existing erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

(d) the re-zoning of a site exceeding 10 000 m^2 in extent; or

(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development."

And:

"The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included:

(k) The identification and mapping of all heritage resources in the area affected;

(l) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;

(m) an assessment of the impact of the development on such heritage resources;

(n) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;

(o) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;

(p) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and

(q) plans for mitigation of any adverse effects during and after the completion of the proposed development (38. [3] 1999:64)."

Consequently, section 35 of the Act requires Heritage Impact Assessments (HIAs) or Archaeological Impact Assessments (AIAs) to be done for such developments in order for all heritage resources, that is, all places or objects of aesthetics, architectural, historic, scientific, social, spiritual, linguistic or technological value or significance to be protected. Thus any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures older than 60 years, living heritage, historical settlements, landscapes, geological sites, palaeontological sites and objects. Heritage resources management and conservation.

10.2 Assessing the Significance of Heritage Resources

Archaeological sites, as previously defined in the National Heritage Resources Act (Act 25 of 1999) are places in the landscape where people have lived in the past – generally more than 60 years ago – and have left traces of their presence behind. In South Africa, archaeological sites include hominid fossil sites, places where people

of the Earlier, Middle and Later Stone Age lived in open sites, river gravels, rock shelters and caves, Iron Age sites, graves, and a variety of historical sites and structures in rural areas, towns and cities. Palaeontological sites are those with fossil remains of plants and animals where people were not involved in the accumulation of the deposits. The basic principle of cultural heritage conservation is that archaeological and other heritage sites are valuable, scarce and *non-renewable.* Many such sites are unfortunately lost on a daily basis through development for housing, roads and infrastructure and once archaeological sites are damaged, they cannot be re-created as site integrity and authenticity is permanently lost. Archaeological sites have the potential to contribute to our understanding of the history of the region and of our country and continent. By preserving links with our past, we may not be able to revive lost cultural traditions, but it enables us to appreciate the role they have played in the history of our country.

- Categories of significance

Rating the significance of archaeological sites, and consequently grading the potential impact on the resources is linked to the significance of the site itself. The significance of an archaeological site is based on the amount of deposit, the integrity of the context, the kind of deposit and the potential to help answer present research questions. Historical structures are defined by Section 34 of the National Heritage Resources Act, 1999, while other historical and cultural significant sites, places and features, are generally determined by community preferences. The guidelines as provided by the NHRA (Act No. 25 of 1999) in Section 3, with special reference to subsection 3 are used when determining the cultural significance or other special value of archaeological or historical sites. In addition, ICOMOS (the Australian Committee of the International Council on Monuments and Sites) highlights four cultural attributes, which are valuable to any given culture:

- *Aesthetic value:*

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria include consideration of the form, scale, colour, texture and material of the fabric, the general atmosphere associated with the place and its uses and also the aesthetic values commonly assessed in the analysis of landscapes and townscape.

- *Historic value:*

Historic value encompasses the history of aesthetics, science and society and therefore to a large extent underlies all of the attributes discussed here. Usually a place has historical value because of some kind of influence by an event, person, phase or activity.

- *Scientific value:*

The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality and on the degree to which the place may contribute further substantial information.

- *Social value:*

Social value includes the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a certain group.

It is important for heritage specialist input in the EIA process to take into account the heritage management structure set up by the NHR Act. It makes provision for a 3-tier system of management including the South Africa Heritage Resources Agency (SAHRA) at a national level, Provincial Heritage Resources Authorities (PHRAs) at a provincial and the local authority. The Act makes provision for two types or forms of protection of heritage resources; i.e. formally protected and generally protected sites:

Formally protected sites:

- Grade 1 or national heritage sites, which are managed by SAHRA
- Grade 2 or provincial heritage sites, which are managed by the provincial HRA (MP-PHRA).
- Grade 3 or local heritage sites.

Generally protected sites:

- Human burials older than 60 years.
- Archaeological and palaeontological sites.
- Shipwrecks and associated remains older than 60 years.
- Structures older than 60 years.

With reference to the evaluation of sites, the certainty of prediction is definite, unless stated otherwise and if the significance of the site is rated high, the significance of the impact will also result in a high rating. The same rule applies if the significance rating of the site is low. The significance of archaeological sites is generally ranked into the following categories.

Significance	Rating Action
No significance: sites that do not require mitigation.	None
Low significance: sites, which may require mitigation.	2a. Recording and documentation (Phase 1) of site; no further action required 2b. Controlled sampling (shovel test pits, auguring), mapping and documentation (Phase 2 investigation); permit required for sampling and destruction
Medium significance: sites, which require mitigation.	3. Excavation of representative sample, C14 dating, mapping and documentation (Phase 2 investigation); permit required for sampling and destruction [including 2a & 2b]
High significance: sites, where disturbance should be avoided.	4a. Nomination for listing on Heritage Register (National, Provincial or Local) (Phase 2 & 3 investigation); site management plan; permit required if utilised for education or tourism
High significance: Graves and burial places	4b. Locate demonstrable descendants through social consulting; obtain permits from applicable legislation, ordinances and regional by-laws; exhumation and reinternment [including 2a, 2b & 3]

Furthermore, the significance of archaeological sites was based on six main criteria:

- Site integrity (i.e. primary vs. secondary context),
- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Density of scatter (dispersed scatter),
- Social value,
- Uniqueness, and
- Potential to answer current and future research questions.

11 ADDENDUM 2: CONVENTIONS USED TO ASSESS THE SIGNIFICANCE OF HERITAGE

11.1 Site Significance Matrix

According to the NHRA, Section 2(vi) the **significance** of heritage sites and artefacts is determined by it aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these. The following matrix is used for assessing the significance of each identified site/feature.

2. SITE EVALUATION			
2.1 Heritage Value (NHRA, section 2 [3])	High	Medium	Low
It has importance to the community or pattern of South Africa's history or pre-colonial history.			
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.			
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.			
It is of importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.			
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.			
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.			
It has marked or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).			
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.			
It has significance through contributing towards the promotion of a local sociocultural identity and can be developed as a tourist destination.			
It has significance relating to the history of slavery in South Africa.			
It has importance to the wider understanding of temporal changes within cultural landscapes, settlement patterns and human occupation.			
2.2 Field Register Rating			
National/Grade 1 [should be registered, retained]			
Provincial/Grade 2 [should be registered, retained]			
Local/Grade 3A [should be registered, mitigation not advised]			
Local/Grade 3B [High significance; mitigation, partly retained]			
Generally Protected A [High/Medium significance, mitigation]			
Generally protected B [Medium significance, to be recorded]			
Generally Protected C [Low significance, no further action]			
2.3 Sphere of Significance	High	Medium	Low
International			
National			
Provincial			
Local			
Specific community			

11.2 Impact Assessment Criteria

The following table provides a guideline for the rating of impacts and recommendation of management actions for sites of heritage potential.

Significance of the heritage resource

This is a statement of the nature and degree of significance of the heritage resource being affected by the activity. From a heritage management perspective, it is useful to distinguish between whether the significance is embedded in the physical fabric or in associations with events or persons or in the experience of a place; i.e. its visual and non-visual qualities. This statement is a primary informant to the nature and degree of significance of an impact and thus needs to be thoroughly considered. Consideration needs to be given to the significance of a heritage resource at different scales (i.e. site-specific, local, regional, national or international) and the relationship between the heritage resource, its setting and its associations.

Nature of the impact

This is an assessment of the nature of the impact of the activity on a heritage resource, with some indication of its positive and/or negative effect/s. It is strongly informed by the statement of resource significance. In other words, the nature of the impact may be historical, aesthetic, social, scientific, linguistic or architectural, intrinsic, associational or contextual (visual or non-visual). In many cases, the nature of the impact will include more than one value.

Extent

Here it should be indicated whether the impact will be experienced:

- On a site scale, i.e. extend only as far as the activity;
- Within the immediate context of a heritage resource;
- On a local scale, e.g. town or suburb
- On a metropolitan or regional scale; or
- On a national/international scale.

Duration

Here it should be indicated whether the lifespan of the impact will be:

- Short term, (needs to be defined in context)
- Medium term, (needs to be defined in context)
- Long term where the impact will persist indefinitely, possibly beyond the operational life of the activity, either because of natural processes or by human intervention; or
- Permanent where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.

Of relevance to the duration of an impact are the following considerations:

- Reversibility of the impact; and
- Renewability of the heritage resource.

Intensity

Here it should be established whether the impact should be indicated as:

- Low, where the impact affects the resource in such a way that its heritage value is not affected;
- Medium, where the affected resource is altered but its heritage value continues to exist albeit in a modified way; and
- High, where heritage value is altered to the extent that it will temporarily or permanently be damaged or destroyed.

Probability

This should describe the likelihood of the impact actually occurring indicated as:

- Improbable, where the possibility of the impact to materialize is very low either because of design or historic experience;
- Probable, where there is a distinct possibility that the impact will occur;
- Highly probable, where it is most likely that the impact will occur; or
- Definite, where the impact will definitely occur regardless of any mitigation measures

Confidence

This should relate to the level of confidence that the specialist has in establishing the nature and degree of impacts. It relates to the level and reliability of information, the nature and degree of consultation with I&AP's and the dynamic of the broader socio-political context.

- High, where the information is comprehensive and accurate, where there has been a high degree of consultation and the socio-political context is relatively stable.
- Medium, where the information is sufficient but is based mainly on secondary sources, where there has been a limited targeted consultation and socio-political context is fluid.
- Low, where the information is poor, a high degree of contestation is evident and there is a state of socio-political flux.

Impact Significance

The significance of impacts can be determined through a synthesis of the aspects produced in terms of the nature and degree of heritage significance and the nature, duration, intensity, extent, probability and confidence of impacts and can be described as:

- Low; where it would have a negligible effect on heritage and on the decision
- Medium, where it would have a moderate effect on heritage and should influence the decision.
- High, where it would have, or there would be a high risk of, a big effect on heritage. Impacts of high significance should have a major influence on the decision;
- Very high, where it would have, or there would be high risk of, an irreversible and possibly irreplaceable negative impact on heritage. Impacts of very high significance should be a central factor in decision-making.

11.3 Direct Impact Assessment Criteria

The following table provides an outline of the relationship between the significance of a heritage context, the intensity of development and the significance of heritage impacts to be expected

	TYPE OF DEVELOPMENT			
HERITAGE CONTEXT	**CATEGORY A**	**CATEGORY B**	**CATEGORY C**	**CATEGORY D**
CONTEXT 1 High heritage Value	Moderate heritage impact expected	High heritage impact expected	Very high heritage impact expected	Very high heritage impact expected
CONTEXT 2 Medium to high heritage value	Minimal heritage impact expected	Moderate heritage impact expected	High heritage impact expected	Very high heritage impact expected
CONTEXT 3 Medium to low heritage value	Little or no heritage impact expected	Minimal heritage impact expected	Moderate heritage impact expected	High heritage impact expected
CONTEXT 4 Low to no heritage value	Little or no heritage impact expected	Little or no heritage impact expected	Minimal heritage value expected	Moderate heritage impact expected

NOTE: A DEFAULT "LITTLE OR NO HERITAGE IMPACT EXPECTED" VALUE APPLIES WHERE A HERITAGE RESOURCE OCCURS OUTSIDE THE IMPACT ZONE OF THE DEVELOPMENT.

HERITAGE CONTEXTS	**CATEGORIES OF DEVELOPMENT**
Context 1: Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 1, 2 or 3A heritage resources **Context 2:** Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources. **Context 3:** Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3C heritage resources **Context 4:** Of little or no intrinsic, associational or contextual heritage value due to disturbed, degraded conditions or extent of irreversible damage.	**Category A: Minimal intensity development** - No rezoning involved; within existing use rights. - No subdivision involved. - Upgrading of existing infrastructure within existing envelopes - Minor internal changes to existing structures - New building footprints limited to less than 1000m2. **Category B: Low-key intensity development** - Spot rezoning with no change to overall zoning of a site. - Linear development less than 100m - Building footprints between 1000m2-2000m2 - Minor changes to external envelop of existing structures (less than 25%) - Minor changes in relation to bulk and height of immediately adjacent structures (less than 25%). **Category C: Moderate intensity development** - Rezoning of a site between 5000m2-10 000m2. - Linear development between 100m and 300m. - Building footprints between 2000m2 and 5000m2 - Substantial changes to external envelop of existing structures (more than 50%) - Substantial increase in bulk and height in relation to immediately adjacent buildings (more than 50%) **Category D: High intensity development** - Rezoning of a site in excess of 10 000m2

	- Linear development in excess of 300m. - Any development changing the character of a site exceeding 5000m2 or involving the subdivision of a site into three or more erven. - Substantial increase in bulk and height in relation to immediately adjacent buildings (more than 100%)

11.4 Management and Mitigation Actions

The following table provides a guideline of relevant heritage resources management actions is vital to the conservation of heritage resources.

No further action / Monitoring

Where no heritage resources have been documented, heritage resources occur well outside the impact zone of any development or the primary context of the surroundings at a development footprint has been largely destroyed or altered, no further immediate action is required. Site monitoring during development, by an ECO or the heritage specialist are often added to this recommendation in order to ensure that no undetected heritage\ remains are destroyed.

Avoidance

This is appropriate where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact. Mitigation is not acceptable or not possible. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources.

Mitigation

This is appropriate where development occurs in a context of heritage significance and where the impact is such that it can be mitigated to a degree of medium to low significance, e.g. the high to medium impact of a development on an archaeological site could be mitigated through sampling/excavation of the remains. Not all negative impacts can be mitigated.

Compensation

Compensation is generally not an appropriate heritage management action. The main function of management actions should be to conserve the resource for the benefit of future generations. Once lost it cannot be renewed. The circumstances around the potential public or heritage benefits would need to be exceptional to warrant this type of action, especially in the case of where the impact was high.

Rehabilitation

Rehabilitation is considered in heritage management terms as a intervention typically involving the adding of a new heritage layer to enable a new sustainable use. It is not appropriate when the process necessitates the removal of previous historical layers, i.e. restoration of a building or place to the previous state/period. It is an appropriate heritage management action in the following cases:

- The heritage resource is degraded or in the process of degradation and would benefit from rehabilitation.
- Where rehabilitation implies appropriate conservation interventions, i.e. adaptive reuse, repair and maintenance, consolidation and minimal loss of historical fabric.
- Where the rehabilitation process will not result in a negative impact on the intrinsic value of the resource