

Phase 1 Cultural Heritage Impact Assessment:

**PROSPECTING RIGHT APPLICATION ON VARIOUS PORTIONS OF THE FARM READS DRIFT 74,
DOUGLAS REGION, PIXLEY KA SEME DISTRICT MUNICIPALITY,
NORTHERN CAPE PROVINCE**

Prepared for:

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Prepared by:

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Report No: 2019/JvS/099

- Status: Final
- Date: November 2019
- Revision No: -
- Date: -

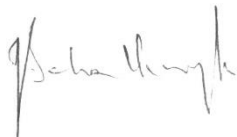


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Specialist competency:

Johan A van Schalkwyk, D Litt et Phil, heritage consultant, has been working in the field of heritage management for more than 40 years. Originally based at the National Museum of Cultural History, Pretoria, he has actively done research in the fields of anthropology, archaeology, museology, tourism and impact assessment. This work was done in Limpopo Province, Gauteng, Mpumalanga, North West Province, Eastern Cape Province, Northern Cape Province, Botswana, Zimbabwe, Malawi, Lesotho and Swaziland. Based on this work, he has curated various exhibitions at different museums and has published more than 70 papers, most in scientifically accredited journals. During this period, he has done more than 2000 Phase 1 and Phase 2 impact assessments (archaeological, anthropological, historical and social) for various government departments and developers. Projects include environmental management frameworks, roads, pipeline-, and power line developments, dams, mining, water purification works, historical landscapes, refuse dumps and urban developments.



J A van Schalkwyk
Heritage Consultant
November 2019

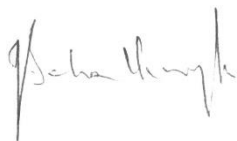


SPECIALIST DECLARATION

I, J A van Schalkwyk, as the appointed independent specialist, in terms of the 2014 EIA Regulations (as amended), hereby declare that I:

- I act as the independent specialist in this application;
- I perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 (as amended) and any specific environmental management Act;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I have no vested interest in the proposed activity proceeding;
- 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;
- I have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- I have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- all the particulars furnished by me in this specialist input/study are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the specialist



J A van Schalkwyk
November 2019

EXECUTIVE SUMMARY

**Phase 1 Cultural Heritage Impact Assessment:
PROSPECTING RIGHT APPLICATION ON VARIOUS PORTIONS OF THE FARM READS DRIFT 74,
DOUGLAS REGION, PIXLEY KA SEME DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE**

Milnex 189 CC was contracted by *Steinmann Groep (Pty) Ltd* as the independent environmental consultant to undertake the Scoping and EIA process for a Prospecting Right Application on Portion 12, the remaining extent of Portion 29 (Portion of Portion 13) and Portion 31 (Portion of Portion 29) of the farm Reads Drift 74, between Douglas and Prieska, Pixley ka Seme District Municipality, Northern Cape Province.

In accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by *Milnex 189 CC* to conduct a cultural heritage assessment to determine if the proposed prospecting activities would have an impact on any sites, features or objects of cultural heritage significance.

This report describes the methodology used, the limitations encountered, the heritage features that were identified and the recommendations and mitigation measures proposed relevant to this. It should be noted that the implementation of the mitigation measures is subject to SAHRA/PHRA's approval.

The cultural landscape qualities of the region are made up of a pre-colonial element consisting of Stone Age and a much later colonial (farmer) component, which eventually gave rise to an urban component which manifest in a number of small towns.

Identified sites

During the physical survey, the following sites, features or objects of cultural significance were identified.

- 7.1 Change finds Stone Age artefacts:
Stone Age artefacts, mostly dating to the Middle Stone Age and Later Stone Age occur in small numbers in parts of the study area. On the ridges closer to the river, the density of artefacts is less than 1/2m², diminishing to 1/10m² in the sandy regions. These are mostly made from banded iron stone (jaspelite), although some quartzite flakes were also noted. Cores, flakes and tools are found. The tools are very rough and informal and only a few that can be described as typical, i.e. blades and end scrapers, were identified.
- 7.3.1: Old farmhouse – referred to on the map as Annex Gewonne.
A rectangular structure with a gable roof that was extended to one side to accommodate more rooms as well as a stoep. A hearth or cooking place, commonly referred to as a komyntjie was added to one end. The house was built with poorly fired clay bricks and it has a corrugated iron roof. Some changes were brought about by entrances that were block off with walls and windows that were installed.
- 7.3.2: Old house – referred to on the map as Dappersfontein
Old farmhouse now completely demolished and stripped of all fittings and usable material. It is therefore impossible to make any statement on the style and materials used. A large stone-built dam is located some distance from the house.
- 7.3.3: Old farmhouse – referred to on the map as Gewonne
Farmhouse currently still in use and well maintained. According to the current owner, the central core still exists, but some alterations and additions were made. It is square in form, built with bricks and has a corrugated iron roof in a gable form.

- **7.3.4: Stone built ‘cottages’**
A series of stone built ‘cottages’ spread out along a small valley. The individual structures were built with loose stones stacked on top of each other. As this was not very well done, i.e. very little interlocking of the stones took place, the walls are prone to topple over. The removal of fittings such as the roof and door frames probably also contributed to their current state. In some of them internal features such as shelves were built into the corner of the walls.
- **7.3.5: Old sheep dip**

Built with local stone, some of which seems to be hammer-dressed. It is classified as a ‘spring dip’, with the sheep entering the trough by jumping in and climbing out by means of a number of steps on the opposite side.
- **7.3.6: Stone built structures**
Some very roughly built structures of which only the foundation remains. Some structures are square in nature and others round. The square ones seem to be more recent than the round ones. It is possible that the former related to diamond digger activities whereas the round ones might have been the base of an early herder (Khoi) structure. Unfortunately, no surface artefactual material could be found to assist in the identification of these structures.
- **7.3.7: Informal burial site**
Informal burial site containing approximately 7 graves. Named graves are from the De Lange family, with death dates ranging between 1945 and 1956. Other graves are only marked with stone cairns. The site used to be fenced off with wire, but this has not been maintained for a long time.
- **7.4.1: Natural spring**
A natural spring that, according to local information, has never dried up, in close vicinity of the structures in 7.3.4.
- **7.4.2 Historic engravings**
The letters AB engraved twice on a flat piece of rock. It is probably the initials of a former land-owner or a diamond miner. It is located far from any known historic structure or other feature. A second site containing even more similar engravings occur some distance to the east.

Impact assessment and proposed mitigation measures

Impact analysis of cultural heritage resources under threat of the proposed development, is based on the present understanding of the development:

IDENTIFIED HERITAGE RESOURCE					
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation	Proposed mitigation (Refer to definitions in Section 12.3)
7.1	Stone Age tools	Section 35	Low significance Grade 4-C	20 20	(5) No further action required.
7.3.1 - 7.3.3	Historic house	Section 34	High significance Grade 4-B	16 16	(1) Avoidance/Preserve; (2) Archaeological investigation
7.3.4.a - 7.3.4.b	Cottage like structures	Section 34	High significance Grade 4-B	16 16	(1) Avoidance/Preserve; (2) Archaeological investigation
7.3.5	Historic sheep dip	Section 34	High significance Grade 4-B	16 16	(1) Avoidance/Preserve; (2) Archaeological investigation
7.3.6.a – 7.3.6.b	Stone structures	Section 34	High significance Grade 4-C	16 16	(1) Avoidance/Preserve; (2) Archaeological investigation
7.3.7	Burial site	Section 36	High significance Grade 4-A	16 16	(1) Avoidance/Preserve; (2) Archaeological investigation
7.4.1	Natural spring	Section 3(2) (c) and (d)	High significance Grade 4-A	16 16	(1) Avoidance/Preserve; (2) Archaeological investigation
7.4.2	Engravings/Graffiti			16	

		Section 3(2) (c) and (d)	High significance Grade 4-A	16	(1) Avoidance/Preserve; (2) Archaeological investigation
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Legal requirements

The legal requirements related to heritage specifically are specified in Section 3 of this report. For this proposed project, the assessment has determined that no sites, features or objects of heritage significance occur in the study area. If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.

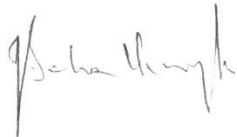
- If the identified structure is to be demolished, a valid permit would be required from SAHRA/PHRA prior to its destruction. Such a permit will only be issued after the site has been fully documented – mapped, photographed and described.

Reasoned opinion as to whether the proposed activity should be authorised:

- From a heritage point of view, it is recommended that the proposed development be allowed to continue on acceptance of the conditions proposed below.

Conditions for inclusion in the environmental authorisation:

- If the identified structure is to be demolished, it must be fully documented – mapped, photographed and described – beforehand.
- The Palaeontological Sensitivity Map (SAHRIS) indicate that the study area has high sensitivity of fossil remains to be found and therefore a desktop palaeontological study of the site is required.
- Should archaeological sites or graves be exposed in other areas during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.



J A van Schalkwyk
Heritage Consultant
November 2019

TECHNICAL SUMMARY

Project description	
Description	Prospecting for diamonds
Project name	EIA365 – Reads Drift 74

Applicant
Steinmann Groep (Pty) Ltd

Environmental assessors
Milnex 189 CC
Mr D Labuschagne

Property details						
Province	Northern Cape Province					
Magisterial district	Hay					
District municipality	Pixley ka Seme					
Topo-cadastral map	2923					
Farm name	Read's Drift 74					
Closest town	Douglas					
Coordinates	Centre point (approximate)					
	No	Latitude	Longitude	No	Latitude	Longitude
	1	S 29,18838	E 23,41577			

Development criteria in terms of Section 38(1) of the NHR Act	Yes/No
Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	No
Construction of bridge or similar structure exceeding 50m in length	No
Development exceeding 5000 sq m	Yes
Development involving three or more existing erven or subdivisions	No
Development involving three or more erven or divisions that have been consolidated within past five years	No
Rezoning of site exceeding 10 000 sq m	No
Any other development category, public open space, squares, parks, recreation grounds	No

Land use	
Previous land use	Farming
Current land use	Farming/Mining

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GLOSSARY OF TERMS AND ABBREVIATIONS

TERMS

Bioturbation: The burrowing by small mammals, insects and termites that disturb archaeological deposits.

Cumulative impacts: “Cumulative Impact”, in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to existing and reasonably foreseeable impacts eventuating from similar or diverse activities.

Debitage: Stone chips discarded during the manufacture of stone tools.

Factory site: A specialised archaeological site where a specific set of technological activities has taken place – usually used to describe a place where stone tools were made.

Historic Period: Since the arrival of the white settlers - c. AD 1830 - in this part of the country.

Holocene: The most recent time period, which commenced c. 10 000 years ago.

Iron Age (also referred to as **Early Farming Communities**): Period covering the last 1800 years, when new people brought a new way of life to southern Africa. They established settled villages, cultivated domestic crops such as sorghum, millet and beans, and they herded cattle as well as sheep and goats. As they produced their own iron tools, archaeologists call this the Iron Age.

Early Iron Age	AD 200 - AD 900
Middle Iron Age	AD 900 - AD 1300
Later Iron Age	AD 1300 - AD 1830

Midden: The accumulated debris resulting from human occupation of a site.

Mitigation, means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.

National Estate: The collective heritage assets of the Nation.

Pleistocene: Geological time period of 3 000 000 to 20 000 years ago.

Stone Age: The first and longest part of human history is the Stone Age, which began with the appearance of early humans between 3-2 million years ago. Stone Age people were hunters, gatherers and scavengers who did not live in permanently settled communities. Their stone tools preserve well and are found in most places in South Africa and elsewhere.

Early Stone Age	2 600 000 - 250 000 Before Present
Middle Stone Age	250 000 - 40-25 000 BP
Later Stone Age	40-25 000 - until c. AD 200

Tradition: As used in archaeology, it is a seriated sequence of artefact assemblages, particularly ceramics.

ACRONYMS and ABBREVIATIONS

ASAPA	Association of Southern African Professional Archaeologists
BCE	Before the Common Era (the year 0)

BP	Before Present (calculated from 1950 when radio-carbon dating was established)
CE	Common Era (the year 0)
ESA	Early Stone Age
EIA	Early Iron Age
HIA	Heritage Impact Assessment
I & AP's	Interested and Affected Parties
LIA	Late Iron Age
LSA	Later Stone Age
MIA	Middle Iron Age
MSA	Middle Stone Age
NARSSA	National Archives and Records Service of South Africa
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System

COMPLIANCE WITH APPENDIX 6 OF THE 2014 EIA REGULATIONS (AS AMENDED)

Requirements of Appendix 6 – GN R982	Addressed in the Specialist Report
1. (1) A specialist report prepared in terms of these Regulations must contain-	
a) details of-	
i. the specialist who prepared the report; and	Front page
ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	Page i Addendum Section 6
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page ii
c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1
(cA) an indication of the quality and age of base data used for the specialist report;	Section 4
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 7.3
d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 4.2.2
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 4
f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Addendum Section 5 Figure 15
g) an identification of any areas to be avoided, including buffers;	Section 8
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Figure 15 Addendum Section 5
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 2
j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Section 7
k) any mitigation measures for inclusion in the EMPr;	Section 9 & 10
l) any conditions for inclusion in the environmental authorisation;	Section 10
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 9
n) a reasoned opinion-	
i. whether the proposed activity, activities or portions thereof should be authorised;	Section 10
(iiA) regarding the acceptability of the proposed activity or activities; and	
ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Section 8, 9, 10
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	-
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	-
q) any other information requested by the competent authority.	-
(2) Where a government notice by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	-

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1. INTRODUCTION

1.1 Background

Milnex 189 CC was contracted by *Steinmann Groep (Pty) Ltd* as the independent environmental consultant to undertake the Scoping and EIA process for a Prospecting Right Application on Portion 12, the remaining extent of Portion 29 (Portion of Portion 13) and Portion 31 (Portion of Portion 29) of the farm Reads Drift 74, between Douglas and Prieska, Pixley ka Seme District Municipality, Northern Cape Province.

South Africa's heritage resources, also described as the 'national estate', comprise a wide range of sites, features, objects and beliefs. However, according to Section 27(18) of the National Heritage Resources Act (NHRA), No. 25 of 1999, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site.

In accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by *Milnex 189 CC* to conduct a cultural heritage assessment to determine if the proposed prospecting activities would have an impact on any sites, features or objects of cultural heritage significance.

This report forms part of the Environmental Impact Assessment (EIA) as required by the EIA Regulations in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended and is intended for submission to the South African Heritage Resources Agency (SAHRA).

1.2 Terms and references

The aim of a full HIA investigation is to provide an informed heritage-related opinion about the proposed development by an appropriate heritage specialist. The objectives are to identify heritage resources (involving site inspections, existing heritage data and additional heritage specialists if necessary); assess their significances; assess alternatives in order to promote heritage conservation issues; and to assess the acceptability of the proposed development from a heritage perspective.

The result of this investigation is a heritage impact assessment report indicating the presence/absence of heritage resources and how to manage them in the context of the proposed development.

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

1.2.1 Scope of work

The aim of this study is to determine if any sites, features or objects of cultural heritage significance occur within the boundaries of the area where the proposed prospecting activities is to take place. This included:

- Conducting a desk-top investigation of the area;
- A visit to the proposed development site.

The objectives were to:

- Identify possible archaeological, cultural and historic sites within the proposed development areas;
- Evaluate the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources;
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.

1.2.2 Assumptions and Limitations

The investigation has been influenced by the following factors:

- It is assumed that the description of the proposed project, provided by the client, is accurate.
- The unpredictability of buried archaeological remains.
- No subsurface investigation (i.e. excavations or sampling) were undertaken, since a permit from SAHRA is required for such activities.
- It is assumed that the public consultation process undertaken as part of the Environmental Impact Assessment (EIA) is sufficient and that it does not have to be repeated as part of the heritage impact assessment.
- The unpredictability of buried archaeological remains.

2. LEGISLATIVE FRAMEWORK

2.1 Background

Heritage Impact Assessments are governed by national legislation and standards and International Best Practise. These include:

- South African Legislation
 - National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA);
 - Mineral and Petroleum Resources Development Act, 2002 (Act No. 22 of 2002) (MPRDA);
 - National Environmental Management Act 1998 (Act No. 107 of 1998) (NEMA); and
 - National Water Act, 1998 (Act No. 36 of 1998) (NWA).
- Standards and Regulations
 - South African Heritage Resources Agency (SAHRA) Minimum Standards;
 - Association of Southern African Professional Archaeologists (ASAPA) Constitution and Code of Ethics;
 - Anthropological Association of Southern Africa Constitution and Code of Ethics.
- International Best Practise and Guidelines
 - ICOMOS Standards (Guidance on Heritage Impact Assessments for Cultural World Heritage Properties); and
 - The UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage (1972).

2.2 Heritage Impact Assessment 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.

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 m² 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 m² 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:

“38 (3) 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:

- (a) The identification and mapping of all heritage resources in the area affected;*
- (b) 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;*
- (c) an assessment of the impact of the development on such heritage resources;*
- (d) 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;*
- (e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;*
- (f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and*
- (g) plans for mitigation of any adverse effects during and after the completion of the proposed development.”*

3. HERITAGE RESOURCES

3.1 The National Estate

The National Heritage Resources Act (No. 25 of 1999) defines the heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations that must be considered part of the national estate to include:

- places, buildings, structures and equipment of cultural significance;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features of cultural significance;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds, including-
 - ancestral graves;
 - royal graves and graves of traditional leaders;
 - graves of victims of conflict;

- graves of individuals designated by the Minister by notice in the Gazette;
- historical graves and cemeteries; and
- other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- sites of significance relating to the history of slavery in South Africa;
- movable objects, including-
 - objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
 - objects to which oral traditions are attached or which are associated with living heritage;
 - ethnographic art and objects;
 - military objects;
 - objects of decorative or fine art;
 - objects of scientific or technological interest; and
 - books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

3.2 Cultural significance

In the NHRA, Section 2 (vi), it is stated that “cultural significance” means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This is determined in relation to a site or feature’s uniqueness, condition of preservation and research potential.

According to Section 3(3) of the NHRA, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of

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

A matrix was developed whereby the above criteria were applied for the determination of the significance of each identified site. This allowed some form of control over the application of similar values for similar identified sites – see Section 2 of the Addendum below.

4. STUDY APPROACH AND METHODOLOGY

4.1 Extent of the Study

This survey and impact assessment cover all facets of cultural heritage located in the study area as presented in Section 5 below and illustrated in Figure 5.

4.2 Methodology

4.2.1 Desktop review

4.2.1.1 Survey of the literature

A survey of the relevant literature was conducted with the aim of reviewing the previous research done and determining the potential of the area. In this regard, various anthropological, archaeological and historical sources were consulted – see list of references in Section 11.

- Information on events, sites and features in the larger region were obtained from these sources.

4.2.1.2 Survey of heritage impact assessments (HIAs)

A survey of HIAs done for projects in the region by various heritage consultants was conducted with the aim of determining the heritage potential of the area – see list of references in Section 11.

- Information on sites and features in the larger region were obtained from these sources.

4.2.1.3 Data bases

The *Heritage Atlas Database*, various SAHRA databases, the *Environmental Potential Atlas*, the *Chief Surveyor General* and the *National Archives of South Africa* were consulted.

- Database surveys produced a number of sites located in the larger region of the proposed development.

4.2.1.4 Other sources

Aerial photographs and topocadastral and other maps were also studied - see the list of references below.

- Features such as areas with a lack of vegetation, possible buildings, hills and pans, were identified and marked for investigation during the field survey.

4.2.1.5 Interpretation

The results of the above investigation are summarised in Table 1 below and can be summarised as follows:

- Stone Age tools, dating to the MSA and LSA occur as low-density surface scatters on the banks of river, near outcrops and on valley floors in the larger region;
- Sites containing rock art, dating to the Later Stone Age, are known to occur in the larger region to the east;
- Historic structures, inclusive of buildings, fortifications, monuments and bridges, occur mostly in an urban environment (Douglas/Prieska), although they also occur sporadically on various farms;
- Formal burial sites occur in an urban setting, with a number of informal ones occurring sporadically throughout the countryside.

*Based on the above assessment, the probability of cultural heritage sites, features and objects occurring in the study area is deemed to be **low**.*

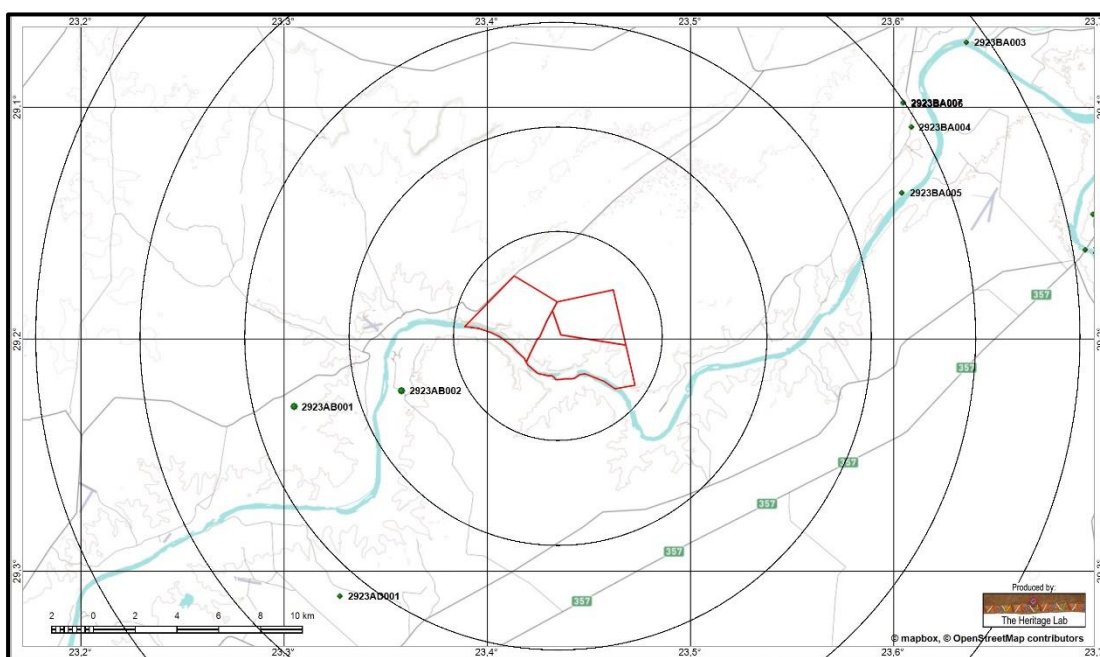


Figure 1. Location of known heritage sites and features in relation to the study area (Circles spaced at a distance of 5km: heritage sites = coded green dots)

Table 1: Pre-Feasibility Assessment

Category	Period	Probability	Reference
Natural			
Landscapes		Possible	Waldman (2003)
Early hominin	Pliocene – Lower Pleistocene		
	Early hominin	None	-
Stone Age	Lower Pleistocene – Holocene		
	Early Stone Age	Low	-
	Middle Stone Age	Possible	Beaumont (2007; 2008); Kruger (2018); van der Walt (2017); van Schalkwyk (2019)
	Later Stone Age	Possible	Beaumont (2007; 2008); van der Walt (2017); van Schalkwyk (2019)
	Rock Art	Possible	Heritage database
Iron age	Holocene		
	Early Iron Age	None	-
	Middle Iron Age	None	-
	Late Iron Age	None	-
Colonial period	Holocene		
	Contact period/Early historic	Possible	Backhouse (1844)
	Recent history	Possible	Beaumont (2007; 2008); Kruger (2018); van der Walt (2017); van Schalkwyk (2019); Waldman (2003)
	Industrial heritage	Low	Heritage database

4.2.2 Field survey

The field survey was done according to generally accepted archaeological practices, and was aimed at locating all possible sites, objects and structures. The area that had to be investigated was identified by

the *Milnex CC* by means of maps and *.kml* files indicating the development area. This was loaded onto an ASUS digital device and used in Google Earth during the field survey to access the areas.

The survey was conducted on 6 November 2019. The site was surveyed by an intensive vehicular and pedestrian investigation – see Fig. 2 below. During the site survey, Mr Ludwig Steinmann, the landowner, accompanied the consultant, pointing out the site boundaries, prospecting area, as well as the location of sites and features of cultural heritage significance.

During the site visit, archaeological visibility good due to the persistent drought in the area which inhibits vegetation growth.

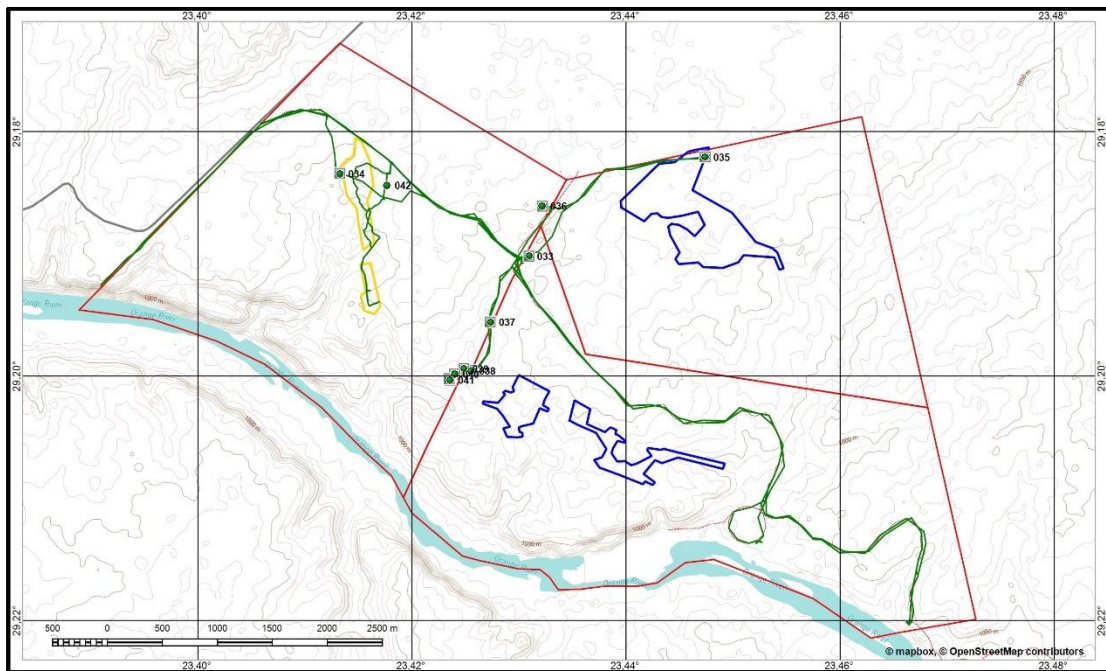


Figure 2. Map indicating the track log of the field survey (Study area = yellow; tracklog = green)

4.2.3 Interviews

Mr Ludwig Steinmann, the landowner.

4.2.4 Documentation

All sites, objects and structures that are identified are documented according to the general minimum standards accepted by the archaeological profession. Coordinates of individual localities are determined by means of the *Global Positioning System* (GPS) and plotted on a map. This information is added to the description in order to facilitate the identification of each locality.

The track log and identified sites were recorded by means of a Garmin Oregon 550 handheld GPS device. Photographic recording was done by means of a Canon EOS 550D digital camera. Map datum used: Hartebeeshoek 94 (WGS84).

4.3 Public participation

No details regarding the public participation process was available during the site visit.

5. PROJECT DESCRIPTION

5.1 Site location

The farm Reads Drift 74 is located along the North Bank of the middle Orange River between Douglas and Prieska in the Northern Cape Province of South Africa, some 35km southwest of Douglas, 85km northeast of Prieska and some 140km from Kimberley (Fig. 3). For more information, see the Technical Summary on p. VI above.

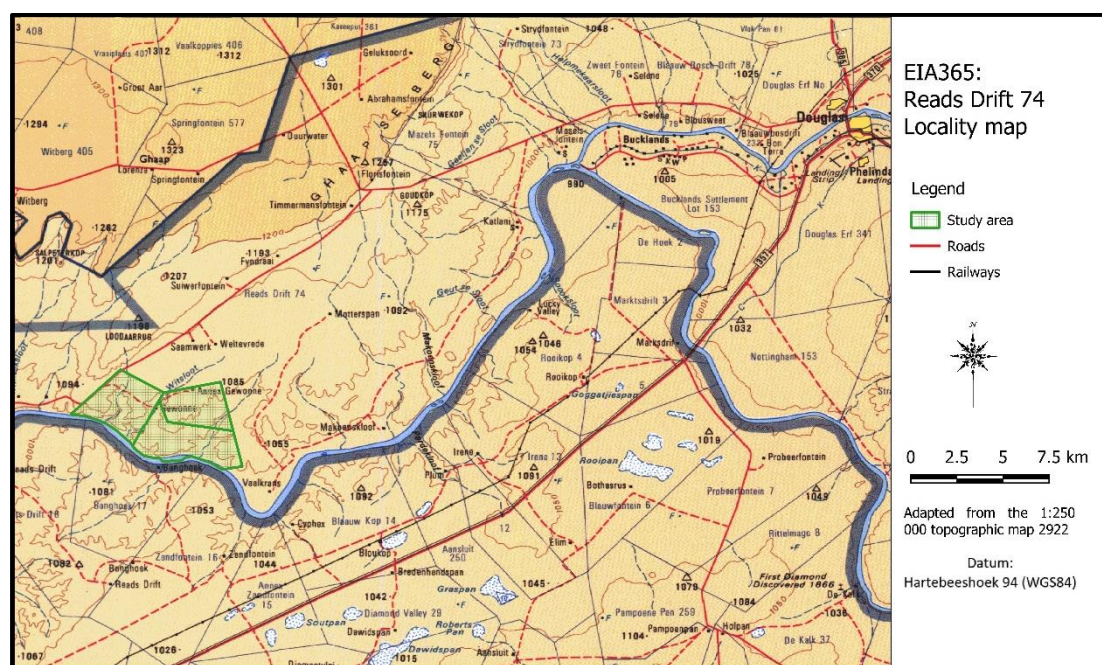


Figure 3. Location of the study area in regional context

5.2 Development proposal

The Steinmann Group holds three portions of the farm Reads Drift 74, i.e. Portions 12, 29 and 31 (Fig. 4 below). The diamond prospecting activities will primarily focus on two sections on the western side of the farm, indicated as the red polygons on the map in Fig. 5 below. These two areas were the main focus of the field survey for the current report. Although other areas have also been identified, indicated by the blue polygons in Fig. 5 below, according to Mr Steinmann the possibility of any prospecting taking place in these areas is “very, very low”. Consequently, these areas were not surveyed. However, considering the very low presence of heritage sites and features in the region, it is anticipated that what is to be found in those areas would be very similar to what was found in the focus area.

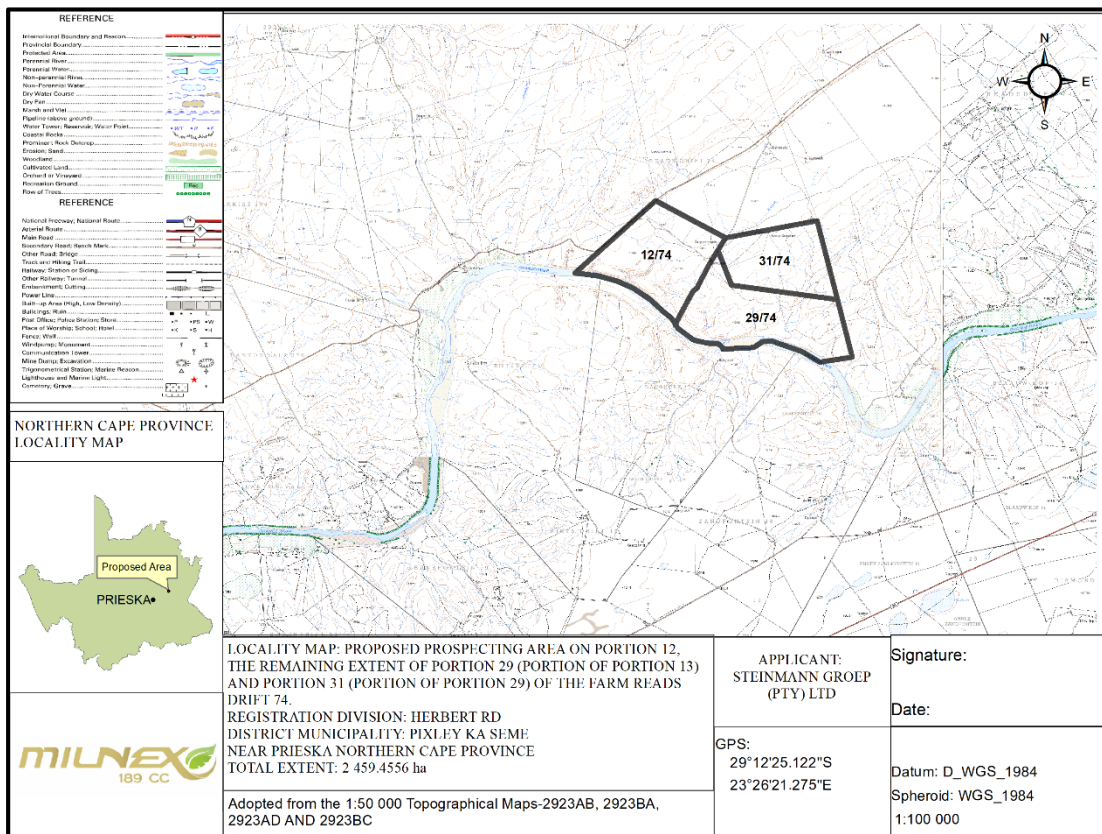


Figure 4. Layout of the study area (Map supplied by Milnex)

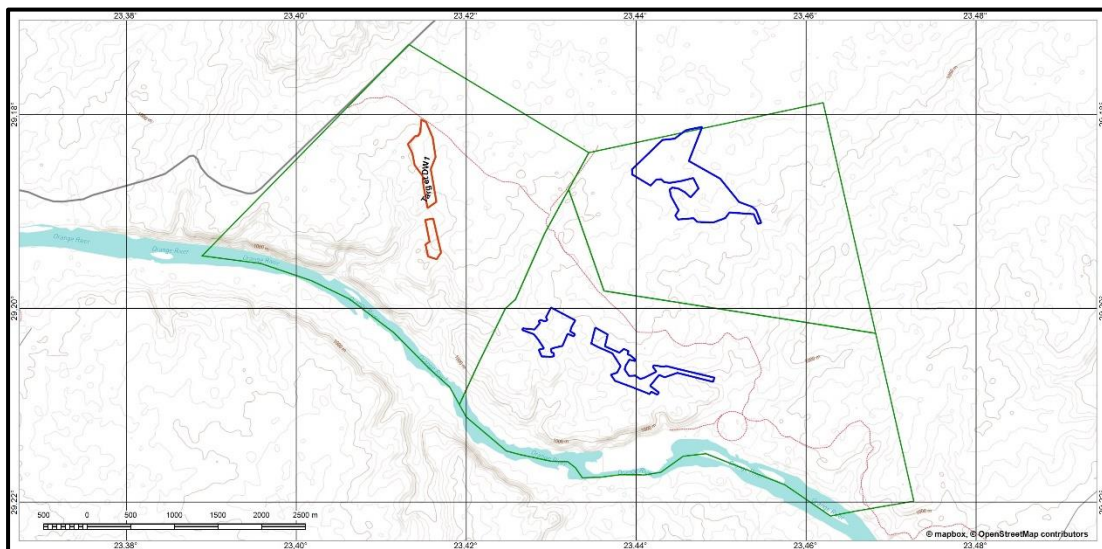


Figure 5. The layout of the focus area in relation to the other areas

The description of the prospecting activities to be undertaken in the focus area is presented below and was taken *ad verbum* from the report by Japie van Zyl (2019):

Site visit

The applicant will appoint Pierre de Jager as the project geologist to conduct the site visit. A formal site visit will be done within 90 days after the prospecting right has been executed. It is foreseen that more than one site visit will be conducted on the farms.

The purpose of the site visit is to assist the applicant to be familiar with the environment and with the assessment of the topography and the general geology before invasive prospecting activities. During this process the applicant will also review all documentation that has been received in relation to the geology of the area.

Desktop studies

Desktop studies will be undertaken after a site investigation is done to determine the target areas including the identification of any infrastructure to be build and any potential problems that may need to be addressed.

This phase involves reviewing the literature surveys, interpretation of aerial photographs, satellite images and ground validation of targets. A preliminary analysis of the environment will be obtained which will improve the project's efficiency and cost by providing a clearer understanding of the challenges may be encountered. Compilation of the results of analysis will be done by the geologist after the finalization of the desktop studies.

Pitting

A trial pit / test pit or inspection pit investigation is a highly effective way of obtaining data on the sub surface soil and rock conditions which underlie a prospecting sight. It allows for the various soils and rock types to be locked, the soil to be sampled and a preliminary assessment to be made.

Pits will be dug, locked, sampled and backfilled. To dig the pits the applicant will make use of the systems of Pierre de Jager, the appointed project geologist.

The applicant will at the end of the pitting process have locked the pits with the following information:

- A description of the soil and rock types from ground level to the base of the pits;
- Record of rock head depth and refusal depth, a list of where the samples will be taken, a record of where ground water seepage will be recorded;
- A general note of the geology and conditions in the vicinity of the test pits
- Pitting will be done within the period of 24 months once the prospecting right has been granted.

Trenches

Due to nature of the alluvial diamond deposit, samples are not taken for assay as would be normal practice to evaluate hard rock precious or base-metal prospects. The diamond distribution pattern grade of alluvial diamonds is also of such a nature that there is no repeatability of sample results, even from adjacent samples.

Bulk samples will have to be taken to determine the average sample grade. By taking of the bulk samples, the applicant foresees to determine the grade of the diamond deposits as the number of carats contained in 100 tons (cpht) of gravel and to determine the average diamond sizes.

During these activities the applicant will then find out the size and value distribution of trenches. Diamond distribution patterns of alluvial deposits varies to such a nature that there is no repeatability of sample results even from adjacent samples.

Alluvial diamond deposits can only be sampled through bulk sampling comprising thousands of cubic meters of gravel. Given the extent of the area and the grades 9 expected to be very low, the applicant will have to process bulk samples of approximately 190 080 tonnes.

The appointed geologist will advise where the samples will be taken. Bulk samples will not be taken along a systematic grid as in the case of drilling.

As the anticipated mining plan for the properties will be based on high volumes (low grades), the bulk samples will have to address average recovery.

As indicated, the bulk sampling exercise has to be conducted to determine the grades (cpht), the diamond size distribution and thereafter to sell the diamonds to determine the diamond values.

The plant/ bulk sampling technique will be that of a typical South African alluvial diamond mining operation. The method is a strip-mining process with oversize material and tailings recovered from the plant will be used as backfill material prior to final rehabilitation. Gravels are excavated, loaded and transported to the treatment facility using dump trucks.

The bulk sampling operation will be conducted using a fleet of conventional open pit mining equipment comprising of dump trucks supported by appropriate excavators and front-end loaders. All equipment is planned to be diesel driven.

Before excavation commences vegetation will be cleared from the proposed bulk sampling block. These will be done as per environmental regulations. Topsoil will then be removed and stored separately for later used for rehabilitation.

The bulk samples will be made in the form of box cuts the dimensions of these individual box cuts will on average be 30m long x 30m wide. It is estimated that the bulk samples will be 5 m in depth.

Gravel will be removed by excavators and will be loaded directly into dump trucks. Ore will be hauled to the screening plant. The material will be screened where after the screened material will be moved to the processing plant where the gravel 10 will be processed. Concentrate will be moved to the sorting plant where the concentrate will be sorted.

It is estimated that pitting and trenching will take approximately 48 months.

6. DESCRIPTION OF THE AFFECTED ENVIRONMENT

6.1 Natural Landscape

The geology of the region consists of shale and dolomite belonging to the Ghaap Group of the Transvaal Supergroup. The surface geology manifest as exposures of dolomite sheets and calcrete gravels and hardpans, with areas covered with red-brown soils. Drainage of the area consist of numerous seasonal channels running into the Orang River.

The extensive diamondiferous gravels of the Lower Vaal, Harts, and Middle Orange River valleys are associated with remnants of outwash deposits formed during the retreat of the ancient Ghaap (Kaa) Valley glacial system and subsequent reworking and alluvial deposition by major rivers. Studies have shown that majority of the alluvial diamonds in gravel deposits along all the terraces along the Orange River are derived from two distinct gravel horizons. These comprise an upper deflation deposit (Rooikoppie) and an underlying (Primary fluvial-alluvial) gravel unit (Japie van Zyl 2017).

The vegetation of the northern section of the study area is classified as Schmidtsdrif Thornveld, a savannah biome forming part of the Eastern Kalahari Bushveld Bioregion. In the southern section, adjacent to the Orange River, the vegetation is classified as Northern Upper Karoo, forming part of the Upper Karoo Bioregion. Swarthaak (*Acacia mellifera*) is quite dominant and occur in varying density.

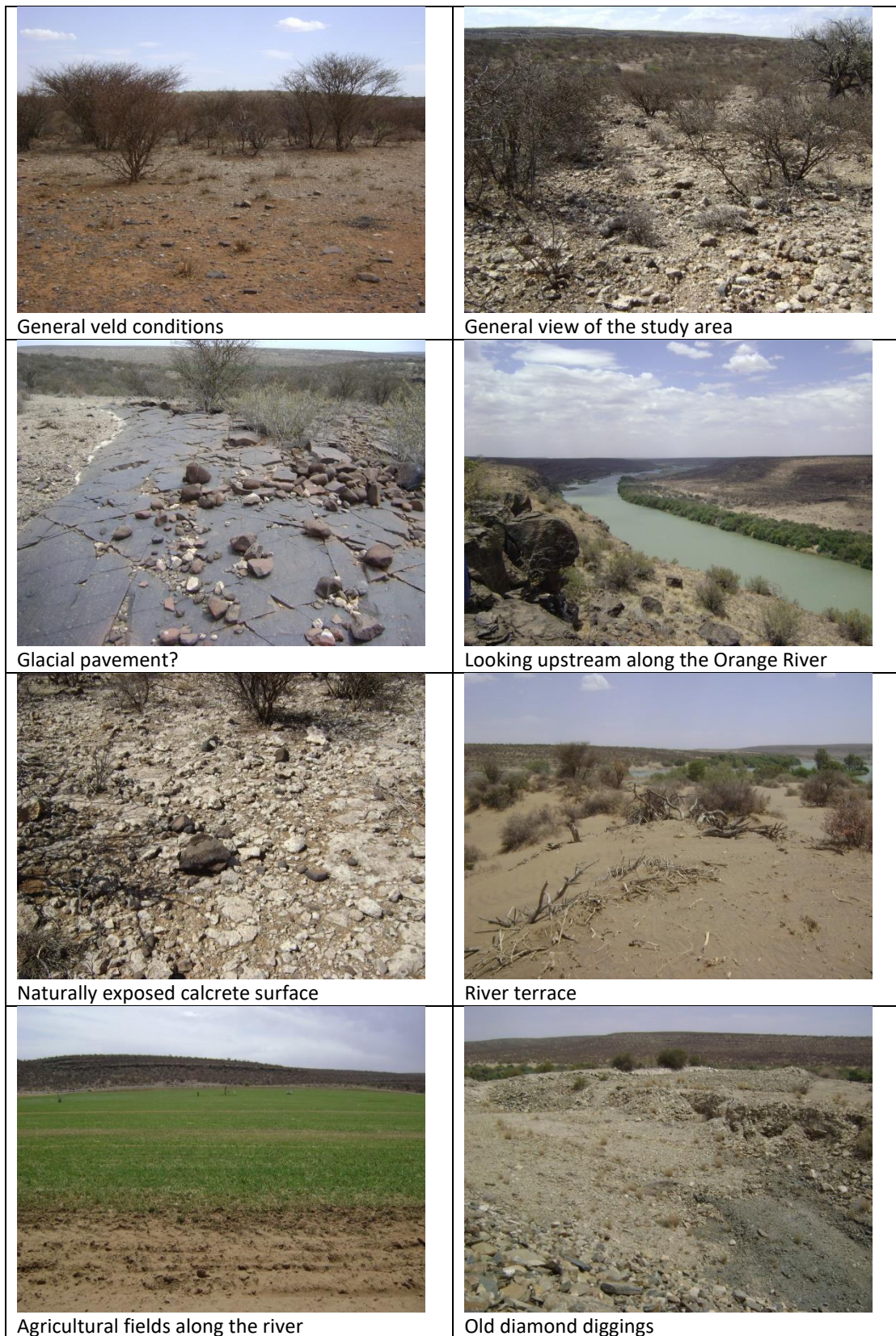


Figure 6. Overviews of the larger study area

The Palaeontological Sensitivity Map (SAHRIS) indicate that most of the region has a very high sensitivity (red) of fossil remains to be found. However, the study area, arrowed in Fig. 7 below has a high sensitivity (orange) of fossil remains to be found and therefore a desktop study is required. Based on the outcome of that study, a field assessment might be required.

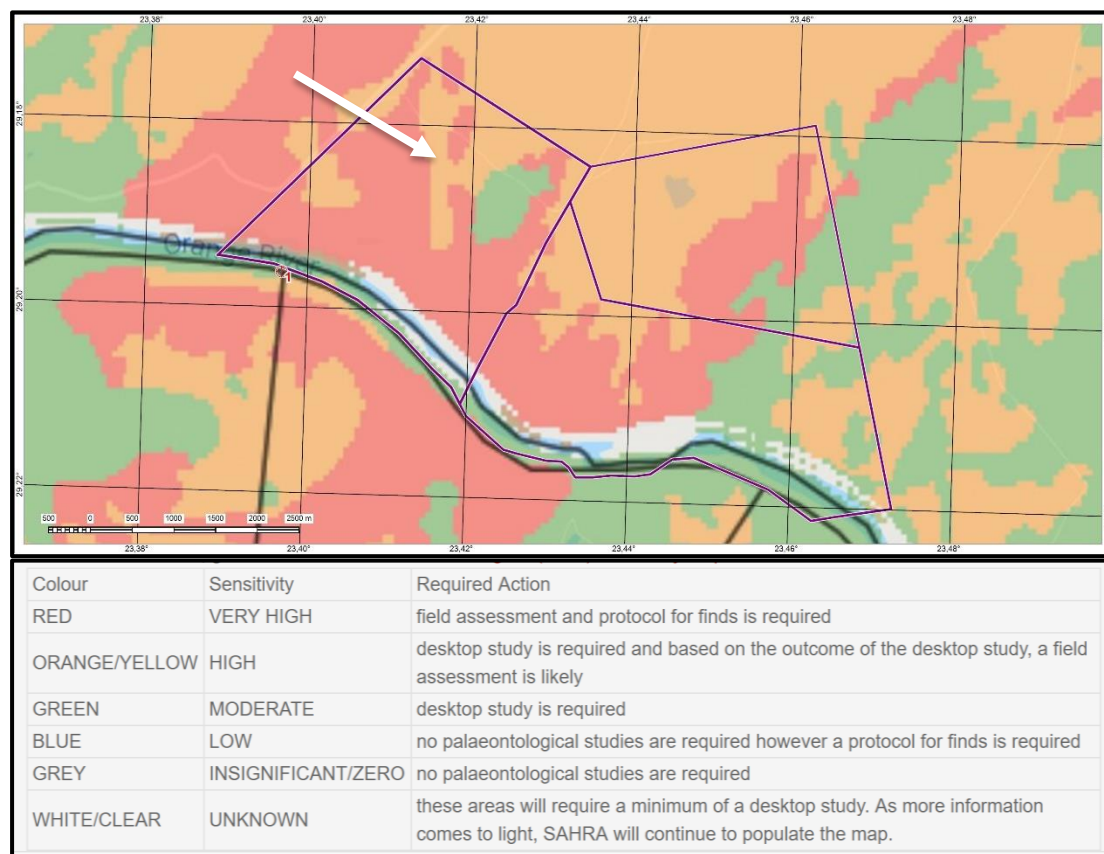


Figure 7. The palaeontological sensitivity of the study area

6.2 Cultural Landscape

The aim of this section is to present an overview of the history of the larger region in order to eventually determine the significance of heritage sites identified in the study area, within the context of their historic, aesthetic, scientific and social value, rarity and representivity.

The cultural landscape qualities of the region are made up of a pre-colonial element consisting of Stone Age and a much later colonial (farmer) component, which eventually gave rise to an urban component which manifest in a number of small towns.

6.2.1 Stone Age

Surveys in the area has revealed that the archaeological record in the larger region is temporarily confined to the Early and Middle Stone Age, with a smaller occurrence dating to the Later Stone Age. It

is spatially concentrated around the rims of pans, the banks of stream and rivers (Morris 2005), but also in the vicinity of raw material resources.

Less obvious in its presence are the Later Stone Age sites, some of which are indicated by Beaumont & Vogel (1984). They equate these sites, some which occur in the larger region, with Cape Coastal pottery associated with amorphous LSA (herders) or Wilton (hunter-gatherers) in the period 100 BC to AD 1900.

Glaciated pavements where Dwyka glaciation polished and striated underlying Ventersdorp lava occur all over and was in many places used by San and Khoi people for executing their rock engravings on. It has been argued by some that the more naturalistic figures are of San origin, whereas the geometric patterns were done by the Khoi.

6.2.2 Iron Age

Early Iron Age occupation did not take place in the region and seems as if the earliest Bantu-language speakers to have settled in the larger region were those of Tswana-speaking origin (Tlhaping and Tlharo) that settled mostly to the north and a bit to the west of Kuruman. However, they continued spreading westward and by the late 18th century some groups occupied the Langeberg region. With the annexation of the Tswana areas by the British in 1885, the area became known as British Betschuana Land. A number of reserves were set up for these people to stay in. In 1895 the Tswana-speakers rose up in resistance to the British authority as represented by the government of the Cape Colony. They were quickly subjected, and their land was taken away, divided up into farms and given out to white farmers to settle on (Snyman 1986).

In his study on the spread of the Iron Age into the Northern Cape, Humphreys (1976) used not only archaeological evidence, literary sources and eyewitness accounts, but also environmental factors such as rainfall data and vegetation cover. From this he concluded that it was not an environment conducive for keeping large herds of cattle, which was the mainstay of Iron Age communities' economy. He even indicates that the occupation of these people contracted from 1700 south of Postmasburg to just south of Kuruman by 1800, indicating a huge change in environmental factors.

Although some researchers would want to identify isolated, undecorated pieces of pottery found in the vicinity of Douglas as of Late Iron Age origin, this is doubtful as they also do not consider the possibility of it being of Khoi origin. Or, alternatively, of very recent origin, i.e. brought into the region by people working as labourers on the various diamond diggings in the larger region.

6.2.3 Historic period

One of the first whites to access the region was Dr Hinrich Lichtenstein, a German explorer that, on his journey to the north, crossed the Orange River in the vicinity of Prieska in 1804. The area was largely under the control of the Griqua, with the well-known Nicholaas Waterboer as their leader. These people led a near nomadic lifestyle, ranging over large areas with their stock, mostly sheep and goats. White farmers that entered the area by the late 19th century seemed to have stuck close to the various rivers where they farmed with sheep as well as practicing some irrigation farming.

The date of the founding of the town of Prieska is not clear, but by 1911 it had a total population of 1648. It attained municipal status in 1892. By this time the asbestos and nitrates occurring in the region was already being mined (Raper 2004).

The town of Douglas developed around the London Mission Society (LMS) mission station known as Backhouse, which was established in 1838. It was probably named after the early missionary, traveller and explorer James Backhouse who travelled extensively in the country during the first half of the 19th

century (Backhouse 1844). In 1867 the site was renamed in honour of Sir Robert Percy Douglas, Lieutenant-Governor of the Cape Colony from 1863-1877 (Raper 2004).

The discovery of diamonds in the larger region during the 1860s would drastically alter the history of the region. Diamonds were first discovered near Hopetown in 1867 on the farm De Kalk and a year later large numbers were discovered in the confluence area of the Vaal and Harts Rivers. By 1870 a few thousand miners were already active along the river, with most in the Pniel and Klipdrift (now Barkley West) regions. The discovery of the 'Star of South Africa' in 1871 led to the development of mining activities in Kimberly and surrounding areas.

These discoveries gave rise to claims being made by various groups for possession of the diamond fields – the Griqua, the government of the Orange Free State, the government of the Transvaal Republic, as well as some Tswana-speaking groups in the region. Competition for control of the territory and its potential wealth was so big that a group of English-speaking diamond miners declared a small republic known variously as "Diamond Diggers Republic" or "Klipdrift Republic". Their first and only president was an outspoken and self-proclaimed leader by the name of Stafford Parker. After long discussions, R.W. Keates, Lieutenant-Governor of Natal, was appointed as arbiter. He decided in favour of the Waterboer (Griqua) claim. However, this did not last very long and in 1871 the British annexed the whole area, including the Kimberley diamond fields, as part of the Cape Colony (Playne 1910-1911).

6.3 Site specific review

Although landscapes with cultural significance are not explicitly described in the NHRA, they are protected under the broad definition of the National Estate (Section 3): Section 3(2)(c) and (d) list "historical settlements and townscapes" and "landscapes and natural features of cultural significance" as part of the National Estate.

The examination of historical maps and aerial photographs help us to reconstruct how the cultural landscape has changed over time as it shows how humans have used the land.

Based on a study of old maps and aerial photographs of the larger region in general and the study area specifically, the following can be said.

The farm Reads Drift 74 was surveyed in 1887 by the famous Joseph M Orpen (1828 -1923), who started working as land surveyor in 1846 in South Africa. The Quitrent¹ Title Deed dating 6 December 1887 was made out to Nicholas Waterboer and signed by Orpen (Fig. 8). Originally the farm was very large and over time was divided into a number of different portions, some of which were given new names by their owners.

However, even by the end of the 19th century little information regarding this area existed, as is presented on the military map dating to 1900 (Fig. 9). This is probably the result of the fact that this was largely a rural area consisting of large white owned farms.

The first great influx of people started during the 1920s with the discovery of alluvial diamonds in the region. This brought a number of small-scale diggers into the region, which led to the establishment of small settlements all along the river. According to archival sources (see Section 11.3 below) most of the formal proclamations of diggings on both sides of the river seems to date from the 1940s, with a number of new ones dating to the early 1970s. Soon most diggings were worked out, resulting in them being abandoned and eventually formally de-proclaimed by the late 1970s.

¹ Quitrent – an annual rental or land tax to be paid by a tenant farmer to secure a renewable tenancy (SESA 1974). This system was abolished some years ago.

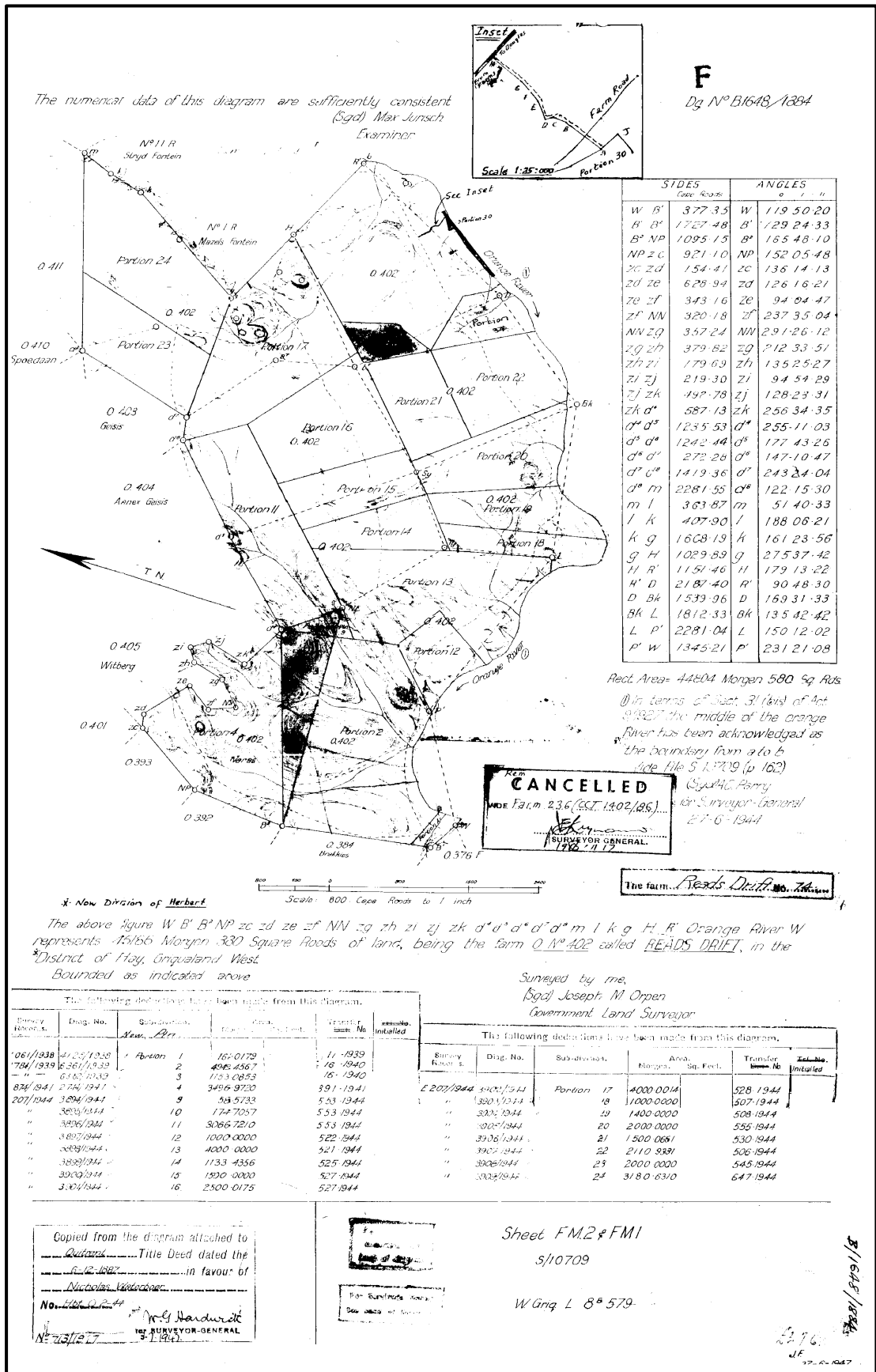


Figure 8. Copy of the Title Deed of the farm Reads Drift 74, dating to 1884

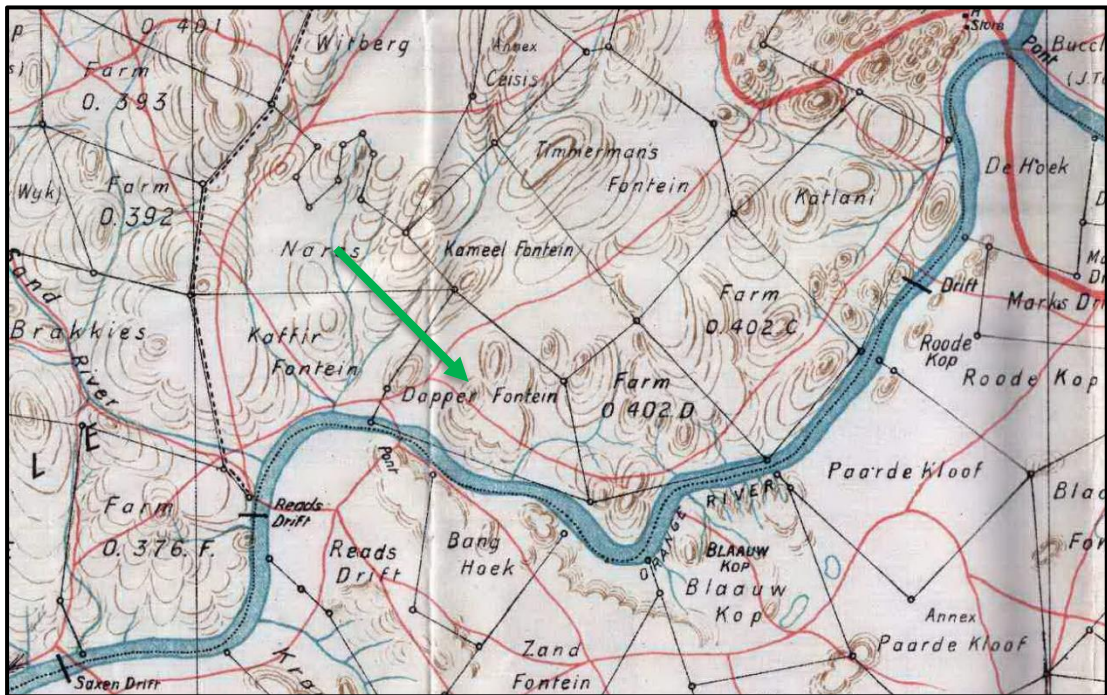


Figure 9. Map showing a section of the farm Reads Drift referred to as Dapperfontein (Map produced in 1900 by the Field Intelligence Department: Griquatown)

From the official aerial photographs dating to 1929 (Fig. 10) some interesting observations can be made (see Section 7.3.4 below). For this particular survey (1929) the flight path did not follow the normal east/west transects, but it tried to follow the course of the river as close as possible. This leads to a deviation from true north when viewing the photographs for some sections of the river.

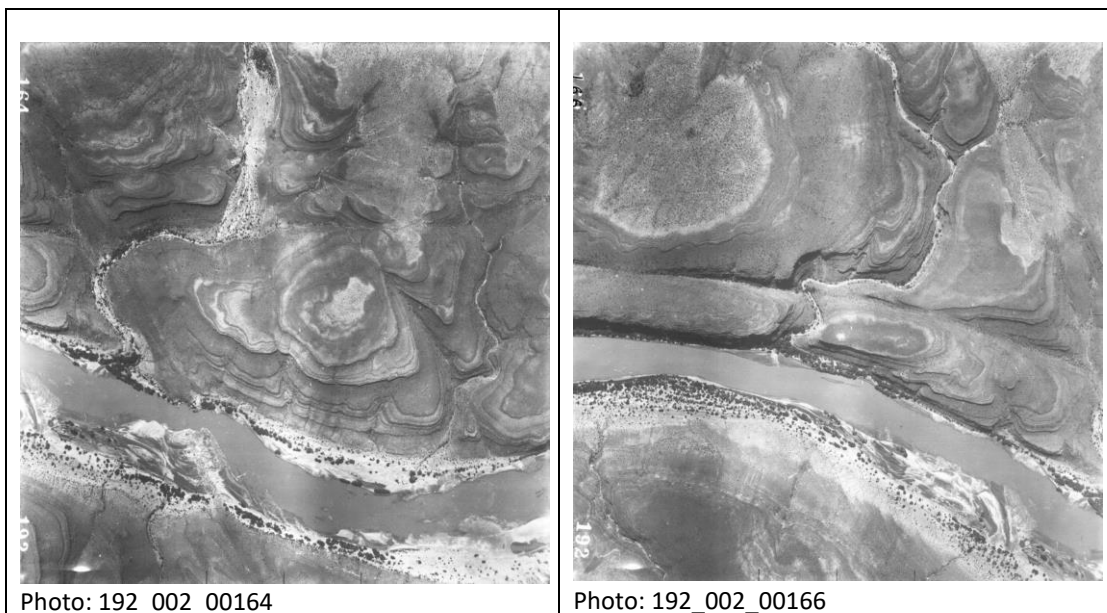


Figure 10. Sections of the river on the 1929 aerial photographs
The study area is located to the northern side of the river

From the official aerial photograph dating to 1957 (Fig. 11), it can be seen that the area was still basically an empty landscape, probably used only for grazing. The intensive agricultural development on the alluvial plains of the Orange River has yet to be started. Similarly, no large-scale diamond mining activities can be seen. However, some of the built features (Section 7.3.4) that can be seen on the 1929 version of the photographs seems to have disappeared or fallen into disuse, making them difficult to identify.

This absence of built environment development is also illustrated on the 1:50 000 topographic map dating to 1964 (Fig. 12), with only two farmsteads indicated: Gewonne and Annex Gewonne, both of which still exists today (see Section 7.3.1 & 7.3.3 below).

The latest aerial images (Fig. 13) obtained by means of Google Earth, apart from the previously mentioned farmsteads, shows roads that have become more formalised and the development of irrigation agriculture adjacent to the Orange River.

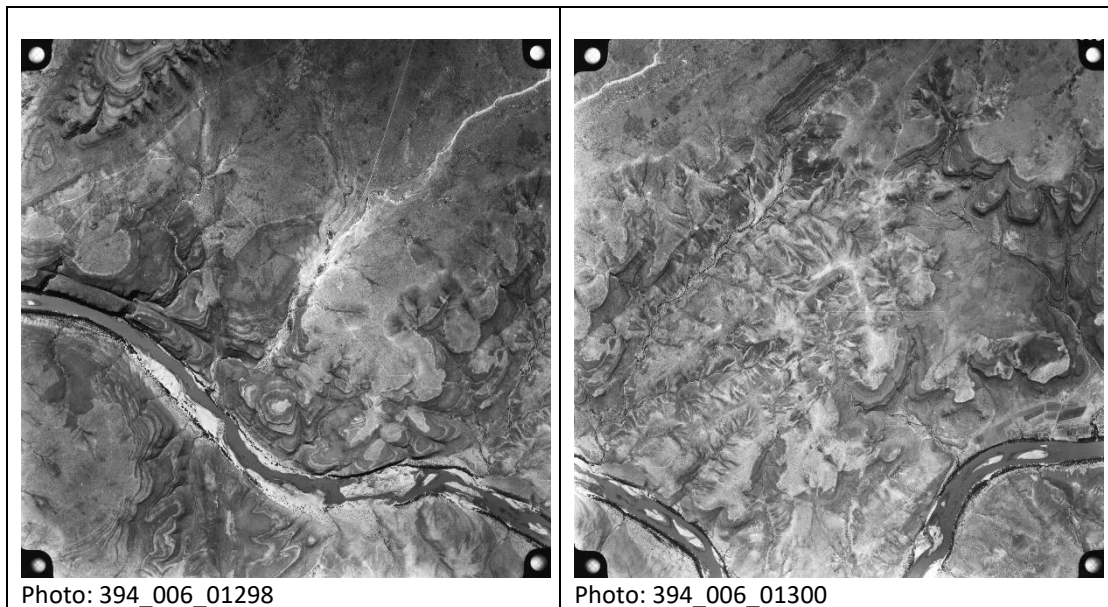


Figure 11. The study area as indicated on the aerial photograph dating to 1957

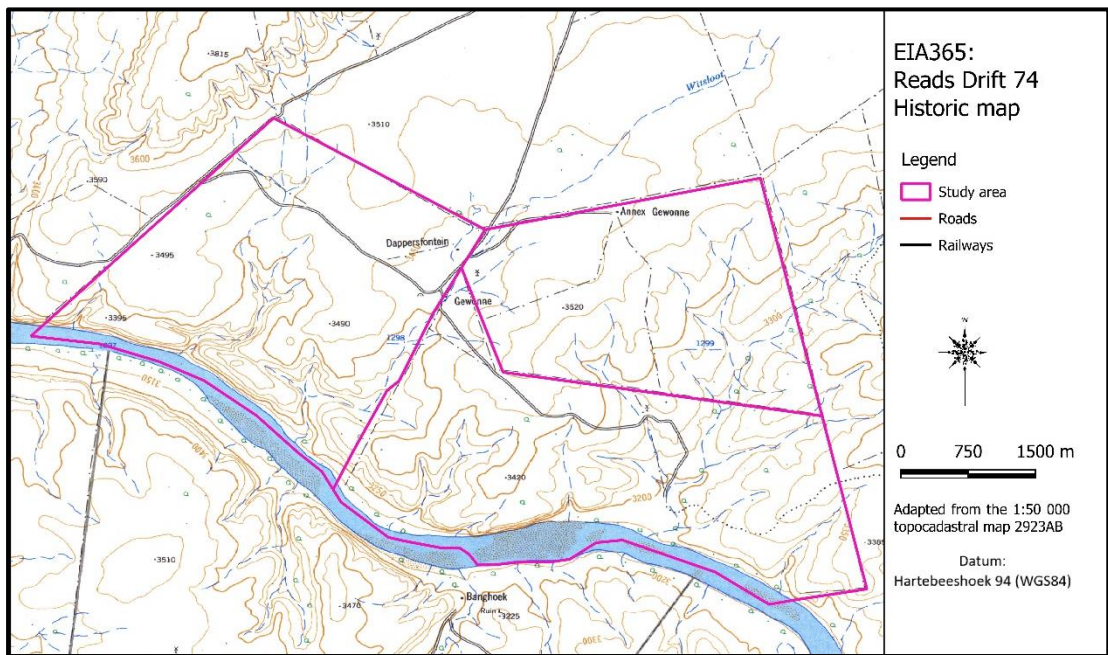


Figure 12. The study area as indicated on 1964 version of the 1:50 000 topographic map



Figure 13. The study area as indicated on the aerial photograph dating to 2019 (Image: Google Earth)

7. SURVEY RESULTS

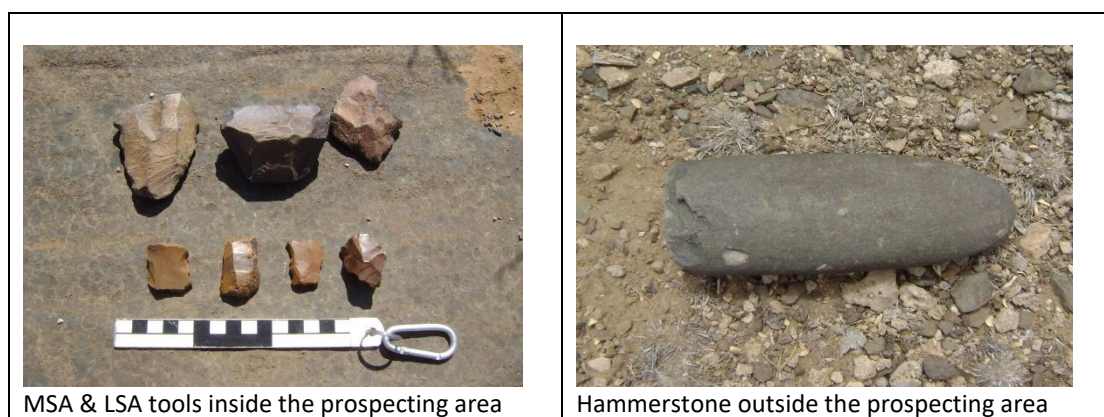
During the physical survey, the following sites, features and objects of cultural significance were identified in the study area (see the map in Fig. 14 for their location):

7.1 Stone Age

NHRA Category	Archaeological resources - Section 35
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- Change finds:
Stone Age artefacts, mostly dating to the Middle Stone Age and Later Stone Age occur in small numbers in parts of the study area. On the ridges closer to the river, the density of artefacts is less than 1/2m², diminishing to 1/10m² in the sandy regions. These are mostly made from banded iron stone (jaspelite), although some quartzite flakes were also noted. Cores, flakes and tools are found. The tools are very rough and informal and only a few that can be described as typical, i.e. blades and end scrapers, were identified.

In contrast to surrounding areas, no significant gravel terraces containing banded iron stone (Jaspelite) occur in or near the study area. Probably as a result of this lack of raw material, which seems to have been the preferred material in this region, Stone Age lithics are found only as low-density surface scatters, which is confirmed by similar findings in the larger region (Beaumont 2007, 2008; Kruger 2018; van der Walt 2017; van Schalkwyk 2019).



7.2 Iron Age

NHRA Category	Archaeological resources - Section 35
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- No sites, features or objects of cultural significance dating to the Iron Age were identified in the study area.

7.3 Historic period

NHRA Category	Structures older than 60 years - Section 34
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- 7.3.1: Old farmhouse (S 29,18209; E 23,44741) – referred to on the map as Annex Gewonne.

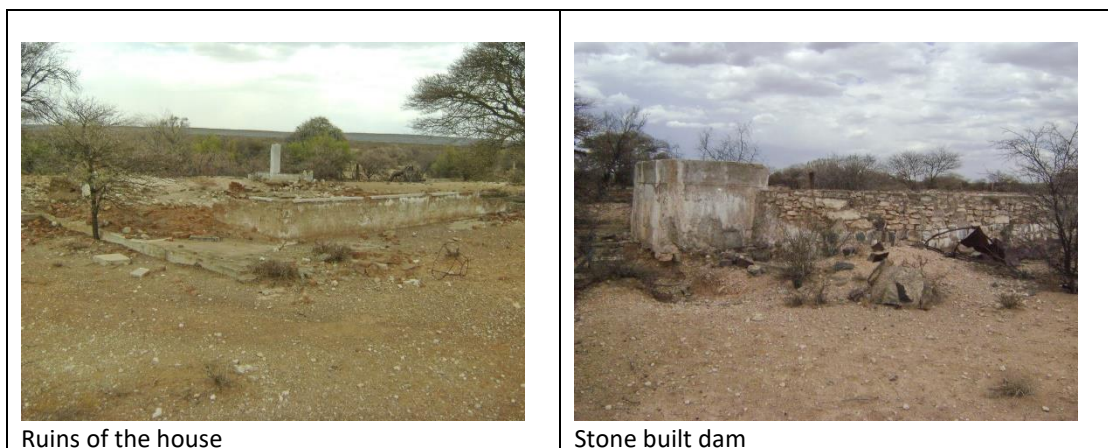
A rectangular structure with a gable roof that was extended to one side to accommodate more rooms as well as a stoep. A hearth or cooking place, commonly referred to as a komynjtjie was

added to one end. The house was built with poorly fired clay bricks and it has a corrugated iron roof. Some changes were brought about by entrances that were block off with walls and windows that were installed.



- 7.3.2: Old house (S 29,18609; E 23,43217) – referred to on the map as Dappersfontein

Old farmhouse now completely demolished and stripped of all fittings and usable material. It is therefore impossible to make any statement on the style and materials used. A large stone built dam is located some distance from the house.



- 7.3.3: Old farmhouse (S 29,19035; E 23,43016) – referred to on the map as Gewonne

Farmhouse currently still in use and well maintained. According to the current owner, the central core still exists, but some alterations and additions were made. It is square in form, built with bricks and has a corrugated iron roof in a gable form.

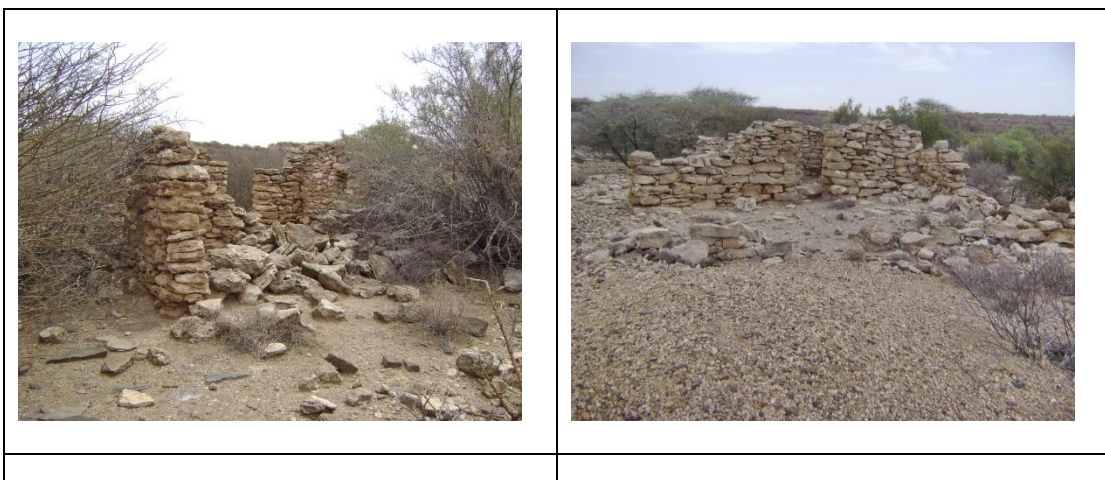


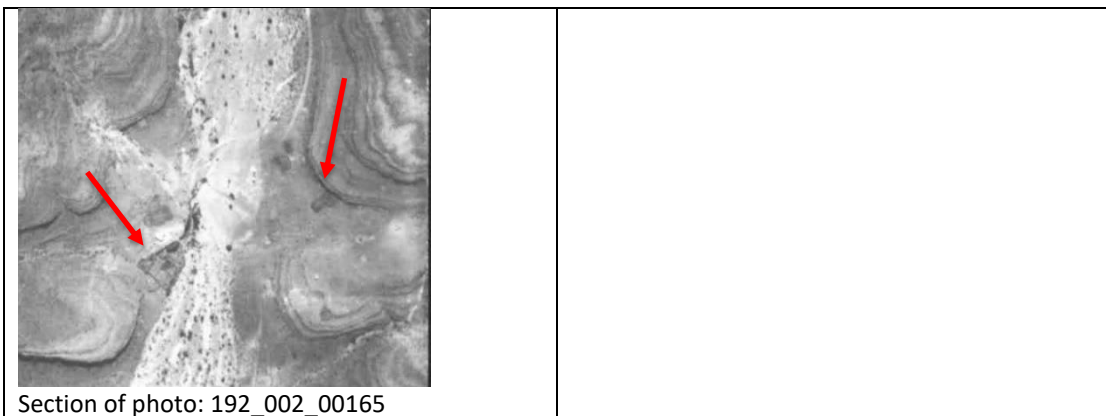
- 7.3.4: Stone built ‘cottages’ (7.3.4.a: S29,19983; E 23,42397; 7.3.4.b: S 29,19955; 23,42558)

A series of stone built ‘cottages’ spread out along a small valley. The individual structures were built with loose stones stacked on top of each other. As this was not very well done, i.e. very little interlocking of the stones took place, the walls are prone to topple over. The removal of fittings such as the roof and door frames probably also contributed to their current state. In some of them internal features such as shelves were built into the corner of the walls.

Based on their location near a natural spring (see 7.4.1 below), as well as the fact that some of them had what seemed like fences around them, gives the idea that they were used by small stock (sheep and goat) farmers as accommodation. This is supported by the presence of a very well-built sheep dip located close by (7.3.5 below).

Its proximity to the natural spring also raises the possibility that this might have been a site of cultural significance, i.e. where young Griqua girls are isolated during their initiation. Such pools are usually seen to be the home of the *waterslang*, a mythological snake which plays a significant role in the initiation of young girls (Waldman 2003). The watersnake is not only associated with the Griqua but is found amongst most indigenous communities in southern Africa (Van Schalkwyk 2016).

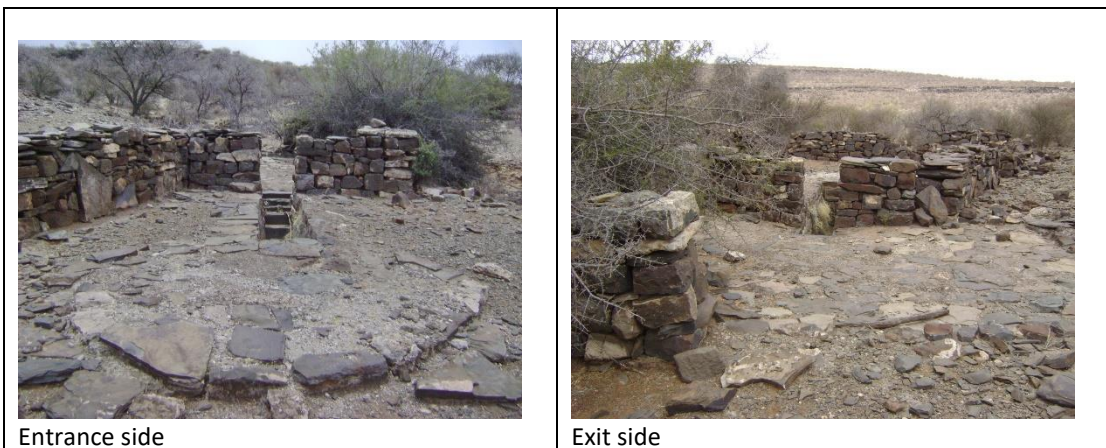




- 7.3.5: Old sheep dip (S 29,20033; E 23,42356)

Built with local stone, some of which seems to be hammer-dressed. It is classified as a 'spring dip', with the sheep entering the trough by jumping in and climbing out by means of a number of steps on the opposite side.

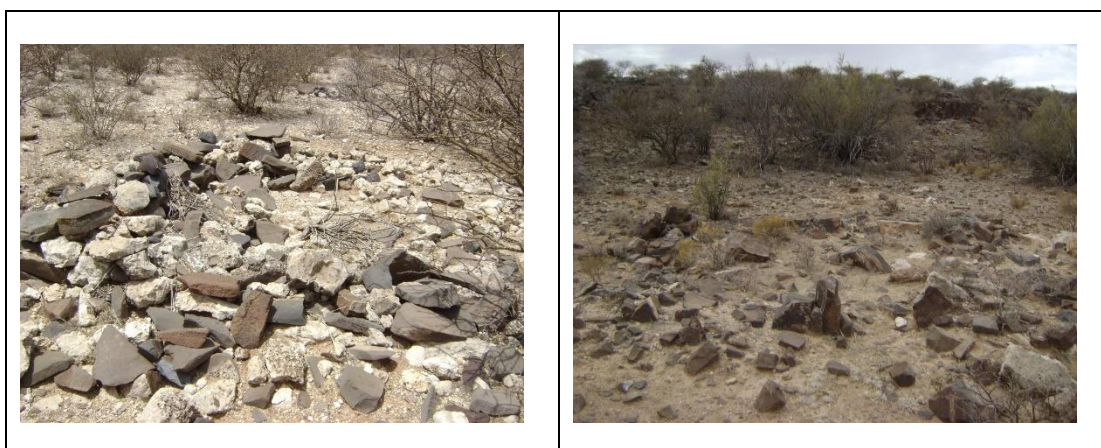
The location of this feature in the vicinity of the number of stone built 'cottage' seems to indicate that this might have been a community of small stock (sheep, goats) herders that stayed here for a period of time



- 7.3.6: Stone built structures (7.3.6.a: S 29,18344; E 23,41325; 7.3.6.b: S 29,19559; E 23,42732)

Some very roughly built structures of which only the foundation remains. Some structures are square in nature and others round. The square ones seem to be more recent than the round ones. It is possible that the former related to diamond digger activities whereas the round ones might have been the base of an early herder (Khoi) structure. Unfortunately, no surface artefactual material could be found to assist in the identification of these structures.

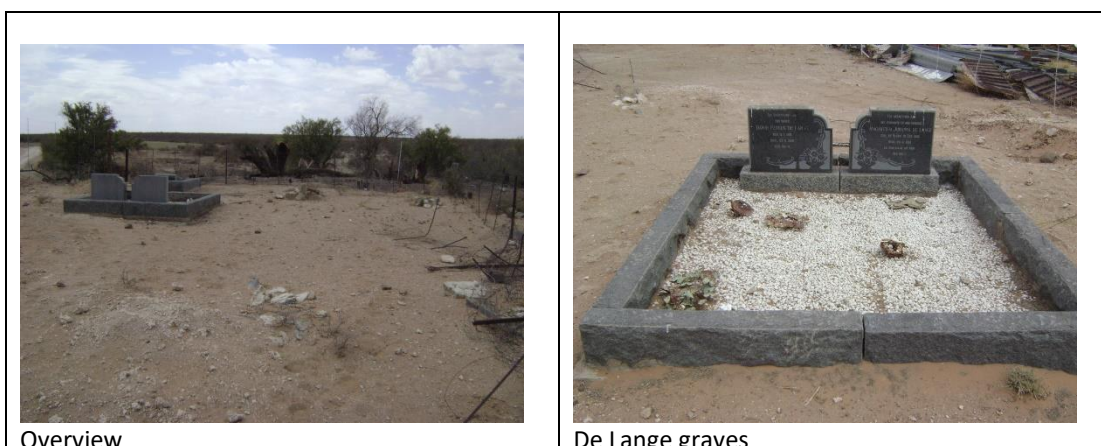
Similar structures have been reported on by van der Walt (2017) on Lanyon Vale to the west. However, he also does not give an acceptable explanation for the origin and function of these features, indicating only that it might relate to early diamond digging activities.



NHRA Category	Burial grounds and graves - Section 36
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- 7.3.7: Informal burial site (S 29,19018; E 23,43092)

Informal burial site containing approximately 7 graves. Named graves are from the De Lange family, with death dates ranging between 1945 and 1956. Other graves are only marked with stone cairns. The site used to be fenced off with wire, but this has not been maintained for a long time.



7.4 Natural landscape features

NHRA Category	Cultural landscapes: Section 3(2)(c) and (d)
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- 7.4.1: Natural spring (S 29,19941; E 23,42487)

A natural spring that, according to local information, has never dried up in close vicinity of the structures in 7.3.4.

The proximity to the stone built ‘cottage’ to the natural spring also raises the possibility that this might have been either (i) a site for the keeping of small stock or (ii) a site of cultural significance, i.e. where young Griqua girls are isolated during their initiation. Such pools are usually seen to be the home of the *waterslang*, a mythological snake which plays a significant role in the initiation of young girls (Waldman 2003). The watersnake is not only associated with the Griqua but is found amongst most indigenous communities in southern Africa (Van Schalkwyk 2016).



- 7.4.2 Historic engraving (S 29,18441, 23,41763; S 29,19417; E 23.42333)

The letters AB engraved twice on a flat piece of rock. It is probably the initials of a former land-owner or a diamond miner. It is located far from any known historic structure or other feature. A second site containing even more similar engravings occur some distance to the east.

Similar type of engravings has been reported on to the west (van der Walt 2017) and to the east at Katlani.



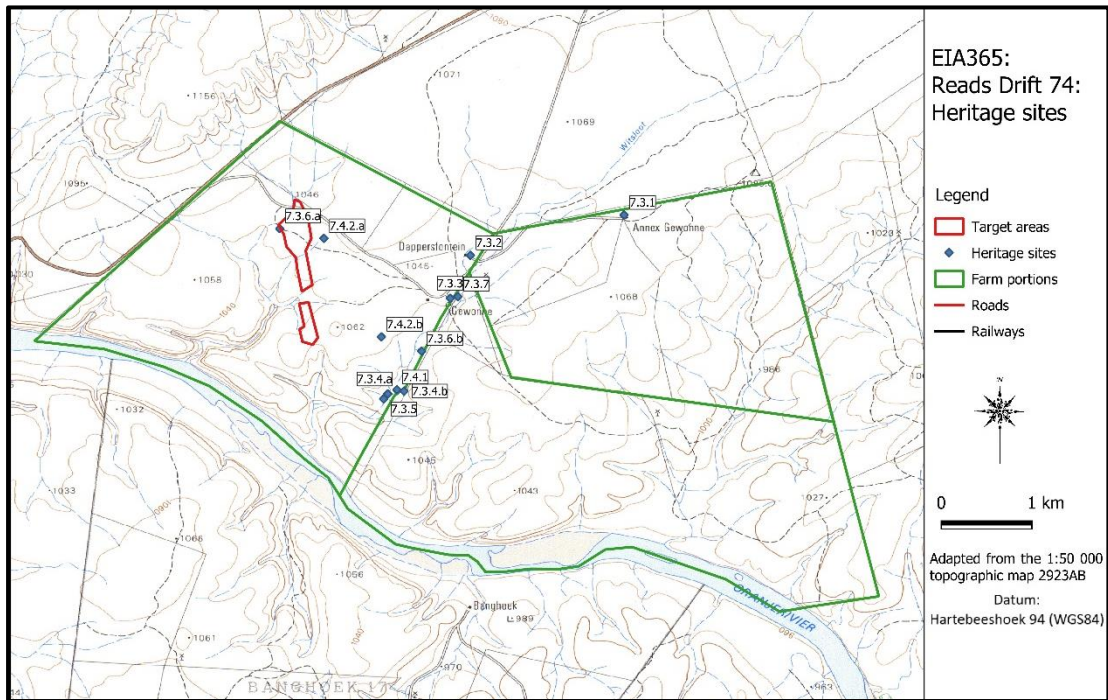


Figure 14. Location of the identified heritage sites

8. STATEMENT OF SIGNIFICANCE, IMPACT RATINGS AND MITIGATION MEASURES

8.1 Impact assessment

Heritage impacts are categorised as:

- Direct or physical impacts, implying alteration or destruction of heritage features within the project boundaries;
- Indirect impacts, e.g. restriction of access or visual intrusion concerning the broader environment;
- Cumulative impacts that are combinations of the above.

Impact analysis of cultural heritage resources under threat of the proposed development, is based on the present understanding of the development and its significance is calculated and presented below:

Table 2: Calculation of the impact on the identified heritage features

IDENTIFIED HERITAGE RESOURCE: Chance find archaeological material – 7.1		
Nature: Chance find Stone Age material: These features are rated to have low significance due to their low numbers as well as the fact that the area has already extensively been disturbed due to be surface material.		
	Without mitigation	With mitigation
Extent	Local area	Local area
Duration	Permanent	Permanent
Intensity	Minor	Minor
Probability	Improbable	Improbable
Significance	Low (20)	Low (20)
Status (positive or negative)	Negative	Neutral
Reversibility	Non-reversible	Non-reversible
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated	Yes	
Mitigation: Avoidance of site		

Cumulative impact: Limited loss of similar features in the larger landscape.					
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation	Proposed mitigation (Refer to definitions in Section 12.3)
EIA365: Stone Age material					
7.1	Chance find Stone Age tools	Section 35	Low significance Grade 4-C	20	(5) No further action required.

IDENTIFIED HERITAGE RESOURCE: Historic houses – 7.3.1 – 7.3.3					
Nature: Prospecting activities will not be taking place in this area.					
			Without mitigation	With mitigation	
Extent			Site	Site	
Duration			Permanent	Permanent	
Intensity			Minor	Minor	
Probability			Improbable	Improbable	
Significance			Low (16)	Low (16)	
Status (positive or negative)			Negative	Neutral	
Reversibility			Non-reversible	Non-reversible	
Irreplaceable loss of resources?			Yes	No	
Can impacts be mitigated			Yes		
Mitigation: Full documentation					
Cumulative impact: Loss of information regarding early settlement in the region.					
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation	Proposed mitigation (Refer to definitions in Section 12.3)
Historic houses					
7.3.1 - 7.3.3	Historic house	Section 34	High significance Grade 4-B	16	(1) Avoidance/Preserve; (2) Archaeological investigation

IDENTIFIED HERITAGE RESOURCE: Stone built cottage like structures – 7.3.4.a – 7.3.4.b					
Nature: Prospecting activities will not be taking place in this area.					
			Without mitigation	With mitigation	
Extent			Site	Site	
Duration			Permanent	Permanent	
Intensity			Minor	Minor	
Probability			Improbable	Improbable	
Significance			Low (16)	Low (16)	
Status (positive or negative)			Negative	Neutral	
Reversibility			Non-reversible	Non-reversible	
Irreplaceable loss of resources?			Yes	No	
Can impacts be mitigated			Yes		
Mitigation: Full documentation					
Cumulative impact: Loss of information regarding early settlement in the region.					
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation	Proposed mitigation (Refer to definitions in Section 12.3)
Stone built cottage like structures					
7.3.4.a - 7.3.4.b	Cottage like structures	Section 34	High significance Grade 4-B	16	(1) Avoidance/Preserve; (2) Archaeological investigation

IDENTIFIED HERITAGE RESOURCE: Historic sheep dip – 7.3.5					
Nature: Prospecting activities will not be taking place in this area.					
			Without mitigation	With mitigation	
Extent			Site	Site	
Duration			Permanent	Permanent	
Intensity			Minor	Minor	
Probability			Improbable	Improbable	
Significance			Low (16)	Low (16)	
Status (positive or negative)			Negative	Neutral	
Reversibility			Non-reversible	Non-reversible	
Irreplaceable loss of resources?			Yes	No	
Can impacts be mitigated			Yes		
Mitigation: Full documentation					

Cumulative impact: Loss of information regarding early settlement in the region.					
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation	Proposed mitigation (Refer to definitions in Section 12.3)
Historic sheep dip					
7.3.5	Historic sheep dip	Section 34	High significance Grade 4-B	16	(1) Avoidance/Preserve; (2) Archaeological investigation
				16	

IDENTIFIED HERITAGE RESOURCE: Historic house – 7.3.6.a – 7.3.6.b					
Nature: Prospecting activities will not take place in these areas					
			Without mitigation		With mitigation
Extent			Site		Site
Duration			Permanent		Permanent
Intensity			Minor		Minor
Probability			Improbable		Improbable
Significance			Medium (16)		Low (16)
Status (positive or negative)			Negative		Neutral
Reversibility			Non-reversible		Non-reversible
Irreplaceable loss of resources?			Yes		No
Can impacts be mitigated			Yes		
Mitigation: Full documentation					
Cumulative impact: Loss of information regarding early settlement in the region.					
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation	Proposed mitigation (Refer to definitions in Section 12.3)
Stone structures					
7.3.6.a – 7.3.6.b	Stone structures	Section 34	High significance Grade 4-C	16	(1) Avoidance/Preserve; (2) Archaeological investigation
				16	

IDENTIFIED HERITAGE RESOURCE: Burial site – 7.3.7					
Nature: Prospecting activities will take place in this area					
			Without mitigation		With mitigation
Extent			Site		Site
Duration			Permanent		Permanent
Intensity			Minor		Minor
Probability			Improbable		Improbable
Significance			Low (16)		Low (16)
Status (positive or negative)			Negative		Neutral
Reversibility			Non-reversible		Non-reversible
Irreplaceable loss of resources?			Yes		No
Can impacts be mitigated			Yes		
Mitigation: Full documentation					
Cumulative impact: Loss of information regarding early settlement in the region.					
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation	Proposed mitigation (Refer to definitions in Section 12.3)
Burial site					
7.3.7	Burial site	Section 36	High significance Grade 4-A	16	(1) Avoidance/Preserve; (2) Archaeological investigation
				16	

IDENTIFIED HERITAGE RESOURCE: Natural/Cultural landscapes – 7.4.1					
Nature: Prospecting activities will not take place in this area					
			Without mitigation		With mitigation
Extent			Site		Site
Duration			Permanent		Permanent
Intensity			Minor		Minor
Probability			Improbable		Improbable
Significance			Medium (16)		Low (16)
Status (positive or negative)			Negative		Neutral
Reversibility			Non-reversible		Non-reversible
Irreplaceable loss of resources?			Yes		No
Can impacts be mitigated			Yes		
Mitigation: Full documentation					

Cumulative impact: Loss of information regarding early settlement in the region.					
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation	Proposed mitigation (Refer to definitions in Section 12.3)
Natural spring					
7.4.1	Natural spring	Section 3(2) (c) and (d)	High significance Grade 4-A	16	(1) Avoidance/Preserve; (2) Archaeological investigation
				16	

IDENTIFIED HERITAGE RESOURCE: Natural/Cultural landscapes – 7.4.2					
Nature: Prospecting activities will not take place in this area					
	Without mitigation	With mitigation			
Extent	Site	Site			
Duration	Permanent	Permanent			
Intensity	Minor	Minor			
Probability	Improbable	Improbable			
Significance	Medium (16)	Low (16)			
Status (positive or negative)	Negative	Neutral			
Reversibility	Non-reversible	Non-reversible			
Irreplaceable loss of resources?	Yes	No			
Can impacts be mitigated	Yes				
Mitigation: Full documentation					
Cumulative impact: Loss of information regarding early settlement in the region.					
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation	Proposed mitigation (Refer to definitions in Section 12.3)
Graffiti					
7.4.2	Engravings/Graffiti	Section 3(2) (c) and (d)	High significance Grade 4-A	16	(1) Avoidance/Preserve; (2) Archaeological investigation
				16	

9. MANAGEMENT MEASURES

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the proposed development can be excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, whence they can be avoided or cared for in the future.

Sources of risk were considered with regards to development activities defined in Section 2(viii) of the NHRA that may be triggered and are summarised in Table 3A and 3B below. These issues formed the basis of the impact assessment described. The potential risks are discussed according to the various phases of the project below.

9.1 Objectives

- Protection of archaeological, historical and any other site or land considered being of cultural value within the project boundary against vandalism, destruction and theft.
- The preservation and appropriate management of new discoveries in accordance with the NHRA, should these be discovered during construction activities.

The following shall apply:

- Known sites should be clearly marked in order that they can be avoided during construction activities.
- The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.

- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).

9.2 Control

In order to achieve this, the following should be in place:

- A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage sites and should be held accountable for any damage.
- Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above.
- In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.

Table 3A: Construction Phase: Environmental Management Programme for the project

Action required	Protection of heritage sites, features and objects		
Potential Impact	The identified risk is damage or changes to resources that are generally protected in terms of Sections 27, 28, 31, 32, 34, 35, 36 and 37 of the NHRA that may occur in the proposed project area.		
Risk if impact is not mitigated	Loss or damage to sites, features or objects of cultural heritage significance		
Activity / issue	Mitigation: Action/control	Responsibility	Timeframe
1. Removal of Vegetation 2. Construction of required infrastructure, e.g. access roads, water pipelines	See discussion in Section 9.1 above	Environmental Control Officer	During construction only
Monitoring	See discussion in Section 9.2 above		

Table 3B: Operation Phase: Environmental Management Programme for the project

Action required	Protection of heritage sites, features and objects		
Potential Impact	It is unlikely that the negative impacts identified for pre-mitigation will occur if the recommendations are followed.		
Risk if impact is not mitigated	Loss or damage to sites, features or objects of cultural heritage significance		
Activity / issue	Mitigation: Action/control	Responsibility	Timeframe
1. Removal of Vegetation 2. Construction of required infrastructure,	See discussion in Section 9.1 above	Environmental Control Officer	During construction only

e.g. access roads, water pipelines			
Monitoring	See discussion in Section 9.2 above		

10. CONSLUSIONS AND RECOMMENDATIONS

This report describes the methodology used, the limitations encountered, the heritage features that were identified and the recommendations and mitigation measures proposed relevant to this. It should be noted that the implementation of the mitigation measures is subject to SAHRA/PHRA's approval.

The cultural landscape qualities of the region are made up of a pre-colonial element consisting of Stone Age and a much later colonial (farmer) component, which eventually gave rise to an urban component which manifest in a number of small towns.

Identified sites

During the physical survey, the following sites, features or objects of cultural significance were identified.

- 7.1 Change finds Stone Age artefacts:
Stone Age artefacts, mostly dating to the Middle Stone Age and Later Stone Age occur in small numbers in parts of the study area. On the ridges closer to the river, the density of artefacts is less than 1/2m², diminishing to 1/10m² in the sandy regions. These are mostly made from banded iron stone (jaspelite), although some quartzite flakes were also noted. Cores, flakes and tools are found. The tools are very rough and informal and only a few that can be described as typical, i.e. blades and end scrapers, were identified.
- 7.3.1: Old farmhouse – referred to on the map as Annex Gewonne.
A rectangular structure with a gable roof that was extended to one side to accommodate more rooms as well as a stoep. A hearth or cooking place, commonly referred to as a komyntjie was added to one end. The house was built with poorly fired clay bricks and it has a corrugated iron roof. Some changes were brought about by entrances that were block off with walls and windows that were installed.
- 7.3.2: Old house – referred to on the map as Dappersfontein
Old farmhouse now completely demolished and stripped of all fittings and usable material. It is therefore impossible to make any statement on the style and materials used. A large stone-built dam is located some distance from the house.
- 7.3.3: Old farmhouse – referred to on the map as Gewonne
Farmhouse currently still in use and well maintained. According to the current owner, the central core still exists, but some alterations and additions were made. It is square in form, built with bricks and has a corrugated iron roof in a gable form.
- 7.3.4: Stone built 'cottages'
A series of stone built 'cottages' spread out along a small valley. The individual structures were built with loose stones stacked on top of each other. As this was not very well done, i.e. very little interlocking of the stones took place, the walls are prone to topple over. The removal of fittings such as the roof and door frames probably also contributed to their current state. In some of them internal features such as shelves were built into the corner of the walls.
- 7.3.5: Old sheep dip

Built with local stone, some of which seems to be hammer-dressed. It is classified as a 'spring dip', with the sheep entering the trough by jumping in and climbing out by means of a number of steps on the opposite side.

- 7.3.6: Stone built structures**
 Some very roughly built structures of which only the foundation remains. Some structures are square in nature and others round. The square ones seem to be more recent than the round ones. It is possible that the former related to diamond digger activities whereas the round ones might have been the base of an early herder (Khoi) structure. Unfortunately, no surface artefactual material could be found to assist in the identification of these structures.
- 7.3.7: Informal burial site**
 Informal burial site containing approximately 7 graves. Named graves are from the De Lange family, with death dates ranging between 1945 and 1956. Other graves are only marked with stone cairns. The site used to be fenced off with wire, but this has not been maintained for a long time.
- 7.4.1: Natural spring**
 A natural spring that, according to local information, has never dried up, in close vicinity of the structures in 7.3.4.
- 7.4.2 Historic engravings**
 The letters AB engraved twice on a flat piece of rock. It is probably the initials of a former land-owner or a diamond miner. It is located far from any known historic structure or other feature. A second site containing even more similar engravings occur some distance to the east.

Impact assessment and proposed mitigation measures

Impact analysis of cultural heritage resources under threat of the proposed development, is based on the present understanding of the development:

IDENTIFIED HERITAGE RESOURCE					
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation	Proposed mitigation (Refer to definitions in Section 12.3)
7.1	Stone Age tools	Section 35	Low significance Grade 4-C	20 20	(5) No further action required.
7.3.1 - 7.3.3	Historic house	Section 34	High significance Grade 4-B	16 16	(1) Avoidance/Preserve; (2) Archaeological investigation
7.3.4.a - 7.3.4.b	Cottage like structures	Section 34	High significance Grade 4-B	16 16	(1) Avoidance/Preserve; (2) Archaeological investigation
7.3.5	Historic sheep dip	Section 34	High significance Grade 4-B	16 16	(1) Avoidance/Preserve; (2) Archaeological investigation
7.3.6.a – 7.3.6.b	Stone structures	Section 34	High significance Grade 4-C	16 16	(1) Avoidance/Preserve; (2) Archaeological investigation
7.3.7	Burial site	Section 36	High significance Grade 4-A	16 16	(1) Avoidance/Preserve; (2) Archaeological investigation
7.4.1	Natural spring	Section 3(2) (c) and (d)	High significance Grade 4-A	16 16	(1) Avoidance/Preserve; (2) Archaeological investigation
7.4.2	Engravings/Graffiti	Section 3(2) (c) and (d)	High significance Grade 4-A	16 16	(1) Avoidance/Preserve; (2) Archaeological investigation

Legal requirements

The legal requirements related to heritage specifically are specified in Section 3 of this report. For this proposed project, the assessment has determined that no sites, features or objects of heritage significance occur in the study area. If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.

- If the identified structure is to be demolished, a valid permit would be required from SAHRA/PHRA prior to its destruction. Such a permit will only be issued after the site has been fully documented – mapped, photographed and described.

Reasoned opinion as to whether the proposed activity should be authorised:

- From a heritage point of view, it is recommended that the proposed development be allowed to continue on acceptance of the conditions proposed below.

Conditions for inclusion in the environmental authorisation:

- If the identified structure is to be demolished, it must be fully documented – mapped, photographed and described – beforehand.
- The Palaeontological Sensitivity Map (SAHRIS) indicate that the study area has high sensitivity of fossil remains to be found and therefore a desktop palaeontological study of the site is required.
- Should archaeological sites or graves be exposed in other areas during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

11. REFERENCES

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11.2 Literature

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11.3 Archival sources, maps and aerial photographs

1: 50 000 Topographic maps

Google Earth

Aerial photographs: Chief Surveyor General

NARSSA:

SAB URU_1860_688_1
SAB URU_6467_612_1
SAB URU_3585_2563_1
SAB URU_7534_541_1
SAB URU_2586_4028_1
SAB URU_1945_1036_1
SAB MNW_854_MM2511/26_1

12. ADDENDUM

1. Indemnity and terms of use of this report

The findings, results, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information. The report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken and the author reserve the right to modify aspects of the report including the recommendations if and when new information may become available from ongoing research or further work in this field, or pertaining to this investigation.

Although all possible care is taken to identify all sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. The author of this report will not be held liable for such oversights or for costs incurred as a result of such oversights.

Although the author exercises due care and diligence in rendering services and preparing documents, he accepts no liability and the client, by receiving this document, indemnifies the author against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by the author and by the use of the information contained in this document.

This report must not be altered or added to without the prior written consent of the author. This also refers to electronic copies of this report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

2. Assessing the significance of heritage resources and potential impacts

A system for site grading was established by the NHRA and further developed by the South African Heritage Resources Agency (SAHRA 2007) and has been approved by ASAPA for use in southern Africa and was utilised during this assessment.

2.1 Significance of the identified heritage resources

According to the NHRA, Section 2(vi) the **significance** of a 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.

Matrix used for assessing the significance of each identified site/feature

1. SITE EVALUATION				
1.1 Historic value				
Is it important in the community, or pattern of history				
Does it have strong or special association with the life or work of a person, group or organisation of importance in history				
Does it have significance relating to the history of slavery				
1.2 Aesthetic value				
It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group				
1.3 Scientific value				
Does it have potential to yield information that will contribute to an understanding of natural or cultural heritage				
Is it important in demonstrating a high degree of creative or technical achievement at a particular period				
1.4 Social value				
Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons				
1.5 Rarity				
Does it possess uncommon, rare or endangered aspects of natural or cultural heritage				
1.6 Representivity				
Is it important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects				
Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class				
Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality.				
2. Sphere of Significance		High	Medium	Low
International				
National				
Provincial				
Regional				
Local				
Specific community				
3. Field Register Rating				
1.	National/Grade 1: High significance - No alteration whatsoever without permit from SAHRA			
2.	Provincial/Grade 2: High significance - No alteration whatsoever without permit from provincial heritage authority.			
3.	Local/Grade 3A: High significance - Mitigation as part of development process not advised.			

4.	Local/Grade 3B: High significance - Could be mitigated and (part) retained as heritage register site	
5.	Generally protected Grade 4A: High/medium significance - Should be mitigated before destruction	
6.	Generally protected Grade 4B: Medium significance - Should be recorded before destruction	
7.	Generally protected Grade 4C: Low significance - Requires no further recording before destruction	

2.2 Significance of the anticipated impact on heritage resources

All impacts identified during the HIA stage of the study will be classified in terms of their significance. Issues would be assessed in terms of the following criteria:

Nature of the impact

A description of what causes the effect, what will be affected and how it will be affected.

Extent

The physical **extent**, wherein it is indicated whether:

- 1 - The impact will be limited to the site;
- 2 - The impact will be limited to the local area;
- 3 - The impact will be limited to the region;
- 4 - The impact will be national; or
- 5 - The impact will be international.

Duration

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

- 1 - Of a very short duration (0–1 years);
- 2 - Of a short duration (2-5 years);
- 3 - Medium-term (5–15 years);
- 4 - Long term (where the impact will persist possibly beyond the operational life of the activity); or
- 5 - Permanent (where the impact will persist indefinitely).

Magnitude (Intensity)

The magnitude of impact, quantified on a scale from 0-10, where a score is assigned:

- 0 - Small and will have no effect;
- 2 - Minor and will not result in an impact;
- 4 - Low and will cause a slight impact;
- 6 - Moderate and will result in processes continuing but in a modified way;
- 8 - High, (processes are altered to the extent that they temporarily cease); or
- 10 - Very high and results in complete destruction of patterns and permanent cessation of processes.

Probability

This describes the likelihood of the impact actually occurring and is estimated on a scale where:

- 1 - Very improbable (probably will not happen);
- 2 - Improbable (some possibility, but low likelihood);
- 3 - Probable (distinct possibility);
- 4 - Highly probable (most likely); or
- 5 - Definite (impact will occur regardless of any prevention measures).

Significance

The significance is determined through a synthesis of the characteristics described above (refer to the formula below) and can be assessed as low, medium or high:

$S = (E+D+M) \times P$; where
 S = Significance weighting
 E = Extent
 D = Duration
 M = Magnitude
 P = Probability

Significance of impact		
Points	Significant Weighting	Discussion
< 30 points	Low	Where this impact would not have a direct influence on the decision to develop in the area.
31-60 points	Medium	Where the impact could influence the decision to develop in the area unless it is effectively mitigated.
> 60 points	High	Where the impact must have an influence on the decision process to develop in the area.

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.

Status

- The status, which is described as either positive, negative or neutral.

Reversibility

- The degree to which the impact can be reversed.

Mitigation

- The degree to which the impact can be mitigated.

Nature:		
	Without mitigation	With mitigation
Construction Phase		
Probability		
Duration		
Extent		
Magnitude		
Significance		
Status (positive or negative)		
Operational Phase		
Probability		
Duration		
Extent		
Magnitude		
Significance		
Status (positive or negative)		
Reversibility		
Irreplaceable loss of resources?		
Can impacts be mitigated		

3. Mitigation measures

- *Mitigation: means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.*

Impacts can be managed through one or a combination of the following mitigation measures:

- Avoidance
- Investigation (archaeological)
- Rehabilitation
- Interpretation
- Memorialisation
- Enhancement (positive impacts)

For the current study, the following mitigation measures are proposed, to be implemented only if any of the identified sites or features are to be impacted on by the proposed development activities:

- (1) Avoidance/Preserve: This is viewed to be the primary form of mitigation and applies 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. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources. The site should be retained *in situ* and a buffer zone should be created around it, either temporary (by means of danger tape) or permanently (wire fence or built wall). Depending on the type of site, the buffer zone can vary from
 - 10 metres for a single grave, or a built structure, to
 - 50 metres where the boundaries are less obvious, e.g. a Late Iron Age site.
- (2) Archaeological investigation: This option can be implemented with additional design and construction inputs. This is appropriate where development occurs in a context of heritage significance and where the impact is such that it can be mitigated. Mitigation is to excavate the site by archaeological techniques, document the site (map and photograph) and analyse the recovered material to acceptable standards. This can only be done by a suitably qualified archaeologist.
 - This option should be implemented when it is impossible to avoid impacting on an identified site or feature.
 - This also applies for graves older than 60 years that are to be relocated. For graves younger than 60 years a permit from SAHRA is not required. However, all other legal requirements must be adhered to.
 - Impacts can be beneficial – e.g. mitigation contribute to knowledge
- (3) Rehabilitation: When features, e.g. buildings or other structures are to be re-used. Rehabilitation is considered in heritage management terms as an intervention typically involving the adding of a new heritage layer to enable a new sustainable use.
 - 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.
 - Conservation measures would be to record the buildings/structures as they are (at a particular point in time). The records and recordings would then become the 'artefacts' to be preserved and managed as heritage features or (movable) objects.
 - This approach automatically also leads to the enhancement of the sites or features that are re-used.

- (4) Mitigation is also possible with additional design and construction inputs. Although linked to the previous measure (rehabilitation) a secondary though 'indirect' conservation measure would be to use the existing architectural 'vocabulary' of the structure as guideline for any new designs.
 - The following principle should be considered: **heritage informs design**.
 - This approach automatically also leads to the enhancement of the sites or features that are re-used.
- (5) No further action required: This is applicable only where sites or features have been rated to be of such low significance that it does not warrant further documentation, as it is viewed to be fully documented after inclusion in this report.
 - 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.

4. Relocation of graves

If the graves are younger than 60 years, an undertaker can be contracted to deal with the exhumation and reburial. This will include public participation, organising cemeteries, coffins, etc. They need permits and have their own requirements that must be adhered to.

If the graves are older than 60 years old or of undetermined age, an archaeologist must be in attendance to assist with the exhumation and documentation of the graves. This is a requirement by law.

Once it has been decided to relocate particular graves, the following steps should be taken:

- Notices of the intention to relocate the graves need to be put up at the burial site for a period of 60 days. This should contain information where communities and family members can contact the developer/archaeologist/public-relations officer/undertaker. All information pertaining to the identification of the graves needs to be documented for the application of a SAHRA permit. The notices need to be in at least 3 languages, English, and two other languages. This is a requirement by law.
- Notices of the intention needs to be placed in at least two local newspapers and have the same information as the above point. This is a requirement by law.
- Local radio stations can also be used to try contact family members. This is not required by law, but is helpful in trying to contact family members.
- During this time (60 days) a suitable cemetery need to be identified close to the development area or otherwise one specified by the family of the deceased.
- An open day for family members should be arranged after the period of 60 days so that they can gather to discuss the way forward, and to sort out any problems. The developer needs to take the families requirements into account. This is a requirement by law.
- Once the 60 days has passed and all the information from the family members have been received, a permit can be requested from SAHRA. This is a requirement by law.
- Once the permit has been received, the graves may be exhumed and relocated.
- All headstones must be relocated with the graves as well as any items found in the grave.

Information needed for the SAHRA permit application

- The permit application needs to be done by an archaeologist.
- A map of the area where the graves have been located.
- A survey report of the area prepared by an archaeologist.
- All the information on the families that have identified graves.
- If graves have not been identified and there are no headstones to indicate the grave, these are then unknown graves and should be handled as if they are older than 60 years. This information also needs to be given to SAHRA.
- A letter from the landowner giving permission to the developer to exhume and relocate the graves.
- A letter from the new cemetery confirming that the graves will be reburied there.
- Details of the farm name and number, magisterial district and GPS coordinates of the gravesite.

5. Curriculum vitae

Johan Abraham van Schalkwyk

Personal particulars

Date of birth: 14 April 1952
Identity number: 520414 5099 08 4
Marital status: Married; one daughter
Nationality: South African

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Qualifications

1995 DLitt et Phil (Anthropology), University of South Africa
1985 MA (Anthropology), University of Pretoria
1981 BA (Hons), Anthropology, University of Pretoria
1979 Post Graduate Diploma in Museology, University of Pretoria
1978 BA (Hons), Archaeology, University of Pretoria
1976 BA, University of Pretoria

Non-academic qualifications

12th HSRC-School in Research Methodology - July 1990
Dept. of Education and Training Management Course - June 1992
Social Assessment Professional Development Course - 1994
Integrated Environmental Management Course, UCT - 1994

Professional experience

Private Practice
2017 - current: Professional Heritage Consultant

National Museum of Cultural History

1992 - 2017: Senior researcher: Head of Department of Research. Manage an average of seven researchers in this department and supervise them in their research projects. Did various projects relating to Anthropology and Archaeology in Limpopo Province, Mpumalanga, North West Province and Gauteng. Headed the Museum's Section for Heritage Impact Assessments.
1978 - 1991: Curator of the Anthropological Department of the Museum. Carried out extensive fieldwork in both anthropology and archaeology

Department of Archaeology, University of Pretoria

1976 - 1977: Assistant researcher responsible for excavations at various sites in Limpopo Province and Mpumalanga.

Awards and grants

1. Hanisch Book Prize for the best final year Archaeology student, University of Pretoria - 1976.
2. Special merit award, National Cultural History Museum - 1986.
3. Special merit award, National Cultural History Museum - 1991.
4. Grant by the Department of Arts, Culture, Science and Technology, to visit the various African countries to study museums, sites and cultural programmes - 1993.
5. Grant by the USA National Parks Service, to visit the United States of America to study museums, sites, tourism development, cultural programmes and impact assessment programmes - 1998.
6. Grant by the USA embassy, Pretoria, under the Bi-national Commission Exchange Support Fund, to visit cultural institutions in the USA and to attend a conference in Charleston - 2000.
7. Grant by the National Research Foundation to develop a model for community-based tourism - 2001.

8. Grant by the National Research Foundation to develop a model for community-based tourism - 2013. In association with RARI, Wits University.

Publications

Published more than 70 papers, mostly in scientifically accredited journals, but also as chapters in books.

Conference Contributions

Regularly present papers at conferences, locally as well as internationally, on various research topics, ranging in scope from archaeology, anthropological, history, cultural historical and tourism development.

Heritage Impact Assessments

Since 1992, I have done more than 2000 Phase 1 and Phase 2 impact assessments (archaeological, anthropological, historical and social) for various government departments and developers. Projects include environmental management frameworks, roads, pipeline-, and power line developments, dams, mining, water purification works, historical landscapes, refuse dumps and urban developments.