

A photograph of raindrops on a window pane. A vertical rainbow is visible in the center, with colors transitioning from red at the top to purple at the bottom. The raindrops are scattered across the surface, some larger and more prominent than others.

Pulafel 4D Consulting



*** Timeous service * Professionalism * Reliability * Value for money**

COMPANY REGISTRATION # 2018/593198/07

Desktop & Field Heritage Impact Assessment for Section 102 Application, to include bulk sampling into existing Prospecting Right, over Remaining Extent, Portion 1, Portion 2 and Portion 3 of the Farm Vlakfontein 433, Hay District, Northern Cape Province, South Africa.

Report prepared for: M & S Consulting

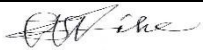
By

Pulafel 4D Consulting (Pty) Ltd


22 September 2023

DECLARATION OF INDEPENDENCE

We declare that other than compensation for services rendered in accordance with applicable legislation, neither the professional consultants herein nor Pulafel4D Consulting have any financial or other fiduciary interest in the planned development project or the clients listed herein.

Heritage Consultants:	PULAFEL4D Consulting (Pty) Ltd
Consultants	Dr Joseph Chikumbirike, PhD Archaeology (Wits), MA (UZ), BSc Geography and Environmental Studies (ZOU) ASAPA Membership No.
	Prof Jesmael Mataga, PhD Heritage and Public Culture (UCT), MA Heritage Studies (UZ), BA Hons (UZ), Certificate in Conservation (ICCROM); (ASAPA No. 546; APHP0147)
Email:	pulafel4d@gmail.com
Signed	
Date	22 September 2023

Document Control

Report Compilation	Dr Joseph Chikumbirike
Internal Reviewer	Prof Jesmael Mataga
Draft 1 Submission	22 September 2023
Final Report	✓
Signed	

ASSUMPTIONS, LIMITATIONS, AND DISCLAIMERS

Pulafel 4D Consulting, (and all or Independent Consultants) declare that we have professional expertise in conducting heritage impact assessments, including knowledge of the NHRA Act, Regulations and any guidelines that have relevance to the proposed activity. We will comply with the Act, Regulations, and all other applicable legislation; perform the work relating to the application in an objective manner.

Our professional conduct and reporting are guided by the legal and procedural prescripts of SAHRA and regulated by the prescripts of the following professional bodies i.e., Southern African Association of Professional Archaeologists (ASAPA) and the Association of Professional Heritage Practitioners (APHP) to which our consultants and affiliates are members. Our work adheres to SAHRA's *Minimum Standards for Heritage Specialist Studies in terms of Section 38 of the National Heritage Resources Act (No. 25 of 1999)*. South Africa's historical, archaeological, and palaeontological heritage resources are unique and non-renewable as defined in section 3 of the NHRA. The 'cultural significance' of the sites, structures, landscapes, and artefacts /objects are determined by means of aesthetic, architectural, historical, scientific, social, spiritual, linguistic, or technological values or significances (National Heritage Resources Act, 1999 (vi)). The evaluation of sites, landscapes or heritage objects herein is done with reference to one or several of these aspects.

Though all possible care was taken during the intensive desktop study and the subsequent field survey, to identify sites of cultural importance within the development areas, some heritage sites could have been missed due to their subterrato access nature, or due to the dense vegetation cover or challenges related to access. It may be that some heritage materials could be discovered during the project implementation. Also, note should be taken that no subsurface investigation (i.e., excavations or sampling) was undertaken during the fieldwork. In both cases as outlined above, should any heritage features and/or objects or architectural features, stone tool scatters, artefacts, human remains, or fossils be uncovered or observed during the project implementation, operations must be stopped, and a qualified archaeologist contacted for further assessment. Observed or located heritage features and/or objects may not be disturbed or removed. In cases like these, as per the SHRA act, a heritage specialist must be able to further assess the

significance of the site or objects discovered in the project implementation phase. Further mitigation measures may be recommended for approval by SAHRA.

EXECUTIVE SUMMARY

At the request of M & S Consulting, a Desktop and Field Heritage Impact Assessment was carried out on the M and S Consulting that had been appointed by Cipla Projects (Pty) Ltd to undertake an environmental Authorisation (EA) Application in support of a Section 102 Amendment process for the extension of prospecting activities as part of an approved Prospecting Right and EA (NC 30/5/1/1/2/12276 PR) on Remaining Extent, Portion 1, Portion 2 and Portion 3 of the Farm Vlakfontein 433, near Beeshoek, in the Northern Cape Province. It is expected that the proposed prospecting activities could impact on cultural heritage and archaeological sites in the form of historical buildings and graves that belong to the Historical Period. However, the scope of the proposed activities, the likelihood of the impact on the archaeological heritage is considered **LOW**, especially if prospecting by way of core drilling is considered. It is considered unlikely that prospecting by way of core drilling, trenching and pitting will have a detrimental effect on the archaeological material (Early Stone Age, Middle Stone Age and Iron Age) it is assigned a site rating of Generally Protected C (GP.C). There is a **LOW** to **MODERATE** chance that trenching and pitting into the sandy overburden especially within the vicinity of natural drainage areas may impact on intact Stone Age archaeological remains and should be avoided where possible, whereas prospecting by way of core drilling is considered least likely to have a detrimental effect on potentially capped archaeological heritage resources. In this case, potential prospecting areas that are capped by well-developed wind-blown sand deposits are assigned a site rating of Generally Protected B (GP.B) and will require archaeological monitoring if trenching and pitting activities are to be conducted.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	6
INTRODUCTION.....	8
LEGISLATIVE FRAMEWORK	9
DESCRIPTION OF THE PROJECT AREA	13
Location	13
Geology	14
Vegetation	15
SCOPE OF WORK.....	17
METHODOLOGY	17
Desktop Assessment	17
Field Survey.....	17
FIELDWORK RESULTS	18
Built Heritage, Graves and Burials	19
Archaeological Finds	24
CONCLUSIONS/RECOMMENDATIONS	28
SELECTED REFERENCES	30

INTRODUCTION

At the request of M & S Consulting (Pty) Ltd, a Desktop Heritage Impact Assessment was carried out on, the Farm Vlaktefontein 433, Postmasburg, Northern Cape Province, where Cipla Projects (Pty) Ltd applied for extension of prospecting activities. The proposed activities include drilling of 60 boreholes, 12 trenches (70 m x 20 m), blasting, storage of diesel, mobile offices and ablution facilities, processing plant, roads, salvage yard, wash bay, waste rock dumps, weighbridge and control room, and workshop within an application area of 3 661.5088 ha. The region'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. Therefore, to comply with the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a Desktop Heritage Impact Assessment (HIA) was completed for the proposed prospecting extension project and is reported herein.

LEGISLATIVE FRAMEWORK

The primary legal trigger for identifying when heritage specialist involvement is required in the Environmental Impact Assessment process is the National Heritage Resources (NHR) Act (Act No 25 of 1999). The NHR Act requires that all heritage resources, that is, all places or objects of aesthetic, architectural, historical, scientific, social, spiritual, linguistic, or technological value or significance are protected. Thus, any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures over 60 years of age, living heritage and the collection of oral histories, historical settlements, landscapes, geological sites, palaeontological sites and objects.

The Act identifies what is defined as a heritage resource, the criteria for establishing its significance and lists specific activities for which a heritage specialist study may be required. In this regard, categories of development relevant to this study are listed in Section 34 (1), Section 35 (4), Section 36 (3) and Section 38 (1) of the NHR Act as follows:

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

35 (4) No person may, without a permit issued by the responsible heritage resources authority

- a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;

36 36 (3) No person may, without a permit issued by SAHRA or a provincial heritage resources authority

- destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

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

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

- The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- The construction of a bridge or similar structure exceeding 50m in length; • Any development or other activity which will change the character of the site
 - a) exceeding 5000 m² in extent; or
 - b) involving three or more existing erven or subdivisions thereof; or
 - c) involving three or more subdivisions thereof which have been consolidated within the past five years;
- The rezoning of a site exceeding 10 000 m²; or
- Any other category of development provided for in regulations by the South African Heritage Resources Agency (SAHRA).

A range of contexts can be identified which typically have high or potential cultural significance and which would require some form of heritage specialist involvement (**Table 1**). This may include formally protected heritage sites or unprotected, but potentially significant sites or landscapes (**Table 2**). The involvement of the heritage specialist in such a process is usually necessary when a proposed development may affect a heritage resource, whether it is formally protected or unprotected, known or unknown. In many cases, the nature and degree of heritage significance is largely unknown pending further investigation (e.g., capped sites, assemblages or subsurface fossil remains). On the other hand, it is also possible that a site may contain heritage resources (e.g., structures older than 60 years), with little or no conservation value.

Table 1: Relationship between different heritage contexts, heritage resources likely to occur within these contexts, and likely sources of heritage impacts in the central interior of South Africa.

Heritage Context	Heritage Resources	Impact
Palaeontology	<p>Precambrian shallow marine and lacustrine stromatolites, organic-walled microfossils, Ghaap Plateau (Transvaal Supergroup)</p> <p>Palaeozoic and Mesozoic fossil remains, e.g. Karoo Supergroup</p> <p>Neogene regolith</p>	<p>Road cuttings</p> <p>Quarry excavation</p> <p>Bridge and pipeline construction</p> <p>(Quaternary alluvial deposits)</p>
<p>Archaeology</p> <p>Early Stone Age</p> <p>Middle Stone Age</p> <p>LSA - Herder</p> <p>Historical</p>	<p>Types of sites that could occur in the Free State include Localized Stone Age sites containing lithic artifacts, animal and human remains found near <i>inter alia</i> the following:</p> <p>River courses/springs</p> <p>Stone tool making sites.</p> <p>Cave sites and rock shelters</p> <p>Freshwater shell middens</p> <p>Ancient, kraals and stonewalled complexes</p> <p>Abandoned areas of past human settlement</p> <p>Burials over 100 years old</p> <p>Historical middens</p> <p>Structural remains</p> <p>Objects including industrial machinery and aircraft.</p>	<p>Subsurface excavations including ground. levelling, landscaping, foundation preparation, road building, bridge building, pipeline construction, construction of electrical infrastructure and alternative energy facilities, township development.</p>
History	<p>Historical townscapes, e.g., Kimberley</p> <p>Historical structures, i.e., older than 60 years</p> <p>Historical burial sites</p>	<p>Demolition or alteration work.</p> <p>New development.</p>

	Places associated with social identity/displacement, e.g., Witsieshoek Cave, Oppermansgronde Historical mission settlements, e.g., Bethulie, Beersheba, Moffat Mission	
Natural Landscapes	Formally proclaimed nature reserves Evidence of pre-colonial occupation Scenic resources, e.g., view corridors, viewing sites, Historical structures/settlements older than 60 years Geological sites of cultural significance.	Demolition or alteration work. New development.
Relic Landscape Context	Battle and military sites, e.g Magersfontein Precolonial settlement and burial sites Historical graves (marked or unmarked, known or unknown) Human remains (older than 100 years) Associated burial goods (older than 100 years) Burial architecture (older than 60 years)	Demolition or alteration work. New development.

Table 2. Examples of heritage resources located in the central interior of South Africa.

Historically, archaeologically and palaeontologically significant heritage sites & landscapes	Examples
Landscapes with unique geological or palaeontological history	Karoo Basin Beaufort Group sedimentary strata Glacial striations on Ventersdorp andesites Vredefort Dome World Heritage Site. Taung World Heritage Site
Landscapes characterised by certain geomorphological attributes where a range of archaeological and palaeontological sites could be located.	Vaal, Modder and Riet River valleys Pans, pandunes and natural springs of the Free State panveld. Ghaap Plateau

Relic landscapes with evidence of past, now discontinued human activities	Wonderwerk Cave Stone Age deposits Cave sites and rock shelters in the Maluti Drakensberg region (rock art) Southern Highveld pre-colonial settlement complexes. Dithakong settlement complexes Rock engravings on Ventersdorp andesites
Landscapes containing concentrations of historical structures.	Concentration camps & cemeteries from the South African War.
Historical towns, historically significant farmsteads, settlements & routes	Batho historical township area in Mangaung (Bloemfontein). Kimberley
Battlefield Sites, burial grounds and grave sites older than 60 years.	Sannaspos Magersfontein

DESCRIPTION OF THE PROJECT AREA

Location

The location of the project area is shown on the 1: 250 000 scale topographic map 2822 Postmasburg (Council for Geoscience in Pretoria) in **Figure.1** below. The following geographic coordinates define the project study area:

- Vlakfontein 433 0 28°11'27.37S 22°57'45.2E Farm
- Vlak fontein 433 3 28°11'20.99S 22°58'19.34E Farm Portion
- Vlak fontein 433 1 28°13'19.61S 22°56'29.76E Farm Portion
- Vlak fontein 433 0 28°9'42.22S 22°59'3.28E Farm Portion
- Vlak fontein 433 2 28°11'56.21S 22°57'15.38E Farm Portion

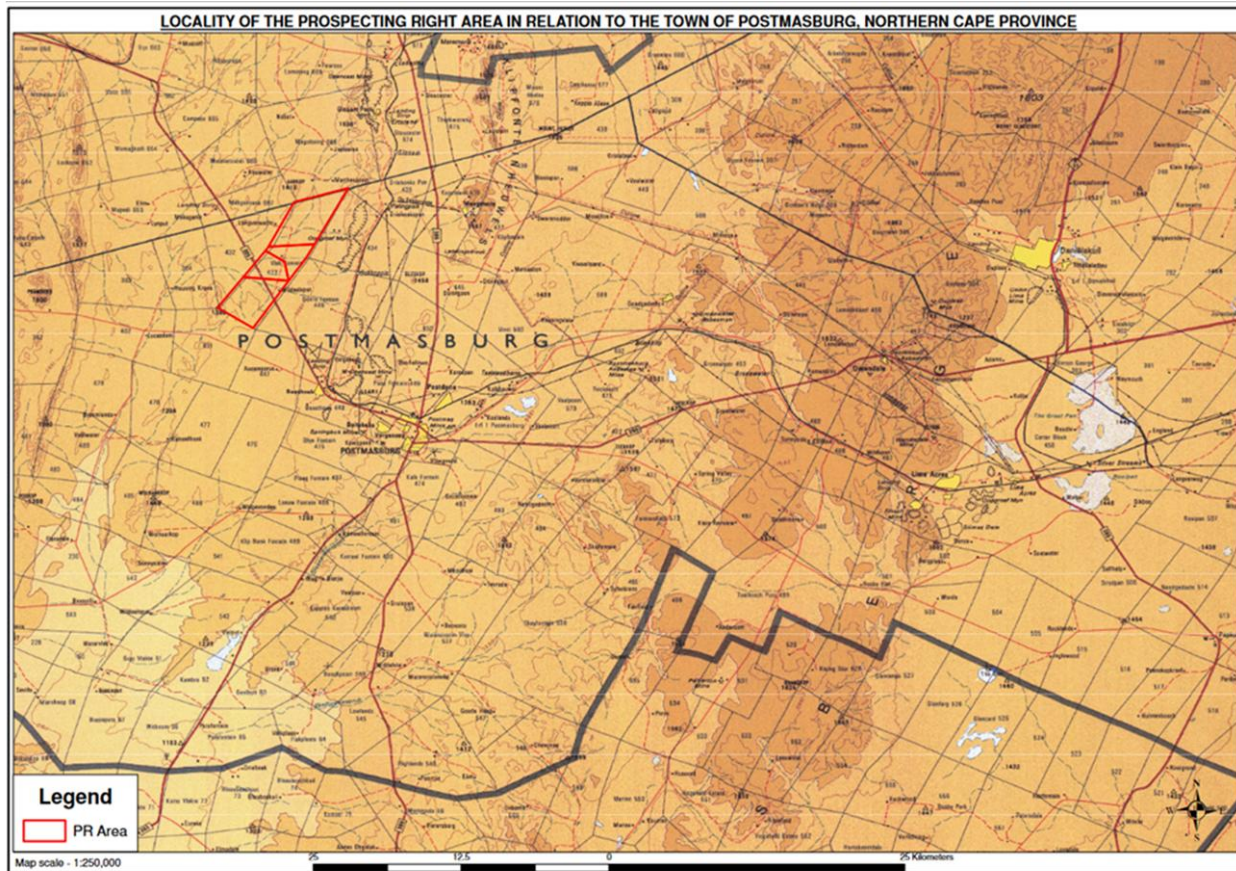


Fig. 1. Extract from 1: 250 000 topographical map 2822 Postmasburg showing the approximate location of the mining rights study area on Farm Vlakfontein 433 located c. 20 km northwest of Postmasburg, Northern Cape.

Geology

In the Griqualand West Basin, the Ghaap Group of the Transvaal Supergroup, is divided into four subgroups, from the oldest, Schmidtsdrift, Campbell Rand, Asbestos Hills and Koegas Subgroups (Eriksson et al., 2006). The Koegas Subgroup is overlain by the Postmasburg Group and the latter is divided into the lower Makganyene Formation and the Ongeluk Formation. There are three formations in the Asbestos Hills Subgroup, from the base, the Kliphuis, Kuruman and Danielskuil Formations, with all three composed of iron-formation. The Asbestos Hills Subgroup is dated at about 2500 Ma.

The Koegas Subgroup overlies the Griquatown Iron Formation, which has youngest zircon U–Pb ages of ~ 2490– 2440 Ma (Beukes, 1978, 1983; Pickard, 2003; Beukes and Gutzmer, 2008). Zircons from a tuffaceous bed near the top of the Koegas Subgroup gave an age of 2415 ± 6 Ma

(Figure. 2; Gutzmer and Beukes, 1998). Outcrop, core and chronostratigraphic data suggest a regional unconformity between the Koegas Subgroup and the overlying Postmasburg Group (glacial Makganyene Formation and volcanic Ongeluk Formation) (Beukes, 1978, 1983). Zircon ages of 2250–2220 Ma for the Ongeluk Formation (Cornell et al., 1996).

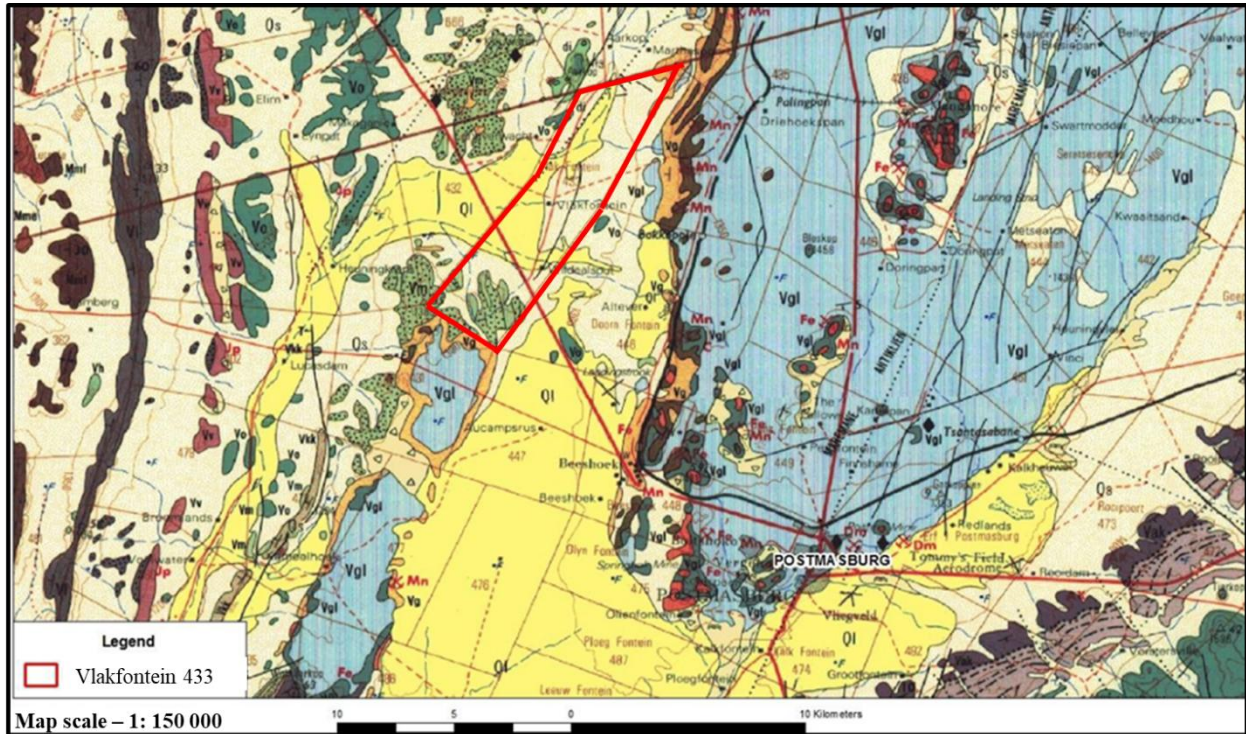


Fig. 2. Detail of the 1: 250 000 geological map shown above to show the main rock units mapped on the farm Vlakfontein 433 and surrounding farms around Postmasburg. Main rock units: Vg (orange) = Gamagara Formation; Vm (green with stipple) = Makganyene Formation; Ql (dark yellow) = Kalahari Group calcrete, limestone and alluvium; Qs (pale yellow) = red Kalahari Group aeolian sands (Gordonia Formation)

Vegetation

The project area is in a semi-arid area which supports a continuous scrub cover, largely vaalbos (*Tarchonanthus camphoratus*), interspersed with sparse, mainly thorn-bearing bush which varies locally and includes swarthaak (*Acacia detinens*), kameeldoring (*Acacia giraffae*), soetdoring (*Acacia karroo*), witgat- boom (*Boshcia albitrunca*), and kareeboom (*Rhus lancea*) (Nel 1929: 15-16). Sparsely distributed clusters of *Z. mucronata* and *A. karroo* were observed.



Figure 3: A cluster of *Accacia karroo* and grass patches in the project area

SCOPE OF WORK

This is a Desktop Heritage Impact Assessment, including Archaeological, and Cultural heritage to determine the potential of impacts on heritage resources within the study area.

The following are the required to perform the assessment:

- A desk-top investigation of the area.
- Identify possible archaeological, cultural, and historical sites within the proposed development area through analysis of known information and fieldwork.
- Evaluate the potential of impacts occurring due to construction and operation of the proposed development on archaeological, cultural, historical resources and built resources; and
- Recommend mitigation measures in terms of detailed studies to determine and ameliorate any negative impacts on areas of archaeological, cultural, and historical importance.

METHODOLOGY

Desktop Assessment

The purpose of this study is to determine the possible occurrence of sites with cultural heritage significance within the study area. The study is based on archival, and document combined with terrain evaluation. The HIA study for the proposed project area was implemented through the various methods. Firstly a desktop study was conducted to gain access to the following literature sources: academic literature, South African Heritage Resources Authority (SAHRA) impact assessment reports on the region, South African Heritage Resources Information System (SAHRIS) map, Genealogical society database, South African archives database, McGregor, Africana libraries, digital collections, as well as previous HIA reports in the Northern Cape and specifically in the Namakwa area of the Namakwa District. The second method involved a field survey.

Field Survey

The field study was undertaken on foot and by car. Geology, soils, and types of vegetation, river valleys and hills / mountains were taken into consideration when deciding the areas to investigate

for archaeological and heritage sites. The weather was bright and sunny, with clear visibility. Relative to desktop predictions it was found that the area had no potentially significant archaeological exposure. Artefact assemblages consisting of mostly cores and flakes were in sporadic and isolated occurrences. The hilly areas were bereft of any artefacts meaning that the scatters are isolated to the area below the hills. The surveyed areas yielded no traces of engravings or past rock art. No stone walling structures of the Tswana were recorded. Overall, it was found that the prospecting area has a generally low surface density of isolated Stone Age artefacts ranging from Pleistocene but mainly Holocene. The artefact scatters are of low archaeological integrity and therefore have limited significance. However, historical buildings and a burial ground were recorded.

FIELDWORK RESULTS

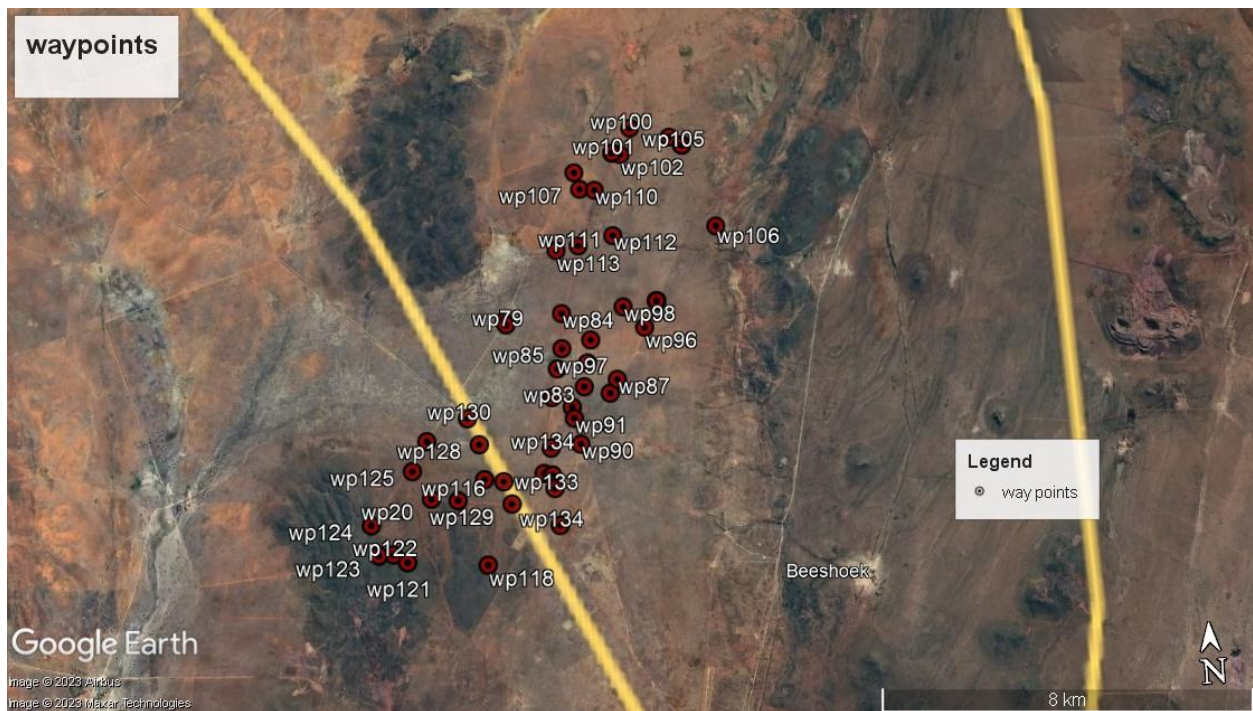


Figure 4: Vlakfontein Way Points

Built Heritage, Graves and Burials

The project area contained several sites related to built heritage, burials, and contemporary social-economic uses. These range from historical graves from the 1880s, and contemporary burial places. Considerable remnants of old farmhouses and foundations or ruins of old infrastructure were also identified (Table 4). Of note is that parts of the project area have been subject to extensive contemporary uses, mainly quarrying. The recommended mitigation includes avoidance, and in the rare cases where the identified sites may be physically impacted by the prospecting activities, the SAHRA protocols on removal /relocation of protected graves and burials should be implemented before commencement.

Table 4: List of Built heritage, Graves, and Burials

Site	Coordinates	Description	Classification
Portion 3			
082	S29 37 865 E022 43 784	Gravesite- about 7 graves, ranging from 1890s to the 1960s.	Graves/Burials
083	S28 11 110 E022 57 145	Old Grid/Gate /Farm Entrance- with a 1958 inscription.	
089	S28 11 358 E022 57 285	Farmhouse/ Current use.	
Portion (Jason)			
095	S28 12 456 E022 58 201	Farmhouse / main - current use with cattle and old watering infrastructure, old foundations and intact but partly abandoned old buildings.	
098	E28 11 532 E022 58 367	Waterpoint/Boundary.	
100	S28 11 260 E022 58 430	Cattle watering point with water infrastructure.	
108	S28 12 837 E022 57 704	Gravesite (6 graves), fenced. A mix of old (late 19 th -early 20 th c), and contemporary (less than 60yrs) burials.	Burials/ Graves
		Quarry site with quarried piles and infrastructure for processing quarry stones.	
Portion (Chris's farm extent 1 and 2)			
103	S28 08 018 E022 59 906	Cattle pen/watering hole with old water structures.	
105	S28 08 929 E022 59 647	Campsite- current use.	
106	S28 09 372	Possible foundation- stone 5m	

	E022 58 694	visible.	
108	S28 09 439 E022 58 624	Remnants of destroyed structure- stone/concrete.	

Graves, and Burials

Two Gravesites were identified, Gravesite 1 on **Portions 3** of Vlakfontein, which contains graves from between 1850 and the 1960s. Grave site 2 on portion is a mix of old graves and contemporary burials. Given the age of graves at Gravesite 1, these are protected by the Heritage Legislation. Grave site 2 contains 5 old graves (burials before 1930s), the proposed mitigation is avoidance. The same is also recommended for Gravesite 2. Both gravesites are located adjacent to the respective farmsteads and can be avoided in the project implementation phase.



Figure 5: Grave site 1 old graves – Portion 1 Stone grade with collapsed headstone



Figure 6: Gravesite 2 showing 5 old graves and a concrete headstone (Portion 2).

Built heritage.

The built heritage identified in the project area include old farmhouses, ruins of old settlements and abandoned and contemporary water infrastructure. There was also extensive current mining and quarrying (for road rehabilitation) processes going on in and near the project area.



Figures 7: Old gate (Portion 2)



Figures 8: old water supply equipment



Figures 9: Old Farmhouses /Infrastructure (Portion 2)

Other Contemporary Land uses

Within the project are several contemporary socioeconomic, and infrastructure development bases land uses such as camping activities (Figure 10), quarrying and road construction (Figure 11).



Figure 10: A campsite.



Quarry and Road construction activities .



Figure 11: Quarrying (Extent 1 and 2)

Archaeological Finds

Background to the Archaeology and Heritage of the Study Area

The South African pre-history follows a complex sequence of stratigraphic deposition, which is preserved in the deep layers underground. There are three progressive phases, namely the Palaeontological phase, the Archaeological phase and the Colonial/historical periods. The present study deals with the last two.

The Northern Cape is known for its rich and varied archaeological resources specifically relating to the Stone Age (Morris 2006). The archaeological signature in the study area includes Stone Age, Iron Age and Historical periods. Within the same landscape are such sites such as Wonderwerck Cave, Gamo Hana, Kathu Pan and Dithakong. The Wonderwerk Cave is one of the archaeological sites in the landscape. It is a cave found in the Kuruman Hills-Asbestos Mountains (Curnoe et al. 2006; Herries et al. 2007, Chazan and Horwitz 2009). According to Chazan and Horwitz (2009), the archaeological record of Wonderwerk Cave serves as a unique and extensive diachronic record of milestones in the development of symbolic behaviour. They further state that local communities associate the cave with a snake spirit, and the rock art executed on the cave walls provide the evidence on how special the cave was during the Later Stone Age. Furthermore, homins introduced manuports in with sensory properties into the back of the cave during the terminal Acheulean (over 180,000 years ago).

Beaumont and Vogel (1989) presented dates of rock art sites that are found within the landscape where the project area is located. These include sites such as Melkboom which is pecked and dated to 330 +/-45, Batlharos dated to 210+/-30, Meidekop finger paintings dated to 180+/-, Nchwaneng pecked and dated to 190+/-40 (Beaumont and Vogel 1989). Also, in the landscape close to the town of Postmasberg is the ancient mine which was excavated by Beaumont and Boshier (1974). According to Beaumont and Boshier (1974), the ancient working is situated on a slight rise in a gently undulating plain, called Jonas Vlakte, on the farm Doornfontein M82, approximately 12 km north-north-west of Postmasburg, and 176 km west-north-west of Kimberley, in the Postmasburg district of the Northern Cape. The excavated assemblage consisted of Strata 1 and 2 both yielded similar amorphous 'Pre- Iron Age' aggregates (Beaumont

& Vogel 1972). In addition, the former includes an abundance of stone mining tools, while the latter contained a few Iron Age and Modern objects (Beaumont and Boshier 1974). According to Beaumont and Boshier (1974),

Archeological Finds

The assemblages from Excavation 2 Strata 1 and 2 both yielded similar 'Pre-Iron Age' aggregates, identical to those from Exc. 1, except that stratum 1 contained far fewer stone mining-tools and included possibly in situ glass and iron objects. Kathu Pan is located north of the project area, and it is one of the richest early prehistoric archaeological sites in South Africa. Excavations conducted at Kathu archaeological site have produced tens of thousands of Earlier Stone Age artifacts, including hand axes and other tools. The archaeological record at Kathu is estimated to be between 700,000 and one million years old. According to Walker et al. (2014), the Kathu Complex includes the excavated sites of Kathu Pan1 (KP1) and Bestwood 1 (BW 1). At Kathu Pan, evidence of early hominin occupation has been observed at multiple locations within the pan, but ESA deposits have only been excavated at KP 1 (Walker et al. 2014).

Table 5: Archaeological Finds

Site	Latitude (S)	Longitude E	Material Culture	Rating
Site 1	29° 39,135'	022° 45,180'	stone flakes on the road	LOW
Site 2	28° 09, 414'	022° 58, 422'	Lithic material, 2 cores had cleaver stuck to the of the quarry mine	LOW
Site 3	28° 13, 052'	022° 56, 509'	Lithic core/ scraper track	LOW
Site 4	28° 13, 052'	022° 56, 509'	Lithic core	LOW



Figure 13: Site 4 - lithic core

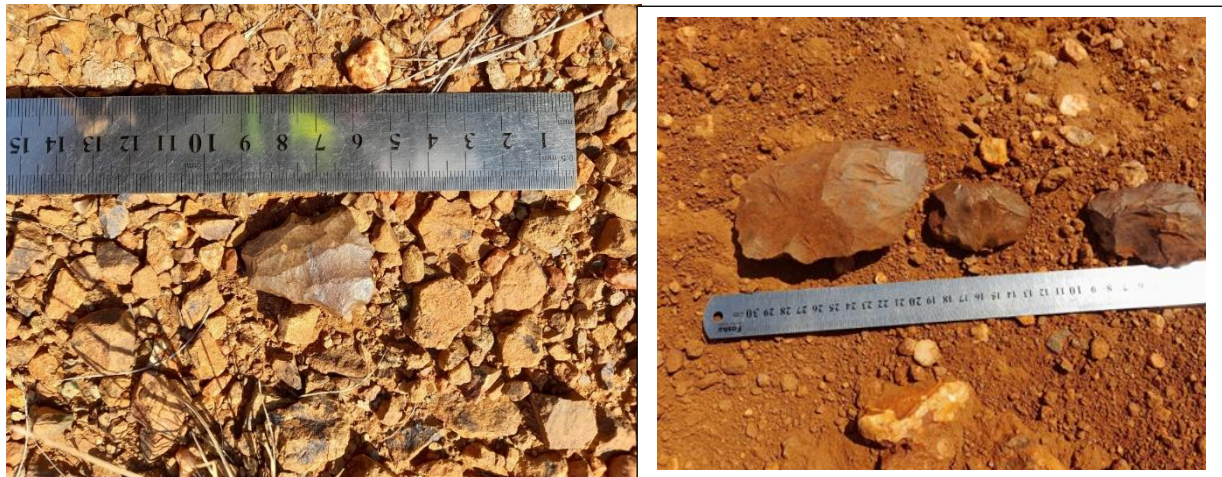


Figure 14: Site 2- lithic flakes



Figure 15: Site 2 – cleaver sticking out of the wall of a quarry excavation.



Figure 16: Site 1- flakes on the road surface

CONCLUSIONS/RECOMMENDATIONS

This study observed deficit of significant archaeological sites particularly those that are still well preserved and undisturbed in their primary contexts. However, isolated scatters of Stone Age material culture of **LOW** significance were observed which were highly weathered with probably secondary context. Some of the Stone Age material culture recorded include stone tool scrapers, cores, and arrowheads. Late Stone Age microliths were also observed at one site. Historical structures that include old pump bouse, old buildings and rectangular structure with cement floors was recorded. These, however, are of **LOW** significance, and mining or prospecting activities can avoid areas where these structures are sited. It is recommended that development goes ahead. The notable observations made are tabulated below.

The study area is rated according to field rating categories as prescribed by SAHRA (**Table 6**).

Table 6. Field rating categories as prescribed by SAHRA.

Field Rating	Grade	Significance	Mitigation
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation: mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP.A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

SELECTED REFERENCES

- Avery, D. M. 1995. Southern savannas and Pleistocene hominid adaptations: the micromammalian perspective. In *Palaeoclimate and Evolution with Emphasis on Human Origins* (eds E. S. Vrba, S. H. Denton, T. C. Partidge and L. M. Burckle). New Haven, CT: Yale Univ Press, pp. 459–78.
- Barham, L. S. 2002. Systematic pigment use in the Middle Pleistocene of south-central Africa. *Current Anthropology*, 31: 181–90.
- Beaumont, P. 1982. Aspects of the Northern Cape Pleistocene project. In *Palaeoecology of Africa and the Surrounding Islands* (eds J. A. Coetzee and E. M. van Zinderen Bakker). Rotterdam: Balkema, pp. 41–4.
- Beaumont, P.B., and Vogel, J. C. 1989. Patterns in age and context of rock art in the Northern Cape. *South African Archaeological Bulletin*, Dec, Vol.44, No. 150:73-81.
- Beaumont, P. 1990. Wonderwerk Cave. In *Guide to Archaeological Sites in the Northern Cape* (eds P. Beaumont and D. Morris). Kimberley: McGregor Museum, pp. 101–34.
- Beaumont, P. 2004. Wonderwerk Cave. In *Archaeology in the Northern Cape: Some Key Sites* (eds D. Morris and P. Beaumont). Kimberley: McGregor Museum. pp. 31–6.
- Beaumont, P. and Vogel, J. C. 2006. On a timescale for the past million years of human history in central South Africa. *South African Journal of Science*, 102: 217–28.
- Beaumont, P. B. and Boshier, A.K. 1974. Report on Test Excavations in a Prehistoric Pigment Mine near Postmasburg, Northern Cape. *South African Archaeological Bulletin*, Jun. 1974, Vol. 29, No. 113/114 (Jun. 1974), pp. 41-59.
- Bednarik, R. G. 2003. The earliest evidence of palaeoart. *Rock Art Research*, 20(2): 3–22.
- Bernard, P. S. 2003. Ecological implications of water spirit beliefs in southern Africa: the need to protect knowledge, nature, and resource rights. *USDA Forest Service Proceedings RMRS-P-27*: 148–54.
- Brook, G., Scott, L., Railsback, L. B. and Goddard, E. A. in press. A 35-ka pollen and isotope record of environmental change along the southern margin of the Kalahari from a stalagmite in Wonderwerk Cave, *South Africa. Journal of Arid Environments*.
- Chazan, M., Ron, H., Matmon, A., Porat, N., Goldberg, P., Yates, R., Avery, D. M., Sumner, A. and Horwitz, L. K. 2008. First radiometric dates for the Earlier Stone Age sequence in Wonderwerk Cave, *South Africa. Journal of Human Evolution*, 55: 1–11.

Chazan, M., Avery, D. M., Goldberg, P., Matmon, A., Porat, N., Ron, H., Ruther, H., Sumner, A., Yates, R. and Horwitz, L. K. in press. The Earlier Stone Age sequence in the Northern Cape Province, South Africa: new research at Wonderwerk Cave. In *Les Cultures a Bifaces* (ed. H. de Lumley).

Clottes, J. 2004. Hallucinations in caves. *Cambridge Archaeological Journal*, 14(1): 81.

Curnoe, D., Herries, A. I. R., Brink, J., Hopley, P., Van Reynveld, K., Henderson, Z. and Morris D. 2006. Discovery of Middle Pleistocene fossil and stone tool-bearing deposits at Groot Kloof, Ghaap Escarpment, Northern Cape Province. *South African Journal of Science*, 102: 180–4.

Goren-Inbar, N and Peltz, S, 1995. Additional remarks on the Berekhat Ram figure. *Rock Art Research*, 12: 131–2.