

Campfronis Crocodile Farm Archaeological Impact Assessment

Archaeological Impact Assessment Report for the Campfronis
Crocodile Farm – Capricorn District Municipality -
Limpopo Province

PREPARED BY:



PREPARED FOR:

G.A. DE KLERK
CAMPFRONIS FARM



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***Disclaimer;** 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. G&A Heritage and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.*

Statement of Independence

As the duly appointed representative of G&A Heritage, I Stephan Gaigher, hereby confirm my independence as a specialist and declare that neither I nor G&A Heritage have any interests, be it business or otherwise, in any proposed activity, application or appeal in respect of which the Environmental Consultant was appointed as Environmental Assessment Practitioner, other than fair remuneration for work performed on this project.

SIGNED OFF BY: STEPHAN GAIGHER



EXECUTIVE SUMMARY

Site name and location: Campfronis Crocodile Farm, Alldays, Limpopo Province.

Municipal Area: Capricorn District Municipality

Developer: G.A. de Klerk

Consultant: G&A Heritage, PO Box 522, Louis Trichardt, 0920, South Africa. 38A Vorster Str. Louis Trichardt, 0920

Date of Report: 26 August 2014

The purpose of the management summary is to distil the information contained in the report into a format that can be used to give specific results quickly and facilitate management decisions. It is not the purpose of the management summary to repeat in shortened format all the information contained in the report, but rather to give a statement of results for decision making purposes.

This study focuses on the development of a 1 ha plot on the farm Campfronis at Alldays in the Capricorn District of the Limpopo Province for the purpose of farming crocodiles.

The purpose of this archaeological impact assessment is to outline the cultural heritage sensitivity of the proposed development area and to advise on mitigation should any heritage sites or landscapes be affected.

Archival Research

Scientific publications

- Murray Schoonraad. *The South African Archaeological Bulletin*, Vol. 23, No. 90 (Aug. 1968). The Discovery of Mapungubwe.
- Emese M. Bordy, Adam J. Bumby, Octavian Catuneanu, Patrick G. Eriksson. *PALAIOS*, Vol. 19, No. 1 (Feb. 2004). Advances Early Jurassic Termite (Insecta Isoptera) Nests: Evidence from the Clarens Formation in the Tuli Bason, Southern Africa.
- E.O.M. Hanisch. *Goodwin Series*, No. 3, Iron Age Studies in Southern Africa (1979). Excavations at Ison, Northern Transvaal.
- Jan C.A. Boeyens. Jan C.A. Boeyens. *The South African Archaeological Bulletin*, Vol. 58, No. 178 (Dec. 2003). The Later Iron Age Sequence in the Marico and Early Tswana History.
- Lynn Meskell. *Current Anthropology*, Vol. 54, No. 4 (Aug. 2013). UNESCO's World Heritage Convention at 40: Challenging the Economic and Political Order of International Heritage Conservation.

Historic Maps

Especially during the evaluation of historic structures, the use of archived historic maps is very handy. They give a direct chronological reference for such sites and also lead the investigation on the ground.

The following historic map sets are relevant for this study (in chronological order);

Topographic sheet, Cadastral Survey

- 2228DB 1968
- 2229CA 1968
- 2228DB 1983
- 2229CA 1983

SAHRA STUDIES

- Pelser, A.J. 2011. A desktop heritage assessment study for a prospecting rights application on various farms southwest of Alldays, Lephalale Magisterial District, Limpopo Province.
- Gaigher, S. 2012. Proposed Venetia Photovoltaic (PV)/Concentrated Photovoltaic (CPV) Solar Energy facility on Gotha Farm, Phase 1 (up to 100MW), near Alldays in the Limpopo Province.
- Gaigher, S. 2013. Revised HIA Report for the proposed establishment of the Alldays (up to 100MW) Photovoltaic Solar Generation Plant on the Farm Gotha near Alldays in the Limpopo Province.
- Hine, P. 2013. Proposed diamond mine adjacent to Venetia Mine, Limpopo Province. Scoping Report. Palaeontology
- Gaigher, S. 2009. Heritage Impact Assessment for the prospecting application – Alldays Limpopo Province.
- Gaigher, S. 2012. Heritage Impact Assessment – Proposed establishment of the Krone-Endora Diamond Mine on a Portion of the farm Endora 66MS adjacent to Venetia Mine near Alldays, Limpopo Province.
- Pelser, A. 2011. A desktop heritage assessment study for a prospecting application on various farms near Alldays in the Musina and Blouberg Magisterial Districts, Limpopo Province.
- Chirikure S., Bandama F. 2014. Archaeological Impact Assessment of the proposed Krone-Endora Mine (Mining Rights Applications 10011MR & 10017MR) of the portions of farms Krone 104MS and Endora 66MS near Alldays, Limpopo Province.
- Koleini, F. 2010. Proposed research on suitable conservation methods for the metal artefacts from Mapungubwe Hill in the Mapungubwe Research Facility and Mapungubwe Museum, University of Pretoria, Pretoria.
- Hanisch, E.O.M. 2009. Proposed surveying, mapping, excavation and documentation of features on the hilltop site north of the Mapungubwe Interpretive Centre at Mapungubwe in the Musina local municipality, Limpopo Province.
- Van Lente, B. 2003. Proposed archaeological excavation at Mapungubwe Cultural Landscape on the farm Schroda 46MS in the Messina District, Limpopo Province.
- Tiley-Nel, S. 2006. Proposed destruction of fibres for C14 dating and isotopic analysis of cellulose fibres, rope cordage, basketry and woody fibres from the Mapungubwe Museum, University of Pretoria, Gauteng Province.
- Kuman, K. 2006. Proposed excavation of the Acheulean at Samaria 1, Kudu Koppie at Mapungubwe Cultural Landscape in the Soutpansberg District, Limpopo Province.
- Nienaber, W.C. 2005. Proposed rehabilitation and stabilization of old excavation trenches and erosion damage in the Mapungubwe Cultural Landscape on the farms Greefswald 35M, Greefswald 37 MS, Schroda 46 Ms and Little Muck in the Soutpansberg District, Limpopo Province.
- Huffman, T. 2006. Proposed sampling and analysis of 20 skeletons from Schroda, in the Mapungubwe Cultural Landscape in the Messina District, Limpopo Province.
- Ashley C., Antonites A., Pikirayi I. 2014. Excavation of the hunter-gatherer occupation site of Boulder Shelter on Little Muck Farm.
- Huffman, T. 2014. DNA studies of Iron Age cattle remains.

Findings

No sites of any cultural significance could be identified on the proposed development area. Some indications of Iron Age deposits were noted on another site approximately 100m from the proposed development site. This area is however not in danger of being modified by the proposed development.

Although the study area lies close to the western extent of the Mapungubwe Cultural Landscape World Heritage Site Buffer Zone it is not within. The recent expansion of the buffer zone in 2014 provides for extensive protection to this area and the site is not within this zone.

Recommendations

It is recommended that the developer be aware of possibly important Iron Age deposits close to the proposed development site and that these are not disturbed by any planned activities or future developments. A bufferzone for this protection is provided within this report.

Fatal Flaws

No fatal flaws were identified.

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LIST OF ABBREVIATIONS

Bp.....	Before Present
DRC	Dutch Reformed Church
EIA.....	Early Iron Age
ESA	Early Stone Age
GPS.....	Geographic Positioning System
HIA	Heritage Impact Assessment
LIA	Late Iron Age
LSA	Late Stone Age
MYA	Million Years Ago
MSA	Middle Stone Age
NHRA.....	National Heritage Resources Act no 22 of 1999
SAHRA.....	South African Heritage Resource Agency
S&EIR	Scoping & Environmental Impact Reporting
WGS 84	World Geodetic System for 1984

Archaeological Impact Assessment

Archaeological Impact Assessment Report for the Campfronis Crocodile Farm

Introduction

LEGAL CONTEXT

G&A Heritage was appointed by *G.A. de Klerk of the farm Campfronis 301MS* at Alldays in the Capricorn District of the Limpopo Province to undertake an Archaeological Impact Assessment for the *Campfronis Crocodile Farm*.

The protection of heritage sites within South Africa is governed by the *National Heritage Resources Act no 25 of 1999*. Certain provincial amendments do apply in some provinces, however the Act describes heritage sites as such;

Heritage is not limited to archaeological artefacts, historical buildings and graves. It is far more encompassing and includes intangible and invisible resources such as places, oral traditions and rituals. A heritage resource is defined as any place or object of cultural significance i.e. of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This includes the following:

- (a) places, buildings, structures and equipment;
- (b) places to which oral traditions are attached or which are associated with living heritage;
- (c) historical settlements and townscapes;
- (d) landscapes and natural features;
- (e) geological sites of scientific or cultural importance;
- (f) archaeological and paleontological sites;
- (g) graves and burial grounds, including –
 - (1) ancestral graves,
 - (2) royal graves and graves of traditional leaders,
 - (3) graves of victims of conflict (iv) graves of important individuals,
 - (4) historical graves and cemeteries older than 60 years, and
 - (5) other human remains which are not covered under the Human Tissues Act, 1983 (Act No.65 of 1983 as amended);
- (h) movable objects, including ;
 - (1) objects recovered from the soil or waters of South Africa including archaeological and paleontological objects and material, meteorites and rare geological specimens;
 - (2) ethnographic art and objects;
 - (3) military objects;
 - (4) objects of decorative art;
 - (5) objects of fine art;
 - (6) objects of scientific or technological interest;
 - (7) books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings; and
 - (8) any other prescribed categories, but excluding any object made by a living person;
- (i) battlefields;
- (j) traditional building techniques.

A **'place'** is defined as:

- (a) A site, area or region;
- (b) A building or other structure (which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure);

(c) A group of buildings or other structures (which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures); and (d) an open space, including a public square, street or park; and in relation to the management of a place, includes the immediate surroundings of a place.

'Structures' means any building, works, device, or other facility made by people and which is fixed to land and any fixtures, fittings and equipment associated therewith older than 60 years.

'Archaeological' means:

(a) material remains resulting from human activity which are in a state of disuse and are in or on land and are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;

(b) rock art, being a form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and is older than 100 years including any area within 10 m of such representation; and

(c) wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land or in the maritime cultural zone referred to in section 5 of the Maritime Zones Act 1994 (Act 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which are older than 60 years or which in terms of national legislation are considered to be worthy of conservation;

(d) features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

'Paleontological' means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

'Grave' means a place of interment and includes the contents, headstone or other marker of and any other structures on or associated with such place. The South African Heritage Resources Agency (SAHRA) will only issue a permit for the alteration of a grave if it is satisfied that every reasonable effort has been made to contact and obtain permission from the families concerned.

The removal of graves is subject to the following procedures as outlined by the SAHRA:

- Notification of the impending removals (using English, Afrikaans and local language media and notices at the grave site);
- Consultation with individuals or communities related or known to the deceased;
- Satisfactory arrangements for the curation of human remains and / or headstones in a museum, where applicable;
- Procurement of a permit from the SAHRA;
- Appropriate arrangements for the exhumation (preferably by a suitably trained archaeologist) and re-interment (sometimes by a registered undertaker, in a formally proclaimed cemetery);
- Observation of rituals or ceremonies required by the families.

LIMITATIONS AND ASSUMPTIONS

The limitations and assumptions associated with this archaeological impact assessment are as follows;

- Field investigations were performed on foot and access was readily available.
- Site was evaluated by means of description of the cultural landscape, direct observations and analysis of written sources and available databases.
- It was assumed that the site layout as provided by G.A. de Klerk is accurate.
- We assumed that the public participation process performed as part of the Scoping and Environmental Impact Reporting (S&EIR) process was sufficiently encompassing not to be repeated in the Heritage Assessment Phase.

Table 1. Impacts on the NHRA Sections

Act	Section	Description	Possible Impact	Action
National Heritage Resources Act (NHRA)	34	Preservation of buildings older than 60 years	No impact	None
	35	Archaeological, paleontological and meteor sites	Yes	Adhere to development buffer zone
	36	Graves and burial sites	No impact	None

	37	Protection of public monuments	No impact	None
	38	Does activity trigger a HIA?	Yes	HIA

Table 2. NHRA Triggers

Action Trigger	Yes/No	Description
Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length.	Yes	1 ha Development of crocodile cages
Construction of a bridge or similar structure exceeding 50m in length.	No	N/A
Development exceeding 5000 m ²	No	N/A
Development involving more than 3 erven or sub divisions	No	N/A
Development involving more than 3 erven or sub divisions that have been consolidated in the past 5 years	No	N/A
Re-zoning of site exceeding 10 000 m ²	No	N/A
Any other development category, public open space, squares, parks or recreational grounds	No	N/A

Background Information

Campfronis Crocodile Farm

Project Description

G&A Heritage was commissioned by G.A. de Klerk to compile an Archaeological Impact Assessment Report for the heritage component of the proposed development of a 1 ha plot on the farm Campfronis 301MS for the Campfronis Crocodile Farm. The study will focus on the occurrence of heritage sites within this area and will give recommendations on the management of such sites, where necessary.

Site Location

The proposed Campfronis Crocodile Farm is situated on the farm Campfronis 845 MS, approximately 11km west of Alldays in the Capricorn District of the Limpopo Province.

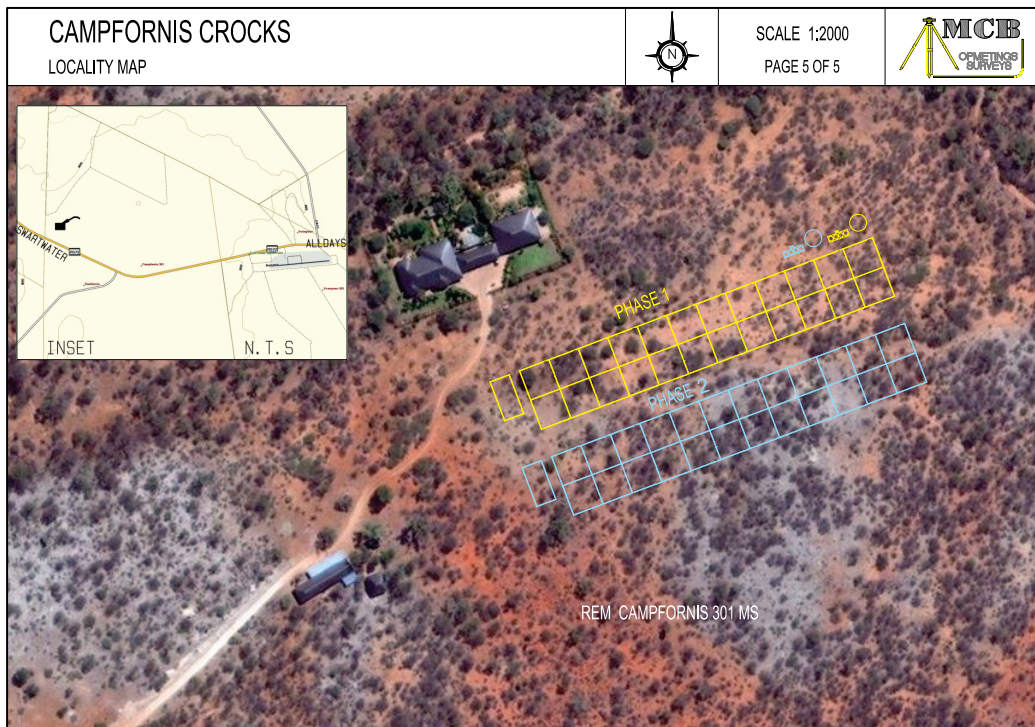


Figure 1. Aerial view of the proposed development on farm Campfronis (MCB Surveys)

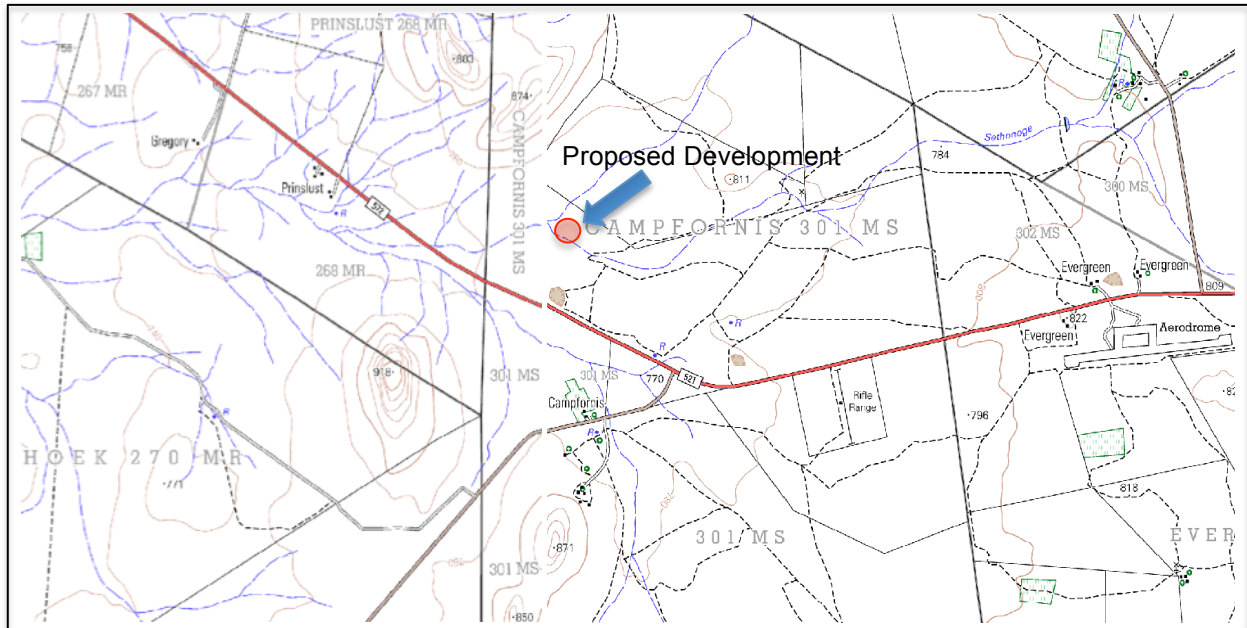


Figure 2. 1:50 000 Location Map (2228DB & 2229CA)

METHODOLOGY

This study defines the heritage component of the S&EIR process being undertaken for the proposed Campfronis Crocodile Farm. It is described as an Archaeological Impact Assessment (AIA). This report attempts to evaluate the accumulated heritage knowledge of the area. The study was based largely on existing published information with some ground-truthing to test the validity of available information.

IMPACT ASSESSMENT COMPONENTS

The evaluation of this site was performed in three phases;

1. Field investigations

Field investigations were performed on foot and access was readily available.

2. Archival and database research

This component involved the identification of previous studies in the area, accumulation of scientific and popular publications on the area and the evaluation of historic map sets.

3. Reporting

This is the phase of the investigation in which the results of the previous two phases of investigation is reported on and evaluations are given regarding the heritage sensitivity of the area as well as recommendations on further actions needed.

FIELD INVESTIGATIONS

The study area was investigated on 21 August 2014. Field investigations were performed on foot and access was readily available. Braam de Klerk (son of G.A. de Klerk, who is commissioning the development) accompanied the Principal Investigator and Field Worker from G&A Heritage.

GPS track paths were taken. The track path information is available on request from G&A Heritage in GPX format.



Figure 3. GPS track path

ARCHIVAL RESEARCH

Three main sources of information regarding the heritage sensitivity of this area could be identified. These were;

- Scientific publications on heritage related research in the area
- Previous heritage studies in the area as per the SAHRIS database
- National and Provincial Heritage Site Lists as per the SAHRA database
- Historic maps and figures as available in the National Archive

Scientific, popular and heritage publications

Several publications on heritage related work in this area could be sourced. These include, but are not limited to;

- Murray Schoonraad. *The South African Archaeological Bulletin*, Vol. 23, No. 90 (Aug. 1968). The Discovery of Mapungubwe.
- Emese M. Bordy, Adam J. Bumby, Octavian Catuneanu, Patrick G. Eriksson. *PALAIOS*, Vol. 19, No. 1 (Feb. 2004). Advances Early Jurassic Termite (Insecta Isoptera) Nests: Evidence from the Clarens Formation in the Tuli Bason, Southern Africa.
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Especially during the evaluation of historic structures, the use of archived historic maps is very handy. They give a direct chronological reference for such sites and also lead the investigation on the ground.

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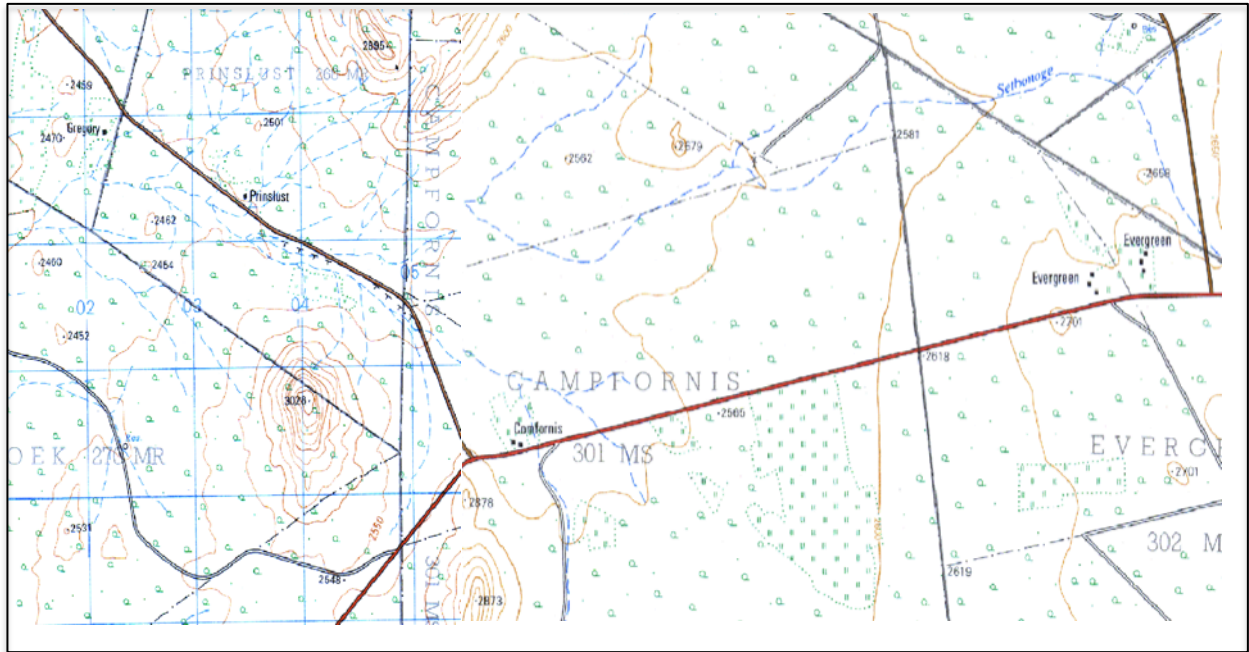


Figure 4. 1968 Map of Study Area (2228DB & 2229CA)

HERITAGE INDICATORS WITHIN THE RECEIVING ENVIRONMENT

REGIONAL CULTURAL CONTEXT

PALEONTOLOGY

Although no published records of site locations of fossils in the study area exist, certain geological strata (i.e. the fossiliferous Madzaringwe and Mikambeni Formations of the Tuli Basin) that occur to the north of adjacent to the study area are known to be fossiliferous. The available literature shows that the Karoo strata of the Limpopo Province are exceptionally rich in fossils. Several palaeontological sites have been reported from the Tuli Basin in South Africa and Zimbabwe and from the Tshipise Basin (Van den Berg, 1980; Kovacs-Endrödy, 1983; Durand, 1996; 2001; 2005; Brandl, 2002).

These fossils fall mainly into two groups: firstly, the plant leaf imprints, stem fossils and coal from the lower part of the Karoo-age sedimentary succession (Middle Permian) and secondly, the dinosaur and thecodont fossils from the upper part (Late Triassic to Early Jurassic) of the Karoo-age sedimentary succession.

Fossil leaf imprints were found in the Tuli Basin sedimentary rocks on the Venetia mine grounds, to the east of the study area in the Tshipise Basin, and to the north of the study area in southern Zimbabwe. The fossils from the Tuli Basin are mainly leaf imprints of the extinct plant *Glossopteris*. (See Figure 4). However, stem imprints of the horsetail *Equisetales* and leaf imprints of ferns are also common. The fossil localities reported in the Tuli Basin are contemporaneous to those in the Tshipise Basin described by Van den Berg (1980) and studied by the author in the Njalaland section of the Kruger National Park, Tshikondeni Mine, Venetia Mine and the farm Nottingham in southern Zimbabwe. The species composition of the fossils and the lithologies of the palaeontological sites are similar in the Tuli and Tshipise Basins (Brandl, 2002).

The most recent taxonomic work on the Middle Permian fossil plants of the Tuli Basin was done by Kovacs-Endrödy in 1983 who identified 37 *Glossopteris* species from the Mikambeni Formation (Brandl, 2002).



Figure 5. Leaf imprint of *Glossopteris* (Middle Permian)

STONE AGE

The Stone Age sites of this area fit within the later Earlier Stone Age and the Middle Stone Age (MSA) periods, and this section therefore discusses the relevant industries, beginning with the Acheulean. The rate of change seen in the lithics of the Acheulean is slow (Klein 2000), however by the MSA tools are becoming more detailed and varied as techniques improve (Barham 2000a, Beaumont & Vogel 2006). This period between the end of the Acheulean and the end of the MSA is a complex and controversial era (Tryon 2006). While the ESA could be defined as a cultural industry using mainly large tools used mainly for cutting, the MSA is traditionally seen as a time when more varied artifacts such as bone points are being used (Kuman, 2000).

The transition between the Acheulean and MSA has also been variably described as the "First Intermediate Period", however this was later dropped. The concept of an intermediate phase is however still supported by some researchers (Kuman, 2000). Clark sometimes refers to the Sangoan as the final "transitional" or ESA phase (Clark 1959). Although a lot of the research in the Mapungubwe area focusses on MSA and LSA sites (LSA sites are often researched as "by-finds" on lower level Iron Age excavations), there has been some ESA or Acheulean type sites identified. Although Beaumont and Vogel suggests a rather more complex transition between the Acheulean and MSA in some areas this era is still described to the Sangoan or Fauresmith Industries (Beaumont & Vogel 2006).

The MSA was followed in many places by the Late Stone Age (LSA). The LSA shows much more refined tool working and deposits are often found in association with Iron Age deposits. The reason for this has variably been given as interaction between Iron Age communities and LSA communities or as mere geographic suitability of the occupation sites resulting in superimposition.

IRON AGE

The Iron Age can be divided into the Early Iron Age (EIA) and the Late Iron Age (LIA). There is a growing support (based mostly on Mapungubwe research) for a Middle Iron Age (MIA). Although Huffman and Calabrese uses the term freely (Huffman 2000, Calabrese 2007) it is still considered a contentious term by many. Much of this criticism is the result of Huffman's continued insistence on the "replacement" of Zhizo by Leopards Kopje communities, suggesting that there was a gap between these that could define a MIA border (Huffman 2000).

The most significant sites here are Mapungubwe, K2, Schroda and Little Muck.

Small Iron Age sites postdating Mapungubwe and K2 have been recorded on Greefswald, including some stone-walled sites on hilltops (Meyer 1996).



Figure 6. Mapungubwe hill

T.N. Huffman has identified some of these sites as Khami type ruins. According to oral tradition,

communities belonging to the Lea and Twamamba tribes, related to the Venda and the Shona-speaking people, settled in the Greefswald region in historical times (Meyer, 2000).

THE HISTORIC ERA

Date	Description
1830's - 1840's	In 1835 a large group of Pioneers, the Voortrekkers, started the "Groot Trek". More than 10 000 Boers, with their families, started the mass exodus north and northeast. The trek was organized in resistance to the politics of the Cape Colony Government.
1830's - 1840's	The Boers established the Orange Free State and Transvaal (which would later become the South African Republic), independent states.
1830's - 1840's	Two groups of Voortrekkers, under the leaders, Hans van Rensburg and Louis Tregardt, were the first to leave the Colony into rugged, uncharted terrain. A stressed relationship between the two groups resulted in a split after a disagreement at Strydpoort near the Olifants River.
1830's - 1840's	The group under Louis Tregardt set up camp near the Zoutpansberg salt pans (approximately 50km southeast of the proposed development area). They stayed at this settlement for a year where unhealthy conditions took its toll on the Voortrekkers and their cattle. Tregardt moved his camp east to the present day Schoemansdal. Voortrekker leader, Andries Potgieter and his party were meant to join Louis Tregardt's group, but were held up by skirmishes and therefore Tregardt's group decided to continue their trek to Delagoa Bay (present day Maputo) on their own.
1890's	Stories were told of a Frenchman named Francois Bernard Motrie who was said to have found and raided a treasure-laden hill at the confluence of the Shashe and the Limpopo Rivers taking gold, diamonds and emeralds.
Mid 1800's	Alldays was founded in the mid-1800s where the beaten track from North to South and from East to West between Botswana, Zimbabwe and South Africa crossed each other. It was this natural meeting point, rather than the surroundings that determined the location at which the city was founded. The place is not really suitable for larger settlements, especially as the access to water is severely limited.
1903	Diamond bearing alluvial gravel is discovered near the Limpopo River, 35 km northeast of the present day Venetia Mine.
1918 – 1922	The botanist Dr. Illyd Pole Evans and politician/ amateur botanist Jan Smuts initiated a Botanical Survey of the Union, the Limpopo Valley consisted of farms of about 300 ha. Under the name Dongola Botanical Reserve, 9 farms were set aside for the survey in 1922. Soon after the cattle ranching stopped, wildlife returned to Dongola (named after the volcano shaped hill that overlooks the area).
1932z	Jerry van Graan discovers the treasures of Mapungubwe. While he was hunting on the farm Greefswald, he was given an unusual ceramic pot by a man named Mowena who claimed that it came from a sacred hill. He returns to the area with his father and friends and on the sacred hill, they discovered many golden objects: bangles, beads, anklets, nails, a miniature buffalo and rhinoceros and a skeleton. In total 2,2kg of gold and many other clay and glass artefacts were found. They never found the rumoured diamonds and emerald that the Lotrie legend spoke of.
1930's	Jerry mailed some of the artefacts to Leo Fouche, his old history teacher at the University of Pretoria.
1933	Jan Smuts visited Mapungubwe Hill and the findings were made public. Excavations were started by Leo Fouche and his team and continued until the outbreak of the Second World War. Research was mainly aimed at typifying artefacts and sequences.
1940s	The government took over the farm Greefswald and added it to the Dongola reserve. Pole Evans lobbied to have the reserve proclaimed as a national park and he found support from Smuts – who became prime minister again in 1939 – and his minister of Lands, Andrew Conroy. They considered a scheme that included land of Rhodesia and Bechuanaland – strikingly similar to the current transfrontier plans in the area.

1940's	Jan Smuts, Andrew Conry and Dr. Illyd Pole Evans propagated a large Dongola Wild Life Sanctuary. They received stiff opposition from the Afrikaners, including the National Parks Board. A heated discussion, known as the Battle of Dongola, followed. Eventually the sanctuary was proclaimed. The area when only compromised of 92 000 ha, which is still four times larger than the current Mapungubwe National Park.
1949	The National Party, lead by D.F. Malan, won the elections and the sanctuary was abolished. The land was returned to the former owners and the Limpopo valley was farmland once again.
1950's & 1960's	Radio-carbon dating of the artefacts made it clear that Mapungubwe were of a lost civilization in the iron age that traded with faraway places. By 1967 there was renewed lobbying for park status, now also including the importance of the archaeological finds in the area.
1969	Exploration began to explore the source of the alluvials found in the Limpopo valley.
1970's & 1980's	South Africa was involved in border wars with neighboring states that harbored freedom fighters. The South African Defense Force built an electric fence along the Limpopo River and an army base on the farm Greefswald. It became a place for rehabilitation of what was seems at the time as social delinquents.
1980's	Greefswald became a popular destination for hunting and due to the attention of the occupancy; the sites K2 and Mapungubwe Hill on the farm were declared a National Monument.
1986	A Provincial National Reserve, consisting of three farms, was proclaimed.
1980	Kimberlite pipes are discovered in the area where the present day Venetia Mine is situated.
1990	Construction on Venetia Mine begins.
1992	The Venetia diamond mine, which opened on 14 August 1992, is De Beers Consolidated Mines' flagship operation.
1995	Control of Greefswald and a few other farms were transferred from the Limpopo Province to South African National Parks in 1995 and the area has been enlarged since then.
2003	The Mapungubwe National Park is proclaimed a World Heritage Site.

Sources:

<http://orphanage.rahmqvist.com/start/about/alldays-village>

<http://www.debeersgroup.com>

<http://sanparks.org.za/parks/mapungubwe>

MAPUNGUBWE CULTURAL LANDSCAPE

The Mapungubwe Cultural Landscape (MCL) is located within the Shashi-Limpopo Confluence area on the connecting borders of South Africa, Botswana and Zimbabwe. On the Botswana side lays the Tuli Conservation Area, while the Zimbabwean side contains the Maremani community area and the privately owned Sentinel Ranch and Nothingham Bridge. The Shashi River between Botswana and Zimbabwe and the Limpopo River between South Africa and Zimbabwe/Botswana divides these three countries.

The nomination of the Mapungubwe Cultural Landscape (MCL) for World Heritage Site (WHS) Status was based on a combination of its exceptional cultural and natural resources. The heritage resources in question could be found mainly on a corridor of sandstone ridges (Clarence Sandstone), close and parallel to the Limpopo River. On the flat sandstone incline approximately 300 meters south of the Southern terrace of Mapungubwe Hill the remains of vertebra and some long bones of a *Massospondylus* sp. can be found, similar, though better defined, fossils are also found in a creek bed on the Sentinel Ranch in Zimbabwe.

The main Iron Age Site of Mapungubwe is located on this sandstone ridge, close to the confluence of the two rivers.

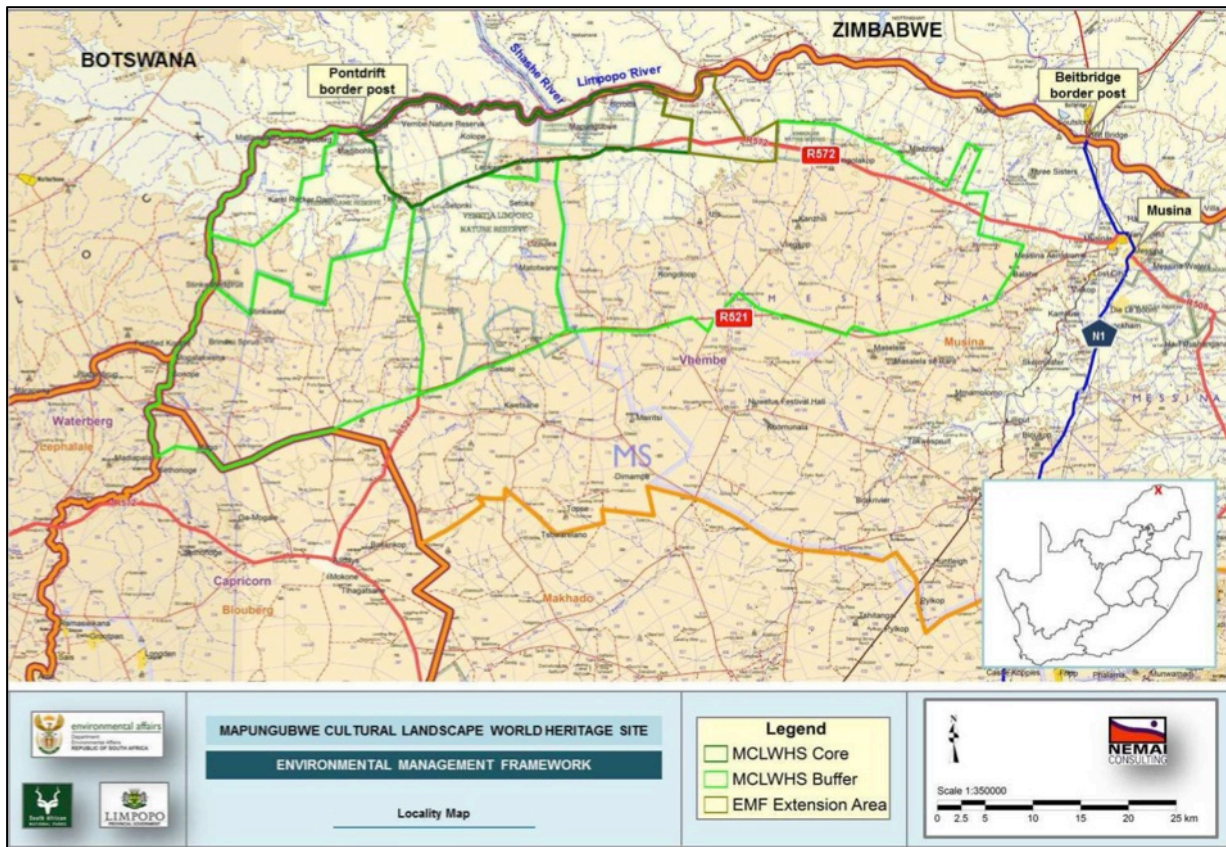


Figure 7. Latest available map indicating the MCLWHS Buffer Zone (Nemai Consulting)

MEASURING AND EVALUATING THE CULTURAL SENSITIVITY OF THE STUDY AREA

In 2003 the SAHRA compiled the following guidelines to evaluate the cultural significance of individual heritage resources:

TYPE OF RESOURCE

- Place
- Archaeological Site
- Structure
- Grave
- Paleontological Feature
- Geological Feature

TYPE OF SIGNIFICANCE

1. HISTORIC VALUE

It is important in the community, or pattern of history

- Important in the evolution of cultural landscapes and settlement patterns
- Important in exhibiting density, richness or diversity of cultural features illustrating the human occupation and evolution of the nation, province, region or locality.
- Important for association with events, developments or cultural phases that have had a significant role in the human occupation and evolution of the nation, province, region or community.
- Important as an example for technical, creative, design or artistic excellence, innovation or achievement in a particular period.

It has strong or special association with the life or work of a person, group or organisation of importance in history

- Importance for close associations with individuals, groups or organisations whose life, works or activities have been significant within the history of the nation, province, region or community.

It has significance relating to the history of slavery

- Importance for a direct link to the history of slavery in South Africa.

2. AESTHETIC VALUE

It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group.

- Important to a community for aesthetic characteristics held in high esteem or otherwise valued by the community.
- Importance for its creative, design or artistic excellence, innovation or achievement.
- Importance for its contribution to the aesthetic values of the setting demonstrated by a landmark quality or having impact on important vistas or otherwise contributing to the identified aesthetic qualities of the cultural environs or the natural landscape within which it is located.
- In the case of an historic precinct, importance for the aesthetic character created by the individual components which collectively form a significant streetscape, townscape or cultural environment.

3. SCIENTIFIC VALUE

It has potential to yield information that will contribute to an understanding of natural or cultural heritage.

- Importance for information contributing to a wider understanding of natural or cultural history by virtue of its use as a research site, teaching site, type locality, reference or benchmark site.
- Importance for information contributing to a wider understanding of the origin of the universe or of the development of the earth.
- Importance for information contributing to a wider understanding of the origin of life; the development of plant or animal species, or the biological or cultural development of hominid or human species.
- Importance for its potential to yield information contributing to a wider understanding of the history of human occupation of the nation, Province, region or locality.
- It is important in demonstrating a high degree of creative or technical achievement at a particular period.
- Importance for its technical innovation or achievement.

4. SOCIAL VALUE

- It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.
- Importance as a place highly valued by a community or cultural group for reasons of social, cultural, religious, spiritual, symbolic, aesthetic or educational associations.
- Importance in contributing to a community's sense of place.

DEGREES OF SIGNIFICANCE

In 2006 SAHRA prescribed classification standards for determining the heritage significance of sites within the SADC region. These recommendations were subsequently approved by ASAPA and are reproduced here to indicate the measuring standards for heritage sensitivity used in this report;

Field Rating	Grade	Significance	Mitigation
National Significance (NS)	Grade 1	-	Conservation; National Heritage Site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; Provincial Heritage Sites nomination
Local Significance (LS)	Grade 3A	High	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High	Mitigation with part of site retained in original
Generally Protected A (GP.A)	-	High/Medium	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium	Recording before destruction
Generally Protected C (GP.C)	-	Low	Destruction

Table 3. SAHRA Assigned Heritage Site Significance Grading

Assessment of Heritage Potential

Assessment Matrix

Determining Heritage Sensitivity

In addition to guidelines provided by the National Heritage Resources Act (Act No. 25 of 1999), a set of criteria based on Deacon (J) and Whitelaw (1997) for assessing archaeological significance has been developed for Northern Cape settings (Morris 2007a). These criteria include estimation of landform potential (in terms of its capacity to contain archaeological traces) and assessing the value to any archaeological traces (in terms of their attributes or their capacity to be construed as evidence, given that evidence is not given but constructed by the investigator). Due to the urban setting of the study area these criteria will most probably not come into play in this study.

Estimating site potential

Table 4 (below) is a classification of landforms and visible archaeological traces used for estimating the potential of archaeological sites (after J. Deacon and, National Monuments Council). Type 3 sites tend to be those with higher archaeological potential, but there are notable exceptions to this rule, for example the renowned rock engravings site Driekopseiland near Kimberley which is on landform L1 Type 1 – normally a setting of lowest expected potential. It should also be noted that, generally, the older a site the poorer the preservation, so that sometimes any trace, even of only Type 1 quality, could be of exceptional

significance. In light of this, estimation of potential will always be a matter for archaeological observation and interpretation.

Table 4. Classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deacon, NMC as used in Morris)

Class	Landform	Type 1	Type 2	Type 3
L1	Rocky Surface	Bedrock exposed	Some soil patches	Sandy/grassy patches
L2	Ploughed land	Far from water	In floodplain	On old river terrace
L3	Sandy ground, inland	Far from water	In floodplain or near features such as hill/dune	On old river terrace
L4	Sandy ground, coastal	>1 km from sea	Inland of dune cordon	Near rocky shore
L5	Water-logged deposit	Heavily vegetated	Running water	Sedimentary basin
L6	Developed urban	Heavily built-up with no known record of early settlement	Known early settlement, but buildings have basements	Buildings without extensive basements over known historical sites
L7	Lime/dolomite	>5 myrs	<5000 yrs	Between 5000 yrs and 5 myrs
L8	Rock shelter	Rocky floor	Loping floor or small area	Flat floor, high ceiling
Class	Archaeological traces	Type 1	Type 2	Type 3
A1	Area previously excavated	Little deposit remaining	More than half deposit remaining	High profile site
A2	Shell of bones visible	Dispersed scatter	Deposit <0.5 m thick	Deposit >0.5 m thick; shell and bone dense
A3	Stone artefacts or stone walling or other feature visible	Dispersed scatter	Deposit <0.5m thick	Deposit >0.5 m thick

Table 5. Site attributes and value assessment (adapted from Whitelaw 1997 as used in Morris)

Class	Landforms	Type 1	Type 2	Type 3
1	Length of sequence /context	No sequence Poor context Dispersed distribution	Limited sequence	Long sequence Favourable context High density of arte / ecofacts
2	Presence of exceptional items (incl. regional rarity)	Absent	Present	Major element
3	Organic preservation	Absent	Present	Major element
4	Potential for future archaeological investigation	Low	Medium	High
5	Potential for public display	Low	Medium	High
6	Aesthetic appeal	Low	Medium	High
7	Potential for implementation of a long-term management plan	Low	Medium	High

Assessing site value by attribute

Table 5 is adapted from Whitelaw (1997), who developed an approach for selecting sites meriting heritage recognition status in KwaZulu-Natal. It is a means of judging a site's archaeological value by ranking the relative strengths of a range of attributes (given in the second column of the table). While aspects of this matrix remain qualitative, attribute assessment is a good indicator of the general archaeological significance of a site, with Type 3 attributes being those of highest significance.

HERITAGE SIGNIFICANCE OF THE STUDY AREA

In addition to the above parameters for measuring the heritage significance of an area, object or structure, this study will be guided by the requirements of the National Heritage Resources Act no 25 of 1999 (NHRA). As most of the study will focus on the built environment the evaluations will be based on the scientific, cultural and social value of these structures as it pertains to the NHRA.

WORLD HERITAGE SITES

MAPUNGUBWE CULTURAL LANDSCAPE WORLD HERITAGE SITE (MCLWHS)

The MCLWHS is located to the east and north of the current study area. As per the World Heritage Charter and Nominations requirements a substantial buffer zone was implemented to ensure the protection of this area (Figure 7). This buffer zone was extended in 2014. From the maps available at this time it can be seen that the proposed development site is located more than 10km south of the nearest point of the buffer zone. Due to the small footprint of this development it is not anticipated that any impact will be affected on the MCLWHS.

NATIONAL HERITAGE SITES

None of the heritage sites within the area are designated as National Heritage Sites. None of the sites identified showed the potential for being designated as National Heritage Sites.

PROVINCIAL HERITAGE SITES

There are only 28 declared Provincial Heritage Sites within the Limpopo Province and none of these fall within the study area.

RESULTS OF THE ARCHIVE STUDY

The archival study indicated the possible occurrence of important Iron Age (especially Early Iron Age) as well as Stone Age (Early, Middle and Late Stone Age) sites within the study area. Most Stone Age sites were located close to river runs while Iron Age sites seems to be associated with elevated and defensible areas.

The study area showed potential for the occurrence of both Stone Age as well as Iron Age sites within the larger areas due to the following factors;

1. Elevated hillsides to the north of the study area
2. Dry river bed running to the north of the study area

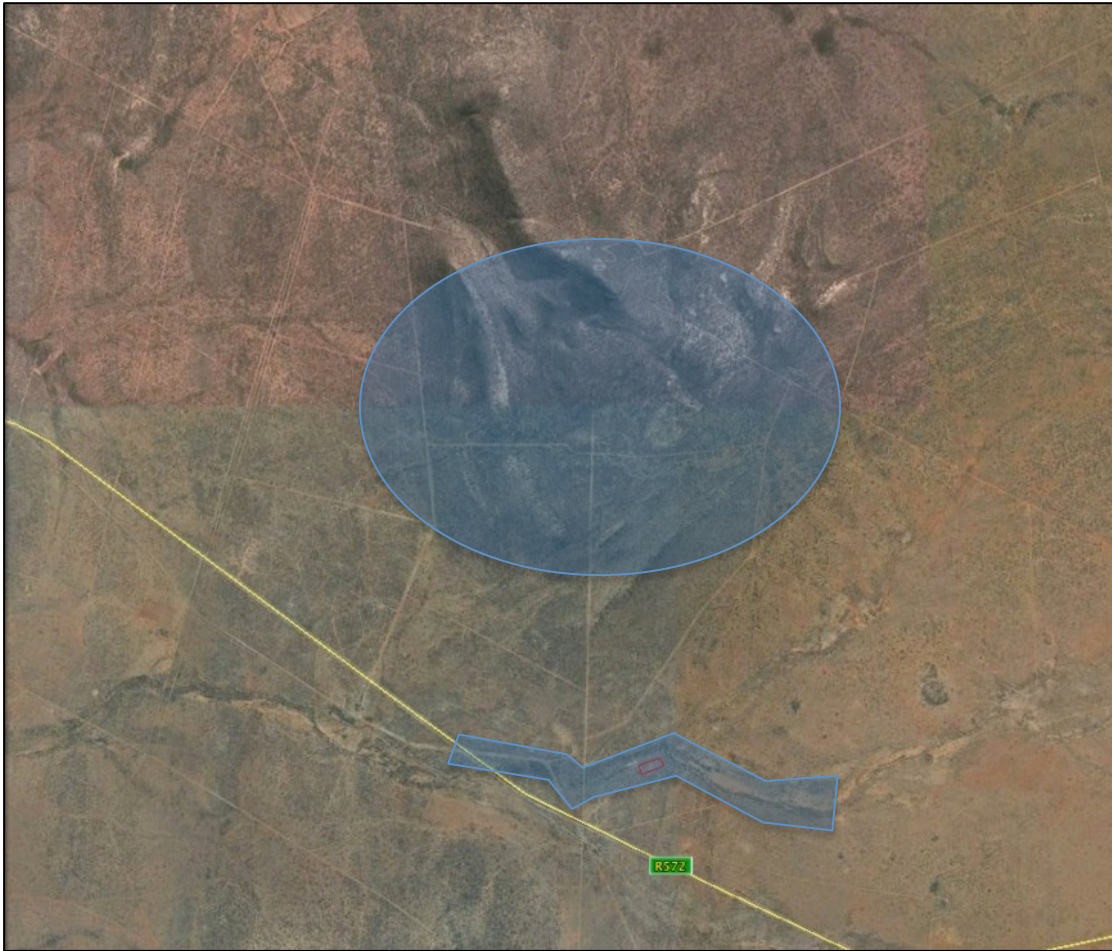


Figure 8. High potential heritage site areas (study area in red)

PALEONTOLOGICAL SITES

Penetration into the underlying bedrock is not anticipated for this project and therefore no specialist palaeontological study was performed. Should this change a specialist palaeontological impact assessment will be required.

ARCHAEOLOGICAL, BURIAL AND BUILT ENVIRONMENT SITES

Although no archaeological sites could be identified within the study area, indications of possible Iron Age deposits were noted some 100m to the south of the proposed development. Although the development in it's current design will not intrude on this area it was felt prudent to indicate this no-go area to ensure that secondary activities during the construction phase does not impact on the site.

Some Late Iron Age potsherds and grinding stones in association with ash deposits were located at this site.

The deposits were spread in a very light concentration around this area. The elevated position of this site did however indicate that this was not the result of alluvial displacement but in fact the original provenance of these artefacts. It is possible that more concentrated deposits will be found when excavating these areas.



Figure 9. Single lower grinder being inspected



Figure 10. Remains of lower grinding stone



Figure 11. Lower grinding stone (note elongated shape indicating maize grinding associated with the Late Iron Age)



Figure 12. Thick undecorated utilitarian pot's shards in situ



Figure 13. Area with deposits



Figure 14. Location of deposits in relation to development (areas with deposits indicated in red)

RATING SYSTEM USED TO CLASSIFY IMPACTS

The rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the mitigation of the impact. Impacts have been consolidated into one rating. In assessing the significance of each issue the following criteria (including an allocated point system) is used:

NATURE		
This include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site
2	Local/district	Will affect the local area or district
3	Province/region	Will affect the entire province or region
4	International and National	Will affect the entire country
PROBABILITY		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY		
This describes the degree to which an impact on an environmental parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.

3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION		
This describes the duration of the impacts on the environmental parameter. Duration indicates the lifetime of the impact as a result of the proposed activity		
1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts on the environmental parameter. A cumulative effect/impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible Cumulative Impact	The impact would result in negligible to no cumulative effects
2	Low Cumulative Impact	The impact would result in insignificant cumulative effects
3	Medium Cumulative impact	The impact would result in minor cumulative effects
4	High Cumulative Impact	The impact would result in significant cumulative effects
INTENSITY / MAGNITUDE		
Describes the severity of an impact		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.

4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
SIGNIFICANCE		
<p>Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the environmental parameter. The calculation of the significance of an impact uses the following formula:</p> <p>(Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.</p> <p>The summation of the different criteria will produce a non weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.</p>		
Points	Impact Significance Rating	Description
6 to 28	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive Low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive Medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive High impact	The anticipated impact will have significant positive effects.
74 to 96	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive Very high impact	The anticipated impact will have highly significant positive effects.

RECOMMENDATIONS

The Campfronis Crocodile Farm will be a small-scale non-intrusive development. The secondary impacts of this development are anticipated to be insignificant.

One possible area of heritage potential was identified close to the proposed development. It is recommended that the developer adhere strictly to the following buffer zone to ensure that the development does not intrude or endanger any historic deposits located here.

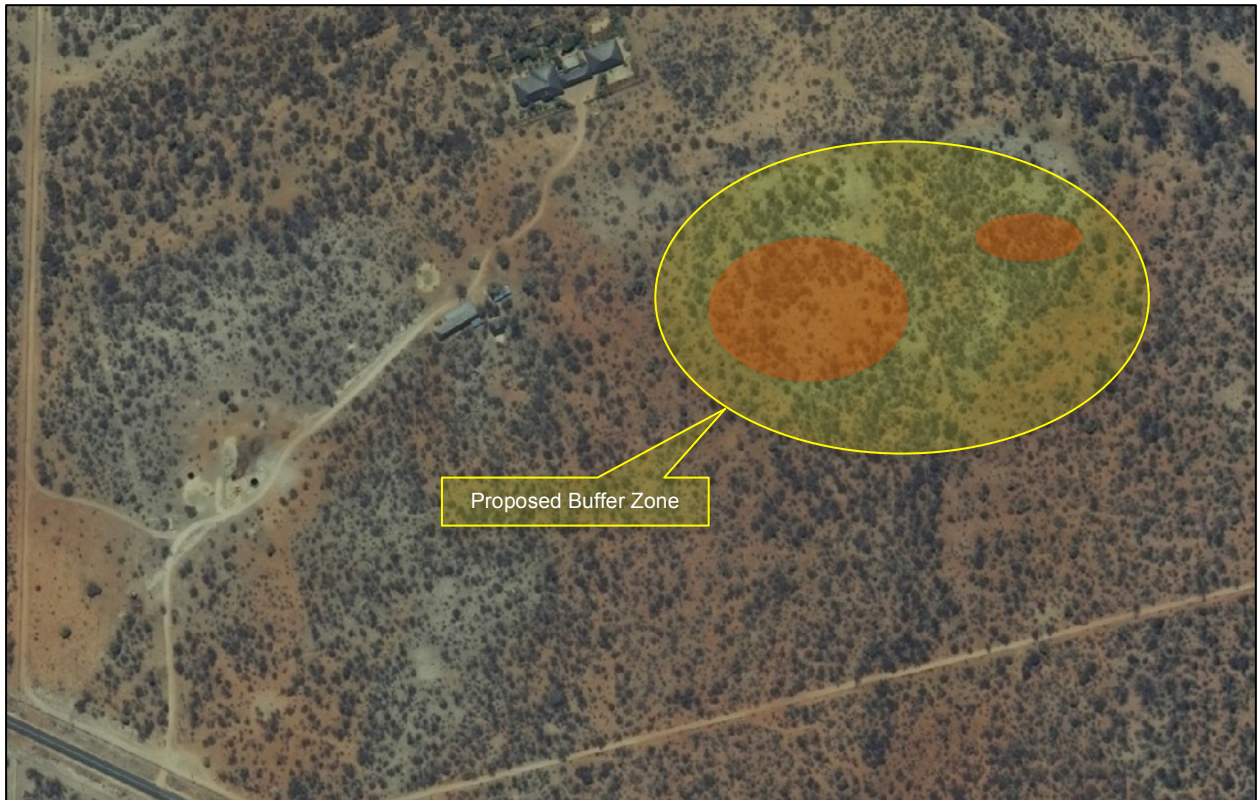


Figure 15. Proposed Buffer Zone

It is further recommended that construction crews and vehicle operators be made aware of the possible location of an archaeological site here and that access to this area be restricted during the construction phase of the project. Ideally the buffer zone should be indicated visually by means of barrier tape to ensure that confusion as to its location does not occur.

Although unlikely, sub-surface remains of heritage sites could still be encountered during the construction activities associated with the project. Such sites would offer no surface indication of their presence due to the high state of alterations in some areas as well as heavy plant cover in other areas. The following indicators of unmarked sub-surface sites could be encountered:

- Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate);
- Bone concentrations, either animal or human;
- Ceramic fragments such as pottery shards either historic or pre-contact;
- Stone concentrations of any formal nature.

The following recommendations are given should any sub-surface remains of heritage sites be identified as indicated above:

- All operators of excavation equipment should be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures should they be encountered.
- All construction in the immediate vicinity (50m radius of the site) should cease.
- The heritage practitioner should be informed as soon as possible.
- In the event of obvious human remains the South African Police Services (SAPS) should be notified.
- Mitigation measures (such as refilling etc.) should not be attempted.
- The area in a 50m radius of the find should be cordoned off with hazard tape.
- Public access should be limited.

2014/08/26

- The area should be placed under guard.
- No media statements should be released until such time as the heritage practitioner has had sufficient time to analyze the finds.

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