

HERITAGE IMPACT ASSESSMENT REPORT  
FOR THE PROPOSED PIG PRODUCTION  
FACILITY ON PORTION 23 OF KAMEEL  
ZYN KRAAL 547 JR, BAPSFONTEIN,  
GAUTENG PROVINCE

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*Prepared for:* **Indima Agri Group (Client)**

*Date:* 27 July 2020

## DECLARATION

I, **Alexander Antonites**, declare that:

- I am conducting all work and activities relating to the proposed construction of a piggery on Portion 23 of Kameel Zyn Kraal 547 JR, in an objective manner, even if this results in views and findings that are not favourable to the client.
- I declare that there are no circumstances that may compromise my objectivity in performing such work.
- I have the required expertise in conducting the specialist report and I will comply with legislation, including the relevant Heritage Legislation (National Heritage Resources Act no. 25 of 1999, Human Tissue Act 65 of 1983 as amended, Removal of Graves and Dead Bodies Ordinance no. 7 of 1925, Excavations Ordinance no. 12 of 1980), the Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment (SAHRA and the CRM section of ASAPA), regulations and any guidelines that have relevance to the proposed activity;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity.
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this declaration are true and correct.



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Signature of specialist  
July 2020

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## ABBREVIATIONS AND ACRONYMS

Abbreviation/Acronym	Description
ASAPA	Association for South African Professional Archaeologists
AIA	Archaeological Impact Assessment
BP	Before Present
BCE	Before Common Era
BGG	Burial Grounds and Graves
CSF	Correctional Services Facility
CRM	Culture Resources Management
DPW	Department of Public Works
DWS	Department of Water and Sanitation
ECO	Environmental Control Officer
EIA	Early Iron Age (also Early Farmer Period)
EIA	Environmental Impact Assessment
EFP	Early Farmer Period (also Early Iron Age)
ESA	Earlier Stone Age
GDS	Green Drop System
GIS	Geographic Information Systems
HIA	Heritage Impact Assessment
ICOMOS	International Council on Monuments and Sites
LFP	Later Farmer Period (also Later Iron Age)
LIA	Later Iron Age (also Later Farmer Period)
LSA	Later Stone Age
MIA	Middle Iron Age (also Early later Farmer Period)
MSA	Middle Stone Age
NHRA	National Heritage Resources Act No.25 of 1999, Section 35
PFS	Pre-Feasibility Study
PHRA	Provincial Heritage Resources Authority
SAHRA	South African Heritage Resources Association
YCE	Years before Common Era (Present)

# 1 EXECUTIVE SUMMARY

This report is the result of a Heritage Impact Assessment (HIA) conducted by Alexander Antonites for construction of a Pig Production Facility on Farm Kameel Zyn Kraal 547 JR, Portion 23, Bapsfontein, Gauteng Province. The R515 road can be found to east of the project area while the R25 is to the south of the project area. Mostly rural agricultural holdings and natural open areas can be found in the area surrounding the project area. A single site visit was conducted on 13 July.

Project Title	Proposed Pig Production Facility on Portion 23, Kameel Zyn Kraal 547 JR
Project Location:	S25.912233° E28.510535° Portion 23 of Kameel Zyn Kraal 547 JR
1:50 000 Map Sheet	2528CB Bronkhorstspuit
Farm Portion / Parcel	Portion 23 of Kameel Zyn Kraal 547JR
Magisterial District / Municipal Area	City of Tshwane Metropolitan Municipality
Province	Gauteng

Scoping revealed the presence of other heritage sites on the property and because of the expected impact beyond the construction phase of the development, a heritage assessment of the entire property was conducted in order to identify sensitive heritage areas and to mitigate against future impacts on the heritage landscape.

Fourteen archaeological sites were identified during the survey and desktop study. Thirteen of these are Late Iron Age stone walled homesteads and associated features. These likely date to the period between 1600-1820. Oral traditions indicate that the sites were likely occupied by the Manala Ndebele groups who occupied the Bronberg-Pienaars River catchment area during this period.

Preparation of the planned construction site and clearing of surface vegetation resulted in one heritage site being damaged UP-KZK-2528-01. The site is rated as Low Significance (Category 2b) and will require a Phase 2 investigation (test excavations, documenting, mapping) subject to the necessary excavation permits. A destruction permit must be applied for before further construction activities commence.

A second stone walled homestead site (UP-KZK-2528-03), rated Medium Significance (Category 3), will be impacted by activities on site and will require mitigation by means of a Phase 2 investigation (test excavations, documenting, mapping) subject to the necessary excavation permits. A destruction permit must be applied for before further construction activities commence at this site.

All the other stone walled sites are rated as medium significance (Category 3) and can successfully be avoided during the construction phase of the development. These sites are placed within an area of archaeological high sensitivity. Activities and impact in this area during the operational phase of the project must be limited as far as possible. If impact to this area is not feasible or unavoidable, further mitigation will be needed and a Heritage Management Plan must be formulated and implemented.

An isolated informal burial ground (UP-KZK-2528-14), likely that of 20<sup>th</sup> century farm workers, were located in an agricultural field well outside the proposed development area. To date, the graves have been avoided by agricultural activities (ploughing and harvesting). It is

recommended that a conservation buffer of at least 5m should be implemented around the burial ground to ensure the necessary protection of the site. In addition, the entire cemetery should be fenced off and access control should be applied. The fence should be positioned no closer than 2m from the nearest grave along the outer periphery of the site.

During the construction and operational phases the area of archaeological high sensitivity must be avoided as far is possible. As a result, no construction activities, staff, vehicles or activities, dumping or clearing is permitted in High Sensitivity Area. Access to these areas should be limited and delegated.

Monitoring of the development progress by an ECO is recommended during the planning and construction phases of the project. Should any subsurface palaeontological, archaeological or historical material, or burials be exposed during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately.

A heritage Site Management Plan (SMP) must be compiled by a qualified heritage practitioner. This plan must outline a course of action and measures for the long-term conservation and management of the heritage resources on Portion 23 of Kameel Zyn Kraal 547 JR.

## HERITAGE SITE LOCATIONS

**Table 1: Summary of Heritage sites**

Site Code	Coordinates	Short Description	Mitigation Action
UP-KZK-2528-01	S 25.911943° / E 28.509269°	Late Iron Age Stone walled site	Phase 2 investigation (excavation, mapping, documentation) before destruction permit issued
UP-KZK-2528-02	S 25.912233° / E 28.510535°	Late Iron Age Stone walled site	Site monitoring, avoidance, 20m conservation buffer.
UP-KZK-2528-03	S 25.914658° / E 28.506278°	Late Iron Age Stone walled site	Phase 2 investigation (excavation, mapping, documentation) before destruction permit issued
UP-KZK-2528-04	S 25.911623° / E 28.510263°	Late Iron Age Stone walled site	Site monitoring, avoidance, 20m conservation buffer.
UP-KZK-2528-05	S 25.911437° / E 28.512473°	Late Iron Age Stone walled site	Site monitoring, avoidance, 20m conservation buffer.
UP-KZK-2528-06	S 25.911476° / E 28.511901°	Late Iron Age Stone walled site	Site monitoring, avoidance, 20m conservation buffer.
UP-KZK-2528-07	S 25.910943° / E 28.510987°	Late Iron Age Stone walled site	Site monitoring, avoidance, 20m conservation buffer.
UP-KZK-2528-08	S 25.910396° / E 28.513041°	Late Iron Age Stone walled site	Site monitoring, avoidance, 20m conservation buffer.
UP-KZK-2528-09	S 25.909464° / E 28.513806°	Late Iron Age Stone walled site	Site monitoring, avoidance, 20m conservation buffer.
UP-KZK-2528-10	S 25.910203° / E 28.514859°	Late Iron Age Stone walled site	Site monitoring, avoidance, 20m conservation buffer.
UP-KZK-2528-11	S 25.909610° / E 28.514653°	Late Iron Age Stone walled site	Site monitoring, avoidance, 20m conservation buffer.
UP-KZK-2528-12	S 25.909180° / E 28.515156°	Late Iron Age Stone walled site	Site monitoring, avoidance, 20m conservation buffer.
UP-KZK-2528-13	S 25.906680° / E 28.517978°	Late Iron Age Stone walled site	Site monitoring, avoidance, 20m conservation buffer.
UP-KZK-2528-14	S 25.905434° / E 28.519866°	20 <sup>th</sup> century burials	Site Monitoring, fence erected to maintain a 5m conservation buffer around burial ground.

A copy of the report will be supplied to the Gauteng Provincial Heritage Resources Authority (Gauteng-PHRA) and recommendations contained in this document will be reviewed.



# HERITAGE IMPACT ASSESSMENT REPORT FOR THE PROPOSED PIG PRODUCTION FACILITY ON PORTION 23 OF KAMEEL ZYN KRAAL 547 JR, BAPSFONTEIN, GAUTENG PROVINCE

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## 1 PROJECT BACKGROUND

Indima Agri Group appointed Alexander Antonites to undertake a heritage assessment of a proposed piggery on Portion 23 of the farm Kameel Zyn Kraal 547. The proposed development is for the construction of a Pig Production Facility as well as the associated infrastructure. The project area is situated north of the M6 and east of the R515 roadways. It is situated 15 km southeast of Pretoria and 15km northeast of Babsfontein.

The total footprint will be 2030m<sup>2</sup> and therefore necessitates a heritage impact assessment (HIA) in terms of section 38(1) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA). At the time of site inspection, preparation of the planned construction site had cleared surface vegetation. This resulted in the damage to heritage sites. In addition, scoping revealed the presence of other heritage sites on the property. Due to the expected impact beyond the construction phase of the development, a heritage assessment of the entire property was conducted in order to identify sensitive heritage areas and to mitigate against future impacts on the heritage landscape.

**Table 2: The affected properties and details of the property owners**

Farm Name	Portion Number	21-SG Code	Property Owner
KAMEEL ZYN KRAAL 547	23	T0JR0000000054700 023	Indima Agri Group NPC

## 2 TERMS OF REFERENCE

The heritage component of the EIA is set out in the National Environmental Management Act (Act 107 of 1998) and section 38 of the National Heritage Resources Act (NHRA; Act 25 of 1999).

The NHRA protects all structures and features older than 60 years, archaeological sites and material and graves as well as burial sites. This legislation is to ensure that developers implement measures to limit the potentially negative effects that the development could have on heritage resources.

Legislation determines that the terms of reference for heritage specialist as the following:

- To provide a detailed description of all archaeological artefacts, structures (including graves) and settlements that may be affected (if any)
- Assess the nature and degree of significance of such resources within the area
- Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance
- Assess and rate any possible impact on the archaeological and historical remains within the area, which may emanate from the proposed development activities.
- Propose possible heritage management measures if such action is necessitated by the development.
- Liaise and consult with the South African Heritage Resources Agency (SAHRA, G-PHRA))

## 2.1 CRM: LEGISLATION, CONSERVATION AND HERITAGE MANAGEMENT

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

### 2.1.1 LEGISLATION REGARDING ARCHAEOLOGY AND HERITAGE SITES

The South African Heritage Resources Agency (SAHRA) and its provincial offices aim to conserve and control the management, research, alteration, and destruction of cultural resources of South Africa. The following Acts has direct bearing on Heritage resource protection and management process:

#### **National Heritage Resources Act No 25 of 1999, section 35**

The National Heritage Resources Act No 25 of 1999 (section 35) defines protected cultural heritage resources as:

- Archaeological artifacts, structures and sites older than 100 years
- Ethnographic art objects (e.g. prehistoric rock art) and ethnography
- Objects of decorative and visual arts
- Military objects, structures and sites older than 75 years
- Historical objects, structures and sites older than 60 years
- Proclaimed heritage sites
- Graveyards and graves older than 60 years
- Meteorites and fossils
- Objects, structures and sites of scientific or technological value.

The national estate includes the following:

- 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 features of cultural significance
- Geological sites of scientific or cultural importance

- Archaeological and paleontological importance
- Graves and burial grounds
- Sites of significance relating to the history of slavery
- Movable objects (e.g. archaeological, paleontological, meteorites, geological specimens, military, ethnographic, books etc.)

In terms of activities carried out on archaeological and heritage sites the Act states that:

*"No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit by the relevant provincial heritage resources authority."*

(NHRA 1999:58)

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

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

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

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

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

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

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

(b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority.

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

### **Human Tissue Act of 1983 and Ordinance on the Removal of Graves and Dead Bodies of 1925**

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

(a) ancestral graves

(b) royal graves and graves of traditional leaders

(c) graves of victims of conflict d. graves designated by the Minister

(e) historical graves and cemeteries

(f) human remains

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

### **National Environmental Management Act No 107 of 1998**

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

## **2.2 RATING OF SIGNIFICANCE**

The National Heritage Resources Act (Act 25 of 1999) also stipulates the assessment criteria and grading of archaeological sites. The following categories are distinguished in Section 7 of the Act:

**Grade I:** Heritage resources with qualities so exceptional that they are of special national significance.

**Grade II:** Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region.

**Grade III:** Other heritage resources worthy of conservation, and which prescribes heritage resources assessment criteria, as set out in Section 3(3) of the act.

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

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

The categories of significance were based on the above criteria the above and the grading system outlined in NHRA. It is summarised in Table 3.

Table 3: Field rating of significance

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

### 3 STATEMENT OF SIGNIFICANCE AND IMPACT RATING

This section outlines the potential impact of risk situations and scenarios commonly associated with heritage resources management. Refer to Appendix 1: for guideline of the rating of impacts and recommendation of management actions for areas of heritage potential within the study area.

#### 3.1 DIRECT, INDIRECT AND CUMULATIVE EFFECTS

Beyond the initial direct or primary impact, the HIA should also consider the potential indirect and cumulative impacts. Winter and Baumann (2005) define **direct or primary impacts** as those that occur at the same time and in the same space as the proposed activity. **Indirect effects** occur at a later stage or at a different place from the causal activity or may be impacts that occur as through a “complex pathway” (Winter and Baumann 2005, 24). **Cumulative effects** are a constellation of processes that are seemingly insignificant in isolation but have a significant cumulative effect on heritage resources (ibid.).

##### 3.1.1 DIRECT IMPACT RATING CRITERIA

The criteria used for assessment of impacts is based on the guidelines set out by Winter and Baumann (2005) and Department of Environmental Affairs and Tourism (1998):

###### Extent

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

###### Duration

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

**Magnitude severity**

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

**Probability**

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

**Impact Significance**

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

## 3.1.2 DIRECT IMPACT WEIGHTING MATRIX

Aspect	Description	Weight
Extent		
	Local	1
	Site	2
	Regional	3
Duration		
	Short term	1
	Medium term	3
	Long term	4
	Permanent	5
Magnitude/Severity		
	Low	2
	Medium	6
	High	8
Probability		
	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Impact Rating	Sum (Duration, Scale, Magnitude) x Probability	
Negligible	<20	
Low	<40	
Moderate	<60	
High	>60	



## 4 ARCHAEOLOGICAL AND HISTORICAL CONTEXT

### 4.1 OVERVIEW OF THE SOUTH AFRICAN ARCHAEOLOGICAL AND HISTORICAL CONTEXT

#### 4.1.1 STONE AGE

In Southern Africa, the Stone Age is defined by the use of stone cobbles and flakes that have been modified into tools such as scrapers, points and hand axes. Our early ancestors such as *Homo ergaster* and early *Homo sapiens* first used these tools as much as 1.4 million years ago (Mitchell 2002, 59). Stone technology would persist throughout the human species development right up to the arrival of iron using farming people in southern Africa some 2000 years ago. Changes in the stone tool technology over time allows different stone tool industries to be chronologically separated based on trends in tool design. This provides the useful partitioning of the entire Stone Age sequence into three broad phases outlined by Lombard et. al. (Lombard et al. 2012) below:

**Early Stone Age:** 2 Million – 200 000 years ago

**Middle Stone Age:** 300 000 – 20 000 years ago

**Later Stone Age:** 40 000 – <2 000 years ago

The overlap in dates is due to regional variations in the timing of the evolutionary steps that signal a change from one phase to the next.

#### 4.1.2 IRON AGE

The Iron Age also derives its name from the ubiquitous use of smelted iron implements; however, it must be noted that tools made from other materials such as bone and stone were still regularly used. The advent of the Iron Age in southern Africa was not simply a new form of technology introduced to the landscape but rather signalled a new way of life with the concomitant arrival of Bantu language speaking agropastoral farming communities from north of the Limpopo river at around AD 350 (Huffman 2007). These farmers would form semi-permanent stone walled settlements that range in size from small villages/outposts to much larger urban complexes with settlement location being consistently guided by the need to access water, wood for fuel, and fertile soils for grazing and crops (Mitchell 2002).

To mark developments in complexity within the near 2000-year sequence of iron using farmers in southern Africa the Iron Age has also been divided into distinct periods. These periods, however, do not mark changes in technology (as is the case with the Stone Age) but rather signify changes in the social and political organisation of the Iron Age farmers. The three periods of the Iron Age are presented by Huffman (2007) as follows:

**Early Iron Age:** AD 200 – 900

**Middle Iron Age:** AD 900 – 1300

**Late Iron Age:** AD 1300 – 1840

The Iron Age is thus considered the period, which covers the unwritten history of precolonial farming communities and, as a chronological unit, ends with the contact between the Bantu farmers and European settlers.

### 4.1.3 HISTORICAL PERIOD

The historical period is best regarded as a phase where historical sources can be reliably used to reconstruct past events. The earliest sources of historical data found in southern Africa take the form of oral accounts that were recorded by travellers and missionaries as they explored the interior of the country while later sources tend to be more formally constructed as literacy rates increased with more European settlers entering the region (Vollenhoven 2006, 189).

## 5 PROJECT LOCATION

The project area is located on Rand Highveld Grassland (Mucina, Rutherford, and Powrie 2018). This vegetation type occurs on highly variable landscapes with extensive sloping plains and a series of ridges slightly elevated over undulating surrounding plains. The vegetation is species-rich, wiry, sour grassland alternating with low, sour shrubland on rocky outcrops and steeper slopes.

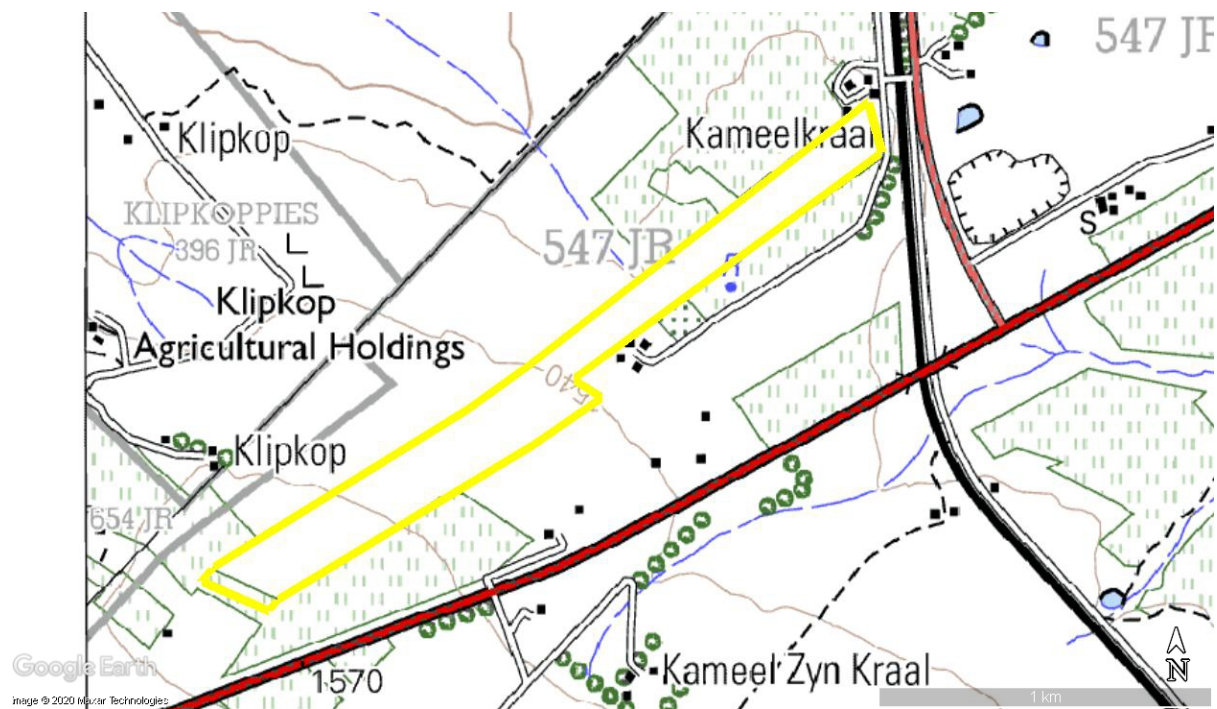


Figure 2: Project alignment indicated on 2009 map (2428DC Bronkhorstspuit)

## 6 HERITAGE IMPACT ASSESSMENT METHODS

Desktop and field-based research were conducted to ensure a high probability of recording heritage sites in the project area.

### 6.1 DESKTOP STUDY

#### 6.1.1 HERITAGE REPORTS

The desktop study focussed on the relevant previous research conducted in the area based on previous reports, published material, aerial photographs, remote sensing data that has bearing on the immediate project area.

#### 6.1.2 MAP DATA

Historical and current topographical maps were consulted as sources of information on potential areas of significance. These were georeferenced in ArcGIS and Google earth with the project area superimposed.

#### 6.1.3 REMOTE SENSING DATA

Historical and modern aerial and satellite imagery of the project area was studied in order to identify any heritage sites. This complements traditional foot survey methods. Historical aerial imagery of the project area is available for 1929, 1958, 1961, 1965, 1969, 1976, 1985/1986, 1991, 2003, 2005, and 2014.

### 6.2 FIELD SURVEY

An archaeological foot survey of the entire Portion 23 of Kameel Zyn Kraal 547 JR was conducted on 13 July 2020. The survey was conducted following standard archaeological practice. The survey team used real time positioning in relation to the project by means of a hand-held tablet-based Google Earth application. Sites of interest and of the project area were photographed and recorded with a handheld GPS (Garmin e-Trex) recorded using Datum WGS 84.

#### 6.2.1 LIMITATIONS

##### **Access**

The project was accessed from the R25. No access restrictions were encountered.

##### **Visibility**

Generally, the visibility at the time of the HIA site inspection (13 July 2020) was low due to dense grass cover, and in places trees obscuring the view. Historical aerial imagery from 2016 captured the area after a recent veld fire which clearly exposed the stone walls on the property.



Figure 3: Visibility on was low due to dense grass and tree cover.

In anticipation of the development, surface vegetation was cleared from the planned construction area thereby limiting observational features on the surface but exposing subsurface deposits for inspection.



Figure 4: Cleared surface vegetation on site.

## 6.3 ARCHAEOLOGICAL AND HISTORICAL CONTEXT OF KAMEEL ZYN KRAAL 547 JR AND SURROUNDING AREA

### 6.3.1 STONE AGE

Early Stone Age sites have been recorded all along the Magaliesberg range where they tend toward a location near one of the six poorts which act as north/south thoroughfares through the mountains. These landscape features were exploited as funnel traps for hunting large game as they migrated toward the northern bushveld. An example of this is found on the southern slopes of Wonderboompoort where a large accumulation of Acheulian stone tools was excavated by Mason and Beaumont in 1959/60 (Mason 1962).

The MSA phase is represented in the greater Tshwane region at three shelter sites located to the south of the study area at Bronberg and in the Erasmusrand. MSA type stone tools have been picked up in the Groenkloof Nature reserve in the south to Akasia in the north, as well as in an area west of Wonderboomnek (Vollenhoven 2006). Further west, near

Hartebeespoort dam in the Magaliesberg two notable sites known as Jubilee shelter and James Cave have yielded continuous MSA to LSA occupational sequences (Horn 1992).

The distribution of LSA sites in the greater Tshwane region closely mirrors that of the MSA with the above-mentioned sites at Erasmusrand and west of Wonderboompoort also yielding LSA occupation layers. LSA stone tools have also been found scattered across the greater Tshwane region in areas closely aligned to those mentioned for the MSA above, with the inclusion of areas around Donkerhoek and Pienaarspoort to the east of the city (Vollenhoven 2006).

In general, the Stone Age period of the area immediately around the project area is poorly understood (Küsel 2019). Van Schalkwyk noted that stone tools from all phases of the Stone Age are present within the region, and especially along water courses and lithic outcrops. In a survey for heritage resources on Hatherley 331 JR recorded isolated elements of Middle Stone Age (MSA) lithics on hornfels, quartz and quartzite (Van Schalkwyk, Pelser, and Van Vuuren 1996). A unique feature of the LSA in the Magaliesberg, is the occurrence of rock art. These sites occur on sites both east and west of Pretoria (van Vollenhoven 2006:185).

### 6.3.2 IRON AGE

As indicated, the Iron Age can be divided into three phases namely the Early, Middle, and Late Iron Age. The middle Iron Age is used to designate specific developments in socio-political complexity which manifested in the region of Mapungubwe Hill between AD 900 – 1300. Therefore, it is only the Early and Late periods of the Iron Age which have relevance in this region.

The EIA is generally less well represented in terms of number of sites nationally and there has only been one EIA site documented in the city of Tshwane, this site is located in Derdepoort (Nienaber, Prinsloo, and Pistorius 1997). Further west, near Hartebeespoort dam, four EIA sites have been recorded (van Vollenhoven 2006:186) – notable of these is a site known as Broederstoom, where the earliest evidence of domesticated stock and crop agriculture in the region has been reported (Huffman 1993).

The LIA is well represented in project area. The earliest LIA site in the region is located west of Wonderboompoort, while further west of the city a high number of sites dating to the Moloko (proto Sotho-Tswana) period (AD 1100 – 1500) can be found all the way to Olifantspoort in the Magaliesberg (van Vollenhoven 2006:186). From around 1600, oral traditions of Nguni-speaking Ndebele groups record their settlement in the eastern parts of the Pretoria-region. Heritage reports conducted on some the stone walled sites east of Pretoria have mostly linked these sites of the Ndebele-speaking people who inhabited the area from the late 1600s to the mid-1800s.

Sites close to the project area have been found on the farms Hatherley 331 JR (Van Schalkwyk, Pelser, and Van Vuuren 1996; 1996), Hatherley 311 JT (Van der Walt 2009), Zwartkoppies 364 JR (Küsel 2019; 2005; 2006) (Küsel 2005; 2008; Kusel et al. 2019) and Zwavelpoort 373JR (Küsel 2008; Pelser 2008; van Schalkwyk 2010).

The LIA stone walled sites east of Pretoria is widely associated with the Manala Ndebele grouping.

Van Vuuren (2006: 81) states that:

*"In terms of South African Ndebele oral tradition, the Ndebele first settled at Emhlangeni ("At the reeds") near Randfontein, Gauteng... The Ndebele entered the region of Pretoria during the early to mid-1600s... The first Ndebele settlement was at KwaMnyamana ("Place of the Black Hills"), an area close to the present Hippo Quarries crusher site on the southern slopes of the range found on De Onderstepoort (300JR) and Doornpoort (295JR) farms."*

The Ndebele divided into various tribal entities through a split between the sons of Musi, the first chief who settled at KwaMnyamana. The descendants of the eldest son, Manala, stayed in the area while the those of the younger son, Nzunzda moved eastward (van Vuuren 2006).

Kameel Zyn Kraal falls within the pre-colonial territory of the Manala Ndebele which Van Vuuren (2006) recorded as roughly corresponding to the Pienaars River drainage basin and that of its main tributary, the Swawelpoort River. This area is roughly demarcated by the Bronberg range in the south and the Pienaarsrant/Magaliesberg in the north and the Sour Grassveld farms towards Bronkhorstspruit the eastern boundary and the present Sefako Makgato Drive (old Hans Strijdom Drive) as the western boundary (Küsel 2019).

Importantly, the oral histories collected by Van Vuuren (2006) has indicated that in earlier times, Kameelzijkraal (547JR) was known as KwaMangungu ("Place of the drums"). This name likely relates to "drums which were used during the girls' initiation rituals". It was also recorded that next to KwaMangungu was an area called KwaMnyakeni, the meaning of which is unknown.

In 1827, the Nguni chief Mzilikaze led a later Ndebele invasion through the Highveld and settled at Kungwini (Wonderboom) in Pretoria North. The Zulu king Dingane, later attacked Mzilikaze in 1832, and it believed that his Zulu impi may have marched past the Bronberg on their way to attack Mzilikazi's royal residence at Kungwini (Wonderboom).

### 6.3.3 HISTORICAL PERIOD

According to oral history one of the earliest Bantu language speaking farmers in the area were a group known as Transvaal Ndebele who swore fealty to the lineage of chief Msi (also Musi or Mmusi) who was settled north of Wonderboompoort on the banks of the Mbibana (aka Apies) River (Horn 1996:23). The largest population of Bantu language speaking people is the so-called Sotho-Tswana groups who are formed by the Northern and Southern Sotho as well as the Tswana and are the major group responsible for the large stone walled complexes, or towns, that dot the area (van Vollenhoven 2012:16). These reconstructions are based largely on oral histories of the groups that were able to re-establish themselves after the major upheaval caused by Mzilikazi's arrival in 1827 during the Difaquane/Mfecane period (van Vollenhoven 2012:16).

The earliest European travellers to visit the northern Gauteng region were the two traders Robert Schoon and William McLuckie who arrived in the August of 1829 while the missionary Dr. Robert Moffat visited the area in the same year (van Vollenhoven 2012:16). In 1839 the first European settler, a Mr. JGS Bronkhorst, settled on the farm Elandspoort, making him and his family the first permanent European settlers in the area (*ibid.*). Sites of historical significance close to Kameel Zyn Kraal include the Sammy Marks house, Zwartkoppies Hall

and others (Küsel 2019). In the wider region, heritage reports make frequent mention of historic farm buildings and the quarters of farm labourers - of which some have been excavated (Küsel 2008; National Culture History Museum 1998).

The area between Bronkhorspruit and Pretoria also was the setting of the Battle of Bronkhorstspuit - the first major engagement of the First Boer War – on 20 December 1880. Küsel (2005; 2006; 2019) also identified trenches in the larger area that could date to the Second Boer War and more specifically, the 1900 Battle of Diamond Hill that took place on 11-12 June 1900.

## 6.4 RESULTS OF THE ARCHAEOLOGICAL INVESTIGATION

### 6.4.1 STONE AGE

No Stone Age material was found during survey of the project area.

Note that Stone Age a number of sites have been recorded wider Magaliesberg region as a whole. These are typically associated with fluvial exposures and erosion gullies. Isolated stone tools and scatters are common surface finds.

### 6.4.2 IRON AGE

Thirteen (13) Iron Age sites were identified on Portion 23 of Kameel Zyn Kraal 547 JR. These include homesteads complexes and freestanding stone walls. While the stone enclosures and homesteads were discontinuous, they likely represent a single community. The boundaries between the sites recoded thus largely arbitrary delimitations. In all cases, the walls were roughly packed and uncoursed.

The location of spatial features was flagged during the desktop assessment and verified during the ground survey. The precise layout of the structures could not be determined on the ground due to the long grass which impaired visibility. An aerial survey was conducted with an UAV (unmanned aerial vehicle), flying at 75m above ground surface.

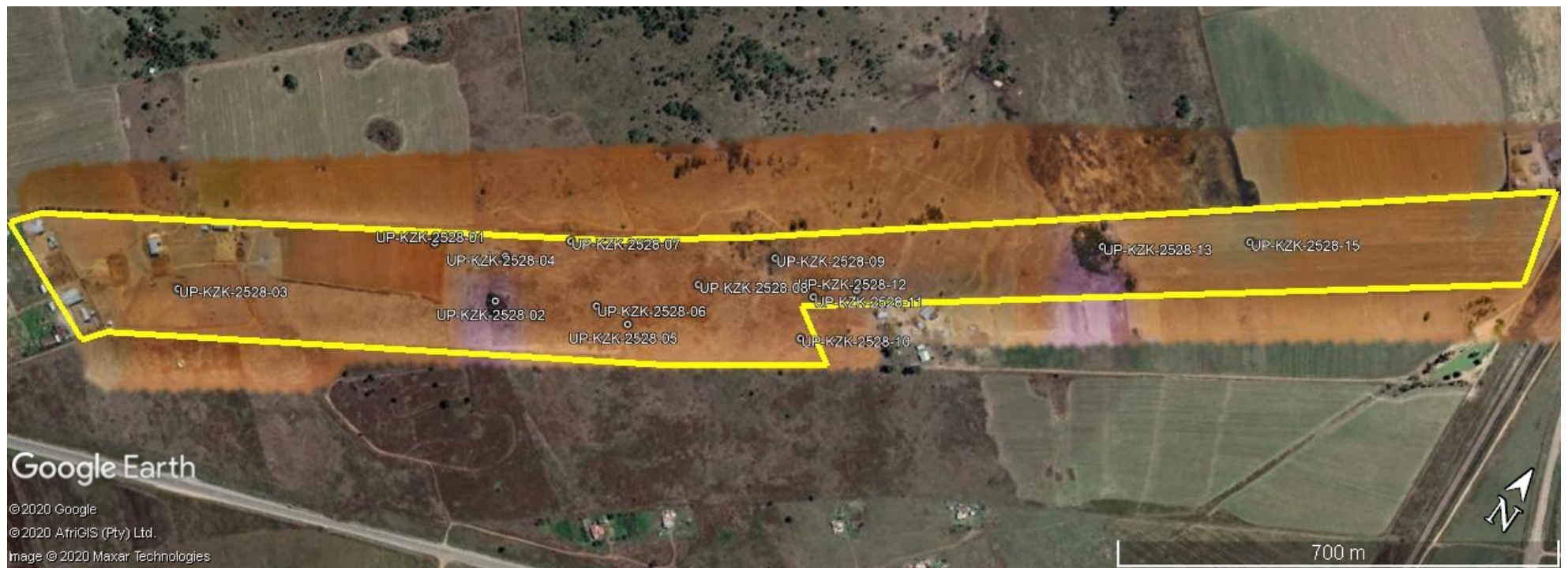


Figure 5: Distribution of Heritage sites on Portion 23 of Kameel Zyn Kraal 547



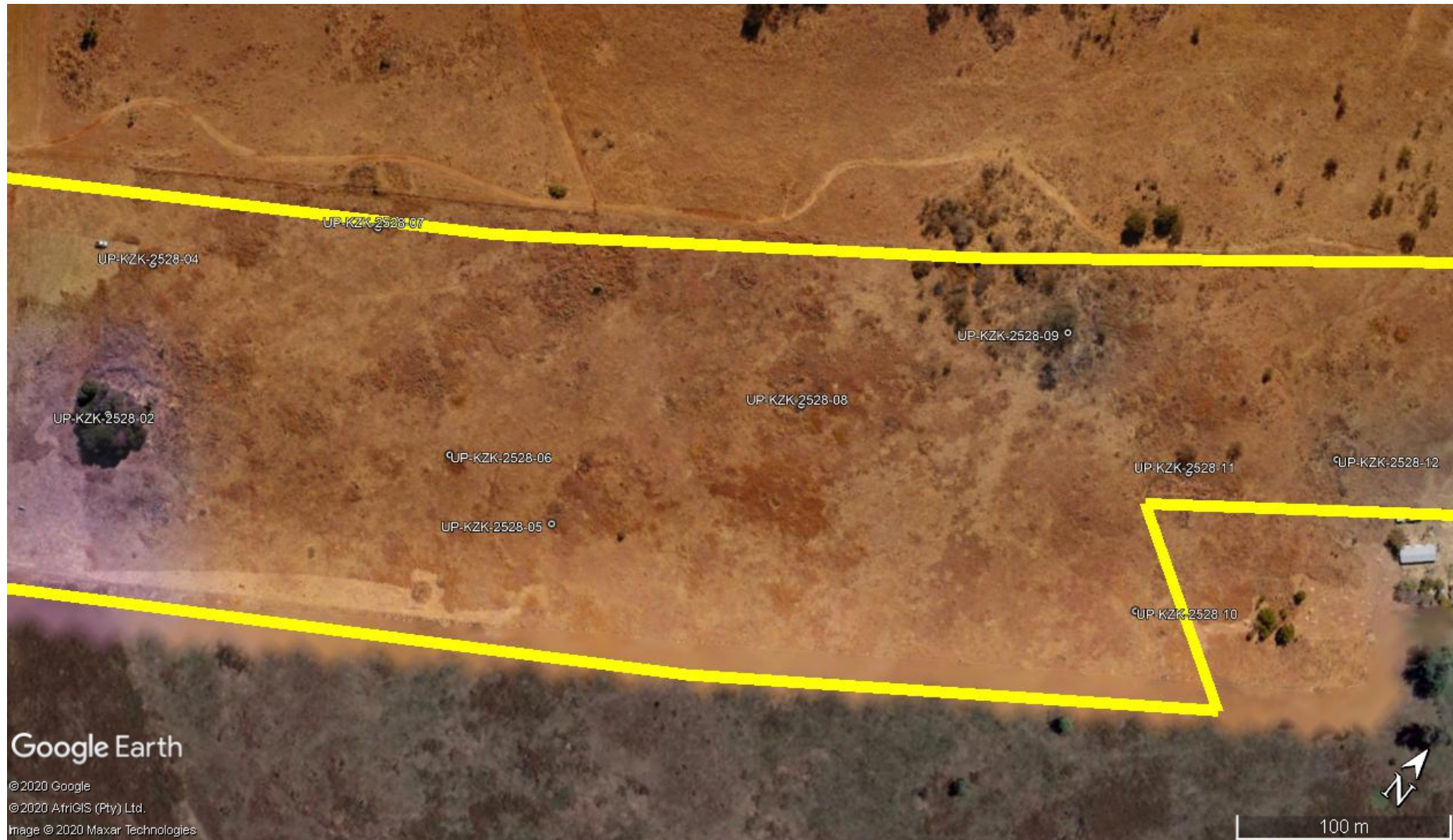


Figure 6: Sites in the central Portion of the study area.

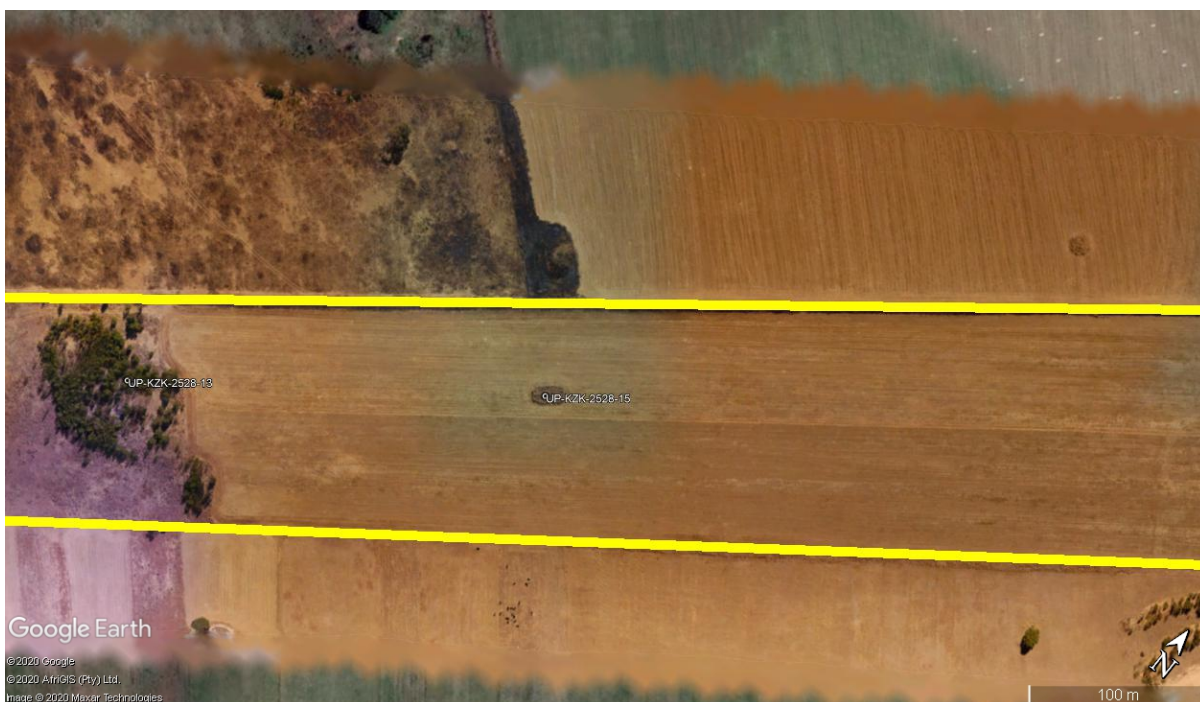


Figure 7: Sites in the Eastern Portion of the study area.



Figure 8: Sites in the eastern Portion of Portion 23 Kameel Zyn Kraal 547.

**Site: UP-KZK-2528-01**

Coordinates: S 25.911943° / E 28.509269°  
Farm: Portion 26 of Kameel Zyn Kraal 547-JR  
50K Map Series: 252DC Bronkhorstspuit  
Type: Late Iron Age homestead  
Rating: Low Significance, 2b

This complex is a collection of stone walls. The site was almost entirely destroyed by premature clearing of vegetation in anticipation for the development. As a result, neither ground survey nor drone imagery could identify the layout. Historical aerial imagery however was used to identify the layout to large extent. Here, imagery captured in 10/08/2015 shows a circular stone enclosure, (+/-4m diam.) enclosed within a larger slightly scalloped wall (+/-20m diam.).



Figure 9: View of UP-KZK-2528-01 with recent clearing of surface vegetation.



Figure 10: UP-KZK-2528-01 showing earth moving damage.



Figure 11: Aerial view of UP-KZK-2528-01 showing extent of damage.



Figure 12: Google Earth imagery of UP-KZK-2528-01 taken in 2016 showing original extent of the site.

**Site: UP-KZK-2528-02**

Coordinates: S 25.912233° / E 28.510535°

Farm: Portion 26 of Kameel Zyn Kraal 547-JR

50K Map Series: 252DC Bronkhorstspuit

Type: Late Iron Age homestead

Rating: Medium significance, 3

A collection of stone walled features which forms a large enclosure of roughly 45m in diameter. A single large kidney-shape enclosure on the northern edge was likely used a cattle kraal while the smaller enclosures were likely used as living spaces. The homestead is located within a dense stand of wattle trees. Downslope wash has deposited soil upslope (south) where the walls are around 30cm high. The interior is much deeper indicating that the walls were likely 1.2m high.

A wall links it to an isolated stone enclosure 15m to the north. A collection of smaller circular enclosures is located 25m to the southwest.



Figure 13: Stone walling on UP-KZK-2528-02 (top and bottom left), and view of site from north east.



Figure 14: Low altitude aerial image of UP-KZK-2528-02.

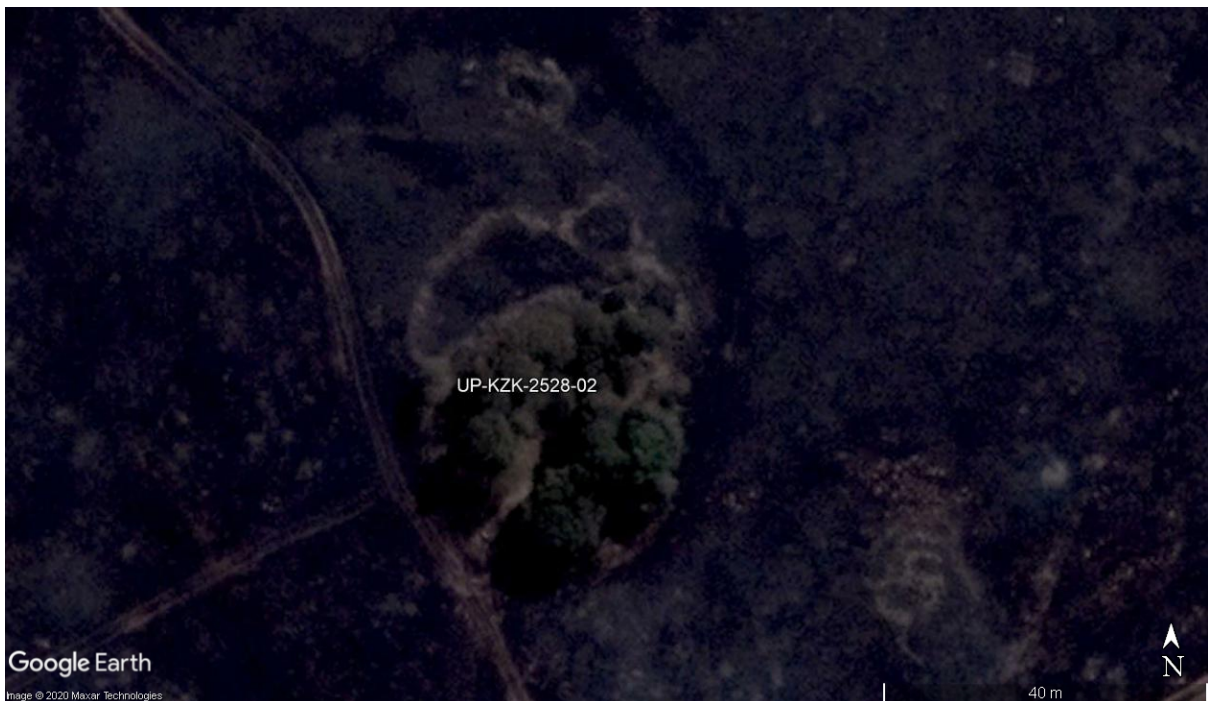


Figure 15: Google Earth Imagery of UP-KZK-2528-02 captured in 2016 showing extent of walling.

**Site: UP-KZK-2528-03**

Coordinates: S 25.914658° / E 28.506278°

Farm: Portion 26 of Kameel Zyn Kraal 547-JR

50K Map Series: 252DC Bronkhorstspuit

Type: Late Iron Age homestead

Rating: Medium significance (3)

A central 15m (diam.) enclosure with abutting to smaller enclosures (+/- 27m diam). An isolated circular enclosure is located 35m to the south east. A dirt road is located immediately to the north west of the site – historical imagery indicates that the road was made constructed between 2012 and 2014. Recent earthmoving activities created large soil embankment on the north-western side of the site. In places, only approximately 20cm of the walls are visible, but up to 40cm in other places. Its low height could be due to either up-fill or robbing of the stones – a common occurrence on historical sites (Küsel 2019).



Figure 16: stone walled features on UP-KZK-2528-03 and recent construction and ground clearing activities in background (bottom right).

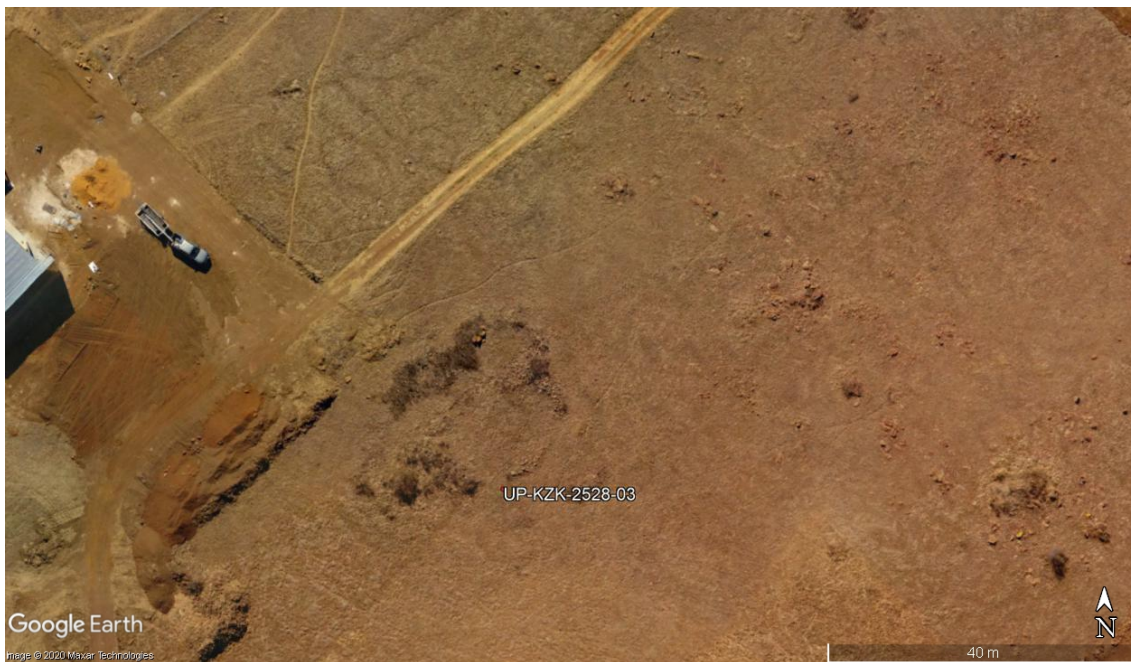


Figure 17: Low altitude aerial image of UP-KZK-2528-03 showing nearby earthmoving activities.



Figure 18: Aerial Imagery of UP-KZK-2528-03 captured in 2011 clearly indicating the extent of the stone walling.



**Site: UP-KZK-2528-04**

Coordinates: S 25.911623° / E 28.510263°  
Farm: Portion 26 of Kameel Zyn Kraal 547-JR  
50K Map Series: 252DC Bronkhorstspuit  
Type: Late Iron Age homestead  
Rating: Medium significance (3)

A complex of stone walls that form a central circular enclosure 10m in diameter inside a scalloped enclosing wall estimated 28m in diameter. Circular enclosures about the scalloped perimeter wall, these are mostly collapsed. During inspection, visibility was mostly obscured by tall grass and layout is mostly determined from historical imagery.

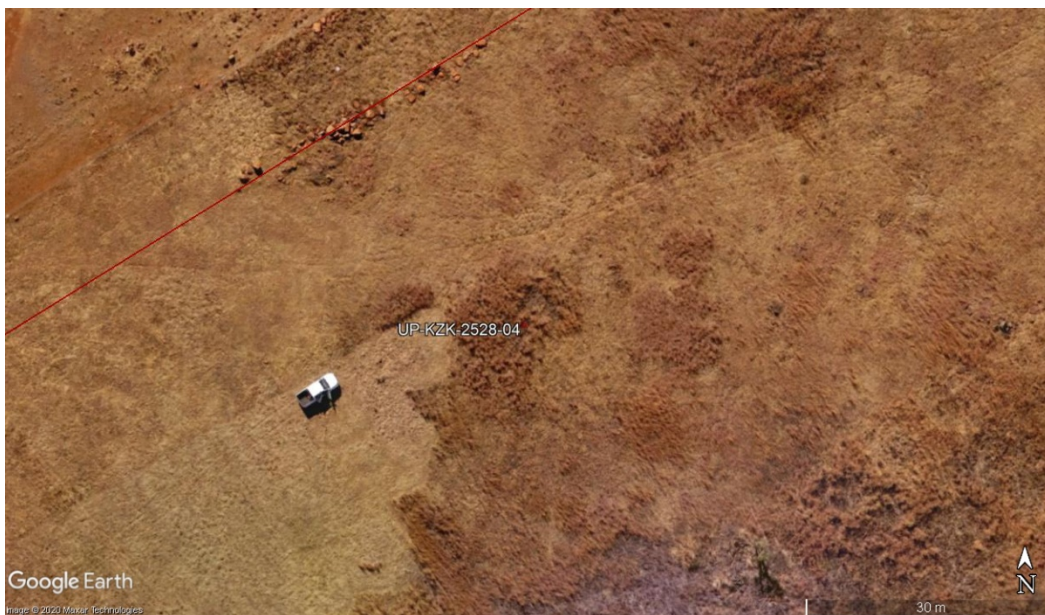


Figure 19: Low altitude aerial image UP-KZK-2528-04.

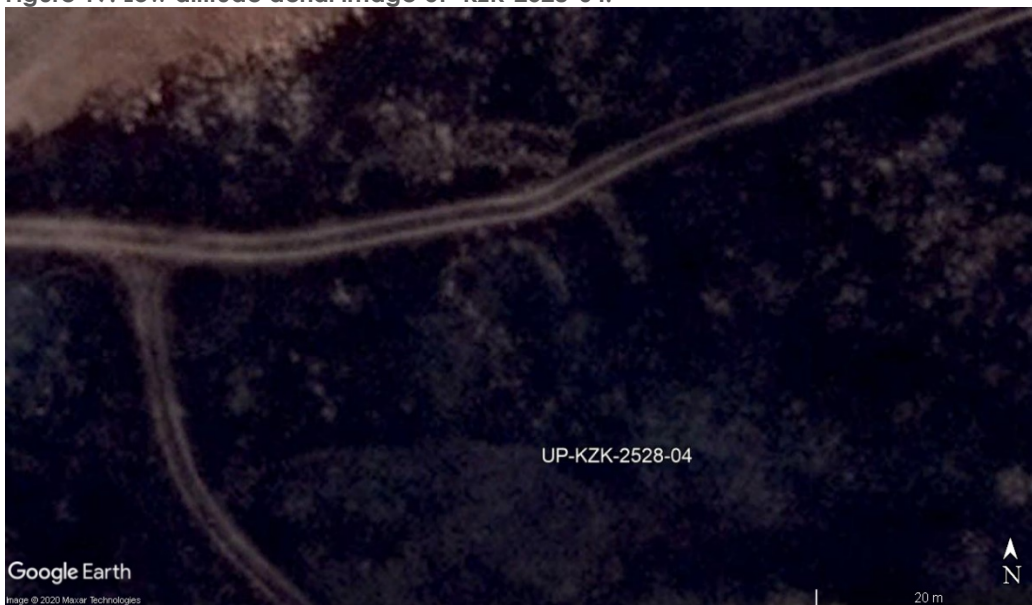


Figure 20: Aerial image of UP-KZK-2528-04 captured in 2016 showing extent of stone walling.

**Site: UP-KZK-2528-05**

Coordinates: S 25. 911437° / E 28. 512473°

Farm: Portion 26 of Kameel Zyn Kraal 547-JR

50K Map Series: 252DC Bronkhorstspuit

Type: Late Iron Age homestead and enclosing walls

Rating: Medium significance (3)

A small bi-lobal stone enclosure roughly in 12m length. A free-standing semi-circular stone wall is located 5m to the southwest. These features are linked by enclosing wall approximately 90m long, starting directly south of the site and arcing away 30m to the east.



Figure 21: Stone walling on UP-KZK-2528-05.



Figure 22: Low altitude aerial image UP-KZK-2528-05 captured on 2020-07-13.



Figure 23: Google Earth image of UP-KZK-2528-05 captured in 2016 showing full extent of stone walling.

**Site: UP-KZK-2528-06**

Coordinates: S 25.911476° / E 28.511901°

Farm: Portion 26 of Kameel Zyn Kraal 547-JR

50K Map Series: 252DC Bronkhorstspuit

Type: A series of Late Iron Age homesteads and kraals

Rating: Medium significance (3)

A series of circular and bilobial stone wall enclosures over a roughly 60m x 20m area directly west (upslope) of the perimeter wall of UP-KZK-2528-05. Visibility was very poor in this area due to dense grass cover, but historical imagery suggests possible three to four of these features.



Figure 24: Low altitude aerial image UP-KZK-2528-06 captured on 2020-07-13.

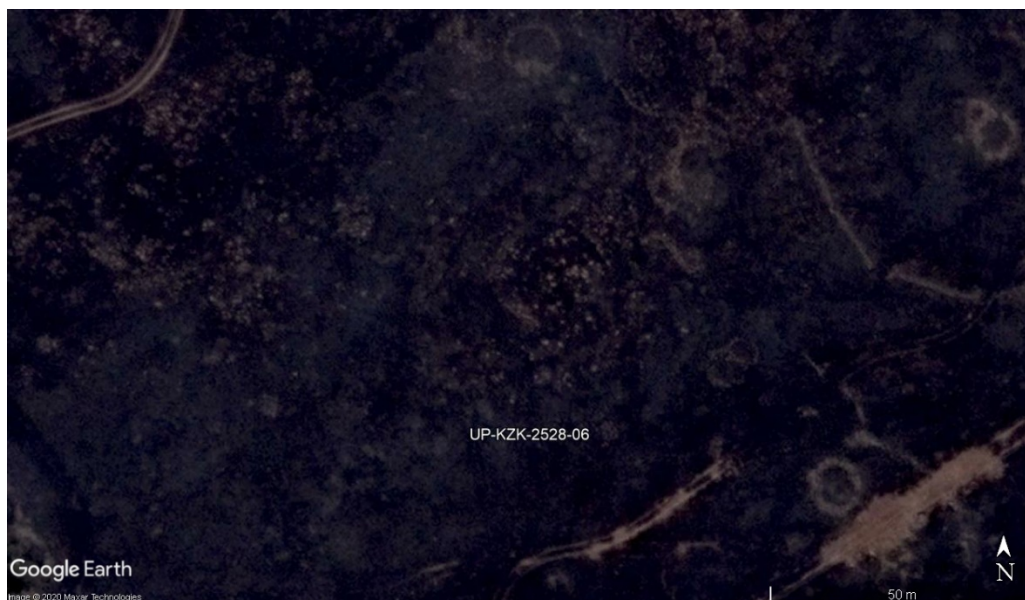


Figure 25: Aerial image of UP-KZK-2528-06 captured in 2016 showing extent of stone walling. Note the presence of bilobial and circular stone walled enclosures west of the UP-KZK-2528-05 perimeter wall.

**Site: UP-KZK-2528-07**

Coordinates: S 25.910943° / E 28.510987°  
Farm: Portion 26 of Kameel Zyn Kraal 547-JR  
50K Map Series: 252DC Bronkhorstspuit  
Type: Late Iron Age homestead  
Rating: Medium significance (3)

A collection of connected circular enclosures. The walls have collapsed in places. Due to the dense vegetation, their precise layout and shape could not be determined. The site is dissected by the northern boundary fence line with a large and well-preserved stone enclosure directly on the northern side of the fence.



Figure 26: Stone walling on UP-KZK-2528-07.



Figure 27: Low altitude aerial image UP-KZK-2528-06 captured on 2020-07-13.



Figure 28: Aerial image of UP-KZK-2528-06 captured in 2011 showing the original stone walling bisected by boundary fence.

**Site: UP-KZK-2528-08**

Coordinates: S 25. 910396° / E 28. 513041°

Farm: Portion 26 of Kameel Zyn Kraal 547-JR

50K Map Series: 252DC Bronkhorstspuit

Type: Late Iron Age homestead

Rating: Medium significance (3)

A complex of connected stone bilobial and circular enclosures forming a roughly circular homestead complex. A stone wall extends away from the north-western end of the main complex, in a shallow arc approximately 50m long. A single isolated enclosure is located roughly 30m to the north east.



Figure 29: Low altitude aerial image UP-KZK-2528-08 captured on 2020-07-13.



Figure 30: Aerial image of UP-KZK-2528-08 captured in 2016 showing central homestead complex arcing wall and isolated enclosure to east.



Figure 31: Walling on UP-KZK-2528-08.



Figure 32: Example of dense grass cover obscuring visibility UP-KZK-2528-08.



**Site: UP-KZK-2528-09**

Coordinates: S 25.909464°/ E 28.513806°

Farm: Portion 26 of Kameel Zyn Kraal 547-JR

50K Map Series: 252DC Bronkhorstspuit

Type: Late Iron Age homestead

Rating: Medium significance (3)

A complex of bilobial, circular and freestanding stone walls partially located under a stand of trees. The walls were relatively low, but likely covered by soil washed downslope. Trees, tall grass and the low profile of the walls meant that their layout could not be determined with any certainty.



Figure 33: Stone walling on UP-KZK2528-09



Figure 34: Stone walling on UP-KZK-2528-09



Figure 35: Low altitude aerial image UP-KZK-2528-09 captured on 2020-07-13.

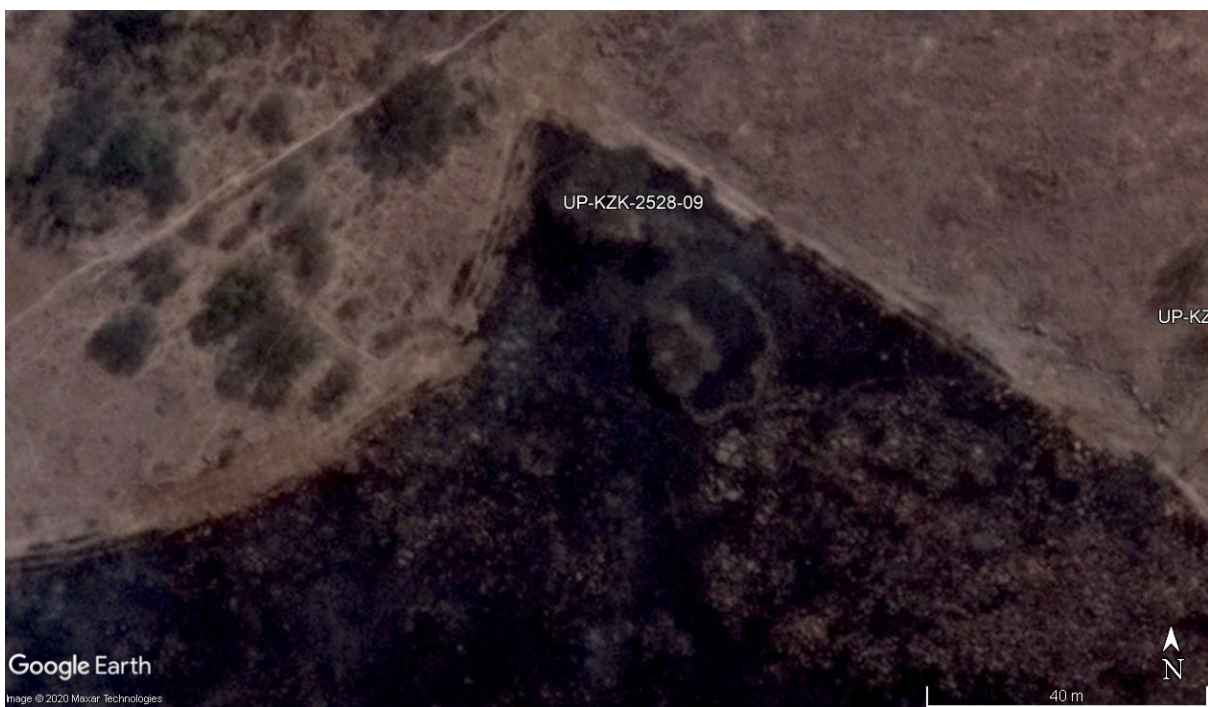


Figure 36: Google Earth image of UP-KZK-2528-09 captured in 2016 showing some of the stone walling. Walling below the trees in unburnt north west area not visible.

**Site: UP-KZK-2528-10**

Coordinates: S 25.910203°/ E 28.514859°

Farm: Portion 26 of Kameel Zyn Kraal 547-JR

50K Map Series: 252DC Bronkhorstspuit

Type: Late Iron Age homestead

Rating: Medium significance (3)

A complex of connected stone bilobial and circular enclosures forming a roughly circular homestead complex. Visibility was hampered by tall grass.



Figure 37: Low altitude aerial image UP-KZK-2528-10 captured on 2020-07-13.



Figure 38: Google Earth image of UP-KZK-2528-10 captured in 2016 showing extent of stone walling.

**Site: UP-KZK-2528-11**

Coordinates: S 25. 909610°/ E 28. 514653°

Farm: Portion 26 of Kameel Zyn Kraal 547-JR

50K Map Series: 252DC Bronkhorstspuit

Type: Late Iron Age homestead

Rating: Medium significance (3)

A complex of connected stone bilobial and circular enclosures in a roughly 30m x 20m area. An old farm road was built through the site at some stage in the past during which stones from the wall was removed and repurposed as a wall that runs along the road for approximately 30m. Visibility was hampered by tall grass and the making precise investigation of the layout difficult.



Figure 39: Stone walling on UP-KZK-2528-11



Figure 40: Low altitude aerial image UP-KZK-2528-11 captured on 2020-07-13.



Figure 41: Aerial image of UP-KZK-2528-10 captured in 2011 showing extent of stone walling.

**Site: UP-KZK-2528-12**

Coordinates: S 25. 909180° / E 28. 515156°

Farm: Portion 26 of Kameel Zyn Kraal 547-JR

50K Map Series: 252DC Bronkhorstspuit

Type: Late Iron Age homestead

Rating: Medium significance (3)

A complex of connected stone bilobial and circular enclosures forming a roughly circular homestead complex of approximately 25m in diameter. Visibility was hampered by tall grass.



Figure 42: Walling on UP-KZK-2528-12



Figure 43: Low altitude aerial image UP-KZK-2528-12 captured on 2020-07-13.



Figure 44: Aerial image of UP-KZK-2528-12 captured in 2011 showing extent of stone walling.

**Site: UP-KZK-2528-13**

Coordinates: S 25. 906680° / E 28. 517978°

Farm: Portion 26 of Kameel Zyn Kraal 547-JR

50K Map Series: 252DC Bronkhorstspuit

Type: Late Iron Age homestead

Rating: Medium significance (3)

A large complex of connected stone walls which includes bilobial and circular enclosures. The complex is located underneath a dense stand of wattle trees, forming a roughly circular homestead complex of approximately 25m in diameter. Some of the walls utilise particularly large stones, and in some places stand over 1m high. The dense stand of wattle trees largely obstructs view of the site from the air as well as the ground. Historical imagery prior to 2004 indicates that the site is largely circular in layout, 65m in diameter but internal layout cannot be determined.



Figure 45: Stone walling on UP-KZK-2528-13.





**Figure 46:** Low altitude aerial image UP-KZK-2528-13 captured on 2020-07-13. Site extent roughly corresponds to the tree cover.



**Figure 47:** Google Earth image of UP-KZK-2528-13 capture in 2015 showing the site area with sparser tree cover.

### 6.4.3 HISTORICAL SITES

**Site: UP-KZK-2528-14**

Coordinates: S 25.905434°/ E 28.519866°

Farm: Portion 26 of Kameel Zyn Kraal 547-JR

50K Map Series: 252DC Bronkhorstspuit

Type: Late Iron Age homestead

Rating: High significance (4b)

This was an informal graveyard located on an agricultural field. Although the field has been regularly ploughed in from 2016 to present, the graveyard itself has been left as an island.

Long grass greatly hampers investigation of the site. Eight (8) graves were counted but this could be either over or under the actual number since individual graves were difficult to identify in below dense grass cover. Only three graves had headstones with names and dates. Most graves were mounds of soil or vaguely outlined with a single row of rocks or a pile of stones. All were orientated east-west, with the headstone in the west.






Figure 48: View of the graveyard looking west



Figure 49: Overview images of the three marked graves.

Table 4: Descriptions of Marked graves at UP-KZK-2528-14

Grave	Inscription	Description	Image
Grave 1:	JORRS SIBANYONI WAHLOGEKA 28-10-1951	Cement Gravestone, c.30 x 40cm x 5cm. Parallel sides with a straight sided peak. Decorated with seven impressed horizontal lines above text. Text drawn in wet cement.	
Grave 2	SARA SIBANYONI WAHLOGEKA 1-10-1953	Cement Gravestone, c.30 x 50cm x 5cm. Parallel sides with a straight sided peak. Decorated with seven impressed horizontal lines above text. Text drawn in wet cement.	
Grave 3	215 AHOSIMA** 9(?)u(?)****	Cement Gravestone, c.20 x 30cm x 5cm. Parallel sides with a straight sided peak. Text drawn in wet cement. Cement eroding and text illegible in places.	

\* = illegible; ? = character uncertain



Figure 50: Detail of Grave 1



Figure 51: Detail of Grave 2



Figure 52: Detail of Grave 3

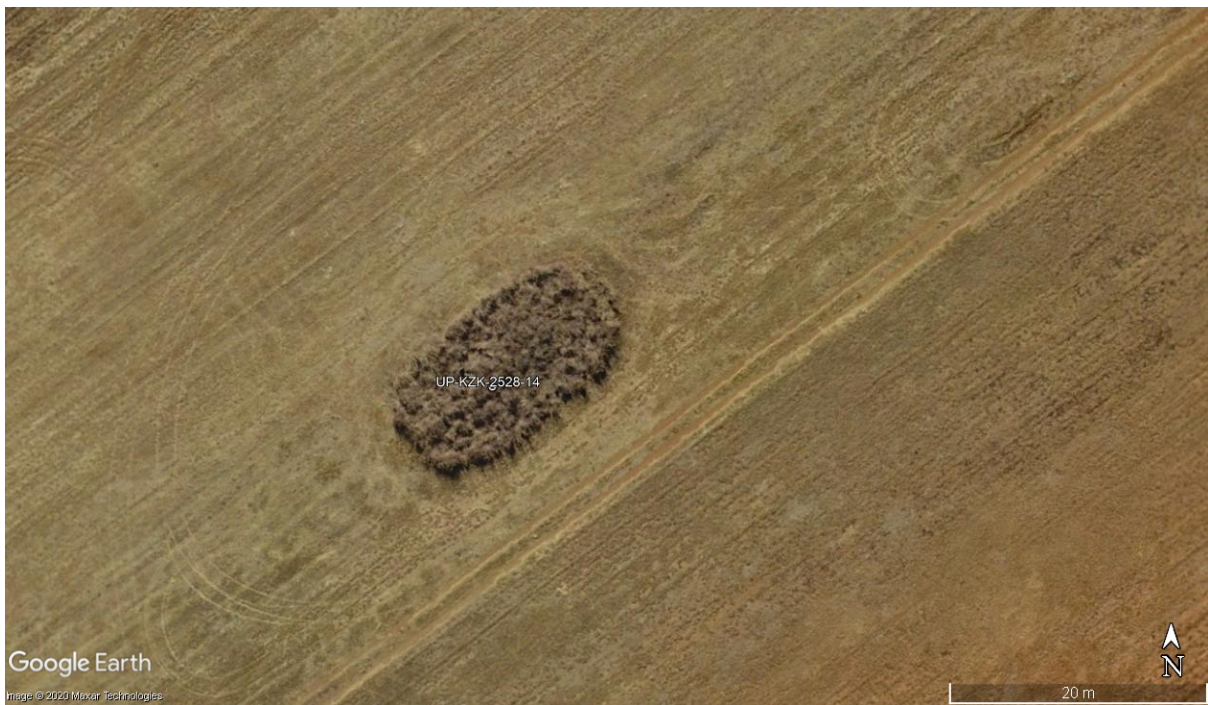


Figure 53: Low altitude aerial image UP-KZK-2528-14 captured on 2020-07-13.



Figure 54: Google Earth image of UP-KZK-2528-05 captured in 2016 when surrounding area was converted to ploughed agricultural field.



**Figure 55: Google earth image of UP-KZK-2528-05 captured in 2015 prior to conversion of surrounding area to ploughed agricultural field.**

## 6.5 AREAS OF ARCHAEOLOGICAL SENSITIVITY

The archaeological features on Portion 23 of Kameel Zyn Kraal 547 JR were mostly concentrated between Longitude 28.509219° in the west and 28.515156° in the east. The HIA mostly identified sites based on stone walls. However, since the community who occupied these sites extended beyond the limits of the walled areas, it is expected that subsurface deposits occur in the areas between these features. Therefore, the area of concentrated stone walled features can be regarded as archaeological sensitive and likely to contain subsurface deposits, and burials (Figure 56: Archaeological High Sensitivity Areas on Portion 23 of Kameel Zyn Kraal 547.).

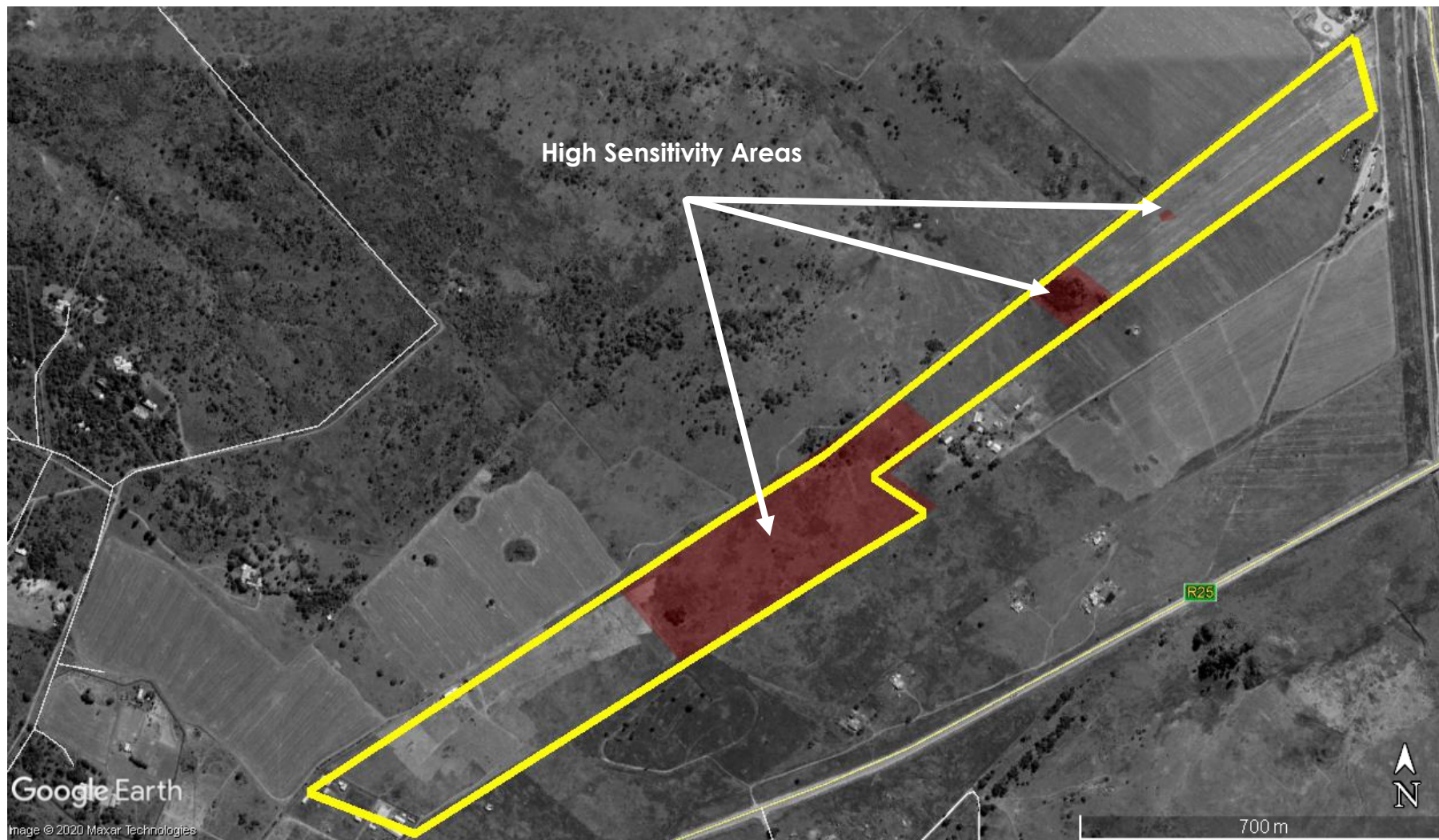


Figure 56: Archaeological High Sensitivity Areas on Portion 23 of Kameel Zyn Kraal 547.

## 6.6 PALEONTOLOGICAL SENSITIVITY

Generally, the farm falls outside paleontologically sensitive areas as indicated on the SAHRIS Paleontological Sensitivity Map (Figure 57). There are some areas that are indicated as sensitive, but these fall outside the area where subsurface deposits will be exposed.

Therefore, desktop or field assessment will probably not be required. This is ultimately subject to review and recommendations by the relevant heritage authorities.



Figure 57: Paleontological sensitivity map.



## 6.7 EVALUATION OF IMPACT

### **Archaeology**

The study identified thirteen archaeological sites. Some of these have been already been negatively affected by construction activities such as clearing surface vegetation and robbing and repurposing of stones. To mitigate this impact and minimise any future impacts that will negatively impinge on the archaeological integrity of the sites, it is important that the proposed mitigation measures outlined below are adhered to.

### **Cultural Landscape**

Kameel Zyn Kraal 537 JR forms part of a rich Late Iron Age cultural landscape. Although stone walled sites are relatively ubiquitous regionally, they are under immense pressure from urban sprawl. The significance of individual sites should be regarded in the larger context of a historical landscape under threat. In addition, the specific mention of Kameel Zyn Kraal in Manala Ndebele oral traditions (Van Vuuren 2006), makes the sites of significant in the local historical landscape. Mitigation measures (avoidance, site management, site monitoring / grave relocation) must be implemented if any future activities beyond the construction phase will impact any of these sites.

### **Graves / Human Burials Sites**

An informal historical graveyard was located with approximately eight graves identified. Because there are several Iron Age homesteads on the property, there is a high likelihood that more graves exist on the property. Therefore, caution should be applied when any earth moving activities take place. Mitigation measures (avoidance, site management, site monitoring / grave relocation) must be implemented if any burials are encountered during the construction and operation of the piggery.

**Table 5: Summary direct impact on heritage finds**

Site	Impact	Mitigation	Extent		Duration		Magnitude		Probability		Impact		Mitigation Measures to be Implemented
			Scale	Score	Scale	Score	Scale	Score	Scale	Score	Scale	Score	
UP-KZK-2528-01	Destruction of Iron Age site	Mitigated	Site	2	Permanent	5	High	8	Definite	5	High	75	Rescue excavation and mapping before destruction permit issued.
		No Mitigation	Site	2	Permanent	5	High	8	Definite	5	High	75	
UP-KZK-2528-02	Damage to Iron Age site	Mitigated	Site	2	Long term	4	Med	2	Improbable	1	Negligible	8	Site monitoring, avoidance, 20m conservation buffer.
		No Mitigation	Site	2	Long term	4	Med	2	Probable	2	Negligible	24	
UP-KZK-2528-03	Destruction of Iron Age site	Mitigated	Site	2	Permanent	5	High	8	Highly Probable	4	High	60	Excavation and mapping before destruction permit issued.
		No Mitigation	Site	2	Permanent	5	High	8	Definite	5	High	75	
UP-KZK-2528-04	Damage to Iron Age site	Mitigated	Site	2	Long term	4	Med	6	Improbable	1	Negligible	12	Site monitoring, avoidance, 20m conservation buffer.
		No Mitigation	Site	2	Long term	4	Med	6	Probable	2	Negligible	24	

UP-KZK-2528-05	Damage to Iron Age site	Mitigated	Site	2	Long term	4	Med	6	Improbable	1	Negligible	12	Site monitoring, avoidance, 20m conservation buffer.
		No Mitigation	Site	2	Long term	4	Med	6	Probable	2	Negligible	24	
UP-KZK-2528-06	Damage to Iron Age site	Mitigated	Site	2	Long term	4	Med	6	Improbable	1	Negligible	12	Site monitoring, avoidance, 20m conservation buffer.
		No Mitigation	Site	2	Long term	4	Med	6	Probable	2	Negligible	24	
UP-KZK-2528-07	Damage to Iron Age site	Mitigated	Site	2	Long term	4	Med	6	Improbable	1	Negligible	12	Site monitoring, avoidance, 20m conservation buffer.
		No Mitigation	Site	2	Long term	4	Med	6	Probable	2	Negligible	24	
UP-KZK-2528-08	Damage to Iron Age site	Mitigated	Site	2	Long term	4	Med	6	Improbable	1	Negligible	12	Site monitoring, avoidance, 20m conservation buffer.
		No Mitigation	Site	2	Long term	4	Med	6	Probable	2	Negligible	24	
UP-KZK-2528-09	Damage to Iron Age site	Mitigated	Site	2	Long term	4	Med	6	Improbable	1	Negligible	12	Site monitoring, avoidance, 20m conservation buffer.
		No Mitigation	Site	2	Long term	4	Med	6	Probable	2	Negligible	24	

UP-KZK-2528-10	Damage to Iron Age site	Mitigated	Site	2	Long term	4	Med	6	Improbable	1	Negligible	12	Site monitoring, avoidance, 20m conservation buffer.
		No Mitigation	Site	2	Long term	4	Med	6	Probable	2	Negligible	24	
UP-KZK-2528-11	Damage to Iron Age site	Mitigated	Site	2	Long term	4	Med	6	Improbable	1	Negligible	12	Site monitoring, avoidance, 20m conservation buffer.
		No Mitigation	Site	2	Long term	4	Med	6	Probable	2	Negligible	24	
UP-KZK-2528-12	Damage to Iron Age site	Mitigated	Site	2	Long term	4	Med	6	Improbable	1	Negligible	12	Site monitoring, avoidance, 20m conservation buffer.
		No Mitigation	Site	2	Long term	4	Med	6	Probable	2	Negligible	24	
UP-KZK-2528-13	Damage to Iron Age site	Mitigated	Site	2	Long term	4	Med	6	Improbable	1	Negligible	12	Site monitoring, avoidance, 20m conservation buffer.
		No Mitigation	Site	2	Long term	4	Med	6	Probable	2	Negligible	24	
UP-KZK-2528-14	Damage to historical graves	Mitigated	Site	2	Long term	4	High	8	Improbable	1	Negligible	14	Fence to be installed around graveyard to create 5m conservation buffer.
		No Mitigation	Site	2	Long term	4	High	8	Highly Probable	3	Moderate	42	

## 7 MANAGEMENT ACTIONS

The HIA identified heritage resources that have either already been impacted or for which impact will be unavoidable. For these Phase 2 Investigations will have to be implemented. Other resources are located in areas where peripheral impacts and impacts during the operational phase of the project can take place. Here impact should be avoided.

It is the opinion of this author that the Piggery on Portion 23 of Kameel Zyn Kraal 547 JR cannot proceed until mitigation measures for sites UP-KZK-2528-01, UP-KZK-2528-03, and UP-KZK-2528-14 are implemented and provided that no subsurface heritage remains are encountered during the construction phase.

The following management measures should be considered during implementation of the Kameel Zyn Kraal Piggery Project.

<b>SITES</b>	<b>UP-KZK-2528-01</b>	
<b>PROJECT COMPONENT/S</b>	Unspecified	
<b>POTENTIAL IMPACT</b>	Destruction of site	
<b>ACTIVITY RISK/SOURCE</b>	Site already damaged by earthmoving. Further damage will result in complete destruction of archaeological context.	
<b>MITIGATION: TARGET/OBJECTIVE</b>	Mapping, recording and rescue excavations to obtain sample of material culture, obtain datable material and map archaeological features. Full documentation of site before destruction permit can be issued.	
<b>MITIGATION: ACTION/CONTROL</b>	<b>RESPONSIBILITY</b>	<b>TIMEFRAME</b>
<b>Fixed Mitigation Procedure (required)</b>		
Rescue excavations, mapping, recording of site and cultural remains	ARCHAEOLOGIST	Prior to the commencement of any further construction and earth-moving activities
<b>Preferred Mitigation</b>		
Phase 2 Investigation: Rescue excavations, mapping, recording of site remains; destruction permit	ARCHAEOLOGIST	Prior to the commencement of any further construction and earth-moving activities
<b>Alternative Mitigation (if preferred mitigation not feasible)</b>		
None: Site already severely damaged due to earthmoving. No other measures possible.		
<b>PERFORMANCE INDICATOR</b>	Excavations, mapping, and recording to document the remaining material on site.	

<b>SITES</b>	<b>UP-KZK-2528-03</b>	
<b>PROJECT COMPONENT/S</b>	Unspecified	
<b>POTENTIAL IMPACT</b>	Destruction of site	
<b>ACTIVITY RISK/SOURCE</b>	Destruction of site due to earthmoving and construction. Site located next to active road and within active project area.	
<b>MITIGATION: TARGET/OBJECTIVE</b>	Mapping, recording and rescue excavations to obtain sample of material culture, obtain datable material and map archaeological features. Full documentation of site.	
<b>MITIGATION: ACTION/CONTROL</b>	<b>RESPONSIBILITY</b>	<b>TIMEFRAME</b>
<b>Fixed Mitigation Procedure (required)</b>		
Site Monitoring: Regular examination project area	ECO, HERITAGE PRACTITIONER	Monitor as frequently as practically possible.
<b>Preferred Mitigation</b>		
Phase 2 Investigation: Rescue excavations, mapping, recording of site remains; destruction permit	ARCHAEOLOGIST	Prior to the commencement of any further construction and earth-moving activities
<b>Alternative Mitigation (if preferred mitigation not feasible)</b>		
Avoidance: Implement a heritage conservation buffer of at least 20m around the heritage resource.	DEVELOPER	Prior to the commencement of any further construction and earth-moving activities
<b>PERFORMANCE INDICATOR</b>	Excavations, mapping, and recording to document the site.	

<b>SITE</b>	<b>UP-KZK-2528-14</b>	
<b>PROJECT COMPONENT/S</b>	Unspecified	
<b>POTENTIAL IMPACT</b>	Damage/destruction of graveyard.	
<b>ACTIVITY RISK/SOURCE</b>	Damage, destruction, or desecration of graves	
<b>MITIGATION: TARGET/OBJECTIVE</b>	To preserve historical graves and create an adequate conservation buffer.	
<b>MITIGATION: ACTION/CONTROL</b>	<b>RESPONSIBILITY</b>	<b>TIMEFRAME</b>
<b>Fixed Mitigation Procedure (required)</b>		
Site Monitoring	ECO, HERITAGE PRACTITIONER	Monitor as frequently as practically possible.
<b>Preferred Mitigation</b>		
Avoidance: Implement a heritage conservation buffer of at least 5m around the graveyard	DEVELOPER	Prior to the commencement of construction and earth-moving
<b>Alternative Mitigation (if preferred mitigation not feasible)</b>		
Phase 2 Specialist Mitigation: Exhumation and repatriation of graves to formal graveyard	HERITAGE PRACTITIONER	Prior to the commencement of construction and earth-moving
<b>PERFORMANCE INDICATOR</b>	Successful protection of graveyard	

<b>SITE</b>	UP-KZK-2528-02 UP-KZK-2528-04 UP-KZK-2528-05 UP-KZK-2528-06 UP-KZK-2528-07 UP-KZK-2528-08 UP-KZK-2528-09 UP-KZK-2528-10 UP-KZK-2528-11 UP-KZK-2528-12 UP-KZK-2528-13	
<b>PROJECT COMPONENT/S</b>	Unspecified	
<b>POTENTIAL IMPACT</b>	Damage/destruction of sites.	
<b>ACTIVITY RISK/SOURCE</b>	Destruction of stone walls; Digging foundations and trenches into sensitive deposits/ earthmoving/ damage from heavy machinery during construction and during operation of piggery.	
<b>MITIGATION: TARGET/OBJECTIVE</b>	To conserve the historical fabric of the sites and to locate undetected heritage remains as soon as possible after disturbance to maximize the chances of successful rescue/mitigation work.	
<b>MITIGATION: ACTION/CONTROL</b>	<b>RESPONSIBILITY</b>	<b>TIMEFRAME</b>
<b>Fixed Mitigation Procedure (required)</b>		
Site Monitoring: Regular examination project area	ECO, HERITAGE PRACTITIONER	Monitor as frequently as practically possible.
<b>Preferred Mitigation</b>		
Avoidance during construction and operation phases of the project. Implement a heritage conservation buffer of at least 20m around the heritage resources in the High Sensitivity Area.	DEVELOPER	Continuous, starting prior to the commencement of construction and earth-moving on property.
<b>Alternative Mitigation (if preferred mitigation not feasible)</b>		
Phase 2 Specialist Analysis: Excavation and mapping Permitting required. Detailed Heritage management plan.	HERITAGE PRACTITIONER	Prior to the commencement of construction and earth-moving.
<b>PERFORMANCE INDICATOR</b>	Archaeological site context is preserved and mitigated with the minimum amount of unnecessary disturbance.	



## 8 RECOMMENDATION

The following general recommendations are made based the impact assessment process:

1. The Iron Age site **UP-KZK-2528-01** was damaged by recent earthmoving activities when surface vegetation was cleared in anticipation of construction. This site is regarded as having a heritage rating of **Low Significance (2b)** and direct impact on the site is **High**. The site will require active mitigation in the form a Phase 2 Specialist Investigation (excavation, mapping, documentation of heritage remains). The Phase 2 investigation is subject to the necessary excavation permits from the South African Heritage Resource Authority (SAHRA). Once this has been completed, a destruction permit should be obtained from SAHRA by the responsible Heritage practitioner.
2. The Late Iron Age stonewalled site **UP-KZK-2528-03** is rated as having **Medium Significance (3b)**. Direct impact on the site will be **High** since it is located next to an active road, farmhouse, and outbuildings and within original planned construction site. As a result, avoidance measures in the form of a buffer area will not be feasible and direct impact is very likely/unavoidable. As a result, active mitigation must be implemented by means of further Phase 2 Specialist Investigation (excavation, mapping, documentation of heritage remains). The Phase 2 investigation is subject to the necessary excavation permits from SAHRA. Once this has been completed, a destruction permit should be obtained from SAHRA by the responsible Heritage practitioner.
3. During the construction phase, it is recommended that building site as well as the Archaeological High Sensitivity Areas be **monitored** by the ECO as Monitor as frequently as is practically possible and whenever site visits are conducted.
4. **UP-KZK-2528-14** is an informal burial ground. It has a heritage significance rating of **High (4b)**. Burial grounds and graves are protected by the National Heritage Resources Act No 25 Of 1999, Section 36 and the Human Tissue Act of 1983. The individuals interred were likely farm labourers. There is no evidence that the graves are actively visited in the present. Since the burial ground have been actively avoided to date - despite being in an agricultural field - avoidance measures should ensure their future protection. A conservation buffer of at least 5m should be implemented around the burial ground to ensure the necessary protection of the site. In addition, the entire cemetery should be fenced off and access control should be applied. The fence should be positioned no closer than 2m from the nearest grave along the outer periphery of the site. If direct impact in future is unavoidable, then the burials should be exhumed and interred in a formal graveyard by a qualified Heritage Practitioner. An exhumation permit from SAHRA will be required for this.
5. In addition to the sites UP-KZK-2528-01 and UP-KZK-2528-03, a further **11 Late Iron Age stone walled sites** were identified (see site listing). These sites have a **Medium Significance (3)** rating. Although the stone enclosures, free standing walls and homestead clusters are discontinuously distributed across the landscape, they likely represent the remains of a single community. While the heritage assessment identified sites mostly based on the presence of surface features, such as stone walls, the presence of sub-surface deposits outside and within the walled areas are certain. These areas are designated to fall within an area of **Archaeological High Sensitivity** (Figure 56) and activity during the construction and operational phases in this area

must be avoided as far is possible. As a result, **no construction activities, staff, vehicles or activities, dumping or clearing is permitted in High Sensitivity Area**. The developer must declare this a "No-Go" area and access to these areas should be limited and delegated.

6. Due to the density of sites in the Archaeological High Sensitivity Area and the presence of a burial ground, a qualified heritage practitioner must draw up a **heritage Site Management Plan (SMP)**. This plan will serve to guide the medium- and long-term protection and conservation of heritage resources on Kameel Zyn Kraal 547 JR.

## 9 CONCLUSION

The Late Iron Age stonewalled sites on Kameel Zyn Kraal 547 JR are linked to the history of the Manala Ndebele people of the area. As a result, the sites are important in a regional context. These and related sites are located on a landscape which is under immense pressure from agricultural and urban intensification and measures should be taken to manage and monitor impact on the identified sites by means of suitable mitigation measures.

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## APPENDIX 1: HERITAGE LEGISLATION BACKGROUND

### A1.1 NATIONAL HERITAGE RESOURCES ACT NO 25 OF 1999, SECTION 35

According to the National Heritage Resources Act of 1999 a historical site is any identifiable building or part thereof, marker, milestone, gravestone, landmark or tell older than 60 years.

The Act identifies heritage objects as:

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

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

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

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

- a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite.
- b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite.
- c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
- d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects or use such equipment for the recovery of meteorites. (35. [4] 1999:58).”

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

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

b) bdestroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority.

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

## A1.2 HUMAN TISSUE ACT OF 1983 AND ORDINANCE ON THE REMOVAL OF GRAVES AND DEAD BODIES OF 1925

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

## APPENDIX 1: MANAGEMENT AND MITIGATION ACTIONS

### A1.1 CATEGORIES OF SIGNIFICANCE

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

#### A1.1.1 AESTHETIC VALUE:

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

#### A1.1.2 HISTORIC VALUE:

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

#### A1.1.3 SCIENTIFIC VALUE:

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

#### A1.1.4 SOCIAL VALUE

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

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

Formally protected sites:

- Grade 1 or national heritage sites, which are managed by SAHRA

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

Generally protected sites:

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

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

## A1.2 MITIGATION CATEGORIES

The following provides a guideline of relevant heritage resources management actions in the conservation of heritage resources:

### A1.2.1 *NO FURTHER ACTION / MONITORING*

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

### A1.2.2 *AVOIDANCE*

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

### A1.2.3 *MITIGATION*

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

### A1.2.4 *COMPENSATION*

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



### *A1.2.5 REHABILITATION*

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. It is not appropriate when the process necessitates the removal of previous historical layers, i.e. restoration of a building or place to the previous state/period. It is an appropriate heritage management action in the following cases:

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

### *A1.2.6 ENHANCEMENT*

Enhancement is appropriate where the overall heritage significance and its public appreciation value are improved. It does not imply creation of a condition that might never have occurred during the evolution of a place, e.g. the tendency to sanitize the past. This management action might result from the removal of previous layers where these layers are culturally of low significance and detract from the significance of the resource. It would be appropriate in a range of heritage contexts and applicable to a range of resources. In the case of formally protected or significant resources, appropriate enhancement action should be encouraged. Care should, however, be taken to ensure that the process does not have a negative impact on the character and context of the resource. It would thus have to be carefully monitored.