Cultural Heritage Impact Assessment:

Phase 1 Investigation for an Environmental Impact Assessment for the Proposed Construction of an Entertainment Area, Chalets, Camps, Cultural Huts, Septic Tank and Restaurant on the farm Driefontein 179, Portion 90, Muldersdrift, Mogale City Local Municipality, West Rand District Municipality, Gauteng Province

For

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Open Rubric

Executive Summary

This report contains a comprehensive heritage impact assessment investigation in accordance with the provisions of Sections 38(1) and 38(3) of the *National Heritage Resources Act* (Act No. 25 of 1999) (NHRA) and focuses on the survey results from a cultural heritage survey as requested by GKM Environmental Services. A Basic Assessment (BA) process will be followed for the proposed entertainment area, chalets, camps, cultural huts, septic tank, restaurant and grazing area on Portion 90 of the Farm Driefontein 179IQ near Muldersdrift, Mogale City Local Municipality, West Rand District Municipality, Gauteng Province. The property is located approximately 11 km north of Krugersdorp. The EIA process for Environmental Authorisation for the proposed recreation development is conducted in terms of the National Environmental Management Act (Act No. 107 of 1998)(NEMA).

Site No	Site Type	Field Rating of Significance	Direct Impacts	Significance of Impact before Mitigation	Significance of Impact after Mitigation	Proposed Mitigation
1	Possible historical prospecting trench with associated structures	Generally protected C: Low significance	High	64 (High)	20 (Low)	• Maintain a buffer zone of 10 metres during construction phase
2	Historical stone-walled livestock enclosure	Generally protected C: Low significance	High	64 (High)	20 (Low)	• Maintain a buffer zone of 10 metres during construction phase

A total of two sites were recorded during the survey of which one is a possible prospecting site (Sites 1) and the other a historical stone-walled livestock enclosure (Sites 2). If any impacts are envisaged the sites should be managed to prevent any impact. An Environmental Management Plan (EMP) should be compiled to address any future impacts by tourist and visitors to the farm.

No Stone Age, Iron Age or other historical settlements, structures, features, assemblages or artefacts were recorded during the survey.

It is therefore recommended, from a cultural heritage perspective that the proposed recreational development may proceed.

Also, please note:

Archaeological deposits usually occur below ground level. Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should be halted, and a university or museum notified in order for an investigation and evaluation of the find(s) to take place **(*cf*. NHRA (Act No. 25 of 1999)**, Section 36 (6)).

Definitions and abbreviations

Midden: Refuse that accumulates in a concentrated heap.
Stone Age: An archaeological term used to define a period of stone tool use and manufacture
Iron Age: An archaeological term used to define a period associated with domesticated livestock and grains, metal working and ceramic manufacture
LIA: Late Iron Age sites are usually demarcated by stone-walled enclosures
NHRA: National Heritage Resources Act (Act No. 25 of 1999)

SAHRA:	South African Heritage Resources Agency
SAHRIS:	South African Heritage Resources Information System
PHRA-G:	Provincial Heritage Resources Authority - Gauteng
GDARD:	Gauteng Department of Agriculture and Rural Development
HIA:	Heritage Impact Assessment
DMR:	Department of Mineral Resources
I&APs:	Interested and Affected Parties
CoH WHS	Cradle of Humankind World Heritage Site

I, Francois Coetzee, hereby confirm my independence as a cultural heritage specialist and declare that I do not have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of the listed environmental processes, other than fair remuneration for work performed on this project.

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1. Introduction and Terms of Reference

GKM Enviromental Services an independent environmental consultant was contracted by Wishington Farm (Pty) Ltd to undertake the EIA process for a recreational development on Portion 90 of the Farm Driefontein 179IQ near Muldersdrift, Mogale City Local Municipality, West Rand District Municipality, Gauteng Province. The properties are located approximately 11km north of Krugersdorp. The EIA process for Environmental Authorisation for the proposed development is conducted in terms of the National Environmental Management Act (Act 107 of 1998)(NEMA). A Cultural Heritage Impact Assessment (HIA) was requested by GKM Environmental on behalf of the client to evaluate the potential impact of the proposed development activities.

2. Objectives

The general objective of the cultural heritage survey is to record and document cultural heritage remains consisting of both tangible and intangible archaeological and historical artefacts, structures (including graves), settlements and oral traditions of cultural significance.

As such the terms of reference of this survey are as follows:

- Identify and provide a detailed description of all artefacts, assemblages, settlements and structures of an archaeological or historical nature (cultural heritage sites) located on the study area,
- Estimate the level of significance/importance of these remains in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value,
- Assess any impact on the archaeological and historical remains within the area emanating from the development activities, and
- Propose recommendations to mitigate heritage resources where complete or partial conservation may not be possible and thereby limit or prevent any further impact.

3. Description of Physical Environment of Study Area

The heritage survey focussed on areas situated approximately located approximately 11 km north of Krugersdorp, Gauteng.

Farm Name(s) and Portions	The following portions and farms: Portion 90 of the Farm Driefontein 179 IQ
Size of Survey Area	20 hectares
Magisterial District	Mogale City Local Municipality West Rand District Municipality
1:50 000 Map Sheet	2527DD 2627BB
1:250 0000 Map Sheet	2526 2626
Central Coordinates of the Development	27.806950°E 25.999590°S

Table 1: Physical Environment

The survey area falls within the Savanna Biome, particularly the Central Bushveld Bioregion and more specifically the Andesite Mountain Bushveld (SVcb 11) (Mucina & Rutherford 2006). This veld type occurs in Gauteng, North-West, Mpumalanga and Free State Provinces. Several separate occurrences of which the main areas are: the Bronberg Ridge in eastern

Pretoria extending to Welbekend, from Hartebeesthoek in the west along the valley between the two parallel ranges of hills to Atteridgeville, hills in southern Johannesburg, several hills encompassing Nigel, Willemsdal, Coalbrook and Suikerbosrand (in part) and the outer ring of ridges of the Vredefort Dome and some hills to the northwest around Potchefstroom. Altitude about 1 350–1 800 m. Erosion is generally very low.

The survey area is located north (11 km) of Krugersdorp and the region is characterised by plains, slightly undulating plains and dolomite hills, supporting open woodland with a fairly dense shrub layer. Infrastructure consists of the R114 to the east and several dirt roads that provide access to the area, as well as houses, power lines, fences, and extensive agricultural fields (both used and fallow).

Please note that the proposed study area falls within the core area of the Cradle of Humankind World Heritage Site (CoH WHS) and as such, is subject to the provisions of the World Heritage Convention Act (Act No. 49 of 1999), the National Environmental Management: Protected Areas Act (Act No. 57 of 2003) and the associated regulations for the proper administration of special Nature Reserves, National Parks and World Heritage Sites.

The Mogale City Local Municipality (MCLM) experiences typical Highveld climate conditions, with warm to hot summers, fairly high rainfall and moderate to cool winters with little to no rainfall. MCLM straddles the Grassland and Savanna Biomes with topography ranging from 1220 m to 1840 m above sea level.

The mean monthly mid-day temperatures in the Krugersdorp area range between 18°C and 25°C, while the mean monthly night time temperatures range between 3° C and 14°C. Average monthly data from Krugersdorp over a 29 year period (1961 – 1990) shows that the highest temperatures are experienced between October to March.

Current Zoning	Agricultural (Cultivation)
Economic activities	Farming and tourism (eco-tourism)
Soil and basic geology	The eastern portions of MCLM are underlain by a wide variety of geologic materials including granite and gneiss to the north-east of Krugersdorp. The Beaufort Group, which consists mainly of sandstone and shale, is found directly to the east of Krugersdorp, while the Witwatersrand, Dominion and Pongo Groups are located to the south-east of Krugersdorp. This variety of geologic materials has given rise to a diverse range of soils which cover MCLM. The dolomites in MCLM belong to the Transvaal Supergroup (Malmani Subgroup of the Chuniespoort Group). The CoH WHS is predominantly underlain by strata of the Chuniespoort and Pretoria Groups of the Transvaal Supergroup with minor sections underlain by rocks of the Halfway House Granites, Ventersdorp Supergroup and Witwatersrand Supergroup (COH WHS EMF Status Quo Report, 2009)
Prior activities	Livestock farming and agriculture
Socio Economic Environment	MCLM has the largest Gross Domestic Product per region (GDP-R) and the highest growth rate in the West Rand. It has a diversified economy, mainly consisting of manufacturing and tourism, and the economic growth is relatively broad-based. In the past gold mining was the core of the region's economy, but due to the closure of mines, the focus has shifted to manufacturing and

	agribusiness. The dominant economic sector in MCLM is retail. Tourism, eco-tourism, agriculture and business all have the potential to generate economic growth in the local economy. Unfortunately economic activity has had significant negative impacts on MCLM's natural environment, resulting in the alteration of the natural landscape, air, soil and water pollution, and loss of biodiversity. MCLM is the most populated city in the West Rand region with a population of 362 422. It had a population growth rate of 62% between 1996 and 2011. Population growth rate showed a significant increase between 1996 and 2006, after which the growth rate slowed. Currently the population growth rate is 2.04% per annum (StatSA Census, 2012) and this is forecast to slow to 1.1% by 2016. Unemployment is at 24.6% of the population (StatsSA Census,2012) which is slightly lower than the 26% reported in the MCLM IDP 2002 report. Trade, manufacturing and households are the major sectors contributing to job opportunities in MCLM (MCLM IDP 2013/2014)
Evaluation of Impact	An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits NHRA (Act No. 25 of 1999, Section 38(3d)): **Positive**

Table 2: Socio-economic environment

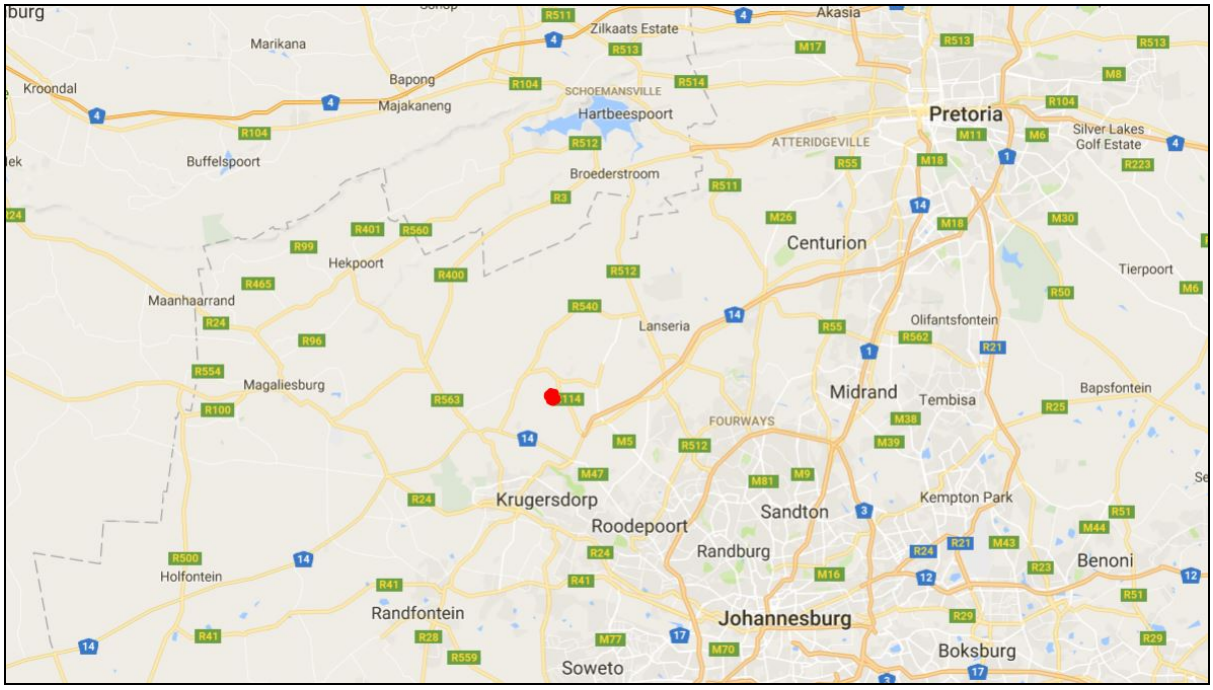

Figure 1: Regional context of the survey footprint located north of Krugersdorp (indicated by the red area)

Figure 2: Local context of the survey area located north of Krugersdorp (indicated by red square)

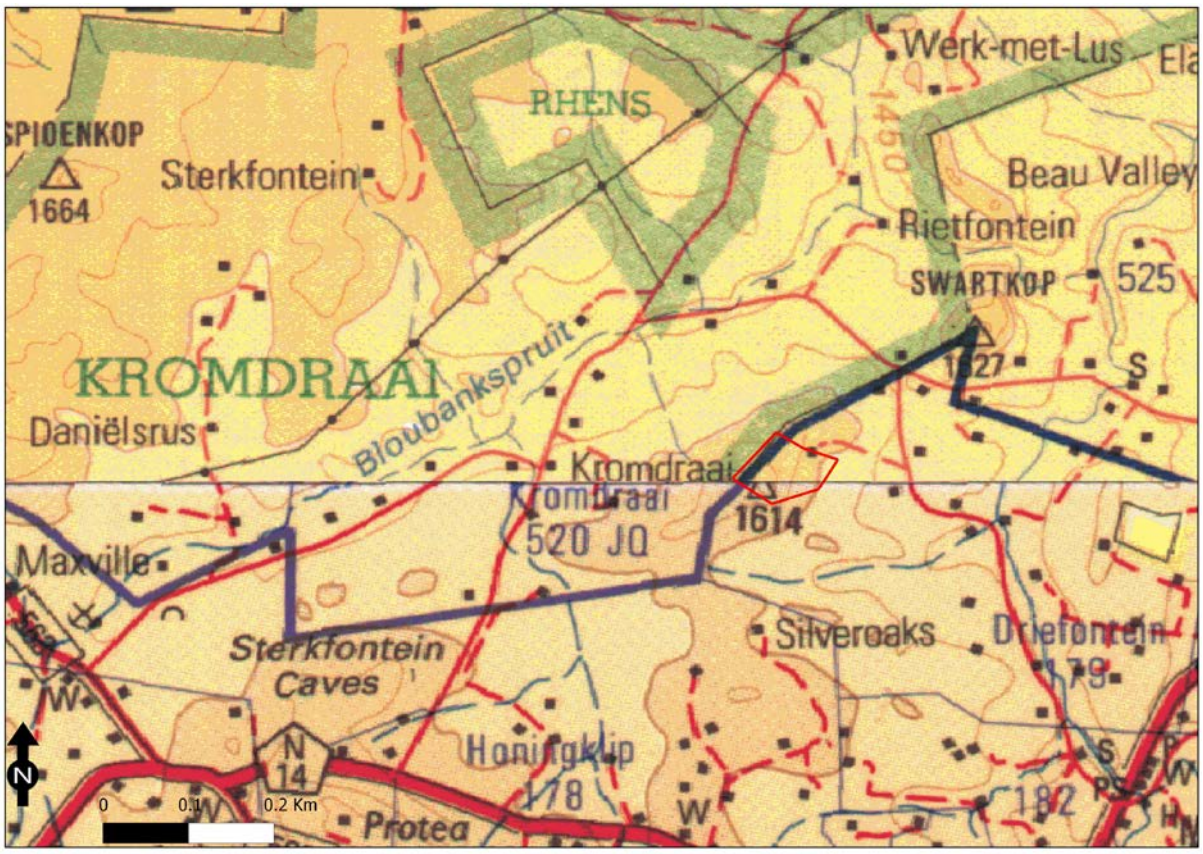

Figure 3: Local context of the survey footprint (1:250 000 Maps 2526 & 2626)

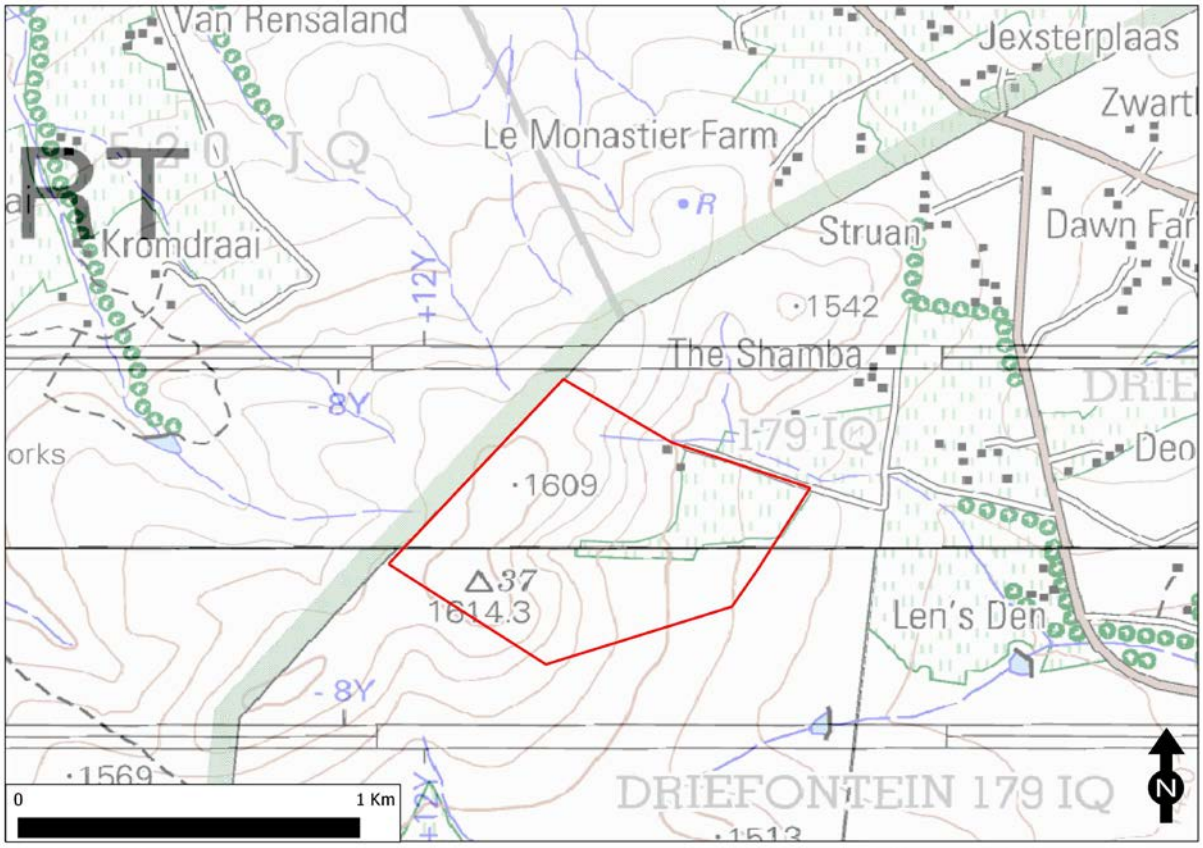

Figure 4: The survey area as indicated on the 1:50 000 topographic maps 2527DD & 2627BB (1994)

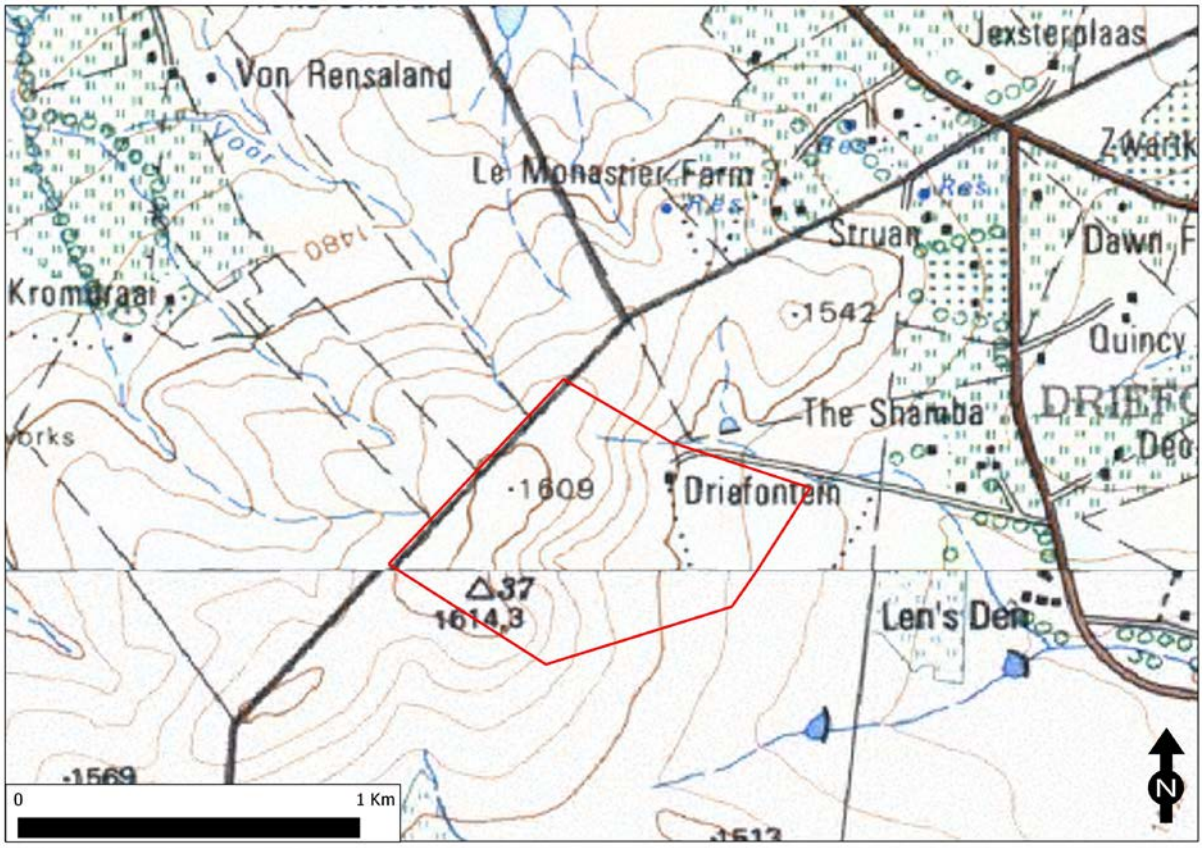

Figure 5: The survey area as indicated on the 1:50 000 topographic maps 2527DD & 2627BB (1986)

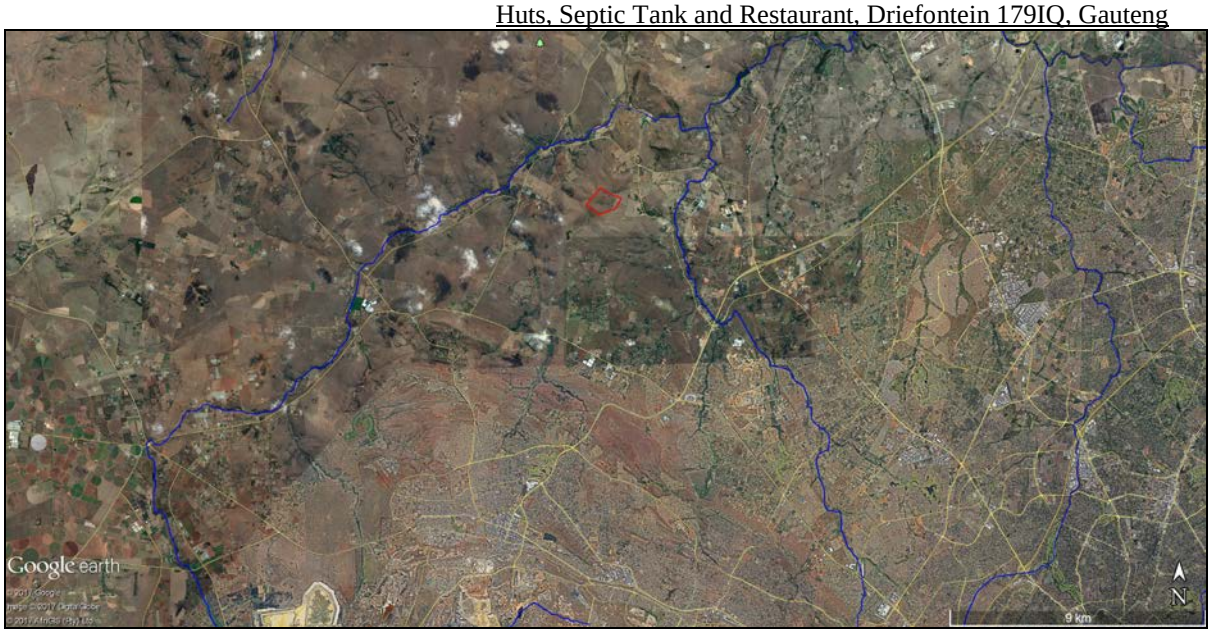

Figure 6: Survey area as indicated on Google Earth Pro (2017)

Figure 7: Detail of survey area as indicated on Google Earth Pro (2017)

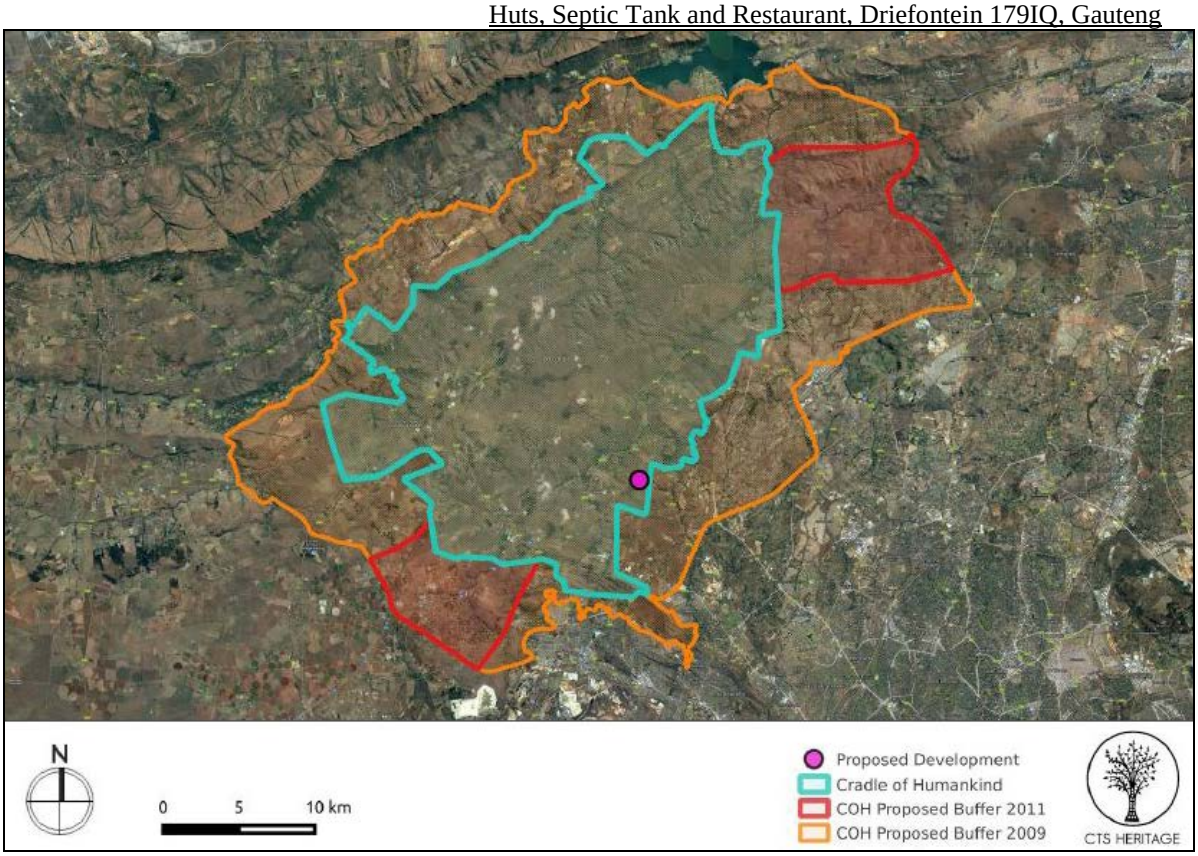

Figure 8: Location of the survey area relative to the CoH WHS (after CTS Heritage Desktop 2017)

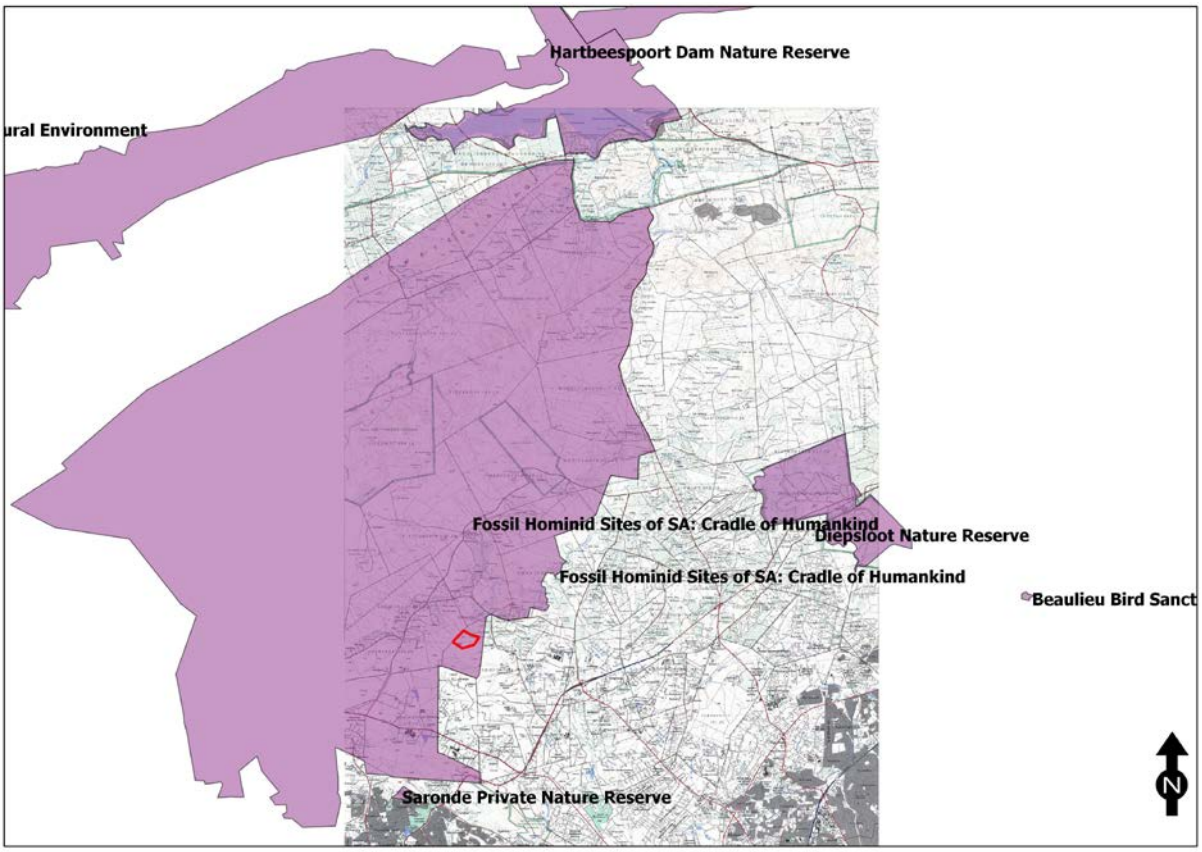

Figure 9: Location of various Protected Areas in the region near the survey footprint

Figure 10: General view of agricultural fields used for growing cattle feed (eastern low-lying areas)

Figure 11: General view of the eastern section of the survey footprint

Figure 12: General view of the central valley in the survey footprint

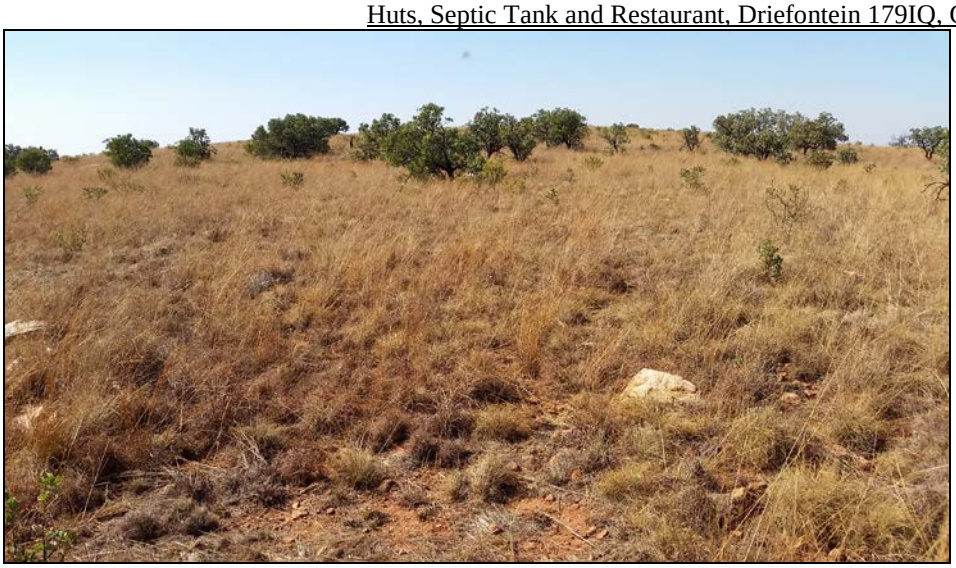

Figure 13: General view of the western section of the survey footprint (top of mountain)

4. Proposed Project Description

The proposed recreational development will consist of the following aspects:

- restaurant;
- entertainment area;
- cultural huts:
- camps;
- chalets
- septic tank; and
- the establishment of a grazing area for livestock.

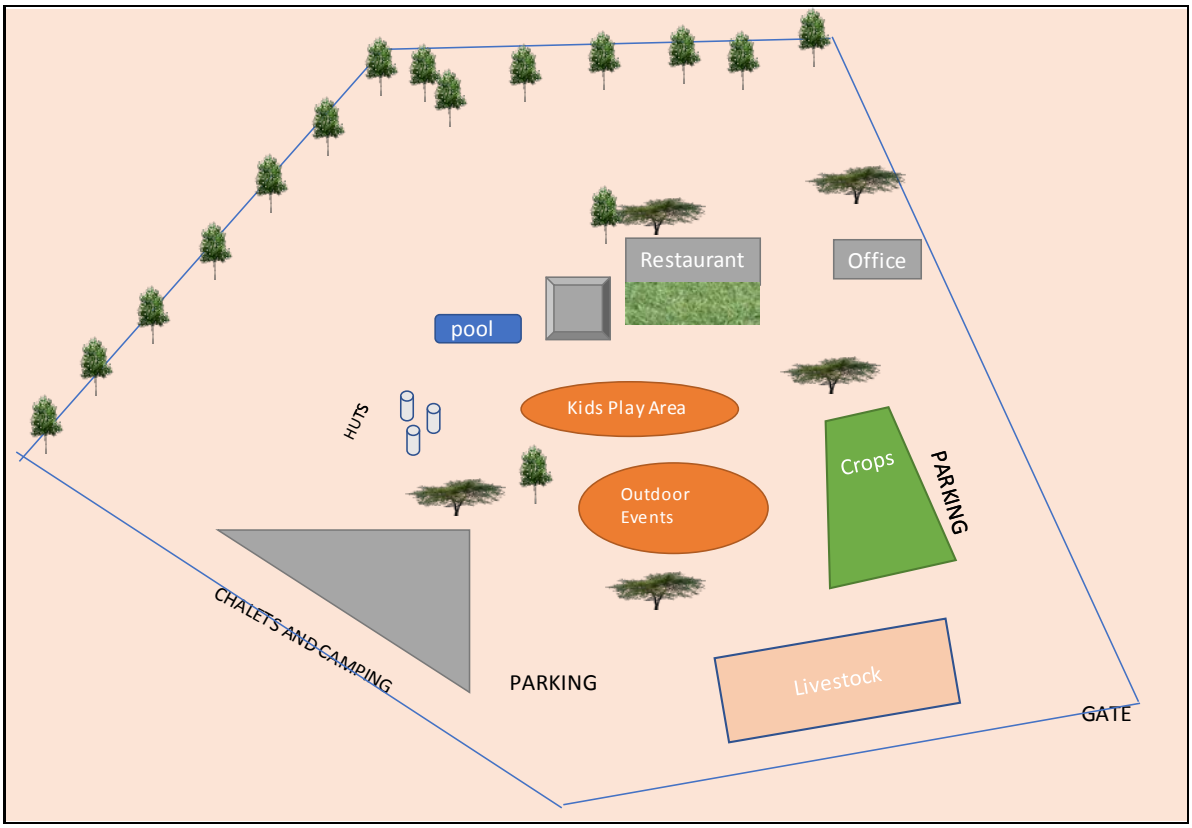

Figure 14: General layout of the proposed recreational development

5. Legal Framework

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE APPLIED
The Constitution of the Republic of South Africa (Act No. 108 of 1996)	
The National Environmental Management Act (Act No. 107 of 1998)	Section 24 Section 28
The National Water Act (Act No. 36 of 1998)	Section 21 (a)(b)
Regulation 2, Appendix 2 of Governmental Notice Regulation (GNR) 982	Appendix 2 (a-l)
Air Quality Act (Act No. 39 of 2004)	Section 21
National Forests Act, Act of 84 of 1998	Chap 3 (Part 1), Section 12(1), Section 15(1)
The National Heritage Resources Act (Act No. 25 of 1999)	Section 38, 34, 35, 36
Conservation of Agricultural Resources Act (Act No. 85 of 1983)	-
Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)	-
The National Water Act (Act No. 36 of 1998);	Section 21(c) and (i)
Mine Health and Safety Act (Act No. 29 of 1996) (MHSA)	
Biodiversity Act (Act 10 of 2004)	
World Heritage Convention Act (Act No. 49 of 1999)	
National Environmental Management: Protected Areas Act (Act No. 57 of 2003)	
National Infrastructure Plan	
The Mogale City Local Municipality Spatial Planning and Land Use Management By-Law 2016	
Mogale City Integrated Management Plan 2017	-
Cradle of Humankind World Heritage Site Management Authority (MA)	

Table 3: Legal framework

Section 38 of the NHRA (Act No. 25 of 1999) stipulates that the following activities trigger heritage survey:

Development criteria in terms of Section 38(1a-e) of the NHRA (Act No. 25 of 1999)	Yes/No
Construction of road, wall, powerline, pipeline, canal or other linear form of development or barrier exceeding 300m in length	Yes
Construction of bridge or similar structure exceeding 50m in length	No
Development exceeding 5000 m^2 in extent	Yes
Development involving three or more existing erven or subdivisions	No
Development involving three or more erven or divisions that have been consolidated within past five years	No
Rezoning of site exceeding 10 000 m^2	Yes
Any other development category, public open space, squares, parks, recreation grounds	No

Table 4: Activities that trigger Section 38 of the NHRA

- Field rating system as recommended by SAHRA:

Field Rating	Grade	Significance	Recommended Mitigation
National Significance	Grade I	High significance	Conservation by SAHRA, national site nomination, mention any relevant international ranking. No alteration
Provincial Significance	Grade II	High significance	Conservation by provincial heritage authority, provincial site nomination. No alteration whatsoever without permit
Local Significance	Grade III-A	High significance	Conservation by local authority, no alteration whatsoever without permit from provincial heritage authority. Mitigation as part of development process not

Local Significance	Grade III-B	High significance	Conservation by local authority, no external alteration without permit from provincial heritage authority. Could
Generally Protected A	Grade IV-A	High/medium significance	Conservation by local authority. Site should be mitigated before destruction. Destruction permit required from
Generally Protected B	Grade IV-B	Medium significance	Conservation by local authority. Site should be recorded before destruction. Destruction permit required from provincial heritage authority.
Generally Protected C	Grade IV-C	Low significance	Conservation by local authority. Site has been sufficiently recorded in the Phase 1 HIA. It requires no further recording before destruction. Destruction permit

Table 5: Field rating system to determine site significance

- Heritage resources have lasting value in their own right and provide evidence of the origins of South African society and they are valuable, finite, non-renewable and irreplaceable.

- All archaeological remains, features, structures and artefacts older than 100 years and historic structures older than 60 years are protected by the relevant legislation, in this case the **National Heritage Resources Act (NHRA) (Act No. 25 of 1999, Section 34 & 35)**. The Act makes an archaeological impact assessment as part of an EIA and EMPR mandatory (see **Section 38**). No archaeological artefact, assemblage or settlement (site) may be moved or destroyed without the necessary approval from the **South African Heritage Resources Agency (SAHRA)**. Full cognisance is taken of this Act in making recommendations in this report.

- Cognisance will also be taken of the Mineral and Petroleum Resources Development Act (Act No 28 of 2002) and the National Environmental Management Act (Act No 107 of 1998) when making any recommendations.

- Human remains older than 60 years are protected by the NHRA, with reference to Section 36. Human remains that are less than 60 years old are protected by the Regulations Relating to the Management of Human Remains (GNR 363 of 22 May 2013) made in terms of the National Health Act No. 61 of 2003 as well as local Ordinances and regulations.

- With reference to the evaluation of sites, the certainty of prediction is definite, unless stated otherwise.

- The guidelines as provided by the NHRA (Act No. 25 of 1999) in Section 3, with special reference to subsection 3, and the Australian ICOMOS (International Council on Monuments and Sites) Charter (also known as the Burra Charter) are used when determining the cultural significance or other special value of archaeological or historical sites.

- A copy of this report will be submitted on SAHRIS as stipulated by the National Heritage Resources Act (NHRA) (Act No. 25 of 1999), Section 38 (especially subsection 4) and the relevant Provincial Heritage Resources Authority (PHRA).

- Note that the final decision for the approval of permits, or the removal or destruction of sites, structures and artefacts identified in this report, rests with the SAHRA (or relevant PHRA).

- World Heritage Convention Act (Act No. 49 of 1999), the National Environmental Management: Protected Areas Act (Act No. 57 of 2003) and the associated regulations for the proper administration of special Nature Reserves, National Parks and World Heritage Sites.

6. Study Approach/Methodology

Geographical information (ESRI shapefiles) on the proposed prospecting areas was supplied by GKM Environmental Services. The most up-to-date Google Earth images and topographic maps were used to indicate the survey area. Topographic maps were sources from the Surveyor General. Please note that all maps are orientated with north facing upwards (unless stated otherwise).

The strategy during this survey was to survey most of the farm footprint. The owner of the farm was consulted to ascertain whether any known heritage sites or graves are known to occur on the farm. Most areas were surveyed by conducting intuitive pedestrian (foot) surveys. The survey area is characterised by ploughed agricultural fields (eastern section) at the foot of a hill and undulating hills (western section).

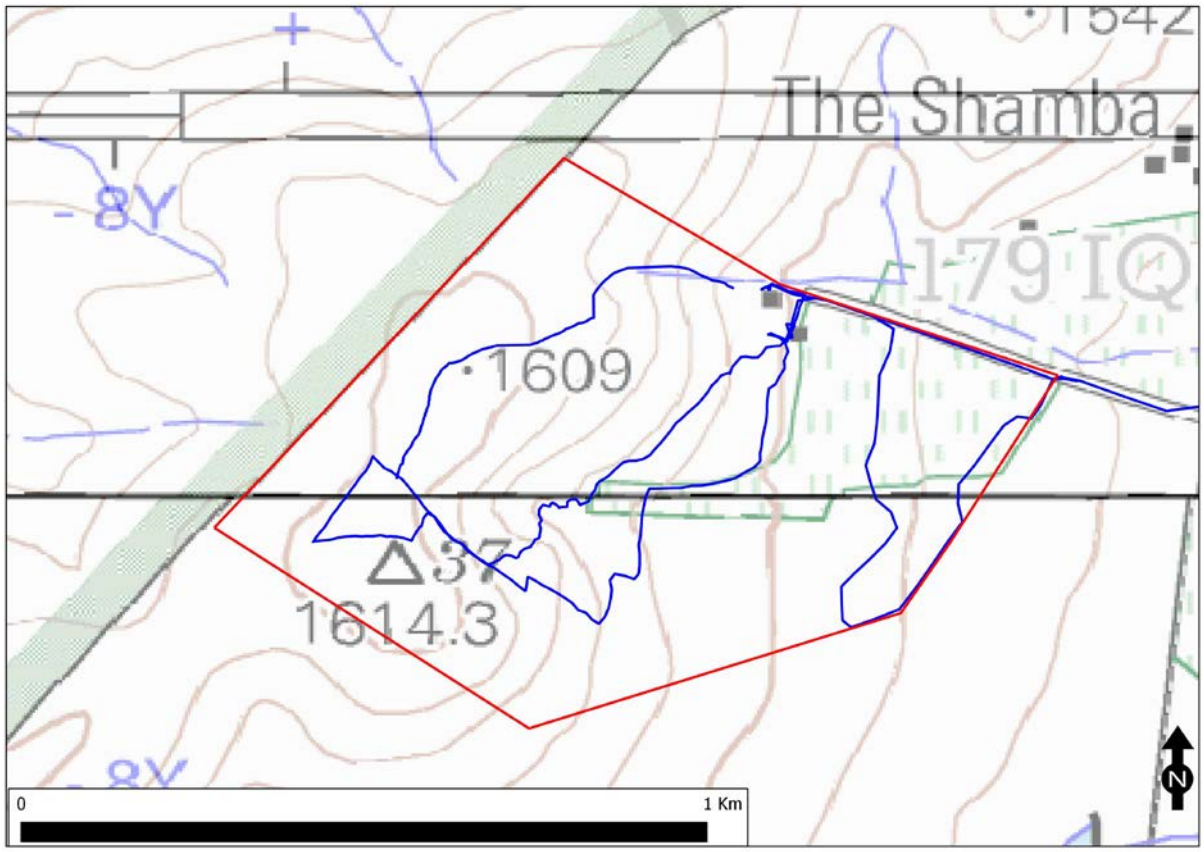

Figure 15: Recorded survey tracks for the project

6.1 Review of existing information/data

Additional information on the cultural heritage of the area was sourced from the following records:

- National Mapping Project by SAHRA (which lists heritage impact assessment reports submitted for South Africa);
- Environmental Potential Atlas (ENPAT);

- Online SAHRIS database;
- National Automated Archival Information retrieval System (NAAIRS);
- Maps and information documents supplied by the client; and
- Several surveys have been conducted in the vicinity of the survey area (published and unpublished material) (Birkholtz 2008, Higgitt & Nel 2014, Huffman 2007, Karodia-Khan et al 2012, Stratford 2013 and Van Schalkwyk 2008)

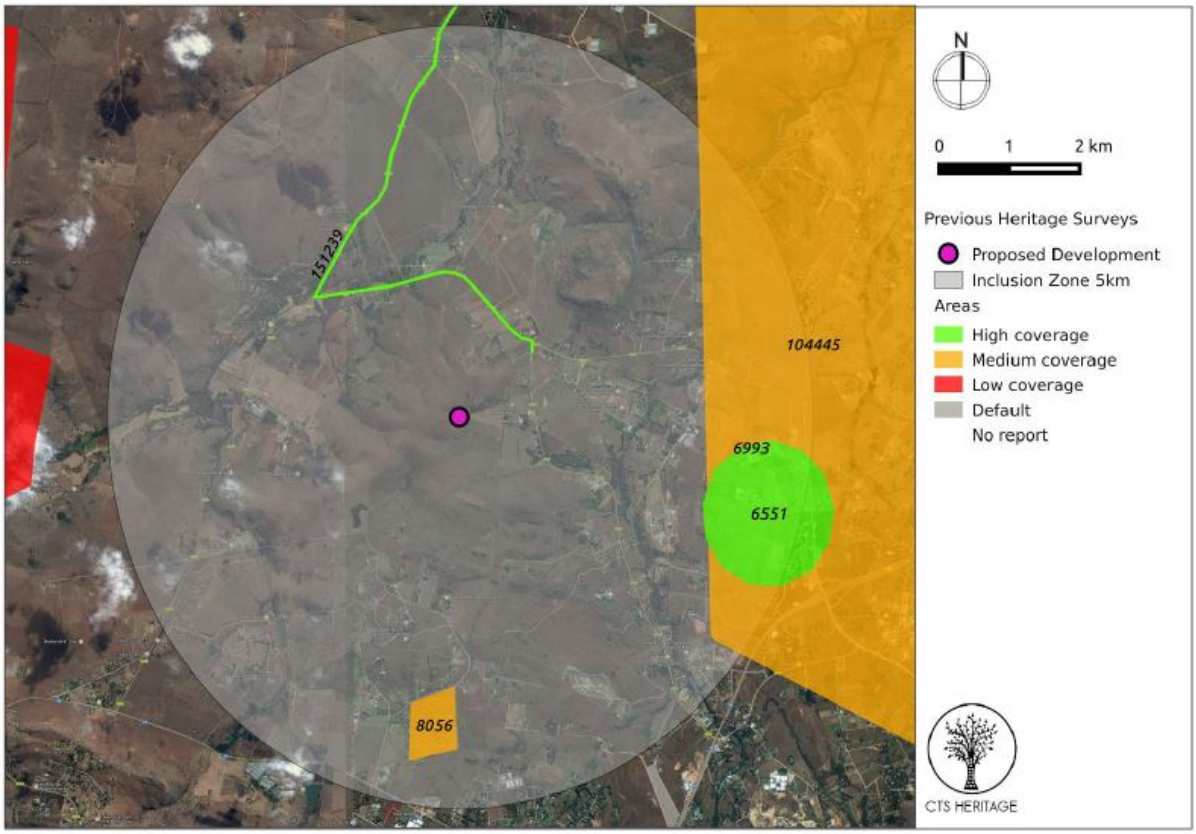

Figure 16: Previous heritage assessments relative to the survey area (after CTS Heritage Desktop 2017)

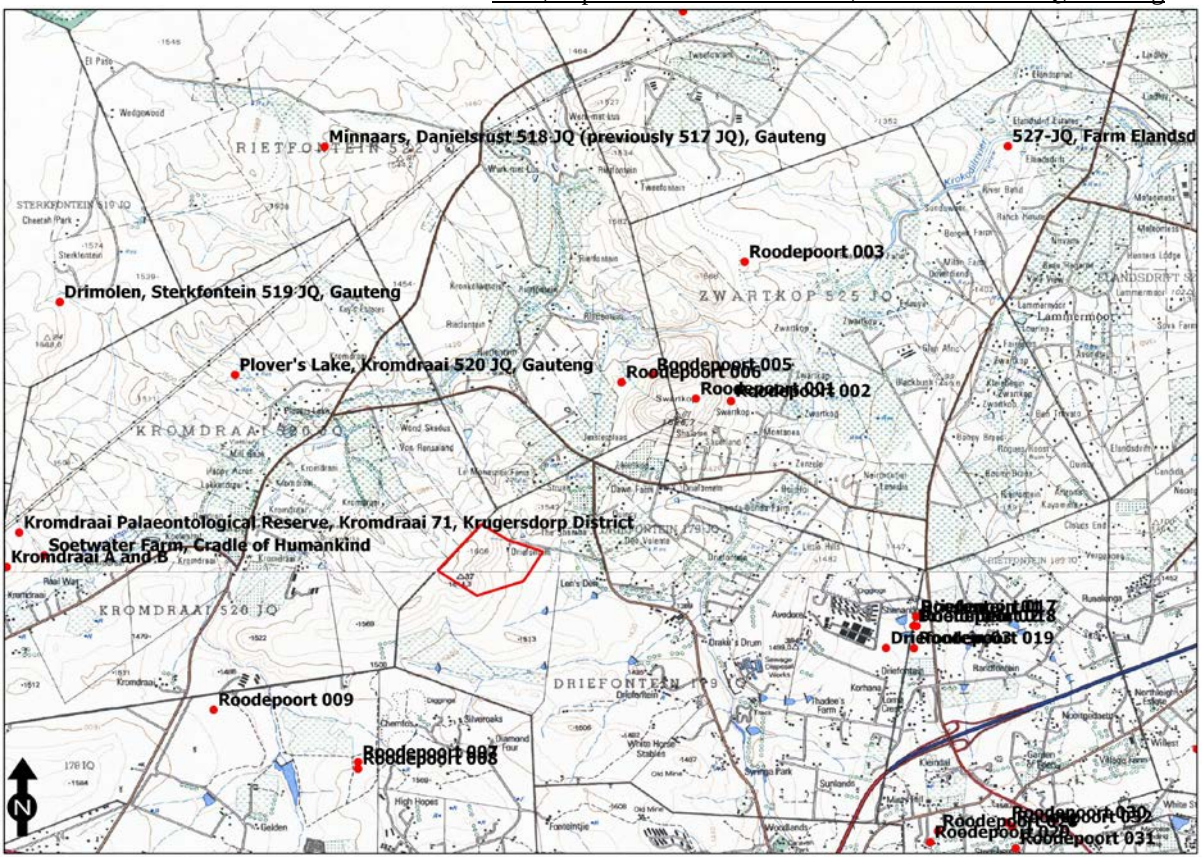

Figure 17: Palaeontological and archaeological sites that are known and surveyed in the region

According to the Surveyor General's database the farm Driefontein 179 IQ was originally surveyed in 1896, but it seems that Portion 90 was subdivided in 1966 and later refined in 1974 (also see Addendum 3). It seems that this portion of the original farm was retained for agriculture and the mountainous areas for grazing. As a result no farmhouse was constructed during this early period (late 19th and early 20th centuries) of occupation and utilisation. The stone kraal (Site 2) might be associated with this early period and possibly functioned as a cattle outpost.

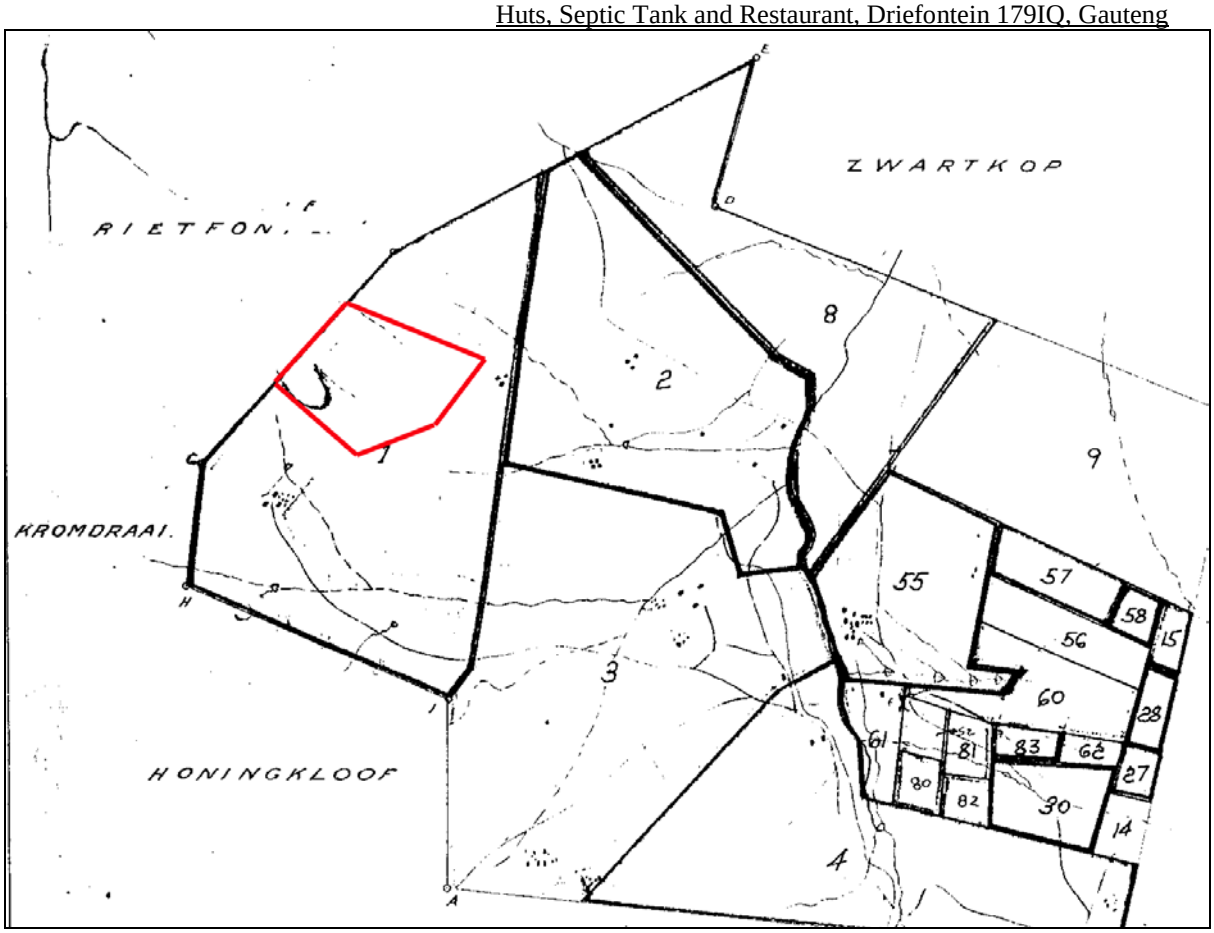

Figure 18: Portion 90 of the farm Driefontein 179IQ as indicated on the 1896 survey drawing

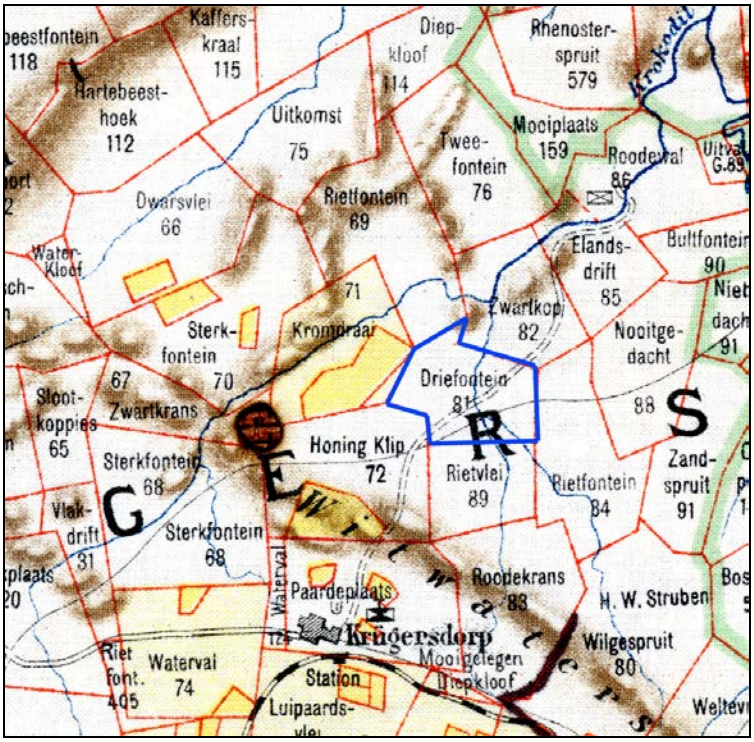

Figure 19: Jeppe's Map dating to 1899 indicates the location the farm under investigation

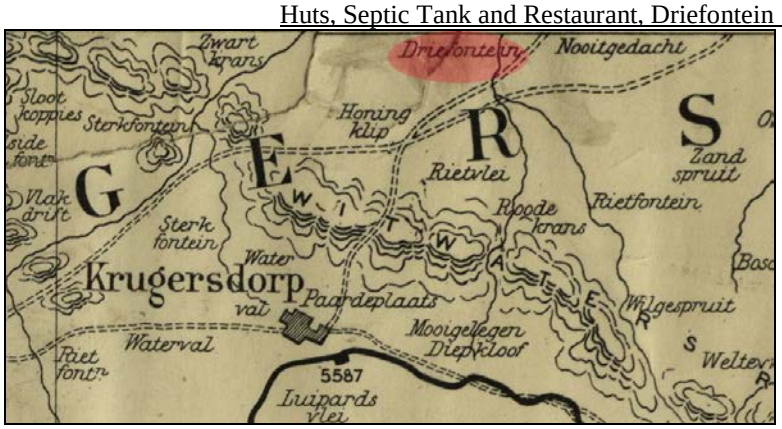

Figure 20: War Office Map indicating the location of the survey area as it was in 1900

6.2 Palaeontological sensitivity

The site proposed for development falls within the Rietgat Formation which, according to the SAHRIS Palaeosensitivity Map is of moderate sensitivity for impacts to palaeontology. According to the SAHRIS Fossil Layer Browser, the Rietgat Formation forms part of the Ventersdorp Supergroup and is known for lacustrine stromatolites reported in carbonates of the Rietgat Formation (Platberg Group) and possible organic-walled microfossils in found in cherts. In close proximity to the proposed development is the Oaktree Formation of very high palaeontological sensitivity. This is the geological formation associated with the location of the fossil hominid sites of the Cradle of Humankind, and is known for its Late Cenozoic fossiliferous cave breccias. However, based on the available information, the proposed development will not be impacting the significant Oaktree Formation and as such, it is unlikely that the proposed development will impact on significant palaeontological resources (CTS Heritage 2017).

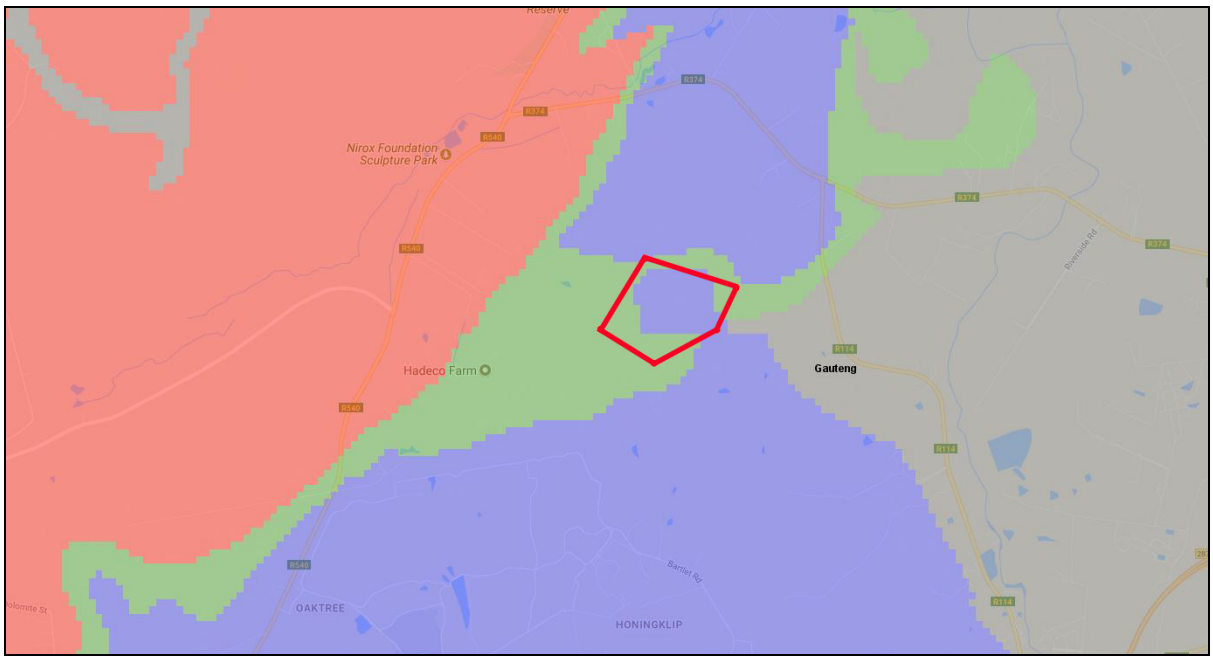

Figure 21: No high palaeontological sensitivity zones are located within the survey footprint (SAHRIS 2017)

6.3 Site visits

The field survey was conducted on 1 September 2017.

6.4 Social interaction and current inhabitants

The current farm owner was consulted during the field survey. Both the main buildings on the farm are currently occupied.

Figure 22: Buildings on the farm which are currently occupied

6.5 Public Consultation and Stakeholder Engagement

Written notices in the form of a background information document were circulated via emails and a knock and drop exercise. A register was used to gather confirmation that the community within the proposed site had received notification. A Background Information Document was used to inform the community and authorities of the proposed project. In addition, emails of acknowledgement have also been included as part of this report as confirmation of notification. The aim of this document is to provide a brief outline of the application and the nature of the development. It is also aimed at providing preliminary details regarding the EIA process, and explains how I&APs could become involved in the project. In compliance with the EIA Regulations (2014), notification of the commencement of the EIA process for the project was advertised in a local newspaper. The advert was placed in the Government Gazette on Friday 11 August 2017. On the 4th of August 2017, an interested and affected party register was opened. Members of the community were encouraged to register their interest in the project and become involved in the EIA process. All those that confirmed interest in the project where included in a register. All concerns and the draft reports discussed at the first Public Participation meeting.

6.6 Assumptions, restrictions, gaps and limitations

No severe physical restrictions were encountered as the survey area was fairly accessible. The survey area is however severely disturbed due to farming and possible prospecting activities. As a result not all areas were investigated in detail, as it was relatively easy to determine which areas will probably not yield archaeological and historical remains.

6.7 Methodology for assessment of potential impacts

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

- The **nature**, a description of what causes the effect, what will be affected and how it will be affected;
- The **physical extent**, wherein it is indicated whether:
    - 1 - the impact will be limited to the site;
    - 2 - the impact will be limited to the local area;
    - 3 - the impact will be limited to the region;

  - 4 - the impact will be national; or
  - 5 - the impact will be international.
- The **duration**, wherein it is indicated whether the lifetime of the impact will be:
  - 1 - of a very short duration (0–1 years);
  - 2 - of a short duration (2-5 years);
  - 3 - of a medium-term (5–15 years);
  - 4 - of a long term (> 15 years); or
  - 5 - permanent.
- The **magnitude** of impact, quantified on a scale from 0-10, where a score is assigned:
  - 0 - small and will have no effect;
  - 2 - minor and will not result in an impact;
  - 4 - low and will cause a slight impact;
  - 6 - moderate and will result in processes continuing but in a modified way;
  - 8 - high, (processes are altered to the extent that they temporarily cease); or
  - 10 - very high and results in complete destruction of patterns and permanent cessation of processes;
- The **probability** of occurrence, which describes the likelihood of the impact actually occurring and is estimated on a scale where:
  - 1 - very improbable (probably will not happen);
  - 2 - improbable (some possibility, but low likelihood);
  - 3 - probable (distinct possibility);
  - 4 - highly probable (most likely); or
  - 5 - definite (impact will occur regardless of any prevention measures);
- The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;
- The **status**, which is described as either positive, negative or neutral;
  - The degree to which the impact can be reversed;
  - The degree to which the impact may cause irreplaceable loss of resources; and
  - The degree to which the impact can be mitigated.

The significance is determined by combining the criteria in the following formula:

S = (E+D+M) x P; where:
S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

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

7. The Cultural Heritage Sites

7.1 Declared Protected Area (CoM WHS)

Portion 90 of the farm Driefontein 179 IQ falls within the CoM WHS and as a result the following additional aspects should be noted.

The listing of the Cradle of Humankind World Heritage Site in terms of the World Heritage Convention resulted in several duties and obligations being imposed on the South African government, which is required to give effect to its international obligations to protect and conserve the site. In practice, this obligation falls primarily with the management authority in line with powers and duties as identified in the World Heritage Convention Act, 1999 (Act No. 49 of 1999) as well as in provisions of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) and the associated regulations for the proper administration of special nature reserves, national parks and World Heritage Sites.

In terms of the above provisions, which are applicable to the proclaimed "property", the management authority has a responsibility and duty to manage the property, which includes the review and a decision on applications for development, including a host of activities and events as defined by the above legislation. In order to facilitate the application and authorisation process as defined by legislation, the management authority requires the submission of completed application forms prior to the commencement of construction or the undertaking of an event or activity that requires authorisation.

Application forms to be completed and duly submitted to the management authority are provided for both development activities as well as events taking place within the defined property. It is important to note that the declared World Heritage Site is a "protected area" and hence, in addition to approvals required for development from local authorities and other provincial authorities, authorisation from the management authority is required for numerous development activities as well as events as defined by legislation.

Should proposed development or events take place within the buffer zone of the property, please contact Hein Pienaar on +27 (0)11 085 2486 or +27 (0)82 454 6617, or at hein@gauteng.net for further information on the authorisation for development and events within the area (http://www.thecradleofhumankind.net/pages/management).

This World Heritage Site is managed on behalf of the Minister of Environmental Affairs by the Cradle of Humankind World Heritage Site Management Authority. The primary goal of the Management Authority is to protect, conserve and interpret the Outstanding Universal Value (OUV) of the site. The Authority also facilitates and supports the following:

- ongoing scientific research in the site;
- ensures tangible community beneficiation, and growth in the visitor economy of the CoHWHS;
- ensures that development within the CoHWHS maintains the OUV;
- supports the participation of small enterprises and cooperatives in the visitor economy of the COHWHS; and
- collaborates with all role-players involved in the socio-economic development of the Western Corridor.

While the protection and conservation of the fossil sites that constitute the OUV of the site is of paramount importance in the overall management of the site, a great emphasis is placed on

the management of the site with and for surrounding communities (https://provincialgovernment.co.za/units/view/153/Gauteng/Cradle-of-Humankind-World-Heritage-Site).

7.2 Isolated occurrences

Isolated occurrences are artefacts or small features recorded on the surface with no contextual information. No other associated material culture (in the form of structures or deposits) was noted that might provide any further context. This can be the result of various impacts and environmental factors such as erosion and modern developments. By contrast archaeological sites are often complex sites with evidence of archaeological deposit and various interrelated features such as complex deposits, stone walls and middens. However, these isolated occurrences are seen as remains of erstwhile complex or larger sites and they therefore provide a broad indication of possible types of sites or structures that might be expected to occur or have occurred in the survey footprint.

Throughout the survey area several isolated occurrences were recorded usually associated with the Middle Stone Age. These surface finds were recorded near open areas in the eastern section (Driefontein 179 IQ) of the survey area. As such a general A°/m² index for the survey footprint is 0 – 5 artefacts per m^2 which is low.

7.3 Heritage sites

A total of two sites were recorded during the survey of which one is a possible prospecting site (Sites 1) and the other a historical stone-walled livestock enclosure (Sites 2). If any impacts are envisaged the sites should be managed to prevent any impact. An Environmental Management Plan (EMP) should be compiled to address any future impacts by tourist and visitors to the farm.

No Stone Age, Iron Age or other historical settlements, structures, features, assemblages or artefacts were recorded during the survey.

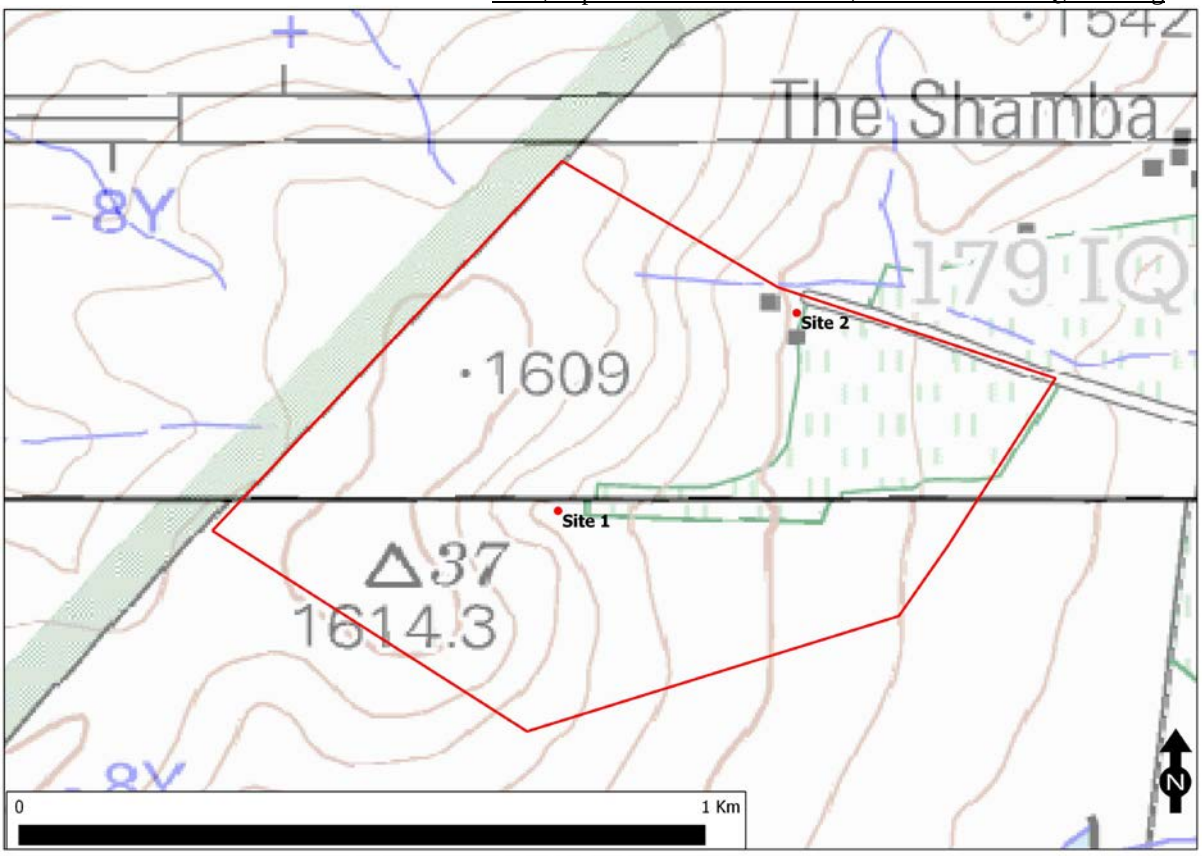

Figure 23: Location of the recorded heritage sites

8. Locations and Evaluation of Sites

Site No	Coordinates	Site Type	Field Rating of Significance	Impact	Proposed Mitigation
1	26.000125°S 27.805444°E	Possible historical prospecting trench with associated structures	Generally protected C: Low significance	High	• Maintain a buffer zone of 10 metres during construction phase
2	25.997231°S 27.808933°E	Historical stone-walled livestock enclosure	Generally protected C: Low significance	High	• Maintain a buffer zone of 10 metres during construction phase

Table 6: Location and evaluation of sites

9. Management Measures

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

9.1 Objectives

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

The following shall apply:

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

9.2 Control

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

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

10. Recommendations and Conclusions

A total of two sites were recorded during the survey of which one is a possible prospecting site (Sites 1) and the other a historical stone livestock enclosure (Sites 2). If any impacts are envisaged the sites should be managed to prevent any impact. An Environmental Management Plan (EMP) should be compiled to address any future impacts by tourist and visitors to the farm.

No Stone Age, Iron Age or other historical settlements, structures, features, assemblages or artefacts were recorded during the survey.

It is well known that Late Iron Age stone-walled settlements do occur further north and south of the survey area. However none were found in the survey footprint.

It is therefore recommended, from a cultural heritage perspective, that the proposed mining activities may proceed.

Nature: Two historical features (Sites 1 & 2) have been recorded within the area of the proposed recreational development.		
	Without mitigation	**With mitigation**
Construction Phase		
Probability	Highly probable (4)	Improbable (2)
Duration	Very short term (1)	Very short term (1)
Extent	Limited to the site (1)	Limited to the site (1)
Magnitude	High (8)	Minor (2)
Significance of Impact	**40 (Medium)**	**8 (Low)**
Status (positive or negative)	Negative	Neutral
Operational Phase		
Probability	Highly probable (4)	Improbable (2)
Duration	Long term (4)	Long term (4)
Extent	Limited to the local area (2)	Limited to the local area (2)
Magnitude	Very high (10)	Low (4)
Significance of Impact	**64 (High)**	**20 (Low)**
Status (positive or negative)	Negative	Neutral
Reversibility	Low	Low
Irreplaceable loss of resources?	High	Low
Cumulative impacts and indirect impacts	Construction and operational phase activities will result in extensive heavy vehicle traffic, extraction of deposits, movements of heavy machinery which culminate in vibrations and dust which will also indirectly affect the	
Can impacts be mitigated?	Yes, buffer zones are recommended (10 metres)	

Table 7: Significance of the impact

Also, please note:

Archaeological deposits usually occur below ground level. Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should be halted, and a university or museum notified in order for an investigation and evaluation of the find(s) to take place **(*cf*. NHRA (Act No. 25 of 1999)**, Section 36 (6)).

11. References

Bergh, J.S. (ed.) 1998. *Geskiedenis Atlas van Suid-Afrika: Die Vier Noordelike Provinsies*. Pretoria: Van Schaik Publishers

Birkholtz, P. 2008. Heritage Scoping: Proposed Second Dwelling, Thorny Valley Estate 240 (Portion 240 a Portion of 264) of the Farm Honingklip 178 IQ, Mogale City, Gauteng Province. Unpublished report.

Cradle of Humankind World Heritage Site Cultural Heritage Resources Management: Sterkfontein Site Plan 2009-2013. Gauteng Provincial Government.

CTS Heritage. 2017. Desktop Study (Heritage Screener). Proposed Construction of entertainment area, chalets, camps, cultural huts, septic tank and restaurant on Driesfontein Farm No 127 Portion 29 and 94RE (Sic), Muldersdrift in the Gauteng Province

Higgitt, N. & Nel. J. 2014. Heritage Impact Assessment for the Roodepoort Strengthening Project, 2527DD, Roodepoort, Gauteng. Unpublished report.

Huffman, T. N. 2007. *Handbook to the Iron Age: the Archaeology of Pre-Colonial Farming Societies in Southern Africa*. University of KZN Press: Pietermaritzburg.

Huffman, T. 2012. Driefontein: Heritage Impact Assessment. Unpublished report ARM: Wits.

Jeppe, F. 1899. Jeppe's Map of the Transvaal. London: Edward Stanford.

Karodia Khan, S., Higgitt, N. & Du Piesanie. 2012. Heritage Statement for Eskom Transmission Division - Roodepoort Strengthening Project in Support of the Basic Assessment Report (BAR). Unpublished report.

Mason, R.J. 1962. *Prehistory of the Transvaal*. Johannesburg. Witwatersrand University Press.

Mason, R.J. 1986. *The origins of black people of Johannesburg and the southern western central Transvaal, AD350 – 1880*. Johannesburg. University of the Witwatersrand Archaeological Research Unit, Occasional Paper 16.

Mucina, L. & Rutherford, M.C. 2010. The Vegetation of South Africa, Lesotho and Swaziland. *Strelitzia 19*. Pretoria: South African National Biodiversity Institute.

National Heritage Resources Act. Act No. 25 of 1999. Government Printer: Pretoria.

Oberholster, J.J. 1972. The Historical Monuments of South Africa. The Rembrandt van Rijn Foundation for Culture: Cape Town.

Ordnance Survey Office (Intelligence Division). 1900. Transvaal and Orange Free State: Potchefstroom. War Office No. 1367. Southampton: War Office.

Office of the President. 27 November 1998. National Environmental Management Act (Act No. 107 of 1998). Government Gazette Vol 401 (19519). Pretoria: Government Printer.

Rasmussen, R.K. 1977. *The Migrant Kingdom: Mzilikazi's Ndebele in South Africa*. London: Rex Collins.

SAHRA, 2005. Minimum Standards for the Archaeological and the Palaeontological Components of Impact Assessment Reports, Draft version 1.4.

Stevens, L., Van Nierop, M. & Clarkse, J. 2014. Climate Change Framework and Operational Climate Change Plan Strategy. Mogale City Local Municipality. Gondwana.

South African Heritage Resources Agency (SAHRA). Report Mapping Project. Version 1.0, 2009.

Stratford, D. 2013. MTB Trail Cradle of Humankind. Unpublished report.

The Karst System of the Cradle of Humankind World Heritage Site. 2010. WRC Consultancy K8/624. WRC REPORT NO. KV 2 4 1/1 0. Water Research Commission.

The Mogale City Local Municipality Spatial Planning and Land Use Management By- Law. 2016. Department Economic Services: Section Development and Planning.

Van Schalkwyk, J. 2008. Heritage Impact Survey Report for Janho Quarry, Driefontein 179 IQ, Krugersdorp Magisterial District, Gauteng Province. Unpublished report.

Winter, S. & Baumann, N. 2005. Guideline for Involving Heritage Specialist in EIA Process Edition 1: CSIR Report No ENV-S-C 2005 E, Cape Town: Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning.

Other Sources

Google Earth Pro 2017 (Images: Sept 2017)

http://samilitaryhistory.org (Accessed: Sept 2017)

https://provincialgovernment.co.za/units/view/153/Gauteng/Cradle-of-Humankind-World-Heritage-Site (Accessed: Sept 2017)

National Archives (NAAIRS): Search

SWAS: www.weathersa.co.za/climate (accessed Sept 2017)

http://www.thecradleofhumankind.net/pages/management (Accessed Sept 2017)

http://www.mogalecity.gov.za/ (Accessed Sept 2017)

Addendum 1: Archaeological and Historical Sequence

The table provides a general overview of the chronological sequence of the archaeological periods in South Africa.

PERIOD	APPROXIMATE DATES
Earlier Stone Age	more than 2 million years ago to >200 000 years ago
Middle Stone Age	<300 000 years ago to >20 000 years ago
Later Stone Age (Includes hunter-gatherer rock art)	<40 000 years ago up to historical times in certain areas
Early Iron Age	c. AD 200 - c. AD 900
Middle Iron Age	c. AD 900 – c. AD 1300
Late Iron Age (Stonewalled sites)	c. AD 1300 - c. AD 1840 (c. AD 1640 - c. AD 1840)

< = less than; > = greater than

Archaeological Context

Stone Age Sequence

Concentrations of Early Stone Age (ESA) sites are usually present on the flood-plains of perennial rivers and may date to over 2 million years ago. These ESA open sites may contain scatters of stone tools and manufacturing debris and secondly, large concentrated deposits ranging from pebble tool choppers to core tools such as handaxes and cleavers. The earliest hominins who made these stone tools, probably not always actively hunted, instead relying on the opportunistic scavenging of meat from carnivore fill sites.

Middle Stone Age (MSA) sites also occur on flood plains, but are also associated with caves and rock shelters (overhangs). Sites usually consist of large concentrations of knapped stone flakes such as scrapers, points and blades and associated manufacturing debris. Tools may have been hafted but organic materials, such as those used in hafting, seldom preserve. Limited drive-hunting activities are also associated with this period.

Sites dating to the Later Stone Age (LSA) are better preserved in rock shelters, although open sites with scatters of mainly stone tools can occur. Well-protected deposits in shelters allow for stable conditions that result in the preservation of organic materials such as wood, bone, hearths, ostrich eggshell beads and even bedding material. By using San (Bushman) ethnographic data a better understanding of this period is possible. South African rock art is also associated with the LSA.

The following chronological sequence was recently established by prominent Stone Age archaeologists (Lombard et al 2012):

Later Stone Age

- Age Range: recent to 20-40 thousand years ago

- General characteristics: expect variability between assemblages, a wide range of formal tools, particularly scrapers (microlithic and macrolithic), backed artefacts, evidence of hafted stone and bone tools, borers, bored stones, upper and lower grindstones, grooved stones, ostrich eggshell (OES) beads and other orna ments, undecorated/decorated OES fragments, flasks/flask fragments, bone tools (sometimes with decoration), fishing equipment, rock art, and ceramics in the final phase.

    - **Ceramic or Final Later Stone Age**
        - Generally < 2 thousand years ago
        - MIS 1
        - Contemporaneous with, and broadly similar to, final Later Stone Age, but includes ceramics
        - Economy may be associated with hunter-gatherers or herders

      Technological characteristics
        - Stone tool assemblages are often microlithic
        - In some areas they are dominated by long end scrapers and few backed microliths; in others formal tools are absent or rare
        - Grindstones are common, ground stone artefacts, stone bowls and boat-shaped grinding grooves may occur
        - Includes grit- or grass-tempered pottery
        - Ceramics can be coarse, or well-fired and thin-walled; some times with lugs, spouts and conical bases; sometimes with decoration; sometimes shaped as bowls
        - Ochre is common
        - Ostrich eggshell (OES) is common
        - Metal objects, glass beads and glass artefacts also occur

    - **Final Later Stone Age**
        - 100 – 4000 years ago
        - MIS 1
        - Hunter-gatherer economy

      Technological characteristics
        - Much variability can be expected
        - Variants include macrolithic (similar to Smithfield [Sampson 1974]) and/or microlithic (similar to Wilton) assemblages
        - Assemblages are mostly informal (Smithfield)
        - Often characterised by large untrimmed flakes (Smithfield)
        - Sometimes microlithic with scrapers, blades and bladelets, backed tools and adzes (Wilton-like)
        - Worked bone is common
        - OES is common
        - Ochre is common
        - Iron objects are rare
        - Ceramics are absent

    - **Wilton**
        - 4000 – 8000 years ago
        - MIS 1

- At some sites continues into the final Later Stone Age as regional variants (e.g. Wilton Large Rock Shelter and Cave James)

Technological characteristics

- Fully developed microlithic tradition with numerous formal tools
- Highly standardised backed microliths and small convex scrapers (for definition
- of standardisation see Eerkens & Bettinger 2001)
- OES is common
- Ochre is common
- Bone, shell and wooden artefacts occur

- **Oakhurst**
  - 7000 – 12 000 years ago
  - MIS 1
  - Includes Albany, Lockshoek and Kuruman as regional variants

Technological characteristics

- Flake based industry
- Characterised by round, end, and D-shaped scrapers and adzes
- Wide range of polished bone tools
- Few or no microliths

- **Robberg**
  - 12 000 to 18 000 years ago
  - MIS 2

Technological characteristics

- Characterised by systematic bladelet (<26mm) production and the occurance of outils ecailles or scaled pieces
- Significant numbers of unretouched bladelets and bladelet cores
- Few formal tools
- Some sites have significant macrolithic elements

- **Early Late Stone Age**
  - 18 000 – 40 000 years ago
  - MIS 2-3
  - Informal designation
  - Also known as transitional MSA-LSA
  - Overlapping in time with final Middle Stone Age

Technological Characteristics

- Characterised by unstandardised, often microlithic, pieces and includes the bipolar technique
- Described at some sites, but not always clear whether assemblages represent a real archaeological phase or a mixture of LSA/MSA artefacts

Middle Stone Age

- Age Range: 20 000 – 30 000 years ago

- General characteristics: Levallois or prepared core techniques (for definitions see Van Peer 1992; Boeda 1995; Pleurdeau 2005) occur in which triangular flakes with convergent dorsal scars, often with faceted striking platforms, are produced. Discoidal systems (for definition see Inizan et al. 1999) and intentional blade production from volumetric cores (for definition see Pleurdeau 2005) also occur; formal tools may include unifacially and bifacially retouched points, backed artefacts, scrapers, and denticulates (for definition see Bisson 2000); evidence of hafted tools; occasionally includes marine shell beads, bone points, engraved ochre nodules, engraved OES fragments, engraved bone fragments, and grindstones.
- In the sequence below we highlight differences or characteristics that may be used to refine interpretations depending on context.

- **Final Middle Stone Age**
- 20 000 – 40 000 years ago
- MIS 3
- Informal designation partly based on the Sibudu sequence

Technological characteristics
- Characterised by high regional variability that may include, e.g. bifacial tools, bifacially retouched points, hollow-based points
- Triangular flake and blade industries (similar to Strathalan and Melikane)
- Small bifacial and unifacial points (similar to Sibudu and Rose Cottage Cave)
- Sibudu point characteristics: short, stout, lighter in mass com pared to points from the Sibudu technocomplex, but heavier than those from the Still Bay
- Can be microlithic
- Can include bipolar technology
- Could include backed geometric shapes such as segments, as well as side scrapers

Sibudu
- 45 000 – 58 000 years ago
- MIS 3
- Previously published as informal late Middle Stone Age and post-Howieson's Poort at Sibudu
- Formerly known post-Howieson's Poort, MSA 3 generally, and MSA III at Klasies River

Technological characteristics
- Most points are produced using Levallois technique
- Most formal retouch aimed at producing unifacial points
- Sibudu unifacial point (type fossil) characteristics: faceted platform; shape is somewhat elongated with a mean length of 43.9 mm), a mean breadth of 26.8 mm and mean thickness of 8.8 mm (L/B ratio 1.7); their mean mass is 11.8 g (Mohapi, 2012)
- Some plain butts
- Rare bifacially retouched points
- Some side scrapers are present
- Backed pieces are rare

- **Howieson’s Poort**
- 58 000 – 66 000 years ago
- MIS 3-4

Technological characteristics

- Characterised by blade technology
- Includes small (<4 cm) backed tools, e.g. segments, scrapers, trapezes and backed blades
- Some denticulate blades
- Pointed forms are rare or absent

- **Still Bay**
  - 70 000 – 77 000 years ago
  - MIS 4-5a

Technological characteristics

- Characterised by thin (<10 mm), bifacially worked foliate or lanceolate points
- Semi-circular or wide-angled pointed butts
- Could include blades and finely serrated points (Lombard et al. 2010)

- **Pre-Still Bay**
  - 72 000 – 96 000 years ago
  - MIS 4-5

Technological characteristics

- Characteristics currently being determined / studied

- **Mossel Bay**
  - 77 000 to —105 000 years ago
  - MIS 5a-4
  - Also known as MSA II at Klasies River or MSA 2b generally

Technological characteristics

- Characterised by recurrent unipolar Levallois point and blade reduction
- Products have straight profiles; percussion bulbs are prominent and often splintered or ring-cracked
- Formal retouch is infrequent and restricted to sharpening the tip orshaping the butt

- **Klasies River**
  - 105 000 to —130 000 years ago
  - MIS 5d-5e
  - Also referred to as MSA I at Klasies River or MSA 2a generally

Technological characteristics

- Recurrent blade and convergent flake production
- End products are elongated and relatively thin, often with curved profiles
- Platforms are often small with diffused bulbs
- Low frequencies of retouch
- Denticulate pieces

- **Early Middle Stone Age**
  - Suggested age MIS 6 to MIS 8 (130 000 to —300 000 years ago)
  - Informal designation

Technological characteristics

- This phase needs future clarification regarding the designation of cultural material and sequencing
- Includes discoidal and Levallois flake technologies, blades from volumetric cores and a generalised toolkit

- **Earlier Stone Age**
  - Age range: >200 000 to 2 000 000 years ago
  - General characteristics: early stages include simple flakes struck from cobbles, core and pebble tools; later stages include intentionally shaped handaxes, cleavers and picks; final or transitional stages have tools that are smaller than the preceding stages and include large blades.
  - In the sequence below we highlight differences or characteristics that may be used to refine interpretations depending on context.

- **ESA-MSA transition**
- 200 to —600 thousand years ago
- MIS 7-15

Technological characteristics

- Described at some sites as Fauresmith or Sangoan
- Relationships, descriptions, issues of mixing and ages yet to be clarified
- Fauresmith assemblages have large blades, points, Levallois technology, and the remaining ESA components have small bifaces
- The Sangoan contains small bifaces (<100 mm), picks, heavy and light-duty denticulated and notched scrapers
- The Sangoan is less well described than the Fauresmith

- **Acheulean**
  - 300 thousand to —1.5 million years ago
  - MIS 8-50

Technological characteristics

- Bifacially worked handaxes and cleavers, large flakes > 10 cm
- Some flakes with deliberate retouch, sometimes classifiedas scrapers
- Gives impression of being deliberately shaped, but could indicate result of knapping strategy
- Sometimes shows core preparation
- Generally found in disturbed open-air locations

- **Oldowan**
  - 1.5 to >2 million years ago
  - MIS 50-75

Technological characteristics

- Cobble, core or flake tools with little retouch and no flaking to predetermined patterns
- Hammerstones, manuports, cores
- Polished bone fragments/tools

Iron Age Sequence

In the northern regions of South Africa at least three settlement phases have been distinguished for early prehistoric agropastoralist settlements during the **Early Iron Age** (EIA). Diagnostic pottery assemblages can be used to infer group identities and to trace movements across the landscape. The first phase of the Early Iron Age, known as **Happy Rest** (named after the site where the ceramics were first identified), is representative of the Western Stream of migrations, and dates to AD 400 - AD 600. The second phase of **Diamant** is dated to AD 600 - AD 900 and was first recognized at the eponymous site of Diamant in the western Waterberg. The third phase, characterised by herringbone-decorated pottery of the **Eiland** tradition, is regarded as the final expression of the Early Iron Age (EIA) and occurs over large parts of the North West Province, Northern Province, Gauteng and Mpumalanga. This phase has been dated to about AD 900 - AD 1200. These sites are usually located on low-lying spurs close to water.

The Late Iron Age (LIA) settlements are characterised by stone-walled enclosures situated on defensive hilltops c. AD 1640 - AD 1830). This occupation phase has been linked to the arrival of ancestral Northern Sotho, Tswana and Ndebele (Nguni–speakers) in the northern regions of South Africa with associated sites dating between the sixteenth and seventeenth centuries AD. The terminal LIA is represented by late 18th/early 19th century settlements with multichrome Moloko pottery commonly attributed to the Sotho-Tswana. These settlements can in many instances be correlated with oral traditions on population movements during which African farming communities sought refuge in mountainous regions during the processes of disruption in the northern interior of South Africa, resulting from the so-called difaqane (or mfecane).

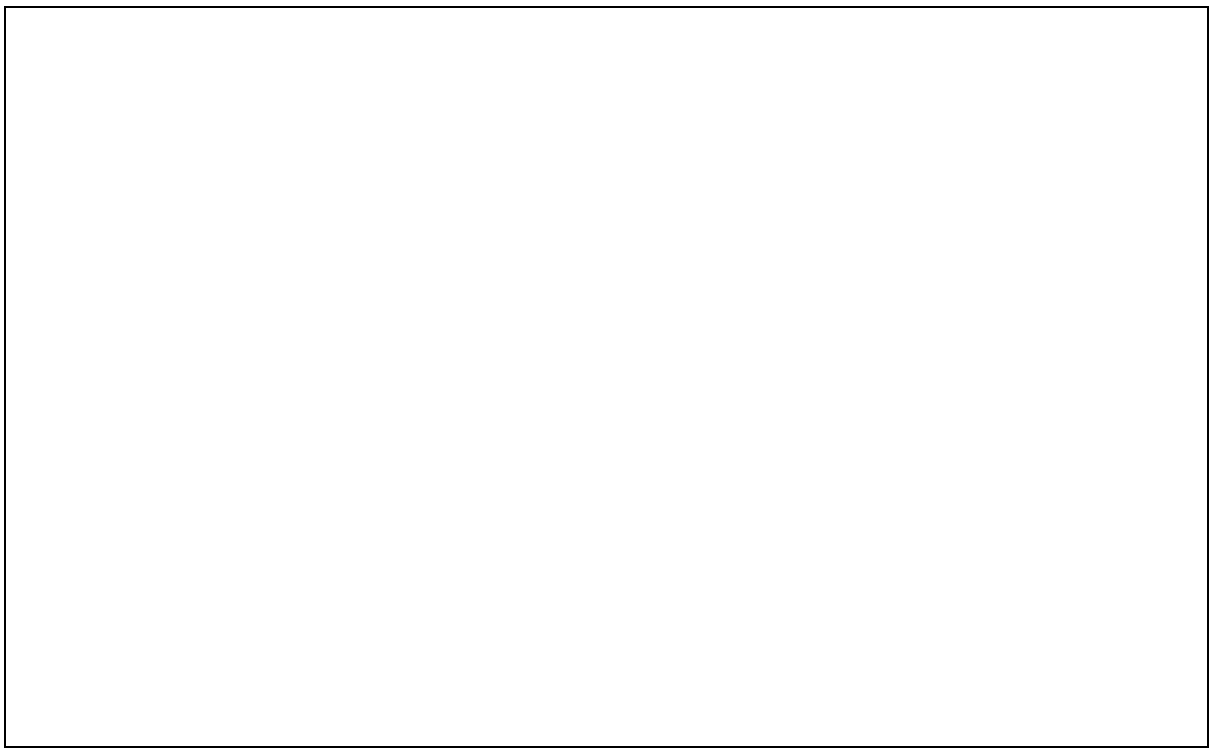

Figure 24: General location of Iron Age settlement in the regions near Krugersdorp (after Bergh 1998)

Ethno-historical Context

Difaqane (mfecane)

The period of upheaval known as the Difaqane (Mfecane) had widespread implications for the northern interior of South Africa. Mzilikazi, one of the generals of King Shaka of the Zulu kingdom left KwaZulu-Natal in 1820 and took his Khumalo clan north-westward on a journey which changed the face of the South African interior. He first reached to Pedi people north of the Olifants and Steelpoort Rivers and took over their land. A year later and after a lengthy sojourn the group arrived at the slopes of the Magaliesberg Mountains in the Pretoria area in about 1827. Mzilikazi established two military kraal or capitals. The one was situated on the Apies River called enDinaneni which was situated north-west of Pretoria on the road to Hartebeespoort Dam and enKungweni which was built along the Daspoort range of hills.

His main residence was on the south side of Meintjieskop, but he later moved to the north of the Magaliesberg Mountains, to a place named emHlahlandlela. This aggressive occupation of the land forced the local Ndebele (Ndzundza) groups to scatter and hide in mountainous areas. Later during the 1830s Mzilikazi moved further west to establish a capital at Gabeni, north of Zeerust where he subjugated various Sotho Tswana groups in the area. His power was only challenged in 1837 by a combined Boer, Tswana and Griqua force. Mzilikazi later migrated into Zimbabwe and established his next capital, Bulawayo (Rasmussen 1977).

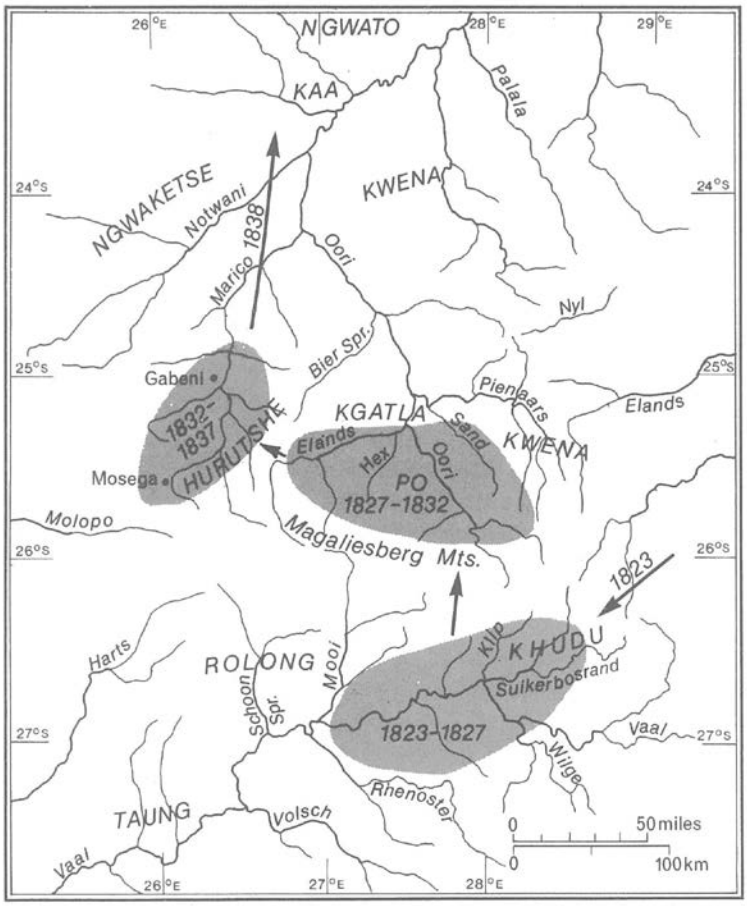

Figure 25: The location of the major spheres of influence of Mzilikazi from the early 1820s to late 1830s

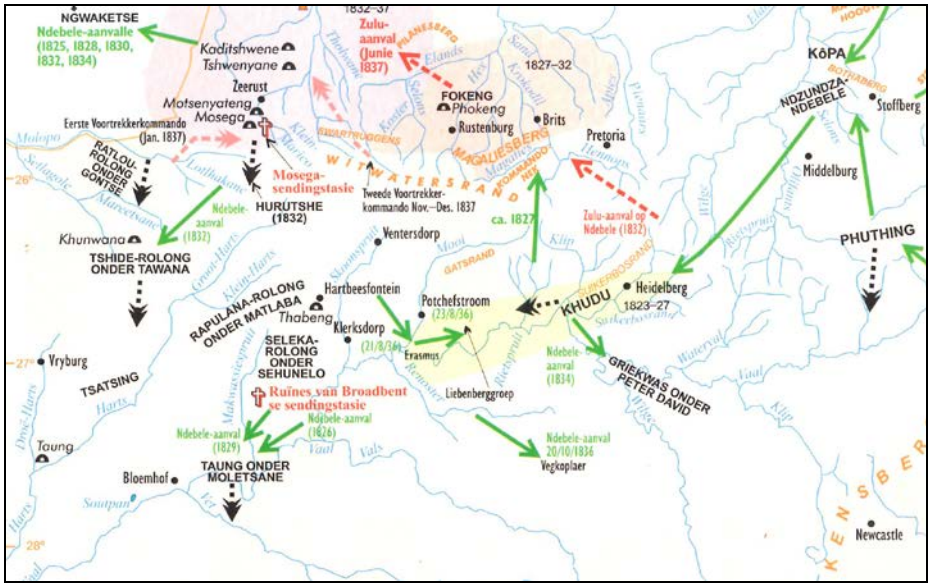

Figure 26: Movement of Mzilikazi's wariors relative to the survey area around Schweizer-Reneke (after Bergh 1998)

Krugersdorp

In 1877 Sir T Shepstone proclaimed the independent *Zuid-Afrikaansche Republiek* as part of the British territory and took over the government. The Boers gradually mustered resistance and in December 1880 the National Committee called a meeting at a site on the farm Paardekraal owned by General A.W.J. Pretorius. At the meeting the *Rebubliek* was restored and a triumvirate Paul Kruger, Piet Joubert and M.W. Pretorius were elected as head of the Government. A large stone cairn marked the occasion. In 1887 the town Krugersdorp was laid out on the farm Paardekraal (Oberholster 1972:297-298).

Sterkfontein Caves is situated roughly 11 km from Krugersdorp on the farm Swartkrans. As far as is known the caves were discovered between 2 January 1896 and 12 July 1897. Three years later limestone was extracted and the caves were opened to the public. Dr D. Draper reported the fossil bones in 1895 but many years passed before the caves became famous as a result of the work by Dr Robert Broom (1936) and others. With the discovery of Mr(s) Ples (*Australopithecus africanus*) more fossil discoveries were made. Later Dr Revil Mason and Prof Philip Tobias of the University of the Witwatersrand started working at the site and surrounds in 1966. These were later taken over by Prof R. Clarke. The caves and 3-4 hectares around it were declared a National Monument in 1945 (Oberholster 1972:298). In 1958 the then owners of the property the Stegmann family donated a section of their land to the University of the Witwatersrand. As a result the first declaration was repealed and declared the Sterkfontein Caves with the Isaac Edwin Stegmann Reserve (20 000 morgen) in 1963. It was later declared a World Heritage site on 2 December 1999 and a National Heritage Site in November 2004.

Kromdraai adjoins the farm Swartkrans. The geologist Dr D. Draper first submitted fossil specimens from the site to the British Museum in 1895. Several fossil bearing rocks from the site were taken to Dr Robert Broom which led to the discovery of *Australopithecus robustus.* The site was declared a National Monument in 1946 (Oberholster 1972:299).

Lime works and mining activities

Also note that due to the presents of limestone in the dolomite caves in the area north east of Krugersdorp limestone mining activities probably started in the late 1800s. An important remnant of this industrial phase is the brick-lines lime kilns that are doted on the landscape throughout the Cradle's footprint. It was used to burn calcite, mined from the caves in the area. The lime and cement manufactured through this process, among others, supplied in the needs of the cement- and lime-hungry emerging gold mining industry on the Witwatersrand. Mining began in the late 1800s and resumed after the Anglo-Boer War, until the price of lime dropped during the Great Depression.

Figure 27: One of the lime kilns near the Sterkfontein Country Estate in the WHS

Addendum 2: Description of the Recorded Sites

A system for grading the significance of heritage sites was established by the NHRA (Act No. 25 of 1999) and further developed by the South African Heritage Resources Agency (SAHRA 2007) and has been approved by ASAPA for use in southern Africa and was utilised during this assessment.

Site 1

A. GENERAL SITE DESCRIPTION	
Site type	Historical mining remains
Site Period	Late 19th to Early 20th century
Physical description	The site comprises the following aspects: ▪ An extensive prospecting trench ▪ Water reservoir lined with cement wall ▪ Cement base for pump or mill The site comprises an extensive prospecting trench in the eastern side mountain with a large water cement lined reservoir for washing the material and a cement base for a pump of mill. No middens or other cultural material were recorded at the site.
Integrity of deposits or structures	The trench seems stable but the cement reservoir is unstable and in the process of collapsing.
Site extent	Prospecting trench: 20 m x 3 m Reservoir: 5 m x 5 m; wall height 1.5 m Cement base: 1 m x 1 m Total displacement: 30 m x 30 m

B. SITE EVALUATION		
B1. HERITAGE VALUE	**Yes**	**No**
Historic Value		
It has importance to the community or pattern of South Africa's history or precolonial history.		X
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.		X
It has significance relating to the history of slavery in South Africa.		X
Aesthetic Value		
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.		X
Scientific Value		
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.	X	
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.		X
It has importance to the wider understanding of the temporal change of cultural landscapes, settlement patterns and human occupation.	X	
Social Value		
It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).		X
Tourism Value		
It has significance through its contribution towards the promotion of a local sociocultural identity and can be developed as tourist destination.		X
Rarity Value		
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.		X
Representative Value		
It is importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.	X	
B2. REGIONAL CONTEXT		
Other similar sites in the regional landscape.	X	

C. SPHERE OF SIGNIFICANCE	**High**	**Medium**	**Low**

International			X
National			X
Provincial			X
Local			X
Specific community			X
D. FIELD REGISTER RATING			
National/Grade 1 [should be registered, retained]			
Provincial/Grade 2 [should be registered, retained]			
Local/Grade 3A [should be registered, mitigation not advised]			
Local/Grade 3B [High significance; mitigation, partly retained]			
Generally Protected A [High/Medium significance, mitigation]			
Generally protected B [Medium significance, to be recorded]			
Generally Protected C [Low significance, no further action]			X
E. GENERAL STATEMENT OF SITE SIGNIFICANCE			
Low			X
Medium			
High			
F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT			
None			
Peripheral			
Destruction			
Uncertain			X

G. RECOMMENDED MITIGATION

- Maintain a buffer zone of 10 metres during the construction phase
- A management plan should be compiled for implementation during tourism activities

H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS

- National Heritage Resources Act (Act No. 25 of 1999, Sections 34)

I. PHOTOGRAPHS

Figure 28: Possible prospecting activities (20 metres trench)

Figure 29: Possible prospecting activities: cement base for pump or mill

Figure 30: Possible prospecting activities: cement reservoir for retaining water

Site 2

A. GENERAL SITE DESCRIPTION			
Site type	Historical stone-walled livestock enclosure		
Site Period	Late 19th to Early 20th century		
Physical description	The site comprises an extensive stone-walled livestock enclosure (two separate enclosures). The walls are constructed with dressed stone and cement. The farm probably functioned as a cattle outpost for grazing during the early 20th century. No farmhouse complex was built as the farm was probably used as a remote station and sporadic planting of grains (agricultural fields). No middens or other cultural material were recorded at the site.		
Integrity of deposits or structures	Stable		
Site extent	Total displacement: 30 m x 30 m		
B. SITE EVALUATION			
B1. HERITAGE VALUE		**Yes**	**No**
Historic Value			
It has importance to the community or pattern of South Africa's history or precolonial history.			X
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.			X

It has significance relating to the history of slavery in South Africa.		X
Aesthetic Value		
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or cultural group.		X
Scientific Value		
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.	X	
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.		X
It has importance to the wider understanding of the temporal change of cultural landscapes, settlement patterns and human occupation.	X	
Social Value		
It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons (sense of place).		X
Tourism Value		
It has significance through its contribution towards the promotion of a local sociocultural identity and can be developed as tourist destination.		X
Rarity Value		
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.		X
Representative Value		
It is importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.	X	
B2. REGIONAL CONTEXT		
Other similar sites in the regional landscape.	X	

C. SPHERE OF SIGNIFICANCE	**High**	**Medium**	**Low**
International			X
National			X
Provincial			X
Local			X
Specific community			X

D. FIELD REGISTER RATING	
National/Grade 1 [should be registered, retained]	
Provincial/Grade 2 [should be registered, retained]	
Local/Grade 3A [should be registered, mitigation not advised]	
Local/Grade 3B [High significance; mitigation, partly retained]	
Generally Protected A [High/Medium significance, mitigation]	
Generally protected B [Medium significance, to be recorded]	
Generally Protected C [Low significance, no further action]	X

E. GENERAL STATEMENT OF SITE SIGNIFICANCE	
Low	X
Medium	
High	

F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT	
None	
Peripheral	
Destruction	
Uncertain	X

G. RECOMMENDED MITIGATION

- Maintain a buffer zone of 10 metres during the construction phase
- A management plan should be compiled for implementation during tourism activities

H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS

- National Heritage Resources Act (Act No. 25 of 1999, Sections 34)

I. PHOTOGRAPHS

Figure 31: One of the stone walls of the enclosure

Figure 32: The structure consists of two livestock sections

Addendum 3: Surveyor General Farm Diagram

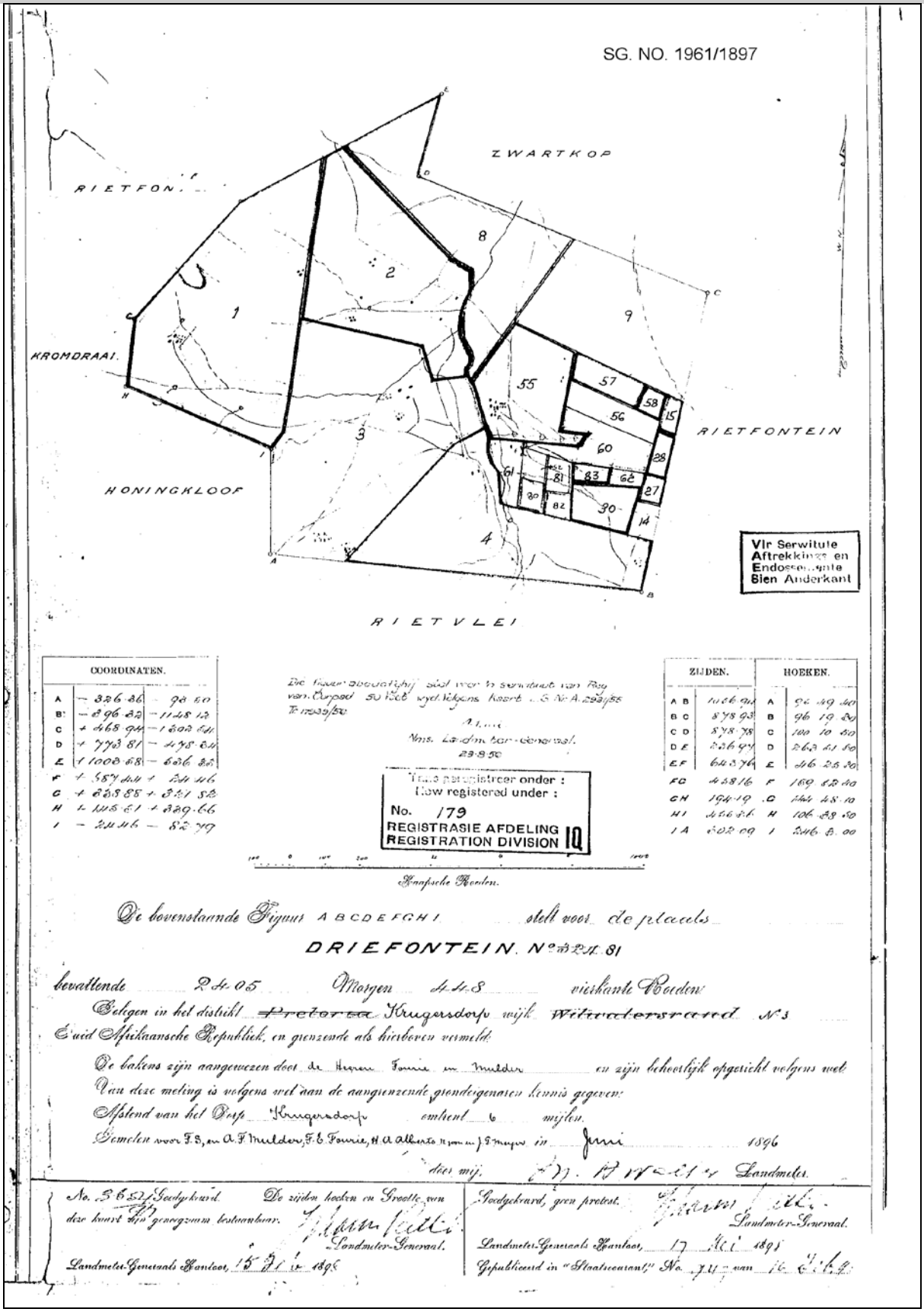

Figure 33: Surveyor General's sketch of the farm Driefontein 179IQ surveyed in 1896

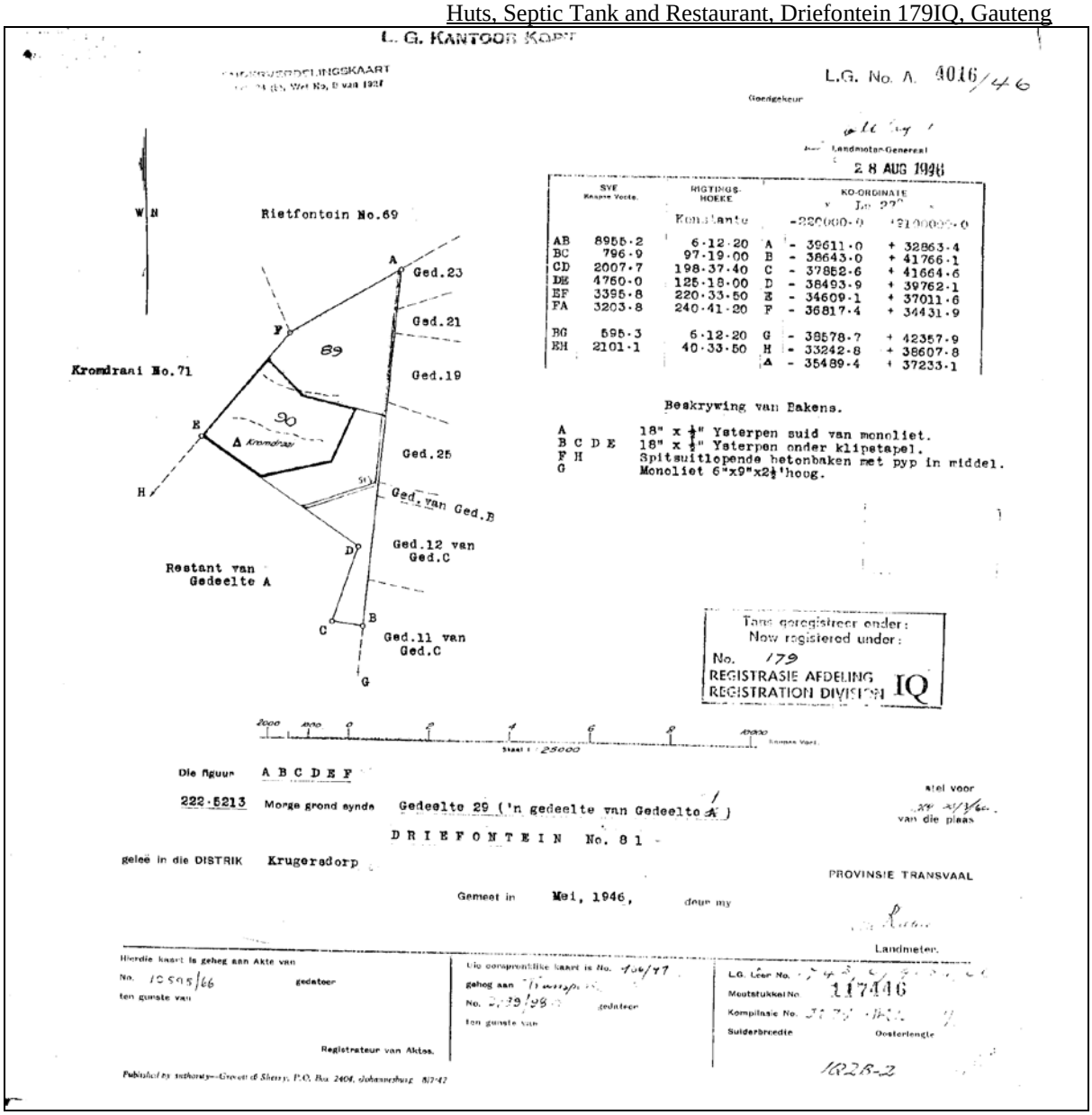

Figure 34: Surveyor General's sketch of the farm Driefontein 179IQ subdivided in 1946

Addendum 4: Relocation of Graves

Marked graves younger than 60 years do not fall under the protection of the NHRA (Act No. 25 of 1999) with the result that exhumation, relocation and reburial can be conducted by an undertaker. This will include logistical aspects such as social consultation, purchasing of plots in cemeteries, procurement of coffins, etc. Other legislative measures which may be pertinent include the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), Regulations Relating to the Management of Human Remains (GNR 363 of 22 May 2013) made in terms of the National Health Act No. 61 of 2003, Ordinance on Exhumations (Ordinance No. 12 of 1980) as well as any local and regional provisions, laws and by-laws that may be in place.

Marked graves older than 60 years are protected by the NHRA (Act No. 25 of 1999) an as a result an archaeologist must be in attendance to assist with the exhumation and documentation of the graves. Note that unmarked graves are by default regarded as older than 60 years and therefore also falls under the NHRA (Act No. 25 of 1999, Section 36).

The relocation of graves entails the following procedure:

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

Information needed for the SAHRA permit application

- The permit application must be done by an archaeologist.
- A map of the area where the graves have been located.
- A survey report of the area prepared by an archaeologist.
- All the information on the families that have identified graves.
- A letter of permission from the landowner granting permission to the developer to exhume and relocate the graves.

- A letter (or proof of purchase of the plots) from the new cemetery confirming that the graves will be reburied there.
- Details of the farm name and number, magisterial district and GPS coordinates of the gravesite.

Graves are generally be classified into four categories. These are:

- Graves younger than 60 years;
- Graves older than 60 years, but younger than 100 years;
- Graves older than 100 years; and
- Graves of victims of conflict or of individuals of royal descent.