

HERITAGE IMPACT ASSESSMENT

(REQUIRED UNDER SECTION 38(8) OF THE NHRA (No. 25 OF 1999)

FOR THE PROPOSED HBP HATCHERY AND LAYER FARM EXPANSION ON PORTION 6/43 OF FARM HOLFONTEIN

Type of development:

Agricultural development

Client:

Eco Impact

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Report Title	Heritage Impact Assessment HBP Hatchery and Layer Farm Expansion on Portion 6/43 Of Farm Holfontein
Authority Reference Number	TBC
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Applicant Name	Quantum Foods

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REPORT OUTLINE

Appendix 6 of GNR 326 EIA Regulations (7 April 2017) provides the requirements for specialist reports undertaken as part of the environmental authorisation process. In line with this, Table 1 provides an overview of Appendix 6 together with information on how these requirements have been met.

Table 1. Specialist Report Requirements.

Requirement from Appendix 6 of GNR 326 EIA Regulations (7 April 2017)	Chapter
(a) Details of - (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae	Section a Section 12
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority	<i>Declaration of Independence</i>
(c) Indication of the scope of, and the purpose for which, the report was prepared	Section 1
(cA) an indication of the quality and age of base data used for the specialist report	Section 1, 3.4 and 7.1.
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	9
(d) Duration, Date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3.4
(e) Description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 3
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 8 and 9
(g) Identification of any areas to be avoided, including buffers	Section 9
(h) Map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers	Section 8
(I) Description of any assumptions made and any uncertainties or gaps in knowledge	Section 3.7
(j) a description of the findings and potential implications of such findings on the impact of the proposed activity including identified alternatives on the environment or activities;	Section 9
(k) Mitigation measures for inclusion in the EMPr	Section 9 and 10
(l) Conditions for inclusion in the environmental authorisation	Section 9 and 10
(m) Monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 9 and 10
(n) Reasoned opinion - (i) as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Section 10.2
(o) Description of any consultation process that was undertaken during the course of preparing the specialist report	Section 6
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to BA report
(q) Any other information requested by the competent authority	Section 10

Executive Summary

Eco-Impact was appointed to conduct a Basic Assessment for the proposed development of the HBP Hatchery and Layer Farm Expansion on Portion 6/43 Of Farm Holfontein in the Gauteng Province. The proposed development has a total infrastructure footprint of 5000 m² on the 2.5ha site. The survey area is situated on the Harterbeespoort Hatchery farm, approximately 27km West of Krugersdorp and Randfontein. The proposed area falls within the Merafong City local Municipality of Gauteng along the R500 between Holfontein and Koster Road. The proposed development is divided into three separate areas (site 3, site 4 and site 5) spread over a section of the Hartebeespoort Hatchery farm east of the main hatchery area. The three proposed developments are specifically located close to or next to electrical power grids and transformers. The study area is a large open field without focal points like pans or rocky outcrops that were focal points in antiquity. The field is covered by a thin growth of new grasses after it had burnt down recently, giving a high visibility over the entirety of the proposed development areas.

HCAC was appointed to conduct a Heritage Impact Assessment of the impact area to determine the presence of cultural heritage sites and the impact of the proposed development on these non-renewable resources. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of three development sites. In terms of the NHRA (Act 25 of 1999) the following findings apply:

Regarding the built environment of the area (Section 34), no standing structures older than 60 years occur within the study area. In terms of the archaeological component of Section 35, two isolated Later Stone Age artefacts were recorded in development site 5. These isolated artefacts do not constitute an archaeological site as they are out of context and of no significance apart from noting their presence as done in this report. Therefore, no further mitigation before construction is recommended for the proposed development to proceed. Regarding the palaeontological component of Section 35, according to the paleo sensitivity map on SAHRIS, the paleontological sensitivity of the project is very high, and an independent paleontological study was conducted (Millsteed 2018). Millsteed concluded that he has not identified any palaeontological reason to prejudice the progression of the HBP hatchery expansion project, subject to the mitigation programs he recommended, being put in place as outlined in his report and summarised here.

Regarding Section 36 of the Act, a possible graveyard was recorded in development Site 3. The presence of graves should be confirmed before construction, and if the site does represent a graveyard, the graves should be retained *in situ*. If any additional graves are located in future, they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation. No public monuments are located within or close to the study area. The existing hatchery and road infrastructure developments surround the study area and the proposed development will not impact negatively on significant cultural landscapes or viewscapes. During the Public Participation process conducted for this project, no heritage concerns were raised.

The impact of the proposed project on heritage resources is considered low, and it is recommended that from a heritage perspective the proposed project can commence on the condition that the recommendations as made in this report are implemented as part of the EMPr and based on approval from SAHRA.

Recommendations:

- Implementation of a chance find procedure.
- It is recommended that the presence of graves at Site 3 should be confirmed through social consultation and if the identified features are graves, the graves should ideally be retained *in situ*, and demarcated with an access gate for family members.
- It is recommended that a close examination of all excavations be made while they are occurring within the Malmani Formation dolomites. Should any fossil materials be identified, the

excavations should be halted and SAHRA informed of the discovery. These examinations must be made by a professional palaeontologist and the investigation should be timed to coincide with the excavation of the trenches to accommodate building foundations.

DECLARATION OF INDEPENDENCE

Specialist Name	Jaco van der Walt
Declaration Independence of	<p>I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I:</p> <ul style="list-style-type: none"> • I act as the independent specialist in this application; • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant; • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity; • I will comply with the Act, Regulations and all other applicable legislation; • I have no, and will not engage in, conflicting interests in the undertaking of the activity; • I 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 form are true and correct; and • I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.
Signature	
Date	13/11/2018

a) Expertise of the specialist

Jaco van der Walt has been practising as a CRM archaeologist for 15 years. He obtained an MA degree in Archaeology from the University of the Witwatersrand focussing on the Iron Age in 2012 and is a PhD candidate at the University of Johannesburg focussing on Stone Age Archaeology with specific interest in the Middle Stone Age (MSA) and Later Stone Age (LSA). Jaco is an accredited member of ASAPA (#159) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, KZN as well as he Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, DRC Zambia and Tanzania. Through this he has a sound understanding of the IFC Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage.

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ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
BIA: Basic Impact Assessment
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DEA: Department of Environmental Affairs
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Programme
ESA: Early Stone Age
ESIA: Environmental and Social Impact Assessment
GIS Geographical Information System
GPS: Global Positioning System
GRP Grave Relocation Plan
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID Notification of Intent to Develop
NoK Next-of-Kin
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

*Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.

GLOSSARY

- Archaeological site (remains of human activity over 100 years old)
- Early Stone Age (~ 2.6 million to 250 000 years ago)
- Middle Stone Age (~ 250 000 to 40-25 000 years ago)
- Later Stone Age (~ 40-25 000, to recently, 100 years ago)
- The Iron Age (~ AD 400 to 1840)
- Historic (~ AD 1840 to 1950)
- Historic building (over 60 years old)

1 Introduction and Terms of Reference:

Heritage Contracts and Archaeological Consulting CC (**HCAC**) has been contracted by Eco Impact to conduct a heritage impact assessment of the proposed infrastructure for an agricultural development that comprises around 5000m². The report forms part of the Basic Assessment Report (BAR) and Environmental Management Programme Report (EMPR) for the **HBP** Hatchery and layer farm expansion on portion 6/43 of farm Holfontein close to Ventersdorp in the Gauteng Province.

The aim of the survey of the proposed development footprint is to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources and to submit appropriate recommendations about the responsible cultural resources management measures that might be required to assist the developer in responsibly managing the discovered heritage resources. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999). The base data is of high quality, and relevant dates are included in section 3.4 and 7.1. The report outlines the approach and methodology utilised before and during the survey, which includes: Phase 1, review of relevant literature; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey conducted, isolated Later Stone Age artefacts and three possible graves were identified. General site conditions and features on sites were recorded using photographs, GPS locations, and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report. SAHRA as a commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) require all environmental documents, compiled in support of an Environmental Authorisation application as defined by NEMA EIA Regulations section 40 (1) and (2), to be submitted to SAHRA. As such the Basic Assessment report and its appendices must be submitted to the case as well as the EMPr, once it is completed by the Environmental Assessment Practitioner (EAP).

1.1 Terms of Reference

Field study

Conduct a field study to: (a) locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources affected by the proposed development footprint.

Reporting

Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with the relevant legislation, SAHRA minimum standards and the code of ethics and guidelines of ASAPA.

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999).

Table 2: Project Description

Size of farm and portions	Portion 6/43 Of Farm Holfontein (Figure 1) The extent of the project infrastructure is the hatchery (0.6 ha), Site 3 (3.6 ha), Site 4 (2.4 ha), Site 5 (1.42 ha), water pipeline (1000 m), water pipeline 1 (345 m), road to Site 3 (473 m), road to Site 4 (489 m) and the road to Site 5 (149 m).
Magisterial District	Merafong City Local Municipality
1: 50 000 map sheet number	2627AB

Table 3: Infrastructure and project activities

Type of development	Agricultural development
Project size	Hatchery (0.6 ha), Site 3 (3.6 ha), Site 4 (2.4 ha), Site 5 (1.42 ha), water pipeline (1000 m), water pipeline 1 (345 m), road to Site 3 (473 m), road to Site 4 (489 m) and the road to Site 5 (149 m).
Project Components	<p>Two additional layer house sites of approximately 2.5 ha each in size with three chicken layer houses (each house will be 15m x 100m = 1500m²) with a total infrastructure footprint of 5000 m² on the 2.5ha site will be constructed. The total number of chickens on the property will be expanded with 35 580. Each house will accommodate 5300 hens and 530 cocks = 5930 chickens per house and 17 790 per site).</p> <p>The existing hatchery building will be expanded by 1500.50m² in order to increase the throughput capacity of the hatchery.</p>

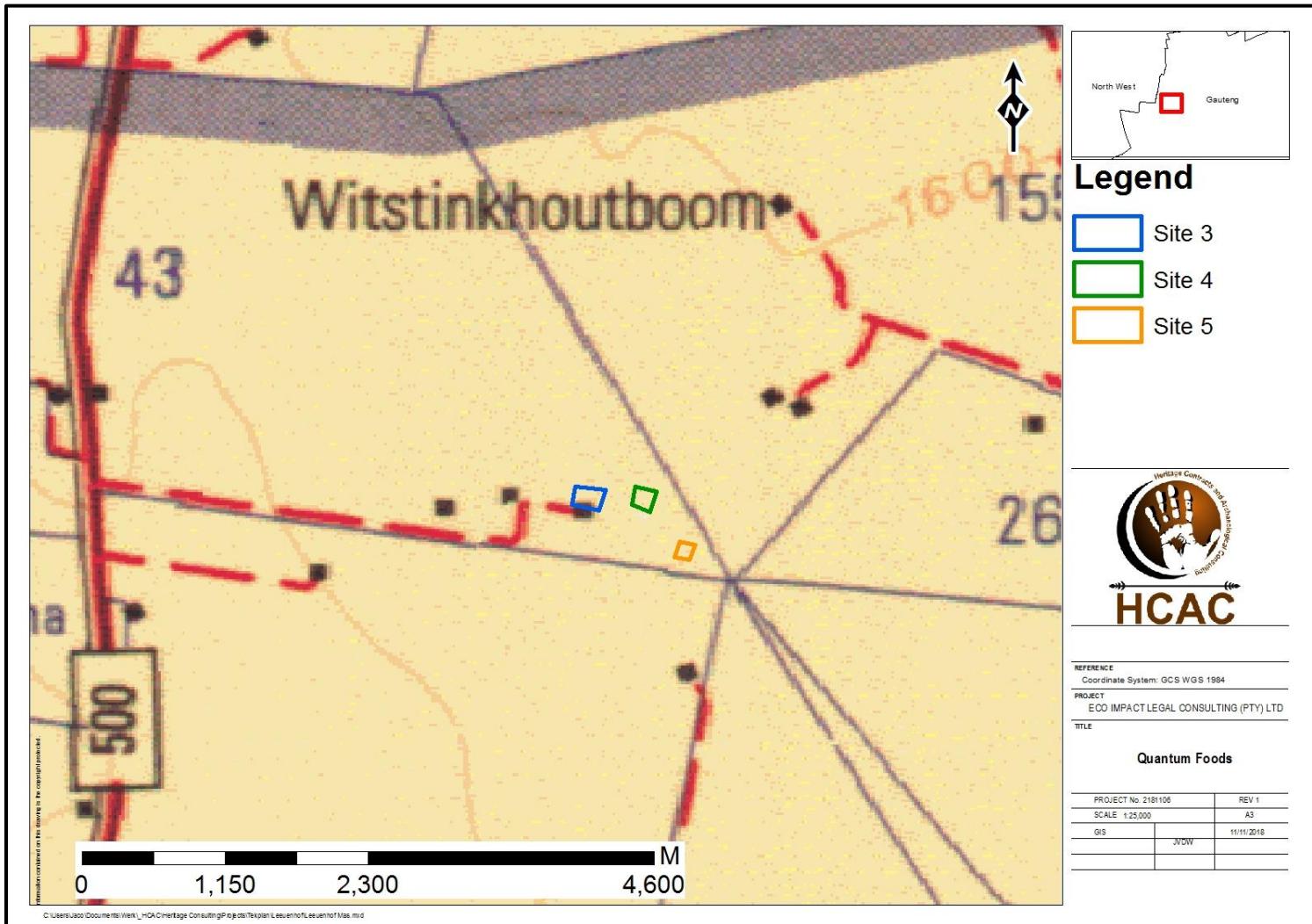


Figure 1. Provincial map (1: 250 000 topographical map) indicating the study areas.

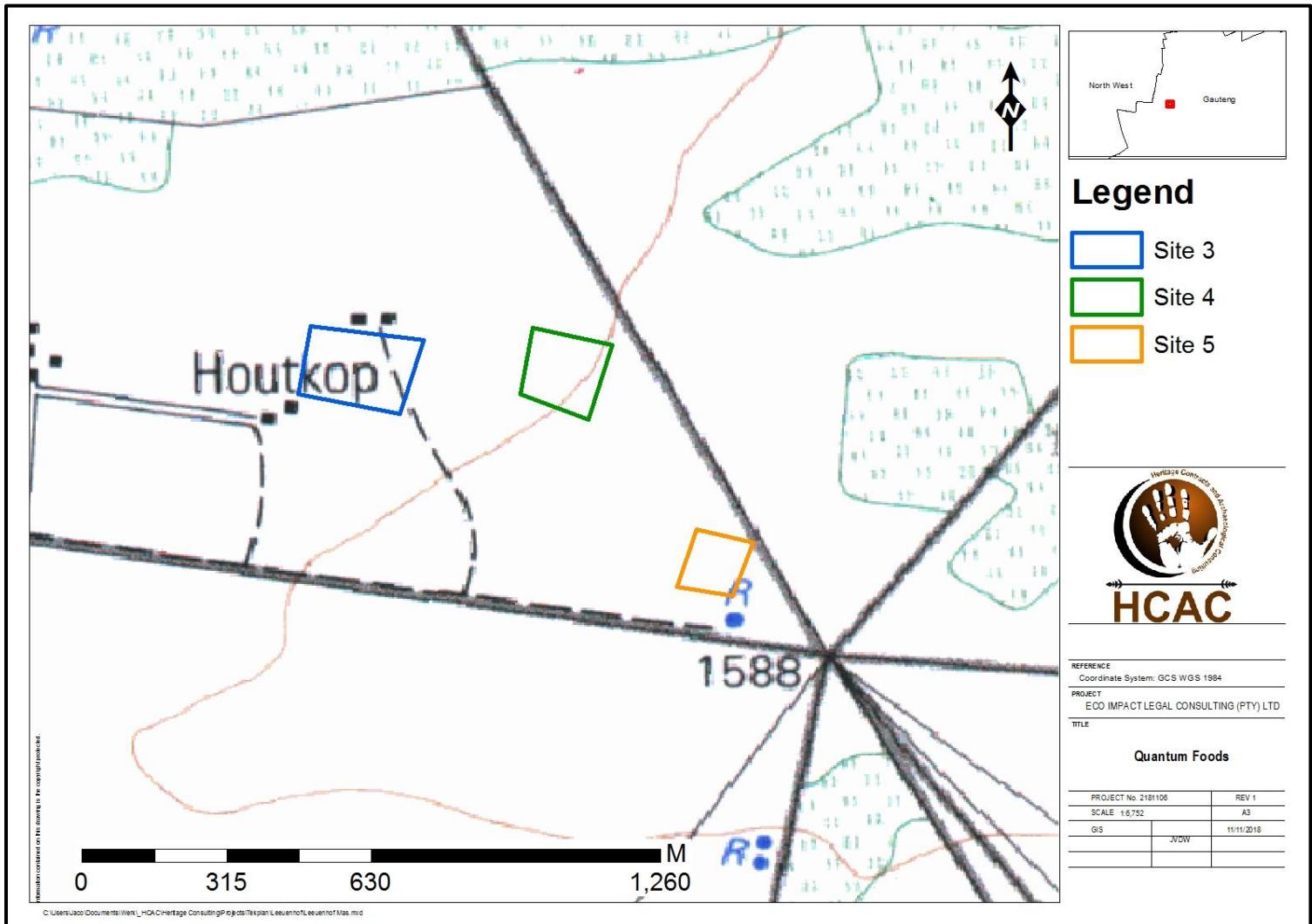


Figure 2: Regional map (1:50 000 topographical map) indicating the study areas.

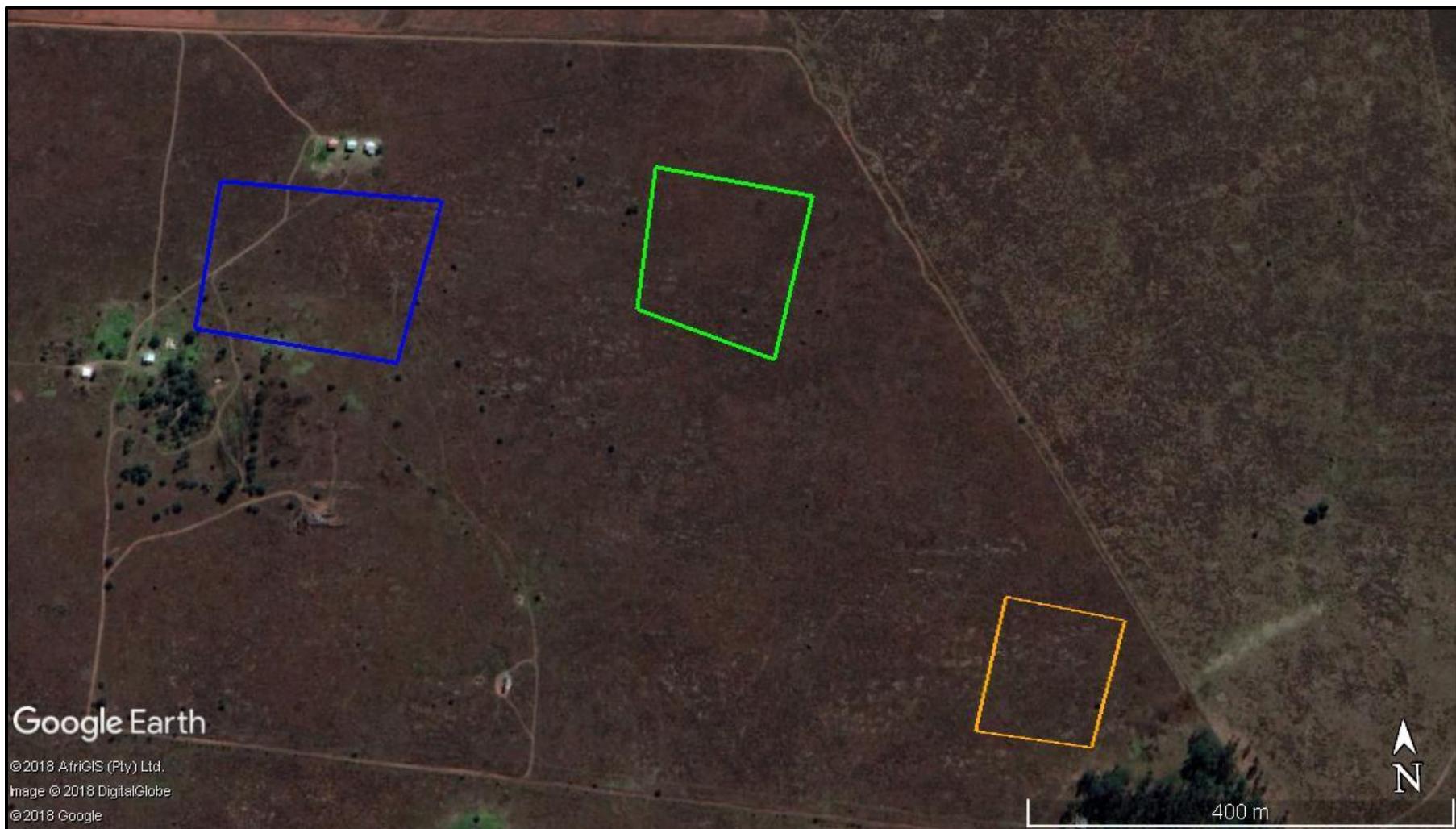


Figure 3. Google Earth Image of the study area.

2 Legislative Requirements

The HIA, as a specialist sub-section of the EIA, is required under the following legislation:

- National Heritage Resources Act (NHRA), Act No. 25 of 1999)
- National Environmental Management Act (NEMA), Act No. 107 of 1998 - Section 23(2)(b)
- Mineral and Petroleum Resources Development Act (MPRDA), Act No. 28 of 2002 - Section 39(3)(b)(iii)

A Phase 1 HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation.

The overall purpose of heritage specialist input is to:

- Identify any heritage resources, which may be affected;
- Assess the nature and degree of significance of such resources;
- Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- Assess the negative and positive impact of the development on these resources; and
- Make recommendations for the appropriate heritage management of these impacts.

The HIA should be submitted, as part of the impact assessment report or EMPr, to the PHRA if established in the province or to SAHRA. SAHRA will ultimately be responsible for the professional evaluation of Phase 1 AIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 AIA reports and additional development information, as per the impact assessment report and/or EMPr, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level). Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 AIA's are primarily concerned with the location and identification of heritage sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision-making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for with SAHRA by the applicant before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5] of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare. Authorisation for exhumation and reinternment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

3 METHODOLOGY

3.1 Literature Review

A brief survey of available literature was conducted to extract data and information on the area in question the provide general heritage context into which the development would be set. This literature included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).

3.2 Genealogical Society and Google Earth Monuments

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located; these locations were marked and visited during the fieldwork phase. The database of the Genealogical Society was consulted to collect data on any known graves in the area.

3.3 Public Consultation and Stakeholder Engagement:

Stakeholder engagement is a key component of any BAR process, it involves stakeholders interested in, or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation process was to capture and address any issues raised by community members and other stakeholders during key stakeholder, land owner, village and public meetings. The process involved:

- Placement of advertisements and site notices
- Stakeholder notification (through the dissemination of information and meeting invitations);
- Stakeholder meetings undertaken with I&APs;
- Authority Consultation
- The compilation of a Basic Assessment Report (BAR).
- The compilation of a Comments and Response Report (CRR).

3.4 Site Investigation

Conduct a field study to: a) systematically survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources recorded in the project area.

Table 4: Site Investigation Details

	Site Investigation
Date	8 Nov 2018
Season	Summer – vegetation in the study area is low and archaeological visibility is high. The impact area was sufficiently covered (Figure 4) to record the presence of heritage resources adequately.

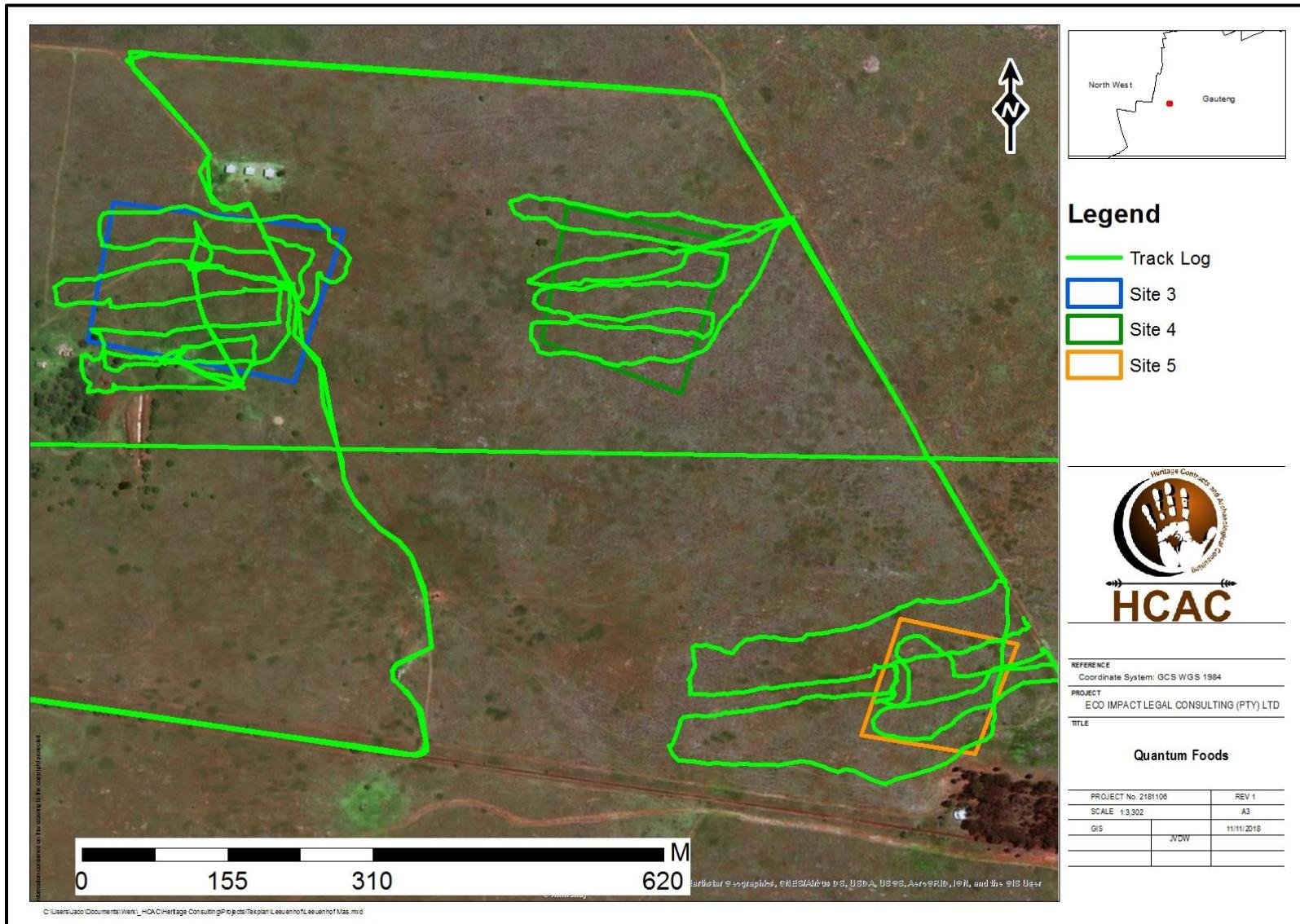


Figure 4: Tracklogs of the survey in green.

3.5 Site Significance and Field Rating

Section 3 of the NHRA distinguishes nine criteria for places and objects to qualify as ‘part of the national estate’ if they have cultural significance or other special value. These criteria are:

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

The presence and distribution of heritage resources define a ‘heritage landscape’. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed project the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface. This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance with cognisance of Section 3 of the NHRA:

- The unique nature of a site;
- The integrity of the archaeological/cultural heritage deposits;
- The wider historic, archaeological and geographic context of the site;
- The location of the site in relation to other similar sites or features;
- The depth of the archaeological deposit (when it can be determined/is known);
- The preservation condition of the sites; and
- Potential to answer present research questions.

In addition to this criteria field ratings prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 10 of this report.

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP.A)	-	High/medium significance	Mitigation before destruction

Generally Protected B (GP.B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

3.6 Impact Assessment Methodology

The criteria below are used to establish the impact rating on sites:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- The **duration**, wherein it will be indicated whether:
 - * the lifetime of the impact will be of a very short duration (0-1 years), assigned a score of 1;
 - * the lifetime of the impact will be of a short duration (2-5 years), assigned a score of 2;
 - * medium-term (5-15 years), assigned a score of 3;
 - * long term (> 15 years), assigned a score of 4; or
 - * permanent, assigned a score of 5;
- The **magnitude**, quantified on a scale from 0-10 where; 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5 where; 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- the **status**, which will be 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.
- the degree to which the impact can be mitigated.

The **significance** is calculated by combining the criteria in the following formula:

$$S = (E + D + M) P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

3.7 Limitations and Constraints of the study

The authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the subsurface nature of archaeological artefacts, the possibility exists that some features or artefacts may not have been discovered/recorded during the survey and the possible occurrence of unmarked graves and other cultural material cannot be excluded. Similarly, the depth of the deposit of heritage sites cannot be accurately determined due its subsurface nature. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this impact assessment.

4 Description of Socio Economic Environmental

According to Census 2011, Merafong City Local Municipality has a total population of 197 520, of which 86,5 % are black African, 11,8 % are white, 1,1 % are coloured, and 0,3 % are Indian/Asian. Of those aged 20 years and older, 6,1 % have completed primary schooling, 39,8 % have some secondary education, 26,4 % have completed matric, and 7,1% have some form of higher education. 91 521 people are economically active (employed or unemployed but looking for work), and of these, 27,7% are unemployed.

5 Description of the Physical Environment:

The survey area is situated on the Harterbeespoort Hatchery farm, approximately 27km West of Krugersdorp and Randfontein. The proposed area falls within the Merafong City local Municipality of Gauteng along the R500 between Holfontein and Koster Road. The proposed development is divided into three separate areas (site 3, site 4 and site 5) spread over a section of the Hartebeespoort Hatchery farm east of the main hatchery area. The three proposed developments are specifically located close to or next to electrical power grids and transformers.

The survey area is a large open field with clusters of small labourers' houses. The field is covered by a thin growth of new grasses after it had burnt down recently, giving a high visibility over the entirety of the proposed development areas. Scattered dolomite outcrops are also visible over all three the proposed development areas.



Figure 5. General site conditions - Site 3



Figure 6. General site conditions – Site 4



Figure 7. General site conditions – Site 5



Figure 8. Exposed soil profile at Site 3

6 Results of Public Consultation and Stakeholder Engagement:

Adjacent landowners and the public at large were informed of the proposed activity as part of the BA process. Site notices and advertisements notifying interested and affected parties were placed at strategic points and in local newspapers as part of the process.

7 Literature / Background Study:

7.1 Literature Review

The following CRM reports were conducted in the area and consulted for this study.

Author	Year	Project	Findings
Van der Walt, J. & Fourie, W.	2005	Portion of The Proposed Pipeline from Brandvlei To Krugersdorp On the Farm Brandvlei 261 IQ, District Mogale City, Gauteng Province Heritage Assessment	Two cemeteries
Gaigher, S.	2014	Heritage Impact Assessment for the Proposed Vogelstruisfontein Sand Mine	No sites
Mathoho, E.	2015	Archaeological Impact Assessment Relating to The Proposed Magaliesberg Cemetery on Portion 22 Of Farm Rietpoort 395 Within Mogale City Local Municipality, Gauteng Province	No sites

Genealogical Society and Google Earth Monuments

Neither the Genealogical Society nor the monuments database at Google Earth (Google Earth also include some archaeological sites and historical battlefields) has any recorded sites in the study area.

7.2 General History of the area

J. S. Bergh's historical atlas of the four northern provinces of South Africa provides local and regional history. An important heritage site in the greater Johannesburg area is the Melville Koppies, which is a Middle Stone Age (MSA) site. (Bergh 1999: 4) This area was also important to Iron Age communities, these people smelted and worked iron ore at the Melville Koppies site since the year 1060, by approximation. (Bergh 1999: 7, 87)

The Difaqane (Sotho), or Mfekane ("the crushing" in Nguni) was a time of bloody upheavals in Natal and on the Highveld, which occurred around the early 1820's until the late 1830's. (Bergh 1999: 10) It came about in response to heightened competition for land and trade and caused population groups like gun-carrying Griquas and Shaka's Zulus to attack other tribes. (Bergh 1999: 14; 116-119) It seems that, in 1827, Mzilikazi's Ndebele started moving through the area where Johannesburg is located today. This group went on raids to various other areas in order to expand their area of influence. (Bergh 1999: 11)

During the time of the Difaqane, a northwards migration of white settlers from the Cape was also taking place. Some travellers, missionaries and adventurers went on expeditions to the northern areas in South Africa, some already as early as the 1720's. It was however only by the late 1820's that a mass-movement of Dutch-speaking people in the Cape Colony started advancing into the northern areas. This was due to feelings of mounting dissatisfaction caused by economic and other circumstances in the Cape. This movement later became known as the Great Trek. This migration resulted in a massive increase in the extent of that proportion of modern South Africa dominated by people of European descent. (Ross 2002: 39) By 1939 to 1940, farm boundaries were drawn up in an area that includes the present-day Johannesburg and Krugersdorp (Bergh 1999: 15).

7.3 Archaeology of the greater study area

Although there are no well-known Stone Age sites located on or around the study area, there is evidence of the use of the larger area by Stone Age communities for example along the Kliprivier where ESA and MSA tools were recorded. LSA material is recorded along ridges to the south of the current study area (Huffman 2008). Petroglyphs (also called rock engravings) occur at Redan as well as along the Vaal River (Berg 1999).

Regarding the Iron Age, the well-known Smelting Site at Melville Koppies requires further mention. The site was excavated by Professor Mason from the Department of Archaeology of Wits in the 1980's. Extensive stone walled sites are also recorded at Klipriviers Berg Nature reserve belonging to the LIA period. A large body of research is available in this area. These sites (Taylor's Type N, Mason's Class 2 & 5) are now collectively referred to as Klipriviersberg (Huffman 2007). These settlements are complex in that aggregated settlements are common, the outer wall sometimes includes scallops to mark back courtyards, there are more small stock kraals, and straight walls separate households in the residential zone. These sites date to the 18th and 19th centuries and were built by people in the Fokeng cluster.

In this area, the Klipriviersberg walling would have ended in about AD 1823, when Mzilikazi entered the area (Rasmussen 1978). This settlement type may have lasted longer in other areas because of the positive interaction between Fokeng and Mzilikazi.

7.4 Cultural Landscape

The site under investigation is located about five kilometres to the north of Holfontein, two kilometres to the east of the R500 and about 29 kilometres to the west of Krugersdorp in Gauteng Province.

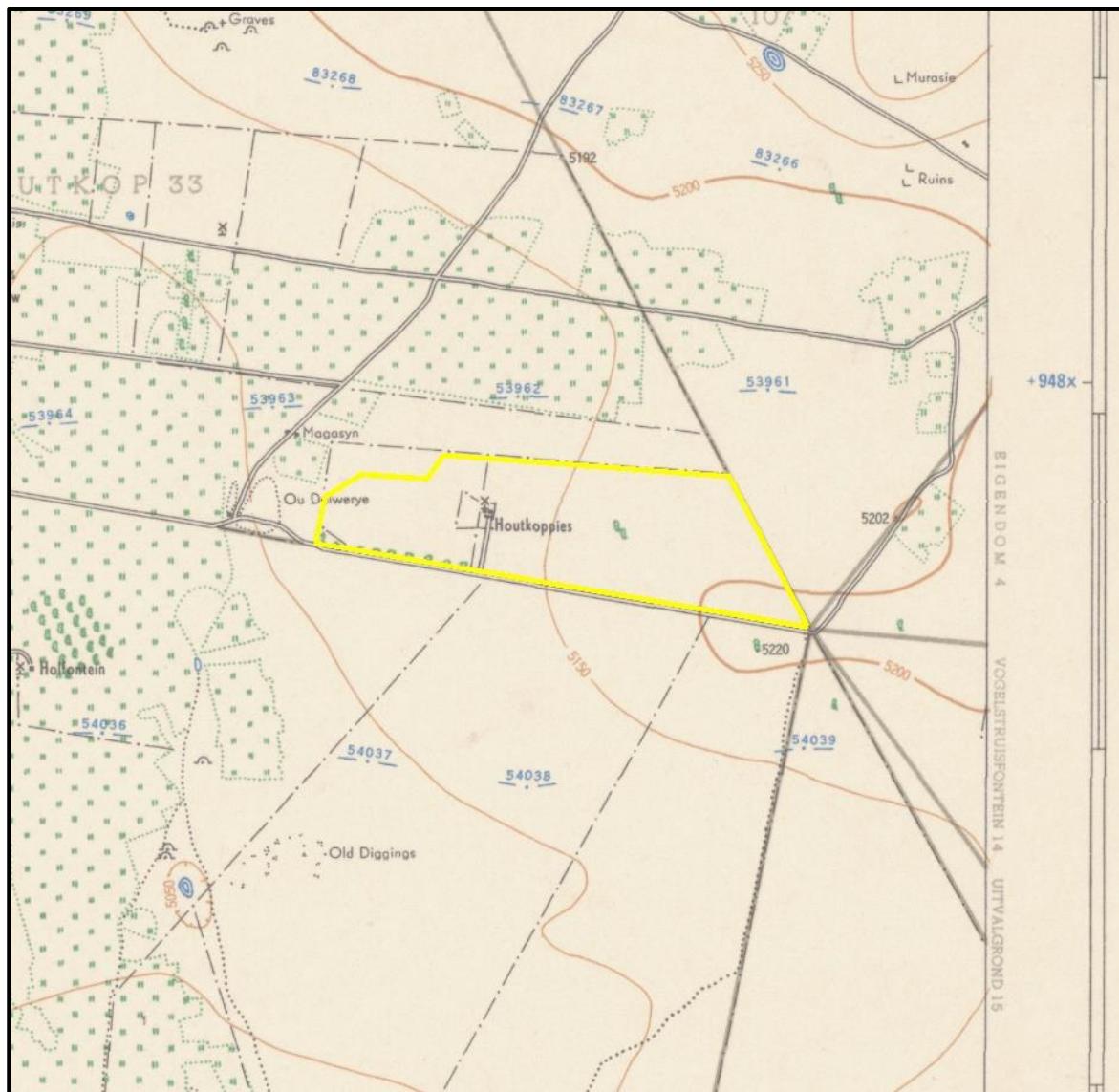


Figure 9. 1938 Topographical map of the farm under investigation. The approximate study area is indicated with a yellow border. A road formed the southern boundary of the site, and there was a road on the property leading to "Houtkoppies", where approximately three buildings and a wind mill were visible. One can see old diggings to the west of the study area. (Topographical Map 1938)

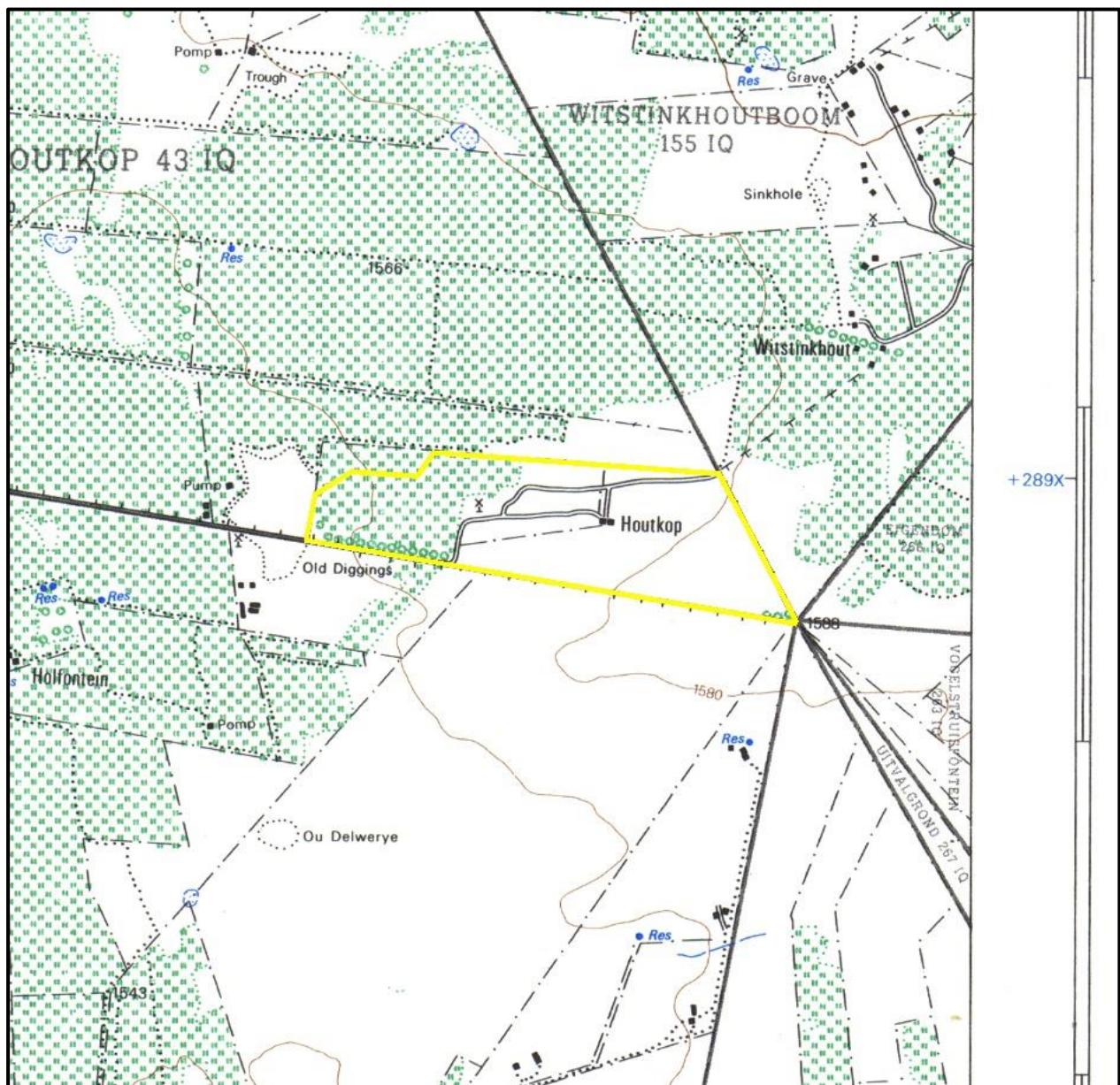


Figure 10. 1975 Topographical map of the farm under investigation. The approximate study area is indicated with a yellow border. A service railway formed the southern boundary of the farm, and a road also ran along a portion of the southern boundary. This road went through the study area, split and continued to the north eastern corner of the farm. Two buildings are visible at "Houtkop", near the road. A western section of the study area was used as cultivated lands, and a windmill is visible nearby. (Topographical Map 1975)

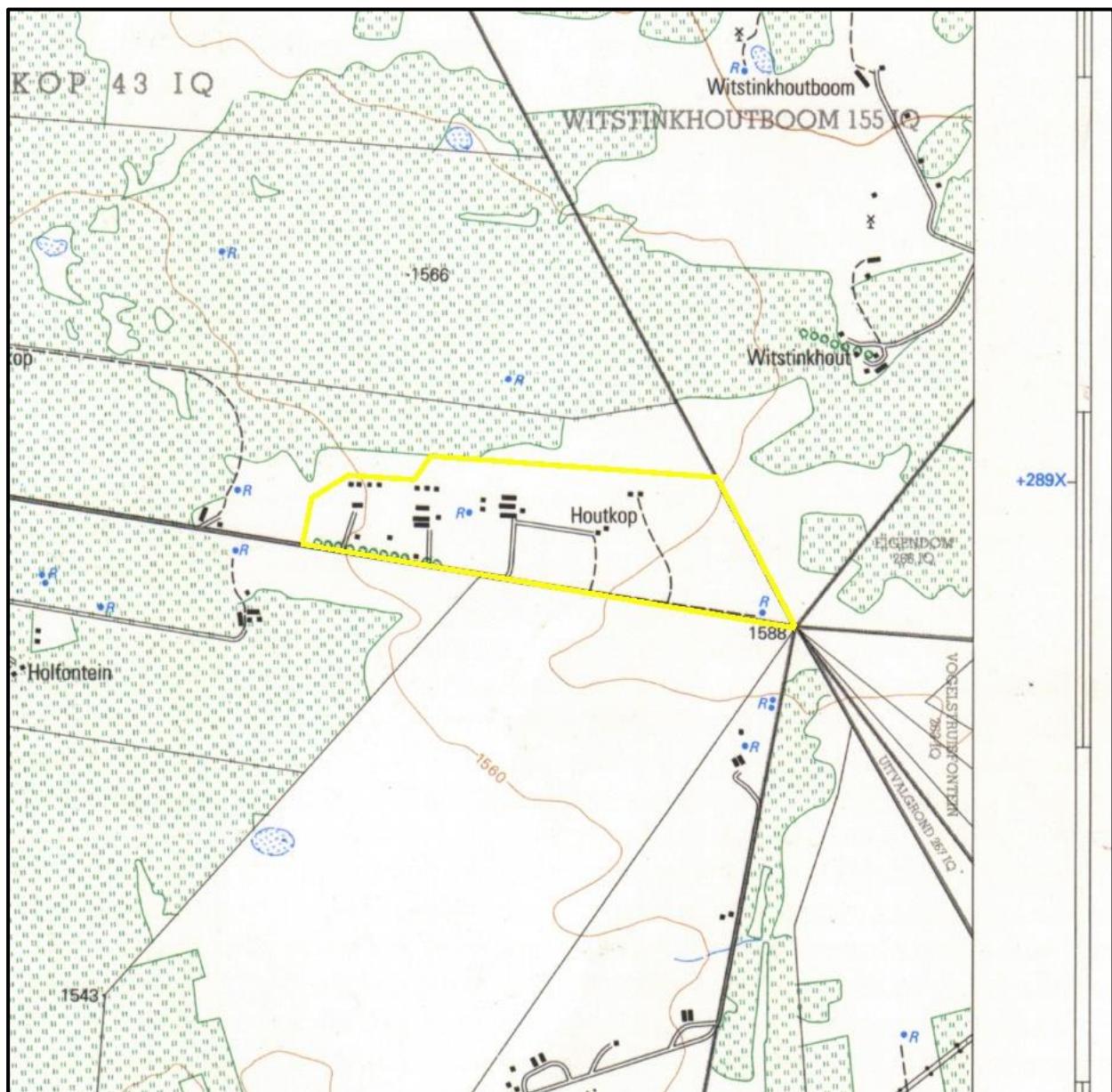


Figure 11. 1995 Topographical map of the farm under investigation. The approximate study area is indicated with a yellow border. A road formed the southern boundary of the farm, and three minor roads and two tracks went into the study area. Two buildings are still visible at "Houtkop", and there were clusters of buildings in a number of different places in the study area. Some of the buildings were large, elongated structures. In total, 24 buildings and two water reservoirs are visible. (Topographical 1995)

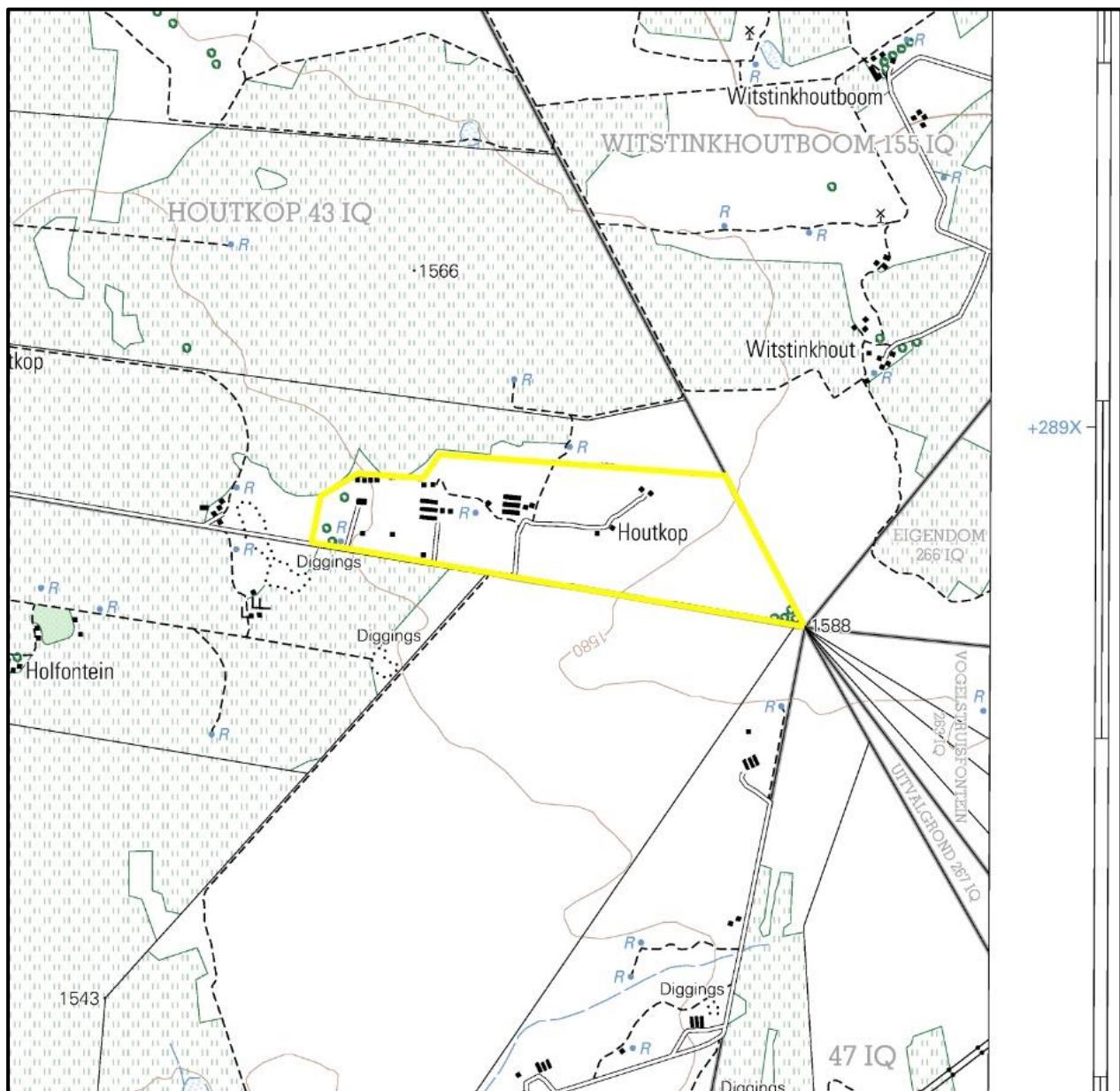


Figure 12. 2006 Topographical map of the farm under investigation. The approximate study area is indicated with a yellow border. A road formed the southern boundary of the farm, and three minor roads went into the study area. Two buildings are visible at "Houtkop", and there were clusters of buildings in a number of different places in the study area. Some of the buildings were large, elongated structures. In total, 26 buildings and two water reservoirs are visible. (Topographical 2006)



Figure 13. 2018 Google Earth image showing the study area in relation to the R500, Holfontein, Randfontein, Krugersdorp and other sites. (Google Earth 2018)

8 Findings of the Survey

Site 3:

This survey covered about 2 hectares at this site and it is the westernmost of the three proposed areas and is situated close to two small clusters of labourers' houses. This area shows some signs of ground disturbance in the form of a large pit on the south side just outside the survey area (Figure 8). Evidence of past agricultural activities is present within this survey area.

A small cluster (approximately 3) of possible graves were identified (Figure 14) on the Northern section of this area close to the second cluster of small labourer's houses located at 27° 28' 49.8288" E, 26° 07' 19.6103" S. A power grid and transformer is situated on the eastern edge of the proposed development area. No other archaeological remains were identified within this area.

Site 4:

This proposed development area is situated 300 meters to the east of site 3. No archaeological remains were identified within this area. A power grid and transformer are situated on the eastern edge of this area.

Site 5:

This area is situated southeast of site 4 and is close to the access road used to get to the survey areas as well as a thicket of eucalyptus trees to the south just outside the survey area. A power grid and transformer are situated on the eastern edge of the survey area. Two isolated stone artefacts were identified within this proposed area located at 27° 29' 13.5061" E, 26° 07' 34.6763" S (Figure 14).

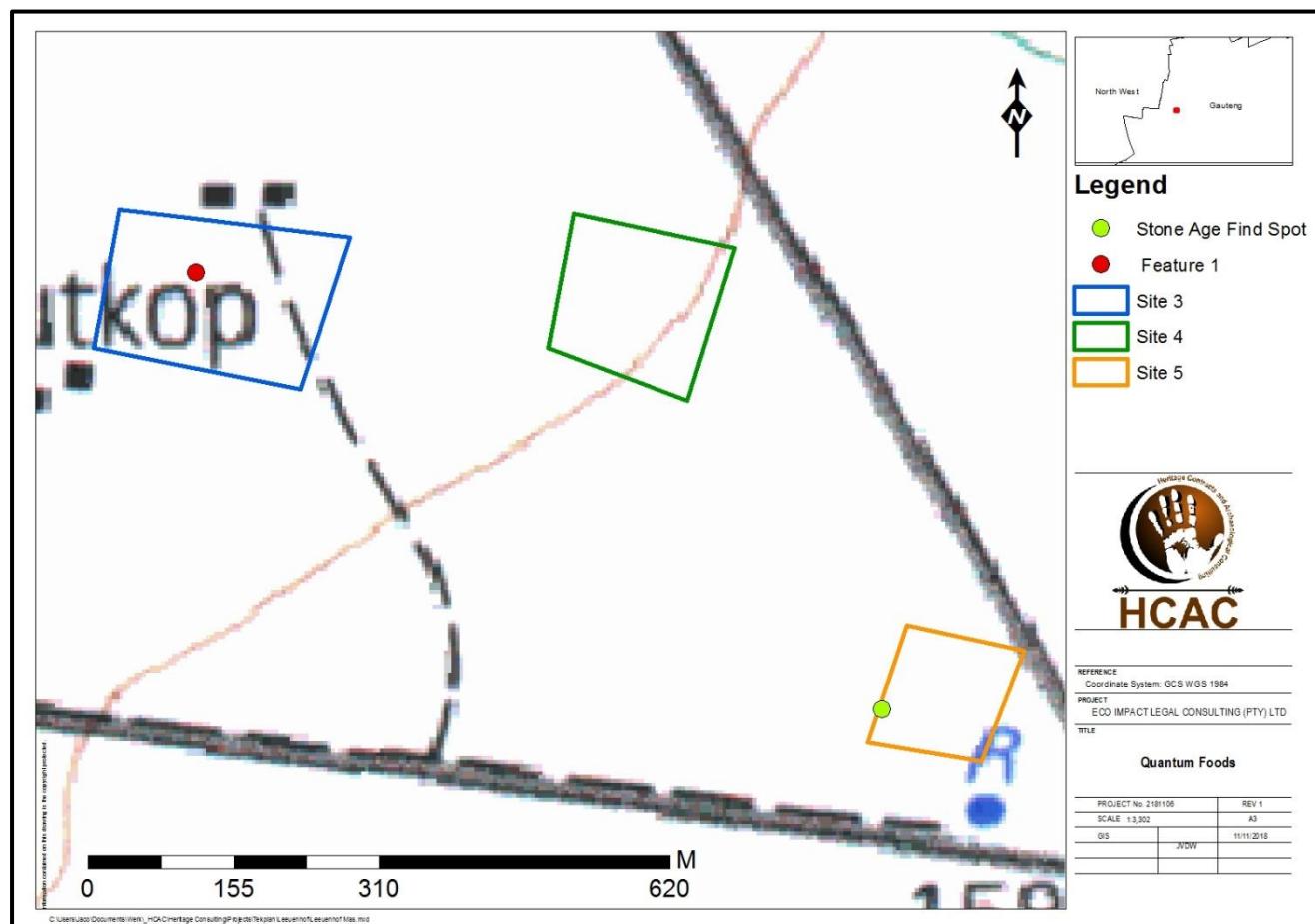


Figure 14. Identified features in relation to the development

9 Description of Identified Heritage Resources (NHRA Section 34 -36)

9.1 Built Environment (Section 34 of the NHRA)

No standing structures older than 60 years occur in the study area.

9.2 Archaeological and Palaeontological resources (Section 35 of the NHRA)

9.2.1 Archaeological Resources

A small LSA bladelet core and miscellaneous flake were identified in Site 5. The stone artefacts were located close to the eastern edge of the survey area close to the transformer connecting to the power grid. These isolated artefacts do not constitute an archaeological site as they are out of context and of no significance apart from noting their presence as done in this report. Therefore, no further mitigation prior to construction is recommended in terms of the archaeological component of Section 35 of the NHRA for the proposed development to proceed.



Figure 15. Core and flake

9.2.2 Paleontological Resources

An independent paleontological study was conducted by Prof Barry Millsteed and found that any negative impacts to the palaeontological heritage of the region will be limited to the footprint area of the construction of the project's infrastructural elements; the extent of any impact is accordingly characterised as local. Any negative impact upon fossil materials caused by the project will be permanent. It is anticipated, herein, that most infrastructural elements will only directly affect the surface of the site to a relatively shallow depth (< 2m). Fossil materials that remain undiscovered after the construction of the project and which are located beneath the maximum depth of the anticipated excavations will only be negatively affected in so far as they will be unavailable for scientific study for the life expectancy of the infrastructural elements that comprise the project (i.e., long term to permanent). The project area is completely underlain by dolomitic sediments of the Malmani Subgroup. These sediments are known to contain prolific assemblages of stromatolites. A layer of unfossiliferous regolith (Terra Rosa soil) was identified as overlying the Malmani Subgroup within the project area; the layer is of inconsistent thickness, with numerous outcrops of Malmani Subgroup visible. A third rock type is potentially present within the project area. This third group consists of discordant Pliocene karst infill deposits (breccia and flowstone deposits) hosted within the Malmani Subgroup rocks. These karst infill deposits are known to be fossiliferous within the adjacent Cradle of Human Kind World Heritage Site where they are known to contain hominin-bearing vertebrate fossil assemblages of world significance. However, no Pliocene karst deposits were located during the conduct of the site investigation. The possibility remains that these deposits may either be present within the subsurface of the Malmani Subgroup, but not crop out or that they may be present, but be located beneath the Cainozoic regolith cover. There is no important negative impact on the palaeontological heritage of the project area that will be caused by the impacts of the project upon the Cainozoic regolith nor the dolomitic sedimentary rocks of the Malmani Subgroup. No Pliocene karst infill deposits hosted were located within the Malmani Subgroup dolomites during the site visit. However, a small chance exists that deposits of this type may exist in the subsurface but not be exposed (or may crop out beneath the regolith cover). If these karst deposits do exist and are fossil-bearing any negative impact upon them would be of the high scientific and cultural significance. The significance of the fossil assemblages they may contain is indicated by the fact that it is the presence of similar fossil assemblages that underpinned the creation of the adjacent Cradle of Human Kind World Heritage Site. Any damage that occurs to such fossil material during the excavation and construction phase of the project would be permanent and irreversible. The potential negative impact to the palaeontological heritage of the area can be substantially mitigated by the implementation of appropriate mitigation processes. Please refer the full report for details.

9.3 Burial Grounds and Graves (Section 36 of the NHRA)

Three stone packed features were recorded here and is currently interpreted as possible graves located in Site 3. It seems to contain three graves orientated East to West. The Easternmost grave is approximately 2m in length and 1m in width with a covering of loosely packed rocks with larger rocks on the outer edge of the grave and smaller rocks towards the centre of the grave covering. The Westernmost graves are about a meter away from the western grave and laid out next to one another. These graves are slightly smaller than the other grave with identically packed rock coverings. Piet Taljaard was consulted regarding the possible graves and he indicated that he is unaware of graves in the area. It is therefore not excluded that these features could be the result of clearing, this should be confirmed during social consultation.



Figure 16. General Site conditions Site 3



Figure 17. Possible Grave at Site 3



Figure 18. Possible grave at Site 3



Figure 19. Possible grave at site 3.

9.4 Battlefields and Concentration Camps

There are no battlefields or related concentration camp sites located in the study area.

9.5 Cultural Landscapes, Intangible and Living Heritage.

Long-term impact on the cultural landscape is considered to be negligible as the surrounding area consists of an agricultural area similar to the proposed development. Visual impacts to scenic routes and sense of place are also considered to be low due to the extensive developments in the area.

9.6 Potential Impact

The site has been impacted on by previous agricultural activities and developments. From a heritage point of view, the area has been impacted on, and the level of additional impacts by the development is considered to be acceptable if the correct mitigation measures are implemented.

9.6.1 Pre-Construction phase:

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of road infrastructure needed for the construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

9.6.2 Construction Phase

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

9.6.3 Operation Phase:

No impact is envisaged to heritage resources during this phase.

Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. This and other projects in the area could have an indirect impact on the heritage landscape. The implementation of suitable mitigation measures will ensure minimal additional impact on the landscape.

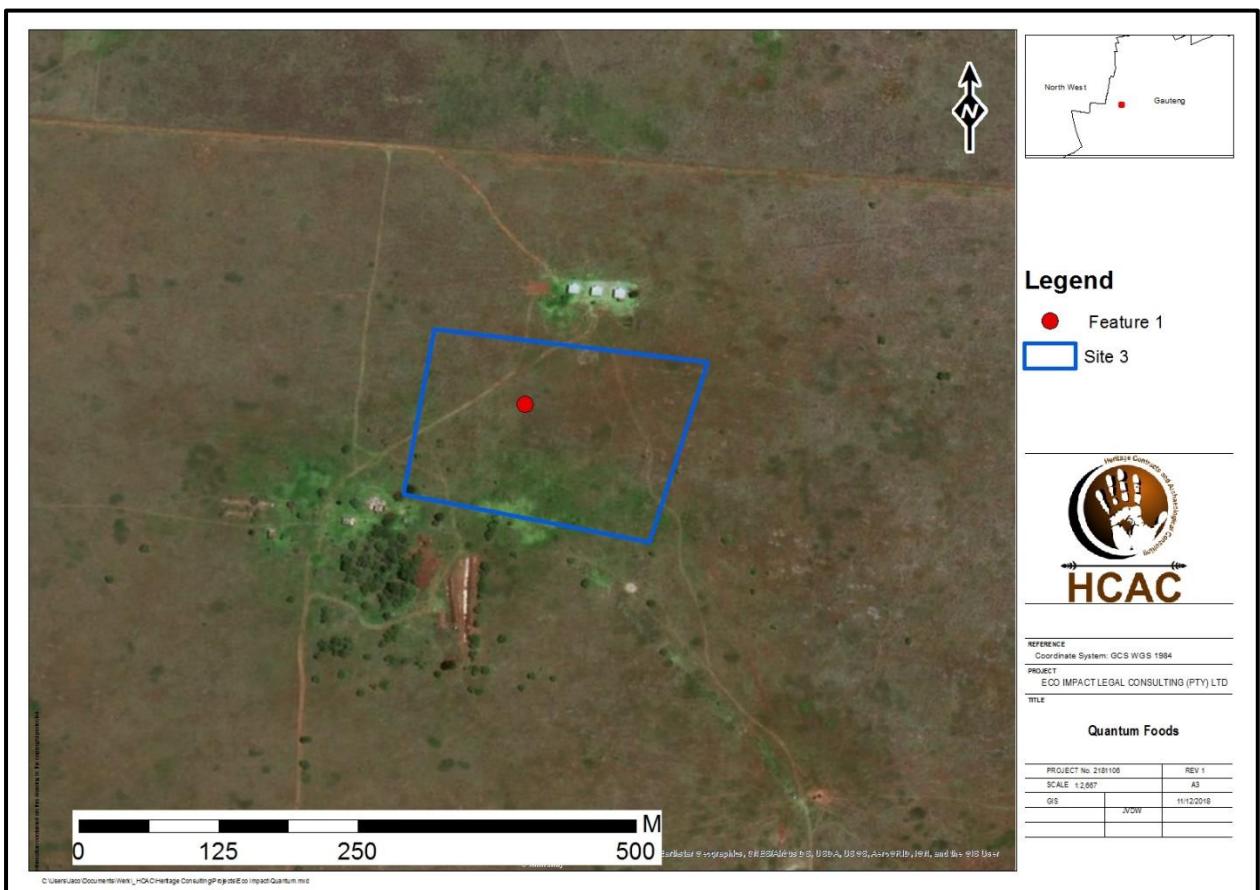


Figure 20. Location of the possible graves in relation to Site 3.

Table 5. Impact of project on identified heritage resources.

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfacing may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	With mitigation (Preservation/ excavation of site)
Extent	Local (3)	Local (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (4)	Low (2)
Probability	Probable (3)	Not probable (2)
Significance	36 (Medium)	20 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	Yes
Mitigation: It is recommended that the presence of graves in Site 3 should be confirmed through social consultation. Graves and cemeteries are of high social significance, and if the presence of graves is confirmed, it is recommended that the graves should be demarcated and preserved <i>in situ</i> . A chance find procedure should be implemented for the project. Palaeontological mitigation is included in the report by Millsteed (2018) and summarised in the HIA		
Cumulative impacts: The surrounding area is characterised by agricultural developments and due to the lack of significant heritage resources that will be impacted on in the study area cumulative impacts are considered to be low.		
Residual Impacts: If sites are destroyed this results in the depletion of archaeological record of the area. However, if sites are recorded and preserved or mitigated this adds to the record of the area.		

10 Recommendations and conclusion

HCAC was appointed to conduct a Heritage Impact Assessment of the proposed project to determine the presence of cultural heritage sites and the impact of the proposed development on these non-renewable resources. The proposed development is divided into three separate areas (site 3, site 4 and site 5) spread over a section of the Hartebeespoort Hatchery farm east of the main hatchery area. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of each area. In terms of the NHRA (Act 25 of 1999) the following findings apply:

Regarding the built environment of the area (Section 34), no standing structures older than 60 years occur within the study area. In terms of the archaeological component of Section 35, two isolated Later Stone Age artefacts were recorded in development site 5. These isolated artefacts do not constitute an archaeological site as they are out of context and of no significance apart from noting their presence as done in this report. Therefore, no further mitigation before construction is recommended for the proposed development to proceed. Regarding the palaeontological component of Section 35, according to the paleo sensitivity map on SAHRIS, the paleontological sensitivity of the project is very high, and an independent paleontological study was conducted (Millsteed 2018). Millsteed concluded that he has not identified any palaeontological reason to prejudice the progression of the HBP hatchery expansion project, subject to the mitigation programs he recommended, being put in place as outlined in his report and summarised here.

Regarding Section 36 of the Act, a possible graveyard was recorded in development Site 3. The presence of graves should be confirmed before construction, and if the site does represent a graveyard, the graves should be retained *in situ*. If any additional graves are located in future, they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation. No public monuments are located within or close to the study area. The existing hatchery and road infrastructure developments surround the study area and the proposed development will not impact negatively on significant cultural landscapes or viewscapes. During the Public Participation process conducted for this project, no heritage concerns were raised.

The impact of the proposed project on heritage resources is considered low, and it is recommended that from a heritage perspective the proposed project can commence on the condition that the recommendations as made in this report are implemented as part of the EMPr and based on approval from SAHRA.

Recommendations:

- Implementation of a chance find procedure.
- It is recommended that the presence of graves at Site 3 should be confirmed through social consultation and if the identified features are graves, the graves should ideally be retained *in situ*, and demarcated with an access gate for family members.
- It is recommended that a close examination of all excavations be made while they are occurring within the Malmani Formation dolomites. Should any fossil materials be identified, the excavations should be halted and SAHRA informed of the discovery. These examinations must be made by a professional palaeontologist and the investigation should be timed to coincide with the excavation of the trenches to accommodate building foundations.

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find and therefore chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below.

10.1 Chance Find Procedures

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or rock engraving, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area.

The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

Should any fossil materials be identified, the excavations should be halted and SAHRA informed of the discovery. These examinations must be made by a professional palaeontologist and the investigation should be timed to coincide with the excavation of the trenches to accommodate building foundations. Conducting the investigation at this time would provide the greatest exposure of the Malmani Subgroup rocks that host the karst infill deposits. Should fossil material be identified the palaeontologist should assess their significance and make further recommendations to mitigate any negative impacts.

10.2 Reasoned Opinion

The impact of the proposed project on heritage resources is considered low and no further pre-construction mitigation is required. Furthermore, the socio-economic and employment opportunities also outweigh the possible impacts on heritage resources.

11 References

- Bergh, J.S., (ed.) *Geskiedenisatlas van Suid-Afrika. Die vier noordelike provinsies*. Pretoria: J. L. van Schaik Uitgewers. 1999.
- Gaigher, S. 2014 Heritage Impact Assessment for the Proposed Vogelstruisfontein Sand Mine
- Hocking, A., 1986: *Randfontein Estates: The First Hundred Years*, Hollards, Bethulie.
- Huffman, T.N. 2007. Handbook to the Iron Age: The Archaeology of Pre-Colonial Farming Societies in Southern Africa. University of KwaZulu-Natal Press, Scottsville.
- Mathoho, E. 2015 Archaeological Impact Assessment Relating to The Proposed Magaliesberg Cemetery on Portion 22 Of Farm Rietpoort 395 Within Mogale City Local Municipality, Gauteng Province
- Rasmussen, R.K. 1978 Migrant kingdom: Mzilikazi's Ndebele in South Africa. London: Rex Collings
- Ross, R. A concise history of South Africa. Cambridge University Press. Cambridge. 1999.
- SAHRA Report Mapping Project Version 1.0, 2009
- SAHRIS (Cited Nov 2018)
- Van der Walt, J. & Fourie, W. 2005 Portion of The Proposed Pipeline from Brandvlei To Krugersdorp On the Farm Brandvlei 261 IQ, District Mogale City, Gauteng Province Heritage Assessment. Unpublished report.

Electronic Sources

- https://joburg.org.za/index.php?option=com_content&Itemid=118&task=view&id=173&limitstart=1
- www.news24.com

MAPS

- Topographical map. 1938. *South Africa. 1:50 000 Sheet. 2627AB Syferbult. First Edition*. Pretoria: Government Printer.
- Topographical map. 1975. *South Africa. 1:50 000 Sheet. 2627AB Syferbult. Second Edition*. Pretoria: Government Printer.
- Topographical map. 1995. *South Africa. 1:50 000 Sheet. 2627AB Syferbult. Third Edition*. Pretoria: Government Printer.
- Topographical map. 2006. *South Africa. 1:50 000 Sheet. 2627AB Syferbult. Fourth Edition*. Pretoria: Government Printer.

Electronic Sources:

- Google Earth. 2018. $26^{\circ}07'25.54''$ S $27^{\circ}28'35.01''$ E eye alt 2.63 km. [Online]. [Cited 29 October 2018].
- Google Earth. 2018. $26^{\circ}08'14.83''$ S $27^{\circ}27'34.75''$ E eye alt 57.58 km. [Online]. [Cited 29 October 2018].

12 Appendices:

Curriculum Vitae of Specialist

Jaco van der Walt
Archaeologist

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Education:

Particulars of degrees/diplomas and/or other qualifications:

Name of University or Institution:	University of Pretoria
Degree obtained	BA Heritage Tourism & Archaeology
Year of graduation	2001
Name of University or Institution:	University of the Witwatersrand
Degree obtained	BA Hons Archaeology
Year of graduation	2002
Name of University or Institution	University of the Witwatersrand
Degree Obtained	MA (Archaeology)
Year of Graduation	2012
Name of University or Institution	University of Johannesburg
Degree	PhD
Year	Currently Enrolled

EMPLOYMENT HISTORY:

2011 – Present:	Owner – HCAC (Heritage Contracts and Archaeological Consulting CC).
2007 – 2010 :	CRM Archaeologist , Managed the Heritage Contracts Unit at the University of the Witwatersrand.
2005 - 2007:	CRM Archaeologist , Director of Matakoma Heritage Consultants
2004:	Technical Assistant , Department of Anatomy University of Pretoria
2003:	Archaeologist , Mapungubwe World Heritage Site
2001 - 2002:	CRM Archaeologists , For R & R Cultural Resource Consultants, Polokwane
2000:	Museum Assistant , Fort Klapperkop.

Countries of work experience include:

Republic of South Africa, Botswana, Zimbabwe, Mozambique, Tanzania, The Democratic Republic of the Congo, Lesotho and Zambia.

SELECTED PROJECTS INCLUDE:

Archaeological Impact Assessments (Phase 1)

Heritage Impact Assessment Proposed Discharge Of Treated Mine Water Via The Wonderfontein Spruit Receiving Water Body Specialist as part of team conducting an Archaeological Assessment for the Mmamabula mining project and power supply, Botswana

Archaeological Impact Assessment Mmamethlake Landfill

Archaeological Impact Assessment Libangeni Landfill

Linear Developments

Archaeological Impact Assessment Link Northern Waterline Project At The Suikerbosrand Nature Reserve

Archaeological Impact Assessment Medupi – Spitskop Power Line,

Archaeological Impact Assessment Nelspruit Road Development

Renewable Energy developments

Archaeological Impact Assessment Karoshoek Solar Project

Grave Relocation Projects

Relocation of graves and site monitoring at Chloorkop as well as permit application and liaison with local authorities and social processes with local stakeholders, Gauteng Province.

Relocation of the grave of Rifle Man Maritz as well as permit application and liaison with local authorities and social processes with local stakeholders, Ndumo, Kwa Zulu Natal.

Relocation of the Magolwane graves for the office of the premier, Kwa Zulu Natal

Relocation of the OSuthu Royal Graves office of the premier, Kwa Zulu Natal

Phase 2 Mitigation Projects

Field Director for the Archaeological Mitigation For Booyensdal Platinum Mine, Steelpoort, Limpopo Province.

Principle investigator Prof. T. Huffman

Monitoring of heritage sites affected by the ARUP Transnet Multipurpose Pipeline under directorship of Gavin Anderson.

Field Director for the Phase 2 mapping of a late Iron Age site located on the farm Kameelbuilt, Zeerust, North West Province. Under directorship of Prof T. Huffman.

Field Director for the Phase 2 surface sampling of Stone Age sites effected by the Medupi – Spitskop Power Line, Limpopo Province

Heritage management projects

Platreef Mitigation project – mitigation of heritage sites and compilation of conservation management plan.

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:

- Association of Southern African Professional Archaeologists. Member number 159
- Accreditation:
 - Field Director Iron Age Archaeology
 - Field Supervisor Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation
- Accredited CRM Archaeologist with SAHRA
- Accredited CRM Archaeologist with AMAFA
- Co-opted council member for the CRM Section of the Association of Southern African Association Professional Archaeologists (2011 – 2012)

PUBLICATIONS AND PRESENTATIONS

- A Culture Historical Interpretation, Aimed at Site Visitors, of the Exposed Eastern Profile of K8 on the Southern terrace at Mapungubwe.
 - J van der Walt, A Meyer, WC Nienaber
 - Poster presented at Faculty day, Faculty of Medicine University of Pretoria 2003
- 'n Reddingsondersoek na Anglo-Boereoorlog-ammunisie, gevind by Ifafi, Noordwes-Provincie. South-African Journal for Cultural History 16(1) June 2002, with A. van Vollenhoven as co-writer.
- Fieldwork Report: Mapungubwe Stabilization Project.
 - WC Nienaber, M Hutten, S Gaigher, J van der Walt
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2004
- A War Uncovered: Human Remains from Thabantšo Hill (South Africa), 10 May 1864.
 - M. Steyn, WS Boshoff, WC Nienaber, J van der Walt
 - Paper read at the 12th Congress of the Pan-African Archaeological Association for Prehistory and Related Studies 2005
- Field Report on the mitigation measures conducted on the farm Bokfontein, Brits, North West Province .
 - J van der Walt, P Birkholtz, W. Fourie
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2007
- Field report on the mitigation measures employed at Early Farmer sites threatened by development in the Greater Sekhukhune area, Limpopo Province. J van der Walt
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2008
- Ceramic analysis of an Early Iron Age Site with vitrified dung, Limpopo Province South Africa.
 - J van der Walt. Poster presented at SAFA, Frankfurt Germany 2008

- Bantu Speaker Rock Engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga (*In Prep*)
 - J van der Walt and J.P Celliers
- Sterkspruit: Micro-layout of late Iron Age stone walling, Lydenburg, Mpumalanga. W. Fourie and J van der Walt. A Poster presented at the Southern African Association of Archaeologists Biennial Conference 2011
- Detailed mapping of LIA stone-walled settlements' in Lydenburg, Mpumalanga. J van der Walt and J.P Celliers
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Bantu-Speaker Rock engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga. J.P Celliers and J van der Walt
 - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Pleistocene hominin land use on the western trans-Vaal Highveld ecoregion, South Africa, Jaco van der Walt.
 - J van der Walt. Poster presented at SAFA, Toulouse, France. Biennial Conference 2016

REFERENCES:

1. Prof Marlize Lombard Senior Lecturer, University of Johannesburg, South Africa
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2. Prof TN Huffman Department of Archaeology Tel: (011) 717 6040
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3. Alex Schoeman University of the Witwatersrand
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