



PROPOSED MAHWELERENG SHOPPING CENTRE EXPANSION IN THE MOGALAKWENA LOCAL MUNICIPALITY, WATERBERG DISTRICT OF THE LIMPOPO PROVINCE

Heritage Impact Assessment (HIA) Report

October 2021

CREDIT SHEET

Stephan Gaigher (BA Hons, Archaeology, UP)

Principle Investigator for G&A Heritage Properties (Pty) Ltd.



Member of ASAPA (Site Director Status)

Cell: +27 73 752 6583

Email: stephan@gaheritage.co.za

REPORT AUTHOR

Stephan Gaigher

***Disclaimer;** Although all possible care is taken to identify all sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. G&A Heritage and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.*

Statement of Independence

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

SIGNED BY: STEPHAN GAIGHER



MANAGEMENT SUMMARY

Project Name and Location

Proposed Mahwelereng Shopping Centre Expansion in the Mogalakwena Local Municipality, Waterberg District of the Limpopo Province.

Consultant

G&A Heritage Management Properties (Pty) Ltd.

P.O. Box 522, Louis Trichardt, 0920

38 A Vorster Street, Louis Trichardt

Stephan Gaigher

+27 73 752 6583

stephan@gaheritage.co.za

Appointed By

EcoTechnik Environmental Consultants



Date of Report

7 October 2021

MANAGEMENT SUMMARY

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

This study focuses on the proposed Mahwelereng Shopping Centre Expansion in the Mogalakwena Local Municipality, Waterberg District of the Limpopo Province.

This study encompasses the heritage impact investigation. A preliminary layout has been supplied to lead this phase of this study.

Scope of Work

A Heritage Impact Assessment (including Archaeological, Cultural heritage, Built Heritage and Basic Palaeontological Assessment to determine the impacts on heritage resources within the study area.

The following is required to perform this assessment:

- A desk-top investigation of the area;
- A site visit to the proposed development site;
- Identify possible archaeological, cultural, historic, built and palaeontological sites within the proposed development area;
- Evaluate the potential impacts of construction and operation of the proposed development on archaeological, cultural, historical resources; built and palaeontological resources; and
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural, historical, built and palaeontological importance.

The purpose of this study is to determine the possible occurrence of sites with cultural heritage significance within the study area. The study is based on archival and document combined with fieldwork investigations.

Findings and Recommendations

The study area, located on Erven 1, 2 and 3 Mahwelereng AI and Erf 1684 Madiba on the Remainder of the Farm Macalacskop 243 KR (Mogalakwena Local Municipality, Waterberg District of the Limpopo Province), was investigated during a field visit and through archival studies.

Four clusters of grave sites were observed within the study area. It is recommended that a permit be obtained, and the graves be relocated to a Municipal Cemetery to avoid damage.

Some occupational remains such as concrete water troughs and hut foundations were noted. According to a local informant these date from the early 1980's when people were relocated to new townships in the area and therefore do not warrant protection under the NHRA.

The rest of the study area was found to be devoid of any heritage sites with significance and severely altered from the natural landscape. It is recommended that obscured, subterranean sites be managed, if they are encountered.

Fatal Flaws

No fatal flaws were identified.

CONTENTS

Scope of Work	4
Findings and Recommendations	4
Fatal Flaws	4
1. General	12
1.1 Project Description	12
1.2 Project Location	12
1.3 Technical Scope of HIA	12
1.4 Geographical / Spatial Scope of HIA	14
1.5 GPS Track Path	14
1.5 Temporal Scope	15
2. Legislative Context	16
2.1 National Legislation	16
3. Methodology	19
3.1 Heritage Management	19
3.2 Inventory	19
3.3 Evaluating Heritage Impacts	19
3.4 Site Visit / Fieldwork Details	20
3.5 Assumptions	20
3.6 Gaps / Limitations / Uncertainty	20
3.7 Specialist Specific Methodology	20
3.8 Impact Assessment Methodology	21
4. Assessment of Heritage Potential	23
4.1 Assessment Matrix	23
4.1.1 Determining Archaeological Significance	23
4.2 Assessing site value by attribute	24
4.3 Impact Statement	24
4.3.1 Assessment of Impacts	24
4.4 Indicators of Impact Severity	25
4.4.1 Pre-Contact Sites	25
4.4.2 Post-Contact Sites	26
4.4.3 Built Environment	26
5. Impact Evaluation	28
5.1 Determination of Significance of Impacts	28
5.2 Impact Rating System	28
5.2.1 Rating System Used to Classify Impacts	28
5.3 Assessing Visual Impact	31
6. Assessment of Impacts	32
6.1 Impact Statement	32
6.1.1 Built Environment	32
6.1.2 Cultural Landscape	32

6.1.3 Natural Landscape	35
7. Measuring Impacts	39
7.1 Magnitude	42
7.2 Duration	43
7.3 Extent	43
7.4 Probability	44
7.5 Significance	44
8. Description of Affected Environment	46
8.1 Map of Key Features	46
8.2 Findings	47
8.2.1 Grave Cluster 1	47
8.2.2 Grave Cluster 2	48
8.2.2 Grave Cluster 3	51
8.2.2 Grave Cluster 4	53
9. Baseline	56
9.1 Palaeontology	56
9.2 Stone Age	57
9.3 Iron Age	63
9.4 Historic Era	66
9.5 Archival Research	66
9.6 SAHRIS Database Studies	67
9.7 Historical Typographical Maps	69
10. Potential Heritage Impacts and Proposed Mitigation	71
10.1 Introduction and scope	71
10.2 Impact Assessment and Proposed Mitigation	71
11. Public Participation	72
12. Conclusions and Recommendations	74
13. Chance Finds Protocol	75
14. References	78

List of Figures

Figure 1. Proposed Mahwelereng Shopping Centre Station Location Map	12
Figure 2. GPS Trackpath	15
Figure 3. Dense sickle bush, disturbed surfaces, overgrazing and littering observed on site	32
Figure 4. Dense sickle bush, disturbed surfaces, overgrazing and littering observed on site	33
Figure 5. Powerline	33
Figure 6. Cement foundations observed on site.....	34
Figure 7. Cement foundations observed on site	34
Figure 8. Zinc shed on site	35
Figure 9. Dense sickle bush cover on site.....	36
Figure 10. Disturbed natural landscape, overgrazing and dense sickle bush cover	36
Figure 11. Map of Key Features (Google Earth)	46
Figure 12. Map of Key Features	46
Figure 13. Grave Cluster 1 – three graves with cement borders visible.....	47
Figure 14. Grave Cluster 1 – one grave decorated with stones	48
Figure 15. Grave Cluster 1 Location Map	48
Figure 16. Grave Cluster 2 – three graves adjacent to one another, all decorated with stones.....	49
Figure 17. Grave Cluster 2	50
Figure 18. Grave Cluster 2	50
Figure 19. Grave Cluster 2 Location Map	51
Figure 20. Grave Cluster 3 – one grave with a fabricated headstone	52
Figure 21. Grave Cluster 3 – one grave decorated with stones	52
Figure 22. Grave Cluster 3 Location Map	53
Figure 23. Grave Cluster 4	53
Figure 24. Grave Cluster 4	54
Figure 25. Grave Cluster 4	54
Figure 26. Grave Cluster 4	55
Figure 27. Grave Cluster 4 Location Map	55
Figure 28. Paleo Sensitivity Map	56
Figure 29. Limpopo Middle Stone Age sites mentioned in the text (Hutson & Cain, 2008) (Baleni in blue).....	58
Figure 30. Middle Stone Age Tools.....	58
Figure 31. Middle Stone Age Tools.....	59
Figure 32. Steenbokfontein blades, flakes and lithics with secondary edge modification	60
Figure 33. Rock Art Locations (Blue dot indicates Baleni)	62
Figure 34. Khoekhoen Geometric Patterns and Finger Dot Painting (Makgabeng Plateau)	63
Figure 35. Red handprints overlain by white handprints, Soutpansberg, Central Limpopo Basin. Scale 200mm	63
Figure 36. Khami-period sites in the Mapungubwe landscape	65
Figure 37. Ceramic facies associated with the three phases of occupation at Machedema.....	65
Figure 38. Roodt, F. 2008.....	69
Figure 39. 2428BB_1969 Topographic Map.....	69

Figure 40. 2428BB_1981 Topographic Map..... 70
Figure 41. 2428BB_2005 Topographic Map..... 70
Figure 42. Placing Site Signage at the entrance to the Study Area..... 72
Figure 43. Site Signage at a Grave Cluster 73
Figure 44. Site Signage at a Grave Cluster 73

List of Tables

Table 1. Impacts on the NHRA Sections	18
Table 2. NHRA Triggers	18
Table 3. Site's Heritage Significance	22
Table 4. Classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deacon, NMC as used in Morris)	23
Table 5. Site attributes and value assessment (adopted from Whitelaw 1997 as used in Morris)	23
Table 6. Description of magnitude and assigned numerical values	42
Table 7. Description of duration and assigned numerical values	43
Table 8. Description of extent and assigned numerical values	43
Table 9. Definition of probability ratings	44
Table 10. Application of significance ratings	44
Table 11. Definition of confidence ratings	45
Table 12. Definition of reversibility ratings	45
Table 13. Definition of irreplaceability ratings	45
Table 14. Palaeontological Sensitivity	56

ABBREVIATIONS

Abbreviation	Meaning
BP	Before Present
c.	circa
BCE	Before the Common Era
Bp	Before Present
CE	Common Era
ECO	Environmental Control Officer
EIA	Early Iron Age
ELO	Environmental Liaison Officer
ESA	Early Stone Age
ESMS	Environmental and Social Management System
ESSS	Environmental and Social Safeguard Standards
Fm	Femtometre (10^{-15} m)
GPS	Geographic Positioning System
HIA	Heritage Impact Assessment
ICP	Informed Consultation and Participation
LIA	Late Iron Age
LSA	Late Stone Age
MSA	Middle Stone Age
MYA	Million Years Ago
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
PIA	Palaeontological Impact Assessment
PS	Performance Standard
SAHRA	South African Heritage Resource Agency
SAHRIS	South African Heritage Information System
SAPS	South African Police Service
SHE	Safety, Health and Environment
SHEQ	Safety, Health, Environment and Quality
S&EIR	Scoping and Environmental Impact Reporting
Um	Micrometre (10^{-6} m)
WGS 84	World Geodetic System for 1984

GLOSSARY OF TERMS

'Archaeological' means:

- a) Material remains resulting from human activity which are in a state of disuse and are in or on land and are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
- b) Rock art, being a form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and is older than 100 years including any area within 10 m of such representation; and
- c) Wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land or in the maritime cultural zone referred to in section 5 of the Maritime Zones Act 1994 (Act 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which are older than 60 years or which in terms of national legislation are considered to be worthy of conservation;
- d) Features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

'Circa' is used in front of a particular year to indicate an approximate date.

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

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

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

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

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

1. General

1.1 Project Description

G&A Heritage was appointed by *EcoTechnik Environmental Consultants* to undertake a Heritage Impact Assessment (HIA) for the proposed Mahwelereng Shopping Centre Expansion in the Mogalakwena Local Municipality, Waterberg District of the Limpopo Province.

The proponent is Olympic Park Trading 171 (Pty) Ltd.

The extent of the study area is approximately 3,08ha. The area will be cleared and levelled where necessary. Site offices may be erected as well as temporary structures where machinery and other equipment will be housed.

1.2 Project Location

The study area is located on Erven 1, 2 and 3 Mahwelereng AI and Erf 1684 Madiba on the Remainder of the Farm Macalacskop 243 KR (Mogalakwena Local Municipality, Waterberg District of the Limpopo Province), just off Dudu Madisha Drive in Mahwelereng at the GPS point 24° 08' 25.54''S 28° 58' 11.30''E.

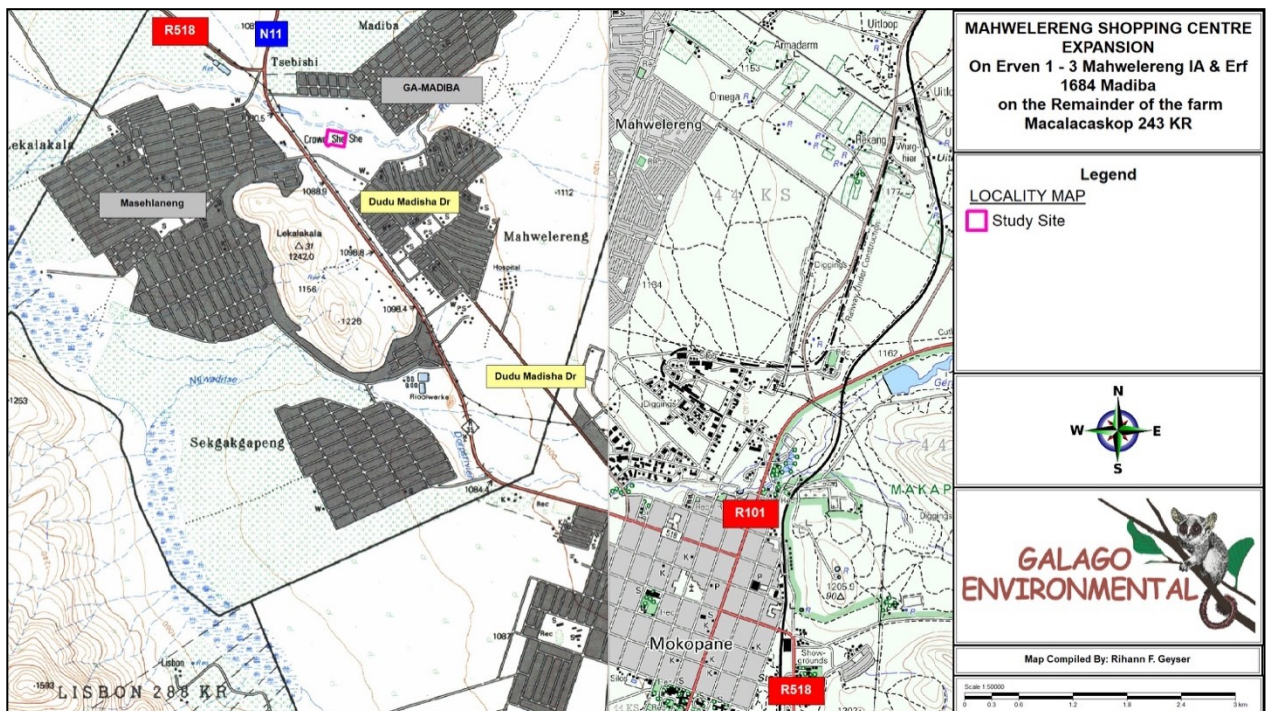


Figure 1. Proposed Mahwelereng Shopping Centre Station Location Map

1.3 Technical Scope of HIA

This HIA focused only on the areas to be directly affected by the proposed development and is meant to deliver, evaluate and inform on the following aspects:

- The identification and mapping of all heritage resources in the area affected;
- An assessment of the significance of such resources in terms of the heritage assessment criteria set out in the relevant legal descriptions, development proponent requirements and as per international best practise approaches and charters;
- An assessment of the impact of the development on such heritage resources;

- (d) An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- (e) The results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- (f) If heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- (g) Plans for mitigation of any adverse effects during and after the completion of the proposed development.

The following categories of heritage objects are considered.

Graves: Places of interment including the contents, headstone or other marker of and any other structures on or associated with such place. This may include any of the following:

- 1) Ancestral graves,
- 2) Royal graves and graves of traditional leaders
- 3) Graves of victims of conflict i.e. graves of important individuals
- 4) Historical graves and cemeteries older than 60 years
- 5) Other human remains, buried or otherwise.

The removal of graves is subject to the following procedures:

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

Movable objects: This includes objects such as historic or rare books and manuscripts, paintings, drawings, sculptures, statuettes and carvings; modern or historic religious items; historic costumes, jewellery and textiles; fragments of monuments or historic buildings; archaeological material; and natural history collections such as shells, flora, or minerals. Discoveries and access resulting from a project may increase the vulnerability of cultural objects to theft, trafficking or abuse. This may include any of the following:

- 1) Objects recovered from the soil or water including archaeological and paleontological objects and material, meteorites and rare geological specimens;
- 2) Ethnographic art and objects
- 3) Military objects
- 4) Objects of decorative art
- 5) Objects of fine art
- 6) Objects of scientific or technological interest
- 7) Books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings
- 8) Any other prescribed categories, but excluding any object made by a living person.

Protection of Historic Battlefields

Heritage “Places”: A ‘place’ is defined as:

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

- e) Traditional Buildings used in cultural ceremonies.

Heritage Structures: Refers to single or groups of architectural works found in urban or rural settings providing evidence of a particular civilisation, a significant development or a historic event. It includes groups of buildings, structures and open spaces constituting past or contemporary human settlements that are recognised as cohesive and valuable from an architectural, aesthetic, spiritual or socio-cultural perspective. This may also include any building, works, device, or other facility made by people and which is fixed to land and any fixtures, fittings and equipment associated therewith older than 60 years.

Archaeological Sites

Archaeological sites comprise any combination of structural remains, artefacts, human or ecological elements and may be located entirely beneath, partially above, or entirely above the land or water surface. Archaeological material may be found anywhere on the earth's surface, singly or scattered over large areas. Such material includes burial areas, human remains, artefacts and fossils. Archaeological sites may include:

- a) Material remains resulting from human activity which are in a state of disuse and are in or on land and are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
- b) Rock art, being a form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and is older than 100 years including any area within 10 m of such representation; and
- c) Wrecks, being any vessel or aircraft, or any part thereof, which was wrecked, whether on land or in the maritime cultural zone, and any cargo, debris or artefacts found or associated therewith, which are older than 60 years or which in terms of national legislation are considered to be worthy of conservation;
- d) Features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

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

Sacred or Spiritual Sites: Refers to natural features with cultural significance, which may include sacred hills, mountains, landscapes, streams, rivers, waterfalls, caves and rocks; sacred trees or plants, groves and forests; carvings or paintings on exposed rock faces or in caves; and paleontological deposits of early human, animal or fossilised remains. This heritage may have significance to local community groups or minority populations.

1.4 Geographical / Spatial Scope of HIA

The geographic and spatial scope of the HIA centres on the proposed Mahwelereng Shopping Centre on Portion 1 of the Farm Zeekoefontein 157 LT in the Greater Letaba Local Municipality in the Mopani District of the Limpopo Province.

Any sites within the directly impacted study areas that can be affected by the proposed development and, where known, are included in this report. Mitigation or secondary investigations take this footprint as the spatial parameters of the study area.

1.5 GPS Track Path

The following image shows a plotting of the GPS track paths recorded during the fieldwork. Several files were combined, and this does not represent a single uninterrupted recording. GPX Files are available.



Figure 2. GPS Trackpath

1.5 Temporal Scope

The proposed project will consist of three phases;

- 1) Planning
- 2) Development
- 3) Operational

Due to the nature of the proposed development, impacts on heritage sites are only anticipated during the development phase of the proposed project. The operational phase will not result in any further alterations to heritage on any significant scale.

2. Legislative Context

2.1 National Legislation

Section 38(1) of the South African Heritage Resources Act (25 of 1999) requires that a heritage study is undertaken for:

- (a) *Construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;*
- (b) *Construction of a bridge or similar structure exceeding 50 m in length; and*
- (c) *Any development, or other activity which will change the character of an area of land, or water –*
 - (1) *Exceeding 10 000 m² in extent;*
 - (2) *Involving three or more existing erven or subdivisions thereof; or*
 - (3) *Involving three or more erven, or subdivisions thereof, which have been consolidated within the past five years; or*
- (d) *The costs of which will exceed a sum set in terms of regulations; or*
- (e) *Any other category of development provided for in regulations.*

While the above describes the parameters of developments that fall under this Act., Section 38 (8) of the NHRA is applicable to this development. This section states that;

- (8) *The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.*

In regard to a development such as this that falls under Section 38 (8) of the NHRA, the requirements of Section 38 (3) applies to the subsequent reporting, stating that;

- (3) *The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2) (a): Provided that the following must be included:*
 - a) *The identification and mapping of all heritage resources in the area affected;*
 - b) *An assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6 (2) or prescribed under section 7;*
 - c) *An assessment of the impact of the development on such heritage resources;*
 - d) *An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;*
 - e) *The results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;*
 - f) *If heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and*
 - g) *Plans for mitigation of any adverse effects during and after the completion of the proposed development.*
 - 1) *Ancestral graves,*
 - 2) *Royal graves and graves of traditional leaders,*
 - 3) *Graves of victims of conflict (iv) graves of important individuals,*
 - 4) *Historical graves and cemeteries older than 60 years, and*
 - 5) *Other human remains which are not covered under the Human Tissues Act, 1983 (Act No.65 of 1983 as amended);*
 - h) *Movable objects, including:*
 - 1) *Objects recovered from the soil or waters of South Africa including archaeological and paleontological objects and material, meteorites and rare geological specimens;*

- 2) Ethnographic art and objects;
 - 3) Military objects;
 - 4) Objects of decorative art;
 - 5) Objects of fine art;
 - 6) Objects of scientific or technological interest;
 - 7) Books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings; and
 - 8) Any other prescribed categories, but excluding any object made by a living person;
- i) Battlefields;
 - j) Traditional building techniques.

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

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

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

'Archaeological' means:

- a) Material remains resulting from human activity which are in a state of disuse and are in or on land and are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
- b) Rock art, being a form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and is older than 100 years including any area within 10 m of such representation; and
- c) Wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land or in the maritime cultural zone referred to in section 5 of the Maritime Zones Act 1994 (Act 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which are older than 60 years or which in terms of national legislation are considered to be worthy of conservation;
- d) Features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

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

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

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

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

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

- Field investigations were performed on foot and by vehicle where access was readily available.
- Sites were evaluated by means of description of the cultural landscape, direct observations and analysis of written sources and available databases.
- It was assumed that the site layout as provided by EcoTechnik Environmental Consultants is accurate.
- We assumed that the public participation process performed as part of the Basic Assessment process was sufficiently encompassing not to be repeated in the Heritage Assessment Phase.

Table 1. Impacts on the NHRA Sections

Act	Section	Description	Possible Impact	Action
National Heritage Resources Act (NHRA)	34	Preservation of buildings older than 60 years	No impact	None
	35	Archaeological, paleontological and meteor sites	No impact	None
	36	Graves and burial sites	Yes	Recommended Relocation of the Graves
	37	Protection of public monuments	No impact	None
	38	Does activity trigger a HIA?	Yes	HIA

Table 2. NHRA Triggers

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

3. Methodology

3.1 Heritage Management

This study defines the heritage component of the EIA process being undertaken for the Mahwelereng Shopping Centre located on Erven 1, 2 and 3 Mahwelereng AI and Erf 1684 Madiba on the Remainder of the Farm Macalacskop 243 KR (Mogalakwena Local Municipality, Waterberg District of the Limpopo Province).

It is described as a first phase (HIA). This report attempts to evaluate both the accumulated heritage knowledge of the area and information derived from direct physical observations.

3.2 Inventory

Inventory studies involve the in-field survey and recording of archaeological resources within a proposed development area. The nature and scope of this type of study is defined primarily by the results of the overview study. In the case of site-specific developments, direct implementation of an inventory study may preclude the need for an overview.

There are a number of different methodological approaches to conducting inventory studies. Therefore, the proponent, in collaboration with the archaeological consultant, must develop an inventory plan for review and approval by the SAHRA prior to implementation (*Dincause, Dena F., H. Martin Wobst, Robert J. Hasenstab and David M. Lacy 1984*).

3.3 Evaluating Heritage Impacts

A combination of document research as well as the determination of the geographic suitability of areas and the evaluation of aerial photographs determined which areas could and should be accessed.

After plotting of the site on a GPS the areas were accessed using suitable combinations of vehicle access and access by foot.

Sites were documented by digital photography and geo-located with GPS readings using the WGS 84 datum. An aerial drone was used to evaluate the site from different heights and to improve coverage of the area.

Further techniques (where possible) included interviews with local inhabitants, visiting local museums and information centers and discussions with local experts. All this information was combined with information from an extensive literature study as well as the result of archival studies based on the SAHRA (South African Heritage Resource Agency) provincial databases.

This Heritage Impact Assessment relies on the analysis of written documents, maps, aerial photographs and other archival sources combined with the results of site investigations and interviews with effected people. Site investigations are not exhaustive and often focus on areas such as river confluence areas, elevated sites or occupational ruins.

The following documents were consulted in this study;

- South African National Archive Documents
 - SAHRIS (South African Heritage Resources Information System) Database of Heritage Studies
 - Historic Maps
 - 1969, 1981 and 2005 Surveyor General Topographic Map series
 - 1952 1:10 000 aerial photo survey
 - Google Earth 2021 imagery
 - Published articles and books
 - JSTOR Article Archive

3.4 Site Visit / Fieldwork Details

Fieldwork for the HIA was done on the 29th of September 2021. Most of the areas were found to be accessible by foot, although thick sickle bush covers a large portion of the site. Vehicular access was impossible in most areas. Areas of possible significance were investigated on foot. The survey was tracked using GPS and a track file in GPX format is available on request.

Where sites were identified it was documented photographically and plotted using GPS with the WGS 84 datum point as reference. GPX files are available on request from G&A Heritage.

The study area was surveyed using standard archaeological surveying methods. The area was surveyed using directional parameters supplied by the GPS and surveyed by vehicle and on foot. This technique has proven to result in the maximum coverage of an area.

Standard archaeological documentation formats were employed in the description of sites. Using standard site documentation forms as comparable medium, it enabled the surveyors to evaluate the relative importance of sites found. Furthermore, GPS (Global Positioning System) readings of all finds and sites were taken. This information was then plotted using a **Garmin Colorado** GPS (WGS 84- datum).

Indicators such as surface finds, plant growth anomalies, local information and topography were used in identifying sites of possible archaeological importance. Test probes were done at intervals to determine sub-surface occurrence of archaeological material. The importance of sites was assessed by comparisons with published information as well as comparative collections.

Test excavation is that form of archaeological excavation where the purpose is to establish the nature and extent of archaeological deposits and features present in a location, which it is proposed to develop (though not normally to fully investigate those deposits or features) and allow an assessment to be made of the archaeological impact of the proposed development. It may also be referred to as archaeological testing' (DAHGI 1999a, 27).

'Test excavation should not be confused with, or referred to as, archaeological assessment which is the overall process of assessing the archaeological impact of development. Test excavation is one of the techniques in carrying out archaeological assessment which may also include, as appropriate, documentary research, field walking, examination of upstanding or visible features or structures, examination of aerial photographs, satellite or other remote sensing imagery, geophysical survey, and topographical assessment' (DAHGI 1999b, 18).

3.5 Assumptions

It was assumed that the impacted areas will be limited to the proposed development. It is furthermore assumed that the *PaleoSensitivity* Map provided on the SAHRIS platform is comprehensive enough to inform on actions in this regard.

3.6 Gaps / Limitations / Uncertainty

Due to the intensive sickle bush cover in the study area, it was difficult to make surface observations of heritage deposits in some areas.

3.7 Specialist Specific Methodology

The scope of work includes:

- the identification and assessment of archaeological, cultural, historic and built sites within the study area.
- Archival study of existing data and information for the study area.
- Site inspection and fieldwork.
- This site work includes communicating with local inhabitants to confirm possible locations of heritage and cultural sites.

- Impact assessment has been performed according to the methodology as described in the relevant Section.

3.8 Impact Assessment Methodology

Degrees of Significance – Significance Criteria

There are several kinds of significance, including scientific, public, ethnic, historic and economic, that need to be taken into account when evaluating heritage resources. For any site, explicit criteria are used to measure these values. Innovative approaches to site evaluation which emphasize quantitative analysis and objectivity are encouraged. The process used to derive a measure of relative site significance must be rigorously documented, particularly the system for ranking or weighting various evaluated criteria.

Site integrity, or the degree to which a heritage site has been impaired or disturbed as a result of past land alteration, is an important consideration in evaluating site significance. In this regard, it is important to recognize that although an archaeological site has been disturbed, it may still contain important scientific information.

Heritage resources may be of scientific value in two respects. The potential to yield information, which, if properly recovered, will enhance understanding of Southern African human history, is one appropriate measure of scientific significance. In this respect, archaeological sites should be evaluated in terms of their potential to resolve current archaeological research problems. Scientific significance also refers to the potential for relevant contributions to other academic disciplines or to industry.

Public significance refers to the potential a site has for enhancing the public's understanding and appreciation of the past. The interpretive, educational and recreational potential of a site are valid indications of public value. Public significance criteria such as ease of access, land ownership, or scenic setting are often external to the site itself. The relevance of heritage resource data to private industry may also be interpreted as a particular kind of public significance.

Ethnic significance applies to heritage sites which have value to an ethnically distinct community or group of people. Determining the ethnic significance of an archaeological site may require consultation with persons having special knowledge of a particular site. It is essential that ethnic significance be assessed by someone properly trained in obtaining and evaluating such data.

Historic archaeological sites may relate to individuals or events that made an important, lasting contribution to the development of a particular locality or the province. Historically important sites also reflect or commemorate the historic socioeconomic character of an area. Sites having high historical value will also usually have high public value.

The economic or monetary value of a heritage site, where calculable, is also an important indication of significance. In some cases, it may be possible to project monetary benefits derived from the public's use of a heritage site as an educational or recreational facility. This may be accomplished by employing established economic evaluation methods; most of which have been developed for valuating outdoor recreation. The objective is to determine the willingness of users, including local residents and tourists, to pay for the experiences or services the site provides even though no payment is presently being made. Calculation of user benefits will normally require some study of the visitor population (*Smith, L.D. 1977*).

- **Rarity**
 - It possesses uncommon, rare or endangered aspects of natural or cultural heritage.
 - Importance for rare, endangered or uncommon structures, landscapes or phenomena.
- **Representivity**
 - It is important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects.
 - Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class.

- Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality.

The table below illustrates how a site's heritage significance is determined

Table 3. Site's Heritage Significance

Spheres of Significance	High	Medium	Low
International			
National			
Provincial			
Regional			
Local			
Specific Community			

4. Assessment of Heritage Potential

4.1 Assessment Matrix

4.1.1 Determining Archaeological Significance

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

Estimating site potential

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

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

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

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

Class	Landforms	Type 1	Type 2	Type 3
1	Length of sequence /context	No sequence Poor context	Limited sequence	Long sequence Favourable context

		Dispersed distribution		High density of arte / ecofacts
2	Presence of exceptional items (incl. regional rarity)	Absent	Present	Major element
3	Organic preservation	Absent	Present	Major element
4	Potential for future archaeological investigation	Low	Medium	High
5	Potential for public display	Low	Medium	High
6	Aesthetic appeal	Low	Medium	High
7	Potential for implementation of a long-term management plan	Low	Medium	High

4.2 Assessing site value by attribute

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

4.3 Impact Statement

4.3.1 Assessment of Impacts

A heritage resource impact may be broadly defined as the net change between the integrity of a heritage site with and without the proposed development. This change may be either beneficial or adverse.

Beneficial impacts occur wherever a proposed development actively protects, preserves or enhances a heritage resource. For example, development may have a beneficial effect by preventing or lessening natural site erosion. Similarly, an action may serve to preserve a site for future investigation by covering it with a protective layer of fill. In other cases, the public or economic significance of an archaeological site may be enhanced by actions, which facilitate non-destructive public use. Although beneficial impacts are unlikely to occur frequently, they should be included in the assessment.

More commonly, the effects of a project on heritage sites are of an adverse nature. Adverse impacts occur under conditions that include:

- a) destruction or alteration of all or part of a heritage site;
- b) isolation of a site from its natural setting; and
- c) introduction of physical, chemical or visual elements that are out-of-character with the heritage resource and its setting.

Adverse effects can be more specifically defined as direct or indirect impacts. Direct impacts are the immediately demonstrable effects of a project which can be attributed to particular land modifying actions. They are directly caused by a project or its ancillary facilities and occur at the same time and place. The immediate consequences of a project action, such as slope failure following reservoir inundation, are also considered direct impacts.

Indirect impacts result from activities other than actual project actions. Nevertheless, they are clearly induced by a project and would not occur without it. For example, project development may induce changes in land use or population density, such as increased urban and recreational development, which may indirectly impact upon heritage sites. Increased vandalism of heritage sites, resulting from improved or newly introduced access, is also considered an indirect impact. Indirect impacts are much more difficult to assess and quantify than impacts of a direct nature.

Once all project related impacts are identified, it is necessary to determine their individual level-of-effect on heritage resources. This assessment is aimed at determining the extent or degree to which future opportunities for scientific research, preservation, or public appreciation are foreclosed or otherwise

adversely affected by a proposed action. Therefore, the assessment provides a reasonable indication of the relative significance or importance of a particular impact. Normally, the assessment should follow site evaluation since it is important to know what heritage values may be adversely affected.

The assessment should include careful consideration of the following level-of-effect indicators, which are defined below:

- magnitude
- severity
- duration
- range
- frequency
- diversity
- cumulative effect
- rate of change

4.4 Indicators of Impact Severity

Magnitude

The amount of physical alteration or destruction, which can be expected. The resultant loss of heritage value is measured either in amount or degree of disturbance.

Severity

The irreversibility of an impact. Adverse impacts, which result in a totally irreversible and irretrievable loss of heritage value, are of the highest severity.

Duration

The length of time an adverse impact persists. Impacts may have short-term or temporary effects, or conversely, more persistent, long-term effects on heritage sites.

Range

The spatial distribution, whether widespread or site-specific, of an adverse impact.

Frequency

The number of times an impact can be expected. For example, an adverse impact of variable magnitude and severity may occur only once. An impact such as that resulting from cultivation may be of recurring or on-going nature.

Diversity

The number of different kinds of project-related actions expected to affect a heritage site.

Cumulative Effect

A progressive alteration or destruction of a site owing to the repetitive nature of one or more impacts.

Rate of Change

The rate at which an impact will effectively alter the integrity or physical condition of a heritage site. Although an important level-of-effect indicator, it is often difficult to estimate. Rate of change is normally assessed during or following project construction.

The level-of-effect assessment should be conducted and reported in a quantitative and objective fashion. The methodological approach, particularly the system of ranking level-of-effect indicators, must be rigorously documented and recommendations should be made with respect to managing uncertainties in the assessment. (*Zubrow, Ezra B.A., 1984*).

4.4.1 Pre-Contact Sites

No Pre-Contact Sites could be identified within the study areas due to local agricultural activities and overgrazing.

4.4.2 Post-Contact Sites

No Pre-Contact Sites could be identified within the study areas as a result of agricultural activities and overgrazing.

4.4.3 Built Environment

Dirt tracks, a powerline and the previously cultivated field (north-eastern border of the site) were observed within the study area. There are no formal structures present on site.

Historic Significance

No	Criteria	Significance Rating
1	Are any of the identified sites or buildings associated with a historical person or group? No	N/A
2	Are any of the buildings or identified sites associated with a historical event? No	N/A
3	Are any of the identified sites or buildings associated with a religious, economic social or political or educational activity? No	N/A
4	Are any of the identified sites or buildings of archaeological significance? No	N/A
5	Are any of the identified buildings or structures older than 60 years? No	N/A

Architectural Significance

No	Criteria	Rating
1	Are any of the buildings or structures an important example of a building type? No	N/A
2	Are any of the buildings outstanding examples of a particular style or period? No	N/A
3	Do any of the buildings contain fine architectural details and reflect exceptional craftsmanship? No	N/A
4	Are any of the buildings an example of an industrial, engineering or technological development? No	N/A
5	What is the state of the architectural and structural integrity of the building? No	N/A
6	Is the building's current and future use in sympathy with its original use (for which the building was designed)? N/A	-
7	Were the alterations done in sympathy with the original design? N/A	-
8	Were the additions and extensions done in sympathy with the original design? N/A	-
9	Are any of the buildings or structures the work of a major architect, engineer or builder? No.	N/A

Spatial Significance

Even though each building needs to be evaluated as a single artefact the site still needs to be evaluated in terms of its significance in its geographic area, city, town, village, neighbourhood or precinct. This set of criteria determines the spatial significance.

No	Criteria	Rating
1	Can any of the identified buildings or structures be considered a landmark in the town or city? No	-
2	Do any of the buildings contribute to the character of the neighborhood? No	-
3	Do any of the buildings contribute to the character of the square or streetscape? No	-
4	Do any of the buildings form part of an important group of buildings? No	-

5. Impact Evaluation

This HIA Methodology assists in evaluating the overall effect of a proposed activity on the heritage environment. The determination of the effect of a heritage impact on a heritage parameter is determined through a systematic analysis of the various components of the impact. This is undertaken using information that is available to the heritage practitioner through the process of heritage impact assessment. The impact evaluation of predicted impacts was undertaken through an assessment of the significance of the impacts.

5.1 Determination of Significance of Impacts

Significance is determined through a synthesis of impact characteristics, which include context and intensity of an impact. Context refers to the geographical scale i.e. site, local, national or global whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

5.2 Impact Rating System

Impact assessment must take account of the nature, scale and duration of effects on the heritage environment whether such effects are positive (beneficial) or negative (detrimental). Each issue / impact is also assessed according to the project stages:

- planning
- construction
- operation
- decommissioning

Where necessary, the proposal for mitigation or optimisation of an impact will be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance has also been included.

5.2.1 Rating System Used to Classify Impacts

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

NATURE		
Including a brief description of the impact of the heritage parameter being assessed in the context of the project. This criterion includes a brief written statement of the heritage aspect being impacted upon by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact		

1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY		
This describes the degree to which an impact on a heritage parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which heritage resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION		
This describes the duration of the impacts on the heritage parameter. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
CUMULATIVE EFFECT		

This describes the cumulative effect of the impacts on the heritage parameter. A cumulative effect/impact is an effect, which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible Cumulative Impact	The impact would result in negligible to no cumulative effects.
2	Low Cumulative Impact	The impact would result in insignificant cumulative effects.
3	Medium Cumulative impact	The impact would result in minor cumulative effects.
4	High Cumulative Impact	The impact would result in significant cumulative effects.
INTENSITY / MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the heritage parameter. The calculation of the significance of an impact uses the following formula:		
(Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.		
The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
Points	Impact Significance Rating	Description
6 to 28	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive Low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive Medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive High impact	The anticipated impact will have significant positive effects.

74 to 96	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive Very high impact	The anticipated impact will have highly significant positive effects.

5.3 Assessing Visual Impact

Visual impacts of developments result when sites that are culturally celebrated are visually affected by a development. The exact parameters for the determination of visual impacts have not yet been rigidly defined and are still mostly open to interpretation. CNdV Architects and The Department of Environmental Affairs and Development Planning (2006) have developed some guidelines for the management of the visual impacts of wind turbines in the Western Cape, although these have not yet been formalised. In these guidelines they recommend a buffer zone of 1km around significant heritage sites to minimise the visual impact.

Due to the fact that the project will mainly involve sub-surface infrastructure it is not anticipated that any visual impacts will be encountered.

6. Assessment of Impacts

6.1 Impact Statement

6.1.1 Built Environment

Some structures associated with rural living were identified;

- Fences (modern)
- Dirt roads (modern)
- A powerline
- A zinc shed
- Cement foundations
- Footpaths

Mitigation

These structures will not be affected by the proposed development.

6.1.2 Cultural Landscape

The cultural landscape in the study area is strongly associated with urban and rural living with overgrazing and previously cultivated fields observed within the study area. Illegal dumping / littering takes place on site.



Figure 3. Dense sickle bush, disturbed surfaces, overgrazing and littering observed on site



Figure 4. Dense sickle bush, disturbed surfaces, overgrazing and littering observed on site



Figure 5. Powerline



Figure 6. Cement foundations observed on site



Figure 7. Cement foundations observed on site



Figure 8. Zinc shed on site

6.1.3 Natural Landscape

The area is classified as Tzaneen Sour Bushveld, featuring deciduous tall open bushveld with a well-developed tall grass layer occurring on low to high mountains with undulating plains mainly at the base of and on the lower to middle slopes of the north-eastern escarpment. Dense sickle bush covers most of the study area. The area has been severely altered from the natural state.



Figure 9. Dense sickle bush cover on site



Figure 10. Disturbed natural landscape, overgrazing and dense sickle bush cover

Landscape Type	Description	Occurrence still possible?	Likely occurrence?
1 Paleontological	Mostly fossil remains. Remains include microbial fossils such as found in Baberton Greenstones	No	No
2 Archaeological	Evidence of human occupation associated with the following phases – Early-, Middle-, Late Stone Age, Early-, Late Iron Age, Pre-Contact Sites, Post-Contact Sites	No	No
3 Historic Built Environment	<ul style="list-style-type: none"> - Historical townscapes/streetscapes - Historical structures; i.e. older than 60 years - Formal public spaces - Formally declared urban conservation areas - Places associated with social identity/displacement 	No	No
4 Historic Farmland	<p>These possess distinctive patterns of settlement and historical features such as:</p> <ul style="list-style-type: none"> - Historical farm yards - Historical farm workers villages/settlements - Irrigation furrows - Tree alignments and groupings - Historical routes and pathways - Distinctive types of planting - Distinctive architecture of cultivation e.g. planting blocks, trellising, terracing, ornamental planting. 	No	No
5 Historic rural town	<ul style="list-style-type: none"> - Historic mission settlements - Historic townscapes 	No	No
6 Pristine natural landscape	<ul style="list-style-type: none"> - Historical patterns of access to a natural amenity - Formally proclaimed nature reserves - Evidence of pre-colonial occupation - Scenic resources, e.g. view corridors, viewing sites, visual edges, visual linkages - Historical structures/settlements older than 60 years - Pre-colonial or historical burial sites - Geological sites of cultural significance. 	No	No
7 Relic Landscape	<ul style="list-style-type: none"> - Past farming settlements - Past industrial sites - Places of isolation related to attitudes to medical treatment - Battle sites - Sites of displacement, 	No	No
8 Burial grounds and grave sites	<ul style="list-style-type: none"> - Pre-colonial burials (marked or unmarked, known or unknown) - Historical graves (marked or unmarked, known or unknown) - Graves of victims of conflict - Human remains (older than 100 years) - Associated burial goods (older than 100 years) - Burial architecture (older than 60 years) 	Yes	Identified on site
9 Associated Landscapes	<ul style="list-style-type: none"> - Sites associated with living heritage e.g. initiation sites, harvesting of natural resources for traditional medicinal purposes 	No	No

	<ul style="list-style-type: none"> - Sites associated with displacement & contestation - Sites of political conflict/struggle - Sites associated with an historic event/person - Sites associated with public memory 		
10 Historical Farmyard	<ul style="list-style-type: none"> - Setting of the yard and its context - Composition of structures - Historical/architectural value of individual structures - Tree alignments - Views to and from - Axial relationships - System of enclosure, e.g. defining walls - Systems of water reticulation and irrigation, e.g. furrows - Sites associated with slavery and farm labour - Colonial period archaeology 	No	No
11 Historic institutions	<ul style="list-style-type: none"> - Historical prisons - Hospital sites - Historical school/reformatory sites - Military bases 	No	No
12 Scenic visual	<ul style="list-style-type: none"> - Scenic routes 	No	No
13 Amenity landscape	<ul style="list-style-type: none"> - View sheds - View points - Views to and from - Gateway conditions - Distinctive representative landscape conditions - Scenic corridors 	No	No

7. Measuring Impacts

In 2003 the SAHRA (South African Heritage Resources Agency) compiled the following guidelines to evaluate the cultural significance of individual heritage resources:

- **Type of Resource**
 - Place
 - Archaeological Site
 - Structure
 - Grave
 - Palaeontological Feature
 - Geological Feature

- **Type of Significance**
 - Historic Value
 - Important in the community, or pattern of history
 - Important in the evolution of cultural landscapes and settlement patterns
 - Important in exhibiting density, richness or diversity of cultural features illustrating the human occupation and evolution of the nation, province, region or locality.
 - Important for association with events, developments or cultural phases that have had a significant role in the human occupation and evolution of the nation, province, region or community.
 - Important as an example for technical, creative, design or artistic excellence, innovation or achievement in a particular period.
 - It has strong or special association with the life or work of a person, group or organisation of importance in history
 - Importance for close associations with individuals, groups or organisations whose life, works or activities have been significant within the history of the nation, province, region or community.
 - It has significance relating to the history of slavery
 - Importance for a direct link to the history of slavery in South Africa.

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

 - Scientific Value
 - It has potential to yield information that will contribute to an understanding of natural or cultural heritage
 - Importance for information contributing to a wider understanding of natural or cultural history by virtue of its use as a research site, teaching site, type locality, reference or benchmark site.
 - Importance for information contributing to a wider understanding of the origin of the universe or of the development of the earth.

- Importance for information contributing to a wider understanding of the origin of life; the development of plant or animal species, or the biological or cultural development of hominid or human species.
 - Importance for its potential to yield information contributing to a wider understanding of the history of human occupation of the nation, Province, region or locality.
 - It is important in demonstrating a high degree of creative or technical achievement at a particular period
 - Importance for its technical innovation or achievement.
- a) Does the site contain evidence, which may substantively enhance understanding of culture history, culture process, and other aspects of local and regional prehistory?
- internal stratification and depth
 - chronologically sensitive cultural items
 - materials for absolute dating
 - association with ancient landforms
 - quantity and variety of tool type
 - distinct intra-site activity areas
 - tool types indicative of specific socio-economic or religious activity
 - cultural features such as burials, dwellings, hearths, etc.
 - diagnostic faunal and floral remains
 - exotic cultural items and materials
 - uniqueness or representativeness of the site
 - integrity of the site
- b) Does the site contain evidence which may be used for experimentation aimed at improving archaeological methods and techniques?
- monitoring impacts from artificial or natural agents
 - site preservation or conservation experiments
 - data recovery experiments
 - sampling experiments
 - intra-site spatial analysis
- c) Does the site contain evidence which can make important contributions to paleo environmental studies?
- topographical, geomorphological context
 - depositional character
 - diagnostic faunal, floral data
- d) Does the site contain evidence which can contribute to other scientific disciplines such as hydrology, geomorphology, pedology, meteorology, zoology, botany, forensic medicine, and environmental hazards research, or to industry including forestry and commercial fisheries?
- o Social Value / Public Significance
- It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons
 - Importance as a place highly valued by a community or cultural group for reasons of social, cultural, religious, spiritual, symbolic, aesthetic or educational associations.
 - Importance in contributing to a community's sense of place.
- a) Does the site have potential for public use in an interpretive, educational or recreational capacity?
- integrity of the site
 - technical and economic feasibility of restoration and development for public use

- visibility of cultural features and their ability to be easily interpreted
 - accessibility to the public
 - opportunities for protection against vandalism
 - representativeness and uniqueness of the site
 - aesthetics of the local setting
 - proximity to established recreation areas
 - present and potential land use
 - land ownership and administration
 - legal and jurisdictional status
 - local community attitude toward development
- b) Does the site receive visitation or use by tourists, local residents or school groups?
- Ethnic Significance
Does the site presently have traditional, social or religious importance to a particular group or community?
- ethnographic or ethno-historic reference
 - documented local community recognition or, and concern for, the site
- Economic Significance
What value of user-benefits may be placed on the site?
- visitors' willingness-to-pay
 - visitors' travel costs
- Scientific Significance
- a) Does the site contain evidence, which may substantively enhance understanding of historic patterns of settlement and land use in a particular locality, regional or larger area?
- b) Does the site contain evidence, which can make important contributions to other scientific disciplines or industry?
- Historic Significance
- a) Is the site associated with the early exploration, settlement, land use, or other aspect of southern Africa's cultural development?
- b) Is the site associated with the life or activities of a particular historic figure, group, organization, or institution that has made a significant contribution to, or impact on, the community, province or nation?
- c) Is the site associated with a particular historic event whether cultural, economic, military, religious, social or political that has made a significant contribution to, or impact on, the community, province or nation?
- d) Is the site associated with a traditional recurring event in the history of the community, province, or nation, such as an annual celebration?
- Public Significance
- a) Does the site have potential for public use in an interpretive, educational or recreational capacity?
- visibility and accessibility to the public
 - ability of the site to be easily interpreted
 - opportunities for protection against vandalism
 - economic and engineering feasibility of reconstruction, restoration and maintenance
 - representativeness and uniqueness of the site
 - proximity to established recreation areas
 - compatibility with surrounding zoning regulations or land use
 - land ownership and administration
 - local community attitude toward site preservation, development or destruction
 - present use of site

- b) Does the site receive visitation or use by tourists, local residents or school groups?
- o Other
 - Is the site a commonly acknowledged landmark?
 - Does, or could, the site contribute to a sense of continuity or identity either alone or in conjunction with similar sites in the vicinity?
 - Is the site a good typical example of an early structure or device commonly used for a specific purpose throughout an area or period of time?
 - Is the site representative of a particular architectural style or pattern?

For each predicted impact, criteria are described. These criteria include the **magnitude** (size or degree scale), which also includes the **type** of impact, being either a positive or negative impact; the **duration** (temporal scale); and the **extent** (spatial scale), as well as the **probability** (likelihood). The methodology is quantitative and generated through a spreadsheet but requires professional judgement in the application of the criteria.

When assessing impacts, broader considerations are also considered, these include the **confidence** with which the assessment was undertaken, the **reversibility** of the impact and the resource **irreplaceability**.

Calculations
(as applied in the excel spreadsheet 'Mahwelereng Shopping Centre.xls')

For each predicted impact, certain criteria are applied to establish the likely **significance** of the impact, firstly in the case of no mitigation being applied and then with the most effective mitigation measure(s) in place.

These criteria include the **magnitude** (size or degree scale), which also includes the **type** of impact, being either a positive or negative impact; the **duration** (temporal scale); and the **extent** (spatial scale). These numerical ratings are used in an equation whereby the **consequence** of the impact can be calculated. Consequence is calculated as follows:

Consequence = type x (magnitude + duration + extent).

To calculate the significance of an impact, the **probability** (or likelihood) of that impact occurring is applied to the consequence.

Significance = consequence x probability

Depending on the numerical result, the impact would fall into a significance category as negligible, minor, moderate or major, and the type would be either positive or negative.

The following tables show the scales used to classify the above variables and define each of the rating categories.

7.1 Magnitude

The magnitude refers to the degree of alteration of the affected environmental receptor. The relevant descriptor for magnitude is selected by the user (refer to Table).

Table 6. Description of magnitude and assigned numerical values

Numerical Rating	Magnitude	
	Category	Descriptors
1	Negligible	Natural and/ or social functions and/ or processes are negligibly altered
2	Very low	Natural and/ or social functions and/ or processes are slightly altered
3	Low	Natural and/ or social functions and/ or processes are somewhat altered

4	Moderate	Natural and/ or social functions and/ or processes are moderately altered
5	High	Natural and/ or social functions and/ or processes are notably altered
6	Very high	Natural and/ or social functions and/ or processes are majorly altered
7	Extremely high	Natural and/ or social functions and/ or processes are severely altered

*NOTE: Where applicable, the magnitude of the impact is related to a relevant standard or threshold or is based on specialist knowledge and understanding of that particular field.

7.2 Duration

The duration refers to the length of permanence of the impact on the environmental receptor. The relevant descriptor for duration is selected by the user (refer to Table).

Table 7. Description of duration and assigned numerical values

Numerical Rating	Duration	
	Category	Descriptors
1	Immediate	Impact will self-remedy immediately
2	Brief	Impact will not last longer than 1 year
3	Short term	Impact will last between 1 and 5 years
4	Medium term	Impact will last between 5 and 10 years
5	Long term	Impact will last between 10 and 15 years
6	On-going	Impact will last between 15 and 20 years
7	Permanent	Impact may be permanent, or in excess of 20 years

7.3 Extent

The extent refers to the geographical scale of impact on the environmental receptor. The relevant descriptor for extent is selected by the user (refer to Table).

Table 8. Description of extent and assigned numerical values

Numerical Rating	Extent	
	Category	Descriptors
1	Very limited	Impacts very limited / felt in isolated areas of the study area
2	Limited	Impacts limited to specific parts of the study area
3	Local	Impacts felt mostly throughout the study area
4	Municipal area	Impacts felt outside the study area, at a municipal level
5	Regional	Impacts felt outside the study area, at a regional / provincial level
6	National	Impacts felt outside the study area, at a national level
7	International	Impacts felt outside the study area, at an international level

7.4 Probability

To calculate the significance of an impact, the probability (or likelihood) of that impact occurring is also taken into account. (Refer to Table).

Table 9. Definition of probability ratings

Numerical Rating	Probability	
	Category	Descriptors
1	Highly unlikely / None	Expected never to happen
2	Rare / improbable	Conceivable, but only in extreme circumstances, and/or might occur for this project although this has rarely been known to result elsewhere
3	Unlikely	Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur
4	Probable	Has occurred here or elsewhere and could therefore occur
5	Likely	The impact may occur
6	Almost certain / Highly probable	It is most likely that the impact will occur
7	Certain / Definite	There are sound scientific reasons to expect that the impact will definitely occur

7.5 Significance

These are auto-calculated in the spreadsheet as described above and includes the following categories in Table 11. This table is for illustration only.

Table 10. Application of significance ratings

Range		Significance rating
-147	-109	Major (-)
-108	-73	Moderate (-)
-72	-36	Minor (-)
-35	-1	Negligible (-)
0	0	Neutral
1	35	Negligible (+)
36	72	Minor (+)
73	108	Moderate (+)
109	147	Major (+)

The following, broader considerations will also be considered. These include the level of confidence in the assessment rating; the reversibility of the impact; and the irreplaceability of the resource as set out in Tables 12, 13 and 14 respectively.

Table 11. Definition of confidence ratings

Rating	Descriptor
Low	Judgement is based on intuition
Medium	Determination is based on common sense and general knowledge
High	Substantive supportive data exists to verify the assessment

Table 12. Definition of reversibility ratings

Rating	Descriptor
Low	The affected environment will not be able to recover from the impact - permanently modified
Medium	The affected environment will only recover from the impact with significant intervention
High	The affected environmental will be able to recover from the impact

Table 13. Definition of irreplaceability ratings

Rating	Descriptor
Low	The resource is not damaged irreparably or is not scarce
Medium	The resource is damaged irreparably but is represented elsewhere
High	The resource is irreparably damaged and is not represented elsewhere

8. Description of Affected Environment

8.1 Map of Key Features

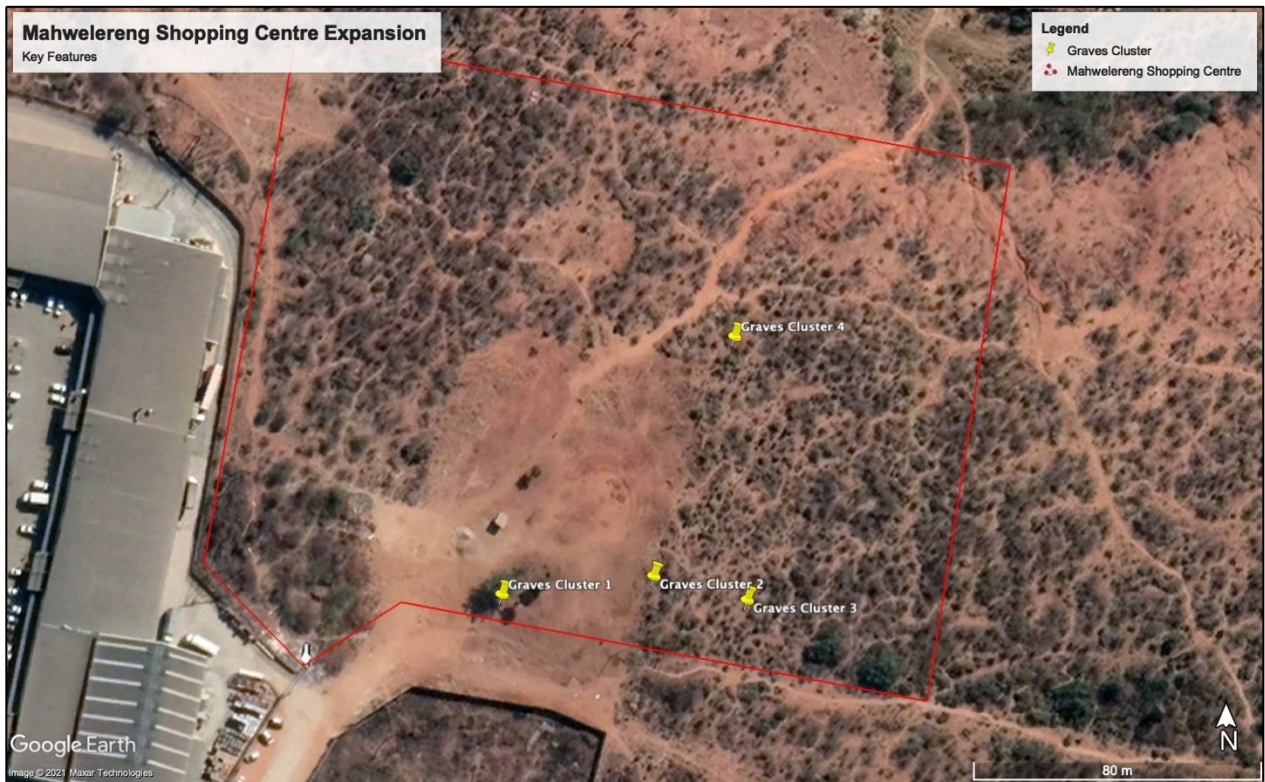


Figure 11. Map of Key Features (Google Earth)

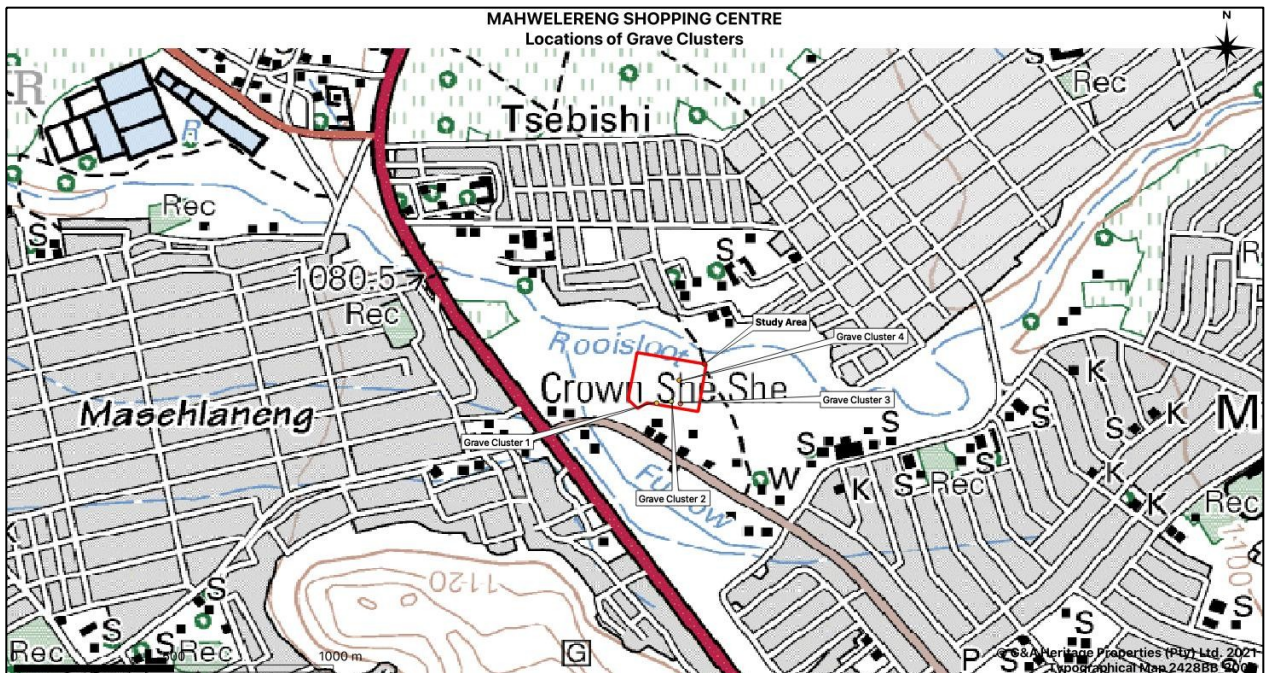


Figure 12. Map of Key Features

8.2 Findings

The area was accessed by vehicle and investigated on foot. The areas have been mostly disturbed from green field condition and is strongly associated with urban and rural living with overgrazing and previously cultivated fields observed within the study area. Dense sickle bush covers most of the study area, making surface observations problematic. Some illegal dumping / littering takes place on site.

Four clusters of graves were observed on site.

8.2.1 Grave Cluster 1

Four graves were observed within the first cluster, three of which have cement borders and are fenced off with barbed wire. The remaining grave is decorated with stones and located outside the fence.

GPS Coordinates: 24° 08' 24.99"S 28° 58' 13.22"E



Figure 13. Grave Cluster 1 – three graves with cement borders visible



Figure 14. Grave Cluster 1 – one grave decorated with stones



Figure 15. Grave Cluster 1 Location Map

8.2.2 Grave Cluster 2

Five graves were observed within the second cluster, all of which are decorated with stones. Three graves are positioned right next to each other and the remaining two are next to each other. None of these graves are fenced.

GPS Coordinates: 24° 08' 24.82''S 28° 58' 14.71''E



Figure 16. Grave Cluster 2 – three graves adjacent to one another, all decorated with stones



Figure 17. Grave Cluster 2



Figure 18. Grave Cluster 2



Figure 19. Grave Cluster 2 Location Map

8.2.2 Grave Cluster 3

Two graves were observed within the third cluster, one of which has a cement border and fabricated head stone. The other is decorated with stones. Neither of these graves are fenced.

GPS Coordinates: 24° 08' 25.04''S 28° 58' 15.63''E



Figure 20. Grave Cluster 3 – one grave with a fabricated headstone



Figure 21. Grave Cluster 3 – one grave decorated with stones



Figure 22. Grave Cluster 3 Location Map

8.2.2 Grave Cluster 4

These graves are located on the border of the proposed development. There are approximately 7 possible gravesites. These are defined by loose concentrations of stones similar to the other sites. There could possibly be more graves in the area which are not visible on the surface due to alternations that have occurred in the area. Dense sickle bush cover could also be obscuring further sites.

GPS Coordinates: 24° 08' 22.68''S 28° 58' 15.50''E



Figure 23. Grave Cluster 4



Figure 24. Grave Cluster 4



Figure 25. Grave Cluster 4



Figure 26. Grave Cluster 4



Figure 27. Grave Cluster 4 Location Map

9. Baseline

Context Relevant to Project Location, Design, Operation, or Mitigation Decisions

The geographical area surrounding the town of Mokopane is well known for its archaeological sites dating to the Stone Age, Iron Age and Historical Age. These sites will be discussed briefly in order to provide the reader with background knowledge of the archaeological history of the immediate area surrounding Mokopane.

9.1 Palaeontology

The study area is designated as “Grey” or “Insignificant” in terms of its paleontological sensitivity. There is no need for a specialist study in such cases.

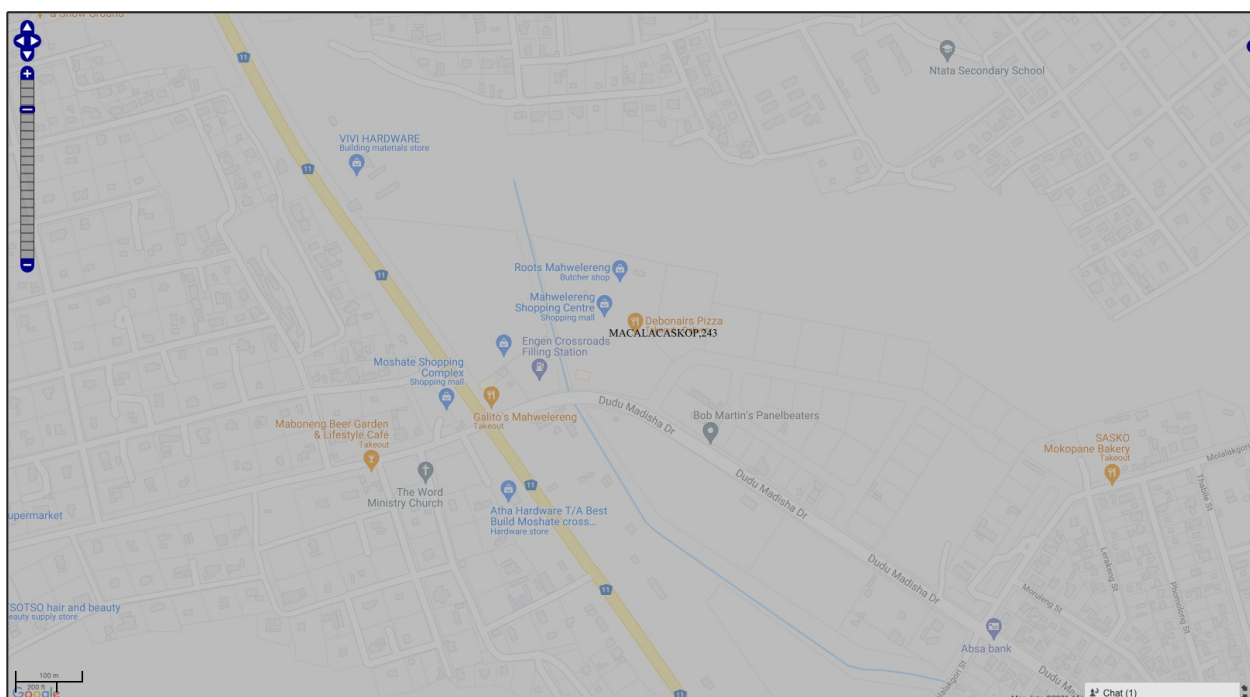


Figure 28. Paleo Sensitivity Map

Table 14. Palaeontological Sensitivity

Colour	Sensitivity	Action Required
RED	VERY HIGH	Field assessment and protocol for finds is required.
ORANGE / YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely.
GREEN	MODERATE	Desktop study is required.
BLUE	LOW	No Palaeontological studies are required however, a protocol for finds is required.
GREY	INSIGNIFICANT / ZERO	No Palaeontological studies are required.
WHITE / CLEAR	UNKNOWN	These area will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

9.2 Stone Age

Early Stone Age: The period from ± 2.5 millions years to $\pm 250\ 000$ years ago. This period is associated with Australopithecines and other early *Homo* species.

Middle Stone Age: Various lithic industries in South Africa dating from $\pm 250\ 000$ years to 25 000 years before present. This period is first associated with archaic *Homo sapiens* and later *Homo sapiens sapiens*.

Late Stone Age: The period from $\pm 25\ 000$ years before present to the period of contact with either Iron Age farmers or European colonists. This period is associated with *Homo sapiens sapiens*.

The antiquity of the Late Stone Age (LSA) south of the Limpopo was realized only recently. Until about 40 years ago it was assumed that Middle Stone Age (MSA) industries gave way to LSA ones at the beginning of the Holocene or at the end of the Pleistocene. As recently as 1974, for example, Sampson's synthesis of the southern African Stone Age placed the earliest LSA at 12,000 years before present (B.P.). Radiocarbon dating after the early 1970s dramatically altered previous ideas and showed that the LSA has its origin in the late Pleistocene, which is defined here as dating between ca. 40,000 and ca. 10,000 B.P.

When Goodwin (1926) introduced the term Later Stone Age (LSA), and when the term was further developed by Goodwin and Van Riet Lowe (1929) in the late 1920s, their definition was unambiguous. The LSA was defined as several stone industries and/or cultures that included non-lithic items, such as ostrich eggshell beads and worked bone implements, and excluded Middle Stone Age (MSA) stone tools, except as recycled manuports. LSA people were explicitly linked with the biologically and behaviourally modern population of hunter gatherers, some being directly identified as Bushmen (Goodwin, 1926, p. 20; Goodwin and Van Riet Lowe, 1929, p. 171).

Today Goodwin and Van Riet Lowe's LSA definition is no longer entirely appropriate. First, ostrich eggshell beads and even a bone point have been found in MSA deposits that predate the LSA by tens of thousands of years. If the associations are reliable then these artifacts can no longer be seen as exclusively LSA. Second, fossils of anatomically modern humans, now thought to predate 100,000 B.P., have been found in MSA deposits at both Klasies River Mouth and at Border Cave (Beaumont et al, 1978; Singer and Wymer, 1982; Rightmire and Deacon, 1991). There is thus no correlation between the appearance of modern people and LSA technological evolution.

The only part of the 1920s definition that remains intact is the qualifier that LSA assemblages should lack MSA artifacts. Although LSA industries and their MSA predecessors share flaking traditions such as the bipolar technique and have some tool types in common, such as some generalized scraper types, they each have other flaking techniques and artifacts that are considered mutually exclusive.

From the 1950s onwards, archaeologists excavating MSA sites in the interior of South Africa recognised a lithic industry containing long blades, truncated blades with retouched edges, and long unifacial points. They named it after the town of Pietersburg (now Polokwane). Pietersburg Industries are located principally in the north of South Africa, but they have not yet been documented north of the Limpopo River. Most Pietersburg sites in Limpopo Province are caves or rockshelters, the best-known being Cave of Hearths (Mason 1962, 1988; Sampson 1974; Sinclair 2009), Olieboomspoort (Mason 1962; Van der Ryst 2006), Bushman Rock Shelter (Plug 1981; Porraz et al. 2015) and Mwulu's Cave (Tobias 1949; Sampson 1974). The open site Blaaubank, a gravel donga near Rooiberg, has many felsite and quartzite Pietersburg tools overlying Earlier Stone Age ones (Mason 1962). Another open site, Kalkbank, also reported to have a Pietersburg industry, yielded only a few dozen lithics (Mason 1962) amongst the large faunal collection that is now known to have been accumulated predominantly by non-human agents (Hutson & Cain 2008).

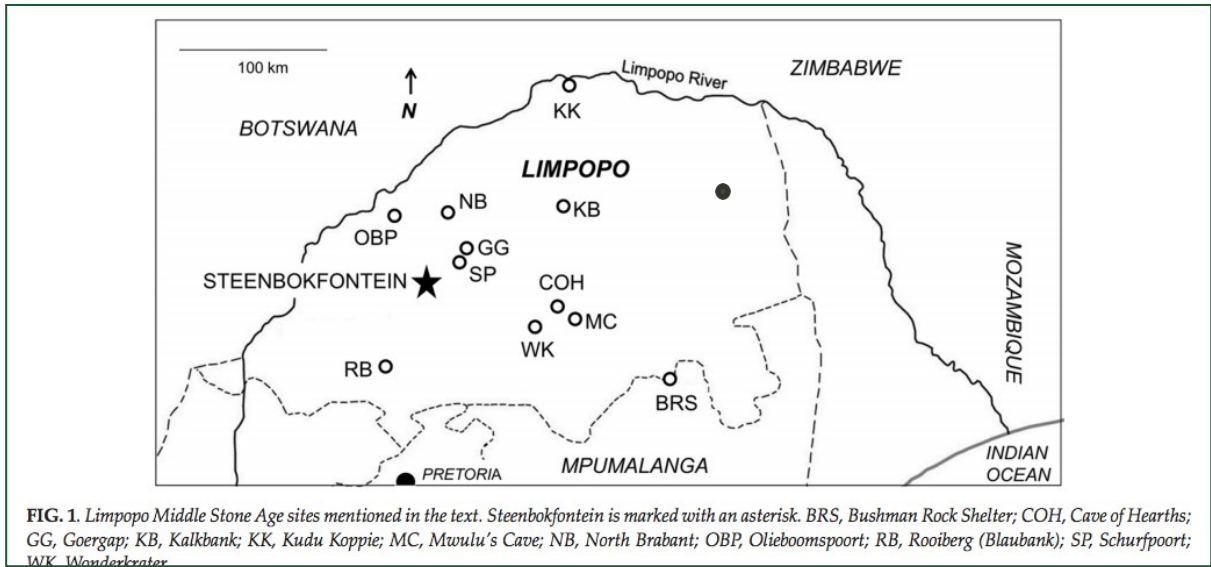


Figure 29. Limpopo Middle Stone Age sites mentioned in the text (Hutson & Cain, 2008) (Baleni in blue)

Most excavated MSA sites in Limpopo are below the escarpment, but amongst the known ones on the Waterberg plateau, is a small rock shelter, North Brabant (New Belgium 608 LR), which was excavated by Schoonraad and Beaumont (1968).

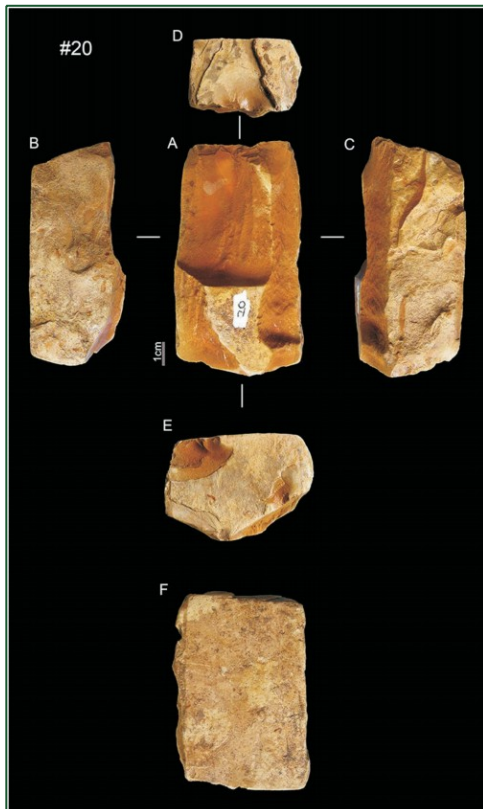


Figure 30. Middle Stone Age Tools



Figure 31. Middle Stone Age Tools

The Limpopo Province of South Africa has a rich archaeological heritage, not least of which is the sub-continent's first town, Mapungubwe, built a thousand years ago (Huffman 2000, 2007). The iron-using farmers who arrived here during the first millennium AD encountered indigenous, stone tool- using, 'Later Stone Age' (LSA) hunter-gatherers. The nature of this contact between two radically different ways of life, and the question of whether the hunter-gatherers survived it, has been much debated (e.g. Mazel 1989; Wilmsen 1989; Solway & Lee 1990; Wilmsen & Denbow 1990; Wadley 1996; Sadr 1997, 2002; Hall & Smith 2000; Schoeman 2006; Mitchell 2009). Where the Limpopo and Shashe Rivers meet, it seemed that the LSA hunting and gathering way of life ended with the rise of the first farmer towns (Sadr 2005; Van Doornum 2007). Recent excavations in rock shelters on the Makgabeng plateau, a hundred or so kilometres south of the Limpopo River, indicate that some hunter-gatherers found refuge there until the 19th century. [BRADFIELD, J., HOLT, S., & SADR, K. (2009).

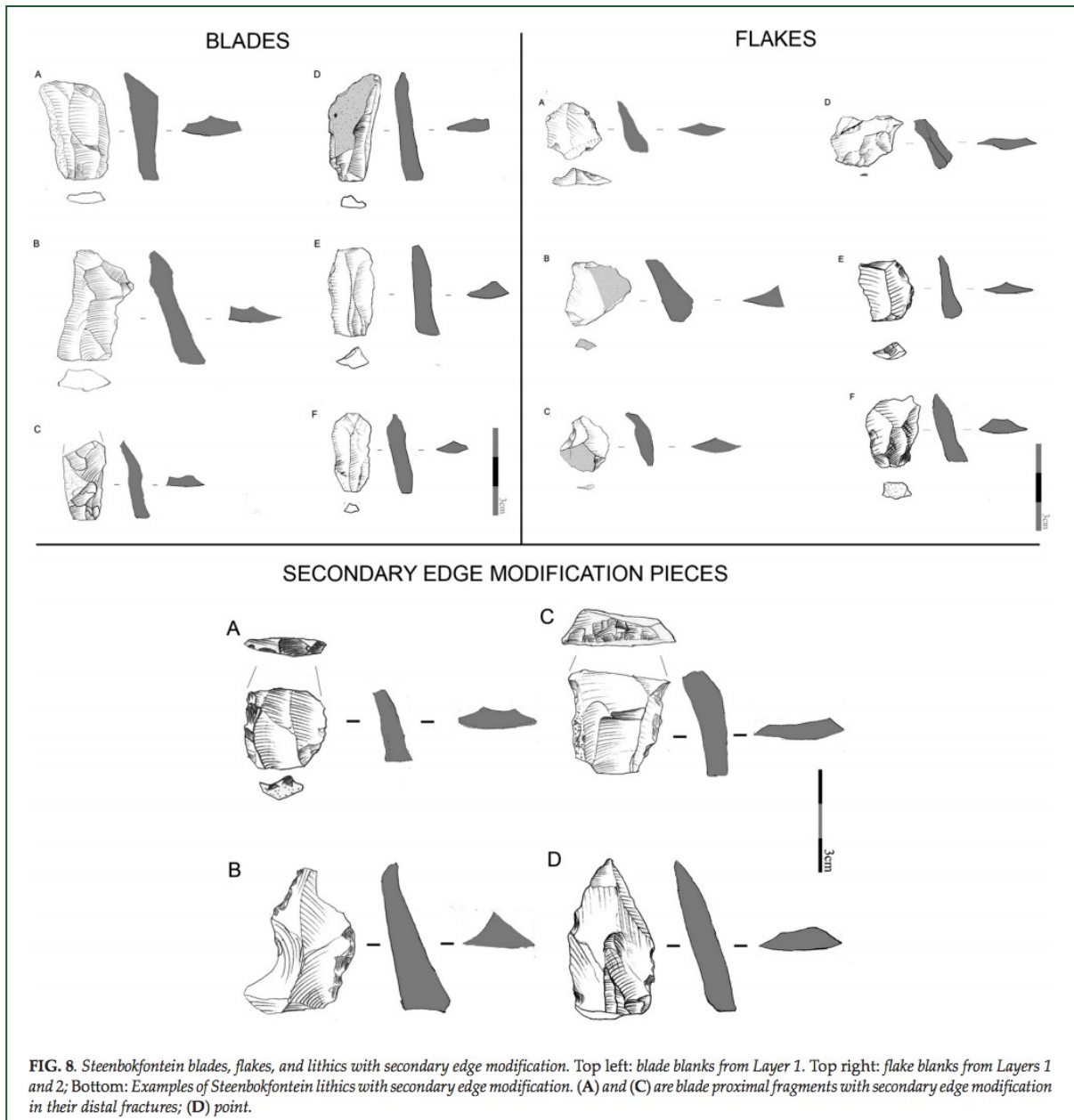


Figure 32. Steenbokfontein blades, flakes and lithics with secondary edge modification.

Several Stone Age sites have been identified around the town of Mokopane in the Limpopo Province. These fall under the larger Makapans Valley area and include the Cave of Hearths, *Scoonheid* Cave, Magazine Shelter and Rufus Cave (Berg, 1999; Mitchell, 2002).

The Makapans Caves are situated approximately 20km northeast of Mokopane. It comprises of a series of caves with evidence of hominid occupation (*Australopithecus africanus*) from approximately 3.3 million years ago. The Cave of Hearths is one of the better known caves associated with Early, Middle and Late Stone age traditions. It represents one of the few rock shelters to present Acheulean assemblages in southern Africa (Mitchell, 2002). This site also presented with one of the oldest Upper Pleistocene hominid remains (Tobias, 2005). *Scoonheid* Cave is also associated with ESA assemblages (Berg, 1999).

The Cave of Hearths presented with MSA stone tool assemblages on top of the ESA Acheulean assemblages as well as being associated with fire-management as several MSA hearths were

identified (Mitchell, 2002). Rufus Cave is also associated with MSA tools and along with Cave of Hearths represents the Howiessonsoort industry (Berg, 1999).

Magazine Shelter and Cave of Hearths are mainly associated with the Smithfield B industry (Berg, 1999).

Rock Art

The Central Limpopo Basin (CLB) is situated nearly equidistant between the rock art concentrations of the Maloti/Drakensberg Mountains of Lesotho/South Africa and the Matopo Hills of Zimbabwe and comprises four separate and distinct rock art areas: the Limpopo-Shashe Confluence Area (LSCA), Northern Venda, the Soutpansberg and the Makgabeng Plateau (Fig. 1). The region is relatively well researched (e.g. Schoonraad 1960; Willcox 1963; Pager 1975, 1977, Eastwood 1999, 2003, 2005; Eastwood & Blundell 1999; Eastwood & Cnoops 1999; Eastwood et al. 1999; Hall & Smith 2000; Blundell & Eastwood 2001; Smith & Ouzman 2004), and since 1992 roughly 60% of the total land area has been surveyed and a total of 953 rock art sites have been located and recorded. Whilst the survey work continues, and much recording work remains to be done, the CLB data set is already amongst the most detailed in southern Africa. [Eastwood, E., & Smith, B. (2005).

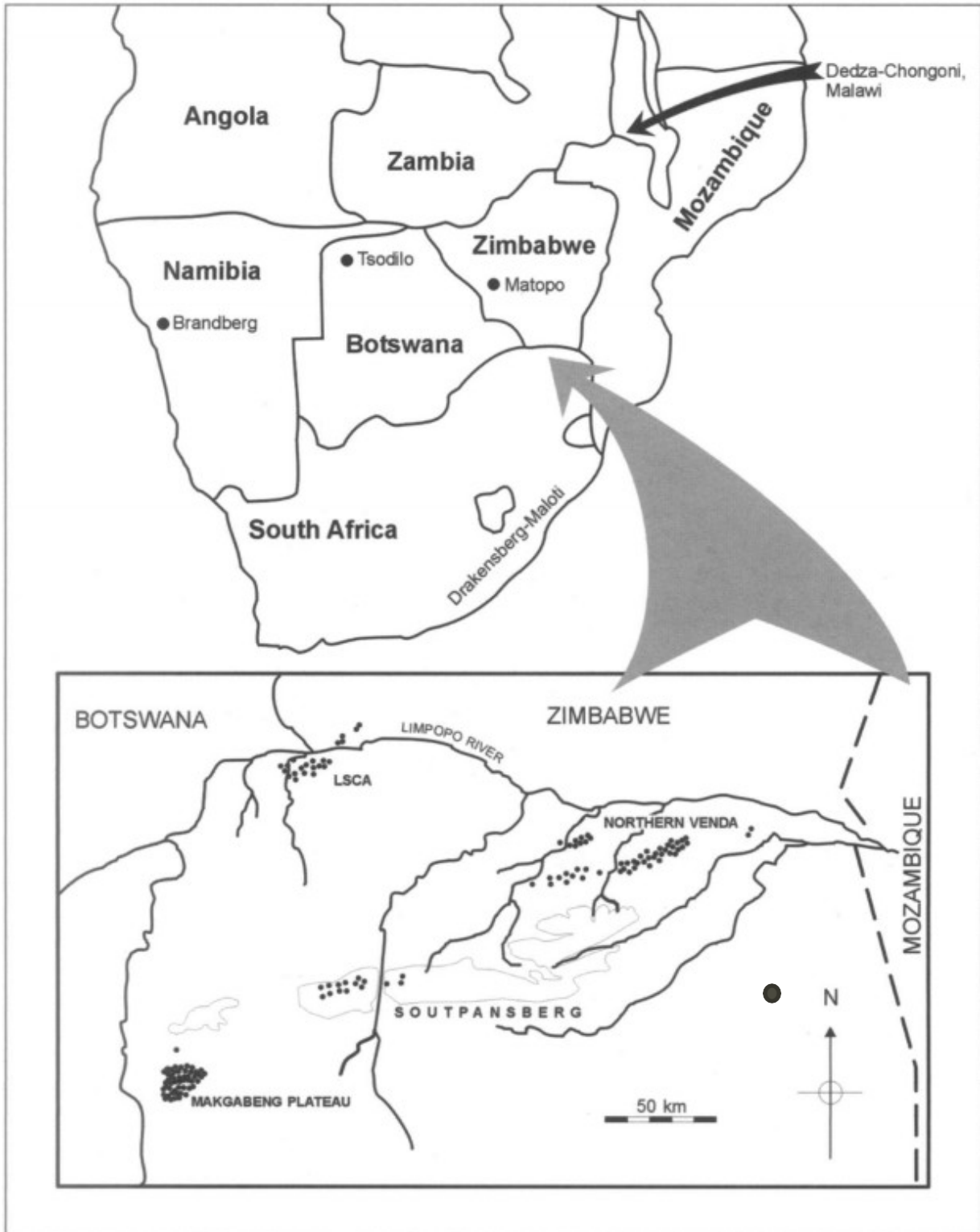


Figure 33. Rock Art Locations (Blue dot indicates Baleni)



Figure 34. Khoekhoen Geometric Patterns and Finger Dot Painting (Makgabeng Plateau)

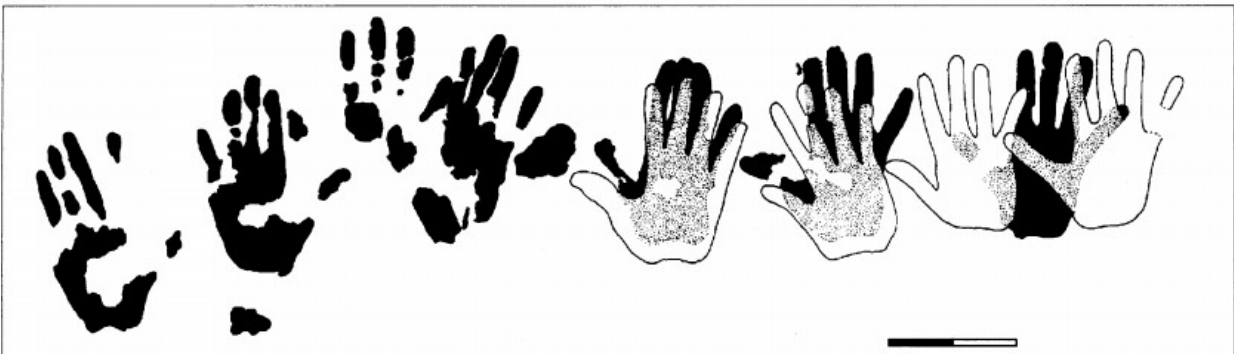


Figure 35. Red handprints overlain by white handprints, Soutpansberg, Central Limpopo Basin. Scale 200mm

There are no known rock art sites in the direct vicinity of Mokopane. The nearest site is situated approximately 20 to 30 km northeast of Mokopane (Berg, 1999).

9.3 Iron Age

The Iron Age as a whole represents the spread of Bantu speaking people and includes both the Pre-Historic and Historic periods. The Iron age can also be divided into three periods:

Early Iron Age: Most of the first millennium AD (Happy Rest, Silver Leaves).

Middle Iron Age: 10th to 13th centuries AD (e.g. K2, Mapungubwe, Thavhatsena).

Late Iron Age: 14th century to colonial period (e.g. Icon, Letaba, Mutamba).

The Limpopo Province and especially the Shashe/Limpopo Confluence area (SLCA) and the Limpopo Basin area contains many Iron Age sites. Although Early Iron age sites are limited (when a distinction is made between Early and Middle Iron Age) there are some important sites on the Soutpansberg such as Happy Rest.

The most significant Iron Age industry in Limpopo must be the Leopards Kopje of Mapungubwe/K2 Industry. These sites are found scattered across the province, although most paramount sites seem to be concentrated on the Limpopo and Levhuvhu Rivers.

Sites that are culturally related to K2 and Mapungubwe have been observed on Hamilton 41 MS, Samaria 28 MS and Den Staat 27 MS (Fig. 1). Another site related to Mapungubwe was excavated by Van Wyk (1987) on Skutwater to the east of Greefswald. Small Iron Age sites postdating Mapungubwe and K2 have been recorded on Greefswald, including some stone-walled sites on hilltops. Some of these sites have been identified by T.N. Huffman as Khami type ruins. (Huffman 2009). According to oral tradition, communities belonging to the Lea and Twa mamba tribes, related to the Venda and the Shona-speaking people, settled in the Greefswald region in historical times. They were followed, after c. AD 1700, by Sotho-speaking people.

A few physical features distinguish Khami muzinda (plural = mizinda , the Shona word for a chief's place) from Zimbabwe centres. For example, Khami palaces often bear check patterns, and the pottery usually incorporates black and red motifs on globular vessels and tall-necked jars. The distribution of Khami markers and the linguistic history of the Zimbabwe culture area show that the Khami phase marks the distribution of Kalanga-speaking polities.

Radiocarbon dates from Khami itself (Huffman 2007: 258-259), the name site (Robinson 1959) for the phase and the largest capital (second only to Great Zimbabwe), suggest an early 15th century beginning. At about the same time, Kalanga groups began to move southwards. The Letsibogo district of Botswana (Campbell et al 1996; Huffman & Kinahan 2002/2003) provides one example. Khami settlements first appear in the Mapungubwe landscape at this same time (Fig. 2). So far, there are some 255 commoner homesteads (Level 1 – Family Head) on record. These homesteads probably housed some 50 people at any one time, 20-30 being children (following Huffman 1986). There are 10 other hilltop sites with stonewalled palaces. These royal centres are all the same size (Level 3 - Petty Chief), supporting about 350 people each. [Huffman, T., & Du Piesanie, J. (2011).

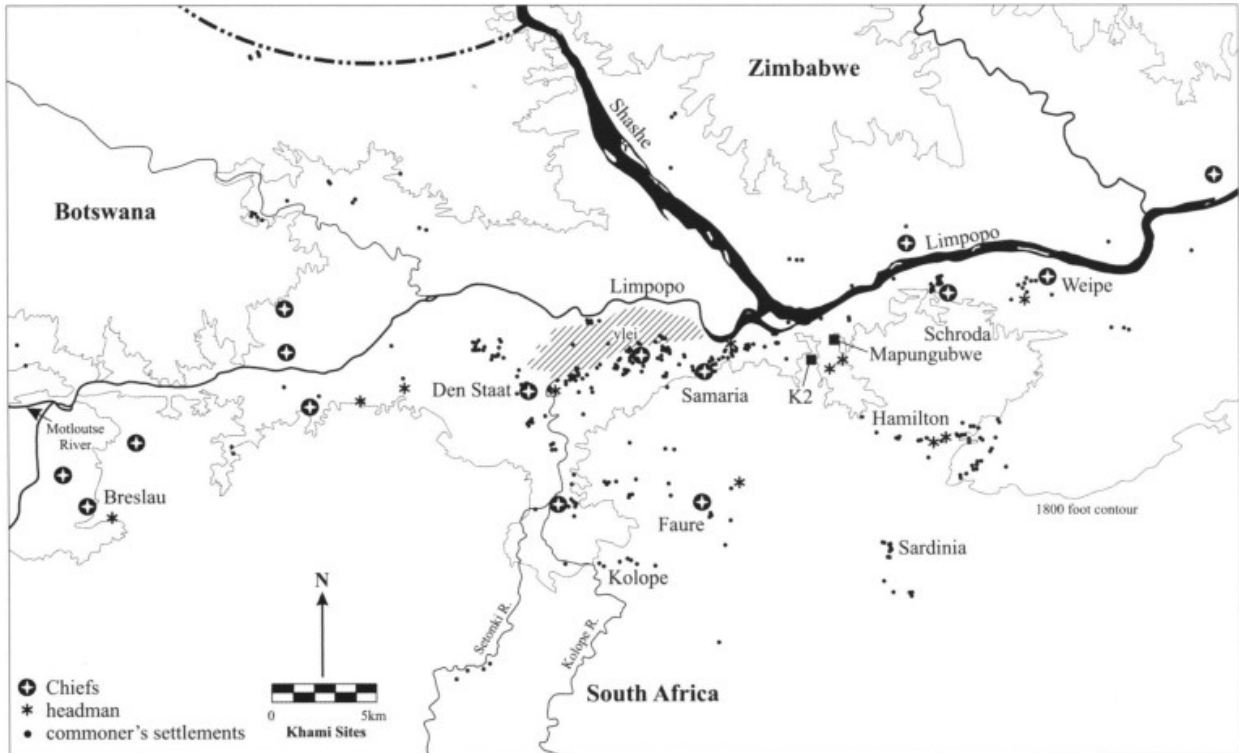


Figure 36. Khami-period sites in the Mapungubwe landscape

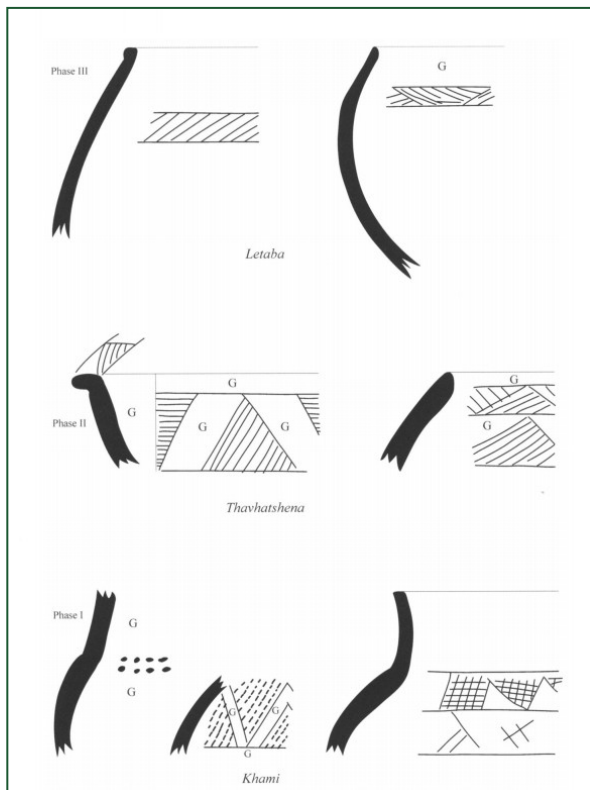


Figure 37. Ceramic facies associated with the three phases of occupation at Machedema

Several EIA Sites could be identified in the area surrounding Mokopane. These sites represent two pottery traditions. The oldest pottery tradition is from the Urewe tradition and represents the Mzonjani

facies dating to between 450 AD and 750 AD (Huffman, 2007). The second pottery tradition can be associated with the Kulumdu tradition representing the Doornkop facies and the Diamant facies which dates to 750 AD to 100 AD (Huffman, 2007).

The only pottery tradition associated with the MIA that could be identified in the area dates to 1000 AD to 1300 AD and represents the Eiland facies of the Kulundu tradition (Huffman, 2007).

Several LIA sites could be identified in the area surrounding Mokopane. These sites fall within the Kulundiu pottery tradition and are associated with the Icon facies dating to 1300 AD to 1500 AD and the Madikwe facies dating to 1500 AD to 1700 AD (Huffman, 2007).

During the 1600's a group of iron working Nguni farmers moved from the Hlubi tribe in the Kwa-Zulu Natal (Tugela River region) and settled on the former Transvaal as the Tranvaal Ndebele. This group was further divided into two tribes and the Northern Ndebele settled themselves in the Mokopane / Polokwane region. The Northern Ndebele could be further sub divided into three groups – The Langa (Laka), the Lidwaba (Letwaba) and the Muledlane (Moletlane).

The tribes of the Langa and the Lidwaba settled mostly north of Mokopane and around Polokwane. One of the ancestors of the Muledlane Ndebele, Musi, had five sons: Manala, Masombuka (Mhwaduba), Ndzundza, Mathombeni (Kekana) and Sdhlomu (Dhlomu). After disputes between Ndzundza and Mathombeni, the Kekana chieftaincy came into existence. Their descendants settled in Zebediela, Makapans Valley and Mokopane regions. From these areas they wages several military campaigns against the Ba-Pedi and Northern Sotho tribes to establish themselves as the dominant group of the region. Mokopane took over the chieftaincy in the 1830's.

9.4 Historic Era

The first Europeans to move into the area were the Voortrekkers who moved to the region in 1840 and eventually founded the town Potgietersrus (now known as Mokopane) in 1861 (Berg, 1999). Several battles associated with the skirmishes between the Voortrekkers and the local tribes took place just outside the boundaries of Mokopane, with Makapansgat being the most famous clash between the Boer Commando of Piet Potgieter and the local Langa and Kekana Ndebele. Chief Makapan, his tribe and their livestock were besieged in the cave from the 25th of October to the 21st of November 1854. During this time, many died of hunger and thirst or were shot by the Boers. Piet Potgieter was killed by one of Mokopane's men during the siege. The cave was declared a National Monument in 1936 (Evers, T.M. 1983).

The area around Mokopane saw no major battles during the second Boer Wat (1899-1902), however it was located on a block line that followed the old railway lines and therefore might have seen small skirmishes (Berg, 1999).

9.5 Archival Research

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

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

Scientific publications

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

- F Bandama – 2013. The archaeology and technology of metal production in the Late Iron Age of the Southern Waterberg, Limpopo Province, South Africa.
- A Esterhuysen, J Smith - e 21st Biennial Conference of the South African Society ..., 2017. Rain, disease and the death of a chief.

- AB Esterhuysen 2008 - Five hundred years rediscovered: Ceramic alliances: Pottery and the history of the Kekana Ndebele in the old Transvaal
- AB Esterhuysen - South African Archaeological Bulletin, 2010. Excavation at historic cave, Makapan's valley, Limpopo: 2001-2005.
- AB Esterhuysen. 2008 - Five hundred years rediscovered: Ceramic alliances: pottery and the history of the Kekana Ndebele in the old Transvaal
- TN Huffman - Southern African Humanities, 2004. The archaeology of the Nguni past.
- JHN Loubser - Navorsing van die Nasionale Museum: Ndebele archaeology of the Pietersburg area: oral history
- M Lombard, I Parsons - South African Archaeological Bulletin, 2003. Ritual practice in a domestic space: Evidence from Melora Hilltop, a Late Iron Age stone-walled settlement in the Waterberg, Limpopo Province, South Africa
- Sinclair and Patrick Quinney, 1996–2001. By John McNabb & Anthony Sinclair (eds.). University of Southampton Series in Archaeology No. 1. BAR

9.6 SAHRIS Database Studies

An extensive research into the SAHRIS database resulted in the identification of the following heritage related studies that have been performed over the last decade in the study area. Only studies within a radius of 50km from the study area were considered.

- Roodt, F. 2008. Phase1 Heritage Resources Scoping Report Mogalakwena Bulk Water Supply Scheme – Phase 1 of Zone 1 Mokopane: Limpopo
- Hutton, M. 2011. Heritage Impact Assessment for the proposed Mokopane Solar Park in Piet Potgietersrust Extension 6 in Mokopane, Limpopo Province.
- Nel, J. 2008. Phase 1 Heritage Impact Assessment Proposed Water Pipeline Routes, Magalakwena District, Limpopo Province.
- Gaigher, S. 2009. Heritage Impact Assessment for the Proposed Mokopane Residential Golf Estate, Mokopane, Limpopo Province.
- Roodt, F. Stegmann, L. 2017. Phase 1 Heritage Resources Scoping Report Proposed Establishment of a Borrow Pit (0), to Surface new N11 on the Farm Planknek 43 KS Portion 0 (Rem), Mokopane, Limpopo.
- Van der Walt, J. 2015. Archaeological Impact Assessment for the Sekuruwe Secondary Bulk Water Supply, Mokopane, Limpopo Province.
- Birkholtz, P. 2020. Proposed Solar PV Plant at Armoede, near Mokopane, Limpopo Province: Heritage Impact Assessment.
- Stegmann, L. Roodt, F. 2018. Phase 1 Heritage Resources Scoping Report Proposed new Diamond Interchange and on-ramp C, additional reserve for road D3519 and concrete causeway on service road A along the new N11 route, Mokopane, Limpopo.
- Pistorius, J.C.C. 2020. A Phase 1 Heritage Impact Assessment (HIA) Study for the proposed Akanani Mining (Pty) Ltd project near Mokopane in the Limpopo Province.
- Roodt, F. 2008. Phase 1 Heritage Impact Assessment: Delagoa Eco-Estate Development Mokopane, Limpopo.
- Steyn, H. 2006. Report on the relocation of 1 grave from the property of the Potgietersrust Platinum Mine, Mokopane, Limpopo Province.
- Nienaber, W.C. 2016. Ivanhoe Mines: Platreef Projects – Planned Community Centre Site. Farm Turfspruit 241 KR, Mokopane, Limpopo. Ground Penetrating Radar (GPR) Survey for Graves.
- Hutton, M. 2009. Heritage Impact Assessment for the Proposed Lake View Township development of the farm Lisbon 288 KR, south-west of Mokopane, Limpopo Province.
- Pelsler, A. 2021. Report on a Phase 1 Heritage Impact Assessment for the Mphalele Mining Rights Application situated 60km south-east of Mokopane and 50km south of Polokwane in the Limpopo Province.

- Birkholtz, P. de Bruyn, C. 2021. Heritage Impact Assessment for the Proposed Solar PV Plant for the Mogalakwena Mine, situated near Mokopane, Limpopo Province.

Relevance of Listed Heritage Studies for the Study Area

From the above it is obvious that the area around Mokopane has been subject to extensive heritage investigations in the recent past. The following guidelines could be extracted from these;

- Several occurrences of Early-, Middle- and Late Iron Age deposits are commonly found within the study area.
- Informal burials (outside of registered cemeteries) are common.
- Some Late Stone Age deposits are found in areas.
- The area is not rich in palaeontological deposits.

Of specific value for this project is the 2008 report from Frans Roodt - Phase1 Heritage Resources Scoping Report Mogalakwena Bulk Water Supply Scheme – Phase 1 of Zone 1 Mokopane: Limpopo. This study area is geographically the closest to the current area under investigation and several grave sites were observed in the general vicinity of the current study area:

- *Point 1: A marked grave with a headstone on the side of the road.*
 - *GPS: 24° 04' 07.6"S 28° 55' 06.1"E*
- *Point 2: A historical graveyard at the foot of a hillock adjacent to an existing township.*
 - *GPS: 24° 01' 10.0"S 28° 52' 36.6"E*
- *Point 3: The graveyard has been extended to the adjacent side of the hillock. These graves have been fenced in and cognisance of the fact that some do not display headstones but are marked by stones must be taken.*
 - *GPS: 24° 00' 58.7"S 28° 52' 28.5"E*
- *Point 4: Graves with a fenced area, some marked by headstones, others are unmarked. Some graves were noted to be outside of the fences area at GPS point 4.*
 - *GPS: 23° 57' 11.9"S 28° 48' 59.4"E*
- *Point 5: Graves close to the site for a potential reservoir.*
 - *GPS: 24° 05' 54.8"S 28° 59' 28.2"E*

Conclusion: From past experiences in the area, it is known that Iron Age remains, including human skeletal remains may be exposed along the pipeline route. It is therefore recommended that

- 1. The Environmental Control Officer and the Community Liaison Officer be made aware of this fact and that the archaeologist be contacted in such an event.*
- 2. In addition, the archaeologist should be allowed to conduct routine inspections during the development phase to ensure that any other archaeological material that comes to light is dealt with appropriately.*
- 3. Graves that occur within 20m from the right of way or servitude must be cordoned off to prevent accidental damage by construction equipment.*

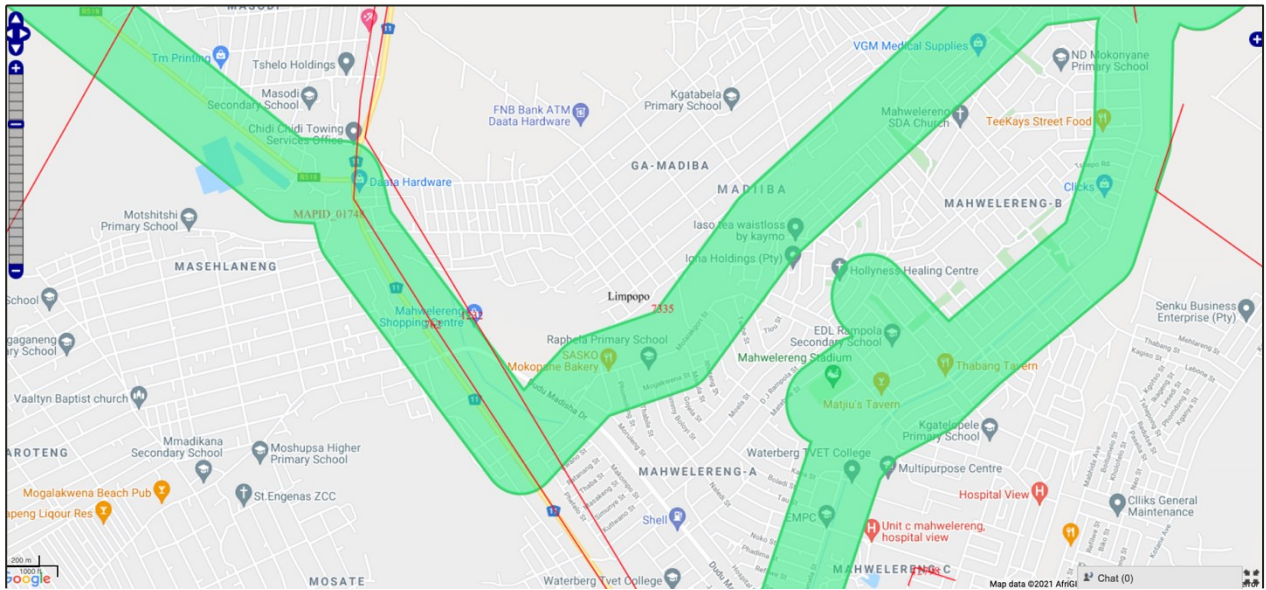


Figure 38. Roodt, F. 2008.

9.7 Historical Typographical Maps

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

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

- 2428AC_1969
- 2428AC_1981
- 2428AC_2005

The historic maps show no heritage significant site indicators within the study area.

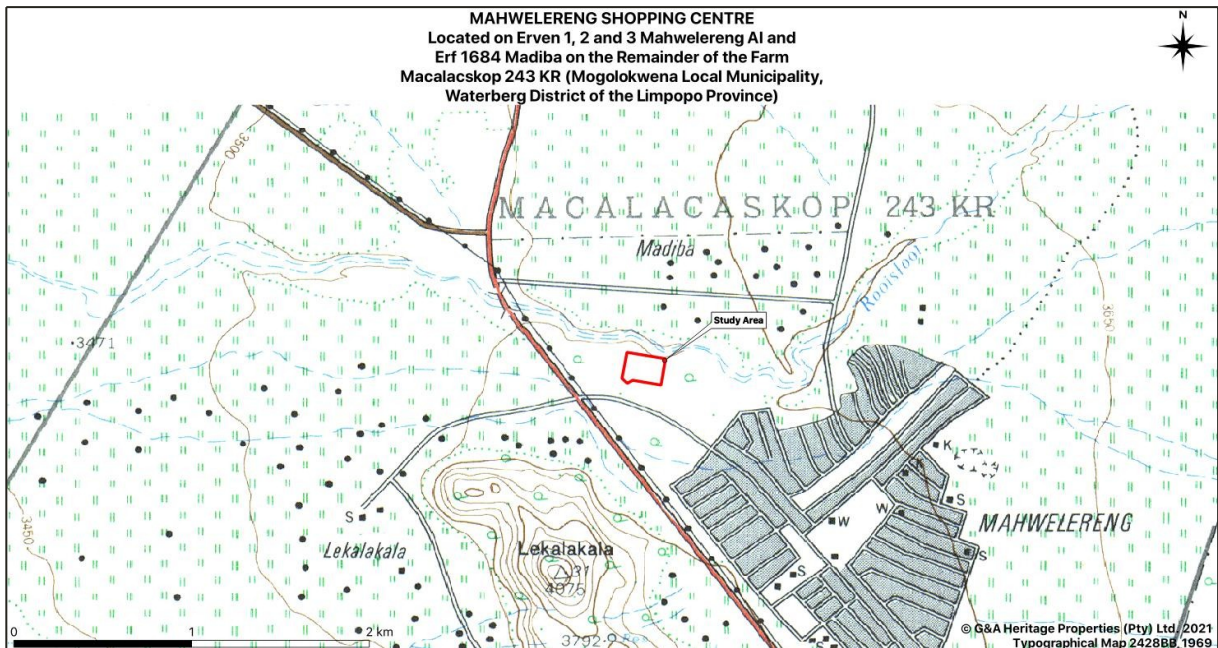


Figure 39. 2428BB_1969 Topographic Map

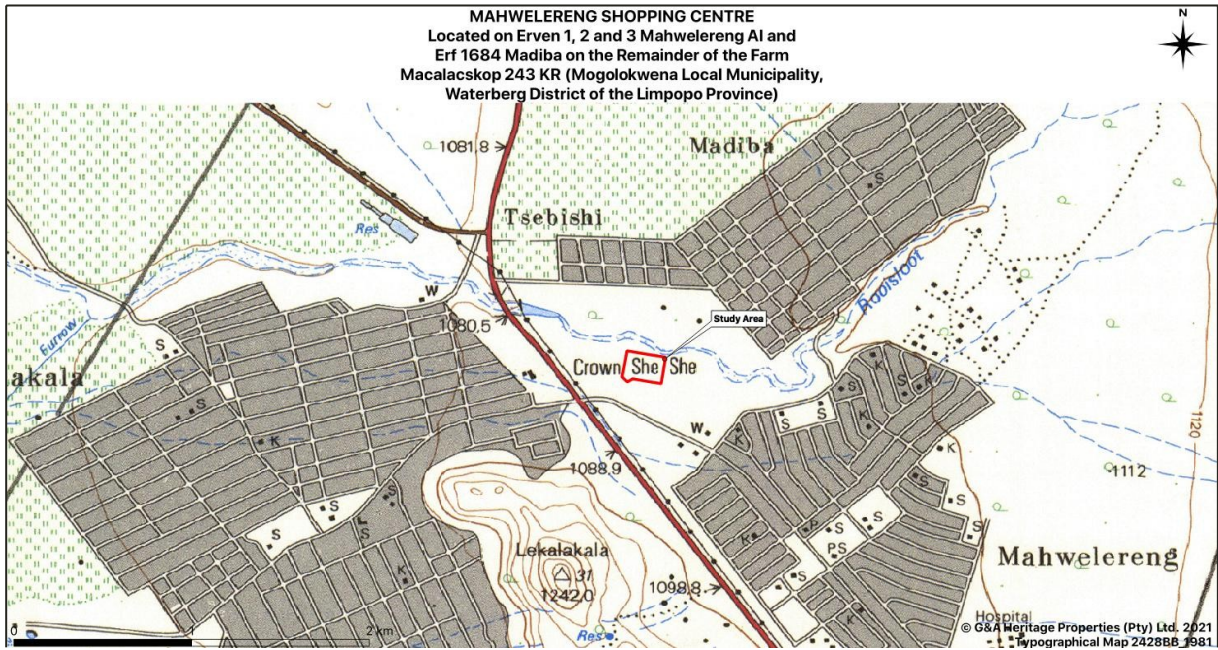


Figure 40. 2428BB_1981 Topographic Map

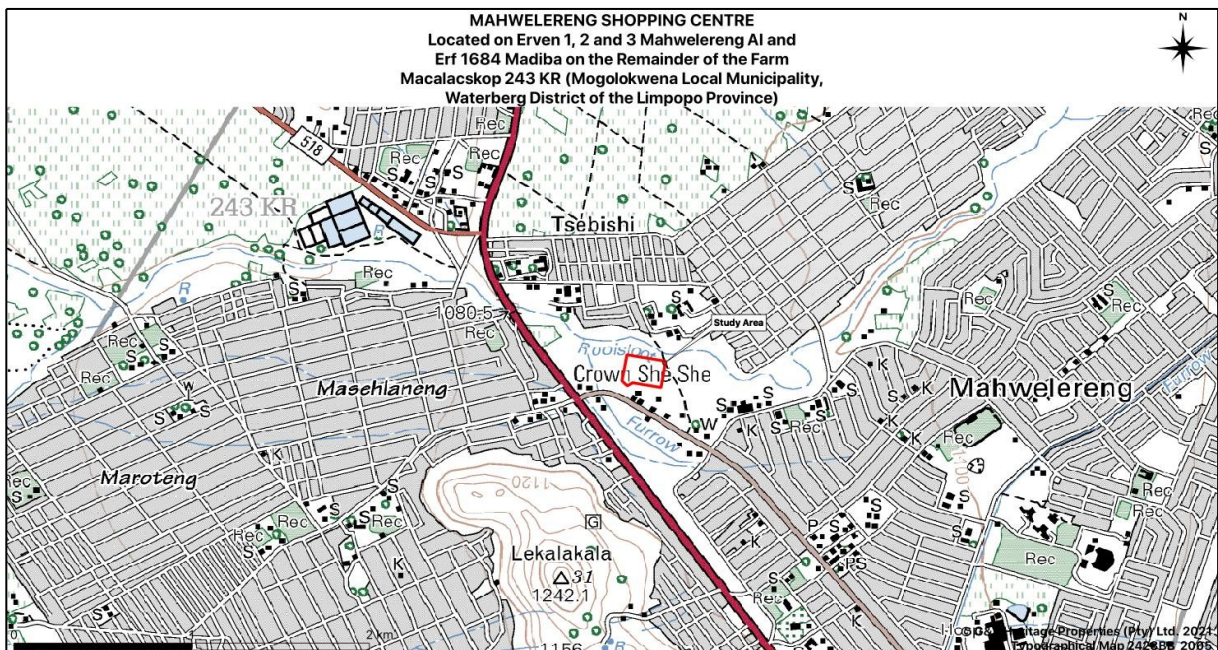


Figure 41. 2428BB_2005 Topographic Map

10. Potential Heritage Impacts and Proposed Mitigation

Heritage Impact Assessment

10.1 Introduction and scope

This component will evaluate the potential impact that the proposed development could have on heritage sites and objects of community, cultural or scientific value. This includes archaeological, cultural heritage, built heritage and basic paleontological assessments to determine the impacts on heritage resources within the study area.

The scope of work includes:

- Identification and assessment of archaeological, cultural, historic, built and paleontological sites within the study area
- Archival study of existing data and information for the study area
- Site inspection and fieldwork: 29 September 2021. This site work includes communicating with local inhabitants to confirm possible locations of heritage and cultural sites.
- Compilation of a Heritage Impact Assessment (HIA) Report.

10.2 Impact Assessment and Proposed Mitigation

Ref.	1			
Project phase	Construction			
Impact	Damage to Grave and Burial Sites			
Description of impact	Construction and site preparation will physically damage burial and grave sites.			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	Exhumation and relocation of the identified grave sites			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Negative	
Duration	Permanent	Impact may be permanent, or in excess of 20 years	Brief	Impact will not last longer than 1 year
Extent	Regional	Impacts felt outside the study area, at a regional / provincial level	Limited	Impacts limited to specific parts of the study area
Magnitude	Very high	Natural and/ or social functions and/ or processes are majorly altered	Low	Natural and/ or social functions and/ or processes are somewhat altered
Probability	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur	Certain / definite	There are sound scientific reasons to expect that the impact will definitely occur
Confidence	High	Substantive supportive data exists to verify the assessment	High	Substantive supportive data exists to verify the assessment
Reversibility	Low	The affected environment will not be able to recover from the impact - permanently modified	High	The affected environmental will be able to recover from the impact
Resource irreplaceability	High	The resource is irreparably damaged and is not represented elsewhere	Low	The resource is not damaged irreparably or is not scarce
Significance	Major - negative		Minor - negative	
Comment on significance	Burial sites have significant cultural value within the local ethnic culture. It is important the the relocation process takes this into account.			
Cumulative impacts	Extensive agricultural and mining activities in the area could compound this effect.			

11. Public Participation

Public participation will be included in the larger environmental study stakeholder engagement process. Posters to this effect was placed on site in visible areas.



Figure 42. Placing Site Signage at the entrance to the Study Area



Figure 43. Site Signage at a Grave Cluster



Figure 44. Site Signage at a Grave Cluster

12. Conclusions and Recommendations

The site for the proposed proposed Mahwelereng Shopping Centre located on Erven 1, 2 and 3 Mahwelereng AI and Erf 1684 Madiba on the Remainder of the Farm Macalacskop 243 KR (Mogalakwena Local Municipality, Waterberg District of the Limpopo Province) was investigated during a field visit and through archival studies.

Four clusters of grave sites were observed within the study area. It is recommended that a permit be obtained, and the graves be relocated to a Municipal Cemetery to avoid damage.

The rest of the study area was found to be devoid of any heritage sites with significance and severely altered from the natural landscape. It is recommended that obscured, subterranean sites be managed, if they are encountered.

Provided the recommendations in this report is followed there is no reason, from a heritage point of view, why this development cannot continue.

13. Chance Finds Protocol

It is important to note that, although unlikely, sub-surface remains of heritage sites could still be encountered during construction of the project. Such sites would offer no surface indication of their presence due to the high state of alterations in some areas as well as heavy vegetation cover in other areas. The following indicators of unmarked sub-surface sites could be encountered:

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

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

- All operators of excavation equipment should be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures should they be encountered.
- All construction in the immediate vicinity (50m radius of the site) should cease.
- The heritage practitioner should be informed as soon as possible.
- Mitigation measures (such as refilling etc.) should not be attempted.
- The area in a 50m radius of the find should be cordoned off with hazard tape.
- Public access should be limited.
- The area should be placed under guard.
- No media statements should be released until such time as the heritage practitioner has had enough time to analyze the finds.

Should any archaeological, palaeontological or cultural heritage resources, including graves or human remains (as defined and protected by the NRA 1999) be identified during the vegetation cleaning, surface scraping, trenching, excavation or construction phases of the development, it is recommended that the process as described below is followed.

On-site Reporting Process:

- The identifier should immediately notify his / her supervisor of the find(s).
- The identifier's supervisor should report the incident to the on-site SHE / SHEQ officer within 24 hours of the find(s).
- Should the find(s) relate to human remains, the on-site SHE / SHEQ officer should immediately notify the nearest SAPS station of the find(s).
- The on-site SHE / SHEQ officer should report the find(s) to the appointed ECO / ELO officer within 24 hours after the find(s) was / were reported by the relevant supervisor.
- Within 72 hours of the find(s) being reported to the SHE / SHEQ officer, the ECO / ELO officer should ensure that the find(s) is reported on the SAHRIS Database and the relevant heritage specialist is contacted to make arrangements for a heritage inspection.
- Should the find(s) relate to human remains, the ECO / ELO officer should ensure that the heritage inspection coincides with the SAPS inspection, to verify if the find(s) is / are of forensic, authentic (informal / older than 60 years) or archaeological (older than 100 years) origin.
- The heritage specialist should compile a heritage site inspection report based on the site-specific findings. The report should make recommendations for the destruction, conservation or mitigation of the find(s) and prescribe a recommended way forward for the development. The report should be submitted to the ECO / ELO officer, who should ensure submission thereof on the SAHRIS database.
- SAHRA / the relevant PHRA will state legal requirements for the development to proceed in the SAHRA / PHRA comments on the heritage inspection report.
- The developer should proceed with implementation of the SAHRA / PHRA comment requirements, which may well stipulate permit specifications to proceed.
 - Should the permit specifications stipulate further Phase 2 archaeological investigations (including grave mitigation), a suitable accredited heritage specialist should be appointed to conduct the work according to the applicable SAHRA / PHRA process.

- The heritage specialist should apply for the permit.
- Upon issue of the SAHRA / PHRA permit, the Phase 2 heritage mitigation program may commence.
- Should the permit specifications stipulate destruction of the find(s) under a SAHRA / PHRA permit, the developer should immediately proceed with the permit application.
- Upon the issue of the SAHRA / PHRA permit, the developer may legally proceed with the destruction of the archaeological, palaeontological or cultural heritage resource(s).
- Upon completion of the Phase 2 heritage mitigation program, the heritage specialist will submit a Phase 2 report to the ECO / ELO officer, who should in turn ensure the submission thereof on the SAHRIS database.
- Report recommendations may include that the remainder of a heritage site be destroyed under a SAHRA / PHRA permit.
- Should the find(s) relate to human remains of forensic origin, the matter will be directly addressed by SAPS. A SAHRA / PHRA permit will not be applicable.

NOTE: the SAHRA / PHRA permit and process requirements relating to the mitigation of human remains requires suitable advertising of the find(s), consultation, mitigation and re-internment / deposition process.

Duties of the Supervisor:

1. The supervisor should ensure that all activities in the vicinity of the find(s) are ceased immediately upon the reporting thereof by the identifier.
2. The supervisor should ensure that the location of the find(s) is secured within 24 hours of the reporting thereof by means of a temporary fence allowing for a 5 – 10m heritage conservation buffer zone around the find(s). The temporary conserved area should be sign-posted as a “No Entry – Heritage Site” zone.
3. Where development was impacted on the resource, no attempt should be made to remove artefacts / objects / remains further from their context and should any artefacts / objects / remains that has / have been removed should be collected and placed within the conservation area or kept for safekeeping with the SHE / SHEQ officer.
4. It is imperative that where development has impacted on any archaeological, palaeontological or cultural heritage resources, the context of the find(s) be preserved as much as possible for interpretive and sample testing purposes.
5. The supervisor should record the name, company and capacity of the identifier and compile a brief report describing the events surrounding the find(s).
6. The report should be submitted to the SHE / SHEQ officer at the time of the incident report.

Duties of the SHE / SHEQ officer:

1. The SHE / SHEQ officer should ensure that the location of the find(s) is recorded with a GPS. A photographic record of the find(s), including implementation of temporary conservation measures, should be compiled. Where relevant a scale bar, or object that can indicate the scale, should be inserted in the photographs for interpretive purposes.
2. The SHE / SHEQ officer should ensure that the supervisor's report, GPS co-ordinate and photographic record of the find(s) are submitted to the ECO / ELO officer.
3. Should the find(s) relate to human remains, the SHE / SHEQ officer should ensure that the mentioned reporting be made available to the SAPS at the time of the incident report.
4. Any retrieved artefacts / objects / remains should, in consultation with the ECO / ELO officer, be kept in a safe place (preferable on site).

Duties of the ECO / ELO officer:

1. The ECO / ELO officer should ensure that the incident is reported on the SAHRIS Database. (The ECO / ELO officer should ensure that he / she is registered on the relevant SAHRIS case with SAHRIS authorship to the case at the time of appointment to enable heritage reporting.)
2. The ECO / ELO officer should ensure that the incident report is forwarded to the heritage specialist for interpretive purposes at his / her soonest opportunity and prior to the heritage site inspection.
3. The ECO / ELO officer should facilitate appointment of the heritage specialist by the developer / construction consultant for the heritage inspection.
4. The ECO / ELO officer should facilitate access by the heritage specialist to any retrieved artefacts / objects / remains that have been kept in safekeeping.

5. Should the find(s) relate to human remains, the SHE / SHEQ officer should facilitate coordination of the heritage site inspection and the SAPS site inspection.
6. The ECO / ELO officer should facilitate heritage reporting and heritage compliance requirements by SAHRA / the relevant PHRA, between the developer / construction consultant, the heritage specialist, the SHE / SHEQ officer (where relevant) and the SAPS (where relevant).

Duties of the Developer / Construction Consultant:

1. The developer / construction consultant should ensure that an adequate heritage contingency budget is accommodated within the project budget to facilitate and streamline the heritage compliance process in the event of identification of incidental archaeological, palaeontological and / or cultural heritage resources during the course of the vegetation cleaning, surface scraping, trenching, excavation or construction phases of the development, when resources not visible at the time of the surface assessment may be exposed.

14. References

- Ahler, S.A. 1977. Functional analysis of nonobsidian chipped stone artefacts: terms, variables and quantification. In: Hayden, B. (ed.). *Lithic use-wear analysis*: 301-328. New York: Academic Press.
- Berg, J.S. 1999. *Geskiedenisatlas van Suid Africa. Die vier Noordelike Provinsies*. Pretoria: J.L. van Schaik.
- Bewsher, P K, & De Jong, R C, (1997), *Ecotourism and cultural resource management*. Document prepared for the SA Wildlife College. Pretoria: Centre for Ecotourism.
- Department of Arts, Culture, Science and Technology, (1996). *White Paper on Arts, Culture and Heritage*. Pretoria: SA Communication Service.
- DEAT, (1996). *White Paper on the Development and Promotion of Tourism in South Africa*. Pretoria: The Department.
- DEAT, (1998). *A national strategy for Integrated Environmental Management in South Africa*. Discussion document. Pretoria: The Department.
- DEAT, (1998). *White Paper on environmental management policy for South Africa*. Government Gazette, Vol 395, No 18894, 15 May 1998.
- Department of Public Works, (1998), *White Paper 1997. Public Works towards the 21st century*.
- Greenfield, H. J. and van Schalkwyk, L. O. 2003. *Intra-settlement social and economic organization of Early Iron Age farming communities in southern Africa: view from Ndongondwane*. *Azania*, 38: 121-37.
- Huffman, T. N. 1993. *Broederstroom and the Central Cattle Pattern*. *South African Journal of Science*, 89: 220-26.
- Huffman, T. N. 2001. *The Central Cattle Pattern and interpreting the past*. *Southern African Humanities*, 13: 19-35.
- Japha, D., Japha, V., Le grange, L & Todeschini, F. *Mission Settlements in South Africa: A Report on their historical background and prospects for conservation*. University of Cape Town.
- Kent, S. 1998. *Invisible gender-invisible foragers: hunter-gatherer spatial patterning and the southern African archaeological record*. In: Kent, S. (ed.) *Gender in African prehistory*: 39-67. California: Altamira Press.
- Maggs, T. O. 1984c. *The Iron Age south of the Zambezi*. In *Southern African Prehistory and Paleoenvironments* (ed. R. Klein). Rotterdam: Balken, pp. 329-60.
- Maggs, T. O. 1995. *The Early Iron Age in the extreme south: some patterns and problems*. *Azania*, 29/30: 171-8.
- Entries on towns in the *Standard Encyclopedia of Southern Africa*, published by Nasou, 1970-1976 (11 volumes).
- Hall, C.M, & McArthur, S. (eds), (1996). *Heritage management in Australia and New Zealand*. Draft publication.
- Huffmann, T.N. 2007. *Handbook to the Iron Age. The Archaeology of Pre-Colonial Farming Societies in Southern Africa*. Durban: University of Kwa-Zulu Natal.
- Harrison, R, (1994). *Manual of heritage management*. Oxford: Butterworth Heinemann.

Jote, K, (1994). International legal protection of cultural heritage. Stockholm: Juristförlaget.

Killick, D. 2004. Review Essay: "What Do We Know About African Iron Working?" Journal of African Archaeology. Vol 2 (1) pp. 135–152

McCarthy, T.S. 2006. The Witwatersrand Supergroup. In: Johnson MR, Anhaeusser and Thomas RJ (Eds). The Geology of South Africa. Geological Society of South Africa, Johannesburg/Council for Geoscience, Pretoria. pp 155-186.

McCarthy, T.S. and Rubidge, B.S. 2005. The story of Earth and Life – a southern African perspective on the 4.6 billion year journey. Struik Publishers, Cape Town. pp 333.

Mason, R. (1986). Origins of Black People of Johannesburg and the Southern Western Central Transvaal AD350-1880. Occasional Paper No. 16 of the Archaeological Research Unit.

Musa, (1994). Museums for South Africa: Intersectoral investigation for national policy. Pretoria: MUSA Secretariat.

National Heritage Council Act, No 11 of 1999.

National Heritage Resources Act, No 25 of 1999.

National Research Foundation, Nexus database of current and completed research projects.

Pistorius, J.C.C. 1992. Molokwane, an Iron Age Bakwena Village. Johannesburg: Perskor Printers.

Republic of South Africa, (1996). Constitution of the Republic of South Africa, Act 108 of 1996. Government Gazette, Vol 378, No 17678, 18 December 1996.

Ross, M. (1996). Planning and the heritage. Policy and procedures. Second edition. London: E & FN Spon. SAHRA website <http://www.sahra.org.za>

Stark, F, (1986). Germiston: The heart of South Africa. Germiston: Felstar Publishing.

UNESCO, (1983). Conventions and recommendations concerning the protection of the cultural heritage. Paris: UNESCO.

US National Parks Service, (1988). Management Policies.

Whitelaw, G. 1997. Archaeological monuments in KwaZulu-Natal: a procedure for the identification of value. Natal Museum Journal of Humanities. 9:99-109.