



PROPOSED NEW TOWNSHIP DEVELOPMENT AT MANGAUNG

Heritage Impact Assessment (HIA) Report

July 2019

CREDIT SHEET

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

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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

A handwritten signature in black ink, appearing to read 'S. Gaigher', written in a cursive style.

MANAGEMENT SUMMARY

Project Name and Location

Proposed New Township Development outside Bloemfontein in the Mangaung Metropolitan Municipality in the Free State Province.

Situated on a Portion of the Farm Klipfontein 716 and the Farm Ceres 626.

Consultant

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Appointed by

Inaluk Consulting Services

Developer / Proponent

Ngoti Development Consultants

Client

Mangaung Metropolitan Municipality

Date of Report

19 July 2019

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 new township development on a portion of the farm Klipfontein 716 and farm Ceres 626 near Bloemfontein in the Mangaung Metropolitan Municipality in the Free State 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 are the required to perform the 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 area was investigated during a field visit and through archival studies. The site was found to be devoid of any heritage sites with significance.

Some modern ruins were observed within the study area. These hold no heritage value and have been documented photographically.

It is recommended that obscured, subterranean sites be managed, if they are encountered.

The area is indicated as *Very High Importance* on the SAHRIS Paleo Sensitivity Map. A field assessment and protocol for finds is required.

Fatal Flaws

No fatal flaws were identified.

CONTENTS

1. General	11
1.1 Project Description	11
1.2 Technical Scope of HIA	11
1.3 Geographical / Spatial Scope of HIA	14
1.4 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 Findings	20
3.6 Consultations	20
3.7 Assumptions	21
3.8 Gaps / Limitations / Uncertainty	21
3.9 Specialist Specific Methodology	21
3.10 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	26
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
5.4 Assumptions and Restrictions	31
6. Assessment of Impacts	32
6.1 Impact Statement	32
6.1.1 Built Environment	32
6.1.2 Cultural Landscape	32

7. Measuring Impacts	34
7.1 Magnitude	37
7.2 Duration	38
7.3 Extent	38
7.4 Probability	39
7.5 Significance	39
8. Description of Affected Environment	41
8.1 Map of Key Features	41
8.1.1 Findings	41
9. Baseline	42
9.1 Palaeontology	42
9.2 Stone Age	42
9.3 Iron Age	47
9.4 Historic Era	49
9.5 Archival Research	51
9.6 SAHRIS Database Studies	51
9.7 Historical Typographical Maps	52
9.8 Natural / Cultural Landscape	53
10. Photos	54
11. Potential Heritage Impacts and Proposed Mitigation	69
11.1 Introduction and scope	69
11.2 Impact Assessment and Proposed Mitigation	69
11.3 No-Go Alternative	72
11.4 Conclusions and Recommendations	72
11.5 Chance Finds Protocol	72
12. References	74

List of Figures

Figure 1. Proposed new township development in Mangaung Metro Municipality.....	11
Figure 2. Proposed layout of the new township	12
Figure 3. Track Path	15
Figure 4. Map of Key Features.....	41
Figure 5. <i>PalaeoSensitivity</i> Map.....	42
Figure 6. Stellenbosch and Fauresmith sites as per Humphreys (1971).....	43
Figure 7. (1,2) Handaxes with large side removal; (3-6) handaxes (Pollarolo, Susino, Kuman, Bruxelles, 2010)	44
Figure 8. Fauresmith Tools (P. Mitchell, 2002)	45
Figure 9. Smithfield A, B & C sites as per van Riet Lowe and Goodwin	46
Figure 10. Central Cattle Pattern of the Iron Age.....	48
Figure 11. Typographical Map 2926 AB 1951.....	53
Figure 12. Typographical Map 2926 AB 2007.....	53
Figure 13. Northern section of the study area near the tar road.....	54
Figure 14. Informal soccer field on the northern side of the study area	54
Figure 15. Illegal dumping and dangerous grazing occurring in the study area	55
Figure 16. Northern section of the study area, view towards the south.....	55
Figure 17. Northern section of the study area, view towards the east.....	56
Figure 18. Dam located in the study area near the northern boundary	56
Figure 19. Water cistern and troughs.....	57
Figure 20. Troughs close up.....	57
Figure 21. Water cistern close up.....	58
Figure 22. A feature near the water cistern.....	58
Figure 23. Modern ruins near the water cistern	59
Figure 24. The study area is currently being used for grazing.....	59
Figure 25. Centre of the study area, view towards the south.....	60
Figure 26. Centre of the study area, view towards the north	60
Figure 27. Western section of the study area, view towards the east	61
Figure 28. Western section of the study area, view towards the north.....	61
Figure 29. Site notice placed on the fence of the western boundary of the study area.....	62
Figure 30. Site notice.....	62
Figure 31. Site notice placed on the fence of the southern boundary of the study area	63
Figure 32. Site notice.....	63
Figure 33. Modern ruins along the southern boundary of the study area.....	64
Figure 34. Modern ruins along the southern boundary of the study area.....	64
Figure 35. Bricks scattered along the southern boundary of the study area	65
Figure 36. Investigating the possibility of this features being a grave, found to be negative	65
Figure 37. Modern ruins along the southern boundary of the study area.....	66
Figure 38. Modern ruins along the southern boundary of the study area.....	66
Figure 39. Modern ruins outside the boundaries on the north-eastern side of the study area	67

Figure 40. Sacred Ibises feeding outside the study area on the north-eastern side 67

Figure 41. Southern section of the study area, view towards the north..... 68

Figure 42. Site Notice 76

Figure 43. BID..... 83

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. Deaon, NMC as used in Morris) 23

Table 5. Site attributes and value assessment (adopted from Whitelaw 1997 as used in Morris)..... 24

Table 6. Historic Significance 26

Table 7. Architectural Significance 26

Table 8. Spatial Significance 27

Table 9. Impact Ratings..... 28

Table 10. Cultural Landscapes..... 32

Table 11. Description of magnitude and assigned numerical values 37

Table 12. Description of duration and assigned numerical values 38

Table 13. Description of extent and assigned numerical values..... 38

Table 14. Definition of probability ratings 39

Table 15. Application of significance ratings 39

Table 16. Definition of confidence ratings 40

Table 17. Definition of reversibility ratings 40

Table 18. Definition of irreplaceability ratings 40

Table 19. Damage to Graves and Burial Sites..... 70

Table 20. Excavation of Palaeontological Materials 71

Table 21. Damage to Unidentified or Buried Archaeological Sites 72



ABBREVIATIONS

Abbreviation	Meaning
BP	Before Present
c.	circa
BCE	Before the Common Era
Bp	Before Present
CE	Common Era
EIA	Early Iron Age
ESA	Early Stone Age
Fm	Femtometre (10^{-15} m)
GPS	Geographic Positioning System
HIA	Heritage Impact Assessment
LIA	Late Iron Age
LSA	Late Stone Age
MSA	Middle Stone Age
MYA	Million Years Ago
NHRA	National Heritage Resources Agency
OFS	Orange Free State
PIA	Palaeontological Impact Assessment
SAHRA	South African Heritage Resource Agency
SAHRIS	South African Heritage Information System
SANNC	South African Native National Congress
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 Inaluk Consulting Services to undertake a Heritage Impact Assessment (HIA) for the proposed new township development on a portion of the farm Klipfontein 716 and farm Ceres 626 near Bloemfontein in the Mangaung Metropolitan Municipality in the Free State Province.



Figure 1. Proposed new township development in Mangaung Metro Municipality

1.2 Technical Scope of HIA

This HIA focused only on the area to be directly affected by the proposed development. The study area is 192.9 Ha in extent.

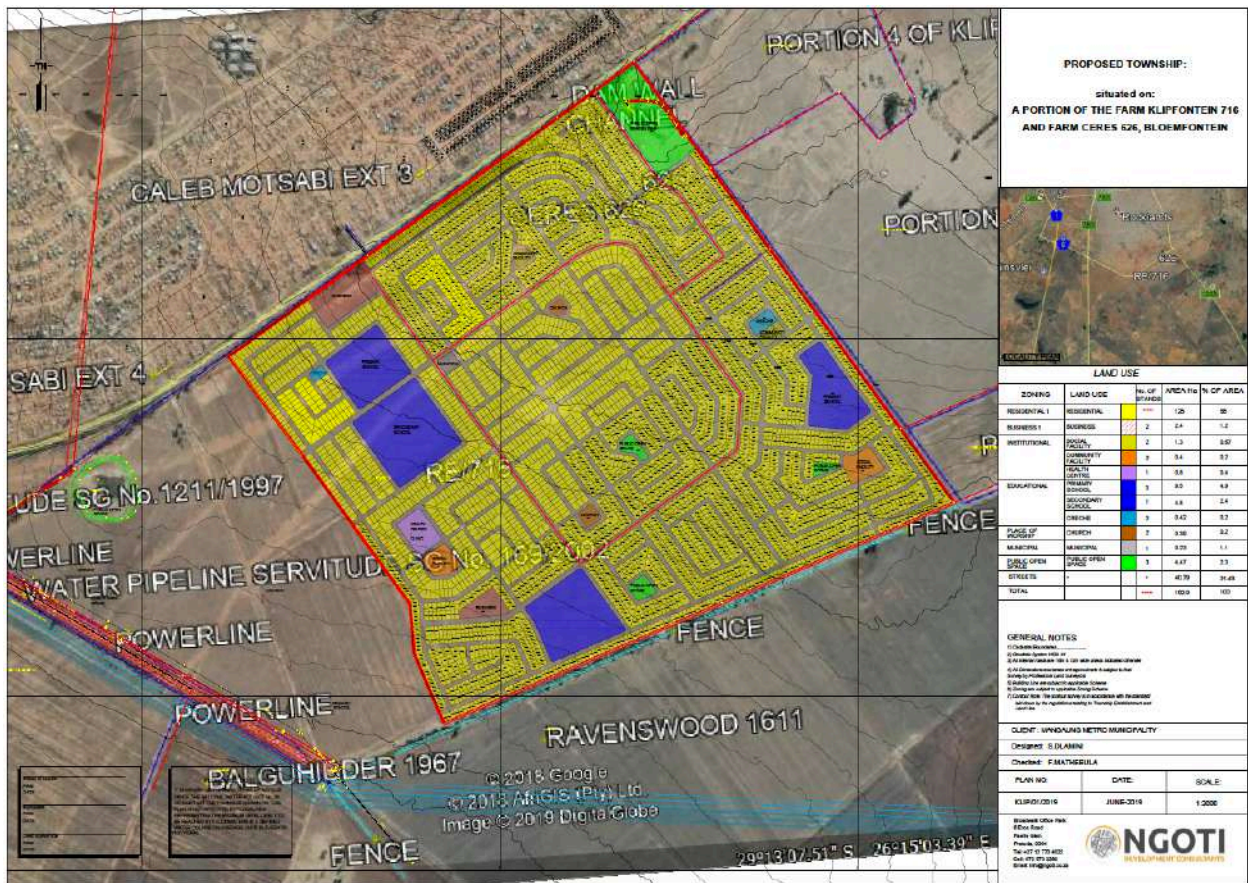


Figure 2. Proposed layout of the new township

The HIA is meant to deliver, evaluate and inform on the following aspects:

- (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 the relevant legal descriptions, development proponent requirements and as per international best practise approaches and charters;
- (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.

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.

1.3 Geographical / Spatial Scope of HIA

The geographic and spatial scope of the HIA centres on the proposed new township development on a portion of the farm Klipfontein 716 and farm Ceres 626, near Bloemfontein in the Mangaung Metropolitan Municipality. Any sites within the directly impacted study area 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.

1.4 GPS Track Path

The investigation was across the span of the study area. GPX Files are available.

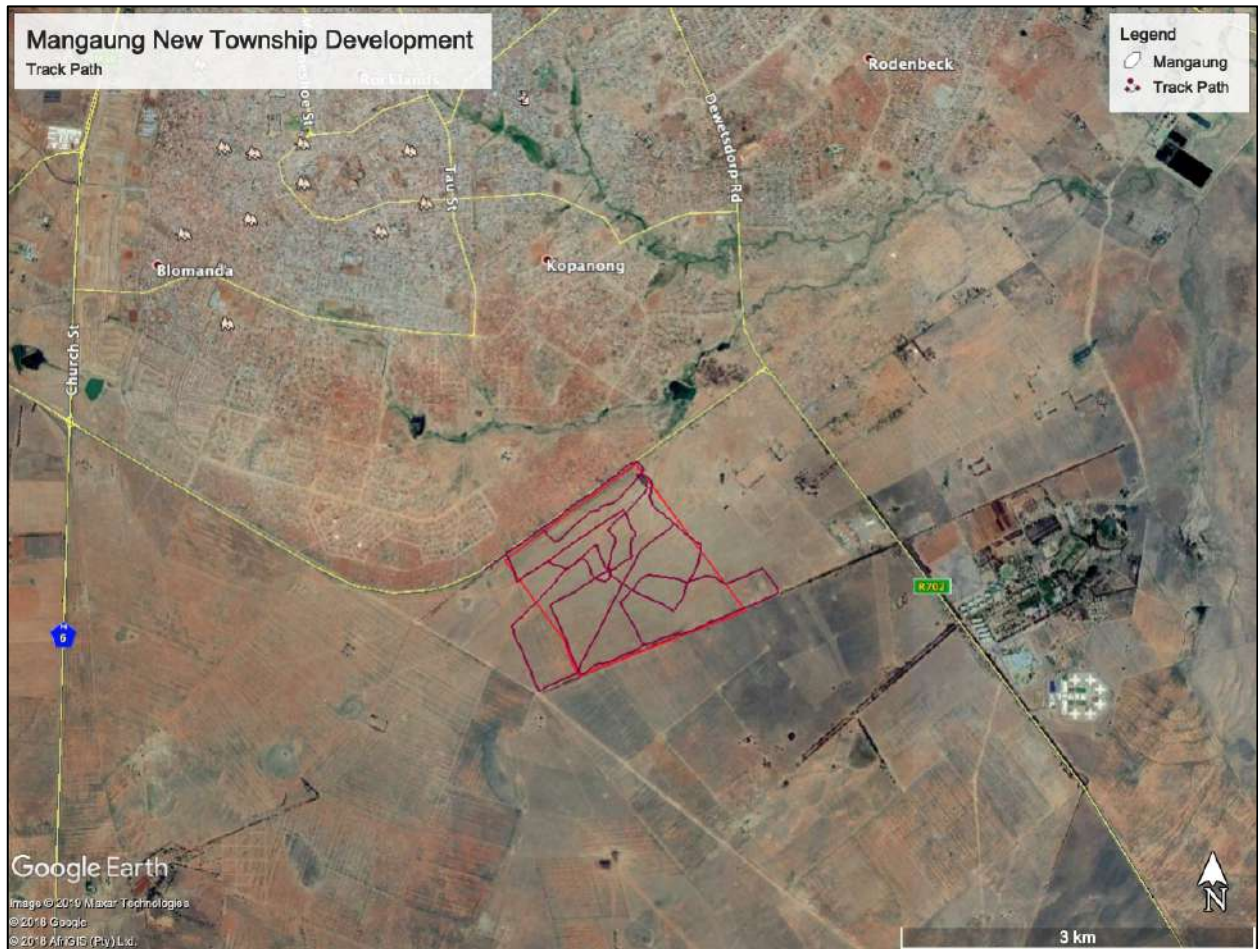


Figure 3. Track Path

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 and at present there is still no defined decommissioning phase.

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

Table 2. NHRA Triggers

Action Trigger	Yes/No	Description
Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length.	No	N/A
Construction of a bridge or similar structure exceeding 50m in length.	No	N/A
Development exceeding 5000 m ²	Yes	Proposed new township development
Development involving more than 3 erven or sub divisions	No	N/A
Development involving more than 3 erven or sub divisions that have been consolidated in the past 5 years	No	N/A
Re-zoning of site exceeding 10 000 m ²	Yes	Proposed new township development
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 proposed new township development on a portion of the farm Klipfontein 716 and the farm Ceres 626 near Bloemfontein in the Mangaung Metropolitan Municipality in the Free State 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
- Internet Search
- Historic Maps
- 1951 and 2007 Surveyor General Topographic Map series
- 1952 1:10 000 aerial photo survey
- Google Earth 2018 imagery
- Published articles and books
- JSTOR Article Archive

3.4 Site Visit / Fieldwork Details

Fieldwork for the HIA was done on the 17th and 18th of July 2019. Most of the areas were found to be accessible by vehicle and on foot. 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. An aerial drone was used to increase coverage of the site. It has been found that high resolution aerial photography is much more effective than transect walks (which is usually prohibitively expensive in terms of time and cost). A meshed image of the site is compiled from a mosaic of photos taken from a height of 60m. This gives a resolution of 2cm/pixel. These photographs were compiled on site, analysed and anomalous areas investigated on foot.

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 foot and aerial drone. 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 Findings

A water cistern, troughs and other modern ruins in the centre of the study area were noted. More modern ruins along the southern boundary of the study area was also identified. None of these are considered to be historically significant.

3.6 Consultations

Signage indicating the HIA performed and the planned development actions were placed on site. The heritage component was also included in the larger ESIA advertisements placed by the lead consultant. Since the site is not occupied and bordered by the informal settlements and commercial farming, it is not anticipated that any public participation feedback will be received. It was noted that the site is used by a local farmers as grazing for their sheep. It is not known if this is a formal arrangement.

3.7 Assumptions

It was assumed that the impacted areas will be limited to the proposed layout as received by *Inaluk Consulting Services*. It is furthermore assumed that the Paleo Sensitivity Map provided on the SAHRIS platform is comprehensive enough to inform on actions in this regard. It is assumed that activities will be limited to the development area and that they will not impact any areas outside of the indicated study area.

3.8 Gaps / Limitations / Uncertainty

The area was readily accessible.

3.9 Specialist Specific Methodology

The scope of work includes:

- the identification and assessment of archaeological, cultural, historic, built and paleontological sites within the study area.
- Interrogation of project-specific Drone data and aerial imagery.
- Archival study of existing data and information for the study area.
- 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.

3.10 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. Checklists of criteria for evaluating pre-contact and post-contact archaeological sites are provided. These checklists are not intended to be exhaustive or inflexible. 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 Dispersed distribution	Limited sequence	Long sequence Favourable context High density of arte / ecofacts
2	Presence of exceptional items (incl. regional rarity)	Absent	Present	Major element
3	Organic preservation	Absent	Present	Major element
4	Potential for future archaeological investigation	Low	Medium	High
5	Potential for public display	Low	Medium	High
6	Aesthetic appeal	Low	Medium	High
7	Potential for implementation of a long-term management plan	Low	Medium	High

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 were identified.

4.4.2 Post-Contact Sites

No Post-contact sites were identified.

4.4.3 Built Environment

Some modern farming related structures (such as troughs and a cistern) was noted on site. These were not of any heritage significance. The area is used for extensive dumping of building materials, which has no significance.

Table 6. 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

Table 7. 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

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.

Table 8. 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:

Table 9. Impact Ratings

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.

5.4 Assumptions and Restrictions

- It is assumed that the South African Heritage Resources Information System (SAHRIS) database locations are correct.
- It is assumed that the paleontological information collected for the project is comprehensive.
- It is assumed that the social impact assessment and public participation process of the environmental assessment will result in the identification of any intangible sites of heritage potential.

6. Assessment of Impacts

6.1 Impact Statement

6.1.1 Built Environment

Some structures associated with rural living were identified;

- Brick outbuildings (modern and historic)
- Barb-wire fences (modern)
- Dirt roads (modern)
- Footpaths
- Farming related structures

Mitigation

None of these structures warrant mitigation.

6.1.2 Cultural Landscape

The following landscape types were identified during the study.

Table 10. Cultural Landscapes

Landscape Type	Description	Occurrence still possible?	Likely occurrence?
1 Paleontological	Mostly fossil remains. Remains include microbial fossils such as found in Baberton Greenstones	Yes, sub-surface	Likely
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	Yes	Unlikely
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	These possess distinctive patterns of settlement and historical features such as: <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 	No	No

	<ul style="list-style-type: none"> - 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. 		
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,	Unlikely
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 - Sites associated with displacement & contestation - Sites of political conflict/struggle - Sites associated with an historic event/person - Sites associated with public memory 	No	No
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?

○ 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 'Mangaung 2019.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 11. 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 12. 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 13. 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 14. 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 15. 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 (+)
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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 16. 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 17. 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 18. 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 4. Map of Key Features

8.1.1 Findings

Some modern ruins were found scattered over the property. None of these had any heritage significance and they have been documented photographically during the field survey.

9. Baseline

9.1 Palaeontology

Several paleontological studies have been performed in this general area. The area is indicated as *Very High Importance* on the SAHRIS Paleo Sensitivity Map. A field assessment and protocol for finds is required.

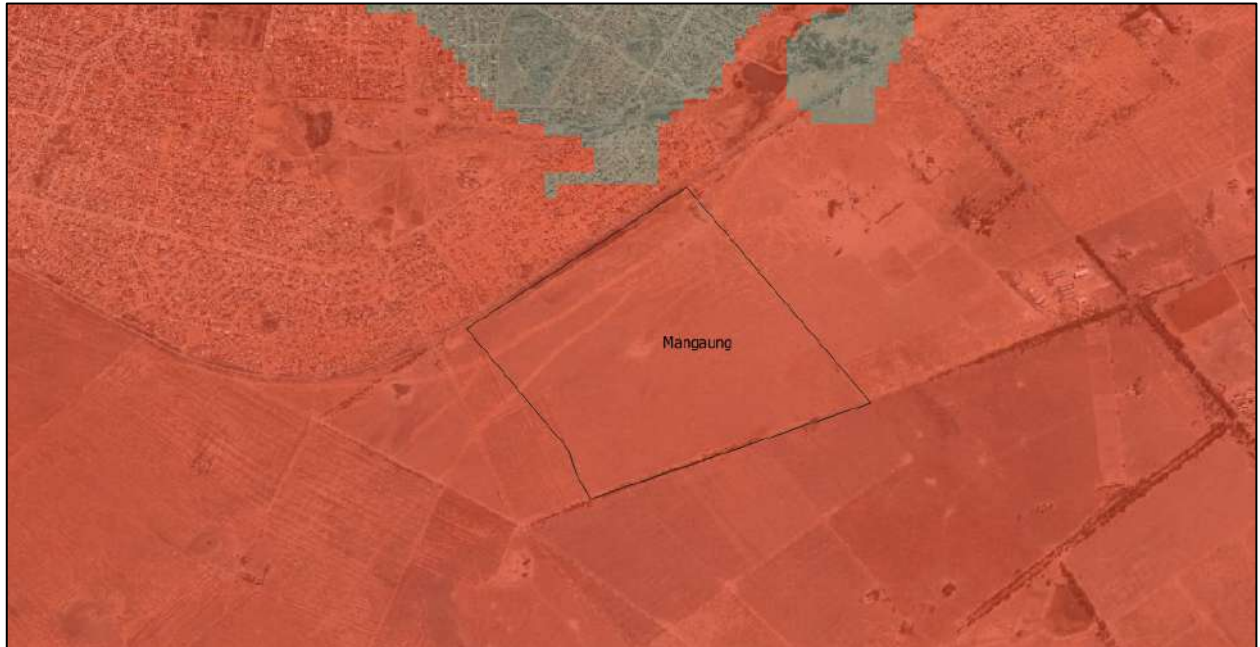


Figure 5. *PalaeoSensitivity Map*

9.2 Stone Age

Extensive research on the Stone Age in this area comes from Goodwin, Van Riet Lowe and Humphreys. Humphreys compiled a map of Fauresmith manufacture sites from 1928, 1929 & 1937 published research of Goodwin and Van Riet Lowe. The map illustrates Fauresmith (circle) and “Stellenbosch” (black dot) manufacturing sites although most of these sites also contain both Smithfield A and B material but in particular Smithfield A with Fauresmith-related sites. It also does not indicate the surface finds of the

Fauresmith tradition that are not manufacturing sites. The most important fact to take from this is that the subject area falls within a known area of the Fauresmith-tradition.

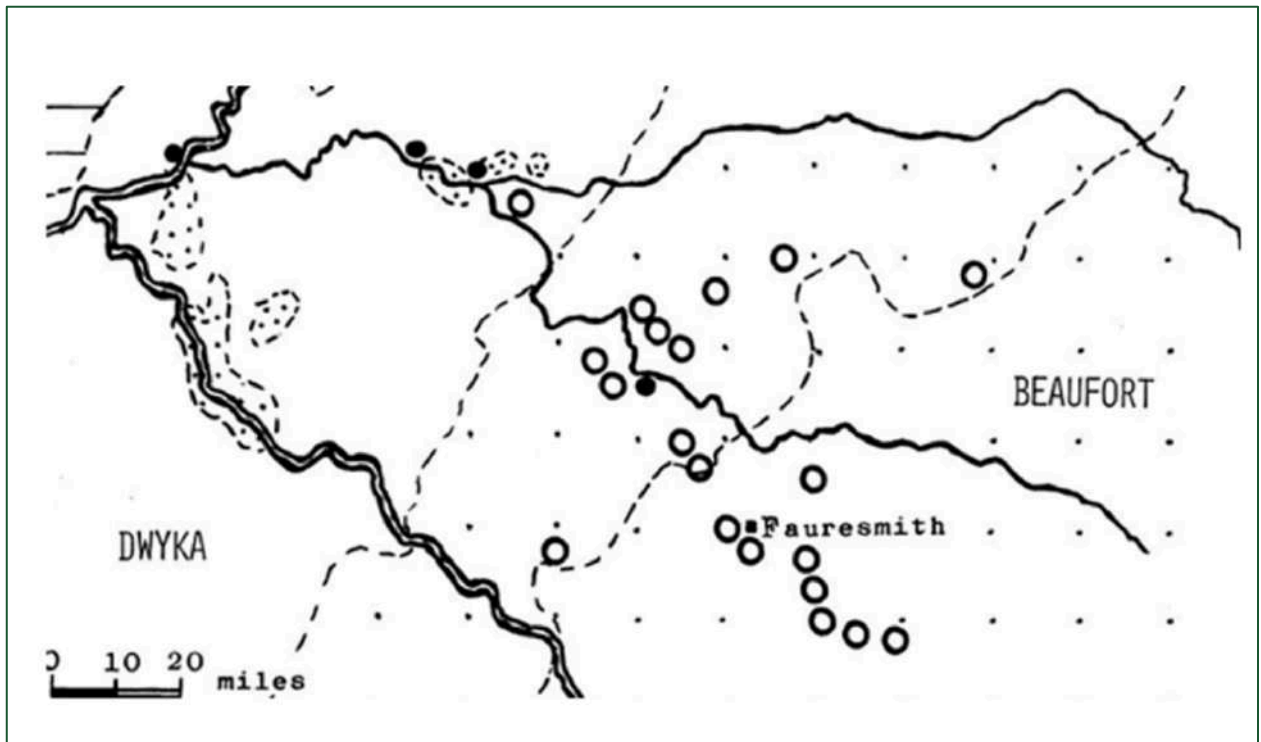


Figure 6. Stellenbosch and Fauresmith sites as per Humphreys (1971)

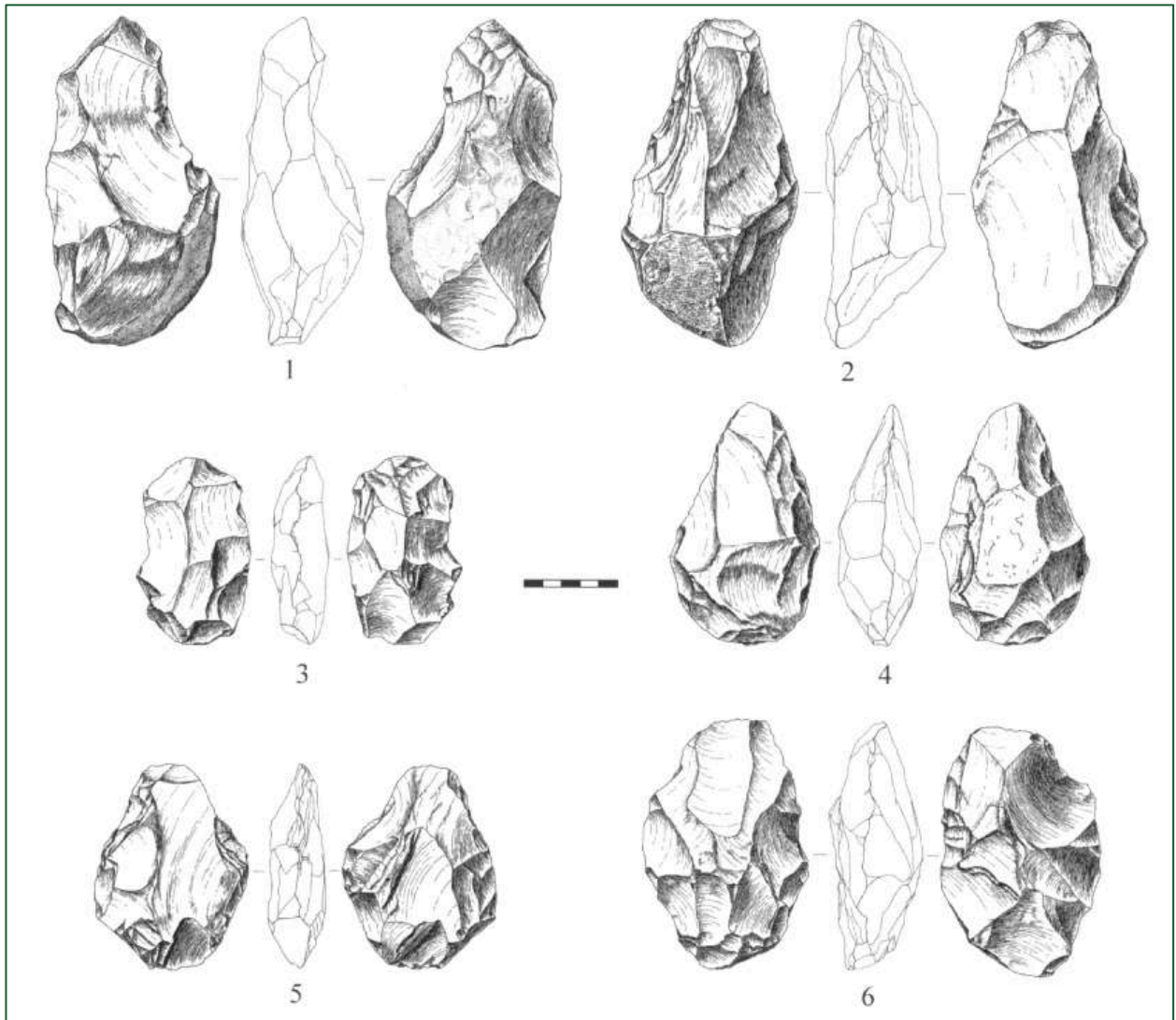


Figure 7. (1,2) Handaxes with large side removal; (3-6) handaxes (Pollarolo, Susino, Kuman, Bruxelles, 2010)

Samson (1974) states that the stratigraphic evidence from three different areas in South Africa demonstrates that the industry following the late Acheulian is not the so-called "Fauresmith", but a complex without any of the characteristics of the Acheulian samples such as hand-axes, cleavers and picks. He furthermore indicate that secondary working of tools is virtually absent in these areas.

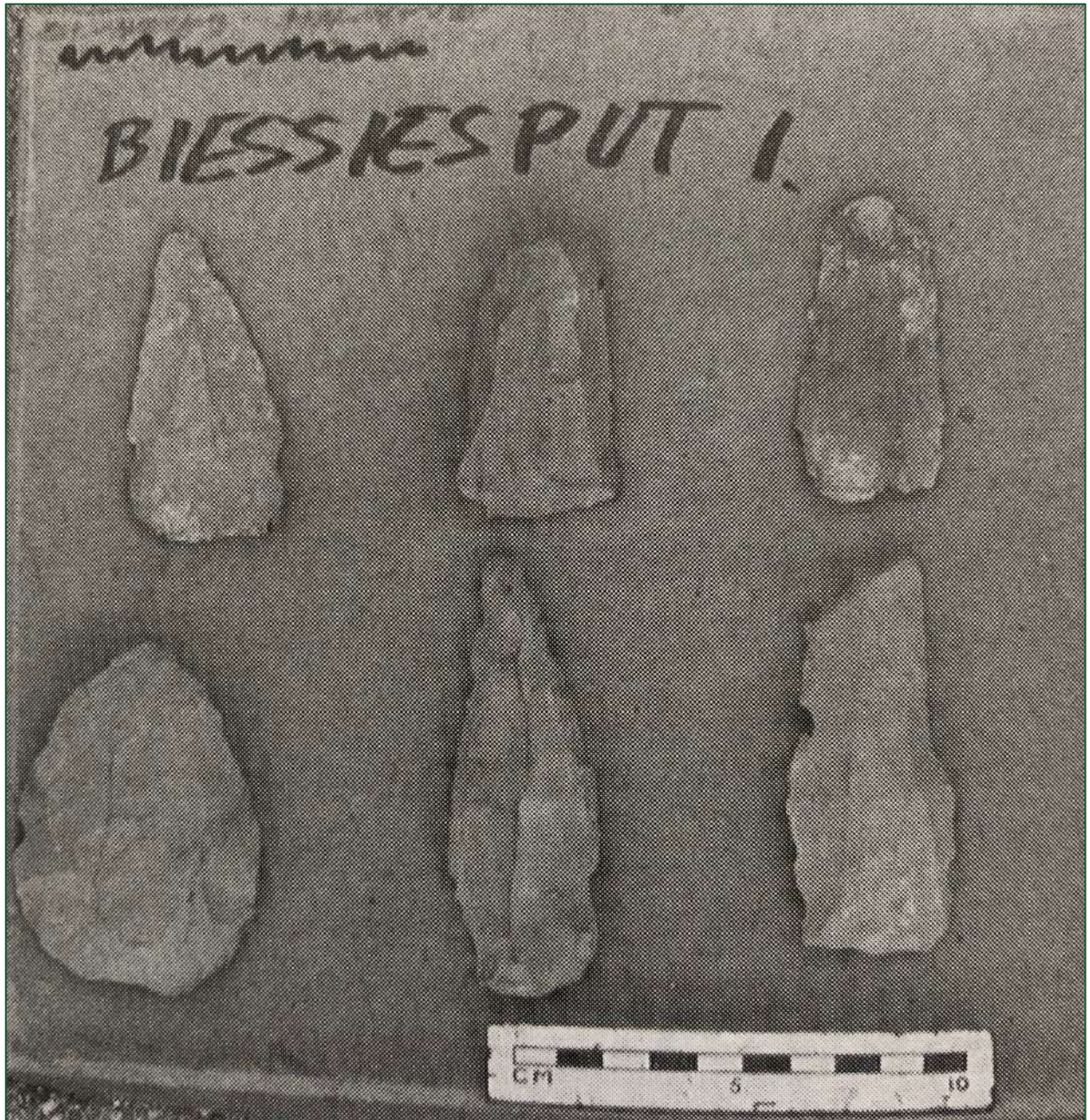


Figure 8. Fauresmith Tools (P. Mitchell, 2002)

Fauresmith Industry manufacturing sites are found on the following farms in the Xhariep District;

- Blaauwheuwel site along the Van Zyl Spruit, a tributary of the Proses Spruit
- Brakfontein (Fauresmith-tradition type site situated 19 km outside Koffiefontein on the road between Koffiefontein and Fauresmith)
- Dwarsvlei-Erfdeel-Fauresmith Townlands
- Koffiefontein
- Leeuwarden
- Petrusberg
- Rorich's Hoop
- Rooidraai
- Spitzkop I and Spitzkop II

- Valschfontein
- Zuurfontein (also along the Van Zyl Spruit)

Material catalogued as Fauresmith-tradition at the National Museum, Bloemfontein, mainly relates to the Orange River area, collected by Sampson during the rescue operation for the new Orange River Scheme (construction of the Gariiep Dam).

Goodwin and Van Riet Lowe (1929, pp. 91-92) describe the finding place of the Fauresmith-tradition material at the Fauresmith Town Spruit as “...in the immediate vicinity of the village, exposed in a bed of water-borne gravel that contains vast quantities of Fauresmith Industry remains.” The characteristic artefact of the Fauresmith-tradition are handaxes, described as “a neat almond, sometimes ovate.....generally small [size], and the implements are of a length and weight which make them eminently suitable for use in the hand” and are noted as in general being found in dense concentrations.

The subject area falls within the boundary of the Smithfield A distribution area as delineated by Goodwin and Van Riet Lowe (1929) in a map of the Orange Free State Smithfield Industry sites.

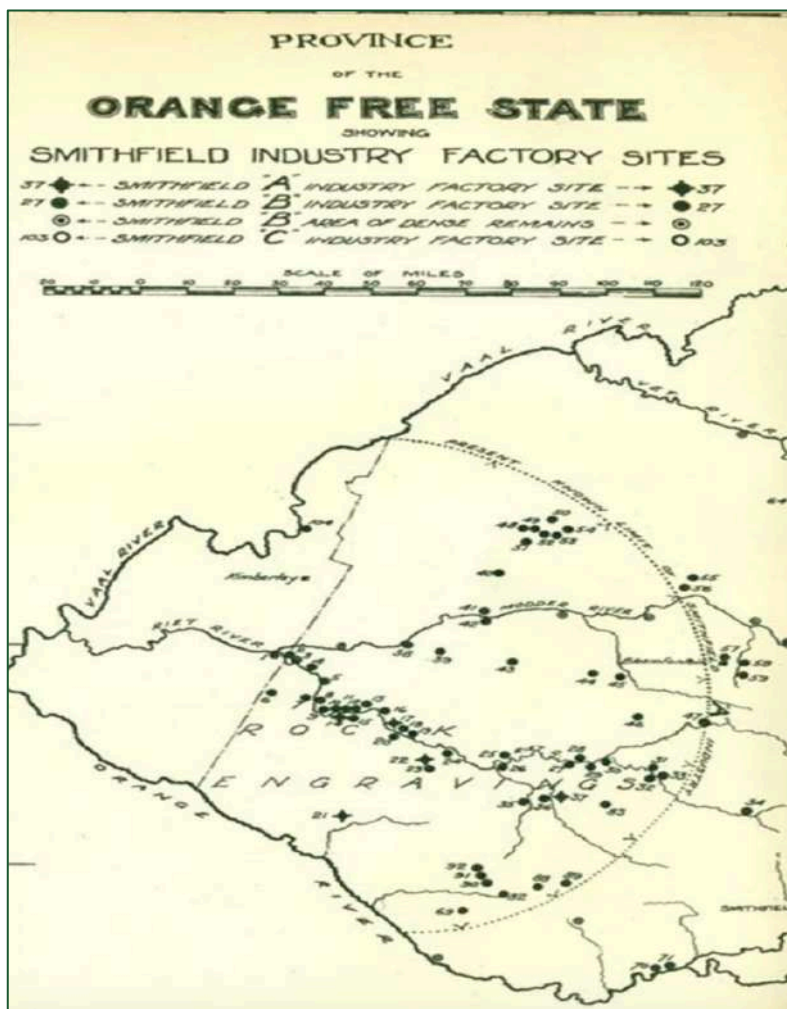


Figure 9. Smithfield A, B & C sites as per van Riet Lowe and Goodwin

A typical factory-site assemblage is described from the Lockshoek site and include:

- Concavo-convex scrapers (restricted to Smithfield A)
- Large circular scrapers (restricted to Smithfield A)
- Duckbill end-scrapers
- Side-scrapers
- Trimmed points
- Stone borers
- Bored Stones
- Grooved Stones
- Grindstones
- Pounders and grinders
- Fabricators: cores; detaching-hammers; trimming-stones; anvils

According to them no notched scrapers are associated with the Smithfield A industry, while re-used Fauresmith hand axes and re-trimmed flakes are found in association with Smithfield industries (Goodwin & Van Riet Lowe, 1929, p. 153).

List of Smithfield sites in vicinity of the study area:

- Smithfield A:
 - Blaauwheuwel 425 (also a Fauresmith industry site)
 - Brakfontein No 231 (typesite for Fauresmith industry – 15 km from Fauresmith on road to Koffiefontein)
 - Lockshoek 191 (also a Fauresmith site) – 27 km north of Jagersfontein

- Smithfield B:
 - Blaauwheuwel
 - Lockshoek

- Smithfield C: None recorded in close proximity of the subject area

9.3 Iron Age

In about 1823, the missionary Rev Burchell hired armed Griqua to protect BaThlaping living at Dithakong, about 300 km northwest of Bloemfontein. These BaThlaping were some of the first Sotho-Tswana people to have been met by Europeans from the Cape (about 1801). The word 'Dithakong' means 'place of walls' and refers to a large concentration of stonewalling on a hill above the 19th century settlement.

Literally, thousands of similar stonewalled settlements lie scattered across the highveld of the Free State. The oldest type of walling stands near the hill known as Ntsuanatsatsi, the legendary place of origin of BaFokeng. Although Tswana-speaking now, new archaeological research indicates that the Fokeng moved up from northern KwaZulu-Natal and were originally Nguni speaking. Type N walling, as it is known, emphasises the centre/side axis expressed through concentric circles: the inner circle encompasses cattle byres and the men's court, while the female residential zone of beehive houses and grain bins constitutes the outer circle. An outer wall sometimes incorporates small stock enclosures because these animals are associated with women. This type of walling first dates to the 15th century.

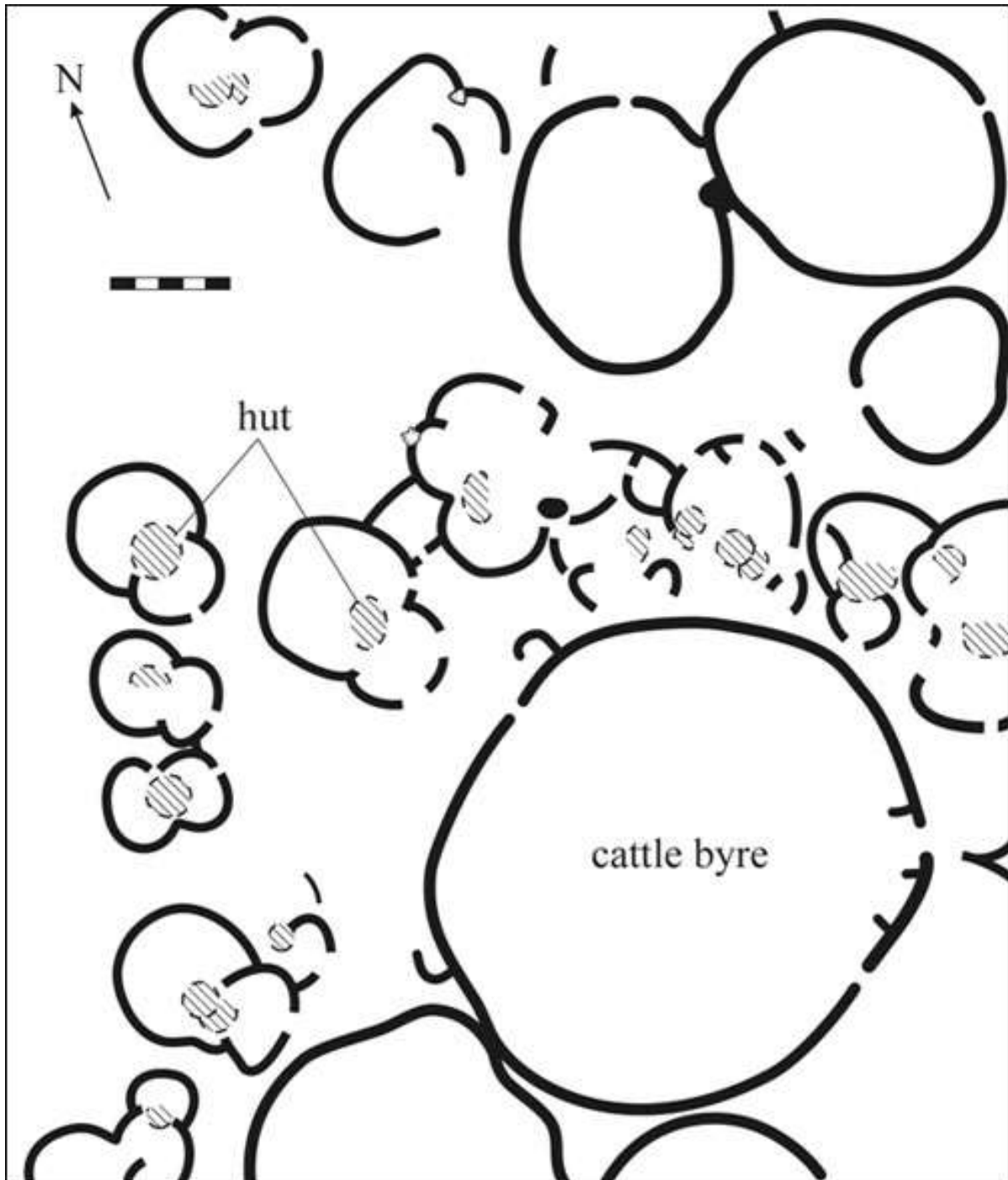


Figure 10. Central Cattle Pattern of the Iron Age

According to oral traditions, Tswana people from the west moved across the Vaal River, found BaFokeng at Ntsuanatsatsi, and assimilated them. Archaeologically, this interaction created another type of walling, called Type V, named after Vegkop near Heilbron. Among other things, this type of settlement includes the famous 'corbelled huts' that captured the imagination of early travellers. Located on the edge of the central cattle area, these low stone huts served mostly as huts for herd boys. In a few places, adults may have lived in larger examples.

The Sand River Nature Reserve contains several stonewalled settlements accessible to the public.

9.4 Historic Era

The area between the Orange and Vaal rivers, originally known as Transoranje, with its abundance of permanent water sources, was the hunting grounds of the San at the beginning of the 19th century. However, other groups began to infiltrate the area in the early 19th century.

The Griquas under Adam Kok came from the west and settled themselves near the area later known as Philippolis. As a result of the Difaqane, many groups came to the Transoranje area in the 1820s from the east, fleeing from Shaka, King of the Zulus, and later Mzilikazi, first King of the Matabele. In 1824, Chief Mzilikazi established himself on ThabaBosiu and began building a strong nation from people previously scattered in the area.

In 1833, the Barolong under the chieftaincy of Moroka II established themselves at what was later known as Thaba Nchu. Around 1821, White stock farmers crossed the Orange River in search of grazing land, after drought and locust infestations ravaged the Cape Colony. Sometime between 1820 and 1826, trek Boer farmer Johan Nicolaas Brits settled in the Transoranje area. The area was convenient as it had a small stream and a fountain provided him with a good water supply.

Johan Nicolaas Brits built a pioneer's home close to the fountain. During the Great Trek many other Voortrekkers also settled in the area. Because these Boers were from the Cape Colony, they were still considered British subjects.

Over a period of time, conflict grew between the different population groups in the Transoranje area, resulting in British intervention. Therefore, in 1846, Major Henry Douglas Warden was appointed to set up a British residency in the area. Warden was tasked with the difficult job of maintaining peace between the different population groups and to set up an administration. His immediate orders were to set up a residency as soon as possible in a centrally situated place, between the areas occupied by Adam Kok and Mosheshwe.

Warden accidentally came across the fountain area between the Riet and Modder rivers. From a military point of view, Warden found the area suitable because it was situated in a small valley surrounded by hills on all sides and was free of horse sickness. The centrality of the site would also make it easy for transport riders to bring necessary commodities to the settlement.

Warden's troops, known as the Cape Riflemen, arrived in Bloemfontein on 26 March 1846 and Warden followed shortly after. He was charmed by the position of the new residency and took over the farm 'Bloemfontein' from Brits and paid him 500 *rijksdaalders* for the layout and improvements that he made. At the time the farm consisted of a small mud house with a garden in the front and an orchard which was watered through a furrow.

One division of Warden's soldiers began building a fort to the north of the fountain which was named Fort Drury, after Sergeant Drury who served the dual function of garrison's doctor and teacher to the children of the soldiers. The second division began building the official residency at the top end of the present St George Street. While this was being done, Warden moved temporarily into the Brits' house. The third division of the regiment concentrated on building clay huts for the soldiers and stables for the horses, which was the beginning of the settlement.

However, relations between the different groups in the area were still strained, with the biggest problem being land. To put an end to this problem, Sir Henry Smith, Governor of the Cape Colony, annexed the area and renamed it the Orange River Sovereignty. This led to the Battle of Boomplaats between the British and Boers who were unhappy with the annexation, which resulted in the British increasing their garrison to 400 men to defend the Bloemfontein area. In addition, a more strategically situated fort called Queen's Fort, was built to replace Fort Drury. Fort Queen was situated at the top end of what was later known as Monument Road. At the foot of the fort were the officers' houses, barracks for the soldiers, the horses' stables and the Commissioner's depot.

Bloemfontein was officially founded in 1846 as a fort by British army major Henry Douglas Warden as a British outpost in the Transoranje region, at that stage occupied by various groups of peoples including Cape Colony Trek Boers, Griqua, and Barolong.

Warden originally chose the site largely because of its proximity to the main route to Winburg, the spacious open country, and the absence of horse sickness. Bloemfontein was the original farm of Johannes Nicolaas Brits born 21 February 1790, owner and first inhabitant of Bloemfontein.

The town was surveyed and pegged out by Andrew Hudson Bain, whose layout took the form of long streets that were parallel to the stream running in a north and south direction. The shorter streets were at right angles to the long ones and the town continued to expand northwards of the stream. Bain's plans went only as far north as St Andrews Street.

The Orange River Colony was made a British sovereignty and in 1848 Sir Harry Smith issued a proclamation establishing a form of government, with Bloemfontein as its seat. On 23 February 1854 the Bloemfontein Convention was signed, which gave the Orange River Sovereignty self-governing status, the first President being Mr. Josias Philip Hoffman. On 11 March 1854, Clark, together with staff and troops, left the Orange River Sovereignty and the area became an independent Republic. The name was changed to the Orange Free State (OFS) and Bloemfontein became the official capital.

In August 1855, JN Boshoff succeeded Hoffman as Hoffman as President of the OFS. During President Boshoff's period in office, Bloemfontein grew slowly but steadily. By 1858, the need for a municipality or town council became stronger and in April 1859 five municipal commissioners were chosen, with James Cameroon becoming the first Town Clerk, tax collector and market-master. With the establishment of a municipality, plans were now made for a regular market and in April 1859 the market began, which quickly became a profitable venture and served as an important source of income.

MW Pretorius succeeded Boshoff in 1860, chosen mainly because Free State residents hoped it would strengthen their bond with the South African Republic. JH Brand succeeded Pretorius in 1864 and was re-elected to office for five consecutive periods until his death in 1888.

The discovery of diamonds between 1867 and 1871, and the discovery of gold on the Witwatersrand in 1886 led to a general boom in trade and gave stimulus to Bloemfontein's growth. The discovery of diamonds near Hopetown in 1867, in Jagersfontein and next to the banks of the Vaal River around the Du Toit's Pan area in 1869, led to an immense number of fortune seekers rushing to the area between the Vaal and Orange Rivers. In 1871, diamonds were also discovered in Kimberly.

After the discovery of diamonds in the OFS the Griqua Chief Nicolas Waterboer claimed that the area between the Vaal and Orange Rivers rightfully belonged to the Grikwas. After some deliberation between Sir Henry Barkly and President Brand, Sir Henry Barkly issued a proclamation that the area known as Griqualand West was now declared a British territory. In March 1876, President Brand undertook a deputation to Britain to discuss compensation for Bloemfontein's loss of the diamond fields. It was decided that Britain would pay a sum of 90 000 pounds as damages to the OFS. During President Brand's long period of office, Bloemfontein became the leading town in the Republic, mainly because the diamond fields created new markets and brought in new trade.

In 1875, the Basotho monument, on the hill near the Fort, was unveiled in memory of the Burghers that lost their lives during the Basotho war of 1865-1866.

During the 1880s, trade in Bloemfontein declined due to the long drought and depression that devastated the OFS. However, trade improved drastically when gold was discovered on the Witwatersrand in 1886. In 1880, Bloemfontein received municipal status with a population of about 2567, and Robert Innes was chosen as the first Town Mayor.

Francis Willem Reitz, who was appointed in 1874 as the OFS Chief Justice, was appointed as candidate in the next election. Reitz accepted the nomination and in December 1888 he was elected as the fifth President of the Orange Free State.

From 1902–10 it served as the capital of the Orange River Colony and since that time as the provincial capital of the Free State. In 1910 it became the Judicial capital of the Union of South Africa.

On 31 May 1910, exactly eight years after the Boers signed the Peace Treaty of Vereeniging that ended the Anglo-Boer War between the British Empire and two Boer states, the South African Republic (Republic of Transvaal) and the Orange Free State, South Africa became a Union.

Due to disagreements over where the Union's capital should be, a compromise was reached that allowed Bloemfontein to host Appellate Division and become the Union's judicial capital. Bloemfontein was also given financial compensation.

On 8 January 1912, the South African Native National Congress (SANNC) was founded in Bloemfontein. The Union of South Africa had not granted rights to black South Africans, causing the organisation's creation. Its primary aim was to fight for the rights of black South Africans.

From 1 to 9 January 1914, James Barry Munnik Hertzog and his supporters met in Bloemfontein to form the National Party of the Orange Free State, and to lay down its principles, following Hertzog's exit from the South African Party in 1913. The National Party grew to govern South Africa in 1948 and implement the policy of racial segregation known as apartheid. When the South African apartheid government passed the Group Areas Act of 1950, the Bloemfontein municipality put into effect changes in the racial set-up of the city.

In 1952 the Bloemfontein municipality began building new residential areas for the city's black population. New residential areas to separate ethnic groups such as Sotho, Xhosa and Tswana were formed. The residential areas were jointly known as Mangaung. Phahameng, a Sotho township, was the first formal housing projects to be approved by the municipality in 1956. In 1968, Mangaung faced serious housing shortages when as much as 3000 to 6000 housing units were needed. To counter this problem, a 55 km east ward expansion called Botshabelo was added in 1979. The Bloemfontein municipality channelled of all black urbanisation to Thaba Nchu and Botshabelo.

In 1994, after the disestablishment of the apartheid government, Bloemfontein, Botshabelo, and Thaba Nchu became part of Motheo District Municipality. The Motheo District Municipality was disestablished on 18 May 2011 and Mangaung was upgraded to become an autonomous metropolitan municipality with Bloemfontein as the main seat.

Free State Provincial Government building Bloemfontein forms part of the Mangaung Metropolitan Municipality, which was upgraded from a Local Municipality in 2011.

Sources:

www.nasmus.co.za

www.theheritageportal.co.za

www.sahistory.org.za/article/colonial-history-bloemfontein

9.5 Archival Research

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

- Previous heritage studies in the area as per the SAHRIS database
- Historic maps and figures as available in the National Archive

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.

- Rossouw, L. 2017. Phase 1 Archaeological Impact Assessment of a new township development on Farm Rodenbeck 2972, Bloemfontein, FS Province.
- Rossouw, L. 2018. Heritage Impact Assessment for a portion of the Remaining Extent of the farm Content 1167, Magisterial District of Bloemfontein, Free State Province.
- Rossouw, L. 2017. Phase 1 Heritage Impact Assessment: Plot 4, Spitskop Smallholdings, Bloemfontein, Free State Province.
- Rossouw, L. 2013. Phase 1 Palaeontological & Archaeological Impact Assessment of portion of remainder of the farm Bloemfontein 654, Bloemfontein, Free State Province.
- Rossouw, L. 2016. Heritage Impact Assessment of Portion 1, Plot 13 Lilyvale, Bloemfontein, Free State Province.
- Dreyer, C. 2014. First Phase Archaeological & Heritage Assessment of the Proposed Bypass Water Pipeline Development at Bloemfontein.
- Du Plooy, J. 2018. Heritage Impact Assessment Suzuki Bloemfontein ERVEN 977/2; 977/3; 978/3; 980 & 3937 Bloemfontein.
- Rossouw, L. 2016. Phase 1 Archaeological Impact Assessment of the proposed new Lourierpark township development on Portion 1 of the farm Brandkop 702, Bloemfontein, FS Province.
- Rossouw, L. 2013. Phase 1 Heritage Impact Assessment of a new borrow pit on the farm Sydenham 445/RE, near Bloemfontein, FS Province.
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- Rossouw, L. 2013. Phase 1 Palaeontological & Archaeological Impact Assessment of a portion of the farm The Retreat 804, Bloemfontein, FS.
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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);

- 2926 AB 1951
- 2926 AB 2007

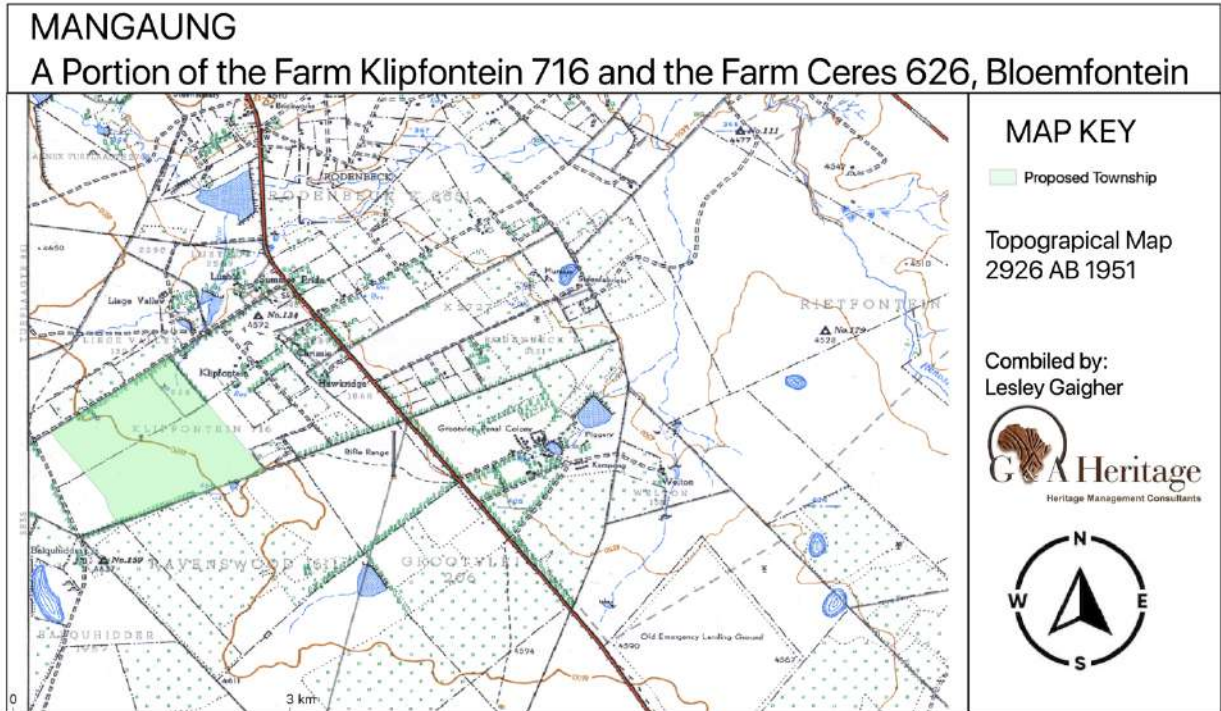


Figure 11. Topographical Map 2926 AB 1951

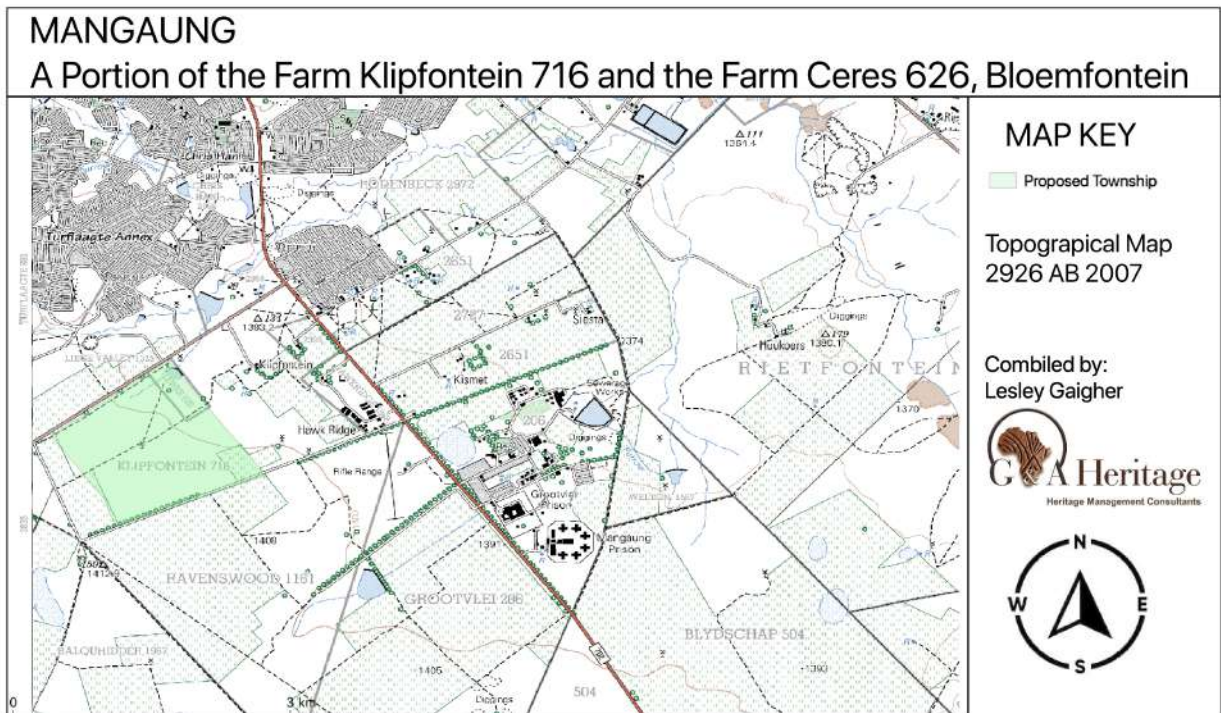


Figure 12. Topographical Map 2926 AB 2007

9.8 Natural / Cultural Landscape

The study area is characterised by open fields and grazing areas with patches of eucalyptus trees and some dumping of building materials.

10. Photos



Figure 13. Northern section of the study area near the tar road



Figure 14. Informal soccer field on the northern side of the study area



Figure 15. Illegal dumping and dangerous grazing occurring in the study area



Figure 16. Northern section of the study area, view towards the south



Figure 17. Northern section of the study area, view towards the east



Figure 18. Dam located in the study area near the northern boundary



Figure 19. Water cistern and troughs



Figure 20. Troughs close up



Figure 21. Water cistern close up



Figure 22. A feature near the water cistern



Figure 23. Modern ruins near the water cistern



Figure 24. The study area is currently being used for grazing



Figure 25. Centre of the study area, view towards the south



Figure 26. Centre of the study area, view towards the north



Figure 27. Western section of the study area, view towards the east



Figure 28. Western section of the study area, view towards the north



Figure 29. Site notice placed on the fence of the western boundary of the study area



Figure 30. Site notice



Figure 31. Site notice placed on the fence of the southern boundary of the study area



Figure 32. Site notice



Figure 33. Modern ruins along the southern boundary of the study area



Figure 34. Modern ruins along the southern boundary of the study area



Figure 35. Bricks scattered along the southern boundary of the study area



Figure 36. Investigating the possibility of this features being a grave, found to be negative



Figure 37. Modern ruins along the southern boundary of the study area



Figure 38. Modern ruins along the southern boundary of the study area



Figure 39. Modern ruins outside the boundaries on the north-eastern side of the study area



Figure 40. Sacred Ibises feeding outside the study area on the north-eastern side



Figure 41. Southern section of the study area, view towards the north

11. Potential Heritage Impacts and Proposed Mitigation

11.1 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
- Interrogation of project specific Drone data and aerial imagery
- Archival study of existing data and information for the study area
- Site inspection and fieldwork: 17 and 18 July 2019. 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.

11.2 Impact Assessment and Proposed Mitigation

The site was readily accessible, and the confidence level of the provided impact evaluation is as a result high.

Damage to Graves and Burial Sites

None

Table 19. Damage to Graves and Burial Sites

Ref:		1	
Project phase	Construction		
Impact	Damage to Unmarked Grave and Burial Sites		
Description of impact	Construction on the site could physically damage unmarked burial and grave sites.		
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts	
Potential mitigation	Chance Finds Protocol to be included in the EMPR		
Assessment	Without mitigation		With mitigation
Nature	Negative		egative
Duration	Permanent	Impact may be permanent, or in excess of 20 years	Brief Impact will not last longer than 1 year
Extent	Limited	Impacts limited to specific parts of the study area	Limited Impacts limited to specific parts of the study area
Magnitude	High	Natural and/ or social functions and/ or processes are notably altered	Low Natural and/ or social functions and/ or processes are somewhat altered
Probability	Probable	The impact has occurred here or elsewhere and could therefore occur	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
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	Minor - negative		Negligible - negative
Comment on significance	Chance finds protocol to be applied to any burial sites encountered during the construction phase.		
Cumulative impacts	Extensive agricultural activities in the area could compound this effect.		

Excavation of Palaeontological Materials

Unlikely

Table 20. Excavation of Palaeontological Materials

Ref:		3	
Project phase	Construction		
Impact	Excavation of Fossils		
Description of impact	If foundation excavations are to intrude deeper than 10m (the upper ceiling of these deposits) it could unearth fossiliferous materials.		
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts	
Potential mitigation	A chance finds protocol for fossils should be included in the ESMP.		
Assessment	Without mitigation		With mitigation
Nature	Negative		Positive
Duration	Long term	Impact will last between 10 and 15 years	Short term impact will last between 1 and 5 years
Extent	Limited	Impacts limited to specific parts of the study area	Limited Impacts limited to specific parts of the study area
Magnitude	High	Natural and/ or social functions and/ or processes are notably altered	Low Natural and/ or social functions and/ or processes are somewhat altered
Probability	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	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
Confidence	Medium	Determination is based on common sense and general knowledge	Medium Determination is based on common sense and general knowledge
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	Medium	The resource is damaged irreparably but is represented elsewhere	Medium The resource is damaged irreparably but is represented elsewhere
Significance	Minor - negative		Negligible - positive
Comment on significance	Due to the limited research on palaeontology in this area, the recovery of fossils will actually be beneficial to science if the		
Cumulative impacts	Mining activities (prospecting) in the area can result in a cumulative increased impact, but also an expansion of knowledge.		

Damage to Unidentified or Buried Archaeological Sites
Unlikely

Table 21. Damage to Unidentified or Buried Archaeological Sites

Ref:	4			
Project phase	Construction			
Impact	Unidentified/Sub-surface Archaeological Remains			
Description of impact	Archaeological deposits not identified during the fieldwork or which are buried under the predominant and shifting alluvial substrates could be uncovered during the construction activities.			
Mitigatability	High	Mitigation exists and will considerably reduce the significance of impacts		
Potential mitigation	A walkdown survey of the final alignment Charve finds protocol to be included in the EMPR			
Assessment	Without mitigation		With mitigation	
Nature	Negative		Positive	
Duration	Short term	Impact will last between 1 and 5 years	Long term	Impact will last between 10 and 15 years
Extent	Local	Impacts felt mostly throughout the study area	Regional	Impacts felt outside the study area, at a regional / provincial level
Magnitude	High	Natural and/ or social functions and/ or processes are notably altered	Moderate	Natural and/ or social functions and/ or processes are moderately altered
Probability	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	Likely	The impact may occur
Confidence	Medium	Determination is based on common sense and general knowledge	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	Medium	The resource is damaged irreparably but is represented elsewhere	Medium	The resource is damaged irreparably but is represented elsewhere
Significance	Negligible - negative		Minor - positive	
Comment on significance	Although information on archaeological sites are scant, there is a possibility of encountering Stone Age and Iron Age sites.			
Cumulative impacts	No cumulative impacts are expected.			

11.3 No-Go Alternative

The no-go option will have the least impact on the heritage components discussed in this report. It is not expected that there will be any significant change in the impact (or lack thereof) in regards to Palaeontological resources.

11.4 Conclusions and Recommendations

The study area was found to be basically devoid of any significant heritage sites. Some modern ruins were observed but for the most part these were out of context and none of the identified structures comprised an occupational or production site.

The palaeontological significance of the site is very high and it is recommended that a field based paleontological study be conducted on site.

It is not anticipated that any sites of heritage significance (with the exclusion of possible paleontological sites) will be impacted upon by the proposed development.

11.5 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.

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Appendix 1: Public Participation



NOTICE OF PHASE 1 HERITAGE IMPACT ASSESSMENT (HIA)



Notice is hereby given that an application for a Phase 1 Heritage Impact Assessment (HIA) in terms of Section 38 of the National Heritage Resources Act (Act 25 of 1999) will be lodged with the Free State Provincial Heritage resources Authority (FSPHRA).

PROJECT NAME: Proposed Township on a Portion of the Farm Klipfontein 716 and Ceres 626, Bloemfontein.

NAME OF PROPONENT: Mangaung Metropolitan Municipality

ANY ENQUIRIES SHOULD BE REFERRED TO:

G&A Heritage Properties (Pty) Ltd

Public Participation Registration and Enquiries

Lesley Gaigher

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0920

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Figure 42. Site Notice



BACKGROUND INFORMATION DOCUMENT

**Proposed New Township Development on a Portion of the Farm
Klipfontein 716 and the Farm Ceres 626 near Bloemfontein in the
Mangaung Metropolitan Municipality, Free State Province.**



38A Vorster street
Louis Trichardt, 0920

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Cell: +27 (0) 82 551 5082
Email: lesley@gaheritage.co.za
www.gaheritage.co.za

Background Information Document

Purpose of this Document

This Background Information Document (BID) provides Interested and Affected Parties (I&APs) with information on the Heritage Impact Assessment (HIA) being done by G&A Heritage Properties (Pty) LTD for the Heritage Impact Assessment for the proposed new township development located on a portion of the farm Klipfontein 716 and the farm Ceres 626 near Bloemfontein in the Mangaung Metropolitan Municipality in the Free State Province.

This BID provides I&APs with the opportunity to register as stakeholders in this process; and comment on the proposed projects. The purpose of a HIA is to identify and evaluate potential impacts, to recommend measures to avoid or reduce negative impacts and to enhance positive impacts. The decision-making authority for this HIA is the South African Heritage Resources Agency (SAHRA) and the Free State Provincial Heritage Resource Authority (FSPHRA).

You will be included in the stakeholder database and receive further documents for review and comment/s. Your comments will ensure that all issues of concern are addressed. To raise your concerns, complete the enclosed registration sheet, write a letter, call or email the public participation office.

Contact Information

G&A Heritage Properties (Pty) LTD

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HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED NEW TOWNSHIP DEVELOPMENT IN THE MANGAUNG METROPOLITAN MUNICIPALITY



THE DEADLINE FOR RECEIPT OF COMMENTS AND REGISTRATION AS AN IAP IS 2019/08/19.

Participation should be free, and you may submit any comments or information you feel may be useful to the HIA. Registered interested and affected parties are entitled to comment, in writing, on all written submissions to the competent authority (SAHRA & FSPHRA) as well as any issues which the party believes may be of significance to the consideration of the application.

Please find attached to this BID a comment sheet to complete, should you wish to comment on the above.

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Heritage Impact Assessment (HIA)

A Heritage Impact Assessment is a study to determine the impact of a proposed development on the cultural heritage value of a property and to recommend an overall approach to the conservation of the heritage resources. This information is then used by the competent authorities to compile a Record of Decision (RoD) regarding the impact of the development on the area's cultural heritage. At the very least the HIA should;

- ✚ Identify the potential impacts of the proposed development;
- ✚ Record the issues, concerns and suggestions raised by I&APs; and
- ✚ Outline mitigation measures to be taken to avoid or reduce negative impacts and enhance positive impacts.

HIA Stakeholder Engagement Phase

As an important part of the HIA for the proposed project, G&A Heritage Properties (Pty) Ltd. will also conduct the stakeholder engagement and public participation component. This will enable stakeholders to influence the course of the investigations and to review the findings of the independent study that is to be undertaken. The steps of the public participation component are outlined below.

The following steps will be taken in this regard:

- ✚ Advertising - public notices in regional and local newspapers;
- ✚ Placement of these site notices around the sites being investigated;
- ✚ Supplying adjacent landowners with this Background Information Document (BID);
- ✚ Contacting stakeholders and notifying them of the process;
- ✚ Documenting stakeholder correspondence within the Draft HIA that will be made available for public review; and
- ✚ Notifying stakeholders when the Record of Decision (RoD) is issued by SAHRA & FSPHRA as well as the appeals process open to them.

HIA Reports

- ✓ The Draft Heritage Impact Assessment Report (DHIAR) will be made available for a period of four weeks. Registered IAP's will then have the opportunity to comment on the findings of the report.
- ✓ The Final Heritage Impact Assessment Report (FHIAR) will be compiled to incorporate and address any comments received during the stakeholder engagement phase.

Final Notification by Authorities

Once the relevant authorities SAHRA & FSPHRA, has issued the RoD, I&APs will be notified of the decision and what procedure to follow should they wish to appeal the RoD. There will be a 14-day appeal period available for this.

HIA QUESTIONNAIRE

PROPOSED NEW TOWNSHIP DEVELOPMENT IN THE MANGAUNG METROPOLITAN MUNICIPALITY

Your comments on this questionnaire will contribute towards ensuring that the process which is applied to direct the Heritage Impact Assessment (HIA) is sound and will permit an informed project decision to be taken.

Correspondent to complete the following:

Title & Name:

Address:

Phone/email:

By completing this questionnaire you indicate that the information provided was done so at your own will and not under duress.

THE DEADLINE FOR THE RECEIPT OF COMMENTS IS 19th OF AUGUST 2019.

1. Are there any concerns that you feel the heritage team should be aware about in terms of heritage preservation of significance within the study area?

2. Would you like to nominate further IAP's that you feel should be involved in this process? (Please provide adequate contact details in order for us to contact I&AP).

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3. Do you feel that the HIA performed upholds the requirements of the NHRA no 25 of 1999 and the minimum standards as set out by SAHRA for HIA reports?

Yes

No *(if no, please give a short explanation below)*

Thank you for taking the time to complete this questionnaire. Your views and opinions are important to us and ensures the protection of our cultural heritage. Please feel free to attach further pages to this questionnaire if needed.

YOUR COMMENTS SHOULD BE SENT TO:

G&A HERITAGE PROPERTIES (PTY) LTD

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Figure 43. BID