

# Phase 1 Heritage Impact Assessment Report

---

HERITAGE IMPACT ASSESSMENT FOR THE  
PROPOSED CROSSWISE ESTATE EXTENSION 1 – 10

PREPARED BY:  
G&A HERITAGE

PREPARED FOR:



# CREDIT SHEET

## Project Director

STEPHAN GAIGHER (BA Hons, Archaeology, UP)

Principal Investigator for G&A Heritage

Member of ASAPA (Site Director Status)

SAHRA Accredited Heritage Practitioner

Tel.: (015) 516 1561

Cell.: 073 752 6583

E-mail: [stephan@gaheritage.co.za](mailto:stephan@gaheritage.co.za)

Website: [www.gaheritage.co.za](http://www.gaheritage.co.za)

## Report Author

STEPHAN GAIGHER

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

SIGNED OFF BY: STEPHAN GAIGHER



# MANAGEMENT SUMMARY

**Site name and location:** Crosswise Estate Extension 1 – 10.

**Municipal Area:** Tswane District Municipality

**Developer:** Gillyfrost 71 (Pty) Ltd.

**Consultant:** G&A Heritage, PO Box 522, Louis Trichardt, 0920, South Africa. 38A Voster Str. Louis Trichardt, 0920

**Date of Report:** 16 April 2012

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 development of the Crosswise Estate Extensions 1 - 10. The proposed development will be situated on Portions 20, 317 and 318 as well as the remainders of Portion 15 and 113 of the farm Doornkloof 391 JR. This area is located in the present area of Irene, near the city of Pretoria. The total size of the proposed development is 397.5 ha. It will be a mixed use zoning with residential, commercial, industrial & retirement village.

A preliminary layout has been drawn to lead the study; however this could be altered to some extent to avoid any identified heritage sites.

A literature study did not indicate the existence of any paleontological deposits in the specific area however it is being proposed that, should bedrock be affected; that a paleontological study should be initiated.

The purpose of this heritage impact assessment is to outline the cultural heritage sensitivity of the proposed development area and to advise on mitigation should any heritage sites or landscapes be affected.

## Findings

Although a scattering of informal structures were identified throughout the study area, no sites of heritage significance could be identified.

The area adjacent to the development site does however have a strong historic association with the late Jan Smuts and the Jan Smuts Museum is located only 500m south of the boundary of the proposed development. The Irene Concentration Camp was also located close to the site. This lends a strong historic character to this landscape.

## Recommendations

It is recommended that the development take into account the historic character of this area as well as its association with Jan Smuts – one of our most prominent statesmen ever – and the South African War through the Irene Concentration Camp and that this character is reflected and preserved in its design and layout. It is further recommended that a visual impact assessment be performed to gauge the possible visual impacts that the development might have on the museum and the cultural landscape.

16/04/2012

**Fatal Flaws**

No fatal flaws were identified.

# TABLE OF CONTENTS

Introduction .....	8
Background Information .....	10
Proposed Crosswise Estate Project .....	10
Project Description.....	10
Site Location .....	11
Alternatives Considered.....	11
Methodology .....	11
Evaluating Heritage Impacts.....	11
Assessing Visual Impact.....	12
Regional Cultural Context .....	13
Paleontology .....	13
Stone Age.....	13
Iron Age .....	13
The Historic Era .....	14
Cultural Landscape.....	14
Assessment of Impacts .....	19
Impact Statement.....	19
Paleontological sites .....	19
Archeological Sites .....	19
Built Environment.....	19
Cultural Landscape.....	20
Resource Management Recommendations .....	21
Conclusion.....	22
References Cited.....	23
Methodology .....	26
Inventory .....	26

16/04/2012

Site Surveying.....	26
Survey Sampling.....	26
Systematic Survey Sampling.....	27
Judgemental Survey Sampling.....	27
Assessment.....	27
Site Evaluation.....	27
Significance Criteria.....	27
Assessing Impacts.....	28

# LIST OF ABBREVIATIONS

Bp .....	Before Present
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
MYA.....	Million Years Ago
MSA.....	Middle Stone Age
NHRA .....	National Heritage Resources Act no 22 of 1999
SAHRA .....	South African Heritage Resource Agency
S&EIR.....	Scoping & Environmental Impact Reporting
Um.....	Micrometre ( $10^{-6}$ m)
WGS 84.....	World Geodetic System for 1984

## HERITAGE IMPACT REPORT

### HERITAGE IMPACT ASSESSMENT REPORT FOR THE PROPOSED CROSSWISE ESTATE EXTENSIONS 1 – 10 PROJECT.

## INTRODUCTION

### Legislation and methodology

G&A Heritage was appointed by *Bokomosa Environmental Consultants and Landscape Architects cc*, to undertake a heritage impact assessment for the proposed Crosswise Estate Extension 1 - 10. Section 27(1) of the South African Heritage Resources Act (25 of 1999) requires that a heritage impact assessment 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 m<sup>2</sup> 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.

A heritage impact assessment is not limited to archaeological artefacts, historical buildings and graves. It is far more encompassing and includes intangible and invisible resources such as places, oral traditions and rituals. A heritage resource is defined as any place or object of cultural significance i.e. of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This includes the following:

- (a) places, buildings, structures and equipment;
- (b) places to which oral traditions are attached or which are associated with living heritage;
- (c) historical settlements and townscapes;
- (d) landscapes and natural features;
- (e) geological sites of scientific or cultural importance;
- (f) archaeological and paleontological sites;
- (g) graves and burial grounds, including –
  - (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;

- Limited 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 Bokomosa is accurate.
- We assumed that the public participation process performed as part of the Scoping and Environmental Impact Reporting (S&EIR) 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	None	None
	35	Archaeological, paleontological and meteor sites	No impact	None
	36	Graves and burial sites	None	None
	37	Protection of public monuments	None	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.	Yes	Access roads to new area as well as upgrading of existing roads
Construction of a bridge or similar structure exceeding 50m in length.	No	N/A
Development exceeding 5000 m <sup>2</sup>	Yes	Crosswise Estate Extension 1-10
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 <sup>2</sup>	No	N/A
Any other development category, public open space, squares, parks or recreational grounds	No	N/A

## BACKGROUND INFORMATION

### PROPOSED CROSSWISE ESTATE PROJECT

#### PROJECT DESCRIPTION

This project proposes the development of Extension 1 – 10 of the Crosswise Estate. This will be developed in four sections.



## SITE LOCATION

The study area is located on Portion 20, 317 & 318 as well as the remainder of Portion 15 and Portion 113 of the farm Doornkloof 391 JR. One of the portions is located to the east of the R21 road while the rest is located to the west of the R21 between the R21 and the M18 highways. The total size of the development is 397.5 ha. The site is roughly halfway between Pretoria and Kempton Park.

## ALTERNATIVES CONSIDERED

- No alternatives were considered.

## METHODOLOGY

This study defines the heritage component of the S&EIR process being undertaken for the Crosswise Estate Extension 1 - 10. It is described as a first phase (HIA). This report attempts to evaluate both the accumulated heritage knowledge of the area as well as information derived from direct physical observations.

## 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.

The proposed study area is divided into four sections. The first section is a narrow band on the eastern side of the R21 highway. Thereafter the other four sections are all between the R21 and the M18 highways.



Sites were documented by digital photography and geo-located with GPS readings using the WGS 84 datum.

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 provincial databases.

Geological maps guided investigations into the paleontological riches of the area.

### 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.



It is possible that a large development such as this could have a negative impact on the historic identity of the Irene area. It is therefore recommended that a cultural specific visual impact assessment be performed before the development continues.

## HERITAGE INDICATORS WITHIN THE RECEIVING ENVIRONMENT

### REGIONAL CULTURAL CONTEXT

#### PALEONTOLOGY

The paleontology of Eastern Gauteng is less well researched than that of the Western Gauteng areas. The discovery of the Sterkfontein skeletons put this area in the forefront of paleontology worldwide. The rule of “absence of evidence is not evidence of absence” should however be applied to this area. Taken the rich paleontology of Western Gauteng it is conceivable that similar finds could be made in the east of Gauteng

#### STONE AGE

No substantial number of Stone Age sites from any period of the Stone Age is known to exist in this area – primarily as a result of a lack of research and general ignorance amongst the layman in recognizing stone tools that often may occur on the surface of the earth. However, it is possible that the first humans in the Irene area may have been preceded by *Homo erectus*, who roamed large parts of the world during the Acheulian period of the Early Stone Age, 500 000 years ago. The forbear of *H. erectus*, *Australopithecus*, considered to be the earliest ancestor of humans, lived in the Blaauwbank Valley around Krugersdorp (today part of the Cradle of Humankind – a World Heritage Site) several million years ago.

During the Middle Stone Age, 200 000 years ago, modern man or *Homo sapiens* emerged, manufacturing a wider range of tools, with technologies more advanced than those from earlier periods. This enabled skilled hunter-gatherer bands to adapt to different environments. From this time onwards, rock shelters and caves were used for occupation and reoccupation over very long periods of time. Two Middle Stone Age sites at the Witboek Spruit (Brakpan) were researched 17 years ago, but no information on this discovery has been published.

The Late Stone Age, considered to have started some 20 000 years ago, is associated with the predecessors of the San and Khoi Khoi. San hunter-gatherer bands with their small (microlithic) stone tools may have lived in Eastern Gauteng, as a magnificent engraving site near Duncanville attests to their presence in Vereeniging, south of, but close to Ekurhuleni. Stone Age hunter-gatherers lived well into the 19th century in some places in SA, but may not have been present in the Tswane area when the first European colonists crossed the Vaal River during the early part of the 19th century. Stone Age sites may occur all over the area where an unknown number may have been obliterated by mining activities, urbanization, industrialization, agriculture and other development activities during the past decades.

#### IRON AGE

A considerable number of Late Iron Age, stone walled sites, dating from the 18th and the 19<sup>th</sup> centuries (some of which may have been occupied as early as the 16th century), occur along and on top of the rocky ridges of the eastern part of the Klipriviersberg towards Alberton. These settlements and features in these sites, such as huts, were built with dry stone, reed and clay available from the mountain and the Klip River (Mason 1968, 1986).

The Late Iron Age sites within Ekurhuleni’s south-western border are a ‘spill-over’ from a larger concentration which are located further towards the west, in the Witwatersrand, while large concentrations of stone walled sites are also located directly to the south of Ekurhuleni, in the mountainous area around the Suikerbosrand in Heidelberg. The stone walled settlements are concentrated in clusters of sites and sometimes are dispersed over large areas making them vulnerable to developments of various kinds. A site consists of a circular or elliptical outer wall that is composed of a number of scalloped walls facing inwards towards one or more enclosures. Whilst the outer scalloped walls served as dwelling quarters for various family groups, cattle, sheep and goat were stock in the

centrally located enclosures. Huts with clay walls and floors were built inside the dwelling units. Pottery and metal items are common on the sites. However, iron and copper were not produced locally on these sites.

### THE HISTORIC ERA

In 1841 the Erasmus family arrived and settled in the area that would later become Centurion. Daniel Jacobus Erasmus settled on the farm Zwartkop, Daniel Elardus Erasmus on the farm Doornkloof and Rasmus Elardus Erasmus developed the farm Brakfontein. Several of the suburbs like Erasmia, Elardus Park, Zwartkop and Doornkloof were named after the original owners of the land and their properties.

In 1849 Rev Andrew Murray visited the farm Doornkloof and christened 129 babies, heard the confession of their faith of 29 new members of the Reformed Church and the next day, 29 December 1849, celebrated Holy Communion.

In the battle for Rooihuiskraal took place in 1881 at the place where the existing historical terrain is situated. A commando under the leadership of DJ Erasmus Jnr. defeated Col Gildea, the Officer Commanding of the Pretoria Garrison.

Eight years later Alois Hugo Nelmapius bought the northern and north-eastern portions of the farm Doornkloof and named it after his daughter Irene, who died 1961.

During the Anglo-South African War the Irene Concentration Camp was established in 1901 on the farm Doornkloof, north of the Hennops River. The Irene Primary School was also established in the camp. The town of Irene was established in 1902 when Van der Bijl laid out 337 erven on the farm. Dr E G Jansen, later Governor General of South Africa, bought the house in which he lived. The farm also has a close relationship with a former Prime Minister of South Africa, Gen. J C Smuts.

Centurion developed from the initial Lyttelton Township that was marked out on the farm Droogegrond in 1904. Lyttelton Manor Extension 1 was established in 1942. These two townships initially resorted under the Peri Urban Board in Pretoria. They acquired a Health Committee consisting of six members in 1950 and in 1955 a town committee was elected. City Council status was awarded to the town in 1962 and this council had control over an area of 777 ha.

After the inclusion of a number of townships and farming areas, the area over which the city council exerted legal control grew to 6 220 ha and in 1973 this area was enlarged to 20 000 ha.

Lyttelton was renamed after the former Prime Minister, Hendrik Verwoerd to become the City of Verwoerdburg in 1967. After the elections of 1994 the Verwoerdburg City Council and the Rantesig local area committee were disbanded and a new local authority consisting of Verwoerdburg, Rantesig, Erasmia, Laudium, Christoburgh and Claudius came into being. The name Centurion was accepted in 1995 by the City Council.

### CULTURAL LANDSCAPE

The Doornkloof farms and associated townships have a strong historic character which is reflected in the buildings and other infrastructure of the area.

#### The Smuts House Museum

Home to General Jan Smuts for over 40 years, Doornkloof in Irene, southeast of Pretoria, is a unique museum that reveals much about the life and the spirit of this great statesman. Soldier, scholar, statesman and philosopher, General Jan Christiaan Smuts was one of South Africa's most remarkable leaders, an enigmatic and multifaceted person who was never fully understood by his countrymen. But despite his fame and many talents, Smuts was at heart a simple man who yearned for peace and simplicity.

It was at Doornkloof, a modest wood-and-iron farmhouse in the veld outside the village of Irene, that he found the tranquility he craved; a place where, surrounded by his many children and grandchildren, he could indulge his passionate interest in botany.



Doornkloof, now called Smuts House Museum, has been preserved for future generations as a living memorial to the man known to everyone as 'Oubaas', housing many relics and mementos that offer fascinating insights into his extraordinary career.



This picturesque village of Irene, with its deep green meadows and hay-scented air, slumbers in its own little time capsule, a peaceful haven that seems oddly out of place on the industrialized Highveld. The road out of the village to Doornkloof winds through deep-shaded avenues of plane trees, poplars and old oaks; after about 2 km, you come to the gates of Doornkloof, where you will catch a glimpse of the old house through the trees.

### The Irene Concentration Camp

The Irene Concentration Camp was opened on 2 November 1900; the intention being that it would be one of the camps that would house the Boer women and their children; that had been driven from their land by the British "scorched earth" policy during the Anglo Boer War of 1899-1902. Tragically the conditions in this camp, and most like it, were primitive and very little notice was taken by the authorities of the deaths that were caused by their lack of interest in the unfortunate inmates of the camps. The situation in Irene was also compounded by two uncaring and officious camp commandants who ironically were Afrikaners themselves.

It took women like Emily Hobhouse to raise public awareness about the situation in the camps, to a point where a commission of 6 women under Mrs. Millicent Fawcett was established, who went and inspected and made recommendations about improving the camps and the lot of those inside of them. Many other people took it upon themselves to assist where possible and often the dedication of medical staff and volunteers was all help there was. Of particular note are Henrietta Armstrong who kept an unofficial diary about the camp, as well as Hansie Van Warmelo and Hester Cilliers.

By the time public opinion had swelled enough to force action it was too late for the thousands of women and children who lost their lives. Approximately 4000 women and 23000 children died in these camps as a result of exposure, disease, starvation and a lack of medical care. There is no accurate figure available



as to how many Africans died in the camps, where they were housed, or even who they were or where they came from.

This particular garden of remembrance site is on the site of the camp cemetery. The generally accepted number of dead is 1149, but it is possible that many more are buried here. The cemetery is a national heritage site, under the protection of the SA Heritage Resource Agency.



## MEASURING AND EVALUATING THE CULTURAL SENSITIVITY OF THE STUDY AREA

In 2003 the SAHRA compiled the following guidelines to evaluate the cultural significance of individual heritage resources:

### TYPE OF RESOURCE

- Place
- Archaeological Site
- Structure
- Grave
- Paleontological Feature
- Geological Feature

### TYPE OF SIGNIFICANCE

#### 1. HISTORIC VALUE

It is 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.

#### 2. 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.

#### 3. 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.

**4. SOCIAL VALUE**

- 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.

**DEGREES OF SIGNIFICANCE**

**1. RARITY**

It possesses uncommon, rare or endangered aspects of natural or cultural heritage.

- Importance for rare, endangered or uncommon structures, landscapes or phenomena.

**2. 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

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

What other similar sites may be compared to this site?

## ASSESSMENT OF IMPACTS

### IMPACT STATEMENT

#### PALEONTOLOGICAL SITES

No paleontological sites of high value could be identified. Paleontological sites could be affected if bedrock was to be disturbed during excavation activities.

#### Mitigation

Paleontological monitoring during excavation activities where bedrock is to be disturbed.

#### ARCHEOLOGICAL SITES

No sites of archaeological value were identified during the study.

#### Mitigation

It is recommended that possible unmarked or unidentified sites be taken into consideration during the construction activities and that the recommendations at the end of this section be applied to such sites. The public participation process should also investigate the possibility of unmarked graves in the area.

#### BUILT ENVIRONMENT

Some modern structures associated with farming were identified on the site these include;

- Brick sheds with corrugated roof (modern)
- Barb-wire fences (modern)
- Dirt roads (modern)
- Footpaths

The remains of a bridge approach were identified on the Rietvlei River near the third section. The build structure seems to be of modern origin. The bridge structure falls just outside of the study area; however it was felt prudent to mention it in this report due to the historic nature of this area.



## Mitigation

None of the structures with the exception of the roads and fences will be affected by the development activities.

## CULTURAL LANDSCAPE

The following landscape types were identified during the study.

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

	<ul style="list-style-type: none"> <li>- Historical graves (marked or unmarked, known or unknown)</li> <li>- Graves of victims of conflict</li> <li>- Human remains (older than 100 years)</li> <li>- Associated burial goods (older than 100 years)</li> <li>- Burial architecture (older than 60 years)</li> </ul>		
9 Associated Landscapes	<ul style="list-style-type: none"> <li>- Sites associated with living heritage e.g. initiation sites, harvesting of natural resources for traditional medicinal purposes</li> <li>- Sites associated with displacement &amp; contestation</li> <li>- Sites of political conflict/struggle</li> <li>- Sites associated with an historic event/person</li> <li>- Sites associated with public memory</li> </ul>	No	No
10 Historical Farmyard	<ul style="list-style-type: none"> <li>- Setting of the yard and its context</li> <li>- Composition of structures</li> <li>- Historical/architectural value of individual structures</li> <li>- Tree alignments</li> <li>- Views to and from</li> <li>- Axial relationships</li> <li>- System of enclosure, e.g. defining walls</li> <li>- Systems of water reticulation and irrigation, e.g. furrows</li> <li>- Sites associated with slavery and farm labour</li> <li>- Colonial period archaeology</li> </ul>	No	No
11 Historic institutions	<ul style="list-style-type: none"> <li>- Historical prisons</li> <li>- Hospital sites</li> <li>- Historical school/reformatory sites</li> <li>- Military bases</li> </ul>	Yes	The Irene Concentration Camp.
12 Scenic visual	<ul style="list-style-type: none"> <li>- Scenic routes</li> </ul>	Yes	The Irene farm landscape.
13 Amenity landscape	<ul style="list-style-type: none"> <li>- View sheds</li> <li>- View points</li> <li>- Views to and from</li> <li>- Gateway conditions</li> <li>- Distinctive representative landscape conditions</li> <li>- Scenic corridors</li> </ul>	No	No

## Mitigation

It is recommended that the development designs take into account the positive and negative characteristics of the existing cultural landscape types and that they endeavor to promote the positive aspects while at the same time mitigating the negative aspects. The historic nature of the area should be taken into account. It is recommended that a visual impact assessment should be performed to determine the impact of this development on the cultural landscape. It is also further recommended that a copy of this report be made available to the Centurion Heritage Society for comments.

## RESOURCE MANAGEMENT RECOMMENDATIONS

Although unlikely, sub-surface remains of heritage sites could still be encountered during the construction activities associated with 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 plant 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.
- In the event of obvious human remains the South African Police Services (SAPS) should be notified.
- 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 sufficient time to analyze the finds.

## CONCLUSION

The area investigated is strongly associated with the recent history of South Africa and specifically with the South African War as well as the life of South African Prime Minister Jan Smuts. Large scale developments could significantly detract from the heritage significance of this area. No sites of heritage significance could be identified in the study areas, however due to its close proximity to important sites such as the Irene Concentration Camp and the Smuts House Museum it is further recommended that a cultural specific visual impact assessment be performed. It is also recommended that should bedrock be affected during trenching activities that a palaeontologist be appointed to monitor the construction activities.

## REFERENCES CITED

- Arts and Culture Task Group, (1995), Draft report for the Ministry of Arts, Culture, Science and Technology. Pretoria: ACTAG.
- Bewsher, P K, & De Jong, R C, (1997), Ecotourism and cultural resource management. Document prepared for the SA Wildlife College. Pretoria: Centre for Ecotourism.
- Canadian Parks Service, (1989). Proposed policy.
- Cultural Institutions Act, No 119 of 1998.
- De Jong, R.C., (1992). Draft policy guidelines for cultural resource management in nature conservation and forestry areas in South Africa. Pretoria: National Cultural History Museum (unpublished)
- De Jong, R.C., (2011). Heritage Impact Assessment Revision 2 in Connection with Amendments to the Middelburg Water Reclamation Project, Steve Tswete Local Municipality, Mpumalanga. Unpublished HIA report.
- Department of Arts, Culture, Science and Technology, (1996). White Paper on Arts, Culture and Heritage. Pretoria: SA Communication Service.
- DEAT, (1996). White Paper on the Development and Promotion of Tourism in South Africa. Pretoria: The Department.
- DEAT, (1998). A national strategy for Integrated Environmental Management in South Africa. Discussion document. Pretoria: The Department.
- DEAT, (1998). White Paper on environmental management policy for South Africa. Government Gazette, Vol 395, No 18894, 15 May 1998.
- Department of Public Works, (1998), White Paper 1997. Public Works towards the 21<sup>st</sup> century. Government Gazette, Vol 391, No 18616, 14 January 1998.
- Entries on towns in the *Standard Encyclopedia of Southern Africa*, published by Nasou, 1970-1976 (11 volumes).
- Eskom Heritage website
- Files in Gauteng Office of SAHRA, Northwards, Parktown, Johannesburg
- Galla, A, (1996), Shifting the paradigm. A plan to diversify heritage practice in South Africa. Cape Town: South African Museums Association.
- Gauteng Department of Economic Affairs and Finance, (1997). Gauteng Tourism White Paper. Johannesburg: The Department.
- Hall, C.M, & McArthur, S. (eds), (1996). Heritage management in Australia and New Zealand. Draft publication.
- Harrison, R, (1994). Manual of heritage management. Oxford: Butterworth Heinemann.
- Jote, K, (1994). International legal protection of cultural heritage. Stockholm: Juristförlaget.
- Mason, R. (1986). Origins of Black People of Johannesburg and the Southern Western Central Transvaal AD350-1880. Occasional Paper No. 16 of the Archaeological Research Unit.
- Musa, (1994). Museums for South Africa: Intersectoral investigation for national policy. Pretoria: MUSA Secretariat.
- National Heritage Council Act, No 11 of 1999.
- National Heritage Resources Act, No 25 of 1999.

16/04/2012

- National Research Foundation, Nexus database of current and completed research projects
- Republic of South Africa, (1996). Constitution of the Republic of South Africa, Act 108 of 1996. Government Gazette, Vol 378, No 17678, 18 December 1996.
- Ross, M. (1996). Planning and the heritage. Policy and procedures. Second edition. London: E & FN Spon.
- SAHRA website <http://www.sahra.org.za>
- UNESCO, (1983). Conventions and recommendations concerning the protection of the cultural heritage. Paris: UNESCO.
- US National Parks Service, (1988). Management Policies.



# APPENDIX A

## GENERAL METHODOLOGY

## METHODOLOGY

### 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*).

### SITE SURVEYING

Site surveying is the process by which archaeological sites are located and identified on the ground. Archaeological site surveys often involve both surface inspection and subsurface testing. For the purposes of heritage investigations, *archaeological sites* refer to any site with heritage potential (i.e. historic sites, cultural sites, rock art sites etc.).

A systematic surface inspection involves a foot traverse along pre-defined linear transects which are spaced at systematic intervals across the survey area. This approach is designed to achieve representative area coverage. Alternatively, an archaeological site survey may involve a non-systematic or random walk across the survey area. Subsurface testing is an integral part of archaeological site survey. The purpose of subsurface testing, commonly called "shovel testing", is to:

- (a) assist in the location of archaeological sites which are buried or obscured from the surveyor's view, and
- (b) help determine the horizontal and vertical dimensions and internal structure of a site.

In this respect, subsurface testing should not be confused with evaluative testing, which is a considerably more intensive method of assessing site significance (*King, Thomas F., 1978*).

Once a site is located, subsurface testing is conducted to record horizontal extent, depth of the cultural matrix, and degree of internal stratification. Because subsurface testing, like any form of site excavation, is destructive it should be conducted only when necessary and in moderation.

Subsurface testing is usually accomplished by shovel, although augers and core samplers are also used where conditions are suitable. Shovel test units averaging 40 square cm are generally appropriate, and are excavated to a sterile stratum (i.e. C Horizon, alluvial till, etc.).

Depending on the site survey strategy, subsurface testing is conducted systematically or randomly across the survey area. Other considerations such as test unit location, frequency, depth and interval spacing will also depend on the survey design as well as various biophysical factors. (*Lightfoot, Keng G. 1989*).

### SURVEY SAMPLING

Site survey involves the complete or partial inspection of a proposed project area for the purpose of locating archaeological or other heritage sites. Since there are many possible approaches to field survey, it is important to consider the biophysical conditions and archaeological site potential of the survey area in designing the survey strategy.

Ideally, the archaeological site inventory should be based on intensive survey of every portion of the impact area, as maximum area coverage will provide the most comprehensive understanding of archaeological and other heritage resource density and distribution. However, in many cases the size of the project area may render a complete survey impractical because of time and cost considerations.

In some situations it may be practical to intensively survey only a sample of the entire project area. Sample selection is approached systematically, based on accepted statistical sampling procedures, or judgementally, relying primarily on subjective criteria (*Butler, W., 1984*).

### SYSTEMATIC SURVEY SAMPLING

A systematic sample survey is designed to locate a representative sample of archaeological or heritage resources within the project area. A statistically valid sample will allow predictions to be made regarding total resource density, distribution and variability. In systematic sample surveys it may be necessary to exempt certain areas from intensive inspection owing to excessive slope, water bodies, landslides, land ownership, land use or other factors. These areas must be explicitly defined. Areas characterized by an absence of road access or dense vegetation should not be exempted. (*Dunnell, R.C., Dancey W.S. 1983*).

### JUDGEMENTAL SURVEY SAMPLING

Under certain circumstances, it is appropriate to survey a sample of the project area based entirely on professional judgement regarding the location of sites. Only those areas which can reasonably be expected to contain archaeological or heritage sites are surveyed.

However, a sufficient understanding of the cultural and biophysical factors which influenced or accounted for the distribution of these sites over the landscape is essential. Careful consideration must be given to ethnographic patterns of settlement, land use and resource exploitation; the kinds and distribution of aboriginal food sources; and restrictions on site location imposed by physical terrain, climatic regimes, soil chemistry or other factors. A judgemental sample survey is not desirable if statistically valid estimates of total heritage resource density and variability are required (*McManamon F.P. 1984*).

### ASSESSMENT

Assessment studies are only required where conflicts have been identified between heritage resources and a proposed development. These studies require an evaluation of the heritage resource to be impacted, as well as an assessment of project impacts. The purpose of the assessment is to provide recommendations as to the most appropriate manner in which the resource may be managed in light of the identified impacts. Management options may include alteration of proposed development plans to avoid resource impact, mitigative studies directed at retrieving resource values prior to impact, or compensation for the unavoidable loss of resource values.

It is especially important to utilize specialists at this stage of assessment. The evaluation of any archaeological resource should be performed by professionally qualified individuals.

### SITE EVALUATION

Techniques utilized in evaluating the significance of a heritage site include systematic surface collecting and evaluative testing. Systematic surface collection is employed wherever archaeological remains are evident on the ground surface. However, where these sites contain buried deposits, some degree of evaluative testing is also required.

Systematic surface collection from archaeological sites should be limited, insofar as possible, to a representative sample of materials. Unless a site is exceptionally small and limited to the surface, no attempt should be made at this stage to collect all or even a major portion of the materials. Intensive surface collecting should be reserved for full scale data recovery if mitigative studies are required.

Site significance is determined following an analysis of the surface collected and/or excavated materials (*Miller, C.L. II, 1989*).

### 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 in Appendix B and Appendix C. 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*).

### ASSESSING 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 in Appendix D:

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

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*).

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. This technique has proven to result in the maximum coverage of an area. This action is defined as;

*'an archaeologist being present in the course of the carrying-out of the development works (which may include conservation works), so as to identify and protect archaeological deposits, features or objects which may be uncovered or otherwise affected by the works'* (DAHGI 1999a, 28).

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).

## Scientific Significance

(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 paleoenvironmental 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?

## **Public Significance**

(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**

(a) 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**

(a) 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?

## **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.

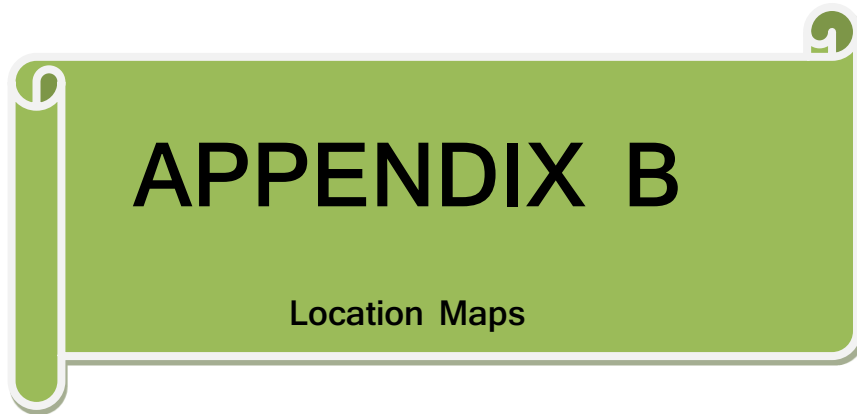
**Cumulative Effect**

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.

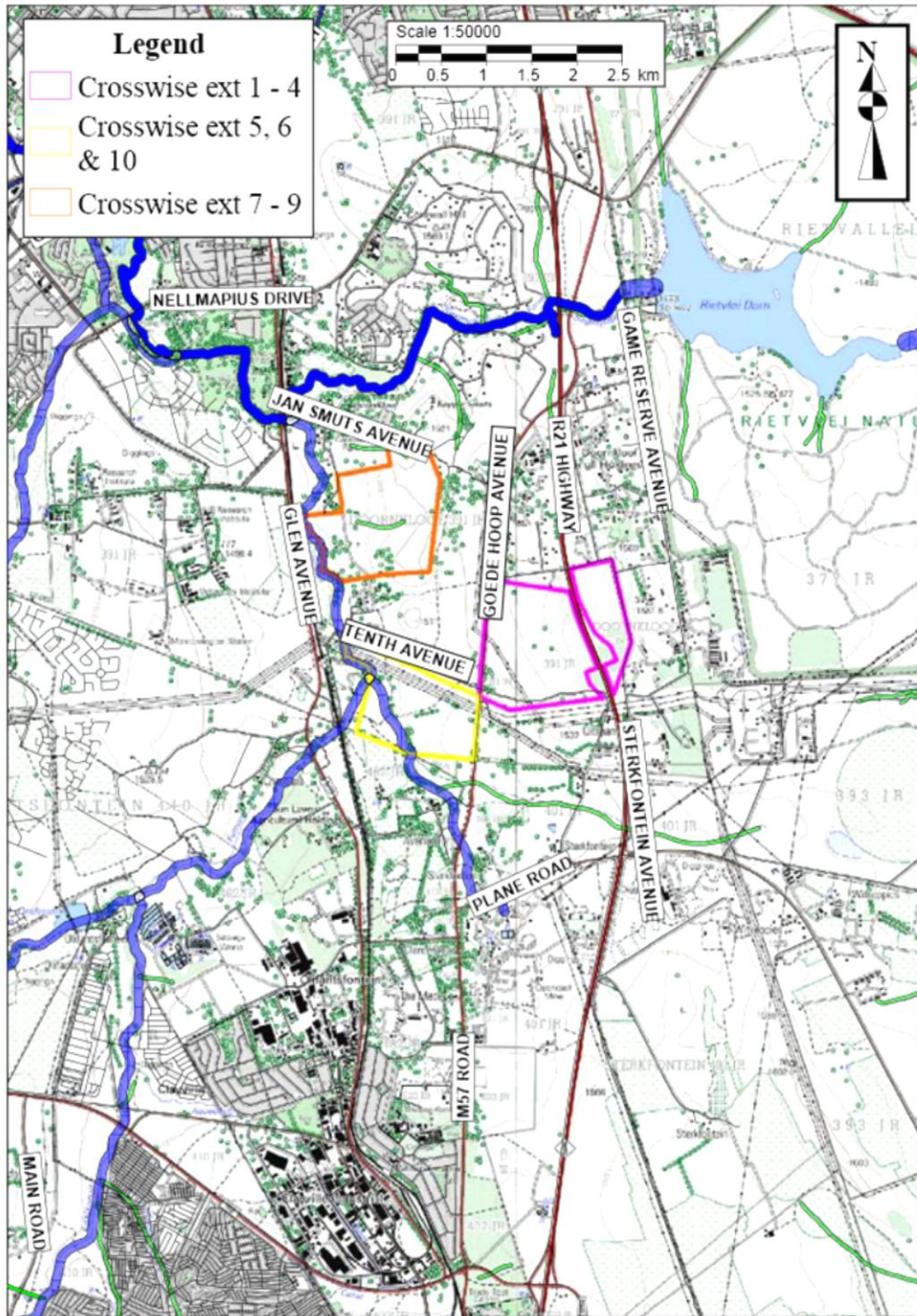




# APPENDIX B

Location Maps

# Location Map for the Crosswise Estate HIA



Aerial View of the Proposed Crosswise Estate

