Phase 1 Heritage Impact Assessment Report

HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED REPAIRS AND UPGRADES OF THE ALBERTS FARM DAM WALL, SITUATED IN GREYMONT, JOHANNESBURG NORTH, CITY OF JOHANNESBURG METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE.

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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.*

Statement of Independence

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

SIGNED OFF BY: STEPHAN GAIGHER

MANAGEMENT SUMMARY

Site name and location: Proposed Repairs and Upgrades of the Alberts Farm Dam Wall, situated in Greymont, Johannesburg North.

Municipal Area: City of Johannesburg Metropolitan Municipality, Gauteng Province.

Developer: Johannesburg Road Agency (JRA)

Consultant: G&A Heritage, PO Box 522, Louis Trichardt, 0920, South Africa
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Date of Report: 19 June 2019

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 repairs and upgrades of the Alberts Farm Dam Wall, situated in Greymont, Johannesburg North, City of Johannesburg Metropolitan Municipality, Gauteng 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 Paleontological 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 paleontological 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 paleontological resources; and
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural, historical, built and paleontological 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 & Recommendations
The area was investigated during a field visit and through archival studies. The indicated graveyard and individual graves should be marked and avoided during the excavations.

Palaeontological Impacts are not anticipated as no excavations are planned for the dam wall rehabilitation. Where material sources are utilised these should be sourced from existing borrow pits.

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

Fatal Flaws
No fatal flaws were identified.

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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

JRA .....Johannesburg Road Agency

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

Chapter 1

PROJECT RESOURCES

HERITAGE IMPACT ASSESSMENT REPORT

HERITAGE IMPACT ASSESSMENT REPORT FOR THE PROPOSED REPAIRS AND UPGRADES OF THE ALBERTS FARM DAM WALL.

1. INTRODUCTION

Legislation and methodology

G&A Heritage was appointed by Galago Environmental to undertake a Heritage Impact Assessment for the proposed repairs and upgrades of the Alberts Farm Dam Wall, situated in Greymont, Johannesburg North, City of Johannesburg Metropolitan Municipality, Gauteng Province.

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 m^2 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 regards 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 Galago Environmental 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	Yes	HIA
	35	Archaeological, paleontological and meteor sites	No impact	None
	36	Graves and burial sites	Yes	HIA
	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 Repairs and Upgrades of the Alberts Farm Dam Wall
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	No	N/A
Any other development category, public open space, squares, parks or recreational grounds	No	N/A

2. Background Information

2.1 Project Description

Alberts Farm is a major regional parkland which currently fulfills both a conservation and recreational function within the City. The Alberts Farm dam is fed by various upstream water sources including an artesian spring. Alberts Farm dam is a heritage site.

The dam wall is an old earth wall and has been failing for a number of years. The wall is currently in danger of breaching completely, which is a risk to the downstream wetland system as well as the biodiversity dependent on this water source. One of the problems is the old roots of the trees which have created pathways for egress of water. At the same time these roots are a part of the structure of the dam wall. The dam wall is in need to significant structural stabilization and/or repair/reconstruction. The problem is exacerbated by the inadequacy of the spillway, which means that during heavy storm events the wall or embankment overtops. The construction of a more formal spillway is therefore required to limit the frequency of overtopping of the embankment.

Construction crew will access the site from De La Rey Drive on the eastern boundary of the study area.

Previous assessments have made the following general observations in regard to these dams:

- Urbanized catchments have increased volumes and peak discharges in comparison with natural catchments – and the problem is exacerbated by the increased drainage efficiency of urbanized catchments. The spillways of these dams are sized for relatively frequent flood events so that for larger events, the balance of the floodwater spills over the embankment crest, creating erosive stress on the downstream slope of the embankment.
- Early stages of urban development expose soil, as development progresses surfaces are more protected from erosion. However, this is generally negated by increased runoff, with the result that urban rivers that are free to erode often carry more sediment than natural rivers. Excess sediment is deposited where velocity is decreased, e.g. impoundments. The cost of constructing and frequently desilting an upstream slit trap is likely to be similar to the cost of less frequent desilting of the impoundment immediately downstream.

2.2 Objectives and Scope of Work

The objectives and scope include the proposed repairs and upgrades of two other dams (Emmarentia Dams) at the upper end of the Jan van Riebeek Park (also referred to as the Johannesburg Botanic Gardens).

Scope of the Work:

- In in-depth hydrological assessment of the wetland and riparian system comprising the three upstream impoundments and associated wetlands and feeder systems, to include inter alia the following:
  - The identification of the primary sources of sediment and sediment deposition;
  - A dam assessment for the 3 upper dams, including inter alia as assessment of water quality, sediment levels and toxicity;
  - Modelling of the sub catchment to identify the hydrological functionality and stress areas, including inflow volumes and peak flow rates into the upper impoundments;
  - Analysis of optimal role of the upper impoundment in relation to the following options or a combination thereof;
  - Restoration of open water impoundment;
  - Design of the impoundment to serve as a managed ‘sediment trap’;
  - Investigate and propose the possibility of each dam having the capacity to perform a dual function; that of a permanent enclosed water body as well as a spare capacity to act as a retention facility which could hold water back for at least 2-4 hours;
  - Establishment of the system as a wetland.
- Feasible design options and cost estimated for modifications required for reshaping of the waterfall area, to address the inadequacy of the current spillway relating to the second upper

impoundment, to repair current breaches and to prevent further scouring and undermining of the spillway and concrete channel.

- Feasible design options and cost estimates for measures to improve the hydrological functioning of the system and to address in particular the following:
  - Reduction of channelization
  - Erosion protection
  - Stream restoration
  - Reduction and removal of sediments and nutrients
  - Improvements in water quality
  - Restoration of wetland functionality
  - Habitat improvement
- Designs for hydrological improvements should be based on Sustainable Urban Drainage Systems and Water Sensitive Urban Design Systems principles and approaches and not seek to further engineer the system with hard engineering methods. The aim should be to build increased sustainability and resilience in the system. Designs should include revegetation of the disturbed areas with indigenous riparian and wetland vegetation.

2.3 Project Location

The study area is located on the farm Waterfall 211 IQ in the area of northern suburbs of Johannesburg, Greymont and Northcliff.

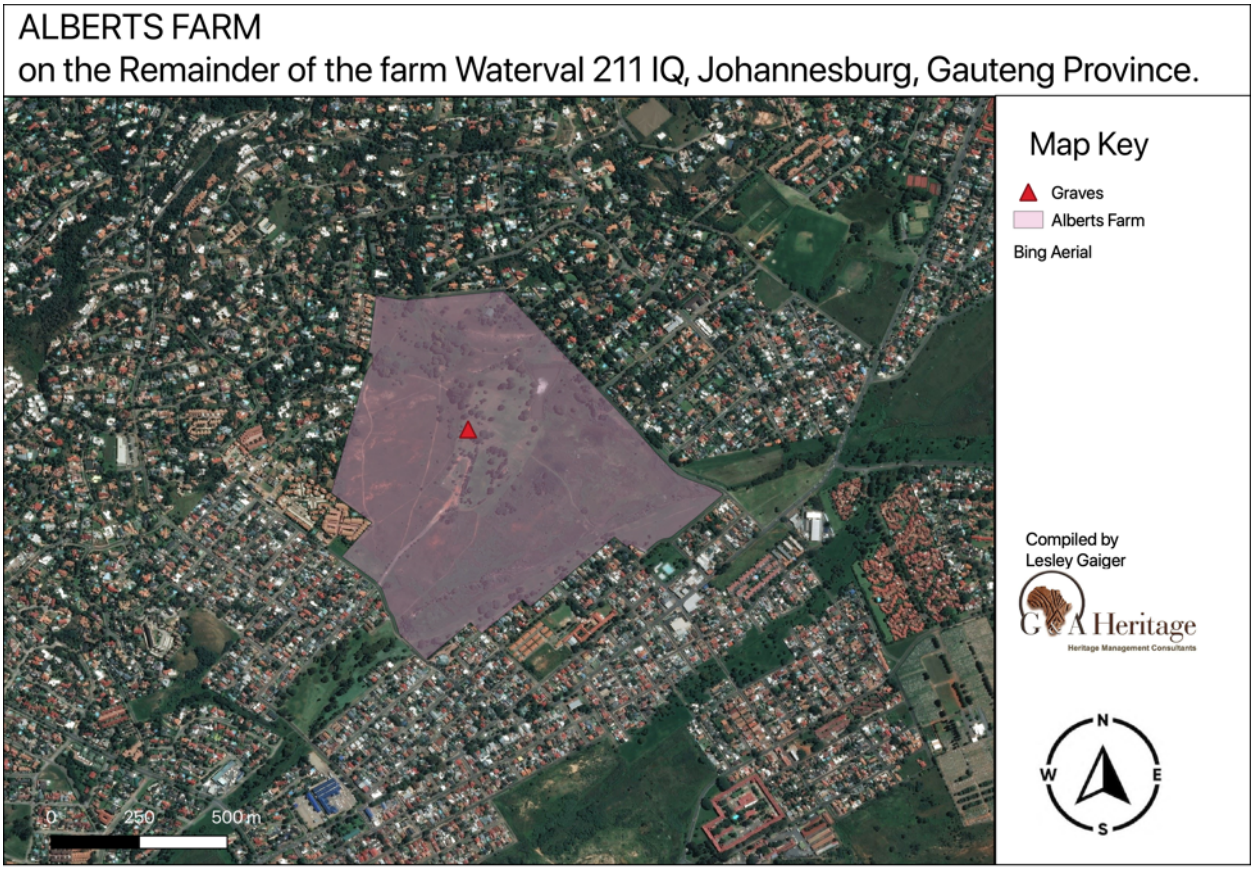

Figure 1. Alberts Farm Location Map

2.4 GPS Track Paths

Figure 2. Google Earth © Image: Alberts Farm Park Trackpath

Chapter 2

FINDINGS

HERITAGE INDICATORS WITHIN THE RECEIVING ENVIRONMENT

3. REGIONAL CULTURAL CONTEXT

3.1 PALEONTOLOGY

A section of the study area falls within the red demarcation on the *PalaeoSensitivity* Map. SAHRA states that in this case a field assessment and a protocol for finds is required, however since no excavations are planned for the project, no impacts on palaeontological deposits are anticipated. (Due to the SAHRIS server being down at the time of writing this report, the Paleo Sensitivity Map for this area could not be included here).

3.2 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. However, it is possible that the first humans in the area may have been preceded by Homo erectus, who roamed large parts of the world during the Aucheulian period of the Early Stone Age, 500 000 years ago. The predecessors of Homo erectus, Australopithecus, which is considered to be the earliest ancestor of modern 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 (Mitchell 2002). Two Middle Stone Age sites at the Withoek Spruit (Brakpan) were researched 17 years ago, but no information on this discovery has been published.

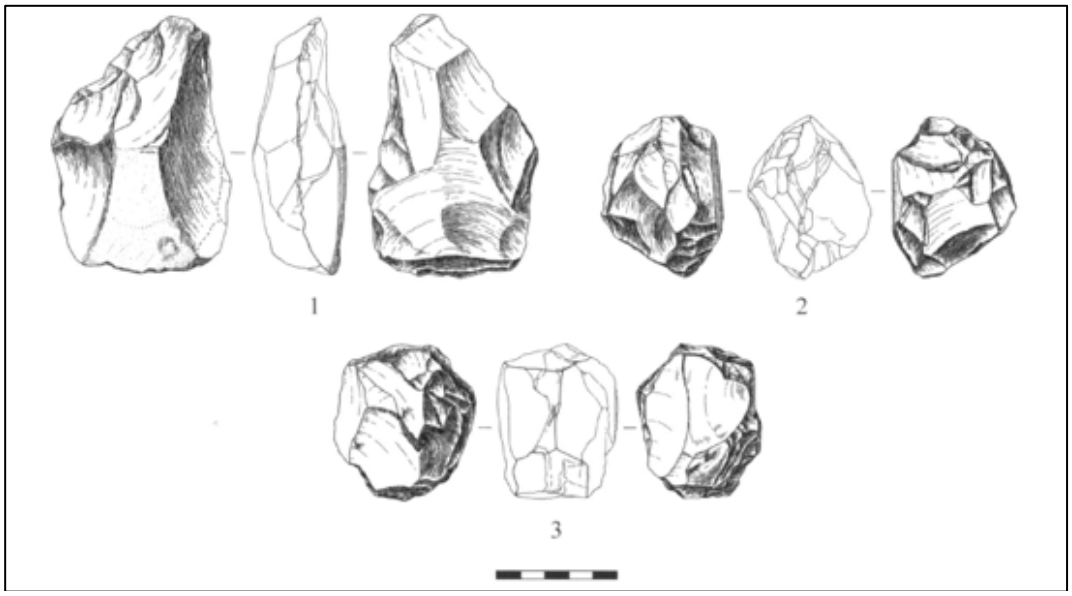

Figure 3. (1) handaxe on flake; (2) thick discoidal core; (3) polyhedral core (Pollarolo, Kuman, Bruxelles, 2010)

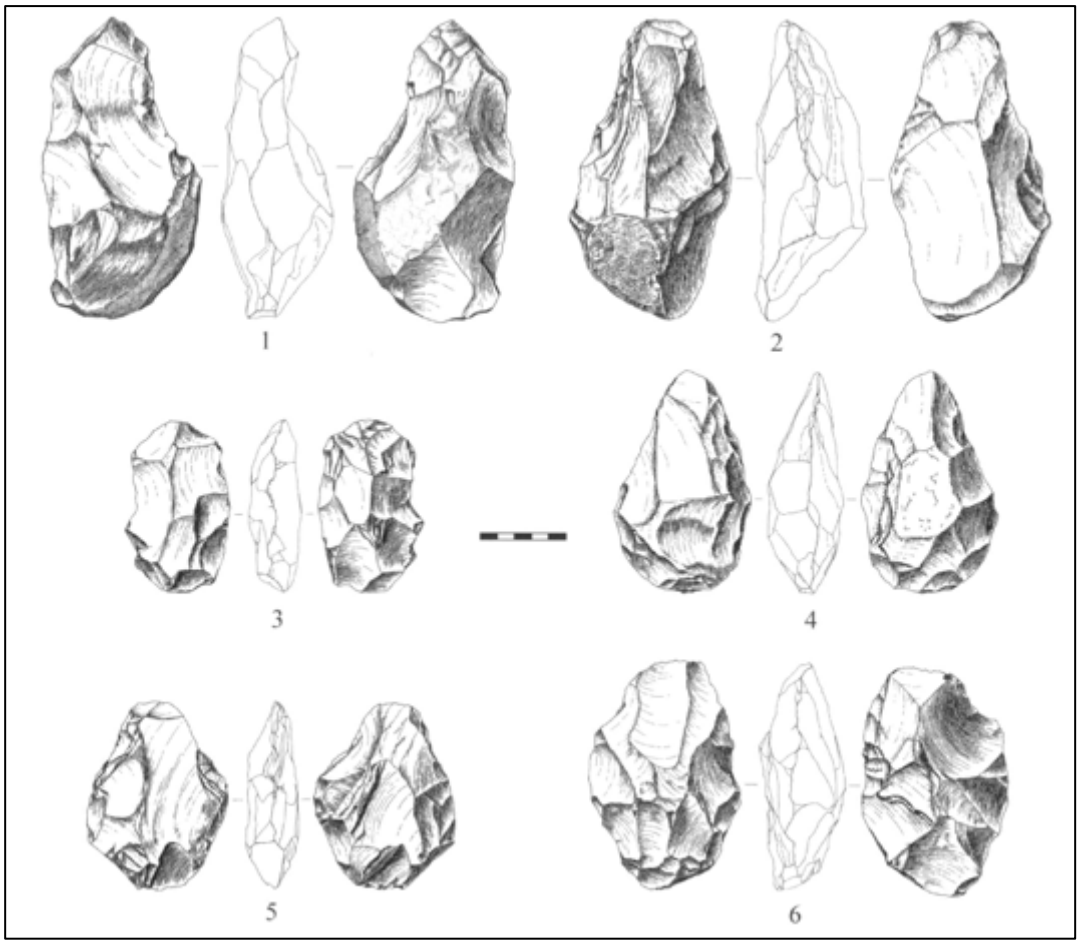

Figure 4. (1,2) Handaxes with large side removal; (3-6) handaxes (Pollarolo, Susino, Kuman, Bruxelles, 2010)

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 Brakpan 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 (Morris 2004).

3.3 Iron Age

A considerable number of Late Iron Age, stone walled sites, dating from the 18th and the 19th 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-eastern 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 Johannesburg, 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 stocked 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 (Killick 2004).

Some 100 years earlier, African farmers in the Fokeng cluster built stonewalled settlements in the Tshwane area that emphasised the centre/side axis. From the air, these earlier settlements resemble a 'fried egg'; that is, a smooth outer ring about 60 metres across enclosed in a central cattle byre about 20 metres in diameter. When these early BaFokeng people moved north across the Vaal River, they met the ancestors of Southwest Sotho-Tswana, such as BaRolong and BaThlaping. Their interaction helped to create a new type of stonewalling called Klipriviersburg. Besides Johannesburg, Klipriviersburg walling is also found around Pretoria. All of these people were mixed farmers; that is, they herded cattle as well as sheep and goats, and they cultivated sorghums, millets and various beans and peas. They were also capable of making metal tools and jewellery.

The earliest evidence of metal working in the region comes from the site Broederstroom west of Pretoria. Archaeologists have uncovered the remains of at least two stratified villages there that date back to between AD 550 and 700, each with evidence of iron forging. Two major technological steps characterise ancient iron production: smelting and forging. Technically, iron ore is reduced in a furnace to create a bloom. During this smelting process, silica in the host rock melts, flowing off as slag leaving the bloom behind. The bloom has to be forged in an oxidised atmosphere, usually in an open hearth. In both smelting and forging, bellows attached to clay pipes help the operators reach the necessary high temperatures. Culturally, Bantu-speaking people in the recent past compared the smelting process to childbirth, a private and sacred affair. Consequently, the smelter was usually secluded outside the settlement. Forging, in contrast, was comparable to raising the child; and so the forge was located in a public area in the centre of the homestead. The forges at Broederstroom follow this pattern. (http://www.sahistory.org.za/topic/prehistory-pretoria)

Melville Koppies

The granite ridge referred to as Melville Koppies has a rich prehistoric history. The majority of the work done in this area was done during the 1960 by Prof. Revil Mason. Seen by some as a radical in terms of research methods (he famously used dynamite to excavate the Makapansgat deposits!) he nonetheless was invaluable in raising interest in the prehistory of this area of Johannesburg and was key in the preservation actions taken as a result of his research. Mason believed that "archaeology is not limited to the distant past but recorded wherever human action leaves its mark on the landscape...". He identified eight archaeological sites on what we call Melville Koppies Central:

- Stone Age camps 250 000 and 100 000 years old.
- Ancestral Tswana Iron Furnace 500 years old.
- African Iron Furnace Models.
- A second Tswana Iron Furnace.
- Tswana hut floor and pottery - 300 years old.
- 1880s gold prospecting.
- 1900s gun emplacement.
- Early 1900s quarries.

The Stone Age camps were revealed in the same excavation, in 1963, which uncovered the 100-year-old furnace. The furnace is on a living floor about 50cm below the present ground-level. The 100 000-year-old camp is about a metre below that, and the 250 000-year-old floor another metre below that.

Part of the excavation was filled in on completion. The furnace and small parts of the older living floors are preserved under glass in a shelter near the lecture hut.

The artefacts discovered are housed at the University of the Witwatersrand. The Melville Koppies Reserve have Stone Age artefacts on display, but they are part of a collection donated to them over the years.

Mason's 250 000BP date places these remains in the Middle Stone Age. He himself uses the term "Fauresmith", which is not common parlance today. The tools would have been made by people called "Archaic Homo Sapiens", meaning that they were anatomically similar to modern humans, but the remains they have left do not make it clear whether they were like us in mind and consciousness or not. Their way of life would have been that of hunter-gatherers and scavengers.

The 100 000-year-old evidence is that of fully modern humans. The commonly accepted "out of Africa" theory today proposes that humans left Africa perhaps 80 000 years ago, equipped with the full human "toolkit" - tools, language, art, control of fire, song, and sociability.

The Iron Age evidence is that of a culture which reached the Witwatersrand possibly 500 years ago. The people were the ancestors of the present Tswana population. The knowledge of iron working came from far north in Africa. People with these skills were also part of a culture which combined pastoralism - goats, sheep, and cattle - with agriculture. They farmed sorghum, millet, and legumes.

The community on Melville Koppies probably survived until the turmoil of the 1820s.

Mason proposes that during these years the Melville Koppies settlement was part of a trading network which included communities at Klipriviersberg, Lonehill, Melville Koppies, and the Magaliesberg area.

More agriculturally prosperous, the south (Klipriviersberg) would have traded cattle and grain for iron from the northern Witwatersrand, copper from the Magaliesberg, and specularite from the Boons and Tarlton area. Specularite, Iron Sulphite Fe_2O_3, is a glittering mineral of no value except for body decoration. It also seems that copper was used only as jewellery. Mason describes a burial of a teenage girl at Klipriviersberg who was adorned with copper earrings and iron beads and anklets. The ability to trade for cosmetics and jewellery as far as Melville Koppies and the Magaliesberg tells us that these communities - or at least some of them - were not living in desperate poverty.

Not only the smelting furnace at Melville Koppies, but also the kloof - through which Beyers Naudé Drive now runs - means that it lay on a major trading route. The British regarded the kloof as an important enough access through the Witwatersrand to maintain a gun emplacement on the Koppies during the South African War.

A less noticed heritage on the Melville Koppies is that of the last "Stone Age" peoples. These of course are the San or Khoisan. Mason does not mention the San living floor on Melville Koppies Central. But he does write about the "cave" on Melville Koppies West.

The "cave" is more like a small rock overhang than a cave in the way speleologists think of one. But it was excavated, and in it were found a grooved stone used by the San to shape arrows and to grind ostrich shell beads.

Also found were bones of hunted animals, and a Zebra tooth. The San had a complicated relationship with the iron using pastoralists. There is evidence at Broederstroom that they may have cooperated with the settlement as hunters - for hunting and gathering, not pastoralism and agriculture, was their way of life. But they were possibly also enslaved or killed.

Mason refers to the cave as a "refuge". This is because it is likely that the settlement in the 1820s fled the invasion by Mzilikatsi and some may have used the cave as a temporary hiding place. (www.mk.org.za)

3.4 The Historic Era

The first inhabitants of this area were Stone Age hunter-gatherers who roamed here some 50 000 years ago. Remnants of their weapons were found in the Rynfield area and near Cranbourne Station many years ago.

The first Voortrekker parties crossed the Vaal River and started occupying the area in the 1830's. Farmers started moving into the area and declared farms for themselves, especially after the singing of the Sand River convention in 1852.

The first major modern settlements in Johannesburg were loosely planned, as they grew up quickly in order to service the need for labour in the gold mines on the Witwatersrand. However, the population of Johannesburg increased rapidly, and the city quickly established formal neighbourhoods, most of which were racially mixed as labourers lived together. The earliest formal settlement to house people of all races, Kliptown, is located near today's Soweto.

During the Apartheid Era (1948 to 1994), it was the discriminatory racial segregation (*apartheid)* legislation, enacted by the Nationalist Party (after coming to power in 1948) that extensively transformed the land-use. Citizens were separated into different townships according to their race with buffer strips of at least 100m wide or by environmental buffer zones thus the Black South Africans in the area lived in the Brakpan Old Location.

The Brakpan Old Location was the backdrop to many anti-apartheid struggles. The people living in the location were actively trying to improve their living conditions and to challenge the laws that were suffocating them.
Mbulelo Vizikhungo Mzamane wrote "*Children of Paradise*" to detail the area and the events of the time, through his own eyes as a young boy living in Brakpan Old Location. It is a poignant story of the innocence and trust of a young, black South African, who does not understand the severity of the situation he is caught in. Although beautifully told, it does not provide specific historical references to events unfolding in the area. It does however mention events and places that can be researched through alternative methods.
The community of Brakpan Old Location were forcibly removed from their homes from 1974 to 1978 and had to re-establish themselves in Tskane approximately 15km South. The Old Location was razed.

Many large freeways were built to link Johannesburg with the rest of South Africa, although this permitted the further outward expansion of the city along the N1, N3, and M2 roadways. Public transport construction was completely abandoned, except for a minor bus system.
This system continued until the 1980s, when international sanctions and a poor security situation led to a large contraction in the economy. Many companies abandoned skyscrapers that had been built in the Central Business District (CBD) in the 1960s and 1970s, and left warehouses empty or little used.

When the Group Areas Act was repealed, there was a mass migration of former township dwellers and illegal immigrants to buildings in the CBD and surrounding areas, which caused crime rates to increase dramatically in the Central area of the city. Many businesses that had not closed their CBD offices left for more secured Northern suburbs, and in particular, Sandton. The amount of business and population of the northern suburbs increased exponentially, while the CBD was left empty and abandoned as a "no-go zone". The previous owners of buildings in the CBD abandoned them as their value

decreased, and more illegal immigrants moved in. Many suburbs near the CBD also felt the demographic change as previously white and middle-class suburbs like Yeoville became mostly black and dangerous within the space of two to three years.

The city government has attempted to rectify this situation as of 2005 by installing CCTV cameras all over the city centre and increasing police presence. Some businesses and residents have returned, although most businesses have built permanent and better facilities in the northern suburbs, so a large-scale return is unlikely. The city has grown so quickly to the north that the border between Johannesburg, Midrand, and Centurion is mostly an arbitrary political border, as the two cities have grown together so there is no space between them.

Alberts Farm Specifically:
The farm dates to the 1890s, when, it is thought, Hendrik Abraham Alberts leased 114 acres from the owner of the large farm Waterval. The original farmhouse is long gone, but the family cemetery exists, a lonely, fenced presence in the parkland.

In 1946 the family sold 45 000 square metres of land to the City, for £18 500, specifying that the land must be kept for public use.

The suburb of Greymont was surveyed in 1903 and was a part of Roodepoort, but in February 1939, it became a part of Johannesburg.

East of the wooded area are unusual rock formations, which are believed relate to the Vredefort Dome at Parys, 100 kilometres south of Johannesburg.

Mention is made of the Alberts Farm House in some historic texts, however this seemed to have been demolished in the 1940's or 1950's. The only remains on site was that of an old water boiler stand ("Donkey").

The remains of the Alberts Family Cemetery is located within the park grounds.

Sources:
http://www.sacp.org.za/docs/history/fifty3.html
http://www.historyworld.net/wrldhis/PlainTextHistories.asp?ParagraphID=otw
http://cals.ukzn.ac.za/Libraries/General_Docs/Mbulelo_Mzamane.sflb.ashx
http://www.sahistory.org.za/people/david-wilcox-bopape
http://www.liferattle.ca/radio/podcast20110213.html
Global.Britannica.com/Brakpan
Historyworld.net
SA History Online
SA History Online/Consumer Boycotts
SA Military History.org
Mbulelo Vizikhungo Mzamane, "Children of Paradise"

3.5 Historical 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);

- 2627 BB 1943
- 2627 BB 1954
- 2627 BB 1977
- 2627 BB 1983
- 2627 BB 1995
- 2627 BB 2002
- 2627 BB 2007

Significance of Scientific Information for the Study Area

The above information when analysed in detail forms a matrix within which the study area at Demaneng 546 can be analysed, it furthermore also gives guidance to investigators to ensure that fieldwork is focussed on the possible occurrence of sites and features as outlined in these studies. The main points that have been derived from these studies are the possible occurrence of the following features within the study area;

- Possible pre-colonial specularite mining activities.
- Sites with petroglyph rock art.
- Sites with mining implements from the Stone Age.
- Stone tool manufacturing sites.
- Colonial graves

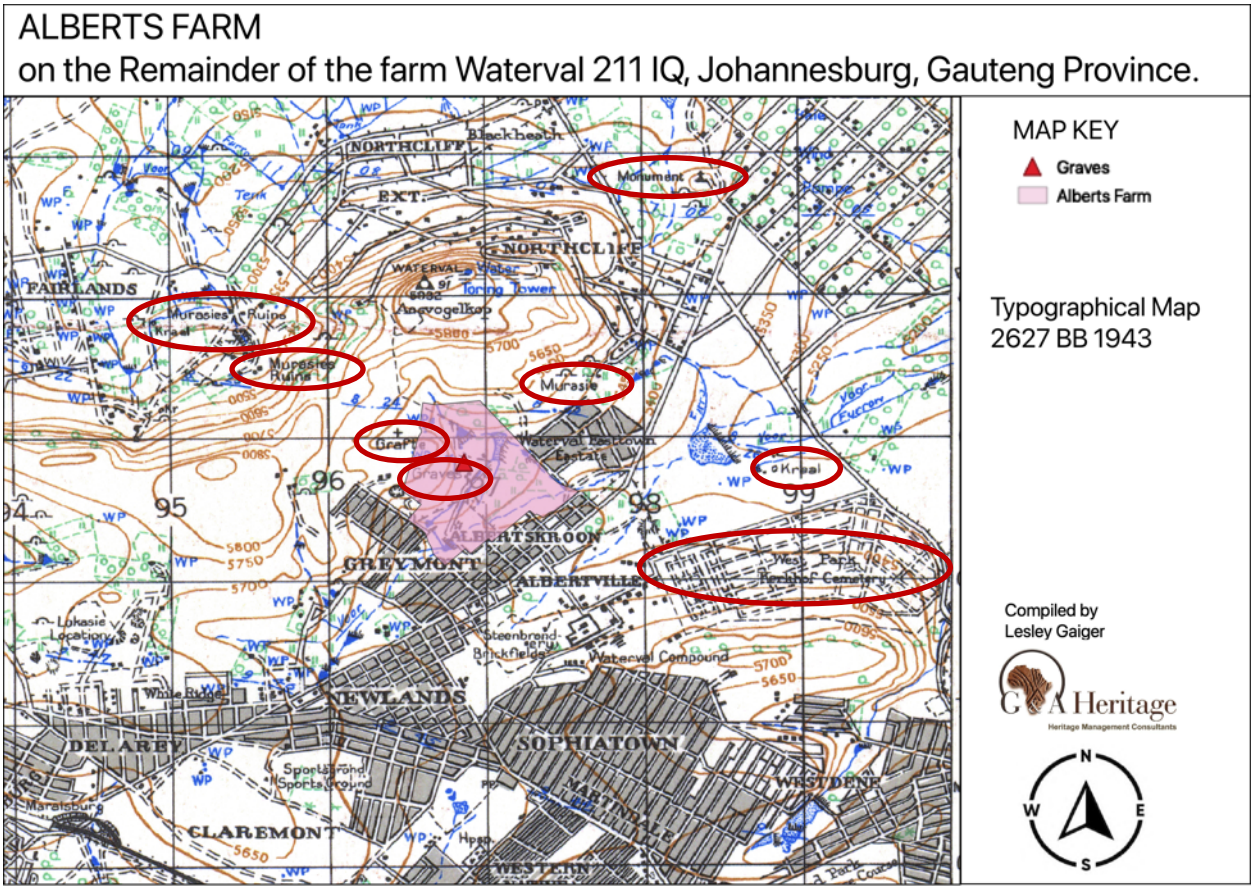

Figure 5. Typographical Map 2627 BB 1943

Note the graves within the study area and just outside the north-western boundary. The West Park Cemetery is located approximately 600m (at the closest point) from the study area. This cemetery is present on all the subsequent maps. It will not be impacted upon.

Several ruins indicated outside the study area (towards the north-east and north-west) and a Monument further north. It will not be impacted upon.

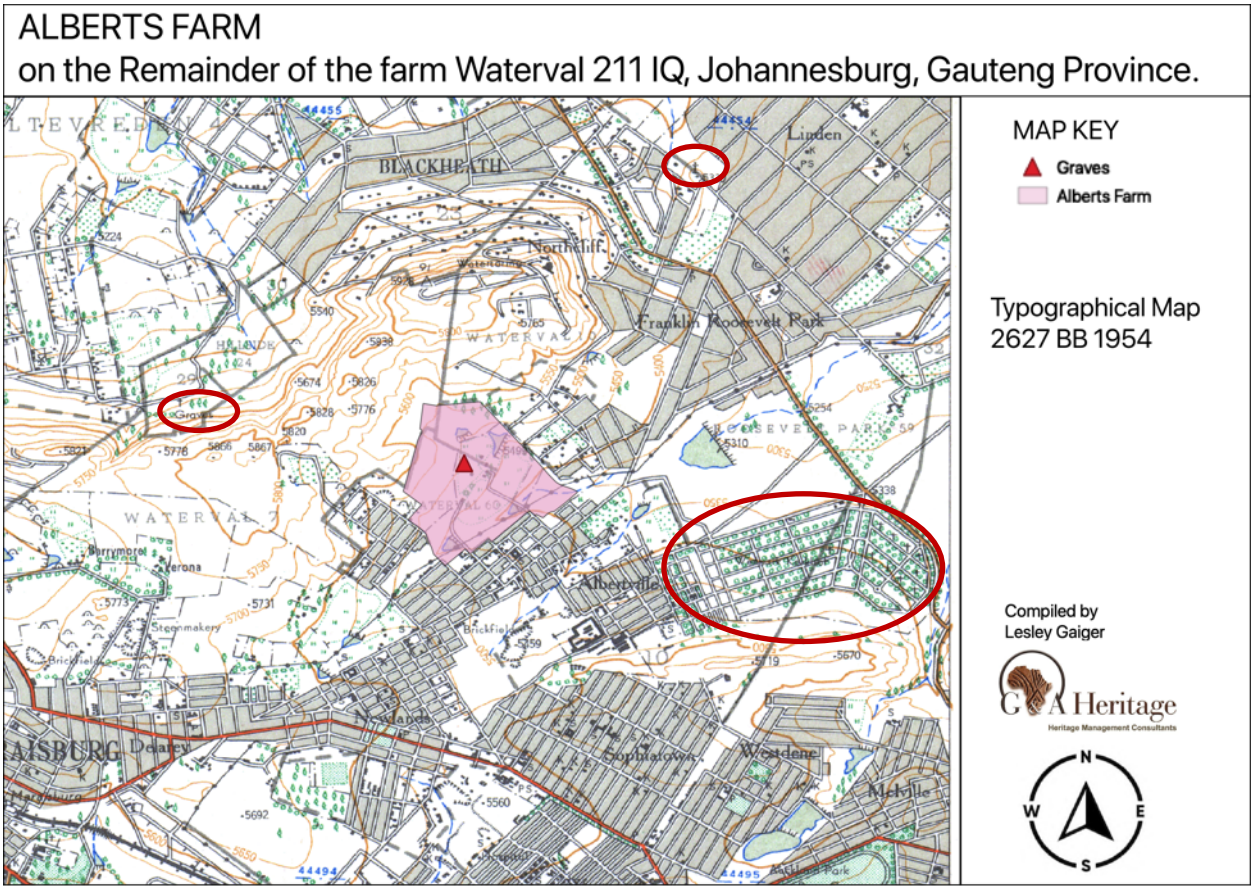

Figure 6. Typographical Map 2627 BB 1954

Graves indicated to the west, outside of the study area and the same Monument as per the previous map. It will not be impacted upon.

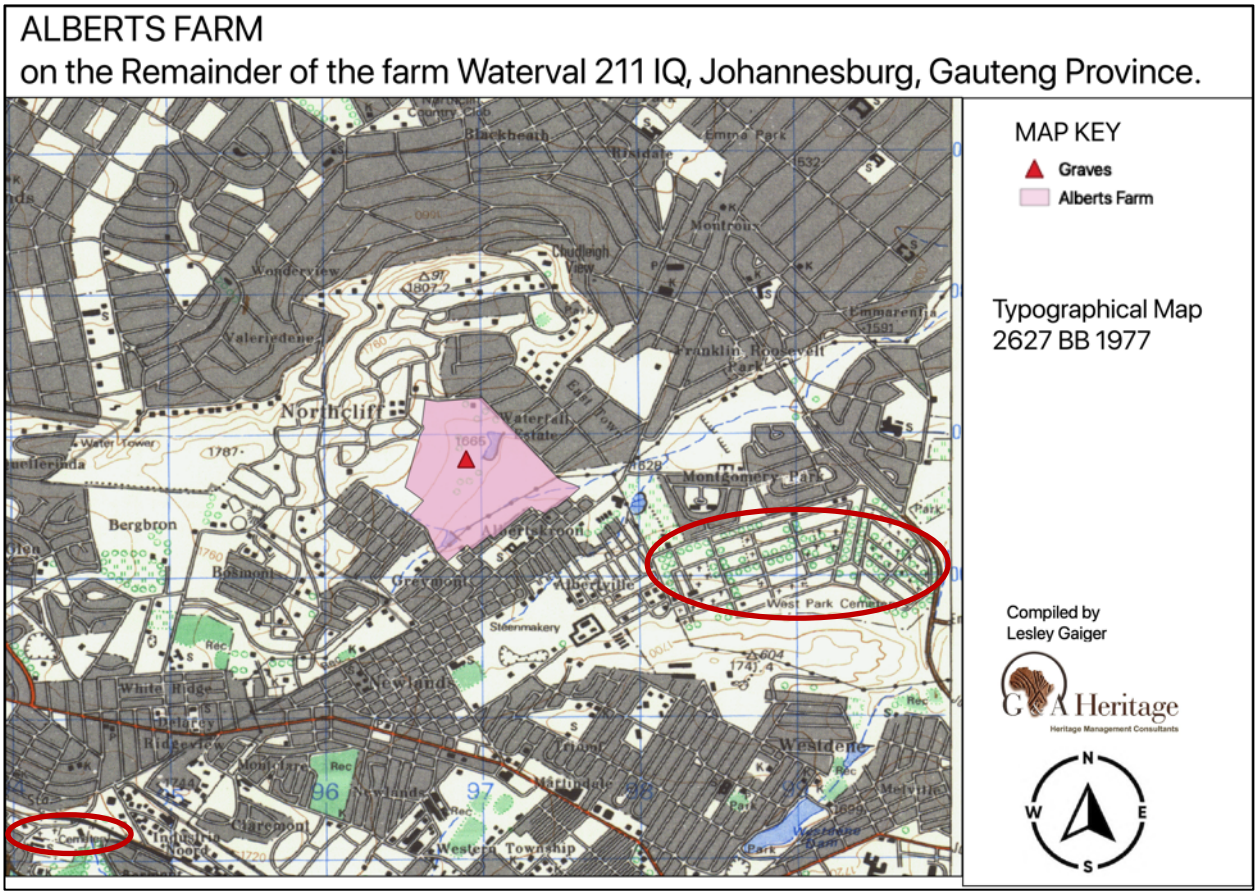

Figure 7. Typographical Map 2627 BB 1977

A new cemetery is noted on the map outside the study area (southwest corner of the map above). It will not be impacted upon. The land for the cemetery was donated to the Municipality by the Alberts family.

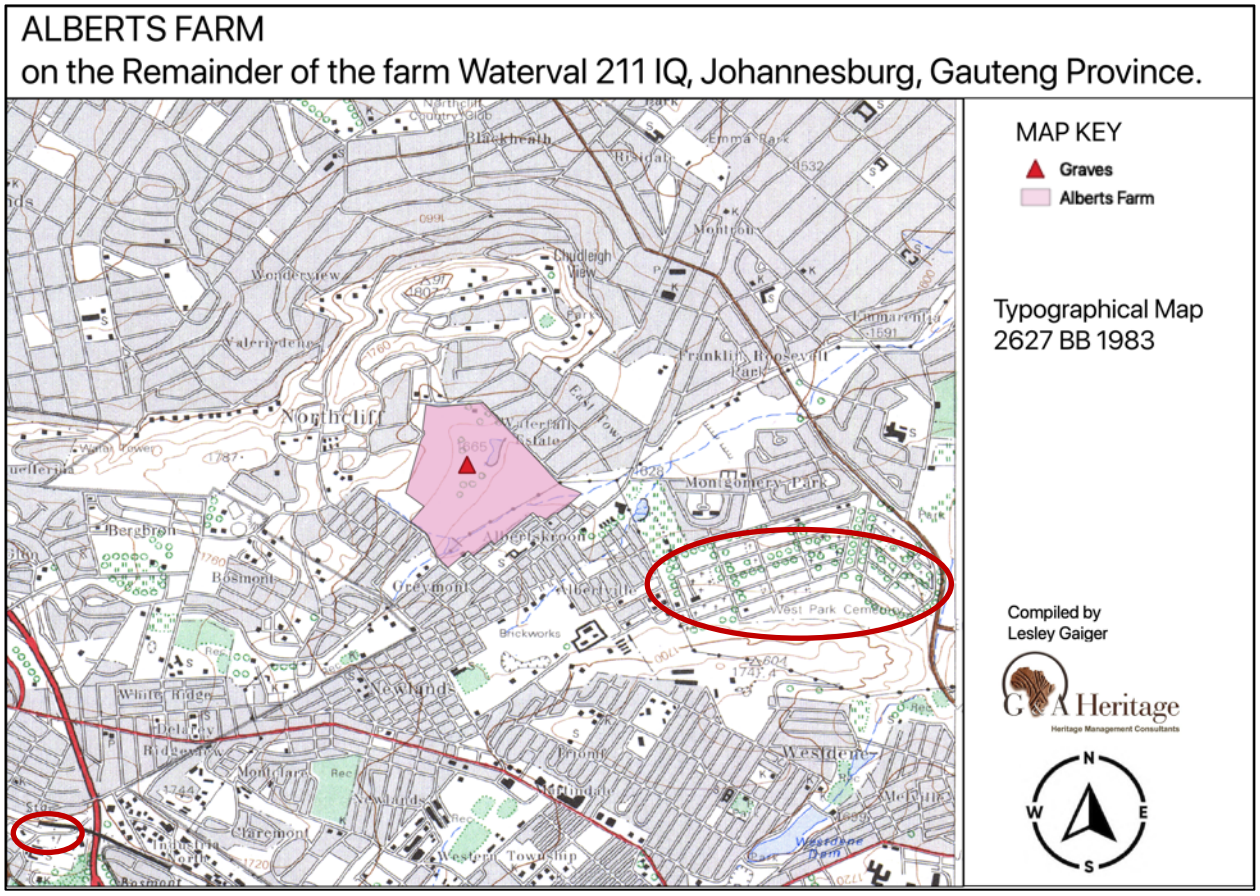

Figure 8. Typographical Map 2627 BB 1983

No change from the previous map.

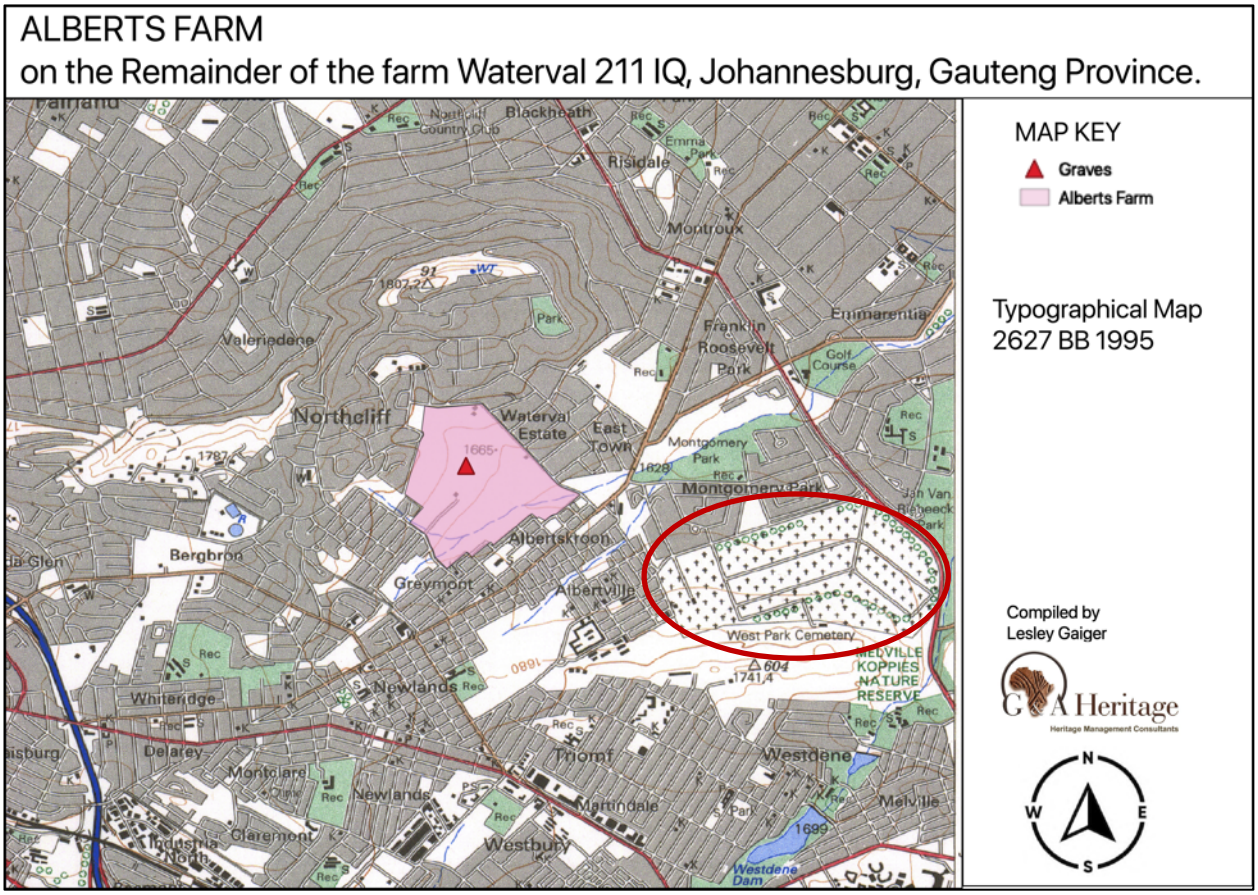

Figure 9. Topographical Map 2627 BB 1995

No change from the previous map.

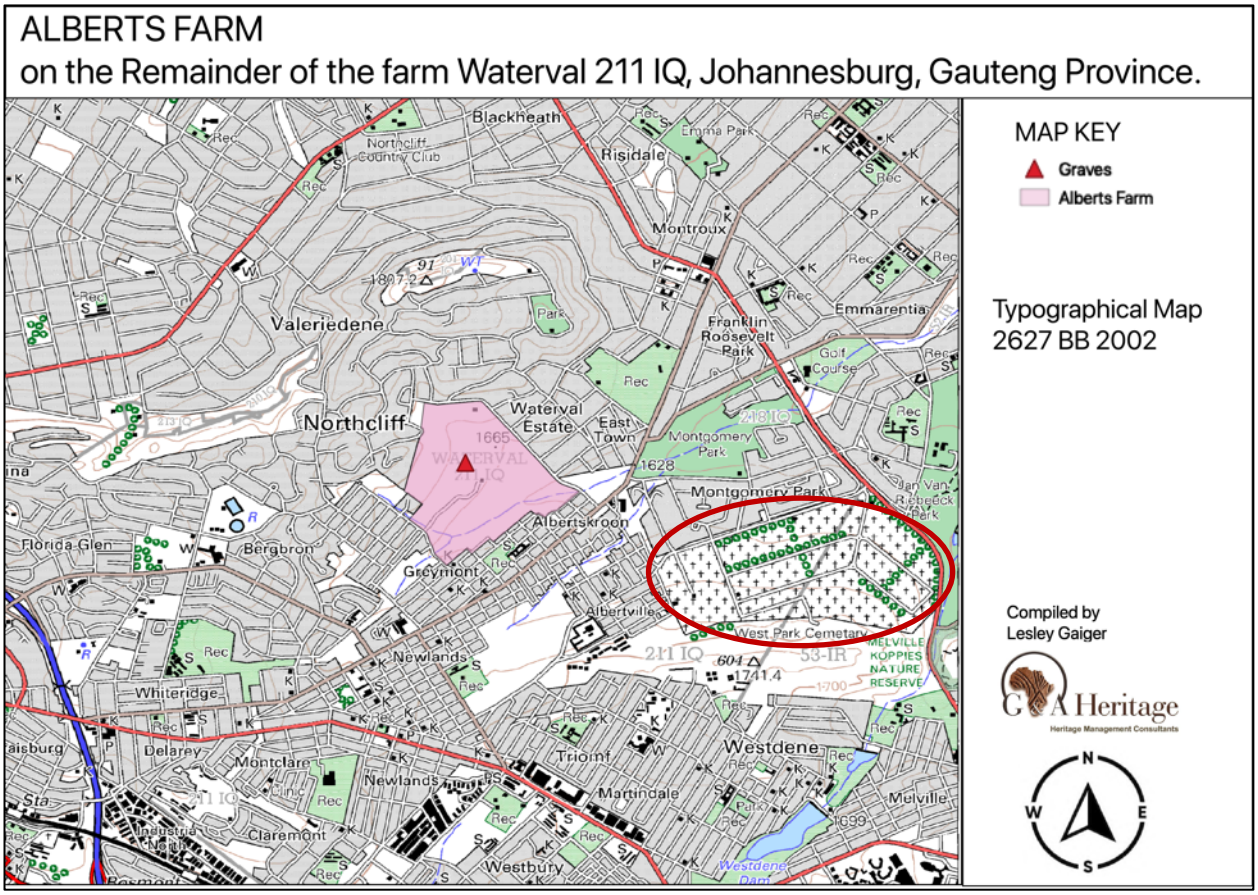

Figure 10. Typographical Map 2627 BB 2002

No change from the previous map.

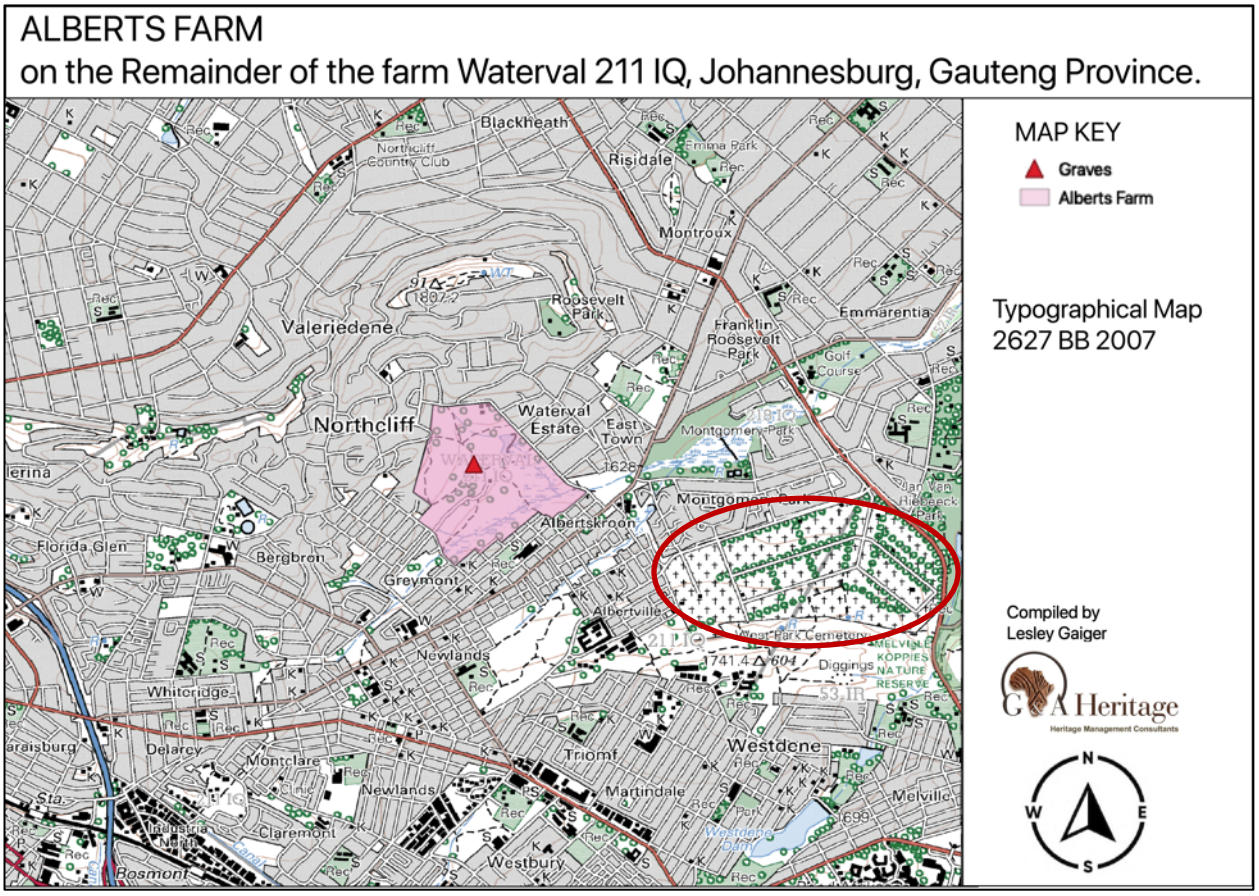

Figure 11. Typographical Map 2627 BB 2007

No change from the previous map.

3.6 Previous 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.

- Pelser, A. 2017. Report on a Desktop Cultural Heritage Assessment for the Proposed Houghton Estate Extension 1 Residential Development Located on the Remaining Extent of Portion 1 of Houghton Estate 56IR, Houghton, Gauteng.
- Van Der Walt, J. 2017. Notification of Intent to Develop for the Proposed Upgrading of Jan Smuts Road to Dual Carriage Way from Northworth Drive to Bolton Road and from 8th Avenue to Kent Road, Rosebank, Johannesburg, Gauteng Province.
- Coetzee, F.P. 2016. Cultural Heritage Assessment of the Proposed 37.5 ML Underground Linksfield Reservoir, City of Johannesburg, Gauteng Province.
- Coetzee, F.P. 2015. Cultural Heritage Assessment of the Proposed Construction of the Additional Meredale Reservoir (210 MI) (Eikenhof System), City of Johannesburg Metropolital Municipality, Gauteng.
- Kusel, U. 2016. Phase 1 Cultural Heritage Resources Impact Assessment for the Proposed Development on Portions of the Klipspruit Township, Nancefield Precint, Soweto, Johannesburg, Gauteng Province.
- Van Ryneveld, K. 2015. HIA – Construction of the Celebration Sewer Pipeline B on Various Agricultural Holdings, North Riding, City of Johannesburg Metropolitan Municipality, Gauteng.
- De Jong, R.C. 2014. Final Heritage Impact Assessment Report Version 3: Proposed Huddle Park Golf Course Development, Johannesburg.
- Kruger, N. 2017. Archeological Impact Assessment (AIA) of areas demarcated for the Proposed Zandspruit Township Establishment on Portions 16, 22, 23, 26, 42, 51, 55, 56,

59, 67, 68, 72, 73, 76, 104, 105, 144 and 160 of the Farm Zandspruit 191-IQ and Holding 43 Sonedal, A.H., City of Johannesburg, Gauteng Province.

- Birkholtz, P. 2015. Proposed Development of the G14 Pipeline by Rand Water: Heritage Impact Assessment for the Proposed Development of the G14 Pipeline between Forest Hill and Turffontein Nek, Southern Johannesburg, Johannesburg Metropolitan Municipality, Gauteng Province.
- Van Schalkwyk, J. 2006. Review of Cultural Heritage Resources in the Modderfontein Area, East of Johannesburg, Gauteng.
- Breetzke, S. 2014. Proposed Alternations and Additions to House Breetzke – Erf 120 & 121 of Forest Town, Gauteng, 5 Cluny Road, Johannesburg.
- Van Schalkwyk, J. 2015. Heritage Impact Assessment for the Proposed Widening of Conrad Drive Bridge and Erosion Protection Measures, Braamfontein Spruit, Blairgowrie, Johannesburg District Municipality, Gauteng Province.

3.7 Cultural & Natural Landscape

The Alberts Farm Park is a 90ha piece of gently sloping land running alongside Greymont with its entrance on 8th street. The park lies against Northcliff ridge and is the second largest green space in the city after Delta Park.

There is no trace of cultivated fields, although it is said that the Albert's family farmed mealies.

It considered to be an important hydrological feature in the landscape and helps to manage flows to the downstream wetland system. The dam supports considerable biodiversity and hence is important from an ecosystem perspective.

The ridge in the northwestern corner of the park is used regularly as a religious/spiritual site for several different groups.

Figure 12. Entrance to the Alberts Farm Park on 8th Street

Figure 13. General Landscape

Figure 14. General Landscape

Figure 15. General Landscape

Figure 16. Alberts Farm Dam

Figure 17. Alberts Farm dam

Figure 18. Northern section of the study area with a religious ceremony being undertaken

Figure 19. Eastern section of the study area - Wetlands

4. Findings

4.1 Map of Key Features

Figure 20. Google Earth © Image: Map of Key Features

4.2 Fieldwork Results

4.2.1 Site 001 – Albert's Family Graves

The graves of the Albert's family are located within the study area at the following coordinates:
S26° 09' 25.92" E27° 58' 07.53"

Formal headstones are present, but many are in a very poor state of preservation. Many headstones have been toppled and are broke. It is recommended that the graves be restored to their original condition and fenced off to be protected from vandalism.

Of what was noted during the field investigations, the oldest of the graves is that of Nicolaas Frans Alberts, born in 1816 and died in 1881.

Figure 21. Albert's Family Graves

Figure 22. Albert's Family Graves

Figure 23. Albert's Family Graves

Figure 24. Albert's Family Graves

Figure 25. Albert's Family Graves

Figure 26. Albert's Family Graves

Figure 27. Albert's Family Graves

Figure 28. Albert's Family Graves

Figure 29. Albert's Family Graves

Figure 30. Albert's Family Graves

Figure 31. Albert's Family Graves

4.1.2 Site 002 – Homestead

A possible former homestead is located within the study area at the following coordinates:
S26° 09' 14.22" E27° 58' 09.53".

This is not the original Alberts Homestead (which has been demolished) and it is not known what age the structure is, although it has been severely altered in the recent past and currently serves as an open barn. This structure will however not be impacted upon.

Figure 32. Former Homestead

Figure 33. Modern brick buildings with water boiler in background

4.1.3 Site 003 – Dam Wall

The dam wall is of historical value and has high heritage significance due to its age and connection to the evolution of Johannesburg.

Chapter 3

IMPACT ASSESSMENT

5. METHODOLOGY

This study defines the heritage component of the EIA process being undertaken for the Proposed Repairs and Upgrades of the Alberts Farm Dam Wall, situated in Greymont, Johannesburg North, City of Johannesburg Metropolitan Municipality, Gauteng Province.
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.

5.1 INVENTORY

Inventory studies involve the in-field survey and recording of archaeological resources within a proposed development and buffer 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)*.

5.2 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.

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

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

The following documents were consulted in this study;

- South African National Archive Documents
- SAHRIS (South African Heritage Resources Information System) Database of Heritage Studies
- Historic Maps
- 2627 BB 1943, 1954, 1977, 1983, 1995, 2002 and 2007 Surveyor General Topographic Map series
- 1952 1:10 000 aerial photo survey
- Google Earth 2019 imagery
- Published articles and books
- JSTOR Article Archive

5.3 Fieldwork

Fieldwork for this study was performed on the 11th of June 2019. Most of the areas were found to be accessible by vehicle. Areas of possible significance were investigated on foot. The survey was tracked using GPS and a track file in GPX format is available on request.

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

The study area was surveyed using standard archaeological surveying methods. The area was surveyed using directional parameters supplied by the GPS and surveyed by 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.

6. Measuring Impacts

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

6.1 Type of Resource

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

6.2 Type of Significance

6.2.1 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.

6.2.2 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.

6.2.3 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.

(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?

6.2.4 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?

6.2.5 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

6.2.6 Economic Significance

(a) What value of user-benefits may be placed on the site?

- visitors' willingness-to-pay
- visitors' travel costs

6.2.7 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?

6.2.8 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?

6.2.9 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?

6.2.10 Other

(a) Is the site a commonly acknowledged landmark?
(b) Does, or could, the site contribute to a sense of continuity or identity either alone or in conjunction with similar sites in the vicinity?
(c) 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?
(d) Is the site representative of a particular architectural style or pattern?

6.3 Degrees of Significance

6.3.1 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. 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)*.

6.3.2 Rarity

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

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

6.3.3 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			

7. Assessment of Heritage Potential

7.1 Assessment Matrix (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 1 (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 1: Classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deaon, 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 2: 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

7.2 Assessing site value by attribute

Table 2 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.

7.3 Impact Statement (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

7.4 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).*

7.5 Post-Contact Sites

No sites associated with the post-contact era will be affected by the proposed development.

7.6 Built Environment

Some structures associated with rural living were identified;

- Fences (modern)
- Brick houses (modern)
- Tarred roads (modern)
- Dirt roads (modern)
- Footpaths

The dam wall, which is the focus of this study, is itself a historic site. The original wall was built by Boers who had no work after the South African War. Hendrik Alberts employed these men to build the original dam and then lease 20-acre plots to each of them downstream from the dam at a rate of 1/3 of their cultivation rate. It is therefore an important historical and heritage site.

7.7 Historic Significance

No	Criteria	Significance Rating
1	***Are any of the identified sites or buildings associated with a historical person or group?*** Yes	Alberts Family
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?*** Yes	Dam Wall

7.8 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 or structures outstanding examples of a particular style or period?*** Yes	Post War Architecture
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 or structure?*** Poor	N/A
6	***Is the building/structure's current and future use in sympathy with its original use (for which the building was designed)?*** Yes	-
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

7.9 Spatial Significance

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

No	Criteria	Rating
1	***Can any of the identified buildings or structures be considered a landmark in the town or city?*** No	-
2	***Do any of the buildings or structures contribute to the character of the neighborhood?*** Yes	-
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	-

8. 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.

8.1 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 if 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.

8.2 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.

8.3 Rating System Used to Classify Impacts

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

NATURE		
Including a brief description of the impact of the heritage parameter being assessed in the context of the project. This criterion includes a brief written statement of the heritage aspect being impacted upon by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY		
This describes the degree to which an impact on a heritage parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		

This describes the degree to which heritage resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION		
This describes the duration of the impacts on the heritage parameter. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts on the heritage parameter. A cumulative effect/impact is an effect, which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible Cumulative Impact	The impact would result in negligible to no cumulative effects.
2	Low Cumulative Impact	The impact would result in insignificant cumulative effects.
3	Medium Cumulative impact	The impact would result in minor cumulative effects.
4	High Cumulative Impact	The impact would result in significant cumulative effects.
INTENSITY / MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.

2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.

SIGNIFICANCE

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the heritage parameter. The calculation of the significance of an impact uses the following formula:

(Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.

The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.

Points	Impact Significance Rating	Description
6 to 28	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive Low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive Medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive High impact	The anticipated impact will have significant positive effects.
74 to 96	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".

74 to 96	Positive Very high impact	The anticipated impact will have highly significant positive effects.

9. Anticipated Impact of the Development

9.1 Subterranean or Unmarked Sites

IMPACT TABLE FORMAT		
Issue/Impact/Heritage Impact/Nature	*Unmarked or buried heritage sites.*	
Extent	*Provincial (3)*	
Probability	*Possible (2)*	
Reversibility	*Partly Reversible (2)*	
Irreplaceable loss of resources	*Significant loss of resources (3)*	
Duration	*Medium term (2)*	
Cumulative effect	*Medium cumulative effect (3)*	
Intensity/magnitude	*Medium (2)*	
Significance Rating of Potential Impact	*30 points. The impact will have a medium negative impact rating.*	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	3	2
Probability	2	1
Reversibility	2	2
Irreplaceable loss	3	1
Duration	2	2
Cumulative effect	3	1
Intensity/magnitude	2	1
Significance rating	30 (medium negative)	8 (low negative)
Mitigation measure	*Should any unmarked sites or subterranean sites be encountered, the chance finds protocol contained in this report should be followed.*	

9.2 Gravesites and Cemeteries: Site 001

IMPACT TABLE FORMAT	
Issue/Impact/Heritage Impact/Nature	*Alberts Family Graves*
Extent	*Provincial (3)*
Probability	*Possible (2)*
Reversibility	*Partly Reversible (2)*
Irreplaceable loss of resources	*Significant loss of resources (3)*
Duration	*Medium term (2)*

Cumulative effect	*Medium cumulative effect (3)*	
Intensity/magnitude	*Medium (2)*	
Significance Rating of Potential Impact	*30 points. The impact will have a medium negative impact rating.*	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	3	2
Probability	2	1
Reversibility	2	2
Irreplaceable loss	3	1
Duration	2	2
Cumulative effect	3	1
Intensity/magnitude	2	1
Significance rating	30 (medium negative)	8 (low negative)
Mitigation measure	*Should any unmarked graves be encountered, the chance finds protocol contained in this report should be followed. Known burial sites and cemeteries should be marked on the development map and avoided by a margin of at least 25m.*	

9.3 Alberts Farms Dam Wall

IMPACT TABLE FORMAT		
Issue/Impact/Heritage Impact/Nature	*Rehabilitation of the Alberts Farms Dam Wall*	
Extent	*Provincial (3)*	
Probability	*Possible (2)*	
Reversibility	*Partly Reversible (2)*	
Irreplaceable loss of resources	*Significant loss of resources (3)*	
Duration	*Medium term (2)*	
Cumulative effect	*Medium cumulative effect (3)*	
Intensity/magnitude	*Medium (2)*	
Significance Rating of Potential Impact	*30 points. The impact will have a medium negative impact rating.*	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	3	2
Probability	2	1
Reversibility	2	2
Irreplaceable loss	3	1
Duration	2	2
Cumulative effect	3	1
Intensity/magnitude	2	1
Significance rating	30 (medium negative)	8 (low negative)

Mitigation measure	*Due to this historic character of the dam wall as well as its high heritage significance it is recommended that the site be subjected to a second phase of documentation before any alterations are made. A permit for the work will also need to be applied for by the developer. Furthermore, it is recommended that the construction work be periodically monitored by an experienced heritage practitioner.*

9.4 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. Pump stations will also be of low profile and will therefore have a minimum of impact.

9.5 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 Basic Assessment will result in the identification of any intangible sites of heritage potential.

10. Assessment of Impacts (Impact Statement)

10.1 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 Barberton Greenstones	Yes	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	- 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	Yes	Yes
4 Historic Farmland	These possess distinctive patterns of settlement and historical features such as:	Yes	Yes

	- 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.		
5 Historic rural town	- Historic mission settlements - Historic townscapes	Yes	Yes
6 Pristine natural landscape	- Historical patterns of access to a natural amenity - Formally proclaimed nature reserves - Evidence of pre-colonial occupation - Scenic resources, e.g. view corridors, viewing sites, visual edges, visual linkages - Historical structures/settlements older than 60 years - Pre-colonial or historical burial sites - Geological sites of cultural significance.	No	No
7 Relic Landscape	- Past farming settlements - Past industrial sites - Places of isolation related to attitudes to medical treatment - Battle sites - Sites of displacement,	Yes	Yes
8 Burial grounds and grave sites	- 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	Yes
9 Associated Landscapes	- 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	- 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	No	No

	- Colonial period archaeology		
11 Historic institutions	- Historical prisons - Hospital sites - Historical school/reformatory sites - Military bases	No	No
12 Scenic visual	- Scenic routes	No	No
13 Amenity landscape	- View sheds - View points - Views to and from - Gateway conditions - Distinctive representative landscape conditions - Scenic corridors	No	No

Mitigation

It is recommended that the development designs take into account the positive and negative characteristics of the existing cultural landscape type and that they endeavor to promote the positive aspects while at the same time mitigating the negative aspects.

11. Chance Finds Protocol

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.

12. Conclusion

Proposed Repairs and Upgrades of the Alberts Farm Dam Wall, situated in Greymont, Johannesburg North, City of Johannesburg Metropolitan Municipality, Gauteng Province was investigated during a field visit and through archival studies.

The park was found to be of significant historic value, although much of the material fabric has been lost over the last 40 years. The remaining historic aspects of the park should be respected, and the proposed development should not impact negatively on these.

The area was investigated during a field visit and through archival studies. The indicated graveyard and individual graves should be marked and avoided by at least a 25m buffer during the construction.

Palaeontological Impacts are not anticipated as no excavations are planned for the dam wall rehabilitation. Where material sources are utilised, these should be sourced from existing borrow pits.

The dam wall itself (which is the focus of the project) has significant heritage value. It is a unique example of post war Boer engineering. It is recommended that the original dam wall be subjected to a second phase of documentation before any work commences. Due to its historic value, a permit for any alterations to the dam wall will have to be applied for through SAHRA and the Gauteng Provincial Heritage Resources Agency's Built Environment Committee.

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

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

13. References Cited & Researched

Ahler, S.A. 1977. Functional analysis of nonobsidian chipped stone artefacts: terms, variables and quantification. In: Hayden, B. (ed.). Lithic use-wear analysis: 301-328. New York: Academic Press.

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)

Department of Arts, Culture, Science and Technology, (1996). White Paper on Arts, Culture and Heritage. Pretoria: SA Communication Service.

DEAT, (1998). White Paper on environmental management policy for South Africa. Government Gazette, Vol 395, No 18894, 15 May 1998.

De Jong, R. 1992. Policy guidelines for cultural resource management in nature conservation and forestry areas in South Africa.

Department of Public Works, (1998), White Paper 1997. Public Works towards the 21st century. Government Gazette, Vol 391, No 18616, 14 January 1998.

Desmond, C: The Discarded People. Penguin, Harmondsworth 1971.

Dreyer, C. 2008. Archaeological and Cultural Heritage Assessment of the Proposed Residential Developments at Namahadi (Frankfort), Free State.

Entries on towns in the *Standard Encyclopedia of Southern Africa*, published by Nasou, 1970-1976 (11 volumes).

Galla, A, (1996), Shifting the paradigm. A plan to diversify heritage practice in South Africa. Cape Town: South African Museums Association.

General Information for archaeologists and palaeontologists on the National Heritage Resources Act (No 25 of 1999).

Greenfield, H. J. and van Schalkwyk, L. O. 2003. Intr a- settlement social and economic organization of Early Iron Age farming communities in southern Africa: view from Ndondondwane. Azania, 38: 121-37.

Government Gazette, Vol 391, No 18616, 14 January 1998.

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.

Huffman, T. N. 1993. Broederstroom and the Central Cattle Pattern. South African Journal of Science, 89: 220-26.

Huffman, T. N. 2001. The Central Cattle Pattern and interpreting the past. Southern African Humanities, 13: 19-35.

Huffman, T.N. 2007. Handbook to the Iron Age: The archaeology of pre-colonial societies in southern Africa. Scottsville: University of Kwa-Zulu Natal Press.

Japha, D., Japha, V., Le grange, L & Todeschini, F. Mission Settlements in South Africa: A Report on their historical background and prospects for conservation. University of Cape Town.

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

Kent, S. 1998. Invisible gender-invisible foragers: hunter-gatherer spatial patterning and the southern African archaeological record. In: Kent, S. (ed.) Gender in African prehistory: 39-67. California: Altamira Press.

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

Maggs, T.M. 1976. Iron Age communities of the southern Highveld. Pietermaritzburg: Natal Museum.

Maggs, T. O. 1984c. The Iron Age south of the Zambezi. In Southern African Prehistory and Paleoenvironments (ed. R. Klein). Rotterdam: Balken, pp. 329-60.

Maggs, T. O. 1995. The Early Iron Age in the extreme south: some patterns and problems. Azania, 29/30: 171-8.

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

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

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

Mitchell, P. 2002. The archaeology of southern Africa. Cambridge: Cambridge University Press.

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

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

National Heritage Resources Act (No. 25 of 1999).

National Heritage Resources Act (No 25 of 1999). 2002. Regulations.

Platzky, L.; Walker, C: The Surplus People: Forced Removals in South Africa. Ravan Press, Johannesburg 1985.

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

Sampson, C.G. 1972. The Stone Age Industries of the Orange River Scheme andSouth Africa. National Museum, Bloemfontein: Memoir no. 6.

Schoeman, K. 1982. Vrystaatse Erfenis: Bouwerk en geboue in die 19e eeu. Cape Town: Human & Rousseau.

Smith, A.B. 1995. Archaeological Observations along the Orange River and its Hinterland. In A.B. Smith (ed.) Einiqua/and, pp. 265 - 300. Rondebosch, UCT Press.

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

The City of Germiston: Official Guide, (1957). Germiston: Publicity Association.

Theal, G.M. 1915. History of South Africa from 1795 to 1884. Allen & Unwin, London.

Ewer R.F. 1956. *The Dating of the Australopithecinae: Faunal Evidence*. The South African Archaeological Bulletin Vol. 11, No. 42 (Jun., 1956), pp. 41-45

Thorp, C.R. 1996. A preliminary report on evidence of interaction between hunter-gatherers and farmers along a hypothesized frontier in the eastern Free State. The South African Archaeological Bulletin, 51: 57-63.

Val, A; Taru P; Steininger, C; 2014. *NEW TAPHONOMIC ANALYSIS OF LARGE-BODIED PRIMATE ASSEMBLAGE FROM COOPER'S D, BLOUBANK VALLEY, SOUTH AFRICA*. The South African Archaeological Bulletin, Vol. 69, No. 199 (JUNE 2014), pp. 49-58

Webley, L. 1990. The use of stone 'scrapers' by semi-sedentary pastoralist groups in Namaqualand, South Africa. South African Archaeological Bulletin 45:28-32.

Walton, J. 1953. An Early Fokeng-Hlakoana Settlement at Metlaeeng, Basutoland. The South African Archaeological Bulletin, 8 (29): 3 – 11.

Webley, L.; Lanham, J. & Miller, D. March 2010. Scoping Heritage Impact Assessment: Proposed prospecting on 20* farms in the Olifantshoek and Kuruman areas of the Northern Cape.