


Heritage Impact Assessment Report

HERITAGE IMPACT ASSESSMENT REPORT FOR THE
PROPOSED ASBESTOS CEMENT PIPELINE
REPLACEMENT IN ANNADALE WITHIN THE
POLOKWANE LOCAL MUNICIPALITY, LIMPOPO
PROVINCE.

PREPARED BY:



PREPARED FOR:

 <p>LILIBARA PROJECTS CIVIL ENGINEERING CONSULTANTS AND PROJECT MANAGERS</p>	<p>Lilibara Projects (Pty) Ltd 60 Kyalami Boulevard, Kyalami Business Park, Kyalami, 1684 96 President Reitz Avenue, Westdene, Bloemfontein, 9301 PO Box 627, Halfway House, 1685 Tel: +27 (0) 87 654 0099 Fax: +27 (0) 11 466 8804</p>
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CREDIT SHEET

Project Director

STEPHAN GAIGHER (BA Hons, Archaeology, UP)

Principal Investigator for G&A Heritage

Member of ASAPA (Site Director Status)

Tel: (015) 516 1561

Cell: 073 752 6583

E-mail: stephan@gaheritage.co.za

Website: www.gaheritage.co.za

Report Author

STEPHAN GAIGHER

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

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 AC Pipeline Replacement in Annadale, within the Polokwane Local Municipality, Limpopo Province.

Municipal Area: Polokwane Local Municipality, which falls within the Capricorn District Municipality.

Developer: City of Polokwane Metropolitan Municipality.

Consultant: G&A Heritage, PO Box 522, Louis Trichardt, 0920, South Africa.
38A Vorster St, Louis Trichardt, 0920

Date of Report: 20 September 2017

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 AC Pipeline Replacement in Annadale with the Polokwane Local Municipality, Limpopo Province.

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

Scope of Work

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

The following are the required to perform the assessment:

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

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

Findings & Recommendations

No sites of Heritage Significance were identified. Subterranean sites could still be present and could be unearthed during the excavation phase, Management recommendations found in this report should be adhered to in such cases.

Fatal Flaws

No fatal flaws were identified.

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LIST OF ABBREVIATIONS

AC	Asbestos Cement
Bp.....	Before Present
CSP	Concentrating Solar Power
EIA	Early Iron Age
ESA.....	Early Stone Age
Fm	Femtometre (10^{-15} m)
GPS.....	Geographic Positioning System
HIA	Heritage Impact Assessment
LIA.....	Late Iron Age
LSA	Late Stone Age
MYA	Million Years Ago
MSA	Middle Stone Age
NHRA.....	National Heritage Resources Act no 22 of 1999
SAHRA.....	South African Heritage Resource Agency
S&EIR	Scoping & Environmental Impact Reporting
Um.....	Micrometre (10^{-6} m)
WGS 84	World Geodetic System for 1984

HERITAGE IMPACT REPORT

HERITAGE IMPACT ASSESSMENT REPORT FOR THE PROPOSED AC PIPELINE REPLACE IN ANNADALE, WITHIN THE POLOKWANE LOCAL MUNICIPALITY, LIMPOPO PROVINCE.

INTRODUCTION

Legislation and methodology

G&A Heritage was appointed by Lilibara Projects (Pty) Ltd. to undertake a heritage impact assessment for the proposed.

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

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

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

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

In 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 Lilibara Projects (Pty) Ltd 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.
- Heavy grass growth inhibited the identification of finds in many areas.

Table 1. Impacts on the NHRA Sections

Act	Section	Description	Possible Impact	Action
National Heritage Resources Act (NHRA)	34	Preservation of buildings older than 60 years	No impact	None
	35	Archaeological, paleontological and meteor sites	Yes	None
	36	Graves and burial sites	Yes	Mitigation
	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.	Yes	AC Pipeline Replacement in Annadale, Polokwane
Construction of a bridge or similar structure exceeding 50m in length.	No	N/A
Development exceeding 5000 m ²	No	N/A
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

BACKGROUND INFORMATION

PROPOSED AC PIPELINE REPLACEMENT IN ANNADALE

The project is located in Annadale in the Polokwane Municipality in the Limpopo Province and covers approximately 44 Ha. The Polokwane Municipality falls under the jurisdiction of the Capricorn District Municipality.

Annadale is predominantly a residential area, but also has businesses and light industries.

The project scope includes for the replacement of approximately 24 400 m of Asbestos Cement (AC) pipes in the existing Annadale water reticulation network. The AC pipes being replaced vary in diameter from 90 mm to 300 mm. The upgraded network will comprise of uPVC pipes varying in diameter from 160 mm up to 450 mm. The other associated activities include installation of various valves sizes and hydrants. The new pipes are being laid in the road reserve parallel to the existing AC pipes. The existing AC pipes will be decommissioned and left in the ground for health reasons.

PROJECT DESCRIPTION

Replacement of existing pipeline with upgraded cement pipes.

SITE LOCATION



Figure 1. Annadale Pipeline

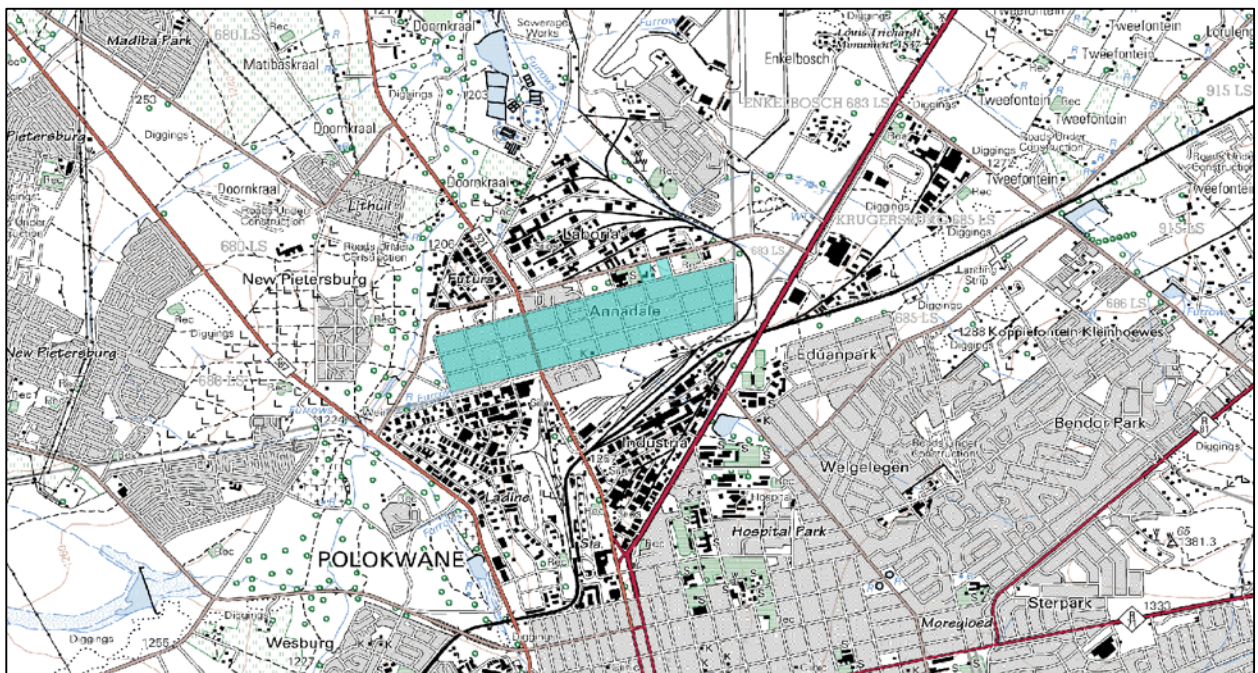


Figure 2. Site Location: Topographical Map 2329 CD 2008



Figure 3. Annadale Drawings

ALTERNATIVES CONSIDERED

No Alternative was considered for the site of the proposed upgrade to the existing pipeline in Annadale, Polokwane.

GPS TRACK PATHS

Due to the linear nature of the development, following the existing roads, the survey route closely follows the indicated pipeline route and it is therefore not necessary to recreate it here. GPX files are available on request from G&A Heritage

HERITAGE INDICATORS WITHIN THE RECEIVING ENVIRONMENT

REGIONAL CULTURAL CONTEXT

PALEONTOLOGY

The paleontology of areas close to Mokopane has been extensively researched. The discovery of the Makapansgat Cave Deposits put this area on the forefront of paleontology worldwide. The rule of “absence of evidence is not evidence of absence” should be applied to this area. Taken the rich paleontology south of Polokwane it is conceivable that similar finds could be made in this area. The palaeontology of this area should form the basis of a dedicated palaeontological impact assessment.

STONE AGE

No substantial number of Stone Age sites from any period of the Stone Age is known to exist in this specific area – primarily as a result of a lack of research and general ignorance amongst the layman in recognizing stone tools that often may occur on the surface of the earth. However, it is possible that the first humans in the Polokwane area may have been preceded by Homo erectus, who roamed large parts of the world during the Acheulian period of the Early Stone Age, 500 000 years ago. The forbear of H. erectus, Australopithecus, considered to be the earliest ancestor of humans, lived in the Blaauwbank Valley around Krugersdorp (today part of the Cradle of Humankind – a World Heritage Site) several million years ago (Robinson & Mason, 1962).

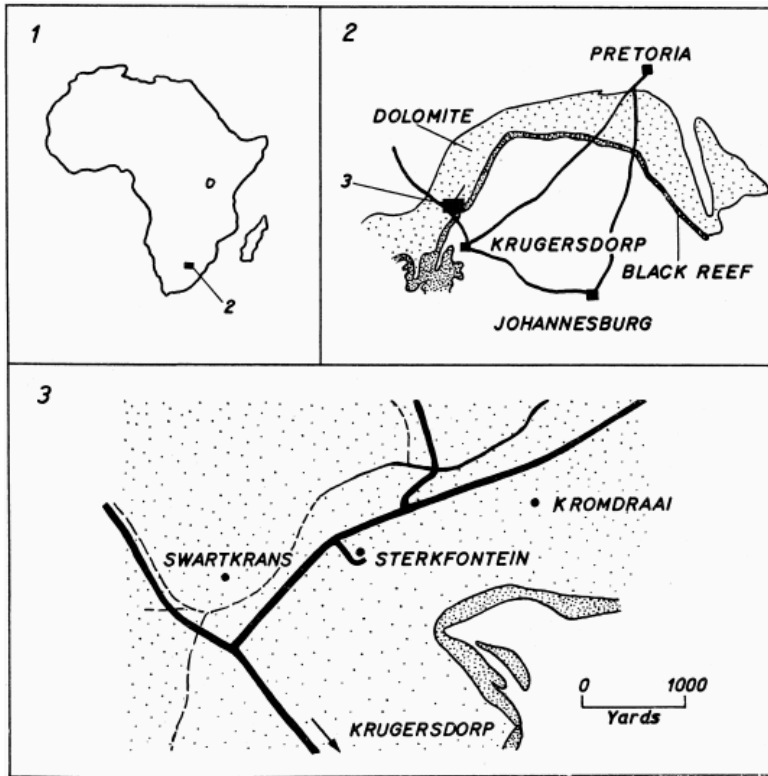


Figure 4. The dolomite band and important Stone Age sites (Mason, 1961)

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. (Freaan, 1961).

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 the Polokwane area.

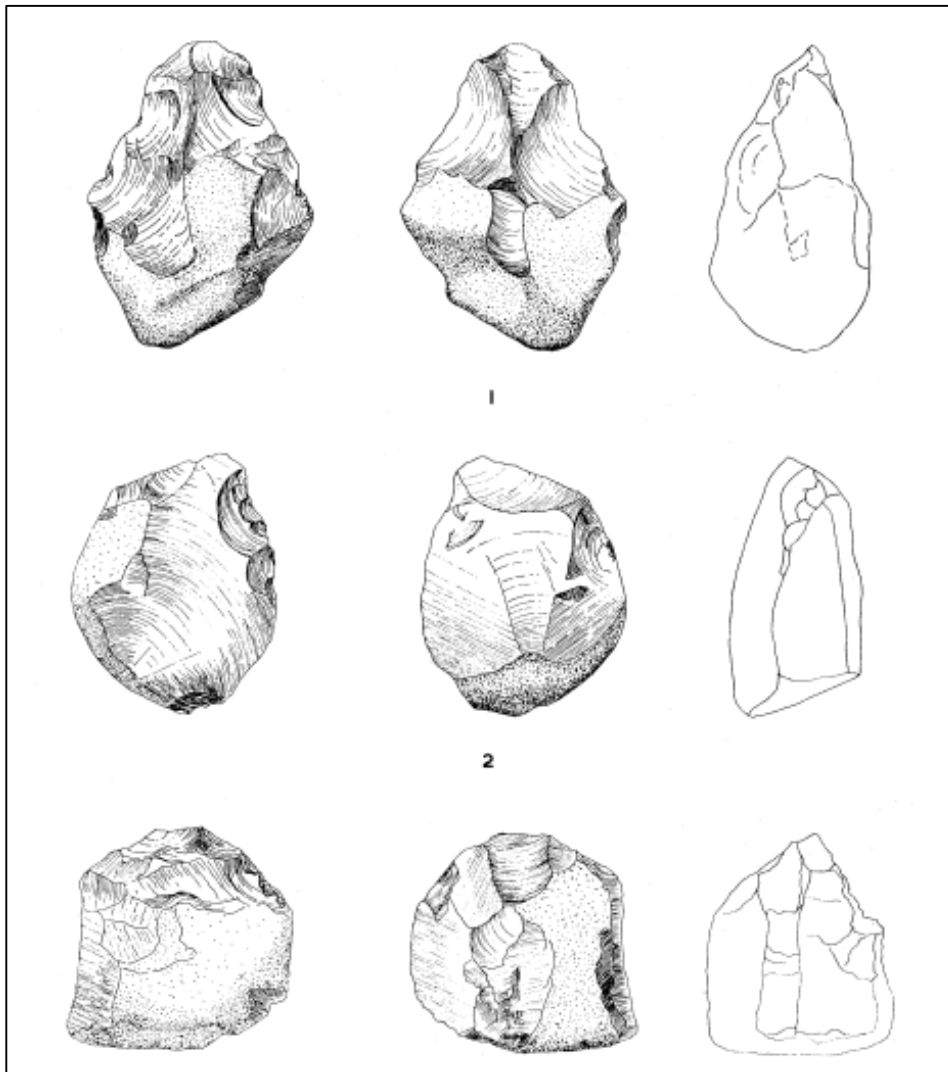


Figure 5. Stone Tools from Sterkfontein (Mason, 1961)

Stone Age hunter-gatherers lived well into the 19th century in some places in SA, but may not have been present in the Polokwane area when the first European colonists crossed the Vaal River during the early part of the 19th century. Stone Age sites may occur all over the area where an unknown number may have been obliterated by mining activities, urbanization, industrialization, agriculture and other development activities during the past decades (Mason, 1961).

IRON AGE

The Iron Age sequence is divided into the Early Iron Age (200 – 1400 BP) and the Late Iron Age (1400 – 1900 BP). Prominent Early Iron Age sites of the Lydenburg era has been identified close to Burgersfort (Matlakala AIA, AINP 2003).

The main Iron Age sequence is however associated with the Bapedi group in this area. Much of the historic structures found in the area can also be attributed to this cultural group. The death of the great Bapedi chief Thulare¹ temporarily halted the growth of Bapedi power and influence which had been steadily increasing in the north-eastern Transvaal, and the appearance on the scene of the dreaded Matabele shortly after his death marked the beginning of a long struggle by the Bapedi to maintain their identity and independence, a struggle which ended with their defeat at the hands of Sir Garnet Wolseley's expeditionary force in November 1879.

The Matabele overwhelmed the Bapedi, and all Thulare's sons, with the exception of Sekwati, were killed. Sekwati fled with the remnants of the tribe across the Olifants River, while the Matabele remained in the country for a year, denuding it of cattle and grain (Wolseley 1881).

For four years Sekwati and his followers wandered around the Zoutpansberg and Blaauwberg, raiding small kraals, capturing women and cattle. They then returned across the Olifants River and re-established their ascendancy in that part of the country, although not without meeting resistance. The tribal stronghold was established at Phiring, which later became Magalies location. Here the Bapedi were attacked by both Zulu and Swazi impis, but they resisted successfully with their traditional method of fighting, by withdrawing to their mountain fastness, waging a defensive war and refusing to meet the enemy in a pitched battle in the open. Although he had repulsed the Zulus, Sekwati realized that they were the biggest threat to Bapedi security, and every year thereafter he sent them presents in order to placate them and remain on friendly terms. For this reason Cetshwayo regarded the Bapedi as his subjects, his 'dogs'. The Swazis too, despite their unsuccessful attack on the Bapedi, regarded them as their subjects, although the Bapedi themselves did not recognize this overlordship (SA History website).

When Andries Hendrik Potgieter and his Boer adherents moved to the Eastern Transvaal in 1845 and founded Ohrigstad, they wanted a legal title to the ground they occupied. Potgieter arranged a meeting with Sekwati, and on 5 July 1845 a vredenstractaat was signed. This treaty later disappeared, but in all probability Sekwati granted the land. A rival group of Boers would not recognize this grant, since it placed Potgieter in too strong a position. They approached Sekwati, who told them that he could not sell the land to the east of the Steelpoort because he had already given it away. This group then decided to purchase from the Swazis the land, including that to the west of the Steelpoort, on which the Bapedi lived, as they were under the impression that the Swazis had conquered the Bapedi, and that Sekwati had acknowledged himself a Swazi subject. The Swazis had no scruples in 'selling' the land to the Boers, even offering to drive the Bapedi away first so that they could hand over an empty land. In the eyes of the Boers this purchase made Sekwati their subject (SA History website).

The Bapedi alarmed their Boer neighbours, who decided that the tribe must be defeated and disarmed before it became too late. In September 1852 a twenty-four-day siege was laid to Phiring, after an initial charge had failed to dislodge the Bapedi. Although the defenders were reduced to sucking the liquid from the stomachs of cattle that had died, the Boers retired without having captured the stronghold. An uneasy peace followed this attack, and cattle raids on Boer farms continued, while Sekwati moved the tribal fastness from Phiring to Mosega, a site beneath the eastern slope of the Lulu Mountains. In November 1857 an agreement was signed between Sekwati and the Boers.

Sekwati died on 20 September 1861. It was expected by the tribe that Mampuru would succeed him, but Sekhukhune with some of his followers seized the stat, killing Mampuru's supporters. Mampuru himself escaped and found refuge with the Swazis.

At first there was little indication that the new chief would depart from the peaceful policy his father had inaugurated in 1857. He recognized the Steelpoort as the boundary, and asked the Boers to protect him from any Zulu or Swazi attacks; he was well-disposed towards the Rev. A. Merensky, who had established a mission station, Kahalatlolu, only a few months before Sekwati's death.

During this period the number of people under Sekhukhune's rule increased rapidly. An estimate of 1879 established their total at 75,000, of whom 15,000 were capable of bearing arms. This included many neighbouring tribes who had been persuaded to declare themselves loyal to Sekhukhune.

As the Bapedi population grew, it became increasingly difficult to maintain so many people on the land between the Steelpoort and Olifants Rivers. Sekhukhune determined to expand eastwards; this was made possible by the old policy of cattle raids and infiltration into Boer farms across the Steelpoort. As the Boers abandoned their farms in consequence of the fever and Bapedi cattle rustlers, Africans occupied this land. As more tribes gave him their allegiance, Sekhukhune began thinking of a domain stretching from the Zoutpansberg in the north to the Vaal River in the south (SA History website).

THE HISTORIC ERA

Date	Description
1830's - 1840's	In 1835 a large group of Pioneers, the Voortrekkers, started the "Groot Trek". More than 10 000 Boers, with their families, started the mass exodus north and northeast. The trek was organized in resistance to the politics of the Cape Colony Government.
1830's - 1840's	The Boers established the Orange Free State and Transvaal (which would later become the South African Republic), independent states.
1830's - 1840's	Two groups of Voortrekkers, under the leaders, Hans van Rensburg and Louis Tregardt, were the first to leave the Colony into rugged, uncharted terrain. A stressed relationship between the two groups resulted in a split after a disagreement at Strydpoort near the Olifants River.
1830's - 1840's	The group under Louis Tregardt set up camp near the Zoutpansberg salt pans (approximately 100km north of present day Polokwane). They stayed at this settlement for a year where unhealthy conditions took its toll on the Voortrekkers and their cattle. Tregardt moved his camp east to the present day Schoemansdal. Voortrekker leader, Andries Potgieter and his party were meant to join Louis Tregardt's group, but were held up by skirmishes and therefore Tregardt's group decided to continue their trek to Delagoa Bay (present day Maputo) on their own.
1830's - 1840's	Hans van Rensburg's group continued on towards Delagoa Bay from Strydpoort, but when it was realized the trek could not be achieved with ox-wagons, their route was altered. They now aimed for Inhambane instead. The group was attacked and all but two children were killed by a native Soshangane troop at a ford in the Limpopo River. The children were taken by a warrior but later died of malaria.
1830's - 1860's	The Voortrekkers, under the command of Andries Hendrik Potgieter, establishes the first Afrikaner settlement at Ohrigstad and owing to a malaria outbreak, the town had to be abandoned. The group moved on and settled on the site where Louis Tregardt's group had camped. Zoutpansbergdorp was established, later renamed Schoemansdal. Andries Potgieter passed away here in 1852. The Venda leader, Magato drove them out of Schoemansdal in 1867.
1850's	After Potgieter's death, his son, also named Piet Potgieter, succeeded him. In a violent clash with Chief Makapaan, Piet's brother, Hermanus, was killed. Potgieter mobilised a command and besieged a cave where Makapaan was hiding. Both Makapaan and Potgieter were killed in the battle. The settlement, Vredenburg was renamed Pietpotgietersrus in honour of the leader. The name was later changed to Potgietersrus (renamed to Mokopane in 2003) and is the neighbouring town to Pietersburg.
1870's	Gold is discovered on the farm Eersteling, just south of present day Polokwane and prospectors came to the area to take advantage of the opportunities in gold mining. The Transvaal Goldfields were discovered as a result of the prospectors branching out their explorations.
1880's	The "Schoemansdallers" settle at Marabastad and suggests that a formal settlement be established. However Petrus (Piet) Jacobus Joubert decides to settle at the farm Sterkloop and a town is founded and named Pietersburg.
1900's	By 1904 Pietersburg had a population of 3276 persons. The growth was due to, of course, the gold industry. During the Second Boer war, the British occupied Pretoria and Pietersburg was the capital of the Transvaal for a few weeks. In this time bank notes were printed there. The town residents built churches and the railway from Pretoria is opened.
1900's	The British occupy Pietersburg in 1901. A concentration camp is erected to incarcerate the Afrikaans women and children, as well as many of the black people who were employed by the Afrikaners.
1900's	The Polokwane cricket club is founded in 1902 and is one of the oldest in the country.

1900's	Pietersburg has an active Jewish community and the Pietersburg-Zoutpansberg Zionist Society builds a communal hall in 1921 and a synagogue in 1953.
1940's	The National Party (NP) came to power in South Africa and D.F. Malan was elected Prime Minister. Tom Naude, Pietersburg's Member of Parliament, was elected to Malan's cabinet. His brother, Dap Naude, served as Pietersburg's mayor in 1947 - 1949 and again in 1951.
1950's - 1960's	Prior to the 1950's, Indian and coloured people were not restricted to live in town, but thereafter the process of unscrambling the races began. Locations were set-aside for the black people (Mankweng, Moletsi, Nanedi, Sebayang / Solomondale and new Pietersburg - just 6 km outside the city centre), the coloured people were moved to Westernburg and the Indians to Nirvana.
1950's	A college for the black community was established on the farm Turfloop. The University of the North opened its doors on 1 August 1959 with Prof. E.F. Potgieter as the first rector.
1950's	Pietersburg saw its first female mayor in 1959, M.E. (Lien) Grimm.
1960's	The Rapportryers of Pietersburg made history when at a function, they had a black speaker from the University of the North, Sociologist, D.E. Mabudafhasi delivers a lecture on the cultural differences between blacks and whites.
1960's	Tom Naude was made acting State President when T.R. Donges passed away in 1967, serving until J.J. Fouche was elected in 1968. Tom Naude was awarded a doctorate from the University of Pretoria. When Naude passed away on Republic Day in 1969, he was given a state funeral, the largest funeral ever in town. SA Air Forces planes flew in formation and military bands marched in street processions.
1960's	Ian Smith declared independence in 1967 and many people from Rhodesia made their way to South Africa and in particular, Pietersburg.
1970's	Radical student activities started when the Black Consciousness Movement was born in a hostel at the University of the North.
1970 - 1980's	The unrest in Soweto had its effects on Pietersburg. Many parents sent their children from Soweto to schools in the area because in the aftermath of the crises, schooling had more or less ceased.
Early 2000's	Pietersburg is renamed Polokwane, meaning "Place of Safety". It is the capital of the Limpopo Province.
2007 - 2009	At the 52nd National Conference of the ANC (which was held in Polokwane from 16 - 20 December 2007), the party elected Jacob Zuma to its top leadership and National Executive Committee after a rivalry between him and Pres. Thabo Mbeki. It was the first leadership contest between two candidates at national level since the 38th National Conference in 1949. Pres. Thabo Mbeki resigned of the presidency on 20 September 2008 and was replaced by Zuma's deputy, Kgalema Motlanthe. Jacob Zuma was elected President of the country in the general election in 2009.
2010	Polokwane is a host city of the FIFA World Cup.

Sources:

<http://www.sahistory.org.za>

<http://www.voortrekker-history.co.za>

<http://www.polokwane.gov.za>

<http://www.southafrica.com/limpopo/polokwane/eersteling-monument/>

Ransford, Olivier. 3: The Voorste Mense". The Great Trek.

Changuion, Louis: Pietersburg. Die Eerste Eeu 1886-1986: Stadsraad van Pietersburg 1986

POSITIONING CIVIL SOCIETY POST-POLOKWANE: COMING TO TERMS WITH ANC POLITICAL LEADERSHIP CHANGES.

Maxine Reitzes, Centre for Policy Studies Research Associate

Fiona White, Centre for Policy Studies Senior Researcher

CULTURAL LANDSCAPE
Urban and Industrial.



Figure 6. General Landscape of the Study Area (Bulawayo Street, Polokwane)



Figure 7. General Landscape of the Study Area (Spelonken Street, Polokwane)



Figure 8. Substation located on Railway Street, Polokwane

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.

- Roodt, H. 2013. Phase 1 HIA. Proposed Private Hospital Site, Polokwane. Portion 175 of the farm Tweefontein 915 LS, Limpopo.
- Roodt, F. 2013. Phase 1 Heritage Resources Impact Assessment (Scoping & Evaluation) proposed new Residential Development.
- Stegman, L. 2013. Phase I HIA. ESTABLISHMENT OF A MOTORCITY AND ASSOCIATED 11KV UNDERGROUND POWER CABLE AT POLOKWANE, LIMPOPO.
- Pistorius, JCC. 2010. A Phase 1 Heritage Impact Assessment (HIA) study for eskom's proposed 132KV power line running between the Witkop and Pietersburg substations near Polokwane in the Limpopo Province of South Africa.
- Roodt, F. 2010. Phase 1 Heritage Resources Impact Assessment (Scoping and Evaluation) proposed new residential development, Polokwane, Limpopo.
- Roodt, F. 2008. Phase 1 Heritage Resource Impact Assessment (Scoping & Evaluation) Truck Stop Polokwane, Limpopo: Statement with Regard to Heritage Resources Management.
- Gaigher, S. 2007. Heritage Impact Assessment for the Proposed Residential Development at the Farm Tweefontein near Polokwane Limpopo.

HISTORICAL MAPS

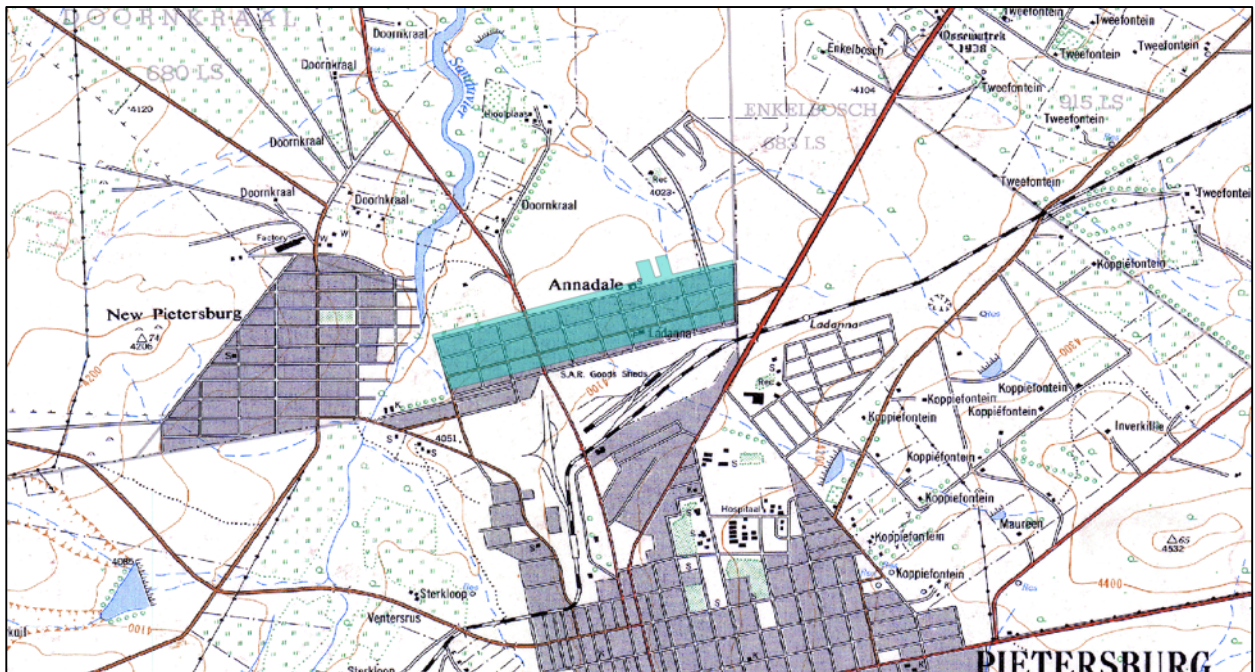


Figure 9. Historical Map: 2329 CD 1968

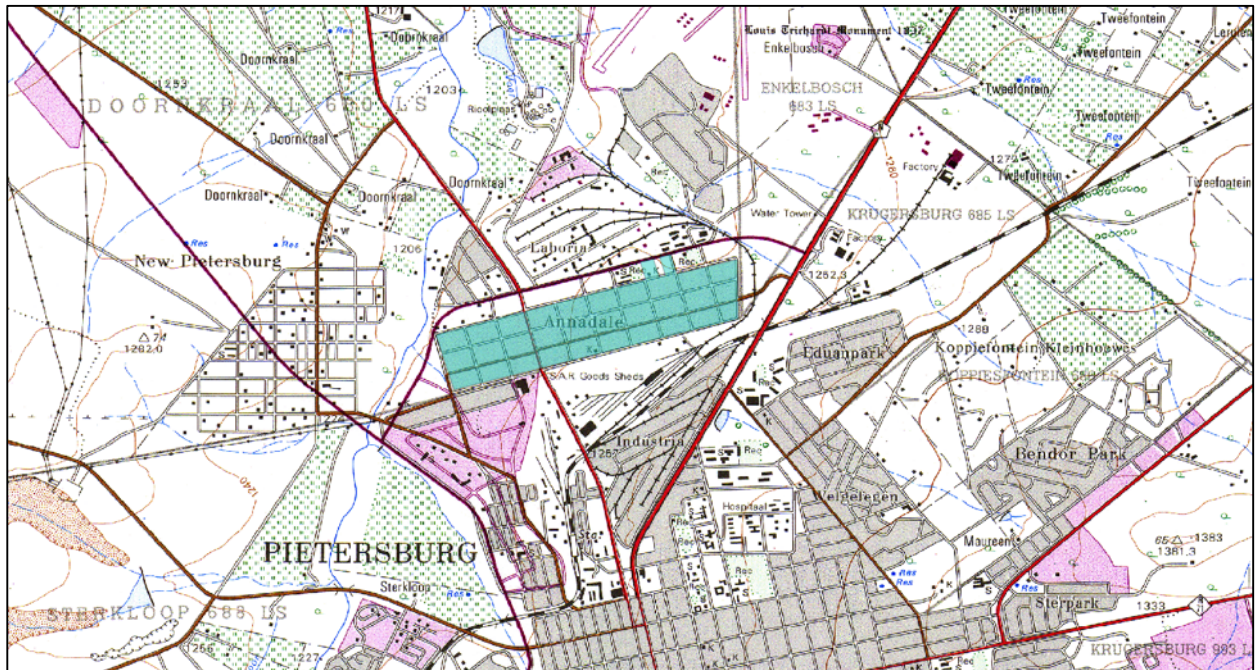


Figure 10. Historical Map: 2329 CD 1997

None of the historic maps shows any structures or features that could be of historic nature or significance.

FINDINGS

No sites of heritage significance were found. It should be noted that the development falls within an area that has undergone severe alteration in the recent past. Very little surface remains have been left in tact due to the urban development in the area. Any possible surface indicators of subterranean sites would have been obliterated in the recent past.

METHODOLOGY

This study defines the heritage component of the EIA process being undertaken for the AC Pipeline Replacement in Annadale within the Polokwane Local Municipality, Limpopo 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.

INVENTORY

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

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

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
- Internet Search
- Historic Maps
- 1968, 1997 and 2008 Surveyor General Topographic Map series
- 1952 1:10 000 aerial photo survey
- Google Earth 2017 imagery
- Published articles and books
- JSTOR Article Archive

FIELDWORK

Fieldwork for this study was performed on the 28th of August 2017. 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 (WGS 84) and a track file in GPX format is available on request.

The study was mainly focused on systematic field surveys of the study area.

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

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

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

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

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

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

MEASURING IMPACTS

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

TYPE OF RESOURCE

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

TYPE OF SIGNIFICANCE

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.

AESTHETIC VALUE

It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group.

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

SCIENTIFIC VALUE

It has potential to yield information that will contribute to an understanding of natural or cultural heritage

- Importance for information contributing to a wider understanding of natural or cultural history by virtue of its use as a research site, teaching site, type locality, reference or benchmark site.
- Importance for information contributing to a wider understanding of the origin of the universe or of the development of the earth.
- Importance for information contributing to a wider understanding of the origin of life; the development of plant or animal species, or the biological or cultural development of hominid or human species.
- Importance for its potential to yield information contributing to a wider understanding of the history of human occupation of the nation, Province, region or locality.
- It is important in demonstrating a high degree of creative or technical achievement at a particular period
- Importance for its technical innovation or achievement.

(a) Does the site contain evidence, which may substantively enhance understanding of culture history, culture process, and other aspects of local and regional prehistory?

- internal stratification and depth
- chronologically sensitive cultural items
- materials for absolute dating
- association with ancient landforms

- quantity and variety of tool type
- distinct intra-site activity areas
- tool types indicative of specific socio-economic or religious activity
- cultural features such as burials, dwellings, hearths, etc.
- diagnostic faunal and floral remains
- exotic cultural items and materials
- uniqueness or representativeness of the site
- integrity of the site

(b) Does the site contain evidence which may be used for experimentation aimed at improving archaeological methods and techniques?

- monitoring impacts from artificial or natural agents
- site preservation or conservation experiments
- data recovery experiments
- sampling experiments
- intra-site spatial analysis

(c) Does the site contain evidence which can make important contributions to 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?

SOCIAL VALUE / PUBLIC SIGNIFICANCE

- It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons
- Importance as a place highly valued by a community or cultural group for reasons of social, cultural, religious, spiritual, symbolic, aesthetic or educational associations.
- Importance in contributing to a community's sense of place.

(a) Does the site have potential for public use in an interpretive, educational or recreational capacity?

- integrity of the site
- technical and economic feasibility of restoration and development for public use
- visibility of cultural features and their ability to be easily interpreted
- accessibility to the public

- opportunities for protection against vandalism
- representativeness and uniqueness of the site
- aesthetics of the local setting
- proximity to established recreation areas
- present and potential land use
- land ownership and administration
- legal and jurisdictional status
- local community attitude toward development

(b) Does the site receive visitation or use by tourists, local residents or school groups?

ETHNIC SIGNIFICANCE

(a) Does the site presently have traditional, social or religious importance to a particular group or community?

- ethnographic or ethno-historic reference
- documented local community recognition or, and concern for, the site

ECONOMIC SIGNIFICANCE

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

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

SCIENTIFIC SIGNIFICANCE

(a) Does the site contain evidence, which may substantively enhance understanding of historic patterns of settlement and land use in a particular locality, regional or larger area?

(b) Does the site contain evidence, which can make important contributions to other scientific disciplines or industry?

HISTORIC SIGNIFICANCE

(a) Is the site associated with the early exploration, settlement, land use, or other aspect of southern Africa's cultural development?

(b) Is the site associated with the life or activities of a particular historic figure, group, organization, or institution that has made a significant contribution to, or impact on, the community, province or nation?

(c) Is the site associated with a particular historic event whether cultural, economic, military, religious, social or political that has made a significant contribution to, or impact on, the community, province or nation?

(d) Is the site associated with a traditional recurring event in the history of the community, province, or nation, such as an annual celebration?

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?

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?

DEGREE OF SIGNIFICANCE

SIGNIFICANCE CRITERIA

There are several kinds of significance, including scientific, public, ethnic, historic and economic, that need to be taken into account when evaluating heritage resources. For any site, explicit criteria are used to measure these values. Checklists of criteria for evaluating pre-contact and post-contact archaeological sites are provided in Appendix B and Appendix C. These checklists are not intended to be exhaustive or inflexible. Innovative approaches to site evaluation which emphasize quantitative analysis and objectivity are encouraged. The process used to derive a measure of relative site significance must be rigorously documented, particularly the system for ranking or weighting various evaluated criteria.

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

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

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

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

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

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

RARITY

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

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

REPRESENTIVITY

- It is important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects.

- Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class.
- Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality.

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

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

ASSESSMENT OF HERITAGE POTENTIAL

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. Deacon, NMC as used in Morris)

Class	Landform	Type 1	Type 2	Type 3
L1	Rocky Surface	Bedrock exposed	Some soil patches	Sandy/grassy patches
L2	Ploughed land	Far from water	In floodplain	On old river terrace
L3	Sandy ground, inland	Far from water	In floodplain or near features such as hill/dune	On old river terrace
L4	Sandy ground, coastal	>1 km from sea	Inland of dune cordon	Near rocky shore
L5	Water-logged deposit	Heavily vegetated	Running water	Sedimentary basin
L6	Developed urban	Heavily built-up with no known record of early settlement	Known early settlement, but buildings have basements	Buildings without extensive basements over known historical sites
L7	Lime/dolomite	>5 myrs	<5000 yrs	Between 5000 yrs and

				5 myrs
L8	Rock shelter	Rocky floor	Loping floor or small area	Flat floor, high ceiling
Class	Archaeological traces	Type 1	Type 2	Type 3
A1	Area previously excavated	Little deposit remaining	More than half deposit remaining	High profile site
A2	Shell of bones visible	Dispersed scatter	Deposit <0.5 m thick	Deposit >0.5 m thick; shell and bone dense
A3	Stone artefacts or stone walling or other feature visible	Dispersed scatter	Deposit <0.5m thick	Deposit >0.5 m thick

Table 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

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.

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

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*).

ARCHAEOLOGICAL SITES

Although some isolated stone tools were observed, none of these represents an archaeological site.

POST-CONTACT SITES

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

BUILT ENVIRONMENT

There is an amount of built environment structures within the study area, such as urban and industrial structures.

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.

DETERMINATION OF SIGNIFICANCE OF IMPACTS

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

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

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.

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		
<p>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:</p> <p>(Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.</p> <p>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.</p>		
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.

ANTICIPATED IMPACT OF THE DEVELOPMENT

AC PIPELINE REPLACEMENT IN ANNADALE, POLOKWANE

IMPACT TABLE FORMAT		
Heritage component	<i>All Heritage Sites</i>	
Issue/Impact/Heritage Impact/Nature	<i>All Heritage Sites</i>	
<i>Extent</i>	<i>Local</i>	
<i>Probability</i>	<i>Unlikely</i>	
<i>Reversibility</i>	<i>Partly Reversible</i>	
<i>Irreplaceable loss of resources</i>	<i>No loss of resources</i>	
<i>Duration</i>	<i>Short term</i>	
<i>Cumulative effect</i>	<i>Low cumulative effect</i>	
<i>Intensity/magnitude</i>	<i>Low</i>	
<i>Significance Rating of Potential Impact</i>	<i>51 points. The impact will have a high negative impact rating.</i>	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	2
Probability	1	1
Reversibility	2	2
Irreplaceable loss	1	1
Duration	1	1
Cumulative effect	1	1
Intensity/magnitude	1	1
Significance rating	8 (low negative)	8 (low negative)
Mitigation measure	<i>None. Guidelines for Subterranean Sites as per report.</i>	

SUB-SURFACE OR UNIDENTIFIED SITES

IMPACT TABLE FORMAT	
Heritage component	<i>Heritage sites of archaeological significance</i>
Issue/Impact/Heritage Impact/Nature	<i>AC Pipeline Replacement</i>
<i>Extent</i>	<i>Local</i>
<i>Probability</i>	<i>Possible</i>
<i>Reversibility</i>	<i>Barely Reversible</i>
<i>Irreplaceable loss of resources</i>	<i>Significant loss of resources</i>
<i>Duration</i>	<i>Long term</i>
<i>Cumulative effect</i>	<i>Low cumulative effect</i>
<i>Intensity/magnitude</i>	<i>High</i>
<i>Significance Rating of Potential Impact</i>	<i>42 points. The impact will have a medium negative impact rating.</i>

	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	2
Probability	2	1
Reversibility	3	2
Irreplaceable loss	3	1
Duration	3	2
Cumulative effect	1	1
Intensity/magnitude	3	1
Significance rating	42 (medium negative)	8 (low negative)
Mitigation measure	<i>Mitigation measures are based on the presence of a monitoring heritage expert during the excavation phase of the planned construction for the project.</i>	

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 obviously high visual impact of this kind of development, the determination of this will be deferred to the contracted VIA specialist. There are however no known heritage sites that will be impacted on visually.

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.

ASSESSMENT OF IMPACTS

IMPACT STATEMENT

BUILT ENVIRONMENT

Some structures associated with rural and urban living were identified;

- Barb-wire fences (modern)
- Pre-cast fences (modern)
- Watering features (agricultural, modern)
- Tarred roads (modern)
- Dirt roads (modern)
- Footpaths
- Houses (modern)
- Substation (modern)

Mitigation

None of the structures will be affected by the pipeline construction activities.

CULTURAL LANDSCAPE

The following landscape types were identified during the study.

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

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

Mitigation

It is recommended that a qualified heritage practitioner be appointed to monitor the excavation phase of the project to ensure that no sub-surface or unidentified sites are damaged.

RESOURCE MANAGEMENT RECOMMENDATIONS

Although it was pointed out that the monument would not be directly affected by the development of the pipeline, it is essential to mention that the monument should not be disturbed or altered during the construction. The monument is a registered National Monument and thus should be protected.

The origins of the vitrified clay fragment could not be explained. Similar fragments have been found at other archaeological sites in the Limpopo Province which could be connected to furnaces for iron reduction and smelting. However, no further archaeological evidence could be found to indicate the presence of any archaeological working activities. No further archaeological work on this site is necessary.

The investigators were not totally convinced that the feature located at site 003 was in fact a grave. The possibility although still exists that it might be a grave and therefore should be avoided. If it is not possible to avoid the site, further investigations are necessary to confirm the existence of the grave. That will provide the information to determine any further actions.

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.

REFERENCES CITED

- Loubser, J.H.N. 1994. Ndebele Archaeology of the Pietersburg Area.
Navorsing van die Nasionale Museum Bloemfontein. (10)2: 61 – 147
Ransford, Olivier. 3: The Voorste Mense, The Great Trek.
Changuion, Louis: Pietersburg. The Eerste Eeu 1886-1986: Stadsraad van Pietersburg 1986
Positioning Civil Society Post-Polokwane: Coming to terms with ANC Political Leadership Changes.
Maxine Reitzes, Centre for Policy Studies Research Associate.
Fiona White, Centre for Policy Studies Senior Researcher
Robinson & Mason 1962
Mason, R. 1961. The South African Archaeological Bulletin, Vol. 39, No. 140 (Dec., 1984), pp. 81-82
Matlakala AIA, AINP, 2003. Unpublished Heritage Report.