


**PHASE 1 ARCHAEOLOGICAL AND HERITAGE IMPACT ASSESSMENT REPORT FOR THE
PROPOSED UPGRADING OF WATER PIPELINES IN EMBALENHLE GOVANI MBEKI LOCAL
MUNICIPALITY, MPUMALANGA PROVINCE.**

DATE: JUNE 2022

Document Information

Item	Description
Proposed development and location	Upgrading of water pipeline in eMbalenhle Govani Mbeki Local Municipality, Mpumalanga Province.
Purpose of the study	To carry out a heritage sensitivity assessment to determine the presence of cultural heritage sites and the impact of the proposed project on heritage resources
1:50 000 Topographic Map	2628CC
Coordinates	See Table 1
Municipalities	Govan Mbeki Local Municipality
Predominant land use of surrounding area	Agriculture, residential and mining
Applicant	 <p>The logo for Rand Water, featuring a stylized blue and cyan wave above the text "RAND WATER" in blue capital letters.</p>
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Date of Report	11 June 2022

NATIONAL LEGISLATION AND REGULATIONS GOVERNING THIS REPORT

This is a specialist report' and is compiled in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014.

DECLARATION OF INDEPENDENCE

In terms of Chapter 5 of the National Environmental Management Act of 1998 specialists involved in Impact Assessment processes must declare their independence.

Trust Mlilo do hereby declare that we are financially and otherwise independent of the client and their consultants, and that all opinions expressed in this document are substantially my own, notwithstanding the fact that we have received fair remuneration from the client for the preparation of this report.

Expertise:

Trust Mlilo, MA. (Archaeology), BA Hons, PDGE, BA & (Univ. of Pretoria) and PhD (Cand. Wits) ASAPA (Professional member) with more than 15 years of experience in archaeological and heritage impact assessment and management. Mr Mlilo is an accredited member of the Association for Southern African Professional Archaeologists (ASAPA), Amafa akwaZulu Natali and Eastern Cape Heritage Resources Agency (ECPHRA). He has conducted more than hundred AIA/HIA Studies, heritage mitigation work and heritage development projects over the past 15 years of service. The completed projects vary from Phase 1 and Phase 2 as well as heritage management work for government, parastatals (Eskom) and several private companies such as BHP Billiton, Rhino Minerals e.t.c.

Independence

The views expressed in this document are the objective, independent views of Mr Trust Mlilo. The survey was carried out under Minenviro Pty Ltd. Integrated Specialist Services (Pty) Ltd has no business, personal, financial, or other interest in the proposed pipeline route apart from fair remuneration for the work performed.

Conditions relating to this report

The content of this report is based on the authors' best scientific and professional knowledge as well as the available information. Integrated Specialist Services (Pty) Ltd reserves the right to modify the report in any way deemed fit should new, relevant or previously unavailable, or undisclosed information becomes known to the author from ongoing research or further work in this field or pertaining to this investigation.

This report must not be altered or added to without the prior written consent of the author, and Minenviro Pty Ltd. This also refers to electronic copies of the report which are supplied for the purposes of inclusion as part of other

reports, including main reports. Similarly, any recommendations, statements, or conclusions drawn from or based on this report must make reference to this report. If these form part of the main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

Authorship: This AIA/HIA Report has been prepared by Mr. Trust Mlilo. The report is for the review of the Heritage Resources Agency (PHRA).


Geographic Co-ordinate Information: Geographic coordinates in this report were obtained using a hand-held Garmin Global Positioning System device. The manufacturer states that these devices are accurate to within +/- 5 m.

Maps: Maps included in this report use data extracted from the NTS Map and Google Earth Pro.

Disclaimer: The Authors are not responsible for omissions and inconsistencies that may result from information not available at the time this report was prepared.

The Archaeological and Heritage Impact Assessment Study was carried out within the context of tangible and intangible cultural heritage resources as defined by the SAHRA Regulations and Guidelines as to the authorisation of the proposed water pipeline upgrade, being proposed by Rand Water.

Signed by



11/ 06/ 2022

Acknowledgments

The author acknowledges Minenviro (Pty) Ltd for the assistance with project information, and the associated project BID as well as for responding to technical queries related to the project.

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EXECUTIVE SUMMARY

Rand Water intends to upgrade the existing water pipelines within eMbalenhle, Govan Mbeki Local Municipality, Highveld Ridge Magisterial District, Mpumalanga Province. This Archaeology and Heritage Impact Assessment (AIA/HIA) is in fulfilment of Section 38 (8) of the National Heritage Resources Act 25 of 1999 (NHRA). This Phase 1 study serves to inform and guide the applicant and contractors about the potential impacts that the proposed upgrade of water pipelines may have on heritage resources (if any) located in the study area. The document must also inform the Mpumalanga Province Heritage Resource Agency (MPHRA) and the South African Heritage Resource Agency (SAHRA) Burial Ground and Graves Unit about the presence, absence and significance of heritage resources that may be located within the proposed development site.

The identification, recording, reporting, and salvaging (if necessary) of significant heritage resources that may occur on the development footprint should be undertaken by a competent heritage practitioner as required by South African heritage legislation. In compliance with the NHRA and Section 39(3)(b) (iii), Minenviro (Pty) Ltd retained Integrated Specialist Services (ISS) to conduct a Phase 1 AIA/HIA of the proposed upgrade of water pipelines in eMbalenhle, Govan Mbeki Local Municipality, Highveld Ridge Magisterial District, Mpumalanga Province.

A stepped approach involving desktop studies, drive-through and detailed field walking was employed in order to identify any heritage landmarks on and around the development footprint. However, it should be noted that the proposed pipeline site is not on pristine grounds, having been previously occupied (see Figure 1). However, when these heritage resources (including graves) are encountered, work must be stopped forth-with, and the finds must be reported to the Mpumalanga Provincial Heritage Resources Agency/SAHRA. However, in terms of the archaeology of the area under study no archaeological remains were identified, as such heritage mitigation will not be required prior to approval of the pipeline upgrade project.

This report must also be submitted to SAHRA for review.

- The findings of this report have been informed by desktop data review, field survey and impact assessment reporting which include recommendations to guide heritage authorities in making decisions with regards to the proposed development.
- The proposed pipeline route is accessible, and the field survey was effective enough to cover most sections of the pipeline route.
- The immediate project area is predominantly mining, agriculture and roads.

The report sets out the potential impacts of the proposed pipeline upgrade development on heritage matters and recommends appropriate safeguard and mitigation measures that are designed to reduce the impacts where appropriate. The report makes the following recommendations:

- The construction team must be inducted on the possibility of encountering archaeological resources that may be accidentally exposed during clearance and excavations of pipeline trenches along the pipeline route in order to ensure appropriate mitigation measures and that course of action is afforded to any chance finds.
- If archaeological materials are uncovered, work must cease immediately and the SAHRA be notified, and activity should not resume until appropriate management provisions are in place.
- The findings of this report, with approval of the SAHRA, may be classified as accessible to any interested and affected parties within the limits of the legislations.

In terms of Section 35 and 36 of the NHRA, the proposed water pipeline development may be approved without any further archaeological investigations. The impacts of the proposed development on the cultural environmental values are not likely to be significant on the entire development site if the Environmental Management Programme (EMPr) includes recommended safeguard and mitigation measures identified in this report.

The assessment reached the following conclusions

- The entire water pipeline route has been heavily disturbed by previous and current agriculture, residential along the proposed pipeline route (see Figure 1).

Recommendations

- The identified municipal cemetery must be preserved in situ and properly mapped before any construction activity commences.
- The planners for the proposed pipeline upgrade must provide for a 30m buffer zone for the recorded cemetery or alternately divert the route to avoid the cemetery completely.
- The proposed pipeline upgrade may be approved to proceed as planned under observation that project work does not extend beyond the surveyed pipeline route.
- Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of the project EMPr, there are no other significant cultural heritage resources barriers to the proposed pipeline upgrade.
- If during development, operational or closure phases of this project, any person employed by the applicant, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance, work must cease at the site of the find and this person must report this find to their immediate supervisor, and through their supervisor to the site manager.
- The Site Manager must then make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area before informing an archaeological practitioner.

- In the event that archaeological materials are unearthed, all construction activities within a radius of at least 30m of such indicator should cease and the area be demarcated by a danger tape. Accordingly, a professional archaeologist should be contacted immediately
- It is the responsibility of the applicant to protect the site from publicity (i.e., media) until a mutual agreement is reached.
- Noteworthy that any measures to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement by MPHRA.
- The applicant is reminded that unavailability of archaeological materials (e.g., pottery, stone tools, remnants of stonewalling, graves, etc.) and fossils does not mean they do not occur, archaeological material might be hidden underground, and as such the client is reminded to take precautions during construction.
- Overall, impacts to heritage resources are not considered to be significant for the project receiving environment. It is thus concluded that the project may be cleared to proceed as planned subject to the Heritage Authority ensuring that detailed heritage monitoring procedures are included in the project EMPr for the construction phase, include chance archaeological finds mitigation procedure in the project EMPr
- It is also advised that the SAHRA/ MPHRA is alerted when work on site begins.
- Strict and clear reporting procedures for chance findings must be followed by and its contractors throughout the whole construction period.

ABBREVIATIONS

AIA	Archaeological Impact Assessment
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
A	Environmental Impact Assessment
EM	Environmental Manager
EMP	Environmental Management Plan
HIA	Heritage Impact Assessment
LIA	Late Iron Age
NHRA	Nation Heritage Resources Act, Act 25 of 1999
PHRA	Provincial Heritage Resources Agency
PM	Project Manager
SAHRA	South African Heritage Resources Agency
SM	Site Manager
ISS	Integrated Specialist Services (Pty) Ltd

KEY CONCEPTS AND TERMS

Periodization

Archaeologists divide the different cultural epochs according to the dominant material finds for the different time periods. This periodization is usually region-specific, such that the same label can have different dates for different areas. This makes it important to clarify and declare the periodization of the area one is studying. These periods are nothing a little more than convenient time brackets because their terminal and commencement are not absolute and there are several instances of overlap. In the present study, relevant archaeological periods are given below;

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

Early Iron Age (~ AD 200 to 1000)

Late Iron Age (~ AD1100-1840)

Historic (~ AD 1840 to 1950, but a Historic building is classified as over 60 years old)

Definitions

Just like periodization, it is also critical to define key terms employed in this study. Most of these terms derive from South African heritage legislation and its ancillary laws, as well as international regulations and norms of best-practice. The following aspects have a direct bearing on the investigation and the resulting report:

Cultural (heritage) resources are all non-physical and physical human-made occurrences, and natural features that are associated with human activity. These can be singular or in groups and include significant sites, structures, features, ecofacts and artefacts of importance associated with the history, architecture, or archaeology of human development.

Cultural significance is determined by means of aesthetic, historic, scientific, social, or spiritual values for past, present, or future generations.

Value is related to concepts such as worth, merit, attraction or appeal, concepts that are associated with the (current) usefulness and condition of a place or an object. Although significance and value are not mutually exclusive, in some cases the place may have a high level of significance but a lower level of value. Often, the evaluation of any feature is based on a combination or balance between the two.

Isolated finds are occurrences of artefacts or other remains that are not in-situ or are located apart from archaeological sites. Although these are noted and recorded, but do not usually constitute the core of an impact assessment, unless if they have intrinsic cultural significance and value.

In-situ refers to material culture and surrounding deposits in their original location and context, for example an archaeological site that has not been disturbed by farming.

Archaeological site/materials are remains or traces of human activity that are in a state of disuse and are in, or on, land and which are older than 100 years, including artefacts, human and hominid remains, and artificial features and structures. According to the National Heritage Resources Act, 1999, (Act No. 25 of 1999), as amended (NHRA), no archaeological artefact, assemblage, or settlement (site) and no historical building or structure older than 60 years may be altered, moved or destroyed without the necessary authorisation from the SAHRA or a provincial heritage resources authority.

Historic material are remains resulting from human activities, which are younger than 100 years, but no longer in use, including artefacts, human remains and artificial features and structures.

Chance finds means archaeological artefacts, features, structures or historical remains accidentally found during development.

A grave is a place of interment (variably referred to as burial) and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place. A grave may occur in isolation or in association with others where upon it is referred to as being situated in a cemetery (contemporary) or burial ground (historic).

A site is a distinct spatial cluster of artefacts, structures, organic and environmental remains, as residues of past human activity.

Heritage Impact Assessment (HIA) refers to the process of identifying, predicting, and assessing the potential positive and negative cultural, social, economic, and biophysical impacts of any proposed project, which requires authorisation of permission by law, and which may significantly affect the cultural and natural heritage resources. Accordingly, an HIA must include recommendations for appropriate mitigation measures for minimising or circumventing negative impacts, measures enhancing the positive aspects of the proposal and heritage management and monitoring measures.

Impact is the positive or negative effects on human well-being and / or on the environment.

Mitigation is the implementation of practical measures to reduce and circumvent adverse impacts or enhance beneficial impacts of an action.

Mining heritage sites refer to old, abandoned mining activities, underground or on the surface, which may date from the prehistorical, historical or the relatively recent past.

Study area or 'project area' refers to the area where the developer wants to focus its development activities (refer to plan).

Phase 1 studies refer to surveys using various sources of data and limited field walking in order to establish the presence of all possible types of heritage resources in any given area

1 INTRODUCTION

1.1. Background

Most heritage sites occur within communities, whose development should not be neglected in the name of heritage preservation but should be encouraged and embraced within legal and adaptive management frameworks (Carter and Grimwade 1997; Salafsky *et al* 2001). This case is true for the entire project area, which hosts archaeological, historical, natural and contemporary heritage resources (see sensitivity map). The purpose of this AIA/HIA Study is to assess presence/absence of heritage resources along the proposed pipeline upgrade route. The study was designed to ensure that any significant archaeological or cultural physical property or sites are located and recorded, and site significance is evaluated to assess the nature and extent of expected impacts from the proposed pipeline upgrade project. The assessment includes recommendations to manage the expected impact of the proposed development. The report includes recommendations to guide heritage authorities in making appropriate decision with regards to the environmental approval process for the proposed water pipeline upgrade project. The report concludes with detailed recommendations on heritage management associated with the proposed development.

Integrated Specialist Services (Pty) Ltd an independent consulting firm, conducted an assessment, research and consultations required for the preparation of the AIA/HIA report in accordance with its obligations set in the NHRA, as well as the environmental management legislations.

In line with SAHRA guidelines, this report, not necessarily in that order, provides:

- 1) Management summary
- 2) Methodology
- 3) Information with reference to the desktop study
- 4) Map and relevant geodetic images and data
- 5) Global Positioning System (GPS) co-ordinates
- 6) Directions to the site
- 7) Site description and interpretation of the cultural area where the project will take place
- 8) Management details, description of affected cultural environment, photographic records of the project area
- 9) Recommendations regarding the significance of the site and recommendations regarding further monitoring of the site.
- 10) Conclusion

1.2. Description of the proposed project

Existing Works

The existing bulk water supply to eMbalenhle consists of a 500mm steel pipe to the 2 x 10ML reservoirs at Adullam and a 400mm uPVC pipe to eMbalenhle. This pipeline is connected to a 600mm steel pipeline operated by Rand

Water on an assumed 24-hour operational basis. The purpose of this project is to construct parallel bulk lines next to the existing bulk pipeline in order to replace the existing aging pipelines to provide a continuous supply to the growing community for the next 30 years. eMbalenhle bulk mains have been experiencing pipe bursts frequently due to aging pipeline infrastructure (some sections are more than 20 years old) which have reached the end of their useful design life. Due to the relative high population growth rate for eMbalenhle and the household size which do not include the large number of backyard dwellers, the expected increase in demand outweighs the current available capacity of the bulk system.

Water Source

Water for eMbalenhle area is provided by the Rand Water Company in the Mpumalanga Province. The current average consumption as received from the municipality from July 2019 to June 2020 =18.4ML/day.

Bulk supply Pipelines

The existing supply mains are mainly large diameter steel and uPVC pipes, supplying water to two existing command reservoirs. The capacity of the existing pipe diameters to supply the full current and future demands will be assessed in order to determine whether larger diameter pipes should be installed.

Available Storage Versus Demand

As the current status of the existing reservoirs still needs to be verified, we assume the storage to be as follows:

- Abdullam : 1 x 10ML & 1 x 12ML Command
- eMbalenhle : 1 x 10ML Command (Square with 0.94kl pressure tower)
- eMbalenhle : 1 x 2.5 ML – not in service
- Current Consumption = 18.4ML/day
- Future (2050) Demand = 88.2 ML/day
- This required an additional storage of 58 ML/day (based on 150 l/c/d consumption).

Proposed Works

The scope of works includes the construction of suitable designed and sized parallel pipelines associated fittings too upgrade the supply and to cater for the future expansion of eMbalenhle. The parallel lines will replace the

existing aging infrastructure. The project will be divided into 4 phases as it is estimated to be a lengthy construction period and expensive project. The following phases are proposed:

- Phase 1: New 630mm diameter line from the Rand Water connection up to the Abdullam Reservoirs.
- Phase 2: New 500mm line from Abdullam reservoirs up to the traffic circle branch connection.
- Phase 3: New 400mm line from the Traffic circle branch up to the 5ML reservoir
- Phase 4: New 355mm line from the old reservoir and pressure tower to the 5ML reservoir

The four (4) main pipe materials which are considered are to be used as follows:

- HDPE – Mainly in CBD areas where trenching will cause undesirable disruptions. In these areas pipe cracking methods will be employed to put the DDPE pipes in place with minimal excavations required.
- uPVC – Used in most other area where trench excavations are possible. This method is considered more affordable and labour intensive, therefore allowing for employment creation.
- PVC-O – Used for large diameter (450 – 600mm) or high pressure (16 – 25 bar) sections of pipeline where HDPE and uPVC pipes won't be sufficient.
- Steel – Only to be used in possible extreme situations where the above materials are insufficient.

1.4. Location of the proposed development

The project area is located in eMbalenhle, Govan Mbeki Local Municipality in Mpumalanga. List of properties within servitude are listed.

Table 1: SG Coordinates of properties within Pipeline servitude

FARM NAME	PORTION	SG CODE																					
Farm Winkelhaak 135 IS	0	T	0	I	S	0	0	0	0	0	0	0	0	0	0	1	3	5	0	0	0	0	0
Farm Leeuwspruit 134 IS	0	T	0	I	S	0	0	0	0	0	0	0	0	0	0	1	3	4	0	0	0	0	0
Farm Witkleifontein 131 IS	1	T	0	I	S	0	0	0	0	0	0	0	0	0	0	1	3	1	0	0	0	0	1
Farm Witkleifontein 131 IS	0	T	0	I	S	0	0	0	0	0	0	0	0	0	0	1	3	1	0	0	0	0	0
Farm Witkleifontein 131 IS	4	T	0	I	S	0	0	0	0	0	0	0	0	0	0	1	3	1	0	0	0	0	4
Farm Witkleifontein 131 IS	10	T	0	I	S	0	0	0	0	0	0	0	0	0	0	1	3	1	0	0	0	1	0
Farm Witkleifontein 131 IS	3	T	0	I	S	0	0	0	0	0	0	0	0	0	0	1	3	1	0	0	0	0	3
Farm Osizweni 575 IS	0	T	0	I	S	0	0	0	0	0	0	0	0	0	0	5	7	5	0	0	0	0	0
Farm Winkelhaak 135 IS	0	T	0	I	S	0	0	0	0	0	0	0	0	0	0	1	3	5	0	0	0	0	0
Farm Langverwacht 282 IS	52	T	0	I	S	0	0	0	0	0	0	0	0	0	0	2	8	2	0	0	0	5	2
Farm Langverwacht 282 IS	2	T	0	I	S	0	0	0	0	0	0	0	0	0	0	2	8	2	0	0	0	0	2
Farm Langverwacht 282 IS	17	T	0	I	S	0	0	0	0	0	0	0	0	0	0	2	8	2	0	0	0	1	7
Farm Langverwacht 282 IS	9	T	0	I	S	0	0	0	0	0	0	0	0	0	0	2	8	2	0	0	0	0	9
Farm Langverwacht 282 IS	1	T	0	I	S	0	0	0	0	0	0	0	0	0	0	2	8	2	0	0	0	0	1
Farm Langverwacht 282 IS	4	T	0	I	S	0	0	0	0	0	0	0	0	0	0	2	8	2	0	0	0	0	4
Farm Middelbult 284 IS	29	T	0	I	S	0	0	0	0	0	0	0	0	0	0	2	8	4	0	0	0	2	9
Farm Middelbult 284 IS	28	T	0	I	S	0	0	0	0	0	0	0	0	0	0	2	8	4	0	0	0	2	8

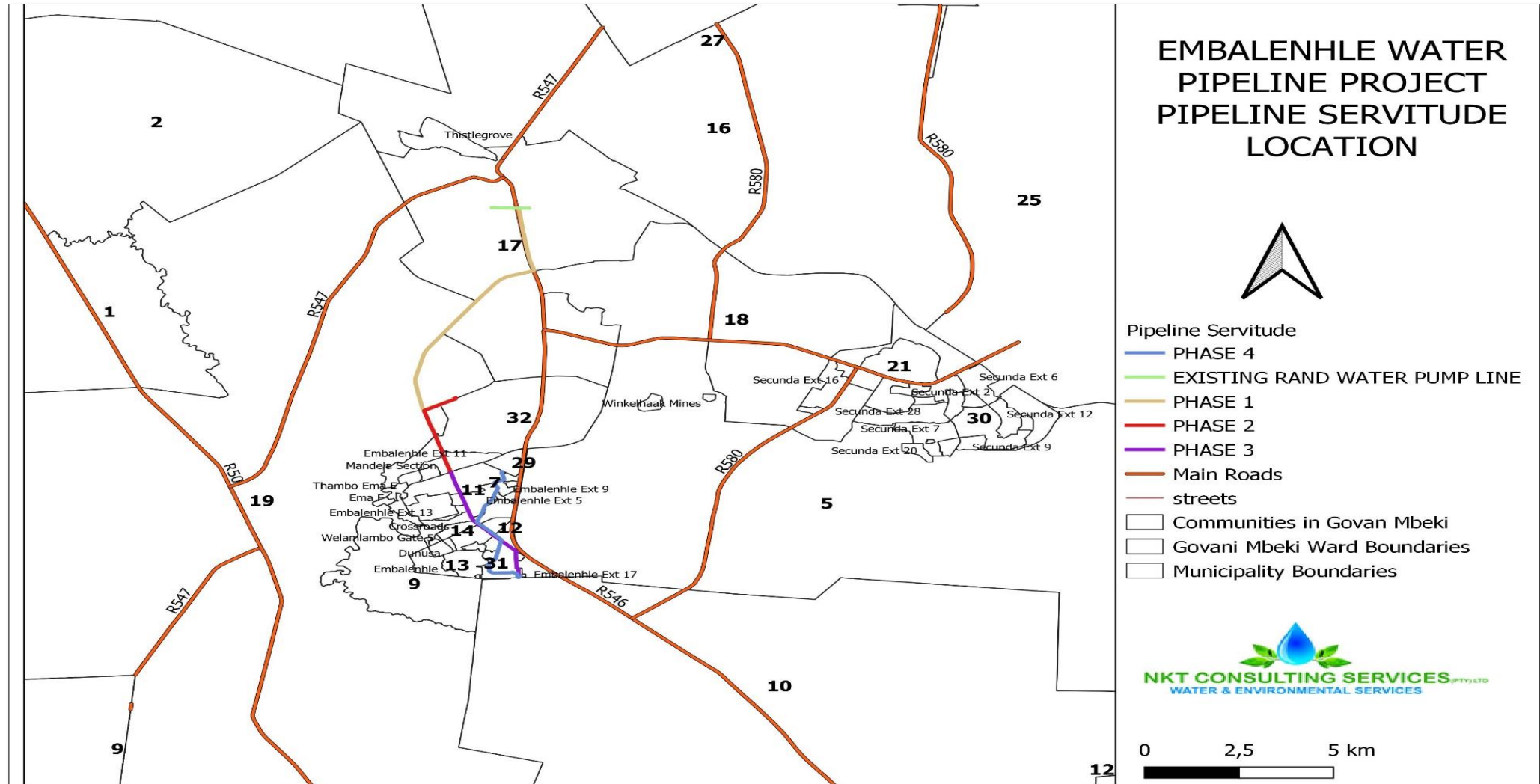


Figure 1: Proposed pipeline route (NKT Consulting Services (Pty) Ltd 2022)

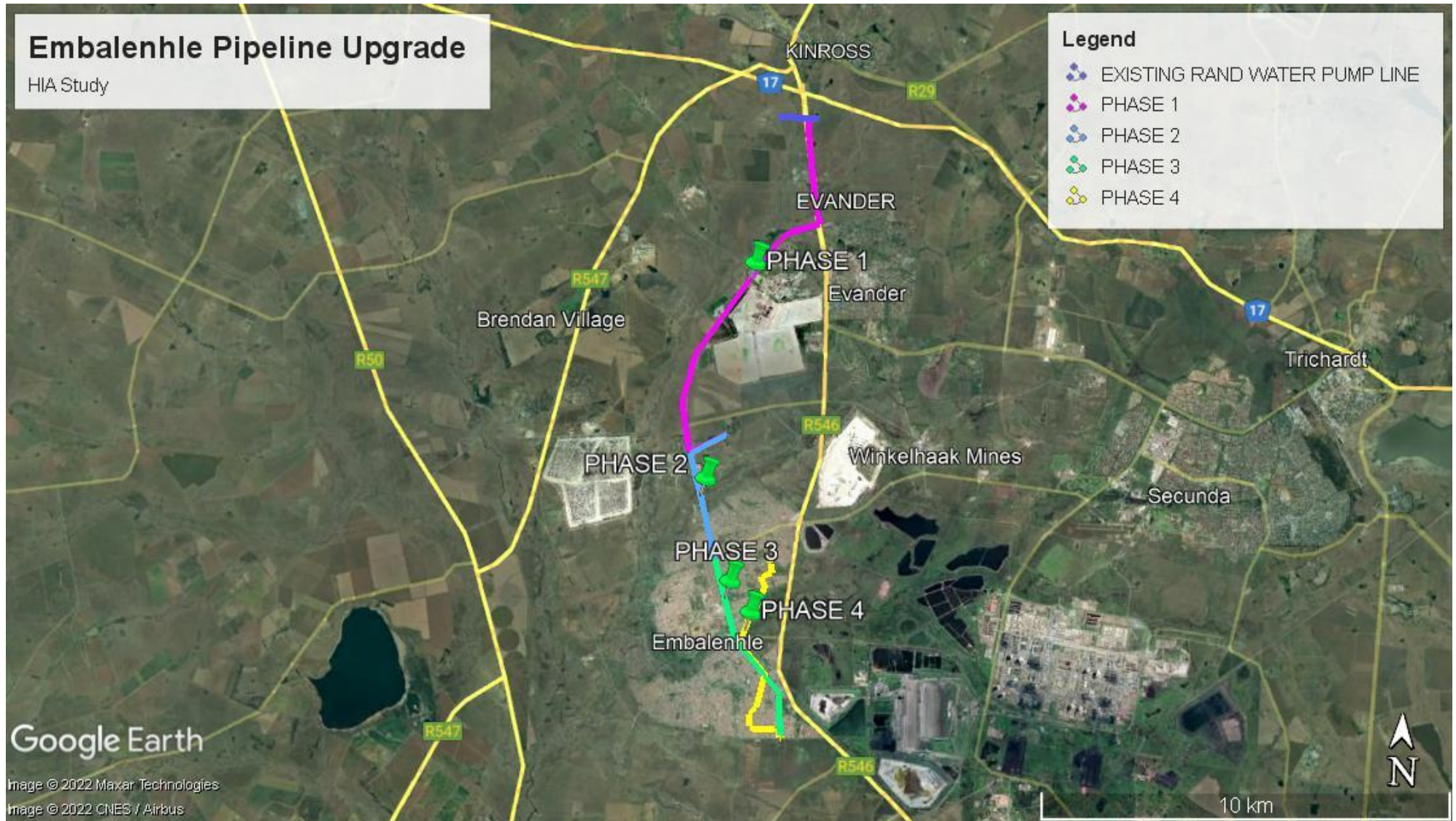


Figure 2: Proposed pipeline route (ISS, 2022)

2 LEGAL REQUIREMENTS

Relevant pieces of legislation are applicable to the present study and are presented in this section. Under the NHRA, Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), as amended (MPRDA), and the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended (NEMA) and the Environmental Impact Assessment (A) Regulations of 2014, as amended, an AIA/HIA is required as a specialist sub-section of the impact assessment.

Heritage management and conservation in South Africa is governed by the NHRA and falls under the overall jurisdiction of the SAHRA and its Provincial Heritage Resources Authorities (PHRAs), ECPHRA in this case. There are different sections of the NHRA that are relevant to this study. The proposed development is a listed activity in terms of Section 38 of the NHRA which stipulates that the following development categories require an HIA to be conducted by an independent heritage management consultant:

- Construction of a road, **wall**, powerline, **pipeline**, canal **or other linear form of development or barrier exceeding 300m in length**
- Construction of bridge or similar structure exceeding 50m in length
- Development or other activity that will change the character of a site -
 - **Exceeding 5 000 square metres (m²)**
 - Involving three or more existing erven or subdivisions
 - Involving three or more erven or divisions that have been consolidated within past five years
 - Rezoning of site exceeding 10 000m²
 - The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority
- Any other development category, public open space, squares, parks, recreation grounds

Thus, any person undertaking any development in the above categories, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development. Section 38(2)(a) of the NHRA also requires the submission of a HIA report for authorization purposes to the responsible heritage resources agencies (SAHRA/PHRA).

Related to Section 38 of the NHRA are Sections 34, 35, 36 and 37. Section 34 stipulates that no person may alter, damage, destroy, relocate etc. any building or structure older than 60 years, without a permit issued by SAHRA or a provincial heritage resources authority. Section 35(4) of the NHRA stipulates that no person may, without a permit issued by SAHRA, destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object. This section may apply to any significant archaeological sites that may be

discovered before or during construction. This means that any chance find must be reported to SAHRA or Mpumalanga PHRA, who will assist in investigating the extent and significance of the finds and inform about further actions. Such actions may entail the removal of material after documenting the find site or mapping of larger sections before destruction.

Section 36(3) of the NHRA also stipulates that no person may, without a permit issued by the SAHRA, destroy, damage, alter, exhume or remove from its original position or otherwise disturb any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority. This section may apply in case of the discovery of chance burials, which is unlikely. The procedure for reporting chance finds also applies to the likely discovery of burials or graves by the developer or his contractors. Section 37 of the NHRA deals with public monuments and memorials which may exist in the proposed project area.

In addition, the EIA Regulations promulgated in terms of NEMA determine that any environmental reports will include cultural (heritage) issues. The EIA Regulations in terms of Chapter 5 of the NEMA provide for an assessment of development impacts on the cultural (heritage) and social environment and for Specialist Studies in this regard. The end purpose of such a report is to alert the applicant and, the environmental consultant, SAHRA and/or Mpumalanga PHRA, and interested and affected parties about existing heritage resources that may be affected by the proposed development, and to recommend mitigatory measures aimed at reducing the risks of any adverse impacts on these heritage resources.

2.1. Assessing the Significance of Heritage Resources

The appropriate management of cultural heritage resources is usually determined on the basis of the assessed significance as well as the likely impacts of any proposed developments. Cultural significance is defined in the Burra Charter as meaning aesthetic, historic, scientific, or social value for past, present, or future generations (Article 1.2). Social, religious, cultural, and public significance are currently identified as baseline elements of this assessment, and it is through the combination of these elements that the overall cultural heritage values of the site of interest, associated place or area are resolved.

Not all sites are equally significant and not all are worthy of equal consideration and management. The significance of a place is not fixed for all time, and what is considered of significance at the time of assessment may change as similar items are located, more research is undertaken, and community values change. This does not lessen the value of the heritage approach but enriches both the process and the long-term outcomes for future generations as the nature of what is conserved and why, also changes over time (Pearson and Sullivan 1995:7). This assessment of the Indigenous cultural heritage significance of the Site of Interest as its environments of the study area will be

based on the views expressed by the traditional authority and community representatives, consulted documentary review and physical integrity.

African indigenous cultural heritage significance is not limited to items, places or landscapes associated with pre-European contact. Indigenous cultural heritage significance is understood to encompass more than ancient archaeological sites and deposits, broad landscapes, and environments. It also refers to sacred places and story sites, as well as historic sites, including mission sites, memorials, and contact sites. This can also refer to modern sites with particular resonance to the indigenous community.

Archaeological sites, as defined by the NHRA are places in the landscape where people once lived in the past – generally more than 60 years ago – and have left traces of their presence behind. In South Africa, archaeological sites include hominid fossil sites, places where people of the Earlier, Middle and Later Stone Age lived in open sites, river gravels, rock shelters and caves, Iron Age sites, graves, and a variety of historical sites and structures in rural areas, towns and cities. Palaeontological sites are those with fossil remains of plants and animals where people were not involved in the accumulation of the deposits. The basic principle of cultural heritage conservation is that archaeological and other heritage sites are valuable, scarce and non-renewable. Many such sites are unfortunately lost on a daily basis through infrastructure developments such as powerlines, roads and other destructive economic activities such as mining and agriculture. It should be noted that once archaeological sites are destroyed, they cannot be replaced as site integrity and authenticity is permanently lost. Archaeological heritage contributes to our understanding of the history of the region and of our country and continent at large. By preserving links with our past, we may be able to appreciate the role past generations have played in the history of our country and the continent at large.

2.2. Categories of Significance

Rating the significance of archaeological sites, and consequently grading the potential impact on the resources is linked to the significance of the site itself. The significance of an archaeological site is based on the amount of deposit, the integrity of the context, the kind of deposit and the potential to help answer present research questions. Historical structures are defined by Section 34 of the NHRA while other historical and cultural significant sites, places and features, are generally determined by community preferences. The guidelines as provided by the NHRA in Section 3, with special reference to subsection 3 are used when determining the cultural significance or other special value of archaeological or historical sites. In addition, ICOMOS (the Australian Committee of the International Council on Monuments and Sites) highlights four cultural attributes, which are valuable to any given culture:

2.3. Aesthetic Value:

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria include consideration of the form, scale, colour, texture and material of the fabric, the general atmosphere associated with the place and its uses and also the aesthetic values commonly assessed in the analysis of landscapes and townscape.

2.4. Historical Value:

Historic value encompasses the history of aesthetics, science and society and therefore to a large extent underlies all of the attributes discussed here. Usually, a place has historical value because of some kind of influence by an event, person, phase or activity.

2.5. Scientific Value:

The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality and on the degree to which the place may contribute further substantial information.

2.6. Social Value:

Social value includes the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a certain group. It is important for heritage specialist input in the impact assessment process to take into account the heritage management structure set up by the NHRA. It makes provision for a 3-tier system of management including the SAHRA at a national level, PHRAs at a provincial and the local authority. The NHRA makes provision for two types or forms of protection of heritage resources; i.e. formally protected and generally protected sites:

2.7. Formally Protected Sites

- Grade 1 or national heritage sites, which are managed by SAHRA
- Grade 2 or provincial heritage sites, which are managed by the PHRAs.
- Grade 3 or local heritage sites.

2.8. General Protection

- Human burials older than 60 years.
- Archaeological and palaeontological sites.
- Shipwrecks and associated remains older than 70 years.
- Structures older than 60 years.

The certainty of prediction is definite, unless stated otherwise and if the significance of the site is rated high, the significance of the impact will also result in a high rating. The same rule applies if the significance rating of the site is low. The significance of archaeological sites is generally ranked into the following categories:

2.9. Significance Rating Action

No significance: sites that do not require mitigation.

Low significance: sites, which may require mitigation.

2a. Recording and documentation (Phase 1) of site; no further action required

2b. Controlled sampling (shovel test pits, auguring), mapping and documentation (Phase 2 investigation); permit required for sampling and destruction.

Medium significance: sites, which require mitigation.

3. Excavation of representative sample, C14 dating, mapping and documentation (Phase 2 investigation); permit required for sampling and destruction [including 2a & 2b]

High significance: sites, where disturbance should be avoided.

4a. Nomination for listing on Heritage Register (National, Provincial or Local) (Phase 2 & 3 investigation); site management plan; permit required if utilised for education or tourism.

High significance: Graves and burial places

4b. Locate demonstrable descendants through social consulting; obtain permits from applicable legislation, ordinances and regional by-laws; exhumation and reinternment [including 2a, 2b & 3]

Furthermore, the significance of archaeological sites was based on six main criteria:

- Site integrity (i.e. primary vs. secondary context),
- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Density of scatter (dispersed scatter),
- Social value,
- Uniqueness, and
- Potential to answer current and future research questions.

An important aspect in assessing the significance and protection status of a heritage resource is often whether or not the sustainable social and economic benefits of a proposed development outweigh the conservation issues at stake. When, for whatever reason the protection of a heritage site is not deemed necessary or practical, its research potential must be assessed and mitigated in order to gain data /information, which would otherwise be lost.

Table 2: Evaluation of the proposed development as guided by the criteria in NHRA, MPRDA and NEMA

ACT	Stipulation for developments	Requirement details
NHRA Section 38	Construction of road, wall, powerline, pipeline, canal or other linear form of development or barrier exceeding 300m in length	Yes
	Construction of bridge or similar structure exceeding 50m in length	No
	Development exceeding 5 000m ²	Yes
	Development involving three or more existing erven or subdivisions	Yes
	Development involving three or more erven or divisions that have been consolidated within past five years	No
	Rezoning of site exceeding 10 000m ²	No
	Any other development category, public open space, squares, parks, recreation grounds	No
NHRA Section 34	Impacts on buildings and structures older than 60 years	Subject to identification during Phase 1 walk down survey
NHRA Section 35	Impacts on archaeological and paleontological heritage resources	Subject to identification during Phase 1 walk down survey
NHRA Section 36	Impacts on graves	Subject to identification during Phase 1
NHRA Section 37	Impacts on public monuments	No
Chapter 5 (21/04/2006) NEMA	HIA is required as part of the impact assessment	Yes
Section 39(3)(b) (iii) of the MPRDA	AIA/HIA is required as part of the impact assessment	No because it is not a mining project

2.10. Other relevant legislations

The Human Tissue Act, 1983

Human Tissue Act, 1983 (Act No. 65 of 1983), as amended (HTA) and Ordinance on the Removal of Graves and Dead Bodies, 1925 (Ordinance No. 7 of 1925), as amended, states that Graves 60 years or older are heritage resources and fall under the jurisdiction of both the NHRA and the HTA. However, graves younger than 60 years are specifically protected by the HTA and the Ordinance on the Removal of Graves and Dead Bodies, 1925 as well as any local and regional provisions, laws and by-laws. Such burial places also fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial must be obtained from the relevant Provincial Member of the Executive Committee (MEC) as well as the relevant Local Authorities.

2.11. Terms of Reference

The author was instructed to conduct an AIA/HIA study addressing the following issues:

- Archaeological and heritage potential of the proposed pipeline upgrade development route including any known data on affected areas.
- Provide details on methods of study; potential and recommendations to guide the SAHRA/MPHRA to make an informed decision in respect of authorisation of the proposed water pipeline upgrade.
- Identify all objects, sites, occurrences, and structures of an archaeological or historical nature (cultural heritage sites) located along the water pipeline upgrade route
- Assess the significance of the cultural resources in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value.
- Describe the possible impact of the proposed pipeline upgrade on these cultural remains, according to a standard set of conventions.
- Propose suitable mitigation measures to minimize possible negative impacts on the cultural resources.
- Review applicable legislative requirements.

PHOTOGRAPHIC PRESENTATION OF THE PROJECT SITE



Plate 1: Photo 1: Showing proposed pipeline route along road servitude (Photograph © by Author 2022).



Plate 2: Photo 2: Proposed pipeline route is in a previously disturbed and cleared agricultural field (Photograph © by Author 2022).



Plate 3: Photo 3: Showing dense grass cover along the proposed pipeline route. Note dense vegetation cover compromises the visibility of archaeological material (Photograph © by Author 2022)



Plate 4: Photo 4: View of the proposed pipeline route along the road servitude (Photograph © by Author 2022).



Plate 5: Photo 5: View of the proposed pipeline route along powerline servitude (Photograph © by Author 2022)



Plate 6: Photo 6: The pipeline route traverses across a landscape disturbed by previous agricultural activities (Photograph © by Author 2022).



Plate 7: Photo 7: View of existing infrastructure along the proposed pipeline route (Photograph © by Author 2022).



Plate 8: Photo 8: View of the existing reservoirs at the terminal point of the proposed pipeline route(Photograph © by Author 2022).



Plate 9: Photo 9: View of the proposed pipeline route (Photograph © by Author 2022).

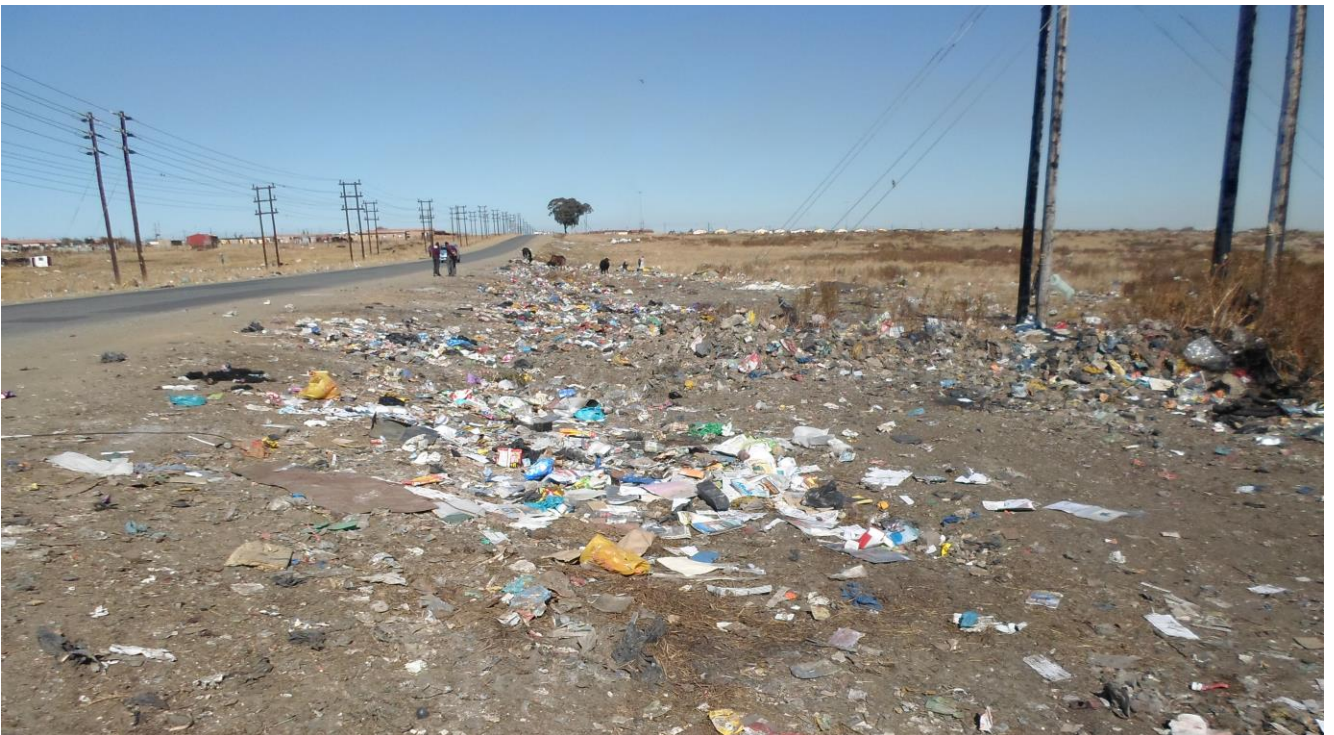


Plate 10: Photo 10: View of dumping site along road and powerline servitude (Photograph © by Author 2022).



Plate 11: Photo 11: Proposed pipeline route along street servitude (Photograph © by Author 2022).



Plate 12: Photo 12: View of proposed pipeline route (Photograph © by Author 2022).



Plate 13: Photo 13: View of proposed pipeline route cutting through a built up area. (Photograph © by Author 2022).



Plate 14: Photo 14: View of proposed pipeline route cutting through a built-up area (Photograph © by Author 2022).



Plate 15: Photo 15: View of the proposed pipeline route along a built-up area. (Photograph © by Author 2022).



Plate 16: Photo 16: View of proposed pipeline route within a disturbed built-up area. (Photograph © by Author 2022).



Plate 17: Photo 17: View of proposed pipeline route. (Photograph © by Author 2022).



Plate 18: Photo 18: View of proposed pipeline route (Photograph © by Author 2022).



Plate 19: Photo 19: View of the existing water reservoirs to be upgraded. (Photograph © by Author 2022).

3 METHODOLOGY

Relevant published and unpublished sources were consulted in generating desktop information for this report. This included online databases such as the United Nations Educational, Scientific and Cultural Organization (UNESCO) website, Google Earth, Google Scholar and South African Heritage Resources Information System (SAHRIS). Previous HIA in the project area were also consulted. A number of published works on the archaeology, history and palaeontology were also consulted. This included dedicated archaeological, paleontological and geological works by (Breutz 1956; 1968; 1987; Button 1971; Clarck 1971; Eriksson *et al* 1975; Bertrand and Eriksson 1977; Humphreys 1978; Humphreys and Thackeray 1983; Beaumont and Vogel 1984; Beaumont and Morris 1990; Beaumont 1999; Holmgren *et al* 1999; Johnson *et al* 1997; Peabody 1954; Shillington 1985; Wills 1992; Young 1934; 1940, Huffman 2007, Mason 1962). Thus, the proposed pipeline upgrade development was considered in relation to the broader landscape, which is a key requirement of the International Council on Monuments and Sites (ICOMOS) Guidelines.

This document falls under the Basic assessment phase of the AIA/HIA and therefore aims at providing an informed heritage-related opinion about the proposed pipeline upgrade project. This is usually achieved through a combination of a review of any existing literature and a basic site inspection. As part of the desktop study, published literature and cartographic data, as well as archival data on heritage legislation, the history and archaeology of the area were studied. The desktop study was followed by field surveys. The field assessment was conducted according to generally accepted AIA/HIA practices and aimed at locating all possible objects, sites and features of cultural significance on the development footprint. Initially a drive-through was undertaken along the proposed pipeline upgrade site as a way of acquiring the archaeological impression of the general area. This was then followed by a walk-down survey in the study area, with a handheld Global Positioning System (GPS) for recording the location/position of each possible site. Detailed photographic recording was also undertaken where relevant. The findings were then analysed in view of the proposed pipeline upgrade project in order to suggest further action. The result of this investigation is a report indicating the presence/absence of heritage resources and how to manage them in the context of the proposed pipeline upgrade development.

3.1 The Fieldwork surveys

The fieldwork survey was undertaken on the 06 June 2022. The main focus of the survey involved a pedestrian survey which was conducted along the proposed powerline route. The pedestrian survey focused on parts of the project area where it seemed as if disturbances may have occurred in the past, for example bald spots in the grass veld; stands of grass which are taller than the surrounding grass veld; the presence of exotic trees; evidence for building rubble, and ecological indicators such as invader weeds. The literature survey suggests that prior to the 20th century modern residential and on-going infrastructure developments; the general area where the proposed development is located would have been a rewarding region to locate heritage resources related to Stone Age and particularly Iron Age and historical sites (Bergh 1999). However, the situation today is completely different. The

study area now lies on a clearly modified landscape that has been cleared of vegetation and residential development (Plates 1-19).

3.2 Visibility and Constraints

The proposed powerline route is accessible although covered by dense grass cover making it difficult to identify surface archaeological remains. In addition, due to the subterranean nature of cultural remains this report should not be construed as a record of all archaeological and historic sites in the area.

3.3 Assumptions and Limitations

The investigation has been influenced by the unpredictability of buried archaeological remains (absence of evidence does not mean evidence of absence) and the difficulty in establishing intangible heritage values. It should be noted that archaeological deposits (including graves and traces of archaeological heritage) usually occur below the ground level. Should artefacts or skeletal material be revealed at the site during construction, such activities should be halted immediately, and a competent heritage practitioner, SAHRA must be notified in order for an investigation and evaluation of the find(s) to take place (see NHRA, Section 36(6)). Recommendations contained in this document do not exempt the applicant from complying with any national, provincial and municipal legislation or other regulatory requirements, including any protection or management or general provision in terms of the NHRA. The author assumes no responsibility for compliance with conditions that may be required by SAHRA in terms of this report.

The field survey did not include any form of subsurface inspection beyond the inspection of burrows, road cut sections, and the sections exposed by erosion. Some assumptions were made as part of the study and therefore some limitations, uncertainties and gaps in information would apply. It should, however, be noted that these do not invalidate the findings of this study in any significant way:

The proposed project activities will be limited to specific right of site as detailed in the development layout.

- The construction team to provide link and access to the proposed site by using the existing access roads and there will be no construction, excavation beyond the demarcated site.
- This study did not include any ethnographic and oral historical studies, nor did it investigate the settlement history of the area.

3.4 Consultations

Public consultations are being conducted by the EAP and issues raised by Interested and Affected parties will be presented during Specialist integration meetings for the project. Issues relating to heritage will be forwarded to the heritage specialist.

4 CULTURE HISTORY BACKGROUND OF THE PROJECT AREA

4.1 Archaeological Context

In order to place the project area in archaeological and historical context, primary and secondary sources were consulted. Ethnographical and linguistic studies by early researchers such as Theal and Van Warmelo provide insights on the cultural groups who lived in and around the project area since ca 1600. Historic and academic sources by Küsel and Bergh, Makhura, Delius, and Webb were also consulted. There are no museums in the eMalahleni and Middelburg towns which could be consulted, and no historical information was available at the municipalities or information centres (Van Wyk Rowe 2012). Very little contemporary research has been done on prehistoric African settlements in the study area, and according to Bergh, there are no recorded sites that date from the Stone Age, (including Rock paintings or engravings), Early or Later Iron Age. The topographical map 2529CC Witbank, shows that the project area is highly disturbed with cultivated land, residential and mining developments as well as other infrastructure development.

4.2 Stone Age Archaeology

Stone Age sites are marked by stone artefacts that are found scattered on the surface of the earth or as parts of deposits in caves and rock shelters. The Stone Age is divided into the Early Stone Age (covers the period from 2.5 million years ago to 250 000 years ago), the Middle Stone Age (refers to the period from 250 000 years ago to 22 000 years ago) and the Late Stone Age (the period from 22 000 years ago to 200 years ago). The Later Stone Age is also associated with rock paintings and engravings which were done by the San, Khoi Khoi and in more recent times by Iron Age farmers. Heritage surveys up to now have recorded few outstanding Stone Age sites, rock paintings and engravings in the Eastern Highveld - primarily as a result of limited extensive archaeological surveys. Stone tools have been recorded around some of the pans which occur on the Eastern Highveld.

In the larger geographical area, there is material manifestation of Stone Age people but generally, Highveld area did not attract much of habitation in these early times due to lack of rock-shelters and domination of exposed environments. Thus, it is mostly in the vicinity of large watercourses and lower parts of mountains that some ESA (~ 2.6 million to 250 000 years ago) materials (crude chopper and other unifacial tools of the Oldowan industry and the characteristic Acheulian hand axes and cleavers) and MSA (~ 250 000 to 40-25 000 years ago) materials are generally found. The MSA is a flake-technological stage characterized by faceted platforms, produced from prepared cores, as distinct from the core tool-based ESA technology. More technological and behavioural changes than those witnessed in the MSA, occurred during the LSA (~ 40-25 000, to recently, 100 years ago), which is also associated with Homo Sapiens (Barham and Mitchell 2008). For the first time we get evidence of people's activities derived from material other than stone tools (ostrich eggshell beads, ground bone arrowheads, small, bored stones

and wood fragments) (Deacon and Deacon 1999). The LSA people are also credited with the production of rock art (engravings and paintings), which is an expression of their complex social and spiritual beliefs (Parkington et al. 2008). However, it is important to note that no Stone Age materials were recorded during the field walking, perhaps due to the presence of tall grass. Nonetheless, it is possible to encounter isolated finds of these objects in the study area, even though these would most likely be out of context due to the modern disturbances.

4.3 Iron Age Archaeology

The Iron Age of the Mpumalanga region dates back to the 5th Century AD when the Early Iron Age (EIA) proto-Bantu-speaking farming communities began arriving in this region which was then occupied by hunter-gatherers. These EIA communities are archaeologically referred to as the Mzonjani Facies of the Urewe EIA Tradition (Huffman, 2007: 127-9). They occupied the foothills and valley lands along the general Indian Ocean coastland introducing settled life, domesticated livestock, crop production and the use of iron (also see Maggs 1984a; 1984b; Huffman 2007). Alongside the Urewe Tradition was the Kalundu Tradition whose EIA archaeological sites have been recorded along the Mpumalanga areas. From AD 650 to 750 the EIA sites in the region were classified as the Msuluzi facies which was replaced by the Ndongondwane and Ntsekane facies from AD 750 to 950 and AD 950 to 1050 respectively (Huffman, 2007).

By 1050 AD proto-Nguni Bantu-speaking groups associated with the Late Iron Age (LIA) called the Blackburn sub-branch of the Urewe Tradition had arrived in the eastern regions of South Africa, including modern day Mpumalanga, migrating from the central African region of the Lakes Tanganyika and Victoria (Huffman 2007: 154-5). According to archaeological data available, the Blackburn facies ranged from AD 1050 to 1500 (ibid. p.155). The Mpumalanga and the Natal inland regions saw the development of the LIA Moor Park facies between AD 1350 and 1750. These archaeological facies are interpreted as representing inland migration by LIA Nguni speaking groups (Huffman 2007). Moor Park is associated with settlements marked by stonewalling. The period from AD 1300 to 1750 saw multiple Nguni dispersal from the coastland into the hinterland and eventually across the Drakensberg Escapement into central and eastern South Africa (ibid).

No Iron Age sites are indicated in a historical atlas around the town of Witbank, but this may only indicate a lack of research. The closest known Iron Age occurrences to the surveyed area are Late Iron Age sites that have been identified to the west of Bronkhorstspuit and in the vicinity of Bethal (Bergh 1999: 7-8). The good grazing and access water in the area would have provided a good environment for Iron Age people although building material seem to be reasonably scarce. One would therefore expect that Iron Age people may have utilized the area. This is the same reason why white settlers moved into this environment later on.

4.4 Historical Background

The Late Iron Age Nguni communities engaged in the Indian Ocean Trade exporting ivory and importing consumables such as cloth and glass beads. The exporting point was Delagoa. This brought the Nguni speaking community in touch with the Indo-Asian and first Europeans (Portuguese). It was the arrival of the Dutch and the English traders that opened up Delagoa Bay to more trade did the Nguni engaged in extensive trade with the international traders (Huffman 2007). From the late 1700s, trade in supply of meat to passing ship had increased substantially to an extent that by 1800 meat trade is estimated to have surpassed ivory trade. At the same time population was booming following the increased food production that came with the introduction of maize that became the staple food. Naturally, there were signs that population groups had to compete for resources especially along the east coastal regions. The KwaZulu Natal coastal region has a special place in the history of the region and country at large. This relates to the most referenced Mfecane (wandering hordes) period of tremendous insecurity and military stress which eventually affected the entire Southern Africa including the modern-day Mpumalanga area. Around the 1830s, the region also witnessed the massive movements associated with the Mfecane. The causes and consequences of the Mfecane are well documented elsewhere (e.g. Hamilton 1995; Cobbing 1988). In this context, new African kingdoms emerged such as the Zulu Kingdom under Shaka in the second quarter of the 1800s AD. Military pressure from Zululand spilled onto the Highveld by at least 1821. Various marauding groups of displaced Sotho-Tswana moved across the plateau in the 1820s. Mzilikazi raided the plateau extensively between 1825 and 1837. For example, at the beginning of the 19th century, the Phuthing, a South Sotho group, stayed to the east of eMalahleni. During the Difaquane they fled to the south from the Ndebele of Mzilikazi who established several settlement complexes in Eastern Bankveld between Pretoria and Witbank (Bergh 1999: 10-11; 109).

At the same time the Boers trekked into this area in the 1830s. And throughout this time settled communities of Tswana people also attacked each other. As a result of this troubled period, Sotho-Tswana people concentrated into large towns for defensive purposes. Their settlements were built of stone because of the lack of trees in the project area. These stone-walled villages were almost always located near cultivatable soil and a source of water. Such sites are known to occur near Kriel (e.g., Pelsler, *et al* 2006) and to the south (Taylor 179). However stonewalled sites associated with Sotho Tswana clans have not been reported in the Witbank area as yet.

White farmers only settled in the Witbank area after 1850 (Bergh 1999: 16). One may therefore expect to find farm buildings, structures and objects from this period in time in the area. Many graveyards from this period have indeed been identified in surrounding areas during past surveys.

4.6 Intangible Heritage

As defined in terms of the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (2003) intangible heritage includes oral traditions, knowledge and practices concerning nature, traditional craftsmanship and rituals and festive events, as well as the instruments, objects, artefacts and cultural spaces associated with group(s) of people. Thus, intangible heritage is better defined and understood by the particular group of people that uphold it. In the present study area, very little intangible heritage remains because no historically known groups occupied the study area and most of the original settler descendants moved away from the area.

4.7 SAHRIS Data Base and Impact Assessment Reports in the project area

Several archaeological and heritage studies were conducted within the project area and its vicinity since 2002 and these presents the nature and heritage character of the area. The HIA conducted in the area also provide some predictive evidence regarding the types and ranges of heritage resources to be expected in the proposed project area: (see reference list for HIA reports). The studies include mining, water pipeline and powerline projects completed by Pistorius (2002, 2003, 2004, 2005, 2006a, 2006b, 2007, 2008, 2009, 2010, 2011, 2013, 2014). No sites were recorded, but the reports mention that structures older than 60 years occur in the area, Pelsler and Van Vollenhoven (2010, 2011, 2014, 2015) for mining and infrastructure development survey also recorded no sites. Van Schalkwyk did extensive work in the project area mostly for mining and infrastructure developments for example Van Schalkwyk, (2002, 2004, 2006, 2006, and 2010). Other than burial sites and buildings older than 60 years the studies did not record any significant archaeological sites in the project area.

5 RESULTS OF THE ARCHAEOLOGICAL/HERITAGE ASSESSMENT STUDY

The main cause of impacts to archaeological sites is direct, physical disturbance of the archaeological remains themselves and their contexts. It is important to note that the heritage and scientific potential of an archaeological site is highly dependent on its geological and spatial context. This means that even though, for example a deep excavation may expose buried archaeological sites and artefacts, the artefacts are relatively meaningless once removed from their original position.

The severe impacts are likely to occur during clearance and excavations within the proposed development site; indirect impacts may occur during movement of construction vehicles. The excavation and construction activities will result in the relocation or destruction of all existing surface heritage material. Similarly, the clearing of access roads will impact material that lies buried below the surface. Since heritage sites, including archaeological sites, are non-renewable, it is important that they are identified, and their significance assessed prior to any construction activities at the site. It is important to note, that due to the localised nature of archaeological resources, that

individual archaeological sites could be missed during the survey, although the probability of this is very low along the proposed pipeline route.

Further, archaeological sites and unmarked graves may be buried beneath the surface and may only be exposed during, clearance of the site and excavations. The purpose of the AIA/HIA is to assess the sensitivity of the area in terms of archaeology and to avoid or reduce the potential impacts of the proposed development by means of mitigation measures (see appended Chance Find Procedure). The study concludes that the impacts will be negligible since the general project area is currently occupied and built up. The following section presents results of the archaeological and heritage survey conducted along the proposed pipeline route.

Table 3: Summary of findings

Heritage resource	Status/Findings
Buildings, structures, places and equipment of cultural significance	None were recorded along the pipeline servitude
Areas to which oral traditions are attached or which are associated with intangible heritage	None exists on the study area
Historical settlements and townscapes	None exist within the study site
Landscapes and natural features of cultural significance	None
Archaeological and paleontological sites	No significant archaeological remains were recorded within the proposed development site
Graves and burial grounds	A formal municipal cemetery was recorded along the pipeline route, However, a formal cemetery was recorded along the proposed powerline route.
Movable objects	None
Overall comment	The pipeline route did not yield any confirmable archaeological remains.

5.1. Archaeological Sites

The study did not record any confirmable archaeological remains along the proposed pipeline route. Surface visibility was compromised by dense vegetation cover in various sections of the pipeline route. However, even though no archaeological artefacts, features or structures were noted chances are that there could be archaeological material that may be buried underneath the surface, and they can only be exposed during excavation work. The affected landscape is heavily degraded from previous agriculture and mining activities (see Figure 1), this limited the chances of encountering significant *in situ* archaeological sites. Given the high sensitivity potential of the study area it is assumed that there was always a chance of finding archaeological remains. However, the chances of recovering significant archaeological materials were seriously compromised and limited due to previous agricultural and settlement activities and other destructive land use activities such access roads, agriculture fields and residential settlements in the vicinity that already exist along the pipeline route.

Based on the field study results and field observations, it is the considered opinion of the author that the receiving environment for the proposed pipeline upgrade site is low to medium potential to yield previously unidentified archaeological sites during subsurface excavations and construction work.

5.2. Buildings and Structures older than 60 years

In terms of built environment, buildings or structures were recorded along the proposed pipeline upgrade route. In terms of Section 34 of the NHRA, the proposed pipeline route may be approved without any further investigation and mitigation.

5.3. Burial grounds and graves

Human remains and burials are commonly found close to archaeological sites; they may be found in abandoned and neglected burial sites or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked on the surface. Archaeological and historical burials are usually identified when they are exposed through erosion, mining and earth moving activities for infrastructure developments such as powerlines and roads. In some instances, packed stones or stones may indicate the presence of informal pre-colonial burials.

The field survey recorded a formal municipal cemetery along the proposed pipeline route. The section of the pipeline from GPS coordinates **26°33'11.50"S, 29° 5'2.14"E** to GPS coordinates **26°33'23.05"S, 29° 5'14.12"E** traverses through the cemetery. As such mitigation is required for the cemetery before any construction activities commence. The cemetery must be treated as a No-Go area and a 30m buffer zone must be provided for the cemetery. In terms of Section 36 of the NHRA the proposed pipeline upgrade site may be approved subject to the recommendations

herein made. The possibility of encountering previously unidentified burial sites is low to medium along the proposed pipeline route, should such sites be identified during excavation, they are still protected by applicable legislations, and they should be protected (also see Appendixes for more details). Burial sites older than 60 years are protected by the NHRA and those younger than 60 years are protected by the Human Tissue Act.



Plate 20: Photo 20: View of the formal cemetery along the proposed pipeline route (Photograph © by Author 2022).



Plate 21: Photo 21: View of the formal cemetery along the proposed pipeline route (Photograph © by Author 2022).



Figure 3: Section of the proposed pipeline route within formal cemetery (ISS, 2022)

5.4. Significance valuation for Burial Ground, Historic Cemeteries, and Individual Graves

The significance of burial grounds and grave sites is closely tied to their age and historical, cultural, and social context. Nonetheless, every burial should be considered as of high socio-cultural significance protected by practices, a series of legislations, and municipal ordinances.

5.5. Public Monuments and Memorials

The survey did not identify any historical monument and public memorials along the proposed development site. There are no monuments or plaques along the proposed development site that are on the National Heritage or provincial List. The proposed pipeline upgrade will not impact on any listed monuments and memorials in the project area.

5.6. Battle fields

No known battles or skirmishes associated with the Anglo-Boer war, colonial wars and the struggle against apartheid were fought on the proposed pipeline upgrade site.

5.7. Archaeo-Metallurgy, Prehistoric Mining and Mining Heritage

No archeo-metallurgy and mining heritage traces were recorded along the proposed pipeline upgrade site.

5.8. Visual impacts

The proposed pipeline upgrade site is not on the view shed of any listed heritage site.

5.9. Mitigation

No mitigation is required however the potential for chance finds is for ever present in the area. As such the chance find procedure will apply (see appended Chance finds procedure).

6 CUMMULATIVE IMPACTS

Cumulative impacts are defined as impacts that result from incremental changes caused by other past, present, or reasonably foreseeable actions together with the project. Therefore, the assessment of cumulative impacts for the proposed pipeline upgrade project are considered the total impact associated with the proposed project when combined with other past, present, and reasonably foreseeable future developments projects. The impacts of the proposed pipeline upgrade were assessed by comparing the post-project situation to a pre-existing baseline. This section considers the cumulative impacts that would result from the combination of the proposed pipeline upgrade.

7 ASSESSMENT OF SIGNIFICANCE

7.1. Assessment Criteria

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to alternatives under study for meeting a project need. The significance of the aspects/impacts of the process will be rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

The significance of the impacts will be determined through a synthesis of the criteria below:

Table 4: Criteria Used for Rating of Impacts

Nature of the impact (N)		
Positive	+	Impact will be beneficial to the environment (a benefit).
Negative	-	Impact will not be beneficial to the environment (a cost).
Neutral	0	Where a negative impact is offset by a positive impact, or mitigation measures, to have no overall effect.
Magnitude(M)		
Minor	2	Negligible effects on biophysical or social functions / processes. Includes areas / environmental aspects which have already been altered significantly and have little to no conservation importance (negligible sensitivity*).
Low	4	Minimal effects on biophysical or social functions / processes. Includes areas / environmental aspects which have been largely modified, and / or have a low conservation importance (low sensitivity*).
Moderate	6	Notable effects on biophysical or social functions / processes. Includes areas / environmental aspects which have already been moderately modified and have a medium conservation importance (medium sensitivity*).
High	8	Considerable effects on biophysical or social functions / processes. Includes areas / environmental aspects which have been slightly modified and have a high conservation importance (high sensitivity*).
Very high	10	Severe effects on biophysical or social functions / processes. Includes areas / environmental aspects which have not previously been impacted upon and are pristine, thus of very high conservation importance (very high sensitivity*).
Extent (E)		
Site only	1	Effect limited to the site and its immediate surroundings.
Local	2	Effect limited to within 3-5 km of the site.
Regional	3	Activity will have an impact on a regional scale.
National	4	Activity will have an impact on a national scale.
International	5	Activity will have an impact on an international scale.
Duration (D)		
Immediate	1	Effect occurs periodically throughout the life of the activity.

Short term	2	Effect lasts for a period 0 to 5 years.
Medium term	3	Effect continues for a period between 5 and 15 years.
Long term	4	Effect will cease after the operational life of the activity ther because of natural process or by human intervention.
Permanent	5	Where mitigation there by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.
Probability of occurrence (P)		
Improbable	1	Less than 30% chance of occurrence.
Low	2	Between 30 and 50% chance of occurrence.
Medium	3	Between 50 and 70% chance of occurrence.
High	4	Greater than 70% chance of occurrence.
Definite	5	Will occur, or where applicable has occurred, regardless or in spite of any mitigation measures.

Once the impact criteria have been ranked for each impact, the significance of the impacts will be calculated using the following formula:

$$\text{Significance Points (SP)} = (\text{Magnitude} + \text{Duration} + \text{Extent}) \times \text{Probability}$$

The significance of the ecological impact is therefore calculated by multiplying the severity rating with the probability rating. The maximum value that can be reached through this impact evaluation process is 100 SP (points). The significance for each impact is rated as High (SP≥60), Medium (SP = 31-60) and Low (SP<30) significance as shown in the below.

Table 5: Criteria for Rating of Classified Impacts

Significance of predicted NEGATIVE impacts		
Low	0-30	Where the impact will have a relatively small effect on the environment and will require minimum or no mitigation and as such have a limited influence on the decision
Medium	31-60	Where the impact can have an influence on the environment and should be mitigated and as such could have an influence on the decision unless it is mitigated.
High	61-100	Where the impact will definitely have an influence on the environment and must be mitigated, where possible. This impact will influence the decision regardless of any possible mitigation.
Significance of predicted POSITIVE impacts		
Low	0-30	Where the impact will have a relatively small positive effect on the environment.
Medium	31-60	Where the positive impact will counteract an existing negative impact and result in an overall neutral effect on the environment.
High	61-100	Where the positive impact will improve the environment relative to baseline conditions.

Table 6: Impact Assessment Matrix

Impacts and Mitigation measures relating to the proposed pipeline upgrade project during construction phase														
Activity/Aspect	Impact /	Aspect	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures	Magnitude	Extent	Duration	Probability	Significance after mitigation
Clearing and Excavations	Destruction of archaeological remains	Cultural heritage	-	6	1	1	2	16	<ul style="list-style-type: none"> Use chance find procedure to cater for accidental finds 	2	1	1	1	4
	Disturbance of graves	Cultural heritage	-	6	2	2	4	40	<ul style="list-style-type: none"> Chance finds procedure and heritage induction for workers 	2	1	1	1	4
	Disturbance of buildings and structures older than 60 years old	Operational	-	6	2	1	2	18	<ul style="list-style-type: none"> Mitigation is not required since no buildings and structures exist on the proposed development site 	4	1	1	1	4
Haulage	Destruction public monuments and plaques	Operational	-	2	1	1	1	4	<ul style="list-style-type: none"> Mitigation is not required because there are no public monuments within the proposed development site 	2	1	1	4	4

Based on the results of the Impact Assessment Matrix the proposed project is viable from a heritage perspective.

8 STATEMENT OF SIGNIFICANCE

8.1. Aesthetic Value

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture, and material of the fabric; sense of place, the smells and sounds associated with the place and its use.

The proposed development site will be situated within an environment and associated cultural landscape, which, although developed by existing settlements, remains representative of the original historical environment and cultural landscape of this part of Mpumalanga Province. The local communities consider the project area a cultural landscape linked to their ancestors and history. However, the proposed development will not alter this aesthetic value in any radical way since it will add to the constantly changing and developing settlements.

8.2. Historic Value

Historic value encompasses the history of aesthetics, science, and society, and therefore to a large extent underlies all the terms set out in this section. A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase, or activity. It may also have historic value as the site of an important event. For any given place, the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.

8.3. Scientific value

The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality, or representativeness, and on the degree to which the place may contribute further substantial information. Scientific value is also enshrined in natural resources that have significant social value. For example, pockets of forests and bushvelds have high ethnobotany value.

8.4. Social Value

Social value embraces the qualities for which a place has become a focus of spiritual, religious, political, local, national, or other cultural sentiment to a majority or minority group. Social value also extends to natural resources such as bushes, trees and herbs that are collected and harvested from nature for herbal and medicinal purposes.

9 DISCUSSIONS

Various specialists conducted several Phase 1 Archaeological/ Heritage studies for various infrastructure developments in the project area since 2006. The current study should be read in conjunction with previous Phase 1 Impact Studies conducted in the proposed project area. Although these studies recorded sites of significance for example Kruger, (2016), (Kusel (2003, 2008), Van Schalkwyk (2011a, 2011b, 2012) and Pistorius (2011, 2012) the recorded sites are far from the current proposed site. Although the proposed pipeline upgrade site did not yield confirmable heritage resources, it is important to note that any heritage site located within 500m from the boundary may be indirectly affected by the proposed pipeline upgrade. As such, it is the responsibility of the applicant to ensure that the heritage sites located near the proposed development site are protected during construction. The sites must be clearly marked, and workers made aware of their existence and significance. In this case a management plan covering the formal burial site must be compiled. The lack of confirmable archaeological sites recorded during the current survey is thought to be a result of two primary interrelated factors:

- The proposed pipeline route is located within a degraded area and have reduced sensitivity for the presence of high significance physical cultural site remains, be they archaeological, historical, or burial sites, due to previous disturbances resulting from developments and other land uses in the project area.
- Limited ground surface visibility on sections of the proposed development that were not cleared at the time of the study may have impeded the detection of other physical cultural heritage site remains, or archaeological signatures immediately associated with the construction activities. It should be borne in mind that the absence of confirmable and significant archaeological cultural heritage site is not evidence in itself that such sites did not exist within the proposed project site.

Based on the significance assessment criterion employed for this report, the proposed development site was rated **low** from an archaeological perspective, However, it should be noted that significance of the sites of Interest is not limited to presence or absence of physical archaeological sites. Significant archaeological remains may be unearthed during construction. (See appended chance find procedure).

10 RECOMMENDATIONS

The study did not find any permanent barriers to the proposed pipeline upgrade route. It is the considered opinion of the authors that the proposed pipeline upgrade may be approved as planned from an archaeology and heritage perspective, provided that mitigation measures are implemented for the formal cemetery recorded (see Figure 3). The following recommendations are based on the results of the AIA/HIA research, cultural heritage background review, site inspection and assessment of significance.

- The identified municipal cemetery must be preserved *in situ* and properly mapped before any construction activity commences.
- The planners for the proposed pipeline upgrade must provide for a 30m buffer zone for the recorded cemetery or alternately divert the route to avoid the cemetery completely.
- The proposed pipeline upgrade may be approved to proceed as planned under observation that project work does not extend beyond the surveyed pipeline route.
- Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of the project EMPr, there are no other significant cultural heritage resources barriers to the proposed pipeline upgrade.
- If during development, operational or closure phases of this project, any person employed by the applicant, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance, work must cease at the site of the find and this person must report this find to their immediate supervisor, and through their supervisor to the site manager.
- The Site Manager must then make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area before informing an archaeological practitioner.
- In the event that archaeological materials are unearthed, all construction activities within a radius of at least 30m of such indicator should cease and the area be demarcated by a danger tape. Accordingly, a professional archaeologist should be contacted immediately
- It is the responsibility of the applicant to protect the site from publicity (i.e., media) until a mutual agreement is reached.
- Noteworthy that any measures to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement by MPHRA.
- The applicant is reminded that unavailability of archaeological materials (e.g., pottery, stone tools, remnants of stonewalling, graves, etc.) and fossils does not mean they do not occur, archaeological material might be hidden underground, and as such the client is reminded to take precautions during construction.
- Overall, impacts to heritage resources are not considered to be significant for the project receiving environment. It is thus concluded that the project may be cleared to proceed as planned subject to the Heritage Authority ensuring that detailed heritage monitoring procedures are included in the project EMPr for the construction phase, include chance archaeological finds mitigation procedure in the project EMPr (See Appendix 1).

- The findings of this report, with approval of the MPHRA, may be classified as accessible to any interested and affected parties within the limits of the laws.

11 CONCLUDING REMARKS

The literature review and field research confirmed that the project area is situated within a contemporary cultural landscape dotted with settlements with long local history. Field survey established that the proposed pipeline upgrade site was degraded by previous and ongoing agriculture, residential and mining activities. The field survey recorded a cemetery along the pipeline route, that may be indirectly affected by excavation work. As such it is the responsibility of the applicant to protect the sites during construction. In terms of the archaeology and heritage in respect of the proposed pipeline upgrade site, there are no obvious 'Fatal Flaws' or 'No-Go' areas on the site, however the recorded burial site must be treated as No Go areas until appropriate mitigation measures are implemented. The potential for chance finds is rated low, however, the applicant and contractors are advised to be diligent during clearance and construction, should construction activities commence on the site. The procedure for reporting chance finds has clearly been laid out (see appended chance find procedure). This report concludes that the proposed pipeline upgrade may be approved by SAHRA/MPHRA to proceed as planned subject to recommendations herein made and heritage monitoring and management plan being incorporated into the EMPr (also see Appendices). The mitigation measures are informed by the results of the AIA/HIA study and principles of heritage management enshrined in the NHRA.

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APPENDIX 1: CHANCE FIND PROCEDURE FOR THE PROPOSED UPGRADING OF WATER PIPELINES IN EMBALENHLE WITHIN GOVANI MBEKI LOCAL MUNICIPALITY, MPUMALANGA PROVINCE.

June 2022

ACRONYMS

BGG	Burial Grounds and Graves
CFPs	Chance Find Procedures
ECO	Environmental Control Officer
HIA	Heritage Impact Assessment
ICOMOS	International Council on Monuments and Sites
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
SAHRA	South African Heritage Resources Authority
SAPS	South African Police Service
UNESCO	United Nations Educational, Scientific and Cultural Organisation

CHANCE FIND PROCEDURE

Introduction

An Archaeological Chance Find Procedure (CFP) is a tool for the protection of previously unidentified cultural heritage resources during construction. The main purpose of a CFP is to raise awareness of all construction workers and management on site regarding the potential for accidental discovery of cultural heritage resources and establish a procedure for the protection of these resources. Chance Finds are defined as potential cultural heritage (or paleontological) objects, features, or sites that are identified outside of or after Heritage Impact studies, normally as a result of construction monitoring. Chance Finds may be made by any member of the project team who may not necessarily be an archaeologist or even visitors. Appropriate application of a CFP on development projects has led to discovery of cultural heritage resources that were not identified during archaeological and heritage impact assessments. As such, it is considered to be a valuable instrument when properly implemented. For the CFP to be effective, the site manager must ensure that all personnel on the proposed pipeline route understand the CFP and the importance of adhering to it if cultural heritage resources are encountered. In addition, training or induction on cultural heritage resources that might potentially be found on site should be provided. In short, the Chance find procedure details the necessary steps to be taken if any culturally significant artefacts are found during construction.

Definitions

In short, the term 'heritage resource' includes structures, archaeology, meteors, and public monuments as defined in the South African National Heritage Resources Act (Act No. 25 of 1999) (NHRA) Sections 34, 35, and 37. Procedures specific to burial grounds and graves (BGG) as defined under NHRA Section 36 will be discussed separately as this require the implementation of separate criteria for CFPs.

Background

The proposed water pipeline in eMbalenhle within, Govan Mbeki Local Municipality, Highveld Ridge Magisterial District, Mpumalanga Province. The proposed development is subject to heritage survey and assessment at planning stage in accordance with the NHRA. These surveys are based on surface indications alone and it is therefore possible that sites or significant archaeological remains can be missed during surveys because they occur beneath the surface. These are often accidentally exposed in the course of construction or any associated construction work and hence the need for a Chance Find Procedure to deal with accidental finds. In this case an extensive Archaeological Impact Assessment was completed by Mlilo (2022) along the entire pipeline route. The AIA/HIA conducted was very comprehensive covering the entire site. The current study (Mlilo 2022) recorded a municipal burial site along the pipeline route.

Purpose

The purpose of this Chance Find Procedure is to ensure the protection of previously unrecorded heritage resources along the proposed project site. This Chance Find Procedure intends to provide the applicant and contractors with appropriate response in accordance with the NHRA and international best practice. The aim of this CFP is to avoid or reduce project risks that may occur as a result of accidental finds whilst considering international best practice. In addition, this document seeks to address the probability of archaeological remains finds and features becoming accidentally exposed during construction and movement of construction equipment. The proposed construction activities have the potential to cause severe impacts on significant tangible and intangible cultural heritage resources buried beneath the surface or concealed by tall grass cover. Integrated Specialist Services developed this Chance Find Procedure to define the process which govern the management of Chance Finds during construction. This ensures that appropriate treatment of chance finds while also minimizing disruption of the construction schedule. It also enables compliance with the NHRA and all relevant regulations. Archaeological Chance Find Procedures are to promote preservation of archaeological remains while minimizing disruption of construction scheduling. It is recommended that due to the low to moderate archaeological potential of the project area, all site personnel and contractors be informed of the Archaeological Chance Find procedure and have access to a copy while on site. This document has been prepared to define the avoidance, minimization and mitigation measures necessary to ensure that negative impacts to known and unknown archaeological remains as a result of project activities and are prevented or where this is not possible, reduced to as low as reasonably practical during construction.

Thus, this Chance Finds Procedure covers the actions to be taken from the discovering of a heritage site or item to its investigation and assessment by a professional archaeologist or other appropriately qualified person to its rescue or salvage.

CHANCE FIND PROCEDURE

General

The following procedure is to be executed in the event that archaeological material is discovered:

- All clearance activities in the vicinity of the accidental find/feature/site must cease immediately to avoid further damage to the find site.
- Briefly note the type of archaeological materials you think you have encountered, and their location, including, if possible, the depth below surface of the find.
- Report your discovery to your supervisor or if they are unavailable, report to the project ECO who will provide further instructions.

- If the supervisor is not available, notify the Environmental Control Officer immediately. The Environmental Control Officer will then report the find to the Site Manager who will promptly notify the project archaeologist and SAHRA.
- Delineate the discovered find/ feature/ site and provide 25m buffer zone from all sides of the find.
- Record the find GPS location, if able.
- All remains are to be stabilised *in situ*.
- Secure the area to prevent any damage or loss of removable objects.
- Photograph the exposed materials, preferably with a scale (a yellow plastic field binder will suffice).
- The project archaeologist will undertake the inspection process in accordance with all project health and safety protocols under direction of the Health and Safety Officer.

- **Finds rescue strategy:** All investigation of archaeological soils will be undertaken by hand, all finds, remains and samples will be kept and submitted to a museum as required by the heritage legislation. In the event that any artefacts need to be conserved, the relevant permit will be sought from the SAHRA.
- An on-site office and finds storage area will be provided, allowing storage of any artefacts or other archaeological material recovered during the monitoring process.
- In the case of human remains, in addition to the above, the SAHRA Burial Ground Unit will be contacted and the guidelines for the treatment of human remains will be adhered to. If skeletal remains are identified, an archaeological will be available to examine the remains.
- The project archaeologist will complete a report on the findings as part of the permit application process.
- Once authorisation has been given by SAHRA, the Applicant will be informed when development activities can resume.

Management of chance finds

Should the Heritage specialist conclude that the find is a heritage resource protected in terms of the NRHA (1999) Sections 34, 36, 37 and NHRA (1999) Regulations (Regulation 38, 39, 40), ISS will notify SAHRA and/or PHRA on behalf of the applicant. SAHRA/PHRA may require that a search and rescue exercise be conducted in terms of NHRA Section 38, this may include rescue excavations, for which Integrated Specialist Services (Pty) Ltd will submit a rescue permit application having fulfilled all requirements of the permit application process.

In the event that human remains are accidentally exposed, SAHRA Burial Ground Unit or ISS Heritage Specialist must immediately be notified of the discovery in order to take the required further steps:

- a. Heritage Specialist to inspect, evaluate and document the exposed burial or skeletal remains and determine further action in consultation with the SAPS and Traditional authorities:
- b. Heritage specialist will investigate the age of the accidental exposure in order to determine whether the find is a burial older than 60 years under the jurisdiction of SAHRA or that the exposed burial is younger than 60 years under the jurisdiction of the Department of Health in terms of the Human Tissue Act.
- c. The local SAPS will be notified to inspect the accidental exposure in order to determine where the site is a scene of crime or not.
- d. Having inspected and evaluated the accidental exposure of human remains, the project Archaeologist will then track and consult the potential descendants or custodians of the affected burial.
- e. The project archaeologist will consult with the traditional authorities, local municipality, and SAPS to seek endorsement for the rescue of the remains. Consultation must be done in terms of NHRA (1999) Regulations 39, 40, 42.
- f. Having obtained consent from affected families and stakeholders, the project archaeologist will then compile a Rescue Permit application and submit to SAHRA Burial Ground and Graves Unit.
- g. As soon as the project archaeologist receives the rescue permit from SAHRA he will in collaboration with the company/contractor arrange for the relocation in terms of logistics and appointing of an experienced undertaker to conduct the relocation process.
- h. The rescue process will be done under the supervision of the archaeologist, the site representative and affected family members. Retrieval of the remains shall be undertaken in such a manner as to reveal the stratigraphic and spatial relationship of the human skeletal remains with other archaeological features in the excavation (e.g., grave goods, hearths, burial pits, etc.). A catalogue and bagging system shall be utilised that will allow ready reassembly and relational analysis of all elements in a laboratory. The remains will not be touched with the naked hand; all Contractor personnel working on the excavation must wear clean cotton or non-powdered latex gloves when handling remains in order to minimise contamination of the remains with modern human DNA. The project archaeologist will document the process from exhumation to reburial.

- i. Having fulfilled the requirements of the rescue/burial permit, the project archaeologist will compile a mitigation report which details the whole process from discovery to relocation. The report will be submitted to SAHRA and to the company.

Note that the relocation process will be informed by SAHRA Regulations and the wishes of the descendants of the affected burial.

Appendix 2: Heritage Management Plan Input into the proposed pipeline route EMPr

Objective	<ul style="list-style-type: none"> • Protection of archaeological sites and land considered to be of cultural value; • Protection of known physical cultural property sites against vandalism, destruction and theft; and • The preservation and appropriate management of new archaeological finds should these be discovered during construction. • Protection of Burial Grounds and Graves 							
No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
Pre-Construction Phase								
1	Planning	Ensure all known sites of cultural, archaeological, and historical significance are demarcated on the site layout plan and marked as no-go areas.	Throughout Project	Weekly Inspection	Contractor [C] CECO	SM	ECO	EA EM PM
Construction Phase								
1	Emergency Response	Should any archaeological or physical cultural property heritage resources be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped until heritage authority has cleared the development to continue.	N/A	Throughout	C CECO	SM	ECO	EA EM PM
		Should any archaeological, cultural property heritage resources be exposed during excavation or be found on development site, a registered heritage specialist or MPHRA official must be called to site for inspection.		Throughout	C CECO	SM	ECO	EA EM PM
		Under no circumstances may any archaeological, historical or any physical cultural property heritage material be destroyed or removed from site;		Throughout	C CECO	SM	ECO	EA EM PM
		Should remains and/or artefacts be discovered on the development site during earthworks, all work will cease in the area affected and the Contractor will immediately inform the Construction/Site Manager who in turn will inform SAHRA/MPHRA.		When necessary	C CECO	SM	ECO	EA EM PM
		Should any remains be found on site that is potentially human remains, the PHRA and South African Police Service should be contacted.		When necessary	C CECO	SM	ECO	EA EM PM
Rehabilitation Phase								
		Same as construction phase.						
Operational Phase								
		Same as construction phase.						

Appendix 3: Legal background in South Africa

Extracts relevant to this report from the National Heritage Resources Act No. 25 of 1999, (Sections 5, 36 and 47):

General principles for heritage resources management

5. (1) All authorities, bodies and persons performing functions and exercising powers in terms of this Act for the management of heritage resources must recognise the following principles:

- (a) Heritage resources have lasting value in their own right and provide evidence of the origins of South African society and as they are valuable, finite, non-renewable and irreplaceable they must be carefully managed to ensure their survival;
- (b) every generation has a moral responsibility to act as trustee of the national heritage for succeeding generations and the State has an obligation to manage heritage resources in the interests of all South Africans;
- (c) heritage resources have the capacity to promote reconciliation, understanding and respect, and contribute to the development of a unifying South African identity; and
- (d) heritage resources management must guard against the use of heritage for sectarian purposes or political gain.

(2) To ensure that heritage resources are effectively managed—

- (a) the skills and capacities of persons and communities involved in heritage resources management must be developed; and
- (b) provision must be made for the ongoing education and training of existing and new heritage resources management workers.

(3) Laws, procedures and administrative practices must—

- (a) be clear and generally available to those affected thereby;
- (b) in addition to serving as regulatory measures, also provide guidance and information to those affected thereby; and
- (c) give further content to the fundamental rights set out in the Constitution.

(4) Heritage resources form an important part of the history and beliefs of communities and must be managed in a way that acknowledges the right of affected communities to be consulted and to participate in their management.

(5) Heritage resources contribute significantly to research, education and tourism and they must be developed and presented for these purposes in a way that ensures dignity and respect for cultural values.

(6) Policy, administrative practice and legislation must promote the integration of heritage resources conservation in urban and rural planning and social and economic development.

(7) The identification, assessment and management of the heritage resources of South Africa must—

- (a) take account of all relevant cultural values and indigenous knowledge systems;
- (b) take account of material or cultural heritage value and involve the least possible alteration or loss of it;
- (c) promote the use and enjoyment of and access to heritage resources, in a way consistent with their cultural significance and conservation needs;
- (d) contribute to social and economic development;
- (e) safeguard the options of present and future generations; and
- (f) be fully researched, documented and recorded.

Burial grounds and graves

36. (1) Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.

(2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.

(3) (a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—

(a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

(b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or

(c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

(4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.

(5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection (3)(b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority—

(a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and

(b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.

(6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority—

(a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and

(b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

(7) (a) SAHRA must, over a period of five years from the commencement of this Act, submit to the Minister for his or her approval lists of graves and burial grounds of persons connected with the liberation struggle and who died in exile or as a result of the action of State security forces or agents provocateur and which, after a process of public consultation, it believes should be included among those protected under this section.

(b) The Minister must publish such lists as he or she approves in the Gazette.

(8) Subject to section 56(2), SAHRA has the power, with respect to the graves of victims of conflict outside the Republic, to perform any function of a provincial heritage resources authority in terms of this section.

(9) SAHRA must assist other State Departments in identifying graves in a foreign country of victims of conflict connected with the liberation struggle and, following negotiations with the next of kin, or relevant authorities, it may re-inter the remains of that person in a prominent place in the capital of the Republic.

General policy

47. (1) SAHRA and a provincial heritage resources authority—

- (a) must, within three years after the commencement of this Act, adopt statements of general policy for the management of all heritage resources owned or controlled by it or vested in it; and
 - (b) may from time to time amend such statements so that they are adapted to changing circumstances or in accordance with increased knowledge; and
 - (c) must review any such statement within 10 years after its adoption.
- (2) Each heritage resources authority must adopt for any place which is protected in terms of this Act and is owned or controlled by it or vested in it, a plan for the management of such place in accordance with the best environmental, heritage conservation, scientific and educational principles that can reasonably be applied taking into account the location, size and nature of the place and the resources of the authority concerned, and may from time to time review any such plan.
- (3) A conservation management plan may at the discretion of the heritage resources authority concerned and for a period not exceeding 10 years, be operated either solely by the heritage resources authority or in conjunction with an environmental or tourism authority or under contractual arrangements, on such terms and conditions as the heritage resources authority may determine.
- (4) Regulations by the heritage resources authority concerned must provide for a process whereby, prior to the adoption or amendment of any statement of general policy or any conservation management plan, the public and interested organisations are notified of the availability of a draft statement or plan for inspection, and comment is invited and considered by the heritage resources authority concerned.
- (5) A heritage resources authority may not act in any manner inconsistent with any statement of general policy or conservation management plan.
- (6) All current statements of general policy and conservation management plans adopted by a heritage resources authority must be available for public inspection on request.