

**PHASE 1 HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED UPGRADING OF  
EXISTING MAIN OUTFALL SEWER ON THE NORTHERN AREA (GRAVITY SEWER MAIN  
EVATON AND SEBOKENG NORTH TO WASTE WATER TREATMENT WORKS)**

**GAUTENG PROVINCE, SOUTH AFRICA.**

**July 2020**

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## DOCUMENT INFORMATION

Item	Description
Proposed development and location	The upgrading of existing main outfall sewer on the Northern area gravity sewer main Evaton and Sebokeng North to Wastewater treatment works in Boitumelo, Gauteng Province
Title	Phase 1 Archaeological and Heritage Impact Assessment study for Proposed Upgrading of gravity sewer line from Sebokeng North through Boitumelo to Wastewater treatment works in Boitumelo, Gauteng Province
Purpose of the study	The purpose of this study is an Archaeological and Heritage Impact Assessment report that describes the cultural values and heritage factors that may be impacted on by the proposed Upgrading of main gravity sewer line Evaton and Sebokeng North to Wastewater treatment works in Boitumelo, Gauteng Province
1:50 000 Topographic Map	2627 DB
Coordinates	S26° 40' 22.87" E027° 53' 47.79"
Municipalities	eMfuleni Local Municipality and Sedibeng District Municipality
Predominant land use of surrounding area	Existing residential, road, commercial and transport
Applicant	eMfuleni Local Municipality.
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Author Identification	Trust Mlilo (Archaeologist and Heritage specialist).

## **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.

I, **Trust Mlilo**, do hereby declare that I am 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 I have received fair remuneration from the client for preparation of this report.

### **Expertise:**

Trust Mlilo, MA. (Archaeology), BA Hons, PDGE and BA & (Univ. of Pretoria) ASAPA (Professional member) with more than 15 years of experience in archaeological and heritage impact assessment and management. 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.

### **Independence**

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

### **Conditions relating to this report**

The content of this report is based on the author's best scientific and professional knowledge as well as 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 become known to the author from on-going 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 NKT consulting (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 a 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 Miilo (Professional Archaeologist). The report is for the review of the Heritage Resources Agency (PHRA).

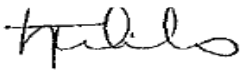
**Geographic Co-ordinate Information:** Geographic co-ordinates in this report were obtained using a hand-held Garmin Global Positioning System device. The manufacturer states that these devices are accurate to within +/- 5 m.

**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 HIA 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 sewer upgrade.

Signed by



23/ 07/ 2020

## **ACKNOWLEDGEMENTS**

The authors acknowledge NKT consulting (Pty) Ltd, for their assistance with project information, and the associated project BID as well as responding to technical queries related to the project.

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## EXECUTIVE SUMMARY

This Archaeological and Heritage Impact Assessment (AIA/HIA) Report has been prepared to address requirements of Section 38 of the National Heritage Resources Act, Act 25 of 1999 (NHRA). Integrated Specialist Services (Pty) Ltd was retained by NKT consulting (Pty) Ltd to conduct this Archaeological and Heritage Impact Assessment (AIA/HIA) Study for the proposed Upgrading of main gravity sewer line Evaton and Sebokeng North to Wastewater treatment works in Boitumelo, Gauteng Province. The proposed project is located in the eMfuleni Local Municipality of Gauteng Province. This report comprises an impact study on potential archaeological and cultural heritage resources that may be associated with the proposed project site. This study was conducted as part of the specialist input for Environmental authorisation. The proposed development consists of Upgrading of main gravity sewer line Evaton and Sebokeng North to Wastewater treatment works in Boitumelo, Gauteng Province and associated infrastructure (see project description below). These have been determined by the developer and project information has been passed to ISS study team by the project EAP. Analysis of the archaeological, cultural heritage, environmental and historic contexts of the study area predicted that archaeological sites, cultural heritage sites, burial grounds or isolated artefacts were likely to be present on the affected landscape. The field survey was conducted to test this hypothesis and verify this prediction along the proposed sewer line. The proposed project area is located to the north west of Vereeniging town. The main urban residential areas in the area include Meyerton, Vanderbijil and Vereeniging.

The report makes the following observations:

- 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 project.
- Most sections of the project area are very accessible, and the field survey was effective enough to cover all sections of the project receiving environs. The proposed project site is generally accessible. However, some portions of the proposed pipeline route had limited access because of dense grass cover.
- The project area is predominantly residential and commercial.
- Most of the proposed pipeline route is severely degraded from existing developments.
- Although the possibility of archaeological sites associated with the general project area is high, however, from a contextual studies perspective, no medium to high significance archaeological, heritage landmark or monument was recorded during this study.

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

- Should construction work commence for this project:

- The proposed project construction teams must be inducted on the significance of the possible archaeological resources that may be encountered during subsurface construction work before work on the area commences in order to ensure appropriate treatment and course of action is afforded to any chance finds.
- If archaeological materials are uncovered, work should 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/PHRA-G, may be classified as accessible to any interested and affected parties within the limits of the laws.

The conclusion of this study is that the impacts of the proposed development of the cultural environmental values are not likely to be significant if the Environmental Management Plan includes recommended safeguard and mitigation measures identified in this report.



## **ABBREVIATIONS**

<b>AIA</b>	Archaeological Impact Assessment
<b>ECO</b>	Environmental Control Officer
<b>EAP</b>	Environmental Assessment Practitioner
<b>EIA</b>	Environmental Impact Assessment
<b>EM</b>	Environmental Manager
<b>EMP</b>	Environmental Management Plan
<b>GPS</b>	Geographical Positioning System
<b>HIA</b>	Heritage Impact Assessment
<b>ISS</b>	Integrated Specialist Services (Pty) Ltd
<b>LIA</b>	Late Iron Age
<b>NHRA</b>	Nation Heritage Resources Act, Act 25 of 1999
<b>PM</b>	Project Manager
<b>PHRA-G</b>	Gauteng Provincial Heritage Agency
<b>SM</b>	Site Manager
<b>SAHRA</b>	South African Heritage Resources Agency

## 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.

***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 (NHRA) (Act No. 25 of 1999), 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 South African Heritage Resources Agency (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 I 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.

# INTRODUCTION

## Background

This Archaeological and Heritage Impact Assessment (AIA/HIA) Report has been prepared by Integrated Specialist Services (Pty) Ltd (Heritage Division) for the purpose of Environmental Authorisation being conducted by NKT Consulting (Pty) Ltd for the proposed Upgrading of main gravity sewer line Evaton and Sebokeng North to Wastewater treatment works in Boitumelo, Gauteng Province. This report details the field study, results of the study as well as discussion on the anticipated impacts of the proposed development as is required by Section 38 of the National Heritage Resources Act, Act 25. It focuses on identifying and assessing potential impacts on archaeological resources as well as on other physical cultural properties including historical heritage resources in relation to the proposed development. ISS heritage specialists undertook the assessments, research and consultations required for the preparation of the report comprising archaeological and heritage impacts for the purpose of ensuring that the cultural environmental values are taken into consideration for the environmental authorisation process.

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 development. The assessment includes recommendations to manage the expected impact of the proposed development project. The report includes recommendations to guide heritage authorities in making appropriate decision with regards to approval process for the proposed pipeline development. The report concludes with detailed recommendations on heritage management associated with the proposed development project. ISS, an independent consulting firm, conducted the assessment; research and consultations required for the preparation of the report in a manner consistent with its obligations set out in the NHRA.

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

- 1) Management summary
- 2) Methodology
- 3) Information regarding the desktop study
- 4) Map and relevant geodetic images and data
- 5) 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) Conclusions.

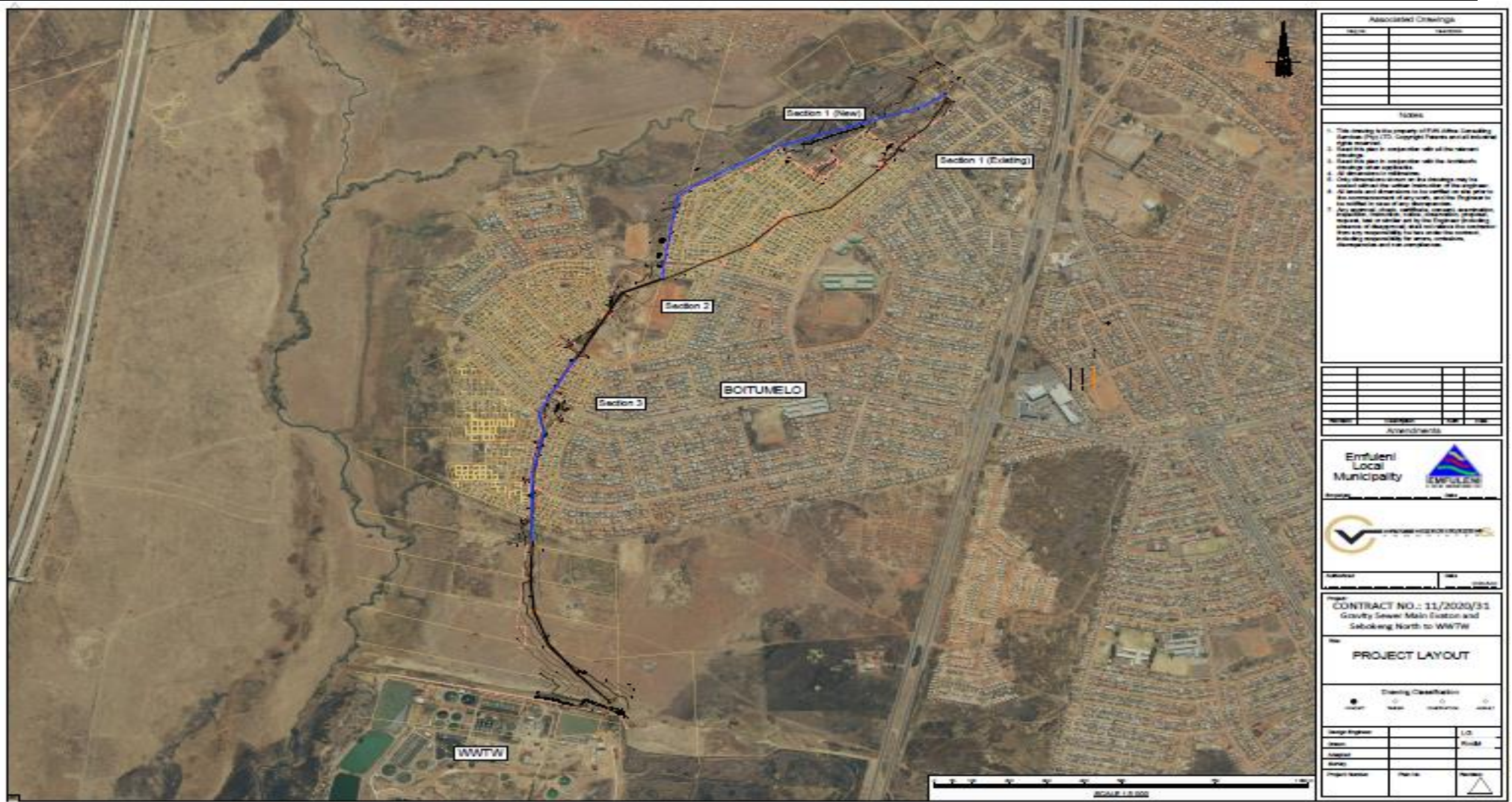
### Location of the proposed project site

The project falls within the jurisdiction of eMfuleni Local Municipality, at Sedibeng District Municipality which lies in south west of Gauteng province, South Africa. More-over, the study area is seen to fall approximately 18 km north east of the town of Vanderbijlpark and approximately 14.8 km North West of town of Vereeniging.

The proposed main outfall line is a sewer bulk line which collect sewerage around the immediate and nearby area`s to the wastewater treatment plant and is located at roughly the following coordinates:

Table 1:Location of sewer line

<b>Position</b>	<b>Latitude</b>	<b>Longitude</b>
Start of Bulk line	26°34'22.35"S	27°48'56.43"E
End of Bulk line	26°33'08.91"S	27°49'38.61"E



Associated Drawings	
Name	Number

Notes:

1. This drawing is the property of ERM Africa Consulting Services (Pty) Ltd. Copyright Patents and all other rights reserved.
2. Read this plan in conjunction with all relevant drawings.
3. Read this plan in conjunction with the technical drawings and specifications.
4. All dimensions in millimeters.
5. Only dimensions shown on this drawing may be used without the written instruction of the engineer.
6. All levels and dimensions to be certified and set prior to the commencement of any work, and the Engineer to be notified in writing of any such certification.
7. Any work to be done, whether contract, variation, repair, test or similar, shall be done in accordance with any responsibility to be taken under the contract. Damages and/or cost variations.

Name	Number	Total	Date

Amendments

No.	Description	Date

Emfuleni Local Municipality

CONTRACT NO.: 11/2020/31  
Gravity Sewer Main Evaton and Sebokeng North to WWTW

**PROJECT LAYOUT**

Drawing Classification

Design Engineer: L.S.  
 Checker: P.H.  
 Approver: P.H.  
 Date: 2020/11/11

Figure 1: Proposed sewer upgrade of gravity sewer main Evaton and Sebokeng north (CV Chavane Engineering 2020)

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### Photographic presentation of the proposed Pipeline route



Plate 1: View of sewer line route (Photograph © by Author 2020). Note the existing manholes on the bottom left



Plate 2: View of proposed sewer line (Photograph © by Author 2020). Burning obliterates any chance find evidence of archaeological artefacts





Plate 3: View of proposed sewer pipeline route (Photograph © by Author 2020).



Plate 4: View of proposed development site (Photograph © by Author 2020).



Plate 5: View of residential units within the proposed route (Photograph © by Author 2020).



Plate 6: View of proposed sewer line route (Photograph © by Author 2020).



Plate 7: Previous excavations impacts still visible (Photograph © by Author 2020).



Plate 8: View of proposed sewer upgrade route (Photograph © by Author 2020).

## Description of the Proposed Project

The project entails upgrading of existing main outfall sewer on the northern area (gravity sewer main Evaton and Sebokeng north to wastewater treatment works) in Boitumelo, Gauteng Province.

These activities will include, but not be limited to the following:

- Clearing and Grubbing
- Trenching
- Concrete works
- Hauling of material

## LEGAL REQUIREMENTS

Relevant pieces of legislations are to the present study are presented here. Under the National Heritage Resources Act, 1999 (Act 25 of 1999) (NHRA), Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), and the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and 2014 EIA Regulations, an AIA or HIA is required as a specialist sub-section of the EIA.

Heritage management and conservation in South Africa is governed by the NHRA and falls under the overall jurisdiction of the SAHRA and its PHRAs. 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 a 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 5000 sq. m
  - 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 10 000 sq. m
  - 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 heritage impact assessment report for authorization purposes to the responsible heritage resources agencies (SAHRA/PHRAs).

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 PHRA-G (the relevant 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 exist in the proposed project area.

In addition, the new EIA Regulations (4 December 2014) promulgated in terms of NEMA (Act 107 of 1998) determine that any environmental reports will include cultural (heritage) issues. The new 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 (Eskom, the environmental consultant, SAHRA or PHRA and interested and affected parties about existing heritage resources that may be affected by the proposed Upgrading of gravity sewer line in Boitumelo in Gauteng Province development, and to recommend mitigatory measures aimed at reducing the risks of any adverse impacts on these heritage resources.

### **Assessing the Significance of Heritage Resources**

The appropriate management of cultural heritage resources is usually determined on the basis of their 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.

Note 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. The site of interest considered in this project falls within this realm of broad significance.

Archaeological sites, as defined by the National Heritage Resources Act (Act 25 of 1999) 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 pipelines, roads and other destructive economic activities such as mining and agriculture. This true for the project area (Vanderbijlpark) which has seen infrastructure and residential developments over the past years. 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.

### **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 National Heritage Resources Act, 1999, while other historical and cultural significant sites, places and features, are generally determined by community preferences. The guidelines as provided by the NHRA (Act No. 25 of 1999) 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:

**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.

**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.

**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.

**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 EIA process to take into account the heritage management structure set up by the NHR Act. It makes provision for a 3-tier system of management including the South Africa Heritage Resources Agency (SAHRA) at a national level, Provincial Heritage Resources Authorities (PHRAs) at a provincial and the local authority. The Act makes provision for two types or forms of protection of heritage resources, i.e. formally protected and generally protected sites:

**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 PHRA.
- Grade 3 or local heritage sites.

**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:

### **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 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 Upgrading of existing main outfall sewer on the northern area (gravity sewer main Evaton and Sebokeng north to waste water treatment works) in Boitumelo, in Gauteng Province development as guided by the criteria in NHRA and NEMA.

ACT	Stipulation for developments	Requirement details
NHRA Section 38	Construction of road, wall, power line, 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 5000 sq. m	No
	Development involving three or more existing erven or subdivisions	No
	Development involving three or more erven or divisions that have been consolidated within past five years	No
	Rezoning of site exceeding 10 000 sq. m	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	No
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	None on the direct footprint
NHRA Section 37	Impacts on public monuments	No
Chapter 5 (21/04/2006) NEMA	HIA is required as part of an EIA	Yes

## **Other relevant legislations**

### **The Human Tissue Act**

Human Tissue Act of 1983 and Ordinance on the Removal of Graves and Dead Bodies of 1925 Graves 60 years or older are heritage resources and fall under the jurisdiction of both the National Heritage Resources Act and the Human Tissues Act of 1983. However, graves younger than 60 years are specifically protected by the Human Tissues Act (Act 65 of 1983) and the Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 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.

## **TERMS OF REFERENCE**

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

- Archaeological and heritage potential of the proposed upgrading of existing main outfall sewer on the northern area (gravity sewer main Evaton and Sebokeng north to waste water treatment works) in Boitumelo in Gauteng Province including any known data on affected areas;
- Provide details on methods of study; potential and recommendations to guide the PHRA/ SAHRA to make an informed decision in respect of authorisation of the proposed development.
- Identify all objects, sites, occurrences and structures of an archaeological or historical nature (cultural heritage sites) located in and around the proposed project area
- 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 project 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;

In addition, the AIA should comply with the requirements of NEMA, including providing the assumptions and limitations associated with the study; the details, qualifications and expertise of the person who prepared the report; and a statement of competency.

## **METHODOLOGY**

The proposed upgrading of existing main outfall sewer on the northern area (Gravity sewer main, Evaton and Sebokeng north to waste water treatment works) in Boitumelo, Gauteng Province development requires clearance and authorisation from government compliance agencies including the heritage authority SAHRA. 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 sewer upgrade development. 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 AIA/HIA practices and aimed at locating all possible objects, sites, and features of cultural significance on the study was followed by field surveys. The field assessment was conducted according to generally accepted development footprint. Initially a drive-through was undertaken around the proposed development site as a way of acquiring the archaeological impression of the general area. This was then followed by a walk down survey along the proposed pipeline route, 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 sewer upgrade development 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 development.

### **The Fieldwork survey**

The fieldwork survey was undertaken on the 19th of July 2020. The desktop studies were followed by intensive and extensive field walking to verify the situation on the ground. A comprehensive survey of this area was conducted to identify the salient features as well as relationships between the different components of the LIA site, buildings and burial sites. The main focus of the survey involved a pedestrian survey which was conducted along the proposed pipeline 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, existing buildings 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: 4). However, the situation today is completely different. The study area now lies on a clearly modified landscape that is dominated by agricultural infrastructure and developments.

## 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 remembered that archaeological deposits (including graves and traces of mining heritage) usually occur below the ground level. Should artefacts or skeletal material be revealed at the site during construction, such activities must be halted immediately, and a competent heritage practitioner, SAHRA or PHRA-G must be notified in order for an investigation and evaluation of the find(s) to take place (see NHRA (Act No. 25 of 1999), Section 36 (6)). Recommendations contained in this document do not exempt the developer 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 or road construction. Some assumptions were made as part of the study and therefore some limitations, uncertainties and gaps in information apply. It should, however, be noted that these do not invalidate the findings of this study in any significant way:

- The proposed development will be limited to specific site as detailed in the development layout plan (Figure 1 & 2).
- The construction team will utilize existing access roads along the proposed pipeline route and service sites will use the existing access roads and there will be no construction without any major deviations.
- Given the heavily degraded nature of the affected project site and the level of existing developments within the affected landscape, most sections of the project area have low potential to yield significant *in situ* archaeological or physical cultural properties.
- No excavations or sampling were undertaken since a permit from heritage authorities is required to disturb a heritage resource. As such the results herein discussed are based on surface observed indicators, these surface observations concentrated on exposed sections such as road cuts and clear farmland.
- This study did not include any ethnographic and oral historical studies nor did it investigate the settlement history of the area.

## CULTURE HISTORY BACKGROUND OF THE PROJECT AREA

### Contemporary Heritage

Boitumelo and Sebokeng are located in Vaal area of Gauteng Province, and its neighbors are Vereeniging (to the South) Vanderbijlpark (to the west), Three Rivers (east) and Sasolburg (south). Vereeniging is the major town in the Vaal Triangle. The Vaal is currently one of the most important industrial manufacturing centres in South Africa, with its main products being iron, steel, pipes, bricks, tiles and processed lime. Several coal, fire clay, silica and quarry stone mines are operational in the Vaal area. There are several Eskom thermal power plants that supply electricity to the nearby gold mines in the vicinity of Vereeniging. Water supply to Gauteng has its history in the Vaal region.

Vereeniging was established in 1892 on the farm Leeuwkuil as a result of rapid coal mining development in the area. The farm Leeuwkuil was bought by Samuel Marks who established the *De Zuid Afrikaanshe en Oranje Vrystaatsche Kolen and Mineralen Vereeniging* (South African and Orange Free State Coal and Mineral Association). The Coal mines in Vereeniging supplied coal to Kimberley by ox drawn wagons. The town experienced rapid growth as a mining town and later as the steel manufacturing hub of South Africa.

The city witnessed the Anglo -Boer war and a concentration camp was established at Vereeniging in September 1900. Many blood battles were fought in the Vereeniging area. A well-preserved British blockhouse still testifies to the Anglo-Boer War of 1899- 1902 (see Plate 11). It is located at Witkop, 10 kilometres to the north of Meyerton on the main road to Johannesburg (R59). By October 1901 the concentration camp housed 185 men, 330 women, and 452 children. Today, the Maccauvlei Golf Course is on the site of the concentration camp. The Vereeniging concentration camp cemetery is located in the old municipal cemetery, off Beaconsfield Avenue near the abattoir. A garden of remembrance also exists on the Makauvlei golf course, near the clubhouse.

The town of Vereeniging played a most significant role in the history of South Africa especially the ending of the Anglo-Boer war. The Treaty of Vereeniging (also called the Peace of Vereeniging) was signed on the 31st of May 1902, and saw the end of a protracted and miserable conflict between the British Crown and the Boer Settlers for sovereignty of the resource-rich land of South Africa. The Treaty of Vereeniging which ended the Second Boer war (1899-1902) was negotiated and signed by the South African Republic, Orange Free State and the British Empire. The Peace of Vereeniging Monument was erected to commemorate the Peace of Vereeniging that ended the Anglo-Boer War in 1902.



Plate 9: Photo 9: View of the blockhouse in Vereeniging built by the British during the Second Boer War.

During the Apartheid era, the city of Vereeniging experienced one of the worst massacres in the history of the struggle against apartheid. In 1960 a group of anti-pass law protesters were massacred at the Sharpeville Police Station which is now a Museum. The Sharpeville Massacre is known around the world as one of the most tragic and significant events in South Africa's Apartheid history. On the 21<sup>st</sup> of March 1960, a demonstration against South Africa's draconian pass laws, held outside the Sharpeville police station, became catastrophic. The apartheid police fired on the demonstrators, killing 69 people and injuring hundreds more. This event is commemorated in this memorial in Sharpeville, as well as in Human Rights Day – an annual public holiday, marked by many memorial events around South Africa. The Sharpeville Massacre site and the Pelandaba Cemetery where the victims are buried are National Heritage Sites managed by SAHRA. The sites have been nominated to be included into the prestigious UNESCO World Heritage list. There are also monuments commemorating the fallen soldiers and victors of the Anglo Boer War, to the women and children who died in the English run concentration camps, and monuments to the victors and loser in various tribal wars. There are monuments and tributes to the incidents, heroes and martyrs in the struggle against Apartheid.

There are pre-historic archaeological discoveries and curiosities, from plant fossils to dinosaur bones to the fossilised remains of hominids and early humans which were discovered in the Vereeniging area. Since the late 19th century, quarrying operations in Vereeniging have revealed some fossiliferous sandstone outcrops in the area. The discoveries were made during mining operations at places such as Leeuwkuil and the Central Colliery Mine as well as at other localities near to the Vaal River. Specimens are displayed at the Bernard Price Institute for Palaeontological Research (Leslie Collection), the Geological Museum in Johannesburg and in the Vereeniging Museum. The most common genera present are *Noeggerathiopsis*, *Gangamopteris* and

Glassopteris. The quarrying operations also unearthed numerous Stone Age sites along earlier or ancient banks of the Vaal River and the Klip River. Early and Middle Stone Age sites were discovered at several localities, such as Klipplaatdrift, the Klip River Quarry site, the Duncanville Archaeological Reserve (also known as the Van Riet Louw Archaeological Reserve). These sites contain thousands of stone tools. 14 A rock engraving site that was declared a national monument was also discovered at Redan on the farm Macuvlei near Vereeniging. The Redan Rock Engraving site contains as many as 244 rock engravings done on an outcrop of rocks. Some of the engravings depicts animals, while others illustrate KhoiSan weapons. A large number of the engravings are geometric designs, such as circles and other symbolic figures. The Redan Rock art site is very significant site testifying that the Vaal area has long been inhabited by prehistoric communities such as the KhoiSan. Some of the remains are housed at the Vaal Teknorama Museum in Vereeniging.



Plate 10: Photo 10 and 11: View of the Sharpeville Memorial and The Peace of Vereeniging – Monument at Vereeniging City Library



Plate 11: Photo 11 and 12: View of the Concentration Camp Graveyard and Memorial and The George William Stow Memorial – Bedworth Farm, Free State, Vaal.

The first railway line over the Vaal River linking the Orange Free State Republic (OFS) and the Zuid-Afrikaanse or Transvaal Republic was officially opened on 21 May 1892 by President Reitz of the OFS and President Kruger of the ZAR. Pillars of the bridge carrying the old railway line can still be seen in the Vaal River ([www.joburg.org.za](http://www.joburg.org.za)). A feature was built to commemorate British soldiers who died during the Anglo-Boer War near the railway line that crosses the Vaal River. The small Voortrekker Monument celebrating the 100-year anniversary of the

Ossewatrek was erected in 1938 in the middle of Voortrekker road in Vereeniging, between Mark laan and Merriman laan. Several coal mines were established on both sides of the Vaal River, such as the Cornelia and Springfield coal mines. A memorial for five miners who died in South Africa's first mining disaster in 1905 was erected at the Vereeniging Cemetery. The previous National Monuments Council unveiled a bronze plaque to commemorate the 100-year anniversary of the discovery of coal at Dickinson Park.

## **Prehistoric Culture**

Gauteng area has yielded evidence of human settlement extending into hundreds of thousands of years of prehistory that include the Stone Age, Iron Age, Historical period and contemporary communities. The palaeontological human-evolution record is rich in palaeoanthropological relics that were found in Sterkfontein and Maropeng areas that have been dubbed the Cradle of Mankind that is also a World Heritage Site. There is evidence of the use of the larger area by Stone Age communities for example along the Kliprivier where ESA and MSA tools were recorded. LSA material is recorded along ridges to the south of the current study area (Huffman 2008). Petroglyphs occur at Redan as well as along the Vaal River (Berg 1999).

Iron Age sites associated with the ancestors of the modern Sotho-Tswana and Ndebele speaking communities are widespread in the region. In recent colonial history, the area played host to different competing local settler communities. The area was a scene of series of colonial wars. By the end of the 19<sup>th</sup> century, the region was placed under British rule and the local people displaced. Today most of the land is used for commercial, mining, agricultural and industrial activities. It is within this cultural landscape that the project area is located. Archaeologically, the Gauteng (Randfontein area) is associated with Late Iron Age Sotho-Tswana communities and has yielded four ceramic sequences of the Urethwe tradition: Ntsuanatsatsi (1450-1650), Olifantspoort (AD 1500 -1700), Uitkomst (AD 1700-1850) and Buispoort (1700-1840) [Huffman 2007: 443]. This area was historically occupied by predominantly Sotho-Tswana -speaking groups before Mzilikazi's Ndebele briefly dominated during the Mfecane. Around the 1830s, the region also witnessed the massive movements associated with the Mfecane ('wandering hordes'). The causes and consequences of the Mfecane are well documented elsewhere (e.g. Hamilton 1995; Cobbing 1988). The area was partitioned into commercial settler farms during the colonial period.

Melville Koppies is the most well documented site in the project area. The site was excavated by Professor Mason from the Department of Archaeology of the Witwatersrand University in the 1980's. Extensive Stone walled sites are also recorded at Klipriviers Berg Nature reserve belonging to the Late Iron Age period. A large body of research is available on this area. These sites (Taylor's Type N, Mason's Class 2 & 5) are now collectively referred to as Klipriviersberg (Huffman 2007). These settlements are complex in that aggregated settlements are common, the outer wall sometimes includes scallops to mark back courtyards, there are more small stock kraals, and straight walls separate households in the residential zone. These sites date back to the 18<sup>th</sup> and 19<sup>th</sup> centuries and were built by people in the Fokeng cluster.



In this area, the Klipriviersberg walling probably ended around AD 1823, when Mzilikazi entered the area (Rasmussen 1978). This settlement type may have lasted longer in other areas because of the positive interaction between Fokeng and Mzilikazi. Prior to the Gauteng region being incorporated into the colonial administration of the Transvaal, the region experienced several episodes of white settler migration and settler settlements as well as the associated colonial wars such as the Anglo-Boer War, which ended in 1902. Today the project area is predominantly residential and commercial.

### **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 because no historically known groups occupied the study area and most of the original settler descendants moved away from the area.

### **SAHRIS DATABASE AND IMPACT ASSESSMENT REPORTS IN THE PROJECT AREA**

Several heritage sites are on record in the Vaal area covered by the 2627DB 1: 50 000 sheet. These sites consist of Stone Age (Redan Rock Engraving site), Late Iron Age, Anglo Boer War remains, and Historic mining remains. More than ten heritage Impact studies were conducted in the general vicinity of the study area. The studies include powerline projects completed by Van Schalkwyk (2007,2013) the report mentions that structures older than 60 years occur in the area. Pelsler and Vollenhoven (2009) for powerline development, the study also mentions several archaeological and heritage sites in the project area. Pistorius (2008) noted the historic mining archaeological sites and several historical structures which were national monuments under the National Monuments Act of 1969. Kusel (2014) noted several historical buildings and structures. Coetzee (2009) completed a study in Luipaardsvlei and recorded no sites of significance. Birkholtz (2008) noted existence of prehistoric sites, sites associated with Anglo Boer war as well as sites associated with the recent struggle against apartheid. Fourie (2011a & 2011b) and Mlilo (2018 a, b, c, d and e and 2019) study for pipeline developments in the Vaal also noted rich cultural history of Vereeniging.

## **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 digging for foundations, indirect impacts may occur during movement of construction vehicles. The excavation for sewer pipeline trenches 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 in the surface sand. Since heritage sites, including archaeological sites, are non-renewable, it is important that they are identified, and their significance assessed prior to construction. 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 within the proposed development site. Further, archaeological sites and unmarked graves may be buried beneath the surface and may only be exposed during construction. The purpose of the AIA 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 site has previously been cleared for infrastructure and residential developments. The following section presents results of the archaeological and heritage survey conducted within the proposed development project site.

The proposed upgrading of existing main outfall sewer on the northern area (gravity sewer main Evaton and Sebokeng north to waste water treatment works) in Boitumelo, Gauteng Province is located on a heavily altered landscape due to infrastructure and residential developments. The proposed development has been established through consideration of biophysical, social, technical, and cultural aspects. The process will aim to provide a final site selection of the proposed development site based on biophysical, social, cultural, and technical considerations. The following section presents results of the archaeological and Heritage survey conducted within the proposed development site.

### **Archaeological and Heritage Site**

The study did not identify any confirmable archaeological sites or material within the proposed sewer upgrade route. The affected landscape is heavily degraded from existing developments (see Plates 1-10, Figure 1). This limited the chances of encountering significant *in situ* archaeological sites. It was assumed that there was always a very high chance of finding archaeological sites beneath the surface. However, the chances of recovering significant archaeological materials were seriously compromised and limited due to infrastructural developments and other destructive land use patterns.

Based on the field study results and field observations, the author concluded that the receiving environment for the proposed development has low to medium potential to yield previously unidentified archaeological remains during subsurface excavation and construction work associated with the proposed sewer upgrade.

### **Historical Buildings and Structures**

The project area and the neighbouring towns have several buildings and structures which are older than 60 years and some which are on the Provincial and National heritage lists (Birkholtz 2010, Coetzee, 2011, 2013, Fourie, 2011, Pistorius, 2008 & Pelsler, 2011). Buildings older than 60 years are protected by Section 34 of the NHRA and may not be altered or destroyed without a permit from PHRA-G. Some of the buildings such as the Old Police Station are National heritage sites while some were National Monuments under the Monuments Act. None of the listed heritage buildings are located within the proposed development site. As such the proposed development project does not trigger Section 34 of the NHRA.

### **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 at the surface. Archaeological and historical burials are usually identified when they are exposed through erosion and earth moving activities for infrastructure developments such as pipelines and roads. In some instances, packed stones or a single stone may indicate the presence of informal pre-colonial burials.

The study did not identify any graves or burial sites within the proposed development site however it should be noted that burial grounds and gravesites are accorded the highest social significance threshold (**See Appendix 3**). They have both historical and social significance and are considered sacred. Wherever they exist or not, they may not be tampered with or interfered with during any development. It is important to note that the possibility of encountering human remains during subsurface earth moving works anywhere on the landscape is ever present. Although the possibility of encountering burial sites is low along the proposed pipeline development, should such sites be identified during subsurface construction work, they are still protected by applicable legislations and they should be protected (**See Appendices 1, 2 & 3 for more details**).

### **Public Monuments and Memorials**

There are several public monuments and plaques on the SAHRIS database, these range from archaeological, historical, colonial, Anglo Boer Wars and the struggle against apartheid, which are on record in the general project area, however, none of them are located within the proposed pipeline route.

### 8.3 Assessment of construction impacts

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 the pipeline route under study for meeting a project need. The significance of the 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:

#### **Probability: This describes the likelihood of the impact actually occurring**

**Improbable:** The possibility of the impact occurring is very low, due to the circumstances, design or experience.

**Probable:** There is a probability that the impact will occur to the extent that provision must be made, therefore.

**Highly Probable:** It is most likely that the impact will occur at some stage of the development.

**Definite:** The impact will take place regardless of any prevention plans and there can only be relied on mitigatory measures or contingency plans to contain the effect.

#### **Duration: The lifetime of the impact**

**Short Term:** The impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.

**Medium Term:** The impact will last up to the end of the phases, where after it will be negated.

**Long Term:** The impact will last for the entire operational phase of the pipeline but will be mitigated by direct human action or by natural processes thereafter.

**Permanent:** The impact is non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.

#### **Scale: The physical and spatial size of the impact**

**Local:** The impacted area extends only as far as the activity, e.g. footprint

**Site:** The impact could affect the whole, or a measurable portion of the above-mentioned properties.

**Regional:** The impact could affect the area including the neighboring residential areas.

#### **Magnitude/ Severity: Does the impact destroy the environment, or alter its function**

**Low:** The impact alters the affected environment in such a way that natural processes are not affected.

**Medium:** The affected environment is altered, but functions and processes continue in a modified way.

**High:** Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

**Significance:** This is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.

**Negligible:** The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.

**Low:** The impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.

**Moderate:** The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.

**High:** The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

**Table 3: The following weights were assigned to each attribute:**

Aspect	Description	Weight
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short term	1
	Medium term	3
	Long term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severity	Low	2

	<b>Medium</b>	<b>6</b>
	<b>High</b>	<b>8</b>
<b>Significance</b>	<b>Sum (Duration, Scale, Magnitude) x Probability</b>	
	<b>Negligible</b>	<b>≤20</b>
	<b>Low</b>	<b>&gt;20 ≤40</b>
	<b>Moderate</b>	<b>&gt;40 ≤60</b>
	<b>High</b>	<b>&gt;60</b>

The significance of each activity should be rated without mitigation measures (WOM) and with mitigation (WM) measures for both construction, operational and closure phases of the proposed development

**Table 4: Impact Assessment Matrix**

Upgrading of existing main outfall sewer on the Northern area (gravity sewer main Evaton and Sebokeng north to wastewater treatment works) in Boitumelo, Gauteng Province.								
<u>Nature of Impact</u>	<u>Management Measures</u>	<u>Duration</u>	<u>Scale</u>	<u>Magnitude/Severity</u>	<u>Probability</u>	<u>Calculations Sum (Duration, Scale, Magnitude) x Probability</u>	<u>Proposed Management Measures</u>	<u>Significance</u>
Archaeological Remains	Without management	3	3	6	2	$(3+3+6) \times 2=24$	No archaeological remains were recorded along the proposed pipeline route, no measures are required.	Low to medium
	With management	3	2	2	2	$(3+2+2) \times 2=14$	No archaeological remains were recorded along the proposed pipeline. However, the chance find procedure applies.	Low to medium
Graves and Burial Grounds	Without management	3	3	1	2	$(3+3+1) \times 4=14$	No graves were recorded along the proposed pipeline. Mitigation is not required except that the chance find procedure still applies.	Low
	With management	3	3	1	2	$(3+3+1) \times 2=14$	No mitigation required but the chance find procedure must be put in place to deal with accidental finds	Negligible
Historical buildings and structures	Without management	3	3	6	3	$(3+3+6) \times 3=36$	The are no buildings and strictures along the proposed pipeline route	Negligible
	With management	3	3	2	2	$(3+3+2) \times 2=16$	Mitigation not required because there are no buildings along the proposed pipeline route	Negligible
Mining Heritage	Without management	3	3	1	2	$(3+3+1) \times 2=14$	No traces of historical mining along the proposed pipeline route. Mitigation not required	Negligible

	With management	3	2	1	2	$(3+2+1) \times 2=12$	No traces of historical mining along the proposed pipeline route. Mitigation not required	Negligible
Public Monuments and memorials	Without management	3	3	1	1	$(3+3+1) \times 1=7$	None recorded along the proposed pipeline route. Mitigation not required	Negligible
	With management	1	3	1	1	$(1+3+1) \times 1=5$	Induct construction workers and mark any memorials and plaques	Negligible
Natural Heritage	Without management	3	3	6	2	$(3+3+6) \times 2=24$	None recorded along pipeline route. Mitigation not required	Low
	Without management	3	2	2	2	$(3+2+2) \times 2=14$	Mitigation not required	Negligible

Based on the impact rating, the anticipated impacts to heritage resources will be minimal, the main impact will be on heritage resources buried beneath the surface. Although the potential of encountering significant heritage resources during construction, these are covered by the appended Chance Find Procedure.



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## **CUMULATIVE IMPACTS**

This section considers the cumulative impacts that would result from the combination of the proposed development. An examination of the potential for other projects to contribute cumulatively to the impacts on heritage resources from this proposed project was undertaken during the preparation of this report. The impacts of the proposed pipeline development were assessed by comparing the post-project situation to a pre-existing baseline. The total impact arising from the proposed project (under the control of the applicant), other activities (that may be under the control of others, including other developers, local communities, government) and other background pressures and trends which may be unregulated. The project's impact is therefore one part of the total cumulative impact on the environment. There are existing infrastructure developments and existing residential developments within the project area. As such increased development in the project area will have a number of cumulative impacts on heritage resource whether known or hidden beneath the surface. For example, during construction phase they will be increase in human activity and movement of heavy construction equipment and vehicles that could change, alter or destroy heritage resources within and outside the proposed development site given that archaeological remains occur on the surface. Cumulative impacts that could result from a combination of the proposed development and other actual or proposed future developments in the broader study area include site clearance and the removal of topsoil could result in damage to or the destruction of heritage resources that have not previously been recorded for example abandoned and unmarked graves.

No specific paleontological resources were found in the project area during the time of this study; however, this does not preclude the fact that paleontological resources may exist within the greater study area. As such, the proposed project has the potential to impact on possible paleontological resources in the area. Sites of archaeological, paleontological, or architectural significance were not specifically identified, and cumulative effects are not applicable. The nature and severity of the possible cumulative effects may differ from site to site depending on the characteristics of the sites and variables.

Cumulative impacts refer to additional impacts, which even if acceptable if considered in isolation, would together with the existing impacts, exceed the threshold of acceptability and cause harm to the cultural landscape. In this case cumulative impacts that need attention are related to the impacts of access roads and impacts to buried heritage resources. Allowing the impact of the proposed development to go beyond the surveyed site would result in a significant negative cumulative impact on sites outside the surveyed area. A significant cumulative impact that needs attention is related to stamping by especially construction vehicles during clearance and excavation for foundations. No significant cumulative impacts, over and above those already considered in the impact assessment, are foreseen at this stage of the assessment process.

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## DISCUSSION

Several archaeologists and heritage specialists conducted Phase 1 studies since 2007. The studies were conducted for various infrastructure developments such as power lines and substations, water supply pipelines and residential developments. These studies noted that project area is a rich cultural landscape. Although now altered significantly several significant archaeological sites were recorded in the area and there are several colonial and post-apartheid monuments in the area for example Birkholtz (2010), Coetzee (2009, 2013), Fourie (2011), Kusel (2014), Pistorius (2008) and Van der Schalkwyk (2013). Therefore, the current study should be read in conjunction with previous Phase 1 Impact Studies conducted in the proposed project area. The lack of confirmable archaeological sites recorded during the current survey is thought to be a result of three primary interrelated factors:

1. That proposed pipeline development is situated within a heavily degraded area, and has reduced sensitivity for the presence of high significance physical cultural site remains, be they archaeological, historical, or burial sites, due to previous earth moving disturbances resulting from developments and other land uses in the project area.
2. That the survey focused on sample sections that had high potential to yield possible archaeological sites. Due to the size of the project site, it was impractical to cover every inch of the project site. As such, there is the possibility that low to medium archaeological sites exist in the project area whereas the sampled sections fell outside sections with potential distinct archaeological sites.
3. Limited ground surface visibility on sections of the project area 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 proposed development site. The absence of confirmable and significant archaeological cultural heritage site is not evidence in itself that such sites do not exist in the project area. It may be that, given the dense development in most sections of the development site, if such sites existed before, changing earth-moving activities may have destroyed their evidence on the surface. Significance of the Site of Interest is not limited to presence or absence of physical archaeological sites. The findings of previous HIA studies testify to the significance of the project area as a cultural landscape of note, which has discernible links to local oral history and folk stories, environmental and ethnobotanical aesthetics, popular memories etc. associated with significance emanating from intangible heritage of the region.

## **ASSESSING HERITAGE SIGNIFICANCE**

The appropriate management of cultural heritage resources is usually determined on the basis of their 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 is based on the views expressed by the claimant and his 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 resonance to the indigenous community. The site of interest considered in this project falls within this realm of broad significance.

## RECOMMENDATIONS

The study did not find any permanent barriers to the proposed upgrading of existing main outfall sewer on the northern area (gravity sewer main Evaton and Sebokeng north to waste water treatment works) in Boitumelo, Gauteng Province. The following recommendations are based on the results of the AIA/HIA research, cultural heritage background review, site inspection and assessment of significance. All the potential impacts associated with the proposed development can be mitigated without serious design alterations. The project may be approved subject to the following recommendations:

- From a heritage point of view, the proposed development may be approved to proceed as planned under observation that construction work does not extend beyond the surveyed site.
- The footprint impact of the proposed development should be kept to minimal to limit the possibility of encountering chance finds outside the site.
- Location of the proposed development infrastructure should be restricted to minimum footprint impact especially where such infrastructure falls within bushy area. Such bushy sections have local ethno-botany significance as sources of traditional herbs and medicines. As such disruption and vegetation clearance should be minimal.
- The project area has considerable existing built-up areas and as such no impacts are anticipated on the cultural built environment given the existence of contemporary built-infrastructure or structures already in the project area.
- 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 a detailed heritage monitoring procedures are included in the project EMP for the construction phase, include chance archaeological finds mitigation procedure in the project EMP (See Appendix 1).
- The chance finds process will be implemented when necessary especially when archaeological materials and burials are encountered during subsurface construction activities.
- If archaeological materials are uncovered, work should cease immediately and the SAHRA be notified and activity should not resume until appropriate management provisions are in place.
- If during the construction or operations phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artifacts 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 senior on-site manager.
- The senior-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 SAHRA/PHRA-G.

- If a human grave/burial is encountered, the remains must be left as undisturbed as possible before the local police and SAHRA or PHRA-G are informed. If the burial is deemed to be over 60 years old and no foul play is suspected, an emergency rescue permit may be issued by SAHRA for an archaeologist to exhume the remains.
- The findings of this report, with approval of the PHRA-G/SAHRA, may be classified as accessible to any interested and affected parties within the limits of the laws.

## 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. In terms of the archaeology and heritage in respect of the proposed upgrading of existing main outfall sewer on the northern area (gravity sewer main Evaton and Sebokeng north to waste water treatment works) in Boitumelo, Gauteng Province, there are no obvious 'Fatal Flaws' or 'No-Go' areas. No archaeological sites were recorded along the proposed pipeline route. The field survey established that the affected project area is degraded by existing infrastructure, residential developments, landscaping, previous agriculture activities and associated infrastructure. This report concludes that the proposed development may be approved by SAHRA/PHRA-G to proceed as planned subject to recommendations herein made which include a heritage monitoring plan being incorporated into the construction EMP (**See Appendices 1, 2 &3**). The measures are informed by the results of the study and principles of heritage management enshrined in the NHRA, Act 25 of 1999.

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**APPENDIX 1: CHANCE FIND PROCEDURE FOR THE PROPOSED UPGRADING OF GRAVITY SEWER LINE**

June 2020

## **ACRONYMS**

<b>BGG</b>	Burial Grounds and Graves
<b>CFPs</b>	Chance Find Procedures
<b>ECO</b>	Environmental Control Officer
<b>HIA</b>	Heritage Impact Assessment
<b>ICOMOS</b>	International Council on Monuments and Sites
<b>ISS</b>	Integrated Specialist Services (Pty) Ltd
<b>NHRA</b>	National Heritage Resources Act (Act No. 25 of 1999)
<b>SAHRA</b>	South African Heritage Resources Authority
<b>SAPS</b>	South African Police Service
<b>UNESCO</b>	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**

Proposed pipeline route 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 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 (2020) over a large area earmarked for EMP upgrade. The AIA/HIA conducted was very comprehensive covering the entire site. The studies did not record any significant archaeological or heritage resources.

### **PURPOSE**

The purpose of this Chance Find Procedure is to ensure the protection of previously unrecorded heritage resources within the proposed development 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 earth moving and ground altering activities during construction. 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 vegetation cover. ISS 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 construction/clearance activity 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've 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 construction 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 ISS 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 a 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, rescue. The report will be submitted to SAHRA and to the developer.

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 UPGRADING OF GRAVITY SEWER LINE

Objective								
<ul style="list-style-type: none"> <li>• Protection of archaeological sites and land considered to be of cultural value;</li> <li>• Protection of known physical cultural property sites against vandalism, destruction and theft; and</li> <li>• The preservation and appropriate management of new archaeological finds should these be discovered during construction.</li> </ul>								
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 PHRA-G 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 remain 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 Manager who in turn will inform PHRA-G.		When necessary	C CECO	SM	ECO	EA EM PM
		Should any remains be found on site that is potentially human remains, the PHRA-G 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: HERITAGE MITIGATION MEASURE TABLE

SITE REF	HERITAGE ASPECT	POTENTIAL IMPACT	MITIGATION MEASURES	RESPONSIBLE PARTY	PENALTY	METHOD STATEMENT REQUIRED
Chance Archaeological and Burial Sites	General area where the proposed project is situated is a historic landscape, which may yield archaeological, cultural property, remains. There are possibilities of encountering unknown archaeological sites during subsurface construction work which may disturb previously unidentified chance finds.	<p>Possible damage to previously unidentified archaeological and burial sites during construction phase.</p> <ul style="list-style-type: none"> <li>• Unanticipated impacts on archaeological sites where project actions inadvertently uncovered significant archaeological sites.</li> <li>• Loss of historic cultural landscape;</li> <li>• Destruction of burial sites and associated graves</li> <li>• Loss of aesthetic value due to construction work</li> <li>• Loss of sense of place</li> </ul> <p>Loss of intangible heritage value due to change in land use</p>	<p>In situations where unpredicted impacts occur construction activities must be stopped and the heritage authority should be notified immediately.</p> <p>Where remedial action is warranted, minimize disruption in construction scheduling while recovering archaeological data. Where necessary, implement emergency measures to mitigate.</p> <ul style="list-style-type: none"> <li>• Where burial sites are accidentally disturbed during construction, the affected area should be demarcated as no-go zone by use of fencing during construction, and access thereto by the construction team must be denied.</li> <li>• Accidentally discovered burials in development context should be salvaged and rescued to safe sites as may be directed by relevant heritage authority. The heritage officer responsible should secure relevant heritage and health authority permits for possible relocation of affected graves accidentally encountered during construction work.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor /</li> <li>• Project Manager</li> <li>• Archaeologist</li> <li>• Project EO</li> </ul>	<p>Fine and or imprisonment under the PHRA-G Act &amp; NHRA</p>	<p>Monitoring measures should be issued as instruction within the project EMP.</p> <p>PM/EO/Archaeologists Monitor construction work on sites where such development projects commence within the site.</p>

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## 1. APPENDIX 4: LEGAL BACKGROUND AND PRINCIPLES OF HERITAGE RESOURCES MANAGEMENT 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.