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A PHASE I HERITAGE IMPACT ASSESSMENT (HIA) STUDY FOR SIBANYE STILLWATER'S PROPOSED MECCANO TAILINGS RETREATMENT PROJECT NEAR MARIKANA IN THE NORTH-WEST

Prepared by:

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EXECUTIVE SUMMARY

Sibanye Stillwater proposes to construct pipelines in support of the proposed Meccano Tailings Retreatment Project near Marikana in the North-West Province (hereafter referred to as the Pipeline Project). The construction of the proposed new pipelines may have an influence on any of the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (NHRA) (No. 25 of 1999) which may occur along the proposed new pipeline corridors (referred to as the Project Area). Therefore, Alta van Dyk Environmental Consultants cc., in accordance with Section 38 of the NHRA (No 25 of 1999), commissioned the author to undertake a Phase I Heritage Impact Assessment (HIA) for the Project Area.

The aims with the heritage survey and impact assessment for the proposed Pipeline Project therefore were the following:

- To establish whether any of the types and ranges of heritage resources as outlined in Section 38 of the NHRA do occur along the proposed new pipeline corridors (Project Area).
- To establish the significance of these heritage resources along the proposed new pipeline corridors as well as the level of significance of any possible impact on these heritage resources.
- To propose mitigation measures for those types and ranges of heritage resources that may be affected by the proposed Pipeline Project.

The Phase I HIA study for the Pipeline Project revealed the following types and ranges of heritage resources, namely:

- A large graveyard (GY01) with high significance along a haul road where several of the pipelines for the Pipeline Project will be constructed (Figures 1 & 8).

The significance of the heritage resources

The significance of the graveyard is determined as well as the significance of any possible impact on the graveyard to propose mitigation and management measures if the graveyard will be affected by the proposed Pipeline Project.

Significance of the graveyard

All graveyards and graves can be considered of high significance and are protected by various laws (Table 2). Legislation regarding graves includes Section 36 of the NHRA in instances where graves are older than sixty years. Other legislation about graves includes those which apply

when graves are exhumed and relocated, namely the Ordinance on Exhumations (No 12 of 1980) and the Human Tissues Act (No 65 of 1983 as amended). Municipal laws about graves and graveyards may differ and professionals involved with the exhumation and relocation of graves and graveyards must adhere to these laws (Table 3).

Impact on the graveyard

According to the layout plan for the Pipeline Project the following can be noted (Figure 15):

- The graveyard (GY01) is located to the north of the haul road whilst the pipelines are to be constructed along the southern shoulder of the haul road. The graveyard therefore will not to be impacted by the proposed Pipeline Project (Figures 1 & 8).

The significance of the impact on the graveyard

The graveyard is rated as of high heritage significance (Table 2). However, the impact on the graveyard during the construction process will be low as the pipelines will be constructed along the southern shoulder of the haul road whilst GY01 is located to the north of the haul road. The graveyard also needs not to be affected by the construction process if the mitigation measures which have been outlined are implemented and followed (Table 3).

Mitigating the graveyard

GY01 is demarcated with a fence on all its sides. However, the front fence bordering on the haul road has collapsed. This fence with its entrance gate must be repaired before the construction of the pipelines commences. It is recommended that the entrance gate be locked during the construction process. Red cautionary barrier tape must be draped along the fence together with signposts with the following warning: ‘Cautious Graveyard. Protected by law. Damage caused will lead to prosecution’.

Visitor hours should be arranged for family members and friends of the deceased during the construction process which comply with the mine’s health and safety policy. Contact numbers should also be provided for any enquiries or complaints which may be raised by any family members or friends of the deceased during the construction process.

If heritage resources have been missed during the survey chance-find procedures outlined for heritage resources and graves as outlined must be implemented during the construction, operation, or closure phases of the Pipeline Project.

Chance-find procedures

If heritage resources have been missed during the survey chance-find procedures outlined for heritage resources and graves as outlined must be implemented during the construction, operation, or closure phases of the Marikana Pipeline Project.

Disclaimer:

It is possible that this Phase I HIA study may have missed heritage resources in the Project Area because of tall grass or other invader vegetation covering unmarked or inconspicuous graves. It is also possible that heritage resources may also occur below the surface of the earth and may only be exposed once development commences. Heritage resources may also have been missed because of human failure to recognise them.

If any heritage resources of significance are exposed during the development of the Pipeline Project the South African Heritage Resources Authority (SAHRA) should be notified immediately, all activities must be stopped, and an archaeologist accredited with the Association for Southern African Professional Archaeologist (ASAPA) should be notified to determine appropriate mitigation measures for the discovered finds. Procedures outlined for chance finds for heritage resources and graves should be implemented during the construction, operation, and closure phases of the Pipeline Project.

ACRONYMS AND ABBREVIATIONS

ASAPA	Association of South African Professional Archaeologists
BP	Before Present
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIA	Early Iron Age
EMPr	Environmental Management Programme
EMPR	Environmental Management Programme Report
ESA	Early Stone Age
GPS	Global Positioning System
GY	Graveyard
HIA	Heritage Impact Assessment
LIA	Late Iron Age
LSA	Late Stone Age
MIA	Middle Iron Age
MPRDA	Mineral and Petroleum Resources Development Act, Act No 28 of 2002
MSA	Middle Stone Age
NEMA	National Environmental Management Act, Act No 107 of 1998
NEM:WA	National Environmental Management: Waste Act, Act No 59 of 2008
NHRA	National Heritage Resources Act, Act No 25 of 1999
No	Number
NWA	National Water Act, Act No 36 of 1998
PHRA	Provincial Heritage Resource Agency
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
ToR	Terms of Reference

TERMINOLOGY

Terms that may be used in this report are briefly outlined below:

- Conservation: The act of maintaining all or part of a resource (whether renewable or non-renewable) in its present condition in order to provide for its continued or future use. Conservation includes sustainable use, protection, maintenance, rehabilitation, restoration and enhancement of the natural and cultural environment.

- Cultural resource management: A process that consists of a range of interventions and provides a framework for informed and value-based decision-making. It integrates professional, technical, and administrative functions and interventions that impact on cultural resources. Activities include planning, policy development, monitoring and assessment, auditing, implementation, maintenance, communication, and many others. All these activities are (or will be) based on sound research.

- Cultural resources: A broad, generic term covering any physical, natural and spiritual properties and features adapted, used and created by humans in the past and present. Cultural resources are the result of continuing human cultural activity and embody a range of community values and meanings. These resources are non-renewable and finite. Cultural resources include traditional systems of cultural practice, belief, or social interaction. They can be but are not necessarily identified with defined locations.

- Heritage resources: The various natural and cultural assets that collectively form the heritage. These assets are also known as cultural and natural resources. Heritage resources (cultural resources) include all human-made phenomena and intangible products that are the result of the human mind. Natural, technological, or industrial features may also be part of heritage resources, as places that have made an outstanding contribution to the cultures, traditions and lifestyles of the people or groups of people of South Africa.

- In-Situ Conservation: The conservation and maintenance of ecosystems, natural habitats, and cultural resources in their natural and original surroundings.

- Iron Age: Refers to the last two millennia and ‘Early Iron Age’ to the first thousand years AD. ‘Late Iron Age' refers to the period between the 16th century and the 19th century and can therefore include the Historical Period.

- Maintenance: Keeping something in good health or repair.

- Pre-historical: Refers to the time before any historical documents were written or any written language developed in a particular area or region of the world. The historical period and historical remains refer, for the Project Area, to the first appearance or use of ‘modern’ Western writing brought to the Eastern Highveld by the first Colonists who settled here from the 1840’s onwards.

- Preservation: Conservation activities that consolidate and maintain the existing form, material, and integrity of a cultural resource.

- Recent past: Refers to the 20th century. Remains from this period are not necessarily older than sixty years and therefore may not qualify as archaeological or historical remains. Some of these remains, however, may be close to sixty years of age and may, soon, qualify as heritage resources.

- Protected area: A geographically defined area designated and managed to achieve specific conservation objectives. Protected areas are dedicated primarily to the protection and enjoyment of natural or cultural heritage, to the maintenance of biodiversity, and to the maintenance of life-support systems. Various types of protected areas occur in South Africa.

- Reconstruction: Re-erecting a structure on its original site using original components.

- Replication: The act or process of reproducing by new construction the exact form and detail of a vanished building, structure, object, or a part thereof, as it appeared at a specific period.

- Restoration: Returning the existing fabric of a place to a known earlier state by removing additions or by reassembling existing components.

- Stone Age: Refers to the prehistoric past, although Late Stone Age people lived in South Africa well into the Historical Period. The Stone Age is divided into an Earlier Stone Age (3 million years to 150 000 thousand years ago) the Middle Stone Age (150 000 years to 40 000 years ago) and the Late Stone Age (40 000 years to 200 years ago).

- Sustainability: The ability of an activity to continue indefinitely, at current and projected levels, without depleting social, financial, physical and other resources required to produce the expected benefits.

- Translocation: Dismantling a structure and re-erecting it on a new site using original components.

- Project Area: refers to the area (footprint) where the developer wants to focus its development activities.

- Phase I archaeological studies refer to surveys using various sources of data to establish the presence of all possible types and ranges of heritage resources in any given Project Area (excluding paleontological remains as these studies are done by registered and accredited palaeontologists).

- Phase II studies include in-depth cultural heritage studies such as archaeological mapping, excavating and sometimes laboratory work. Phase II work may include the documenting of rock art, engraving or historical sites and dwellings; the sampling of archaeological sites or shipwrecks; extended excavations of archaeological sites; the exhumation of human remains and the relocation of

graveyards, etc. Phase II work involves permitting processes, requires the input of different specialists and the co-operation and approval of the SAHRA.

CONTENTS

1 INTRODUCTION

1.1 Background and context

This document contains the report on the results of a Phase I Heritage Impact Assessment (HIA) study done for Sibanye Stillwater for proposed pipelines in support of the Tailings Retreatment Facility (hereafter referred to as the Marikana Pipeline Project) near Marikana in the Central Bankeveld in the North-West Province**.**

The Central Bankeveld is located, ecologically speaking, between the Bushveld (to the north) and the Highveld (to the south). The Central Bankeveld has a rich heritage comprised of remains dating from the prehistoric and the historical (or colonial) periods of South Africa. Prehistoric and historical remains in the Central Bankeveld form a record of the cultural heritage of most groups living in South Africa today. Various types and ranges of heritage resources as outlined in the National Heritage Resources Act (Act No 25 of 1999) occur in this region (see Box 1).

Consequently, Alta van Dyk Environmental Consultants cc. who is responsible for obtaining environmental authorisation for the project, commissioned the author to undertake a Phase I Heritage Impact Assessment (HIA) study for the Marikana Pipeline Project.

1.2 Aim of this report

Sibanye Stillwater intends to establish new pipelines for the proposed Marikana Pipeline Project near Marikana in the Central Bankeveld in the North-West Province. To comply with legislation, Sebanye Stillwater requires knowledge of the presence, relevance and the significance of any heritage resources that may occur in the project area to take pro-active measures about any heritage remains that may be affected, damaged, or destroyed when the proposed new pipelines are constructed. Alta van Dyk Environmental Consultants cc. therefore commissioned the author to undertake a Heritage Impact Assessment (HIA) study for the project area to be affected by the proposed new development.

The aims with the heritage survey and impact assessment for the proposed new pipelines therefore were the following:

- To establish whether any of the types and ranges of heritage resources as outlined in Section 38 of the NHRA do occur along the proposed new pipeline corridors (Project Area).
- To establish the significance of any heritage resources along the proposed new pipeline corridors as well as the level of significance of any possible impact on these heritage resources.
- To propose mitigation measures for those types and ranges of heritage resources that may be affected by the construction of the Marikana Pipeline Project.

1.3 Assumptions and limitations

The findings, observations, conclusions, and recommendations reached in this report are based on the author's best scientific and professional knowledge, available information, and his ability to keep up with the physical challenges that the project commanded. The project area was surveyed on several former occasions in the past when various heritage surveys were done for Kroondal, Marikana and Tharisa Mines as well as for other developments projects in the larger area (See Part 13, 'Bibliography relating to heritage studies').

The report's findings are based on accepted archaeological survey and assessment techniques and methodologies. However, the author preserves the right to modify aspects of the report including the recommendations when new information becomes available particularly if this information may have an influence on the reports results and recommendations. This applies to the uncovering of graves as these may have been missed during the survey because of various reasons.

The heritage survey may also have missed other heritage resources as these may be located below the surface of the earth and may be exposed because of future developmental activities such as the construction of the parking areas. It is also possible that heritage resources simply may have been missed because of human failure to observe or to recognise them.

2 DETAILS OF THE SPECIALIST

Profession: Archaeologist, Museologist (Museum Scientists), Lecturer, Heritage Guide Trainer and Heritage Consultant

Qualifications:

BA (Archaeology, Anthropology and Psychology) (UP, 1976)

BA (Hons) Archaeology (distinction) (UP, 1979)

MA Archaeology (distinction) (UP, 1985)

D Phil Archaeology (UP, 1989)

Post Graduate Diploma in Museology (Museum Sciences) (UP, 1981)

Work experience:

Museum curator and archaeologist for the Rustenburg and Phalaborwa Town Councils (1980-1984)

Head of the Department of Archaeology, National Cultural History Museum in Pretoria (1988-1989)

Lecturer and Senior lecturer Department of Anthropology and Archaeology, University of Pretoria (1990-2003)

Independent Archaeologist and Heritage Consultant (2003-)

Accreditation: Member of the Association for Southern African Professional Archaeologists. (ASAPA)

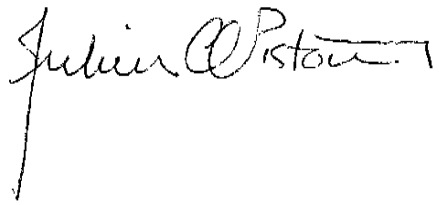
Summary: Julius Pistorius is a qualified archaeologist and heritage specialist with extensive experience as a university lecturer, museum scientist, researcher and heritage consultant. His research focussed on the Late Iron Age Tswana and Lowveld-Sotho (particularly the Bamalatji of Phalaborwa). He has published a book on early Tswana settlement in the North-West Province and has completed an unpublished manuscript on the rise of Bamalatji metal workings spheres in Phalaborwa during the last 1 200 years. He has excavated more than twenty LIA settlements in North-West and twelve IA settlements in the Lowveld and has mapped hundreds of stone walled sites in the North-West. He has written a guide for Eskom's field personnel on heritage management. He has published twenty scientific papers in academic journals and several popular articles on archaeology and heritage matters. He collaborated with environmental companies in compiling State of the Environmental Reports for Ekhurhuleni, Hartebeespoort and heritage management plans for the Magaliesberg and Waterberg. Since acting as an independent consultant he has done approximately

800 large to small heritage impact assessment reports. He has a longstanding working relationship with Eskom, Rio Tinto (PMC), Rio Tinto (EXP), Impala Platinum, Angloplats (Rustenburg), Lonmin, Sasol, PMC, Foskor, Kudu and Kelgran Granite, Bafokeng Royal Resources, Pilanesberg Platinum Mine (PPM) etc. as well as with several environmental companies.

3 DECLARATION OF INDEPENDANCE

I, Dr Julius CC Pistorius declare the following:

- I act as an independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even, if this result in views and findings that are not favourable for the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialists report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the applications;
- I will comply with the Act, Regulations and other applicable legislation;
- I will consider, to the extent possible, the matters listed in Regulation 13;
- I understand to disclose to the applicant and the competent authority all material information in my possession
- All the particulars furnished by me in this form are true and correct that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



4 November 2022

4 LEGAL FRAMEWORK

South Africa's heritage resources ('national estate') are protected by international, national, provincial, and local legislation which provides regulations, policies and guidelines for the protection, management, promotion, and utilization of heritage resources. South Africa's 'national estate' includes a wide range of various types of heritage resources as outlined in Section 3 of the NHRA (see Box 1).

At a national level, heritage resources are dealt with by the National Heritage Council Act (Act No 11 of 1999) and the NHRA. According to the NHRA, heritage resources are categorized using a three-tier system, namely Grade I (national), Grade II (provincial) and Grade III (local) heritage resources.

At the provincial level, heritage legislation is implemented by Provincial Heritage Resources Agencies (PHRA's) which apply the NHRA together with provincial government guidelines and strategic frameworks. Metropolitan or Municipal (local) policy regarding the protection of cultural heritage resources is also linked to national and provincial acts and is implemented by the SAHRA and the PHRA's.

4.1 Legislation relevant to heritage resources

Legislation relevant to South Africa's national estate includes the following:

- National Environmental Management Act (NEMA), Act No 107 of 1998
- Minerals and Petroleum Resources Development Act (MPRDA), Act No 28 of 2002
- National Heritage Resources Act (NHRA), Act No 25 of 1999.

Box 1: Types and ranges of heritage resources (the national estate) as outlined in Section 3 of the National Heritage Resources Act, 1999 (No 25 of 1999).

The National Heritage Resources Act (Act No 25 of 1999, Art 3) outlines the following types and ranges of heritage resources that qualify as part of the National Estate, namely:

(a) places, buildings structures and equipment of cultural significance;
(b) places to which oral traditions are attached or which are associated with living heritage;
(c) historical settlements and townscapes;
(d) landscapes and natural features of cultural significance;
(e) geological sites of scientific or cultural importance;
(f) archaeological and palaeontological sites;
(g) graves and burial grounds including-
  (i) ancestral graves;
  (ii) royal graves and graves of traditional leaders;
  (iii) graves of victims of conflict;(iv) graves of individuals designated by the Minister by notice in the Gazette;
  (v) historical graves and cemeteries; and
  (vi) other human remains which are not covered by in terms of the Human Tissues Act, 1983 (Act No 65 of 1983);
(h) sites of significance relating to the history of slavery in South Africa;
(i) movable objects, including -
(i) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
  (ii) objects to which oral traditions are attached or which are associated with living heritage;
  (iii) ethnographic art and objects;
  (iv) military objects;
  (v) objects of decorative or fine art;
  (vi) objects of scientific or technological interest; and
  (vii) books, records, documents, photographs, positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No 43 of 1996).

The National Heritage Resources Act (Act No 25 of 1999, Art 3) also distinguishes nine criteria for places and objects to qualify as 'part of the national estate if they have cultural significance or other special value …'. These criteria are the following:

(a) its importance in the community, or pattern of South Africa's history;
(1) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
(2) its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
(3) its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
(e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
(f) its importance in demonstrating a high degree of creative or technical achievement at a particular period;
(g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons; (h)
(h) its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;
(i) sites of significance relating to the history of slavery in South Africa.

4.1.1 NEMA

The NEMA stipulates under Section 2(4)(a) that sustainable development requires the consideration of all relevant factors including (iii) the disturbance of landscapes and sites that constitute the nation's cultural heritage must be avoided, or where it cannot be altogether avoided, is minimised and remedied. Heritage assessments are implemented in terms of the NEMA Section 24 to give effect to the general objectives. Procedures considering heritage resource management in terms of the NEMA are summarised under Section 24(4) as amended in 2008. In addition to the NEMA, the National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003) may also be applicable. This act applies to protected areas and world heritage sites, declared as such in terms of the World Heritage Convention Act, 1999 (Act No 49 of 1999).

4.1.2 MPRDA

The MPRDA stipulates under Section 5(4) no person may prospect for or remove, mine, conduct technical co-operation operations, reconnaissance operations, explore for and produce any mineral or petroleum or commence with any work incidental thereto on any area without (a) an approved environmental management programme or approved environmental management plan.

4.1.3 NHRA

According to Section 3 of the NHRA the 'national estate' comprises a wide range and various types of heritage resources (see Box 1).

4.1.3.1 Heritage Impact Assessment studies

According to Section 38 of the NHRA, a HIA process must be followed under the following circumstances:

- The construction of a linear development (road, wall, power line, canal etc.) exceeding 300m in length

- The construction of a bridge or similar structure exceeding 50m in length
- Any development or activity that will change the character of a site and which exceeds 5 000m^2 or which involve three or more existing erven or subdivisions thereof
- Re-zoning of a site exceeding 10 000 m^2
- Any other category provided for in the regulations of SAHRA, a provincial or local heritage authority or any other legislation such as NEMA, MPRDA, etc.

4.1.3.2 Section 34 (Buildings and structures)

Section 34 of the NHRA provides for general protection of structures older than 60 years. According to Section 34(1) no person may alter (demolish) any structure or part thereof which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

A structure means any building, works, device or any other facility made by people and which is fixed to land and which includes fixtures, fittings and equipment associated with such structures.

Alter means any action which affects the structure, appearance or physical properties of a place or object, whether by way of structural or any other works such as painting, plastering, decorating, etc.

Most importantly, Section 34(1) clearly states that no structure or part thereof may be altered or demolished without a permit issued by the relevant PHRA. These permits will not be granted without a HIA being completed. A destruction permit will thus be required before any removal and/or demolition may take place, unless exempted by the PHRA according to Section 34(2) of the NHRA.

4.1.3.3 Section 35 (Archaeological and palaeontological resources and meteorites)

Section 35 of the NHRA provides for the general protection of archaeological and palaeontological resources, and meteorites. If archaeological resources are discovered during development, Section 38(3) specifically requires that the discovery must immediately be reported to the PHRA, or local authority or museum who must notify the PHRA. Furthermore, no person may without permits issued by the responsible heritage resources authority:

- destroy, damage, excavate, alter, deface, or otherwise disturb any archaeological or paleontological site or any meteorite
- destroy, damage, excavate, remove from its original position, collect or own any archaeological or paleontological material or object or any meteorite
- trade in, sell for private gain, expor,t or attempt to export from the Republic any category of archaeological or paleontological material or object, or any meteorite; or bring onto or use at an archaeological or paleontological site any excavation equipment or any equipment that assists in the detection or recovery of metals or archaeological and paleontological material or objects, or use such equipment for the recovery of meteorites
- alter or demolish any structure or part of a structure which is older than 60 years.

Heritage resources may only be disturbed or moved by an archaeologist after being issued with a permit received from SAHRA. To demolish heritage resources, the developer must acquire a destruction permit from SAHRA.

4.1.3.4 Section 36 (Burial grounds and graves)

Section 36 of the NHRA allows for the general protection of burial grounds and graves. Should burial grounds or graves be found during development, Section 36(6) stipulates that such activities must immediately cease, and the discovery reported to the responsible heritage resources authority and the South African Police Service

(SAPS). Section 36 also stipulates that no person without a permit issued by the relevant heritage resources authority may:

(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, 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; or

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

Section 36 of the NHRA divides graves and burial grounds into the following categories:

a. ancestral graves
b. royal graves and graves of traditional leaders
c. graves of victims of conflict
d. graves designated by the Minister
e. historical graves and cemeteries
f. human remains

Human remains less than 60 years old are subject to provisions of the National Health Act, 2003 (Act No 61 of 2003), Ordinance 12 of 1980 (Exhumation Ordinance) and Ordinance No 7 of 1925 (Graves and dead bodies Ordinance, repealed by Mpumalanga). Municipal bylaws about graves and graveyards may differ. Professionals involved with the exhumation and relocation of graves and graveyards must establish whether such bylaws exist and must adhere to these laws.

Unidentified graves are handled as if they are older than 60 years until proven otherwise.

Permission for the exhumation and relocation of graves older than sixty years must also be gained from descendants of the deceased (where known), the National Department of Health, Provincial Department of Health, Premier of the Province, and

local police. Furthermore, permission must also be gained from the various landowners (i.e., where the graves are located and where they are to be relocated) before exhumation can take place.

Human remains can only be handled by a registered undertaker, or an institution declared under the Human Tissues Act (Act No 65 of 1983 as amended).

4.1.3.5 Section 37 (Public monuments and memorials)

Section 37 makes provision for the protection of all public monuments and memorials in the same manner as places which are entered in a heritage register referred to in Section 30 of the NHRA.

4.1.3.6 Section 38 (Heritage Resource Management)

Section 38 (8): The provisions of this section do not apply to a development as described in Section 38 (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act No 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No 50 of 1991), or any other legislation. Section 38(8) ensures cooperative governance between all responsible authorities through ensuring that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of Subsection (3), and any comments and recommendations of the relevant heritage resources authority about such development have been considered prior to the granting of the consent.

4.2 NEMA (Appendix Six requirements)

NEMA Regulations, 2014 (as amended 2107) **Appendix 6 Relevant section in report**	
Details of the specialist who prepared the report and the expertise of that person to compile a specialist report including a curriculum vitae	Part 2. Details of the specialist
A declaration that the person is independent in a form as may be specified by the competent authority	Part 3. Declaration of independence
An indication of the scope of, and the purpose for which the report was prepared	Part 1. Introduction Part 1.2. Aims with this report
An indication of the quality and age of base data used for the specialist report	Part 7. Approach and Methodology
The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment	Part 7. Approach and Methodology Part 7.1. Field survey
A description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Part 7. Approach and Methodology
Details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives	Part 8. Heritage survey Part 8.1. Field survey
An identification of any areas to be avoided, including buffers	Part 9.2 Impact on the heritage resources Part 10. Conclusion and recommendations

A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Figures 1 & 8
A description of any assumptions made and any uncertainties or gaps in knowledge;	Part 1.3. Assumptions and limitations
A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment	Part 9.2 Impact on the heritage resources Part 10 Conclusion and recommendations
Any mitigation measures for inclusion in the EMPr	Part 9.4 Mitigation measures Part 9.5 Chance find procedures
Any conditions for inclusion in the environmental authorisation	Disclaimer Part 9.5 Mitigation measures Part 10. Conclusion and recommendations
Any monitoring requirements for inclusion in the EMPr or environmental authorisation	
A reasoned opinion – • whether the proposed activity, activities or portions thereof should be authorised. • regarding the acceptability of the proposed activity or activities; and if the opinion is that the proposed activity, activities, or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr.	Part 9.5 Mitigation measures Part 10. Conclusion and recommendations
A description of any consultation process that was undertaken during preparing the specialist report	Part 7.3 Consultation process undertaken, and comments received from stakeholders

A summary and copies if any comments that were received during any consultation process	Part 7.3 Consultation process undertaken and comments received from stakeholders
Any other information requested by the competent authority.	None

5 THE PROJECT AREA

5.1 Location

Sebanye Stillwater's proposed pipelines in support of the Tailings Retreatment Facility will be established to the north and to the south of the town of Marikana and the N4 Highway further to the south. The Project Area is located approximately thirty kilometres to the east of Rustenburg in the Rustenburg Local Municipality in the North-West Province (Figure 1; 1:50 000 topographical map of Rustenburg East [2527CB]).

5.2 The altered state of the study area

The Project Area is covered with mine infrastructure, small towns, and villages such as Marikana in the centre and Nkaneng and Thekwane further to the west. Only a few undisturbed patches of land still occur in the far northern and in the southern part of the Project Area. However, in the south, a large part of the Project Area was mined in the past and therefore is marked with various open cast pits and waste dumps which have not been rehabilitated.

Parts of the wider study area have also been utilised for agricultural activities such as dry land agriculture and limited citrus farming. However, in general the Project Area can be defined as a brown field since it has been scarred by agricultural and younger development activities such as the building of mine shafts and other mine infrastructure as well as residential development.

This was accompanied with the construction of tar roads, power lines, laying of pipelines, erecting power lines and other supportive infrastructure. These development activities have changed the indigenous vegetation, landscape, and appearance of the Project Area to such an extent that it cannot be described as a pristine area any longer.

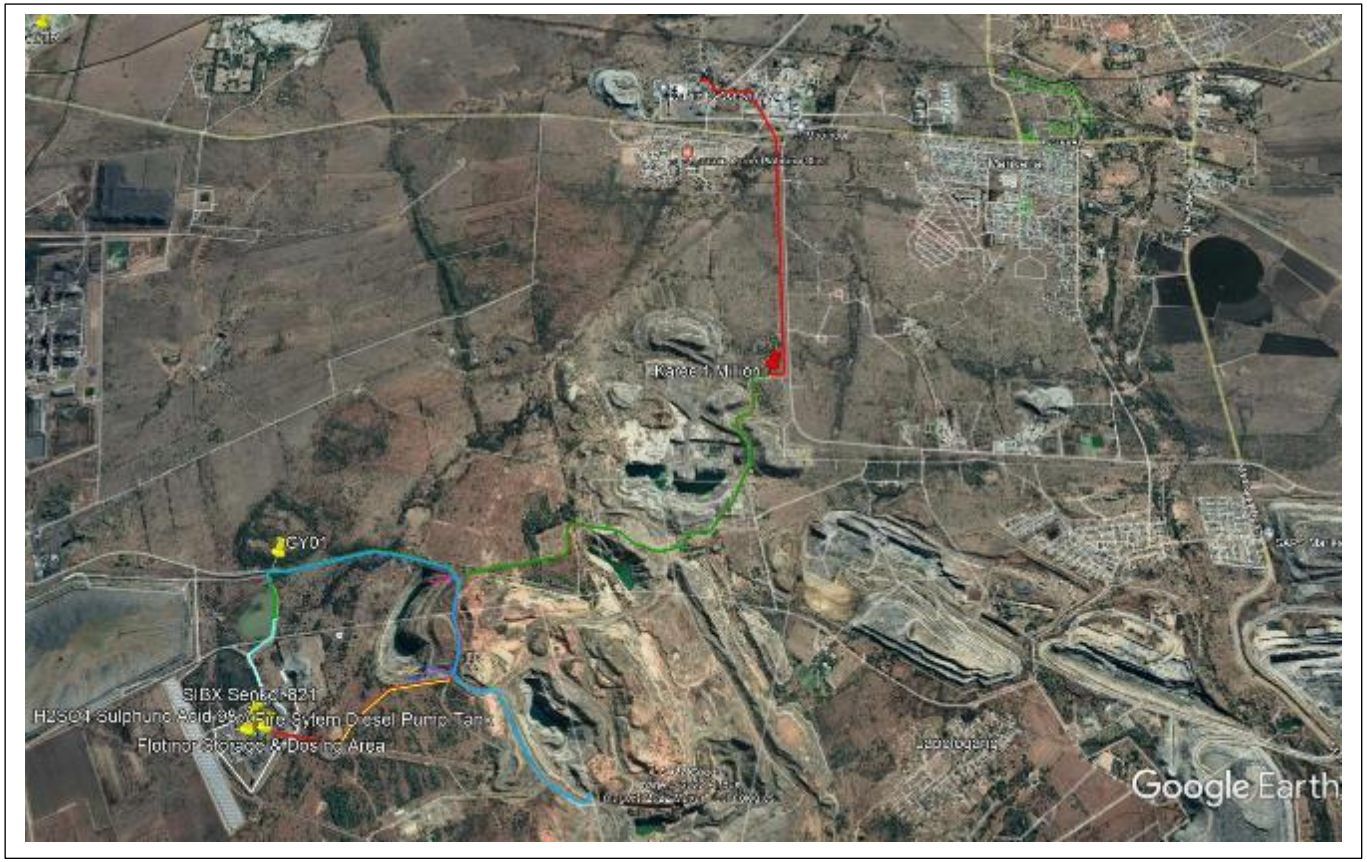


Figure 1- Sibanye Stillwater's proposed pipelines in support of the Meccano Tailings Retreatment Project near Marikana in the North-West (above).

5.3 Sibanye Stillwater's proposed pipelines in support of the Tailings Retreatment Facility

Sibanye-Stillwater are the primary producers of Platinum Group metals (PGMs) in South Africa. The proposed pipeline project is associated with the Marikana (Western Platinum Limited) and the Marikana Platinum Mine operations. The core business focus of these operations includes Platinum Group Metals (PGMs) such as platinum (Pt), palladium (Pd), rhodium (Rh), iridium (Ir), ruthenium (Ru), osmium (Os) and gold (Au). Other refined by-products that are produced include silver, copper, nickel, chromite, and cobalt sulphate, as well as sulphuric acid and sodium sulphate. Both the Merensky and Upper Group 2 Reef (UG2) are mined through opencast and underground mining methods.

Over the next few years, Sibanye-Stillwater intends to roll-out the Meccano project. The Meccano project includes the recovery of fine chrome and PGMs from live tailings material from various tailings sites which forms part of the long-term strategic planning for Sibanye Stillwater. To ensure that the mine is ready to accommodate the proposed retreatment and reclamation process as well as to optimise the existing processes, Sibanye-Stillwater intends to construct various pipelines for the conveyance of tailings and return water. The pipelines will have a diameter of 0.36m and a peak throughput of 120l/s. The proposed lines will be High Density Polyethylene (HDPE) pipelines.

The Pipeline Project will be rolled out in phases. This report discusses the survey and assessment which was done for the following pipelines, namely:

Tailings Pipelines

- K3 Concentration to the booster pump station (3.12km) Throughput capacity 75l/s.
- K3 booster pump station to the Meccano processing plant (5.75km) Throughput capacity 75l/s.
- K3 bypass line to void 5 (0.21km) Throughput capacity 75l/s.

Return Water Pipelines

- Void 4 to Marikana Return Water Dam (3.44km). Throughput capacity 49l/s. For the pipeline from Void 4 to RWD, penstock lines have been included on the KMZ file.
- Void 5 to Marikana Return Water Dam (2.45km). Throughput capacity 88l/s. For the pipeline from Void 5 to RWD, penstock lines have been included on the KMZ file.
- Return Water Dam to the Pandora tank (5.24km) Throughput capacity 41.3l/s
- Return Water Dam to the Meccano Process water tank (0.98km) Throughput capacity 84.5l/s
- Meccano process water dam to the Meccano Return Water dam (0.54km) Throughput capacity 68.7l/s

The dangerous goods storage space in the Meccano Plant will include the following:

- Sulphuric Acid 98%
- FLOTINOT V 2711
- SASFROTH 200
- SIBX SENKOL
- DIESEL
- Hydraulic oil

5.4 Earlier heritage studies

Several heritage studies have been conducted during the last two to three decades for different, mostly mining related projects covering amongst others the proposed Marikana Pipeline Project and the larger area which next to numerous other developments also incorporates the Kroondal and Marikana Mines. A number of these studies are listed (see Part 13, Bibliography relating to heritage studies').

These studies have pointed out that the main types and ranges of heritage resources in the area comprise of the following:

- Stone walled settlements dating from approximately AD1700 although these are mainly confined to rocky outcrops in the area. The sites usually are small and do

not cover extensive surface areas as contemporary stone walled sites elsewhere in the Bankeveld.

- Graveyards younger and older than sixty years. The numbers of graves in these cemeteries vary from single graves to large cemeteries holding more than hundred graves.
- Other settlements from the Iron Age without stone walls but with a limited number of potsherds. However, these sites are limited in numbers.
- Settlements with numbers of potsherds and MSA artefacts. These sites are also limited in numbers.
- Settlements with potsherds, usually limited in numbers and historical structures. These sites in general are seldom found.
- Historical farmsteads with main residential houses and limited other outbuildings and other infrastructure such as tobacco and wagon sheds, kraals, etc.
- Limited mine infrastructure which may be older than sixty years.

The most common types and ranges in the larger therefore include Late Iron Age stone walled sites (if kopjes occur) and graveyards.

6 CONTEXTUALISING THE PROJECT AREA

The proposed Pipeline Project will be established north of the Magaliesberg in the Rustenburg (Bafokeng) District of the North-West. This region is known for its rich and diverse range of heritage resources. Subsequently, a broad outline of the historical context of this region is provided below.

6.1 Pre-historical context

Stone Age sites are scattered along the Magaliesberg and are also found in caves and rock shelters in the mountain. Rock engraving sites are located further towards Maanhaarrand and to the west of the Magaliesberg. The most abundant heritage resources in the Bankeveld are those that date from the Late Iron Age and which are associated with the numerous Tswana chiefdoms who occupied this region during the last four centuries. This proto-historical period therefore is associated with the ancestors of the Tswana who lived in the general area where the proposed Marikana Mine New Tailings Storage Facility Pipeline Project will be established

6.2 Proto-historical context

The interaction between the climate, geology, topography, and the fauna and flora of the Central Bankeveld established a milieu in which the first Tswana found a suitable living environment to practised herding, agriculture, metal working and trading. It was here that their chiefdoms flourished during AD1600 to 1840.

The settlements of these early Tswana chiefdoms are characterised by an impressive and elaborate stone-built tradition. Hundreds and perhaps thousands of sites were built along the bases of the granite hills. The most formidable of these chiefdoms were the Kwena Môgôpa and the Kwena Môgale (Bapô) between Brits and Marikana. Further to the west, closer to Rustenburg, was the Fôkeng chiefdom while several Kgatla spheres of influence emerged further to the east near Brits. The Kgatla were subjected by

Mzilikazi and were used as labourers to build one of the Ndebele's villages, probably known as emHlalandlela.

The Bapô, a people whose earliest ancestors were descended from the Amambô Nguni from Kwa Zulu/Natal, arrived in the Magaliesberg during the 16th or 17th centuries. They established a sphere of influence close to Segwalane and Makolokwe. One of their capitals was Tlhôgôkgôlô (Wolhuterskop). Several of the chiefs of this clan where known by the name of Môgale. The name of the Magalies Mountains (Magaliesberg) was derived from the name Môgale.

Numerous *difaqane* wars were fought during the last quarter of the 18th century and during the first quarter of the 19th century in the Central Bankeveld. These wars led to the displacement of large numbers of Tswana in the Bankeveld. The *difaqane* wars were caused by the Ndebele (Matabele) of Mzilikazi who arrived from the Vaal River region to occupy the Bankeveld in August 1827. The Ndebele destroyed the Kwena Môgôpa, the Kgatla and what had remained of the Bapô after an earlier defeat by the Pedi of Thulare. These wars exacerbated the havoc started earlier in the Bankeveld and gradually became a characteristic feature of historical events in this region during the early 19th century.

The Ndebele established several settlement complexes in the Central Bankeveld from whence they maintained their grip on the indigenous population. Four of these Zulu/Nguni residences (*imisi*) and military kraals (*amakhanda*) have been discovered during archaeological surveys.

Internal strife between the various Tswana chiefdoms also seems to have been on the increase from the latter half of the 18th century onwards. Paternal relatives fought against each other to attain the chieftaincy of the various Tswana chiefdoms. Succession disputes also led to the splintering of the existing chiefdoms into a growing number of independent spheres of influence in the Bankeveld.

During the early 19th century travellers, traders and missionaries visited the Central Bankeveld where they encountered the devastated Tswana chiefdoms. They also mentioned that numerous Tswana tribes were displaced. These travellers included the

traders Robert Schoon and William McLuckie in August 1829. They were soon followed by the missionary Robert Moffat who visited Mzilikazi in an *umuzi* near what is today, Pretoria. In June 1835 Charles Bell and other members of Andrew Smith's expedition visited a Ndebele village near Rustenburg which Bell subsequently painted. One year later, in December 1836, Cornwallis Harris also visited the Central Bankeveld where he painted emHlalandlela near Brits.

The Bankeveld was rich in fauna which attracted the Griqua and the first white hunters to the region. Ivory was plentiful, with herds of elephants roaming the area. Ivory and the skins of the wide variety of fauna were sought after as precious trade commodities. Although the Tswana hunted the fauna of the Bankeveld, they were more renowned as agriculturists and cattle herders than as hunters.

Complex causes led to the unfolding of the numerous Tswana chiefdoms and their spheres of influence throughout the Bankeveld during the last decades of the 18th century and during the first decades of the 19th century. These causes were multidimensional and included the ecological potential of the region, the social and political formation and expansion of different spheres of influence, the establishment of short and long-distance trade relations and local and regional wars. These causes and historical events were complex and are not fully recorded in oral traditions or in any other records.

6.3 Historical context

The first immigrant Boers established themselves to the north of the Magaliesberg in the late 1840's. Colonial farmsteads were established along the southern and the northern foot of the Magaliesberg. Early colonial farm homesteads also arose near Marikana (Schaapkraal), in the Selons River valley to the west of Rustenburg and at Tierpoort and Garsfontein near Pretoria. Some of the earliest Voortrekkers who moved into the Rustenburg and Phokeng areas, close to the Impala Shaft 16 project area, established themselves on the farms Kafferskraal and Witpensfontein (today Rustenburg) and Schaapkraal, to the east of the study area.

During the Second/Anglo Transvaal Boer War (1899-1902) British blockhouses were built along the ridge of the Magaliesburg, from Pretoria in the east to Rustenburg in the west. Several of these structures are in Kommandonek and in Pampoennek in the Magaliesberg, south of the current project area.

Since the second half of the 19th century, farmers and workers have occupied the Rustenburg District (including the Mooinooi, Marikana, Hartebeespoort and Brits areas). Tobacco and citrus farming, together with cattle herding, became a subsistence pattern that has lasted to this day. Old farm homesteads, agricultural implements, and other infrastructure such as tobacco drying sheds may still exist on farms adjacent to the study area.

After the discovery of the Merensky Reef in 1929, the economy of the area was gradually changed from farming into platinum and chrome mining. Farmers, farm-workers, and more recently, mine workers have therefore occupied the area without interruption for more than a hundred and fifty years. Remains dating from this historical (colonial and modern) period and from the relatively recent past therefore exist in or near the study area.

7 APPROACH AND METHODOLOGY

This heritage survey and impact assessment study for the Pipeline Project was conducted by means of the following:

7.1 Field survey

A field survey for the Pipeline Project was conducted during the first week of December 2021 and on 7 October 2022 for the final alignment of the pipelines. Earlier heritage surveys for Marikana and Tharisa Mines, well as for several other mining areas, power lines, and infrastructure related projects were undertaken during the past two decades, several of these in which the author was involved with (see Part 13, 'Bibliography relating to heritage studies').

Google Earth imagery was used as a supplementary source (*prior* and after fieldwork) to establish the presence of any possible heritage resources in the proposed project area. A track which was followed during the survey was logged on a Google Earth image (Figure 2).

As the development will occur along existing infrastructure such as a railway line, pipelines, roads and through a mining area, relatively good visibility was experienced for the identification and recognition of conspicuous, above surface heritage resources. Google Earth's historical imagery also confirmed the general absence of heritage resources along the linear trajectories that the pipelines will travel.

All coordinates for heritage resources recorded by the author were done with a Garmin Etrex hand set Global Positioning System (instrument) with an accuracy of < 15m.

The nature and character of the project area has further been illuminated with descriptions and photographs (Part 8, 'The Phase I heritage survey').

Figure 2a & b- Two GPS tracks logged (red lines) during two surveys done for the Pipeline Project (above and below).

7.2 Databases, literature surveys and maps

Databases kept and maintained at institutions such as the PHRA, the Archaeological Data Recording Centre at the National Flagship Institute (Museum Africa) in Pretoria and SAHRA's national archive (referred to as the South African Heritage Resources Information System, (SAHRIS) were consulted to determine whether any heritage resources of significance had been identified during earlier heritage surveys in or near the project area. The larger project area has been subjected to several heritage assessments studies in the past (see Part 13**,** 'Bibliography relating to heritage studies').

Literature relating to the pre-historical and the historical unfolding of the region where the project area is located was reviewed (see Part 6, 'Contextualising the Project Area' and Part 12, 'Select Bibliography).

7.3 Consultation process undertaken and comments received from stakeholders

No specific consultation process was undertaken for the purposes of the heritage study as the stakeholder consultation for the project is being done by Alta van Dyk Environemental Consultants cc. as part of their Environmental Authorisation and Assessment Process.

7.4 Significance ratings

The significance of possible impacts on the heritage resources was determined using a ranking scale based on the following:

Evaluation Component	Rating	Scale	Description / criteria
MAGNITUDE of negative impact (at the indicated spatial scale)	**10**	**Very high**	Bio-physical and/or social functions and/or processes might be *severely* altered.
	8	**High**	Bio-physical and/or social functions and/or processes might be *considerably* altered.
	6	**Medium**	Bio-physical and/or social functions and/or processes might be *notably* altered.
	4	**Low**	Bio-physical and/or social functions and/or processes might be *slightly* altered.

	2	**Very low**	Bio-physical and/or social functions and/or processes might be *negligibly* altered.
	0	**Zero**	Bio-physical and/or social functions and/or processes will remain *unaltered.*
MAGNITUDE of POSITIVE IMPACT (at the indicated spatial scale)	**10**	**Very high**	Positive: Bio-physical and/or social functions and/or processes might be *substantially* enhanced.
	8	**High**	**Positive**: Bio-physical and/or social functions and/or processes might be *considerably* enhanced.
	6	**Medium**	**Positive**: Bio-physical and/or social functions and/or processes might be *notably* enhanced.
	4	**Low**	**Positive**: Bio-physical and/or social functions and/or processes might be *slightly* enhanced.
	2	**Very low**	**Positive**: Bio-physical and/or social functions and/or processes might be *negligibly* enhanced.
	0	**Zero**	**Positive**: Bio-physical and/or social functions and/or processes will remain *unaltered.*
DURATION	**5**	**Permanent**	**Impact in perpetuity. –**
	4	**Long term**	Impact ceases after operational phase/life of the activity > 60 years.
	3	**Medium term**	Impact might occur during the operational phase/life of the activity – 60 years.
	2	**Short term**	Impact might occur during the construction phase - < 3 years.
	1	**Immediate**	**Instant impact.**
EXTENT (or spatial scale/influence of impact)	**5**	**International**	**Beyond the National boundaries.**
	4	**National**	Beyond provincial boundaries, but within National boundaries.
	3	**Regional**	Beyond 5 km of the prject and within the provincial boundaries.
	2	**Local**	Within a 5 km radius of the project.
	1	**Site-specific**	**On site or within 100 meters of the site boundaries.**
	0	**None**	**Zero extent.**
IRREPLACEABLE loss of resources	**5**	**Definite**	**Definite** loss of irreplaceable resources.
	4	**High potential**	**High** potential for loss of irreplaceable resources.
	3	**Moderate potential**	**Moderate** potential for loss of irreplaceable resources.
	2	**Low potential**	**Low** potential for loss of irreplaceable resources.
	1	**Very low potential**	**Very low** potential for loss of irreplaceable resources.
	0	**None**	**Zero potential.**
REVERSIBILITY of impact	**5**	**Irreversible**	Impact **cannot** be reversed.
	4	**Low irreversibility**	**Low** potential that impact might be reversed.
	3	**Moderate reversibility**	**Moderate** potential that impact might be reversed.
	2	**High reversibility**	**High** potential that impact might be reversed.
	1	**Reversible**	Impact **will be** reversible.
	0	**No impact**	No impact.
PROBABILITY (of occurrence)	**5**	**Definite**	>95% chance of the potential impact occurring.
	4	**High probability**	75% - 95% chance of the potential impact occurring.
	3	**Medium probability**	25% - 75% chance of the potential impact occurring
	2	**Low probability**	5% - 25% chance of the potential impact occurring.
	1	**Improbable**	<5% chance of the potential impact occurring.
	0	**No probability**	**Zero probability.**
Evaluation Component	**Rating scale and description / criteria**		
CUMULATIVE impacts	**High**: The activity is one of several similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the natural, cultural, and/or socio-economic resources of local, regional or national concern. ***Medium****:* The activity is one of a few similar past, present or future activities in the same geographical area, and might have a combined impact of moderate significance on the natural, cultural, and/or socio-economic resources of local, regional or national concern. ***Low****:* The activity is localised and might have a negligible cumulative impact. ***None****:* No cumulative impact on the environment.		

Once the Environmental Risk Ratings have been evaluated for each potential environmental impact, the Significance Score of each potential environmental impact is calculated by using the following formula:

- **SS (Significance Score) = (magnitude + duration + extent + irreplaceable + reversibility) x probability.**

The maximum Significance Score value is 150.

The Significance Score is then used to rate the Environmental Significance of each potential environmental impact as per Table below. The Environmental Significance rating process is completed for all identified potential environmental impacts both before and after implementation of the recommended mitigation measures.

Significance Score	Environmental Significance	Description / criteria
125 – 150	Very high (VH)	An impact of very high significance will mean that the project cannot proceed, and that impacts are irreversible, regardless of available mitigation options.
100 – 124	High (H)	An impact of high significance which could influence a decision about whether or not to proceed with the proposed project, regardless of available mitigation options.
75 – 99	Medium-high (MH)	If left unmanaged, an impact of medium-high significance could influence a decision about whether or not to proceed with a proposed project. Mitigation options should be relooked at.
40 – 74	Medium (M)	If left unmanaged, an impact of moderate significance could influence a decision about whether or not to proceed with a proposed project.
<40	Low (L)	An impact of low is likely to contribute to positive decisions about whether or not to proceed with the project. It will have little real effect and is unlikely to have an influence on project design or alternative motivation.
+	Positive impact (+)	A positive impact is likely to result in a positive consequence/effect, and is likely to contribute to positive decisions about whether or not to proceed with the project.

8 THE PHASE I HERITAGE SURVEY

8.1 The field survey

The field survey was conducted with a vehicle following existing and proposed pipeline corridors. Where new pipelines and an access road are to established foot surveys were undertaken.

All the proposed new tailings and water pipelines were investigated. Most of these either follow existing pipeline routes or new pipelines are joined to follow a single corridor. However, each pipeline route is not outlined in detail and discussed.

As older and newer pipelines follow the same pipeline corridor or newer pipelines are joined less impact occur due to fewer corridors used for the various pipelines.

<u>The pipeline from the K3 Tailings to the Booster Pump</u>

Figure 3- The proposed pipeline corridor between the K3 Tailings to the Booster Pump will be established along the shoulder of an existing tar road. This stretch of land was disturbed in the past because of various developmental activities (above).

Figure 4- The proposed water pipeline route between the K3 Tailings and the Booster Pump Station already holds a pipeline as well as electric power lines (above).

The K3 Tailings Bypass

Figure 5- The K3 Tailings Bypass is a short pipeline added to the K3 Tailings to the Booster Pump Station pipeline corridor. It crosses an intersection of several dirt roads and then descends into Void 5 (above).

The K3 Tailings Booster Pump Station to the Meccano Plant and
The Return Meccano Water Dam to the Pandora Dam

This pipeline corridor can be divided into three major parts, namely:

- A top part which runs through a mining area, and which is severely disturbed.
- A middle part which also runs through a mining area, and which is also severely disturbed. It crosses a small agricultural field.
- A bottom part which runs along the shoulder of a haul road to the Meccano Plant along which a large graveyard (GY01) is located (see Figures 6-8, below).

Figure 6- The top part of the pipeline corridor runs through abandoned mining areas which have caused severe transformation of the natural landscape (above).

Figure 7- The top and middle part of the pipeline corridor (except for a small agricultural field in the middle) runs through severely disturbed mining areas which have altered the natural landscape (above).

Figure 8- The last and lower part of the pipeline corridor runs along a haul road. A large graveyard (GY01) (yellow marker) is located on the northern shoulder of this road. The pipelines running to Void 4 and Void 5 also follow this corridor (above).

Figure 9- The large graveyard (GY01) on the northern shoulder of a haul road (above).

Figure 10- GY01 hold more than fifty and perhaps close to one hundred graves most of which are undecorated (above).

Marikana Return Water Dam to Void 4 and Marikana Return Water Dam to Void 5

These two pipelines can be divided into:

- A top part which runs along the shoulder of a haul road.
- A southern stretch which runs across disturbed mining areas (see figure).

A large graveyard (GY01) is situated on the northern shoulder of the haul road. The pipeline between the Pandaro Dam and the Meccano Plant also follows this road and the graveyard has been discussed and pointed out.

Figure 11- Both these stretches of pipeline (dark blue) follow the shoulder of a haul road at the top whilst the lower part crosses intensely disturbed mining areas (above).

The Return Water Dam to the Meccano Return Water Dam and

The Meccano Process Water Dam to the Marikana Return Water Dam

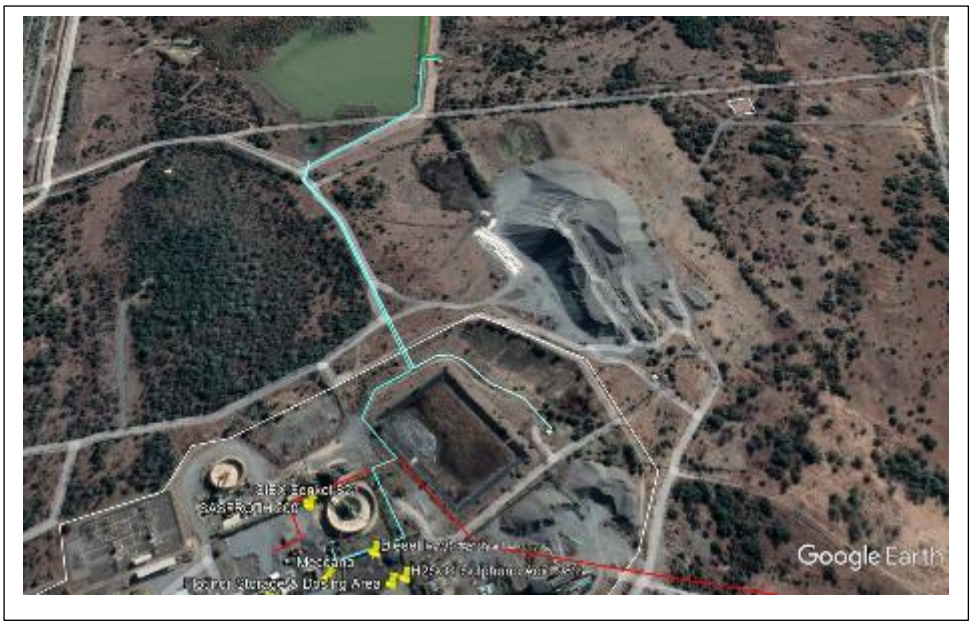


Figure 12- Both these short pipelines (light blue) follow the shoulder of a haul road one entering the Meccano Plant (above).

The dangerous goods storage space in the Meccano Plant will include the following various products

Figure 13- The storage of various dangerous goods will occur within the Meccano Plant where no heritage resources will be affected (above).

Figure 14- The Meccano Plant is totally disturbed, and no heritage resources will be affected if a storage space for dangerous goods is established inside the plant (above).

The new access road

A newly planned access road will provides access to the Meccano Plant and runs across open veld which has been disturbed by agricultural activities as well as former human occupation.

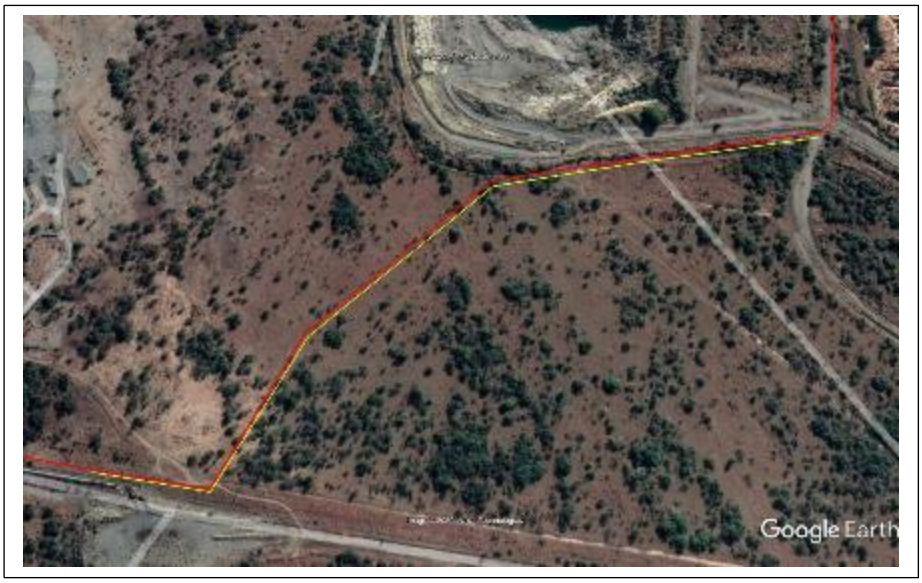


Figure 15- The newly planned access road runs across open veld (above).

Figure 16- Note the depletion of vegetation and the presence of rubble along the proposed new access road (above).

Figure 17- The proposed new access road reveals evidence for earlier human activities which have left the area scarred (above).

8.2 Types and ranges of heritage resources

The Phase I HIA study for the proposed Marikana new pipeline corridor revealed the following types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) in the project area, namely:

- A large graveyard (GY01) north of a haul road along which several of the pipelines will be constructed.

The graveyard was geo-referenced and mapped (Figures 1 & 18; Table 1).

The significance of the graveyard that may be affected by the Pipeline Project was determined by means of stipulations derived from the National Heritage Resources Act (No 25 of 1999) and by means of various other criteria. The significance of the impact of the Pipeline Project was determined according to a rating scheme outlined in Part 7.5, 'Significance ratings.'

Mitigation and well as chance-find procedures are proposed for the Pipeline Project.

8.2.1 Graveyard 01

A large graveyard with more than 50 and perhaps as many as 100 graves occurs to the north of the haul road along which several of the proposed pipelines of the Pipeline Project will be constructed (Figure 16). Most of the graves are undecorated and without headstones with inscriptions. However, it can be expected that many of the graves may be older than sixty years.

8.3 Table

Table 1- Coordinates for GY01 between the open cast mines and the Meccano Plant (below).

Positive identified graves	Coordinates	Significance
Graveyard 01	25º 43 38.60's; 27º 25 18.10'e Corners of graveyard:	**HIGH**

More than 100 graves, older and younger than 60 years.	25º 43.654's; 27º 25.288'e 25º 43.629's; 27º 25.285'e 25º 43.618's; 27º 25.295'e 25º 43.616's; 27º 25.309'e 25º 43.634's; 27º 25.311'e 25º 43.639's; 27º 25.315'e	

9 THE SIGNIFICANCE, POSSIBLE IMPACT ON AND MITIGATION OF THE HERITAGE RESOURCES

The Phase I HIA study for the Pipeline Project revealed the following types and ranges of heritage resources, namely:

- A large graveyard (GY01) with high significance along a haul road where several of the pipelines for the Pipeline Project will be constructed (Figures 1 & 8).

9.1 The significance of the heritage resources

The significance of the graveyard is determined as well as the significance of any possible impact on the graveyard to propose mitigation and management measures if the graveyard will be affected by the proposed Pipeline Project.

9.1.1 Graveyard

All graveyards and graves can be considered of high significance and are protected by various laws (Table 2). Legislation regarding graves includes Section 36 of the NHRA in instances where graves are older than sixty years. Other legislation about graves includes those which apply when graves are exhumed and relocated, namely the Ordinance on Exhumations (No 12 of 1980) and the Human Tissues Act (No 65 of 1983 as amended). Municipal laws about graves and graveyards may differ and professionals involved with the exhumation and relocation of graves and graveyards must adhere to these laws.

Graveyard	**Low**	**Medium**	**High**
GY01			X

Table 2- Rating the significance of the graveyard (above).

9.2 Impact on the graveyard

According to the layout plan for the Pipeline Project the following can be noted (Figures 1 & 8):

- The graveyard (GY01) is located to the north of the haul road whilst the pipelines are to be constructed along the southern shoulder of the haul road. The graveyard therefore will not to be impacted by the proposed Pipeline Project.

9.3 The significance of the impact on the graveyard

The graveyard is rated as of high heritage significance (Table 2). However, the impact on the graveyard during the construction process will be low as the pipelines will be constructed along the southern shoulder of the haul road whilst GY01 is located to the north of the haul road. The graveyard also needs not to be affected by the construction process if the mitigation measures which have been outlined are implemented and followed (Table 3).

Table 3- The significance of the impact on the graveyard (below).

GY01	Magn	Duration	Extent	Irreverse	Replace	Prob	Sig Score	Heritage Signific Before and after mitigation	
	2	5	1	1	2	2	24	**HIGH**	**LOW**

9.4 Mitigating the graveyard

GY01 is demarcated with a fence on all its sides. However, the front fence bordering on the haul road has collapsed. This fence with its entrance gate must be repaired before the construction of the pipelines commences. It is recommended that the entrance gate be locked during the construction process. Red cautionary barrier tape must be draped along the fence together with signposts with the following warning: ‘Cautious Graveyard. Protected by law. Damage caused will lead to prosecution’.

Visitor hours should be arranged for family members and friends of the deceased during the construction process which comply with the mine's health and safety policy. Contact numbers should also be provided for any enquiries or complaints which may be raised by any family members or friends of the deceased during the construction process.

9.5 Chance-find procedures

If heritage resources have been missed during the survey the following chance-find procedures must be implemented during the construction, operation, or closure phases of the Pipeline Project.

The chance-find procedures apply to all contractors, subcontractors, subsidiaries, or service providers. If any of these institutions' employees find any heritage resources during any developmental activity all work at the site must be stopped and kept on hold. Chance-finds must be reported to supervisors and through supervisors to the senior manager on site. Chance-find procedures are summarized for heritage resources and graveyards.

9.5.1 Chance-find procedures for heritage resources

The initial procedure to follow whenever heritage resources are uncovered during development is aimed at avoiding any further possible damage to the heritage resources, namely:

- The person or group (identifier) who identified or exposed the heritage resource or graves must cease all activity in the immediate vicinity of the site.
- The identifier must immediately inform the senior on-site manager of the discovery.
- The senior on-site manager must make an initial assessment of the extent of the find and confirm that further work has stopped and ensure that the site is secured, and that controlled access is implemented.

- The senior on-site manager will inform the Environmental Officer (EO) and Health and Safety (HS) officers of the chance-find and its immediate impact on the Project. The EO will then contact the project archaeologist.
- The project archaeologist will do a site inspection and confirm the significance of the discovery, recommend appropriate mitigation measures to the mine and notify the relevant authorities.
- Based on the comments received from the authorities the project archaeologist will provide the mine with a Terms of References Report and associated costs if mitigation measures must be implemented.

9.5.2 Chance-find Procedures for graves

If previously unidentified graves are uncovered and/or exposed during any of the developmental phases of the Project, the following steps must be implemented after those outlined above:

- The project archaeologist must confirm the presence of graveyards and graves and follow the following procedures.
- Inform the local South African Police Service (SAPS) and traditional authority.
- The project archaeologist in conjunction with the SAPS and traditional authority will inspect the possible graves and make an informed decision whether the remains are of forensic, recent, cultural-historical or of archaeological significance.
- Should it be concluded that the find is of heritage significance and therefore protected in terms of heritage legislation the project archaeologist will notify the relevant authorities.
- The project archaeologist will provide advice about mitigation measures for the graveyards and graves.

10 CONCLUSION AND RECOMMENDATION

The Phase I HIA study for the Pipeline Project revealed the following types and ranges of heritage resources, namely:

- A large graveyard (GY01) with high significance along a haul road where several of the pipelines for the Pipeline Project will be constructed (Figures 1 & 8).

The significance of the heritage resources

The significance of the graveyard is determined as well as the significance of any possible impact on the graveyard to propose mitigation and management measures if the graveyard will be affected by the proposed Pipeline Project.

Significance of the graveyard

All graveyards and graves can be considered of high significance and are protected by various laws (Table 2). Legislation regarding graves includes Section 36 of the NHRA in instances where graves are older than sixty years. Other legislation about graves includes those which apply when graves are exhumed and relocated, namely the Ordinance on Exhumations (No 12 of 1980) and the Human Tissues Act (No 65 of 1983 as amended). Municipal laws about graves and graveyards may differ and professionals involved with the exhumation and relocation of graves and graveyards must adhere to these laws.

Impact on the graveyard

According to the layout plan for the Pipeline Project the following can be noted (Figures 1 & 8):

- The graveyard (GY01) is located to the north of the haul road whilst the pipelines are to be constructed along the southern shoulder of the haul road. The graveyard therefore will not to be impacted by the proposed Pipeline Project (Figures 1 & 8).

The significance of the impact on the graveyard

The graveyard is rated as of high heritage significance (Table 2). However, the impact on the graveyard during the construction process will be low as the pipelines will be constructed along the southern shoulder of the haul road whilst GY01 is located to the north of the haul road. The graveyard also needs not to be affected by the construction

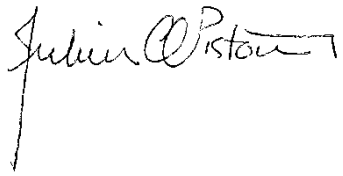
process if the mitigation measures which have been outlined are implemented and followed (Table 3).

Mitigating the graveyard

GY01 is demarcated with a fence on all its sides. However, the front fence bordering on the haul road has collapsed. This fence with its entrance gate must be repaired before the construction of the pipelines commences. It is recommended that the entrance gate be locked during the construction process. Red cautionary barrier tape must be draped along the fence together with signposts with the following warning: 'Cautious Graveyard. Protected by law. Damage caused will lead to prosecution'.

Visitor hours should be arranged for family members and friends of the deceased during the construction process which comply with the mine's health and safety policy. Contact numbers should also be provided for any enquiries or complaints which may be raised by any family members or friends of the deceased during the construction process.

If heritage resources have been missed during the survey chance-find procedures outlined for heritage resources and graves as outlined must be implemented during the construction, operation, or closure phases of the Pipeline Project.



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12 SELECTED BIBLIOGRAPHY

Breutz, P.L. 1953. *The tribes of the Rustenburg and the Pilanesberg districts.* Pretoria: Government Printer.

Coertze, R. D. 1987. *Bafokeng family law and law of succession*. Revised edition. Pretoria: Sabra.

Bergh, J.S. 1992. Die vestiging van die Voortrekkers noord van die Vaalrivier tot 1840. *Historia*, 37(2);38-42.

Breutz, P.L. 1986. *A history of the Batswana and origin of Bophuthatswana*. Margate: Thumbprint.

De Beer, B.K. 1975. *Agter die Magalies*. Postma Publikasies:Fontainebleau.

Horn, A.C. 1996. Okkupasie van die Bankeveld voor 1840 n.C.: 'n sintese. *Suid-Afrikaanse Tydskrif vir Etnologie,* 19(1), 17-27.

Lombaard, B. V. 1945. Die ontdekkers van platina in die Transvaal. *Historical Studies*. University of Pretoria, South Africa. 6(1):32-40.

Môkgatle, N. 1971. *Autobiography of an unknown South African*. London: University of California Press.

Pistorius, J.C.C. 1992. *Molokwane an Iron Age Bakwena Village. Early Tswana settlement in the Western Transvaal*. Perskor: Johannesburg. (pp79).

Pistorius, J.C.C. 1994. Molokwane, a seventeenth century Batswana village. *South African Journal of Ethnology*. 17(2), 38-53.

Pistorius, J.C.C. 1997a. The Matabele village which eluded History, Part I. *South African Journal of Ethnology*. 20(1), 26-38.

Pistorius, J.C.C. 1997b. The Matabele village which eluded History, Part II. *South African Journal of Ethnology*. 20(2), 43-55.

Pistorius, J.C.C. 1998. EmHlalandlela, a Matabele settlement in the Bankeveld. *South African Journal of Enthnology*. 21(2), 55-65.

Pistorius, J.C.C. 2000. New Late Iron Age spatial identities in the Bankeveld. *South African Journal of Enthnology*. 23 (4),150-163.

Pistorius, JCC 2001. Late Iron Age sites of Mmatshetshele Mountain in the Central Bankeveld of the North-West Provice, South Africa. *South African Archaeological Bulletin*. 56 (173&174), 45-56.

Pretorius, Z.L. 1967. *Die Geskiedenis van Rustenburg*, 1851-1918. MA verhandeling. Potchefstroom: PU vir CHO.

Rasmussen, R.K. 1978. *Migrant Kingdom: Mzilikazi's Ndebele in South Africa*. David Philip: Cape Town.

Schapera, I. 1976. *The Tswana*. Great Britian: Clarke, Doble & Brendon.

Viljoen, M.J. & Reinhold, W.U. 1999. *An introduction to South Africa's geological and mining heritage*. Mintek: Randburg.

Wagner, P.A. 1973. *The platinum deposits and mines of South Africa*. Struik: Cape Town.

13 BIBLIOGRAPHY RELATING TO HERITAGE STUDIES

ARM 2005. The archaeology of the Anglo Platinum Lease Area. Unpublished report, T. Huffman. Archaeological Resources Management. Wits.

HCAC 2012b. Archaeological Impact Assessment for the proposed RustMo3 PV Plant on Portion 90 of the farm Spruitfontein 341JQ near Buffelspoort, North-West Province. Unpublished report.

NCHM 1997. A Survey of Cultural Resources on the farm Kroondal 304JQ east of Rustenburg. Unpublished report. J. A van Schalkwyk and A. Pelser. National Cultural History Museum, Pretoria.

NCHM 1999. A Survey of Cultural Resources on the farms Spruitfontein 341JQ and Kafferskraal 342JQ, Rustenburg district. Unpublished report. J. A van Schalkwyk and A. Pelser. National Cultural History Museum, Pretoria

NCHM 2001. A Survey of Cultural Resources on the farm Kroondal 304JQ east of Rustenburg. Unpublished report. J. A van Schalkwyk and A .Pelser. National Cultural History Museum, Pretoria

Pistorius, J.C.C. 1999. Spatial identity and expression in a stone walled complex on Kroondal 304JQ. South African Journal of Ethnology. 22(3) p116-128.

Pistorius, J.C.C. 2007. A Phase I Heritage Impact Assessment for the proposed new Tharisa Platinum Mine on the farm Kaffferskraal 342JQ near Marikana in the North-West Province. Unpublished report for Metago Environmental Engineers.

Pistorius, J.C.C. 2007. A Phase I Heritage Impact Assessment for the proposed new Tharisa Platinum Mine on the farm Kaffferskraal 342JQ and Elandsdrift 462JQ near Marikana in the North-West Province. Unpublished report for Metago Environmental Engineers.

Pistorius, J.C.C. 2015. A Phase I Heritage Impact Assessment for the proposed new railway line for the Tharisa Platinum Mine near Marikana in the North-West Province. Unpublished report for Shangoni Management Services Pty (Ltd)..

Van Schalkwyk, J.A. 2011a. Heritage Impact Assessment for the proposed development of a Photo Voltaic Plant on the farm Spruitfontein 341 JQ, Rustenburg Magisterial district. North-West Province. Unpublished report.