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**A PHASE I HERITAGE IMPACT ASSESSMENT FOR A
PROPOSED NEW RAILWAY LINE FOR THARISA PLATINUM
MINE NEAR MARIKANA IN THE NORTH-WEST PROVINCE**

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EXECUTIVE SUMMARY

This Phase I Heritage Impact Assessment (HIA) study for Tharisa Minerals (Pty) Ltd and Transnet Freight Rail's (TFR) proposed new railway line near Marikana in the Rustenburg District in the North-West Province was done according to Section 38 of the National Heritage Resources Act (No 25 of 1999).

The aims with the Phase I HIA study were the following, namely:

- To determine if any of the types and ranges of heritage resources (the 'national estate') as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) do occur in the Project area and, if so, to establish the significance of these heritage resources.
- To establish the level of significance of any possible impact on these heritage resources.
- To propose appropriate mitigation measures for those types and ranges of heritage resources that may be affected by the proposed railway line project.

The Phase I heritage survey revealed the following types and ranges of heritage resources as outlined in Section 3 of the NHRA (No 25 of 1999) in the project area, namely:

- Graveyards.

The graveyards were mapped and geo-referenced (Figure 6; Table 1). The significance of the graveyards is indicated as well as mitigation measures should the graveyards be affected by the proposed railway line (Tables 1 & 2).

The significance of the graveyards

All graveyards and graves can be considered to be of high significance and are protected by various laws (Table 1). Legislation with regard to graves includes Section 36 of the National Heritage Resources Act (Act No 25 of 1999) whenever graves are older than sixty years. GY01 and GY02 are probably older than sixty years. Other legislation with regard to 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).

Possible impact on the graveyards

Graveyard 01 is located approximately 300m from the proposed northern loop of the railway line whilst GY02 is located approximately 105m to the west of the main railway line servitude. The graveyards therefore need not to be affected by the proposed construction, operation and eventual closure of the railway line. Nevertheless, the significance of the graveyards is

indicated as well as mitigation measures should the graveyards be affected, indirectly during the construction, operation and eventual closure of the railway line.

The significance of the impacts on the graveyards

The significance of possible impacts on the graveyards was determined using a ranking scale, based on various criteria.

The significance of any possible impact on the graveyards is very low (Table 2).

Mitigating the graveyard impacts

The graveyards will not be affected by the proposed new railway line project during the construction, operation or the closure of the railway line. Consequently, no mitigation measures are recommended for the graveyard.

However, it is recommended that the graveyards be demarcated with red cautionary tape during the construction phase of the project as contractors may stray from the construction site. The red cautionary tape would aware straying contractors or contractor vehicles to take cognisance of the presence of the graveyards.

Option 2B serves as the recommended alternative for the proposed new railway line. This alternative moves onto the mine site which has been extensively disturbed in the past as a result of earlier and ongoing mining activities.

General remark (disclaimer)

It is possible that this Phase I HIA study may have missed heritage resources in the Project area as heritage sites may occur in clumps of vegetation or tall grass while others may lie below the surface of the earth and may only be exposed once development commences.

If any heritage resources of significance is exposed during the project the South African Heritage Resources Authority (SAHRA) should be notified immediately, all development activities must be stopped and an archaeologist accredited with the Association for Southern African Professional Archaeologist (ASAPA) should be notify in order to determine appropriate mitigation measures for the discovered finds. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.

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1 INTRODUCTION

1.1 Project background

This Phase I Heritage Impact Assessment (HIA) study is one of a series of specialist study reports which are compiled in support of the terms of reference for the Environmental Impact Assessment (EIA) for a proposed new railway line for Tharisa Minerals (Pty) Ltd and Transnet Freight Rail (TFR) near Marikana in the North West Province.

Previous heritage surveys that were conducted for developers in the Rustenburg District in the North-West Province indicated that the most common types and ranges of heritage resources which exist in this part of the province consists of stone walled sites which date from the Late Iron Age. However, various types and ranges of heritage resources that qualify as part of South Africa's 'national estate' as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) do occur across the North-West Province (see Box 1, next page).

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

The National Heritage Resources Act (Act 25 of 1999, Section 3) outlines the following types and ranges of heritage resources that qualify as part of the national estate:

- 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 in terms of the Human Tissue Act (Act 65 of 1983);
- h. Sites of significance relating to the history of slavery in South Africa;
- i. Moveable objects, including -
 - i. Objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects, 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 (Act 43 of 1996).

The National Heritage Resources Act (Act 25 of 1999, Sec 3) also distinguishes nine criteria for a place and/or object 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;
- b. Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- c. Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- d. 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. Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and/or

1.2 Definitions

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.
- Conservation (*in-situ*): The conservation and maintenance of ecosystems, natural habitats and cultural resources in their natural and original surroundings.
- Cultural (heritage) 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.
- Cultural (heritage) 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.
- Heritage resources: The various natural and cultural assets that collectively form the heritage. These assets are also known as cultural and natural resources. Heritage (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.

- Stone Age: Refers to the prehistoric past, although Late Stone Age peoples 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 300 years ago).
- 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.
- Historical period: Refers to the first appearance or use of 'modern' Western writing in a particular area or region of the world.
- 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.
- 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, in the near future, qualify as heritage resources.
- Maintenance: Keeping something in good health or repair.
- Preservation: Conservation activities that consolidate and maintain the existing form, material and integrity of a cultural resource.
- 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.
- 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.
- 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 (refer to plan).
- Phase I studies refer to surveys using various sources of data in order to establish the presence of all possible types and ranges of heritage resources in any given Project area.
- 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 involve permitting processes, require the input of different specialists and the co-operation and approval of SAHRA.

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)

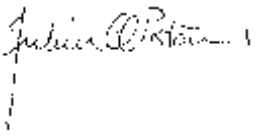
Lecturer and Senior lecturer Department of Anthropology and Archaeology, University of Pretoria (1990-2003)

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 Ekurhuleni, 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. Julius Pistorius 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 INDEPENDENCE

<p>I, Julius CC Pistorius, declare that:</p> <ul style="list-style-type: none"> • I act as the independent environmental practitioner in this application • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting environmental impact assessments, including knowledge of the National Heritage Resources Act (No 25 of 1999) and any guidelines that have relevance to the proposed activity; • I will comply with the Act, regulations and all other applicable legislation; • I will take into account, to the extent possible, the matters listed in regulation 8 of the regulations when preparing the application and any report relating to the application; • I have no, and will not engage in, conflicting interests in the undertaking of the activity; • I undertake to disclose to the applicant and the competent authority all material information in my possession 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; • I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application; • I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report; • I will keep a register of all interested and affected parties that participated in a public participation process; and • I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not • all the particulars furnished by me in this form are true and correct; • I will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and • I realise that a false declaration is an offence in terms of regulation 71 and is punishable in terms of section 24F of the Act. <p>Disclosure of Vested Interest</p> <p>I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2010.</p>
<div style="text-align: center;">  </div> <hr style="width: 20%; margin-left: 0;"/> <p>Signature of the environmental practitioner: Private Consultant</p> <hr style="width: 20%; margin-left: 0;"/> <p>Name of company: 4 April 2015</p> <hr style="width: 20%; margin-left: 0;"/> <p>Date:</p>
<hr style="width: 20%; margin-left: 0;"/> <p>Signature of the Commissioner of Oaths:</p> <hr style="width: 20%; margin-left: 0;"/> <p>Date:</p> <hr style="width: 20%; margin-left: 0;"/> <p>Designation:</p>

4 SCOPE OF WORK

Tharisa Minerals (Pty) Ltd (Tharisa) and Transnet Freight Rail (TFR) propose to develop a new railway line near Marikana in the North West Province. Shangoni Management Services (Pty) Ltd who is responsible for compiling an Environmental Impact Assessment (EIA) report for the new railway line commissioned the author to undertake a Phase I HIA study for the proposed Project area on the farms Rooikoppies 287JQ, Kafferskraal 343JQ and Elandsdrift 462JQ.

The aims with the Phase I HIA study were the following, namely:

- To determine if any of the types and ranges of heritage resources (the 'national estate') as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) do occur in the Project area and, if so, to establish the significance of these heritage resources.
- To establish the level of significance of any possible impact on these heritage resources.
- To propose appropriate mitigation measures for those types and ranges of heritage resources that may be affected by the proposed railway line project.

5 LEGAL FRAMEWORK

South Africa's heritage resources ('national estate') are protected by international, national and regional 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 National Heritage Resources Act (NHRA, Act No 25 of 1999) (see Box 1).

According to the NHRA (Act No 25 of 1999) heritage resources are categorised 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 (PHRAs) which apply the National Heritage Resources Act (Act 25 of 1999) 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 acts and is implemented by the South African Heritage Resources Agency (SAHRA) and the Provincial Heritage Resources Agencies.

At a national level heritage resources are dealt with by the National Heritage Council Act (Act No 11 of 1999) and the National Heritage Resources Act (Act No 25 of 1999).

5.1 Legislation relevant to heritage resources

The identification, evaluation and assessment of heritage resources in South Africa are regulated by the following legislation:

- National Environmental Management Act (NEMA) Act 107 of 1998
- National Heritage Resources Act (NHRA) Act 25 of 1999
- Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002

5.2 The National Heritage Resources Act (NHRA)

According to the NHRA (Act No 25 of 1999) the 'national estate' comprises the following (see Box 1):

- a. Archaeological artefacts, structures and sites older than 100 years
- b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography
- c. Objects of decorative and visual arts
- d. Military objects, structures and sites older than 75 years
- e. Historical objects, structures and sites older than 60 years
- f. Proclaimed heritage sites
- g. Graveyards, burial grounds and graves older than 60 years
- h. Meteorites and fossils
- i. Objects, structures and sites of scientific or technological value.

Elaborating on the above the 'national estate' also includes (Box 1):

1. Places, buildings, structures and equipment of cultural significance
2. Places to which oral traditions are attached or which are associated with living heritage
3. Historical settlements and townscapes
4. Landscapes and features of cultural significance
5. Geological sites of scientific or cultural importance
6. Archaeological and paleontological sites of importance
7. Sites of significance relating to the history of slavery
8. Movable objects (e.g. archaeological, paleontological, meteorites, geological specimens, military and ethnographic objects, books etc.)

5.3 Heritage Impact Assessment studies

According to Section 38 of the National Heritage Resources Act (Act No 25 of 1999) a Heritage Impact Assessment (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 000m² or which involve three or more existing erven or subdivisions thereof
- Re-zoning of a site exceeding 10 000 m²
- Any other category provided for in the regulations of SAHRA or a provincial heritage authority

5.4 Regulations with regard to heritage resources

The regulations outlined below are applicable to the types and ranges of heritage resources which are the most common in the region where the heritage study was conducted, namely:

5.4.1 Buildings and structures

According to Section 34(1) of the NHRA (Act No 25 of 1999) 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..

5.4.2 Graves and burial grounds

Graves and burial grounds are divided into the following:

- 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

In terms of Section 36(3) of the NHRA (Act No 25 of 1999) 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
- 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.

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

Human remains that are less than 60 years old are subject to provisions of the Human Tissue Act (Act 65 of 1983) and to local regulations. Exhumation of graves must conform to the standards set out in the Ordinance on Excavations (Ordinance no. 12 of 1980) (replacing the old Transvaal Ordinance no. 7 of 1925).

Permission must also be gained from the descendants (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 65 of 1983 as amended).

5.4.3 Archaeology, palaeontology and meteorites

Section 35(4) of the NHRA (Act No 25 of 1999) deals with archaeology, palaeontology and meteorites and states that no person without a permit issued by the responsible heritage resources authority (national or provincial) may:

- 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, export 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 the South African Heritage Resources Agency (SAHRA). In order to demolish heritage resources the developer has to acquire a destruction permit by from SAHRA.

6 METHODOLOGY

The Phase I HIA study was conducted by means of the following:

6.1 Desktop study

Literature relating to the pre-historical and the historical unfolding of the Rustenburg District was reviewed. This review provides a broad chronological overview of the region ranging from pre-historical times to the historical period including the development of platinum and chrome mining in the region. It also refers to Tswana clans who together with the colonial Voortrekkers were the most influential pre-historic and historical groups in the region. This contextual evidence contributes to a better understanding of the identity and meaning of heritage sites which may occur in and near the Project area.

A number of heritage studies which were done for developers near the Project area also provided information regarding the general heritage characteristics of the larger project area (see Part 13, 'Bibliography relating to earlier heritage studies').

The desktop study also involved consulting heritage data banks maintained at institutions such as the North-West Provincial Heritage Resources Agency in Mmabatho, the Archaeological Data Recording Centre at the National Flagship Institute (Museum Africa) in Pretoria and the national heritage resources register (SAHRIS) at the South African Heritage Resources Agency in Cape Town.

The Project area was also studied by means of maps on which it appears (Rustenburg East 2527CB 1: 50 000 topographical map; 2527 Pretoria 1:250 000 map and Google imagery).

6.2 Fieldwork and research

The Project area was surveyed with a vehicle and by means of pedestrian surveys. A track log which was registered with a mounted GPS instrument outlines the main route for the field survey from where pedestrian surveys were conducted. The author has

surveyed the larger area on previous occasions in the past and is acquainted with most of the heritage resources which do occur in the region (see Part 13, 'Bibliography relating to earlier heritage studies').



Figure 1- Track pathway registered with a mounted GPS instrument outlines the main routes that were followed during the field survey. Pedestrian surveys were conducted from these main tracks (above).

Photographs and descriptions illuminate the nature and characteristic features of the Project area (see Part 6.1 'Fieldwork survey').

6.3 Assumptions and limitations

It is possible that this Phase I HIA study may have missed heritage resources in the Project area as heritage sites may occur in clumps of vegetation or tall grass while others may lie below the surface of the earth and may only be exposed once development commences.

If any heritage resources of significance is exposed during the project the South African Heritage Resources Authority (SAHRA) should be notified immediately, all development activities must be stopped and an archaeologist accredited with the

Association for Southern African Professional Archaeologist (ASAPA) should be notified in order to determine appropriate mitigation measures for the discovered finds. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.

7 THE BASELINE DESCRIPTION

7.1 Location of the project area

The Project area involves the development of a new railway line which runs from a main railway line in the north to the Platinum Highway (N4) in the south. The proposed new railway line with two loops, one in the north at the existing railway line and one in the south within the Tharisa's mine, runs across the farms Rooikoppies 287JQ, Kafferskraal 342JQ and Elandsdrift 462JQ which are all located near the town of Marikana in the Bonjanala District Council in the Rustenburg Local Municipality. Several platinum and chrome mines have been established in this part of the North-West Province during the last few decades (Rustenburg East 2527CB 1: 50 000 topographical map; 2527 Pretoria 1:250 000 map and Google imagery) (Figure 2).

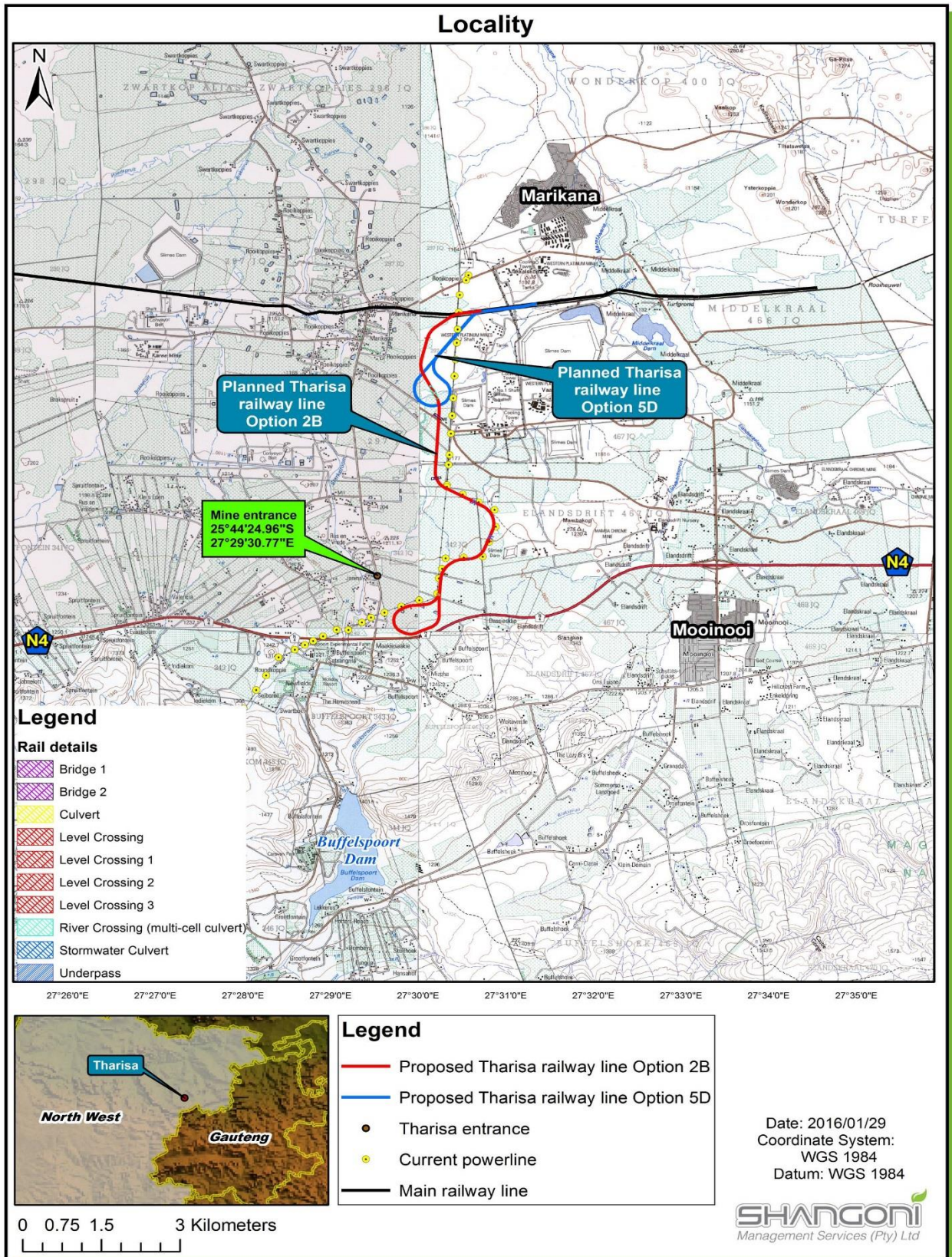


Figure 2- Regional location for the proposed new railway line for Tharisa Minerals (Pty) Ltd near Marikana in the North West Province (above).

7.2 The nature of the Project area

The larger area has been subjected to development for longer than a century, initially for the cultivation of tobacco and citrus as well as other agricultural produce which was cultivated from as early as the second half of the nineteenth century whilst platinum mining commenced in the early 1920's and 1930's and was soon followed by chrome mining. Some of these mining activities are visible in the form of Lonmins smelter complex and shafts with headgear, associated underground workings and Tharisa' open cast pits in the immediate surroundings of the Project area. Waste rock dumps are also a feature along the Project area's eastern perimeter.

The most pronounced development in the immediate vicinity of the proposed railway line comprises of the cultivation of land along the northern stretch of the proposed railway line whilst the central and southern part is characterised by mining activities. Cattle tracks criss-cross the veld around the Project area and rubble of former dwellings occur in the northern part of the Project area where a graveyard was also recorded. These developments have transformed and affected the landscaped which cannot be described as pristine any longer.

Heritage surveys which have been done in the general area have indicated that the most common heritage resources in the region are the following:

- Stone walled sites which date from the Late Iron Age are relatively common in the region and can be associated with pre-historical and historical Tswana spheres of influence.
- Farmstead complexes which can be associated with colonial farmers.
- Historical graveyards and graveyards which date from the more recent past.

Heritage resources which are scarce in the larger project area include the following:

- Stone Age sites with dense concentrations of stone tools on the surface of the land.
- Historical platinum and chrome mining activities. When these occur they are associated with limited infrastructure.

7.3 The nature of the proposed railway project

Tharisa Minerals (Pty) Ltd (Tharisa) operates a mine south of the town of Marikana in the North West Province. The mine produces chrome and platinum concentrates from the middle group ore body of the Western Bushveld Complex. Chrome concentrate is the bulk commodity. When the mine is at full capacity it will produce approximately 160 000 tons chrome concentrate per month. These concentrates are taken by road from the mine to either the Marikana rail siding or to City Deep in Johannesburg in order to be exported to China.

Tharisa undertook a feasibility study to evaluate options for a rail siding for the export of the chrome concentrates. This study which was conducted by R&H Rail identified nine possible sites with a number of siding configurations. Transnet Rail Freight (TRF) agreed to develop the project concepts and defined several proposals for the benefit of both parties to the pre-feasibility level, namely a public private partnership with TRF for the construction and operation of an on-mine railway siding. TRF will be responsible for the land acquisition, design, procurement, construction, commissioning and operation of the rail way line and the associated infrastructure. Tharisa will be responsible for the design, procurement, construction, commissioning and operation of the material handling and rapid load facility on the mine.

To cater for the high volumes in chrome concentrate TFR proposes the construction of a new 26 ton railway line. The new railway line will run from the main railway line near the existing Marikana siding along Eskom's 275kV power line to the Tharisa mine. The total distance of the railway line is approximately 12 kilometres plus 2 km railway line from the main line to the loading area within Tharisa.

Potential alternatives for the railway line project are the following, namely:

- Option 5D - To construct a rail siding from the mainline which runs onto farm land. The chrome concentrates will be delivered to this facility from the mine by conveyor or road transport. The siding will be equipped with a rapid load out station.

- Option 2B - To construct a siding from the mainline which runs onto the mine site near the N4 in the south. This siding will also be equipped with a rapid load out station.

8 CONTEXTUALISING THE PROJECT AREA

The following overview of pre-historical, historical and cultural evidence outlines the types and range of heritage resources which do occur across the larger project area which is part of the central Bankeveld of the North-West Province. The Bankeveld is a narrow strip of land between the northern bushveldt savannah and the centrally situated Highveld. The central Bankeveld is covered by older grabbo penetrated by younger volcanic magma which formed the series and chains of pyramid-shaped norite hills from the Pilanesberg in the north-west to Brits in the east. These hills, as part of the Magaliesberg valley, represent a unique ecozone characterised by grassveld, savannah veld and near wooded valleys. The region has abundant surface water supplies. The Pienaar, the Moretele, the Hex and the Apies Rivers all drain their waters into the Crocodile River (Horn 1996).

8.1 Pre-historical context

The Project area is located to the north of the Magaliesberg which is known for its rich and diverse range of heritage resources (Carruthers 2000; De Beer 1975). 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 Rustenburg in the west. Blockhouses along the Magaliesberg and colonial farm homesteads are still common in Marikana and on the outskirts of Brits (Madibeng). The most abundant heritage, however, 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 (Mason 1968). 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 in order to practise herding, agriculture, metal working and trading. It was here that their chiefdoms flourished during AD1600 to AD1840 (Horn 1996; Pistorius 1995).

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 close to Tharisa were the Kwena Môngôpa and the Kwena Môngale (Bapô) the latter whose spheres of influence overlapped with Tharisa's mine lease area. Further to the west, closer to Rustenburg was the Fôkeng chiefdom while several Kgatla spheres of influence emerged further to the west near Brits (Pistorius 2000). The Kgatla were subjected by Mzilikazi and were used as labourers to build one of the Ndebele's villages, probably known as emHlalandlela, which is located to the north-east of Tharisa (Pistorius 1998).

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 Tharisa. One of their capitals was Tlhôgôkgôlô (Wolhuterskop). Several of the chiefs of this clan were known by the name of Môngale. The name of the Magalies Mountains (Magaliesberg) was derived from the name Môngale (Breutz 1953, 1986).

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 Môngôpa, 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 (Rasmussen 1978).

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 the course of earlier archaeological surveys (Pistorius 1997a, 1997b & 1998).

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 (Manson and Bhenga 2000).

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 (Lye (ed.) 1975). One year later, in December 1836, Cornwallis Harris also visited the Central Bankeveld where he painted the village of emHlalandlela (Harris 1963).

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.

8.2 Historical context

The nineteenth century travellers and adventures were followed from the 1840's by the first colonists who settled in various places in the Magaliesberg such as Rustenburg, Marikana and Madibeng (Brits) near the Crocodile River close to the Project area. Farms were occupied by the Voortrekkers were De Kroon 444, Krokodildrift 446 and Kafferskraal 342.

The farm Kafferskraal 342 was established by Willem Cornelis Janse van Rensburg (born, 16 May 1818) married to Elisabeth Maria Jacoba du Plessis (born, 31 Oct 1819) during the early 1850's. W.C.J. van Rensburg and family members survived the massacre of Voortrekker parties at Bloukrans and Moordspruit in 1838 when they were saved due to the actions of Marthinus Oosthuizen.

After Natal was annexed by the British, W.C.J. van Rensburg moved to the Transvaal, initially settling at Ohrigstad and then on Kafferskraal. The farm took its name from the stone walled settlements ('kraals') which used to exist on the property.

During 1850-1855 W.C.J. van Rensburg was a member of the Transvaal Volksraad and in February 1858 he became a member of the Executive Committee. When M.W. Pretorius left for the Free State in January 1860 van Rensburg was nominated as acting president for the Z.A.R. For reasons unknown he did not accept the position. In April 1862 he was elected acting president of the Z.A.R. and served until October 1863 when the presidential election took place. He was elected president with a majority vote. However, a new presidential election was held in 1864 upon which M.W. Pretorius was re-elected president. Due to deteriorating health C.W.J. van Rensburg withdrew to his farm on Kafferskraal where he died on 13 August 1865 at the age of 47 years.

W.C.J. van Rensburg was buried in August 1865 on Kafferskraal together with his wife who died in 1895. The exact location of their residence on Kafferskraal is unknown. It was searched for by the historian, Dr. H.M. Rex, but could not be found. Together with his wife, W.C.J. van Rensburg was exhumed and reburied in the 'Heldeakker' (Heroes Acre) in Church Street in Pretoria on 17 August 1974.

The van Rensburg couple had five sons and one daughter who inherited various portions of the farm which again were divided and passed down to their descendants and their offspring. Many of W.C.J. van Rensburg's descendants therefore still occupy the farms Kafferskraal 342 and Elandsdrift 467.

8.3 Early farming

The original Kafferskraal was approximately 2 000 morgen in size. It was situated on the banks of the Sterkstroom which roughly divided the farm in two halves. It was close to the original road which ran between Pretoria and Rustenburg. It was a fertile piece of land characterised by a temperate climate, adequate summer rain falls and with a variety of soil types. Fruits and vegetables as well as tobacco and sorghum were planted on the black soils to the west and east of the Sterkstroom and on the sandy and loam soils in the south-west. The tobacco and sorghum were replaced with citrus in the more recent past. The farm was irrigated from the river as well as from the Buffelspoort Dam with a network of canals which were constructed from as early as the 1930's.

General business on Kafferskraal was conducted at the station at Marikana which is situated on the Pretoria-Thabazimbi railway line which was established in 1910. Marikana is situated five kilometres to the north of Kafferskraal. Here various shops, a post office, police station and two Afrikaans churches (Dutch Reform and N.G. Church) existed from an early period. However, main business was conducted in Rustenburg, 20 kilometres to the west.

The main occupants of Kafferskraal for many years were seventy Afrikaans speaking families who were born here and who made farming their lively hood. They were relatively affluent, ambitious and progressive and maintained a keen interest in affairs pertaining to the state, school and church. Several old farm homesteads with outbuildings still exist. These farmers and their co-workers therefore occupied the farm without interruption since the 19th century. However, the historical character of the farm has changed over the last few decades as a result of changing agricultural practices,

the expansion of mining industries near Marikana and general development in the wider region.

Some of the earliest Voortrekkers who moved across the Magaliesberg in the early 19th century established themselves on the farms Kafferskraal and Witpensfontein (today Rustenburg) and Schaapkraal, to the west and north of the study 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 (Bergh 1992; Pretorius 1967).

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 located in Kommandonek and in Pampoennek in the Magaliesberg, to the south of Tharisa (Carruthers 2000).

8.4 Mining

After the discovery of the Merensky Reef in 1929, the economy of the area was gradually changed from farming into platinum and chrome mining. What started as small scale mining activities north of the Magaliesberg during the 20th century was soon eclipsed by the rise of the platinum mining complex near Rustenburg. The discovery of the Merensky Reef and the accompanying platinum boom was soon followed by the establishment of numerous chrome and norite mines in the North-West Province.

9 THE PHASE I HERITAGE IMPACT ASSESSMENT

9.1 The field survey

The Project area was subjected to a survey with a vehicle and a pedestrian survey. The northern and central part of the Project area occurs outside the Tharisa mine area whilst the southern part falls within the mine's boundaries. The southern part has totally been transformed as a result of mining and mining related activities whilst the northern and central area can be described as relatively pristine. The most northerly tip of the Project area, adjoining the existing railway line was intensely disturbed as a result of agricultural activities. Informal settlers also occupied a part of this land in the more recent past. A graveyard was recorded in close proximity of the railway line.

The Phase I heritage survey is now briefly discussed and illuminated with photographs.



Figure 3- The northern part of the Project area is characterised by agricultural fields and evidence for the recent occupation of this area next to the railway line which have disturbed the natural features of this area (above).



Figure 4- The central part of the Project area is relatively pristine although mine infrastructure and mining related activities do occur in close proximity of the proposed railway line (above).



Figure 5- The southern part of the Project area has totally been transformed by mining activities (above).

9.2 Types and ranges of heritage resources

The Phase I heritage survey revealed the following types and ranges of heritage resources as outlined in Section 3 of the NHRA (No 25 of 1999) in the project area, namely:

- Graveyards.

The graveyards were mapped and geo-referenced (Figure 6; Table 1). The significance of the graveyards is indicated as well as mitigation measures should the graveyards be affected by the proposed railway line (Tables 1 & 2).

The Phase I heritage survey is now briefly discussed and illuminated with photographs.

9.2.1 Graveyards

Two graveyards were recorded near the project area, namely:

9.2.1.1 Graveyard 01

This graveyard is designated GY01 and is located in close proximity of the existing railway line. GY01 holds approximately thirty graves most of whom merely comprises heaps of stone of which are demarcated with upright stones

At least seven graves are decorated with granite headstones and trimmings. The inscriptions on some of the graves read as follow:

- Molepolle Ramekgele Michael *1930 †1991
- Molepolle Ramakoti Johannes *1906 †1923

GY01 is older than sixty years.



Figure 7- GY01 holds approximately thirty graves some of which are decorated with granite headstones and trimmings (above).

9.2.1.2 Graveyard 02

Graveyard 02 (GY02) holds at least five visible graves. It is situated in the northern part of the project area, approximately 105m to the west of the Tharisa railway line servitude. One of the graves is fitted with a granite headstone and trimmings. The inscription on the headstone reads as follow:

- 'Christinah Moselane Born 1914 Died 5-02-1978 Rest in Peace'

It is most likely that GY02 could be older than sixty years.



Figure 8- GY02 holds at least five visible graves one of which is decorated with a granite headstone and trimmings (above).

9.2.1.3 Table

Table 1- Coordinates and significance rating for graveyards (above).

Heritage resources	Coordinates	Significance
Graveyard 01 (GY01)	25° 41.560's 27° 30.396'e	VERY HIGH
Graveyard 02 (GY02)	25°42'9.56"s; 27°30'18.81"e	VERY HIGH

10 POSSIBLE IMPACT ON AND MITIGATION OF HERITAGE RESOURCES

10.1 The significance of the graveyards

All graveyards and graves can be considered to be of high significance and are protected by various laws (Table 1). Legislation with regard to graves includes Section 36 of the National Heritage Resources Act (Act No 25 of 1999) whenever graves are older than sixty years. GY01 and GY02 are probably older than sixty years. Other legislation with regard to 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).

10.2 Possible impact on the graveyards

Graveyard 01 is located approximately 300m from the proposed northern loop of the railway line whilst GY02 is located approximately 105m to the west of the main railway line servitude. The graveyards therefore need not to be affected by the proposed construction, operation and eventual closure of the railway line. Nevertheless, the significance of the graveyards is indicated as well as mitigation measures should the graveyards be affected, indirectly during the construction, operation and eventual closure of the railway line.

10.3 The significance of the impacts on the graveyards

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

- Occurrence
 - Probability of occurrence (how likely is it that the impact may/will occur?), and
 - Duration of occurrence (how long may/will it last?)
- Severity
 - Magnitude (severity) of impact (will the impact be of high, moderate or low severity?), and

- Scale/extent of impact (will the impact affect the national, regional or local environment, or only that of the site?).

Each of these factors has been assessed for each potential impact using the following ranking scales:

Probability: 5 – Definite/don't know 4 – Highly probable 3 – Medium probability 2 – Low probability 1 – Improbable 0 – None	Duration: 5 – Permanent 4 - Long-term (ceases with the operational life) 3 - Medium-term (5-15 years) 2 - Short-term (0-5 years) 1 – Immediate
Scale: 5 – International 4 – National 3 – Regional 2 – Local 1 – Site only 0 – None	Magnitude: 10 - Very high/don't know 8 – High 6 – Moderate 4 – Low 2 – Minor

The environmental significance of each potential impact was assessed using the following formula:

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

The maximum value is 100 Significance Points (SP). Potential environmental impacts are rated as very high, high, moderate, low or very low significance on the following basis:

- More than 80 significance points indicates VERY HIGH environmental significance.
- Between 60 and 80 significance points indicates HIGH environmental significance.
- Between 40 and 60 significance points indicates MODERATE environmental significance.

- Between 20 and 40 significance points indicates LOW environmental significance.
- Less than 20 significance points indicates VERY LOW environmental significance.

The significance of any possible impact on the graveyards is very low (Table 2).

Table 2: The significance of potential impacts on the graveyards (below).

Grave-yard	Probability of impact	Magnitude of impact	Duration of impact	Scale	Significance points	Significance of impact	Significance after mitigation
GY01	1	2	1	1	2	Very low	Not applicable
GY02	1	2	1	1	2	Very low	Not applicable

10.4 Mitigating the graveyard impacts

The graveyards will not be affected by the proposed new railway line project during the construction, operation or the closure of the railway line. Consequently, no mitigation measures are recommended for the graveyard.

However, it is recommended that the graveyards be demarcated with red cautionary tape during the construction phase of the project as contractors may stray from the construction site. The red cautionary tape would aware straying contractors or contractor vehicles to take cognisance of the presence of the graveyards.

Table 2: The significance of potential impacts on the graveyard (below)

Environmental impact, extent, duration, significance and degree to which impact has caused irreplaceable loss	Risk rating (before mitigation)			Environmental objective	Degree to which impact can be reversed and the supporting mitigatory action plan	Timeframe	Responsibility	Risk rating (after mitigation)		
	Probability	Magnitude	Severity					Probability	Magnitude	Severity
ENVIRONMENTAL COMPONENT: Archaeology and heritage										
ACTIVITY: Construction and operational activities could affect graveyard										
PROJECT PHASE APPLICABILITY: Construction and operation phase										
<p><u>Impact description:</u> The Phase I HIA study for Tharisa Minerals (Pty) Ltd and Transnet Freight Rail's (TFR) proposed new railway line reveal the presence of two graveyards. GY01 is approximately 300m from the northern loop of the railway line and GY02 is located approximately 105m to the west of the main railway line servitude.</p> <p>The graveyards needs not to be affected during the construction, operation and eventual closure of the railway line. The significance of possible impacts on the graveyard was determined using a ranking scale, based on the following:</p> <p><u>Extent of impact:</u> Not applicable</p> <p><u>Duration of impact:</u> Not applicable</p>	1	1	L	Identify, conserve and manage heritage resources (that exist).	<p><u>Degree to which impact can be reversed:</u> None.</p> <p><u>Proposed mitigation:</u> No mitigation measures are recommended. It is however recommended that the graveyards be demarcated with red cautionary tape during the construction phase should contractors stray from the construction sites to take cognizance of the presence of the graveyards.</p>	Commence during construction phase	ECO/ Environmental manager	1	1	L

11 CONCLUSION AND RECOMMENDATION

The Phase I heritage survey revealed the following types and ranges of heritage resources as outlined in Section 3 of the NHRA (No 25 of 1999) in the project area, namely:

- Graveyards.

The graveyards were mapped and geo-referenced (Figure 6; Table 1). The significance of the graveyards is indicated as well as mitigation measures should the graveyards be affected by the proposed railway line (Tables 1 & 2).

The significance of the graveyards

All graveyards and graves can be considered to be of high significance and are protected by various laws (Table 1). Legislation with regard to graves includes Section 36 of the National Heritage Resources Act (Act No 25 of 1999) whenever graves are older than sixty years. GY01 and GY02 are probably older than sixty years. Other legislation with regard to 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).

Possible impact on the graveyards

Graveyard 01 is located approximately 300m from the proposed northern loop of the railway line whilst GY02 is located approximately 105m to the west of the main railway line servitude. The graveyards therefore need not to be affected by the proposed construction, operation and eventual closure of the railway line. Nevertheless, the significance of the graveyards is indicated as well as mitigation measures should the graveyards be affected, indirectly during the construction, operation and eventual closure of the railway line.

The significance of the impacts on the graveyards

The significance of possible impacts on the graveyards was determined using a ranking scale, based on various criteria.

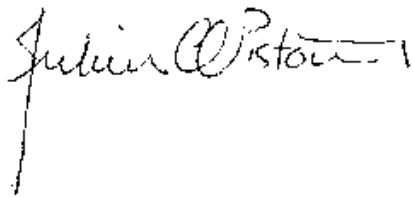
The significance of any possible impact on the graveyards is very low (Table 2).

Mitigating the graveyard impacts

The graveyards will not be affected by the proposed new railway line project during the construction, operation or the closure of the railway line. Consequently, no mitigation measures are recommended for the graveyard.

However, it is recommended that the graveyards be demarcated with red cautionary tape during the construction phase of the project as contractors may stray from the construction site. The red cautionary tape would aware straying contractors or contractor vehicles to take cognisance of the presence of the graveyards.

Option 2B serves as the recommended alternative for the proposed new railway line. This alternative moves onto the mine site which has been extensively disturbed in the past as a result of earlier and ongoing mining activities.

A handwritten signature in black ink, appearing to read 'Julius CC Pistorius', with a long vertical line extending downwards from the end of the signature.

Dr Julius CC Pistorius
Archaeologist & Heritage Consultant

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