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A PHASE I HERITAGE IMPACT ASSESSMENT (HIA) STUDY FOR THE PROPOSED MAFUBE LIFE X ROAD REALIGNMENT PROJECT NEAR BELFAST IN THE MPUMALANGA PROVINCE

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ACRONYMS AND ABBREVIATIONS

AIA Archaeological Impact Assessment

ASAPA Association of South African Professional Archaeologists

CRM Cultural Resource Management

EAP Environmental Assessment Practitioner

ECO Environmental Control Officer

EIA Environmental Impact Assessment

EMP Environmental Management Plan

EPS Environmental Performance Standards

EIA Early Iron Age

ESA Early Stone Age

GPS Global Positioning System

HIA Heritage Impact Assessment

IEM Integrated Environmental Management

IFC PS International Finance Corporation Performance Standards on Environmental and Social Sustainability, 2012

I & Aps Interested and Affected Parties

LIA Late Iron Age

LSA Late Stone Age

MIA Middle Iron Age

MPRDA Mineral and Petroleum Resources Development Act, 28 of 2002

MSA Middle Stone Age

NEMA National Environmental Management Act, 107 of 1998

NEMBA National Environmental Management: Biodiversity Act, 10 of 2004

NEMAQA National Environmental Management: Air Quality Act, 39 of 2004

NEMWA National Environmental Management: Waste Act, 59 of 2008

NHRA National Heritage Resources Act, 25 of 1999

NWA National Water Act, 36 of 1998

OSHA Occupational Health and Safety Act, 85 of 1993

PHRA Provincial Heritage Resource Agency

RSA Republic of South Africa

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:

- 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, in the near future, 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 activities or phenomena to continue indefinitely, at current and projected levels, without depleting social, financial, physical and other resources required to produce the expected benefits. Heritage resources are non-renewable and whenever damaged or destroyed cannot be replaced. Conservation and restoration aim to employ heritage resources in a sustainable way so that it can be enjoyed, studied or utilized into the undefined future.

- 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 Figure 7).

- 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 (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.

EXECUTIVE SUMMARY

This document contains the report on a Phase I Heritage Impact Assessment (HIA) study which was done according to Section 38 of the National Heritage Resources Act (No 25 of 1999) for the proposed Mafube Life X Road Realignment Project (Mafube Project) near Belfast on the eastern Highveld in the Mpumalanga Province of South Africa**.**

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

- To establish whether any of the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) (see Box 1) do occur in the project area and, if so, to determine the nature, the extent and the significance of these remains.
- To establish if any of these heritage resources will be affected by the proposed Mafube Project and, if so, to evaluate what appropriate mitigation measures must be taken if any of the types and ranges of heritage resources will be affected by the project.

The Phase I HIA for the proposed project area 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 and near the project area, namely:

- A graveyard (previously identified as GY07).

The graveyard was geo-referenced and mapped (Figure 8, Tables 1 & 2). Its significance is indicated as well as any possible impact on the graveyard.

Mitigation measures are outlined to take precautionary measures that the graveyard is not impacted during the construction of the road.

The significance of the graveyard

The significance of the graveyard is indicated in order to determine the significance of any possible impact on the graveyard and to establish if any mitigation measures are required for the graveyard.

All graveyards and graves can be considered to be of high significance and are protected by various laws (Table 2). Legislation with regard to graves includes Section 36 of the National Heritage Resources Act (NHRA) (Act No 25 of 1999) in instances where graves are older than sixty years. It is highly likely that most of the graves are 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 graveyard

GY07 is located approximately 100m from the proposed Alternative F and therefore needs not to be impacted by the new road.

The significance of any impact on the graveyard therefore is very low and will remain low if the mitigation measures outlined in this report is implemented (Table 2).

Mitigating the graveyard

GY07 needs not to be affected by the Mafube Project. However, to ensure that no accidental damage may befall GY07 during the construction of the road it is recommended that the graveyard be demarcated with red cautionary tape and that a signpost with the following be erected at the graveyard: 'Beware and avoid graveyard. Any damage caused may lead to prosecution'. Demarcation measures to be done in accordance with community requirements.

Summary

There is no reason from a heritage point of view why the proposed Alternative F for the Mafube Life X Road Realignment Project cannot be implemented if the mitigation measures outlined in this report are followed.

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 maize fields or in tall grass or thick clumps of vegetation while others may be located below the surface of the earth and may only be exposed once development commences.

If any heritage resources of significance are exposed during the Mafube 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 impacts to the discovered finds. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.

CONTENTS

1 INTRODUCTION

1.1 Background and context to the project

Mafube Coal, an existing operation outside of Middelburg in Mpumalanga, is a 50/50 joint venture involving Anglo Operations Limited and Exxaro Coal Mpumalanga (Pty) Ltd. The expansion of the existing Mafube opencast operations onto the Nooitgedacht reserve (Mafube LifeX Nooitgedacht and Wildfontein operations) extends the life of the existing Mafube operations. Mafube LifeX Nooitgedacht and Wildfontein operations will supply power station and A-grade thermal export coal.

Golder Associates Africa (Pty) Ltd (Golder) has been conducting environmental authorisation process, studies and monitoring for the Mafube LifeX Nooitgedacht and Wildfontein operations since 2008. The project plan has evolved during this time and a number of updates and amendments have taken place.

The Mafube LifeX Nooitgedacht and Wildfontein operations are in the construction phase and operations are scheduled to commence in May 2018. Coal extracted from the life expansion pits on Nooitgedacht will be transported by conveyor approximately 6 km to the existing plant, at Springboklaagte, for processing. Construction is due to commence on 10 December 2016 and is scheduled to take18 months. First coal is planned for 1 April 2018 and over the life of mine, of 13 years, approximately 63 million tonnes of coal will be extracted.

In 2011 Golder was appointed by Mafube to conduct the Environmental Impact Assessment (EIA) process for the proposed Mafube LifeX Nooitgedacht and Wildfontein operations, which included the mining operations at Nooitgedacht and Wildfontein. An Environmental Management Programme (EMP) was also submitted to the Department of Mineral Resources (DMR) for approval as part of their mining rights application, as required under the Mineral and Petroleum Resources Act (Act No. 28 of 2002) (MPRDA).

Environmental authorisation (EA) conducted under the National Environmental Management Act (NEMA) for the Mafube Nooitgedacht and Wildfontein opencast

coal expansion project (Mafube LifeX) was received from the Mpumalanga Department of Environmental Affairs and Tourism (MDEDET) in April 2013 (17/2/6/3 (101) N-1). An approval for the mining right's application was granted by the Mpumalanga Department of Minerals Resources (DMR) on 30 August 2013 (MR 30/5/1/2/2/10026 MR) and the EMP approved by them on 14 November 2013.

In terms of the National Water Act (Act No. 36 of 1998) (NWA), an Integrated Water Use Licence application & Waste Water Management Plan was also required for the LifeX Nooitgedacht and Wildfontein operations. These applications were submitted in December 2013 and approved on 1 December 2014. Subsequent amendments to these licences were issued on 1 February 2016. A WUL authorising a number of section 21 (c) & (i) water uses associated with wetland interventions as part of an extensive wetland rehabilitation programme were issued on 13 April 2017.

During the feasibility phase investigations it was assessed that sections of district road D684 and district road D1048 traverse the Nooitgedacht Coal Reserve and their closure and/or re-alignment are required before this operation can commence (Figure 1). These roads fall under the jurisdiction of the Mpumalanga Department of Public Works, Roads and Transport (DPWRT) their approval will ultimately be required to re-align these roads.

Mafube has appointed Golder to conduct the EIA/EMP and public participation process (under NEMA) for the proposed realignment of sections of the D684 and D1048 district roads. Part of this process is to identify potential route realignment alternatives and follow an alternative analysis process to identify the most preferred alternative route. Alternative F was identified as the preferred alternative and this study consequently focusses on this road alternative.

An EIA application has been submitted to the Department of Mineral Resources (DMR) in terms of Regulations 326, 327, 325, and 324 published under NEMA on 7 April 2017. This proposed road realignment project triggers a full scoping and environmental assessment EIA process for certain listed activities under NEMA, an Environmental Management Programme (EMP) based on the findings of the EIA and a Water Use Licence Application (IWULA). The public participation process will

provide stakeholders with information about the proposed project, and several opportunities to comment throughout the EIA/EMP/WULA process.

1.2 Aims with this report

In order to comply with heritage legislation the Mafube Coal Mining (Pty) Ltd (Mafube Colliery) requires knowledge of the presence, relevance and the significance of any heritage resources that may be affected by the proposed new road Alternative F. Mafube Coal needs this knowledge in order to take pro-active measures with regard to any heritage resources that may be affected, damaged or destroyed when the road is constructed, in operation or when the road is decommissioned. Golder Associates Africa (Pty) Ltd, the environmental company responsible for compiling the Environmental Impact Assessment report (EIAr) for the road therefore commissioned the author to undertake a Phase I HIA study in accordance with Section 38 of the NHRA (25 of 1999) for the proposed road alternatives.

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

- To establish whether any of the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) (see Box 1) do occur in the project area and, if so, to determine the nature, the extent and the significance of these remains.
- To establish if any of these heritage resources will be affected by the proposed Mafube Project and, if so, to evaluate what appropriate mitigation measures must be taken if any of the types and ranges of heritage resources will be affected by the project.

Focused archaeological research has been conducted in the Mpumalanga Provinces for several decades. This research consists of surveys and of excavations of Stone Age and Iron Age sites as well as of the recording of rock art and historical sites in this area. The Mpumalanga Provinces have a rich heritage comprised of remains dating from the pre-historical and from the historical (or colonial) periods of South Africa. Pre-historical and historical remains in the Mpumalanga Province form a record of the heritage of most groups living in South Africa today. Heritage resources in the Mpumalanga Province therefore constitute a rich and wide diversified range

(comprising the ‘national estate’) as outlined in Section 3 of the National Heritage Resources Act (Act 25 of 1999) (see Box 1).

1.3 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 maize fields or in tall grass or thickets of wattle bush while others may be located below the surface of the earth and may only be exposed once development commences.

If any heritage resources of significance are exposed during the construction, operation or decommissioning of the Mafube 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 impacts to the discovered finds. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.

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 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 etc. as well as with several environmental companies.

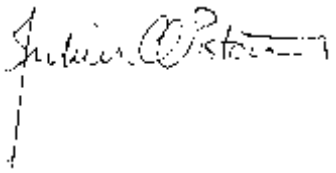
3 DECLARATION OF INDEPENDENCE

I, Julius CC Pistorius, declare that:

•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;
•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.

Disclosure of Vested Interest

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.



Signature of the heritage practitioner:
Private Consultant

_____

1 August 2017

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 National Heritage Resources Act (NHRA, Act No 25 of 1999) (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 National Heritage Resources Act (NHRA, Act No 25 of 1999). According to the NHRA (Act No 25 of 1999) 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 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 and provincial acts and is implemented by the South African Heritage Resources Agency (SAHRA) and the Provincial Heritage Resources Agencies (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 107 of 1998
- Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002
- National Heritage Resources Act (NHRA) Act 25 of 1999
- Development Facilitation Act (DFA) Act 67 of 1995

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;
(a) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
(b) its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
(c) 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 in order 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) (NEMPA) 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) (WHCA).

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, as the case may be.

4.1.3 NHRA

According to Section 3 of the NHRA (Act No 25 of 1999) 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 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 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 Provincial Heritage Resources Authority (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. In the event that archaeological resources are discovered during the course of 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 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.

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 the course of 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
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 with regard to 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 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 (HRM)

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 with regard to such development have been taken into account prior to the granting of the consent.

The Listed Activities in terms of the Government Notice Regulations (GNRs) stipulated under NEMA for which Environmental Authorisation (EA) will be applied for will trigger a HIA as contemplated in Section 38(1) above as follows:

4.2 NEMA: EIA Regulations, dated 2014 - Appendix 6 requirements

NEMA Regulations (2014) - Appendix 6	Relevant section in report
Details of the specialist who prepared the report	Dr Julius CC Pistorius
The expertise of that person to compile a specialist report including a curriculum vitae	See Part 2, Details of the specialist
A declaration that the person is independent in a form as may be specified by the competent authority	See Part 3, Declaration of independence
An indication of the scope of, and the purpose for which, the report was prepared	See Part 2.1,Aims with the report
The date and season of the site investigation and the relevance of the season to the outcome of the assessment	See Part 6, Approach and Methodology. (6.1 Fieldwork)
A description of the methodology adopted in preparing the report or carrying out the specialised process	See Part 6, Approach and Methodology
The specific identified sensitivity of the site related to the activity and its associated structures and infrastructure	See Part 7 Contextualising the project area and Part 8.1 Types and ranges of heritage resources
An identification of any areas to be avoided, including buffers	See Part 9.2 Possible impact on the graveyard
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;	See Figure 8, p45
A description of any assumptions made and any uncertainties or gaps in knowledge;	See 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	See Part 8.1 Types and ranges of heritage resources and Part 8.5 Possible impact on the graveyard
Any mitigation measures for inclusion in the EMPr	See 8.6 Mitigating the graveyard impacts

Any conditions for inclusion in the environmental authorisation	See Part 1.3 Assumptions and limitations
Any monitoring requirements for inclusion in the EMPr or environmental authorisation	None, but see Part 8.6 Mitigating the graveyard impacts
A reasoned opinion as to whether the proposed activity or portions thereof should be authorised and	See Part 9 Conclusion and recommendation. There is no reason from a heritage point of view why the proposed Alternative F for the Mafube LifeX Realignment Project cannot proceed if the mitigation measures outlined in this report be implemented.
If the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	See Part 8.6 Mitigating the graveyard impacts.
A description of any consultation process that was undertaken during the course of carrying out the study	None
A summary and copies if any comments that were received during any consultation process	None
Any other information requested by the competent authority.	None

5 THE MAFUBE LIFEX ROAD REALIGNMENT PROJECT

5.1 Location

Mafube Coal's prospecting area is spread out across several farms located between Middelburg and Belfast in the Mpumalanga Province of South Africa. The proposed Mafube LifeX Road Realignment Project which involves several road deviations are located across the farms Roodepoort 418JS, Hartbeeshoek 393JS, Genadebult 121JS, Panplaats 395JS, Bayview 430JP, Jubilatum 401JS and Witklip 391JS in the central part of the mining rights area. The project area therefore is located in the Steve Tshwete Local Municipality in the Nkangala District Municipality in the Mpumalanga Province (2529DA Selonsrivier, 2529DB Languitsig, 2529DD; 1:50 000 topographical maps and Pretoria 2528; 1: 250 000 map) (Figure 1).

5.2 The nature of the project area

The project area covers an undulating piece of land that is marked by vast outstretched agricultural fields, pieces of grass veld and a number of pans. Several dirt roads criss-cross the area. Few trees occur, the majority of which are exotics such as Blue Gums, wattles and a few Oak trees which are sometimes associated with historical farmsteads. These trees are anthropogenic in origin as they were planted by the first colonists who settled on the Eastern Highveld during the first part of the 19th century.

The Mafube Coal prospecting area was subjected to several surveys in the summer and winter seasons during the last decade (see Part 11, 'Bibliography relating to earlier heritage studies'). The nature and character of the project area was first hand observed and illuminated in detail when field survey was conducted (Part 9.1, 'Types and ranges of heritage resources'). The project area is part of a bigger cultural landscape that is marked by heritage remains dating from the pre-historical into the historical (colonial) period. Stone Age sites, Iron Age remains and colonial remains therefore do occur on the Eastern Highveld (see Part 8, 'Contextualising the project area'). The field survey and photographs revealed the following main characteristics of the project area.

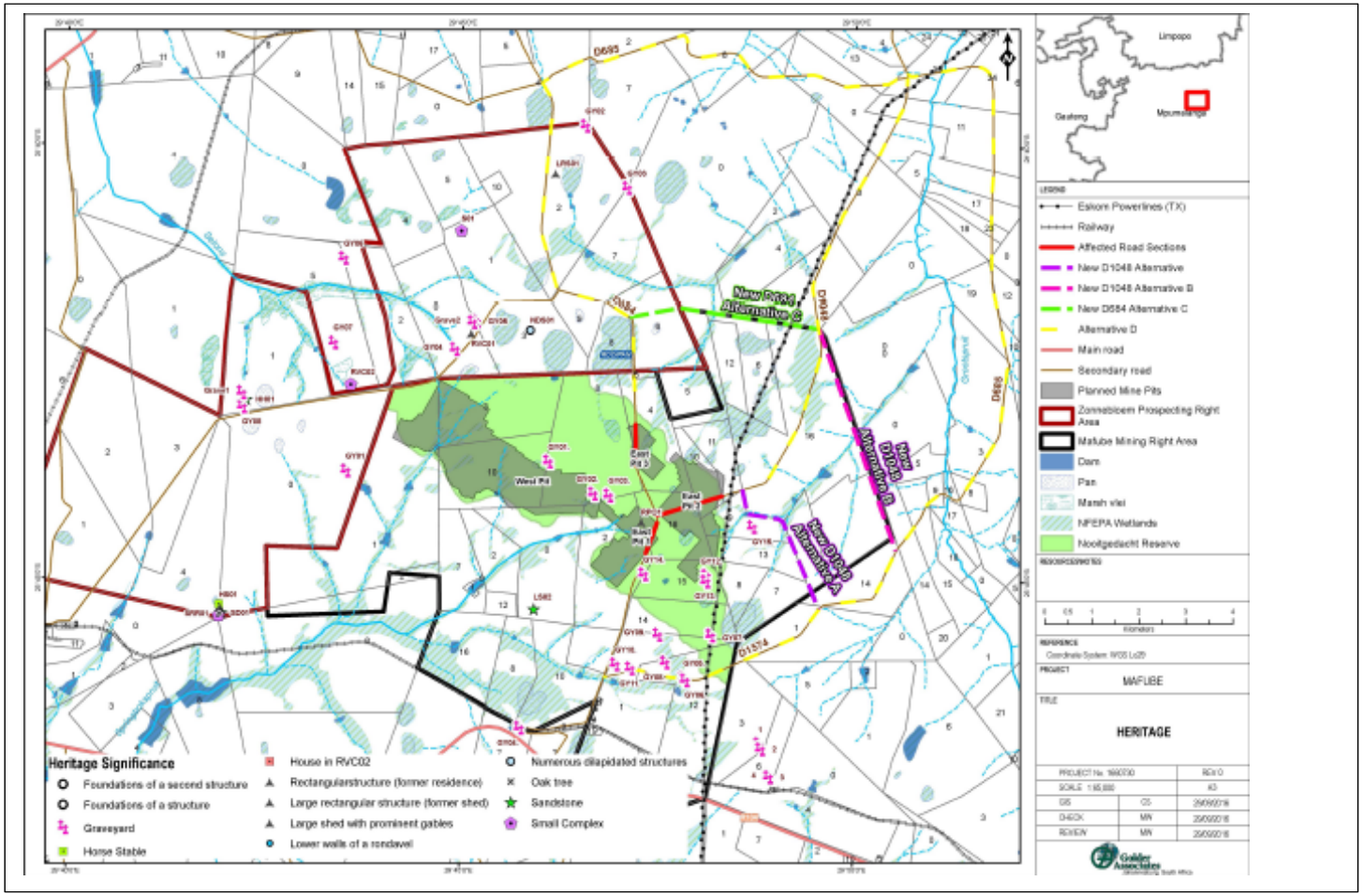


Figure 1- The Mafube Coal prospecting area has been surveyed in the past. Heritage resources such as graveyards and farm homestead complexes have been identified. The current survey only dealt with the proposed Mafube Life X Road Realignment Project involving a survey and assessment for Alternative F which is the preferred road alternative (above).

Figure 2- The undulating project area is occupied by large stretches of grass veld which are mostly used for grazing (above).

Figure 3- The larger part of the project area is covered with agricultural fields (above).

Figure 4- Dirt roads here and there criss-cross the project area and assisted with the survey of the road alternatives. Alternative F runs along Eskom's existing 400kV power lines (above).

Figure 5- Short stretches of existing roads such as D1574, D685, D1048 and D684 criss cross the project area and assisted with the heritage survey (above).

5.3 The nature of the Mafube LifeX Road Realignment Project

Several road alternatives were planned for the Mafube Life X Road Realignment Project, namely:

- Alternative A runs across Portions 7, 9, 11 and 13 as well as Portions 14 and 16 of Roodepoort 418JS. This alternative is approximately 3,51km long of which 1,54km traverses agricultural fields. The entire length of this alternative runs along existing property boundaries.
- Alternative B runs across Portions 14 and 16 of Roodepoort 418JS, RE of Bayview 430JS, RE of Jubilatum 401JS and Portions 5 and 14 of Witklip 391JS. Alternative B is approximately 5,9km long and the entire length runs along existing property boundaries and in-between existing agricultural fields.
- Alternative C runs across Portions 4, 6, 12, and 16 of Roodepoort 418JS and the RE and Portion 4 of Hartbeeshoek 392JS as well as Portion 1 of Genadebult 121JS and Portion 6 of Panplaats 395JS. Alternative C is approximately 4,06km long: 2,47km runs through natural vegetation and approximately 1,59km traverses agricultural fields.
- Alternative D involves the construction of a new alternative route. It includes the upgrades of the existing river/water course crossings and the D1574, D685 and D1048.
- Alternative E entails the proposed closure of the affected road and the construction of a new gravel road. This alternative route has an approximate length of 7.52 km and will run along exiting property fences (which currently do not exist). The entire length of Alternative E runs along existing agricultural field boundaries or has agricultural fields on one side and grazing veld/natural vegetation on the other side.

<u>Alternative F:</u>

Alternative F is the preferred alternative and was surveyed, accessed and is reported on this report.

Alternative F entails to serve as a link between the new Road D683/D1048 link Road and will affect the following farms Springboklaagte 416JS (portions 1, 12), Nooitgedacht 417JS (portions 04, 14 & 15), Roodepoort 418JS (Portion 8, 9, 10, 11 & 13). Alternative F entails the proposed closure of the affected road and the construction of a new gravel road. This alternative route has an approximate length of 5.0 km and will run along exiting property boundaries although currently there is no boundary fences. The entire length of the proposed Alternative F run along existing agricultural field boundaries or have agricultural fields on one side and grazing veld on the other side.

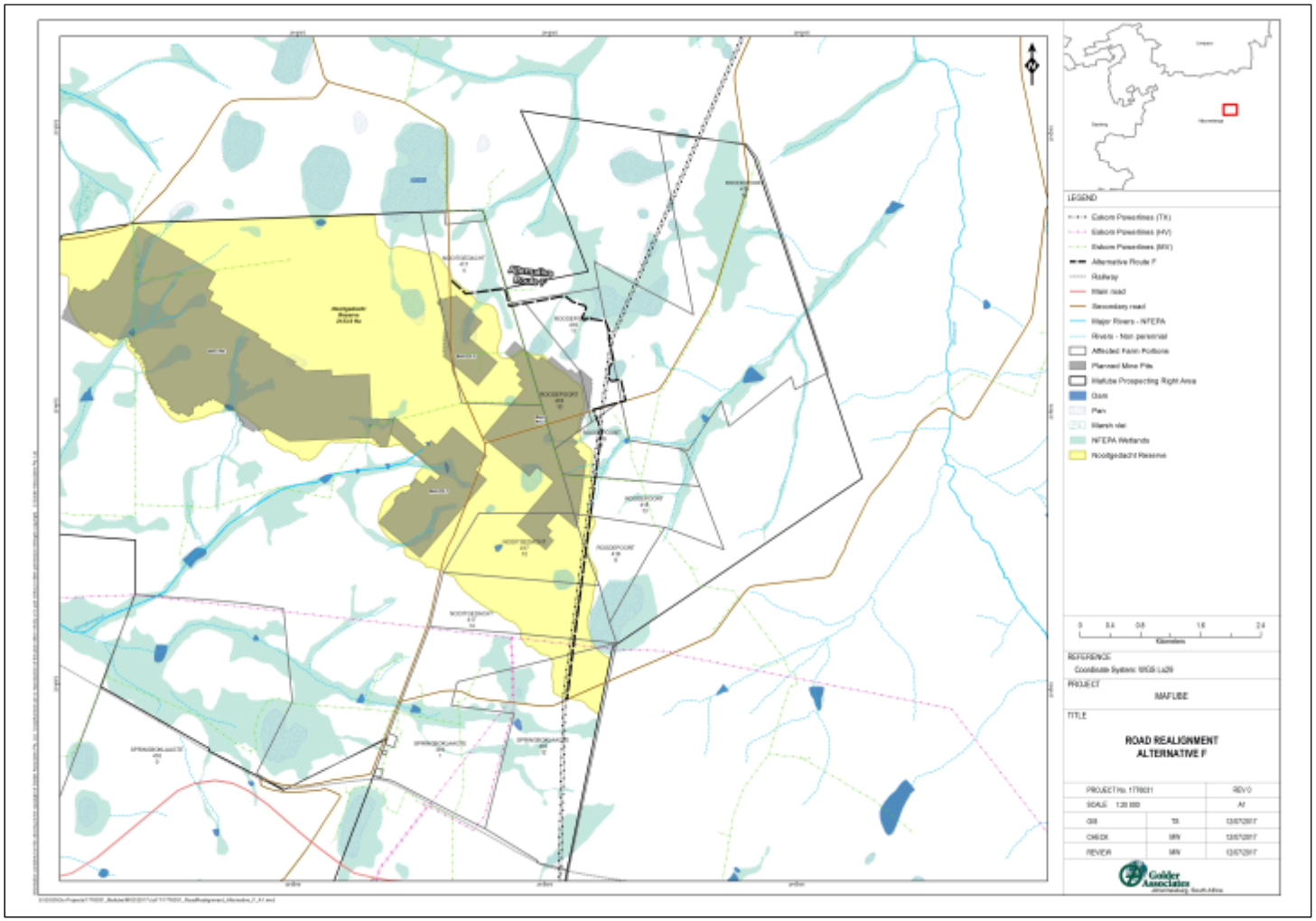


Figure 6- Preferred Alternative F for the Mafube LifeX Road Realignment Project (above).

6 APPROACH AND METHODOLOGY

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

6.1 Field survey

Field surveys were conducted during 3 to 4 April 2017. The field survey for the proposed road deviations was conducted by means of following district and two track roads as well as any other accessible pathways in the project area in order to gain access to the footprint of the proposed new road alternatives. The routes that were followed with a vehicle during the survey were recorded with a mounted GPS instrument. Pedestrian surveys were undertaken from these primary access routes and not all of these tracks were necessarily recorded on a GPS.

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

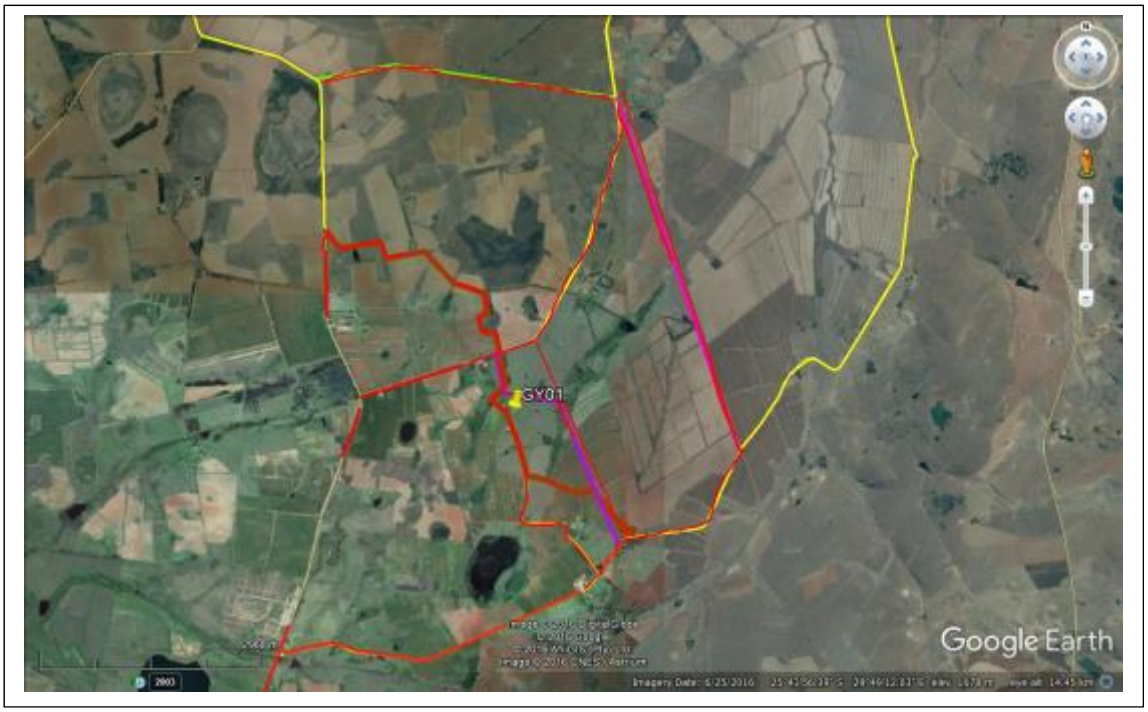


Figure 7- GPS track log which was registered for the project area. Pedestrian surveys were conducted from the main pathway which was recorded with a GPS instrument which was mounted in a vehicle (above).

Large parts of the project area are covered with maize fields. These fields could not be surveyed as a result of the dense stands of maize.

Google imagery was used as a supplementary source next to the fieldwork to establish the possible presence of heritage resources such as historical farm homesteads with outbuildings.

Ecological indicators such as alternations in vegetation patterns; open or bald spots in the veld covered only with grass or extremely dense patches of vegetation were searched as possible indicators for settlements such as stone walls or as former abodes where farm workers may have settled in the past.

6.2 Databases, literature survey and maps

Databases kept and maintained at institutions such as the Provincial Heritage Resources Agency (PHRA), the Archaeological Data Recording Centre at the National Flagship Institute (Museum Africa) in Pretoria and SAHRA's national archive (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 author is acquainted with the project area at large as he has done several heritage impact assessment studies near the proposed project area. Several earlier heritage impact assessment studies have been done in close proximity to the current project area. These studies provided information regarding the nature and heritage character of the area, namely (see 'Part 9, Bibliography relating to earlier 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 8, 'Contextualising the Project Area' and Part 10, 'Select Bibliography). The pre-historical and historical context of the larger area assisted with assumptions about the possible types and ranges of heritage resources to be expected in the project area as well as to comprehend the identity and meaning of heritage sites which may be found in and near the project area.

In addition, the project area was studied by means of maps outlining Mafube Coal's prospecting area and the farms Nooitgedacht 417JS and Roodepoort 418JS where the road deviations occur (2529DA Selonsrivier, 2529DB Languitsig, 2529DD Pan; 1:50 000 topographical maps; Pretoria 2528 1: 250 000 map and Google Earth imagery).

6.3 Significance rating

The significance of possible impacts on the heritage resources 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	Magnitude: 10 - Very high/don't know 8 – High 6 – Moderate

2 – Local 1 – Site only 0 – None	4 – Low 2 – Minor

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

Significance Points (SP) = (Magnitude + Duration + Scale) x 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 significance.
- Between 60 and 80 significance points indicates HIGH significance.
- Between 40 and 60 significance points indicates MODERATE significance.
- Between 20 and 40 significance points indicates LOW significance.
- Less than 20 significance points indicates VERY LOW significance.

7 CONTEXTUALISING THE PROJECT AREA

The following overview of pre-historical, historical and cultural evidence indicates the wide range of heritage resources which do occur across the Eastern Highveld in which the project area is located, namely:

7.1 Stone Age and rock art sites

Stone Age sites are marked by stone artefacts that are found scattered on the surface of the earth or as parts of deposits in caves and rock shelters. The Stone Age is divided into the Early Stone Age (ESA) (covers the period from 2.5 million years ago to 250 000 years ago), the Middle Stone Age (MSA) (refers to the period from 250 000 years ago to 22 000 years ago) and the Late Stone Age (LSA) (the period from 22 000 years ago to 200 years ago).

Dongas and eroded areas at Maleoskop near Groblersdal is one of only a few places in Mpumalanga where ESA Olduwan and Acheulian artefacts have been recorded. Evidence for the MSA has been excavated at the Bushman Rock Shelter near Ohrigstad. This cave was repeatedly visited over a prolonged period. The oldest layers date back to 40 000 years BP (Before Present) and the youngest to 27 000BP (Esterhuysen & Smith 2007).

LSA occupation of the Mpumalanga Province also has been researched at Bushman Rock Shelter where it dates back 12 000BP to 9 000BP and at Höningnestkrans near Badfontein where a LSA site dates back to 4 870BP to 200BP (Esterhuysen & Smith 2007).

The LSA is also associated with rock paintings and engravings which were done by San hunter-gatherers, Khoi Khoi herders and EIA (Early Iron Age) farmers (Maggs 1983, 2008). Approximately 400 rock art sites are distributed throughout Mpumalanga, notably in the northern and eastern regions at places such as Emalahleni (Witbank) (4), Lydenburg (2), White River and the southern Kruger National Park (76), Nelspruit and

the Nsikazi District (250). The Ermelo area holds eight rock paintings (Smith & Zubieta 2007).

The rock art of the Mpumalanga Province can be divided into San rock art which is the most wide spread, herder or Khoe Khoe (Khoi Khoi) paintings (thin scattering from the Limpopo Valley) through the Lydenburg district into the Nelspruit area) and localised late white farmer paintings. Farmer paintings can be divided into Sotho-Tswana finger paintings and Nguni engravings (Only 20 engravings occur at Boomplaats, north-west of Lydenburg). Farmer paintings are more localised than San or herder paintings and were mainly used by the painters for instructional purposes (Smith & Zubieta 2007).

During the LSA and Historical Period, San people called the Batwa lived in sandstones caves and rock shelters near Lake Chrissie in the Ermelo area. The Batwa are descendants of the San, the majority of which intermarried with Bantu-Negroid people such as the Nhlapo from Swazi-descend and Sotho-Tswana clans such as the Pai and Pulana. Significant intermarriages and cultural exchanges occurred between these groups. The Batwa were hunter-gatherers who lived from food which they collected from the veldt as well as from the pans and swamps in the area. During times of unrest, such as the *difaqane* in the early nineteenth century, the San would converge on Lake Chrissie for food and sanctuary. The caves, lakes, water pans and swamps provided relative security and camouflage. Here, some of the San lived on the surfaces of the water bodies by establishing platforms with reeds. With the arrival of the first colonists in the nineteenth century many of the local Batwa family groups were employed as farm labourers. Descendants of the Batwa people still live in the larger Project Area (Schapera 1927; Potgieter 1955; Schoonraad & Schoonraad 1975).

No sites dating from the Stone Age or any lithic scatters with tools, flakes or waste material have been recorded close to where the proposed road alignments are planned.

7.2 Iron Age remains

The Iron Age is associated with the first agro-pastoralists or farming communities who lived in semi-permanent villages and who practised metal working during the last two millennia. The Iron Age is usually divided into the Early Iron Age (EIA) (covers the 1st millennium AD) and the Later Iron Age (LIA) (covers the first 880 years of the 2nd millennium AD).

Evidence of the first farming communities in the Mpumalanga Province is derived from a few EIA potsherds which occur in association with the LSA occupation of the Höningnest Shelter near Badfontein. The co-existence of EIA potsherds and LSA stone tools suggest some form of 'symbiotic relationship' between the Stone Age hunter-gatherers who lived in the cave and EIA farmers in the area (also note Batwa and Swazi/Sotho Tswana relationship) (Esterhuysen & Smith 2007).

The Welgelegen Shelter on the banks of the Vaal River near Ermelo also reflects some relationship between EIA farmers who lived in this shelter and hunter-gatherers who manufactured stone tools and who occupied a less favourable overhang nearby during AD1200 (Schoonraad & Beaumont 1971).

EIA sites were also investigated at Sterkspruit near Lydenburg (AD720) and in Nelspruit where the provincial governmental offices were constructed. The most infamous EIA site in South Africa is the Lydenburg head site which provided two occupation dates, namely during AD600 and from AD900 to AD1100. At this site the Lydenburg terracotta heads were brought to light. Doornkop, located south of Lydenburg, dates from AD740 and AD810 (Evers 1981; Whitelaw 1996).

The LIA is well represented in Mpumalanga and stretches from AD1500 well into the nineteenth century and the Historical Period. Several spheres of influence, mostly associated with stone walled sites, can be distinguished in the region. Some of the historically well-known spheres of influence include the following:

- Early arrivals in the Mpumalanga Province such as Bakone clans who lived between Lydenburg, Badfontein and Machadodorp and Eastern Sotho clans

such as the Pai, Pulana and Kutswe who established themselves in the eastern parts of the province (Collett 1979, 1983; Delius 2007; Makhura 2007; Delius & Schoeman 2008).

- Swazi expansion into the Highveld and Lowveld of the Mpumalanga Province occurred during the reign of Sobhuza (AD1815 to 1836/39) and Mswati (AD1845 to 1868) while Shangaan clans entered the province across the Lembombo Mountains in the east during the second half of the nineteenth century (Delius 2007; Makhura 2007.).
- The Bakgatla (Pedi) chiefdom in the Steelpoort Valley rose to prominence under Thulare during the early 1800's and was later ruled by Sekwati and Sekhukune from the village of Tsjate in the Leolo Mountains. The Pedi maintained an extended sphere of influence across the Limpopo and Mpumalanga Provinces during the nineteenth century (Mönnig 1978; Delius 1984).
- The Ndzundza-Ndebele established settlements at Kwasimkulu (between Middelburg and Belfast) and at the foot of the Bothasberge (Kwa Maza and Esikhunjini) in the 1700's and lived at Erholweni from AD1839 to AD1883 where the Ndzundza-Ndebele's sphere of influence known as KoNomthjarhelo stretched across the Steenkampsberge.
- The Bakopa lived at Maleoskop (1840 to 1864) where they were massacred by the Swazi while the Bantwane live in the greater Groblersdal and Marble Hall areas.
- Corbelled stone huts which are associated with ancestors of the Sotho on Tafelkop near Davel which date from the AD1700's into the nineteenth century (Hoernle 1930).
- Stone walled settlements spread out along the eastern edge of the Groot Dwarsriver Valley served as the early abode for smaller clans such as the Choma and Phetla communities which date from the nineteenth century.

Stone walled sites which occur closest to the project area are those approximately twenty kilometers to the north-west of the project area. Here the Ndzundza-Ndebele

established a capital Kwasimkulu and other villages in a hilly area from AD1600 onwards.

7.3 The Historical Period

Historical towns closest to the project area include Delmas, Leandra, Kinross and Devon.

Delmas was laid out in 1907 on the farm Witklip (‘white stone’) which was divided into 192 residential stands, 48 smallholdings of 4 ha each and a commonage of 138ha. The farm belonged to Frank Dumat who originated from France where his grandfather had a small farm. He named the town Delmas which is derived from ‘mas’ which means a small farm in a southern dialect of French. In 1909 the government added another 5 500 ha to Frank Dumat’s original rural settlement.

The town of Leandra’s name is derived from two townships, Leslie and Eendrag, which are incorporated in this mining village.

Kinross, about 20 km east of Leandra, is the railhead for the township of Leandra and four gold mines in the region, namely Winkelhaak, Leslie, Bracken and Kinross which all opened in the 1950's.

The village was proclaimed in the 1915 and named after Kinross in Scotland by the engineers who constructed the railway line between Springs and Breyton. Kinross is near the watershed that separates the rivers flowing towards the Indian Ocean in the east and the rivers flowing towards the Atlantic Ocean in the west.

Devon is one of a number of small towns on the Eastern Highveld located approximately 40km to the south-east of Springs. The town gives the impression of a scarce number of scattered buildings held together by a giant grain silo. The town's name is derived from the hometown of the surveyor, namely Devon in England. Nearby, but inaccessible to everybody but the military, is the underground nerve centre of the country's northern radar defence system.

7.4 A coal mining heritage

Coal mining on the eastern Highveld is now older than one century and has become the most important coal mining region in South Africa**.** Whilst millions of tons of high-grade coal are annually exported overseas more than 80% of the country's electricity is generated on low-grade coal in Eskom's power stations such as Duvha, Matla and Arnot situated near coal mines on the eastern Highveld.

The earliest use of coal (charcoal) in South Africa was during the Iron Age (300-1880AD) when metal workers used charcoal, iron and copper ores and fluxes (quartzite stone and bone) to smelt iron and copper in clay furnaces.

Colonists are said to have discovered coal in the French Hoek Valley near Stellenbosch in the Cape Province in 1699. The first reported discovery of coal in the interior of South Africa was in the mid-1830s when coal was mined in Kwa-Zulu/Natal.

The first exploitation for coal was probably in Kwa-Zulu/Natal as documentary evidence refers to a wagon load of coal brought to Pietermaritzburg to be sold in 1842. In 1860 the coal trade started in Dundee when a certain Pieter Smith charged ten shillings for a load of coal dug by the buyer from a coal outcrop in a stream. In 1864 a coal mine was opened in Molteno. The explorer, Thomas Baines mentioned that farmers worked coal deposits in the neighbourhood of Bethal (Transvaal) in 1868. Until the discovery of diamonds in 1867 and gold on the Witwatersrand in 1886, coal mining only satisfied a very small domestic demand.

With the discovery of gold in the Southern Transvaal and the development of the gold mining industry around Johannesburg came the exploitation of the Boksburg-Spring coal fields, which is now largely worked out. By 1899, at least four collieries were operating in the Middelburg-Witbank district, also supplying the gold mining industry. At this time coal mining also had started in Vereeniging. The Natal Collieries importance was boosted by the need to find an alternative for imported Welsh anthracite used by the Natal Government Railways.

By 1920 the output of all operating collieries in South Africa attained an annual figure of 9,5million tonnes. Total in-situ reserves were estimated to be 23 billion tonnes in Witbank-Springs, Natal and Vereeniging. The total in situ reserves today are calculated to be 121 billion tonnes. The largest consumers of coal are Sasol, Mittal and Eskom.

No evidence for early coal mining activities was observed in or near the project area.

7.5 A vernacular stone architectural heritage

A unique stone architectural heritage was established in the eastern Highveld from the second half of the 19th century well into the early 20th century. During this time period stone was used to build farmsteads and dwellings, both in urban and in rural areas. Although a contemporary stone architecture also existed in the Karoo and in the Eastern Free State Province of South Africa a wider variety of stone types were used in the eastern Highveld. These included sandstone, ferricrete ('ouklip'), dolerite ('blouklip'), granite, shale and slate (Naude 1993).

The origins of a vernacular stone architecture in the eastern Highveld may be ascribed to various reasons of which the ecological characteristics of the region may be the most important. Whilst this region is generally devoid of any natural trees which could be used as timber in the construction of farmsteads, outbuildings, cattle enclosures and other structures, the scarcity of fire wood also prevented the manufacture of baked clay bricks. Consequently stone served as the most important building material in the eastern Highveld (Naude 1993, 2000). One of these historical structures was excavated and described after a heritage mitigation project was conducted for a coal mine (Pistorius 2005).

LIA Sotho, Pedi, Ndebele and Swazi communities contributed to the Eastern Highveld's stone walled architecture. The tradition set by these groups influenced settlers from Natal and the Cape Colony to utilise the same resources to construct dwellings and shelters. Farmers from Scottish, Irish, Dutch, German and Scandinavian descend settled and farmed in the eastern Highveld. They brought the knowledge of stone masonry from Europe. This compensated for the lack of fire wood on the Eastern Highveld which was necessary to bake clay bricks.

No sandstone structures was recorded in the project area although farmsteads with wagon sheds and outbuildings that were constructed with this building material occur in the wider Mafube prospecting area (Figure 1).

7.5 Most common types and ranges of heritage resources

Heritage resources which are common on the Eastern Highveld near the project area are the following (see Part 10 ‘Bibliography relating to earlier heritage studies’):

- Historical remains associated with farmstead complexes consisting of houses, associated outbuildings, cattle enclosures and graveyards.
- Abandoned graveyards left by farm workers who moved from farms to urban areas.

8 THE PHASE I HERITAGE IMPACT ASSESSMENT

8.1 Types and ranges of heritage resources

The Phase I HIA for the proposed project area 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 and near the project area, namely:

- A graveyard (previously identified as GY07).

The graveyard was geo-referenced and mapped (Figure 8, Tables 1 & 2). Its significance is indicated as well as any possible impact on the graveyard.

Mitigation measures are outlined to take precautionary measures that the graveyard is not impacted during the construction of the road.

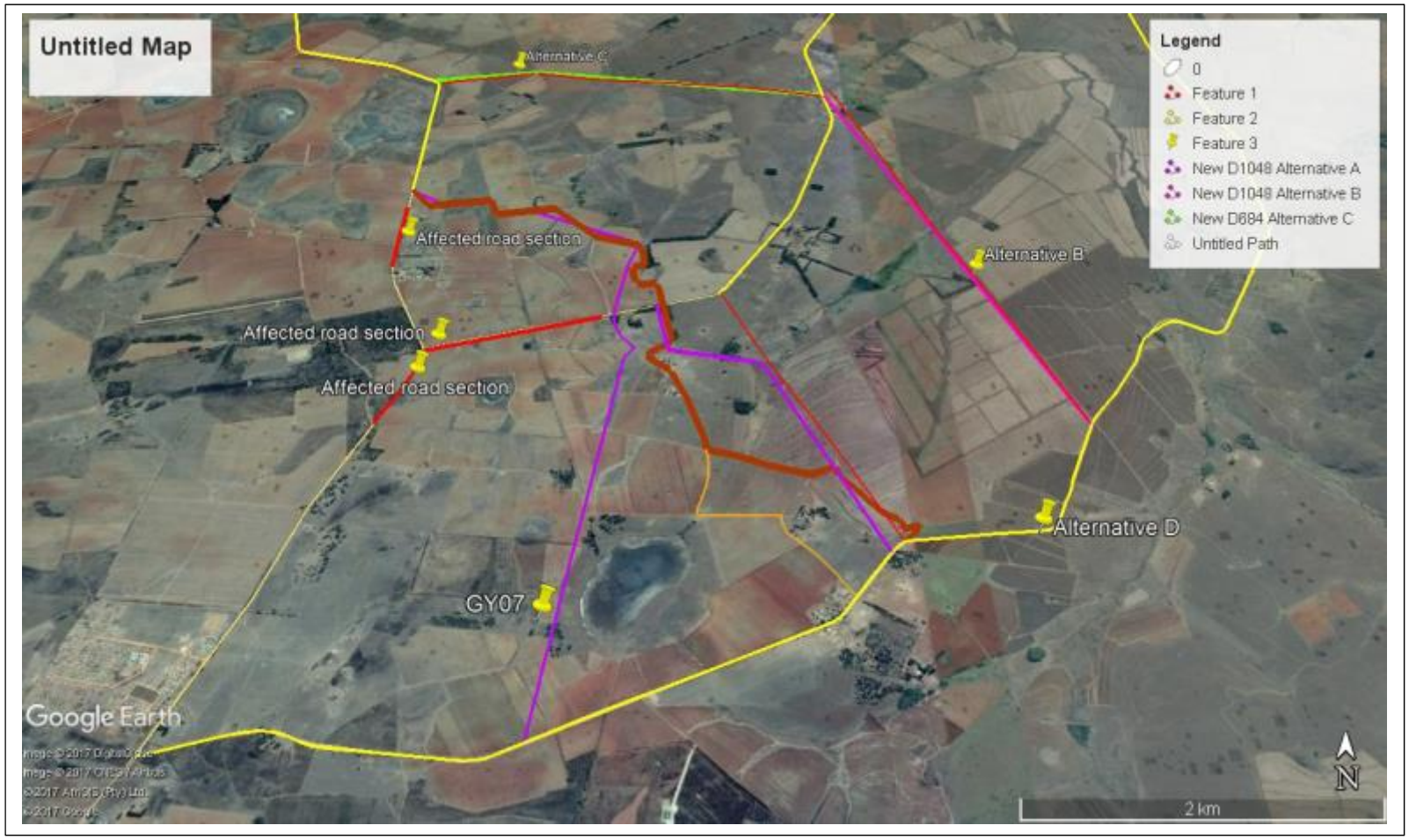


Figure 8- Graveyard 07 is located approximately one hundred meters from Alternative F (purple) for the proposed Mafube LifeX Road Realighnment Project and will not be directly affecetd by the construction of the road (above).

8.2 The graveyard

Graveyard 07 (GY07) is located near Eskom's power lines. During the survey conducted in 2012 it contained approximately eleven graves but now has grown to approximately twenty eight graves. Many of the graves are older than sixty years and many of these are demarcated with ferricrete stones.

Figure 9- Graveyard 07 is located near Eskom's power lines and approximately one hundred meters from Road Alternative F (above).

8.3 Table

Table 1- Coordinates and significance rating for graveyard (below).

GY07. Graveyard 07	25° 45.629' 29° 48.185'	**HIGH**

8.4 The significance of the graveyard

The significance of the graveyard is indicated in order to determine the significance of any possible impact on the graveyard and to establish if any mitigation measures are required for the graveyard.

All graveyards and graves can be considered to be of high significance and are protected by various laws (Table 2). Legislation with regard to graves includes Section 36 of the National Heritage Resources Act (NHRA) (Act No 25 of 1999) in instances where graves are older than sixty years. It is highly likely that most of the graves are 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).

8.5 Possible impact on the graveyard

GY07 is located approximately 100m from the proposed Alternative F and therefore needs not to be impacted by the new road.

The significance of any impact on the graveyard therefore is very low and will remain low if the mitigation measures outlined in this report is implemented (Table 2).

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

	Probability of impact	**Magnitude of impact**	**Duration of impact**	**Scale**	**Significance points**	**Significance rating**	**Significance after mitigation**
GY07	**1**	**6**	**5**	**1**	**12**	**Very Low**	**Na**

8.6 Mitigating the graveyard

GY07 needs not to be affected by the Mafube Project. However, to ensure that no accidental damage may befall GY07 during the construction of the road it is recommended that the graveyard be demarcated with red cautionary tape and that a signpost with the following be erected at the graveyard: ‘Beware and avoid graveyard. Any damage caused may lead to prosecution’. Demarcation measures to be done in accordance with community requirements.

Summary

There is no reason from a heritage point of view why the proposed Alternative F for the Mafube Life X Road Realignment Project cannot be implemented if the mitigation measures outlined in this report are followed.

9 CONCLUSION AND RECOMMENDATIONS

The Phase I HIA for the proposed project area 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 and near the project area, namely:

- A graveyard (previously identified as GY07).

The graveyard was geo-referenced and mapped (Figure 8, Tables 1 & 2). Its significance is indicated as well as any possible impact on the graveyard.

Mitigation measures are outlined to take precautionary measures that the graveyard is not impacted during the construction of the road.

The significance of the graveyard

The significance of the graveyard is indicated in order to determine the significance of any possible impact on the graveyard and to establish if any mitigation measures are required for the graveyard.

All graveyards and graves can be considered to be of high significance and are protected by various laws (Table 2). Legislation with regard to graves includes Section 36 of the National Heritage Resources Act (NHRA) (Act No 25 of 1999) in instances where graves are older than sixty years. It is highly likely that most of the graves are 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 graveyard

GY07 is located approximately 100m from the proposed Alternative F and therefore needs not to be impacted by the new road.

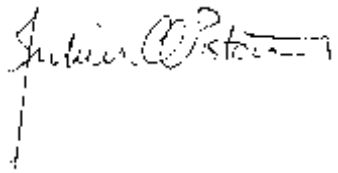
The significance of any impact on the graveyard therefore is very low and will remain low if the mitigation measures outlined in this report is implemented (Table 2).

Mitigating the graveyard

GY07 needs not to be affected by the Mafube Project. However, to ensure that no accidental damage may befall GY07 during the construction of the road it is recommended that the graveyard be demarcated with red cautionary tape and that a signpost with the following be erected at the graveyard: 'Beware and avoid graveyard. Any damage caused may lead to prosecution'. Demarcation measures to be done in accordance with community requirements.

Summary

There is no reason from a heritage point of view why the proposed Alternative F for the Mafube Life X Road Realignment Project cannot be implemented if the mitigation measures outlined in this report are followed.



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