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**A PHASE I HERITAGE IMPACT ASSESSMENT (HIA) STUDY FOR
ANGLO OPERATIONS (PTY) LTD (KLEINKOPJE COLLIERY)
PROPOSED PIT 2A EXTENSION PROJECT NEAR EMALAHLENI IN
THE MPUMALANGA PROVINCE**

Prepared by:

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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 Anglo Operations (Pty) Ltd (Kleinkopje Colliery) proposed Pit 2A Extension Project near Emalahleni on the Eastern Highveld in the Mpumalanga Province. The author of this report was appointed by Shangoni Management Services (the Environmental Assessment Practitioner (EAP) appointed to facilitate the Environmental Authorisation process for the mentioned project). The competent authority responsible to evaluate the Scoping-, Environmental Impact Assessment- and Environmental Management Programme Reports for the project is the Department of Mineral Resources (DMR). The Scoping Report for the project was uploaded on SAHRIS in order to obtain comment from the South African Heritage Resource Agency (SAHRA) (commenting authority). The Environmental Impact Assessment Report and Environmental Management Programme Report have not yet been compiled and will follow based on DMR's decision on the Scoping Report.

The Phase I Heritage Impact Assessment (HIA) study was conducted based on an Interim Comment received from the SAHRA (Case No. 9753), which required the following:

- 1) All the previous SAHRA comments and permits that were issued to the mine should be uploaded to the case.
- 2) A Letter of Recommendation for Exemption from Heritage Studies to be written by a suitably qualified archaeologist. The letter should also contain a map of the location of heritage resources still conserved *in situ* overlaying the proposed expansion plans and PCD Dam area.
- 3) The mine will be mining out very highly sensitive fossiliferous shale rocks of the Vryheid Formation, which the impacts to these rocks have not been considered in both heritage reports submitted to SAHRA. As such, SAHRA requires or the developer to commission a Palaeontological Impact Assessment (PIA) that comprises a field assessment to be conducted by a suitably qualified palaeontologist.

With reference to the above, please note the following:

Point No 1 above: The applicant / EAP are not aware of any previous SAHRA comments and permits that were issued to the mine. Therefore, these cannot be uploaded to the case. Neither was any comments found on SAHRIS.

Point No 2 above: Although SAHRA required a letter of recommendation from a specialist for exemption from conducting Heritage Studies, the EAP and applicant decided that it would be best to have a Phase 1 Heritage Impact

Assessment (HIA) undertaken, instead of the compilation of a letter of recommendation for exemption from conducting such a study for the project (especially due to the location off Graveyard 01 (GY01) being located within the project (application) area. This report therefore is the Phase 1 HIA study which was done for the Kleinkopje Pit 2A Extension Project.

This report contains a map indicating the identified heritage resources still conserved *in situ* within the Project Area (as per SAHRA's requirement No. 2 above). Refer to Figure 7b.

Point No 3 above: Please note that the EAP and applicant have appointed a Palaeontologist to conduct the required Palaeontological Impact Assessment (PIA), the results of which will be included in a separate specialist report.

All information obtained in response to SAHRA's Interim Comment therefore has been addressed in this report.

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

- 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 Pit 2A Extension Project.

Heritage resources that were identified during earlier heritage studies in and near the current Kleinkopje Pit 2A Extension Project (Cilliers 2010, Van Vollenhoven 1993, 2012) have no bearing on this study. These heritage resources either occur at a considerable distance to the east of the Project Area; had no heritage significance when they were documented (as they dated from the recent past) and /or have fallen into disrepair and /or were demolished. The exception being GY02 (earlier identified as WK1) which is described in this report. Its significance is determined and mitigation and management measures are outlined for this graveyard which will not be affected by the Pit 2A Extension Project (Figure 7a & 7b).

The Phase I HIA study for the proposed Pit 2A Extension Project 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 (Figure 7b):

- One graveyard in the Project Area (GY01).
- Two graveyards directly outside the Project Area (GY02, GY03).

The graveyards were geo-referenced and mapped (Figure 7b; Table 1). The significance of the graveyards is indicated as well as the significance of any impact on these graveyards (Table 2). Mitigation measures are outlined for those graveyards which will be affected by the proposed mine development project. Management measures are proposed for the graveyard which remains unaffected outside the mining area.

Possible impact on the heritage resources

GY01 will be affected by the Pit 2A Extension Project.

GY02 and GY03 fall outside the footprint of the Pit 2A Extension Project and will not be affected by the proposed Pit 2A Extension Project.

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. It seems as if all the graveyards hold graves which 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).

The significance of the impact on the graveyards

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

The significance of any possible impact on GY01 is very high (Table 2).

Mitigating the graveyard impacts

The impacts to the graveyard can be mitigated by means of exhumation and relocation. The exhumation of human remains and the relocation of graveyards are regulated by various laws, regulations and administrative procedures. This task is undertaken by forensic

archaeologists or by reputed undertakers who are acquainted with all the administrative procedures and relevant legislation that have to be adhered to whenever human remains are exhumed and relocated. This process also includes social consultation with a 60 days statutory notice period for graves older than sixty years. Permission for the exhumation and relocation of human remains have to be obtained from the descendants of the deceased (if known), the National Department of Health, the Provincial Department of Health, the Premier of the Province and the local police.

The significance of the impact on the graveyard will be low after mitigation, i.e. after the graveyard has been relocated (Table 2).

Managing graveyards that remain unaffected

Graveyards that remain unaffected should be managed (by Anglo Operations) to ensure their future unaffected existence during the construction, operation and decommissioning phases of its mining operations. The following mitigation measures are recommended:

- Graveyards must be demarcated with fences or with walls and should be fitted with access gates.
- Regulated visitor hours should be implemented that is compatible with mine safety rules. This will not be necessary when graveyards are located next to national roads.
- Corridors of at least 20m should be maintained between graveyard's fences and any developmental components such as roads or other infrastructure that may be developed in the future.
- Graveyard should be inspected every three months. Inspections should be noted in an inspection register. The register should outline the state of the graveyards during each inspection. Reports on damages to any of the graves or to the graveyards (fences, walls, gates) should be followed with the necessary maintenance work. Maintenance work should be recorded in in the inspection register.
- Graveyards should be kept tidy from any invader weeds and any other refuse.

Summary

There is consequently no reason from a heritage point of view why Anglo's proposed Pit2A Extension Project cannot proceed after the appropriate mitigation measures outlined in this report have been implemented.

General: disclaimer

Although due consideration was given to the observing and documenting of all heritage resources in the Project Area, some resources may not have been detected due to various reasons (occurring beneath the surface, unmarked, inconspicuous or eroded nature, covered by vegetation, human failure to recognise, etc.).

If any heritage resources of significance are exposed during the Pit 2A Extension Project the SAHRA should be notified immediately, all development activities must be stopped and an archaeologist accredited with the Association for Southern African Professional Archaeologists (ASAPA) should be notified in order to determine appropriate mitigation measures for the discovered finds. This may include obtaining the necessary authorisation (permits) from the SAHRA to conduct the mitigation measures.

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1 INTRODUCTION

1.1 Project background

This document contains the report on a Phase I Heritage Impact Assessment (HIA) study which was done for Anglo Operations (Pty) Ltd's Kleinkopje Colliery Pit 2A Extension Project near Emalahleni on the Eastern Highveld in the Mpumalanga Province.

The Mpumalanga Province has a rich heritage, comprised of remains dating from the pre-historical to the historical (or colonial) periods of South Africa. Pre-historical and historical remains in the Mpumalanga Province therefore form a record of the heritage of most groups living in South Africa today.

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), occur in the Mpumalanga Province (see Box 1, next page).

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 paleontological 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 paleontological 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;
- (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;
- (i) sites of significance relating to the history of slavery in South Africa

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.
- **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 man-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 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 Figure 3).
- 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.

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)

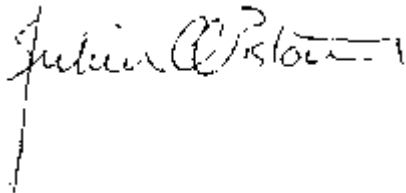
Summary: Julius Pistorius is a qualified archaeologist and heritage specialist with extensive experience as a university lecturer, museum scientist, researcher and heritage consultant. His research focussed on the Late Iron Age Tswana and Lowveld-Sotho (particularly the Bamalatji of Phalaborwa). He has 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. He has a longstanding working relationship with Eskom, Rio Tinto (PMC), Rio Tinto (EXP), Impala Platinum, Angloplats (Rustenburg), Lonmin, Sasol, PMC, Foskor, Kudu and Kelgran Granite, Bafokeng Royal Resources, Pilanesberg Platinum Mine (PPM) etc. as well as with several environmental companies.

3 DECLARATION OF 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 environmental practitioner:
Private Consultant
22 July 2016

4 SCOPE OF WORK

Anglo Operations (Pty) Ltd's proposed Pit 2A Extension Project near Emahlaleni on the Eastern Highveld in the Mpumalanga Province may have an influence on any of the types and ranges of heritage resources ('national estate') which are outlined in Section 3 of the National Heritage Resources Act (No25 of 1999).

In order to comply with Section 38 of the National Heritage Resources Act (No 25 of 1999), Kleinkopje Colliery requires knowledge of the presence, relevance and significance of any heritage resources that may be affected or influenced in the proposed mine development area (hereafter referred to as the Project Area).

Kleinkopje Colliery needs this information in order to take pro-active measures with regard to any heritage resources that may be affected by the proposed mine development project. Furthermore, an Interim Comment from SAHRA was received on the proposed Pit 2A Extension project (Case No. 9753). Shangoni Environmental Services, the Environmental Assessment Practitioner (EAP) responsible to undertake the required Scoping and Environmental Impact Reporting (S&EIR) process for the mine development project, therefore commissioned the author to undertake a Phase I Heritage Impact Assessment (HIA) study for the Project Area.

SAHRA's Interim Comment mentioned above required the following:

- 4) All the previous SAHRA comments and permits that were issued to the mine should be uploaded to the case.
- 5) A Letter of Recommendation for Exemption from Heritage Studies to be written by a suitably qualified archaeologist. The letter should also contain a map of the location of heritage resources still conserved *in situ* overlaying the proposed expansion plans and PCD Dam area.
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This report contains a map indicating the identified heritage resources still conserved *in situ* within the Project area (as per SAHRA's requirement No. 2 above). Refer to Figure 7b.

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- 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 Pit 2A Extension 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 NHRA (see Box 1).

According to the NHRA 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 NHRA together with provincial government guidelines and strategic frameworks. Metropolitan or Municipal (local) policy regarding the protection of cultural heritage resources is also linked to national acts and is implemented by the SAHRA and the PHRAs.

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

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, 107 of 1998)
- NHRA
- Minerals and Petroleum Resources Development Act (MPRDA, 28 of 2002)

5.2 The National Heritage Resources Act (NHRA)

According to the NHRA 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 NHRA a HIA process must be followed under the following circumstances:

- The construction of a linear development (road, wall, power line, canal etc.) exceeding 300m in length
- The construction of a bridge or similar structure exceeding 50m in length
- Any development or activity that will change the character of a site and which exceeds 5 000m² or which involves three or more existing erven or subdivisions thereof
- Re-zoning of a site exceeding 10 000m²

- 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 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 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 (HTA, No 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 HTA as amended.

5.4.3 Archaeology, palaeontology and meteorites

Section 35(4) of the NHRA 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 SAHRA. In order to demolish heritage resources the developer has to acquire a destruction permit by from SAHRA.

5.4.4 NEMA 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 4, Scope of work
The date and season of the site investigation and the relevance of the season to the outcome of the assessment	See Part 6, Methodology. (6.1 Fieldwork)
A description of the methodology adopted in preparing the report or carrying out the specialised process	See Part 6, Methodology
The specific identified sensitivity of the site related to the activity and its associated structures and infrastructure	See Part 7.2 The nature of the project area and see Part 8 Contextualising the project area
An identification of any areas to be avoided, including buffers	None, not required
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 Map 8, p40
A description of any assumptions made and any uncertainties or gaps in knowledge;	See Part 6.4. Assumptions and limitations
A description of the findings and potential implications of such findings on the impact of	See Part 9.2 Types and ranges of heritage resources

the proposed activity, including identified alternatives, on the environment	
Any mitigation measures for inclusion in the EMPr	See Part 9.8 Mitigating the graveyard impacts and 9.9 Managing graveyards that remain unaffected
Any conditions for inclusion in the environmental authorisation	See Part 6.4 Assumptions and limitations
Any monitoring requirements for inclusion in the EMPr or environmental authorisation	None, but see Part 6.4 Assumptions and limitations
A reasoned opinion as to whether the proposed activity or portions thereof should be authorised and	See Part 10 Conclusion and recommendation. There is consequently no reason from a heritage point of view why the proposed Pit2A Extension 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 9.8 Mitigating the graveyard impacts and 9.9 Managing graveyards that remain unaffected.
A description of any consultation process that was undertaken during the course of carrying out the study	See Part 9.10 Consultation process undertaken and comments received from stakeholders
A summary and copies if any comments that were received during any consultation process	See Part 9.3 Consultation process undertaken and comments received from stakeholders
Any other information requested by the competent authority.	None

6 APPROACH AND METHODOLOGY

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

6.1 Field survey

The field survey for the proposed Pit 2A Extension Project (open cast mine and various developmental components, such as the areas where the haul road (and dewatering pipeline, as well as the proposed Pollution Control Dam will be located) was conducted with a vehicle and by means of pedestrian surveys. The main route which was followed with a vehicle was recorded with a mounted GPS instrument. Pedestrian surveys were undertaken from the main pathway (Figure 1).

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



Figure 1- GPS track log which was registered for the Project Area. Pedestrian surveys were conducted from the main pathway which was recorded with a mounted GPS instrument (above).

Fieldwork was done on 29 August 2017. The author was assisted by Jerome Ncina (Environmental Specialist) at Kleinkopje Colliery who is well acquainted with the Project Area.

The proposed open cast pit extension was surveyed following two track roads through the veld. Pedestrian surveys were conducted from these roads across the proposed open cast pit area. The proposed open cast pit extension area as well as the land where the proposed Pollution Control Dam will be established is severely disturbed. The proposed haul road and pipeline will be located on the outer perimeter of the proposed open cast mine area which is also disturbed.

The fieldwork survey (Part 7.1) illuminates the nature and character of the Project Area by means of a few photographs.

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 have been identified during earlier heritage surveys in or near the Project Area.

Literature relating to the pre-historical and the historical unfolding of the Eastern Highveld where the Project Area is located was reviewed (see Part 8, 'Contextualising the Project Area').

A number of heritage impact assessment studies have been done near the Project Area (see 'Part 12, Bibliography relating to earlier heritage studies').

In addition, the Project Area was studied by means of maps (2529CD Middelburg; 1:50 000 topographical map; 2528 Pretoria; 1: 250 000 map and Google imagery).

6.3 Spokespersons consulted

Jerome Ncina (Environmental Specialist at Kleinkopje Colliery) who is well acquainted with the Project Area assisted the author on 29 August 2016 with fieldwork (See 'Part 13, Spokespersons consulted').

6.4 Assumptions and limitations

It is possible that this heritage survey may have missed heritage resources in the Project Area considering the size of the area as well as due to various other reasons (e.g. occurring beneath the surface, unmarked, inconspicuous or eroded nature, covered by vegetation, human failure to recognise, etc.).

If any heritage resources of significance are 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 Archaeologists (ASAPA) should be notified in order to determine appropriate mitigation measures for the discovered finds. This may include obtaining the necessary authorisation (permits) from the SAHRA to conduct the mitigation measures.

7 THE BASELINE DESCRIPTION

7.1 Location of the Project Area

The Kleinkopje Colliery is an operational open cast coal mine which is located 15km south-east of Emalahleni on the Eastern Highveld in the Mpumalanga Province. The Kleinkopje Colliery is located in the Emalahleni and Steve Tshwete Local Municipalities which in turn is located within the Nkangala District Municipality. The mine covers various portions of the farms Landau 349JS (0), Klippan 332JS (4,8,10,13,18) and Kleinkopje 15JS (1) (2529CD Middelburg; 1:50 000 topographical map; 2528 Pretoria; 1: 250 000 map and Google imagery (Figures 1, 2 and 8).

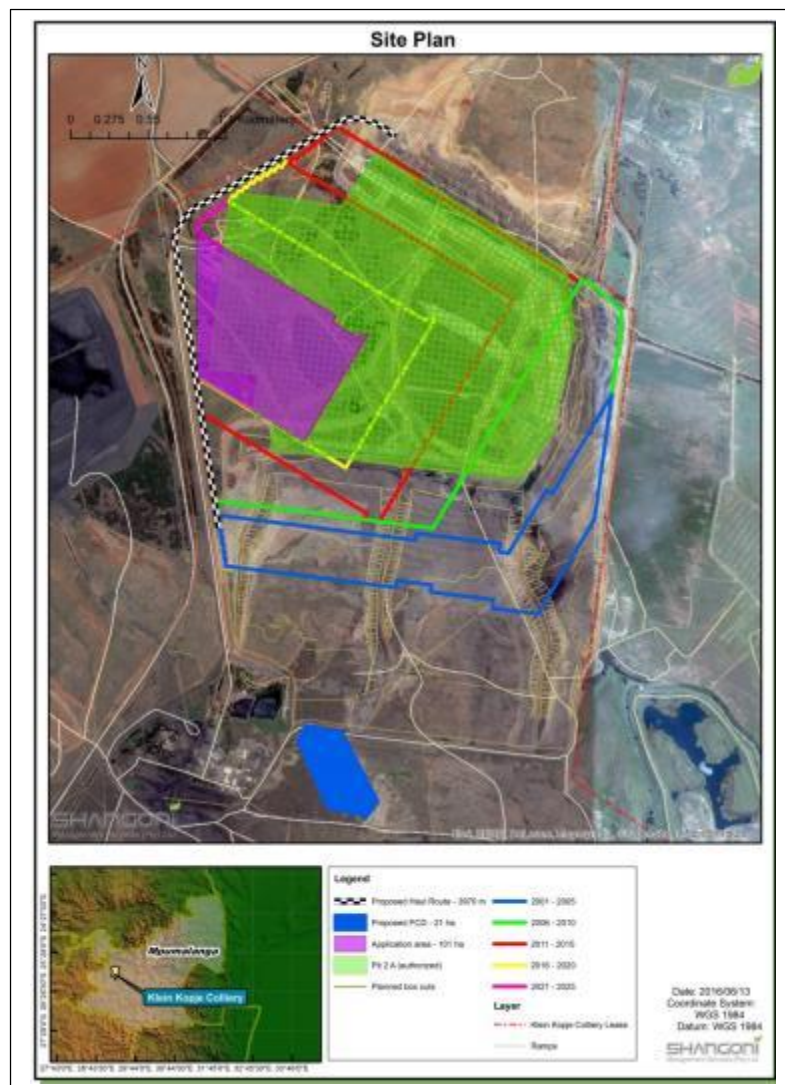


Figure 2- Regional location of Kleinkopje Colliery near Emalahleni on the Eastern Highveld in the Mpumalanga Province (above).

7.2 The nature of the Project Area

The Eastern Highveld of Mpumalanga is characterised by heritage resources which date from the pre-historical into the historical (colonial) period. Stone Age sites, including rock paintings, Iron Age sites and colonial remains do occur on the Eastern Highveld in the Mpumalanga Province. The archaeological and historical significance of this cultural landscape is briefly outlined in this report (see Part 8, 'Contextualising the Project Area').

The Project Area as defined by the limits of the proposed extension of Pit 2A and its associated developmental components is currently, in contrast with the regions heritage attributes, characterised as a disturbed piece of land which have been affected by mining related activities over a long period of time. Small patches with pristine grass veld do occur. It seems as if parts of the Project Area also may have been used for dry-land agriculture in the past. Eskom's large transmission lines as well as several rural power lines cross the Project Area. The proposed extension of open cast pit 2A will extend across a pan. Whilst recent mining and past farming related activities have scarred large surface areas of the Project Area current dirt roads, trenches, dumps with soil and large haul roads contribute to a totally transformed landscape that cannot be described as pristine any longer.

7.3 The nature of the Kleinkopje Project

Kleinkopje Colliery is an existing opencast coal mining operation which produces approximately 7.6 million run of mine tons of coal annually. Kleinkopje Colliery consists of a number of mining sections, a coal beneficiation plant, the Klippan co-disposal site and the 2A Pollution Control Dam (2A PCD Dam) which was constructed as the main pollution control dam. The Pit 2A extension area comprises 101 hectares of land and the PCD involves 21 hectares of land.

Kleinkopje is currently revising its mine plan to include the mining of the coal situated in the area beneath its 2A PCD (sometimes referred to as the Vleishaft dam). Since the existing 2A PCD is located within the area where mining will be extended to, the Plant

Return Water Dam (RWD) may need to be upgraded or the Pollution Control Dam may need to be relocated (newly constructed) and operated in another location.

The mineral deposit mined at Kleinkopje Colliery is that of bituminous coal. Only the lower portions of the Vryheid Formation are preserved within the Kleinkopje mining area. The economical seams that can be exploited are the No. 1, No. 2, No. 4 and No. 5 seams. The Kleinkopje coal reserves are predominantly contained within the No. 1 and No. 2 seams. However, the No. 4 and No. 5 seams are located at deeper elevations that are exploited through open cast mining at the current Pit 2A mining area.

The proposed Pit 2A Extension Project will include the following main mining activities and processes, namely:

- Clearance of vegetation;
- Mining activities by means of dragline production units (removal and stockpiling of topsoil and overburden and the subsequent removal and stockpiling of the ore reserve) (note: truck and shovel methods used for waste movement);
- Hauling activities;
- The continuation of the disposal of mine residue on Kleinkopje Colliery's existing mine residue facility (co-disposal facility);
- Concurrent rehabilitation of the open pit area (which includes spoils reshaping, topsoil placement and re-vegetation);
- Rehabilitation and/or offset strategy implementation for the wetland system associated with the 2A PCD and Pit 2A Extension area (as part of the mitigation/management measures);
- Dewatering of the open pit area; and
- Reticulation and storage of process water (upgrading of Plant Return Water Dam (RWD) and/or
- construction of a new Pollution Control Dam (PCD) (i.e. relocation of the 2A Dam)

Kleinkopje Colliery's proposed extension of the Pit 2A is hereafter referred to as the Pit 2A Extension Project and the footprint of the development area as the Project Area.

8 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 Mpumalanga Province.

8.1 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) (covering the period from 2.5 million years ago to 250 000 years ago), the Middle Stone Age (MSA) (referring 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 widespread, 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 sandstone 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).

8.2 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 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.

8.3 The Historical Period

Historical towns closest to the Project Area include Witbank and Middelburg.

Witbank came into being as the railway line between Pretoria and Lourenço Marques which was built in 1894 passed close to where Witbank is located today. The first Europeans who came to the area observed the abundance of coal, which was evident on the surface or in the beds of streams. A stage post for wagons close to a large outcrop of whitish stones (a 'white ridge') gave the town its name. Witbank was established in 1903 on a farm known as Swartbos which belonged to Jacob Taljaard.

Middelburg is one of the oldest towns that was established by the Voortrekkers in the previous Transvaal. The town was established on the farms of Klipfontein and Keerom on the banks of the Klein Olifants River in 1859. It is generally accepted that Middelburg's name is derived from the fact that the Transvaal Republic established the town midway between Pretoria and Lydenburg.

The choice for Middelburg's location was not well accepted by the inhabitants and it was moved to the farm Sterkfontein. Here, a town was established and named Nasaret (Nazareth). However, the name did not appeal to the local community and its original name was reinstated. Middelburg temporarily served as the seat of the Transvaal Republic after the siege of Pretoria during the Second Anglo Boer War.

Today Middelburg and Witbank are important centres where coal is mined and transported to Richards Bay from where it is exported all over the world. The 20th century also saw the introduction of large-scale irrigation and dry land farming on the Eastern Highveld. Today the economic activities of the area include diamond and coal mining, light and heavy industries as well as steel and vanadium operations.

8.4 A coal mining heritage

Coal mining on the Eastern Highveld is now older than one century and the region has become the most important coal mining region in South Africa. Whilst millions of tons of high-grade coal is annually exported overseas, more than 80% of the country's electricity is generated from 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 9,5 million 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.

8.5 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 ('oukclip'), dolerite ('bloukclip'), 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 descent 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.

9 THE PHASE I HERITAGE IMPACT ASSESSMENT

9.1 The fieldwork survey

The Phase I HIA study is now briefly discussed and illustrated with photographs. The fieldwork survey incorporated the footprint for the Pit2A Extension Project (PCD, haul road, etc.). The following photographs illuminate the nature and character of the Project Area and the footprints of the proposed mine development project.



Figures 3 & 4- The extension of the proposed open cast Pit 2A will occur across land which have been disturbed by mining related activities such as haul road, patches of land which have been cleared from vegetation and surfaces that are scarred, dumps of soil, etc. (above and below).





Figure 5- The proposed new haul road will be constructed along the fringes of mining activities which have disturbed the larger Project Area (above).



Figure 6 - The Pollution Control Dam is to be established on a piece of land where it appears as if dumps of waste material have been deposited in the past (above).



Figure 7- Existing haul roads, excavations, cleared surfaces and dumps of soil have disturbed the proposed Pit 2A extension area (which includes the location of the planned Pollution Control Dam and the haul road (above)).

9.2 Earlier archaeological and heritage findings

Three earlier HIA studies were done in and near the current Project Area (see Part 12, 'Bibliography relating to earlier heritage studies') namely:

- A 1993 survey revealed the presence of two graveyards, a cattle enclosure and farmhouses (4) to the east and north-east of the Project Area (Van Vollenhoven 1993). None of the remains, except the graveyards, had any heritage significance. These remains also have no bearing on the Pit 2a Extension Project as they are located more than 1,5km to the east and north-east of the Project Area.
- A 2010 survey for the proposed Khanyisa Power Station revealed six localities with possible heritage resources (WK1 to WK6) (Cilliers 2010). Only site WK1 had heritage significance as it represented a graveyard. Site WK1 equals Graveyard 02 which was identified during this study. Sites WK2 to WK6 comprised remains dating from the recent past and hold no heritage significance. These remains also do not exist any longer as they have fallen into disrepair and/or have been demolished.

- A 2012 survey for a proposed pipeline and two dams revealed no heritage resources of significance (Van Vollenhoven 2012).

None of these heritage resources, except GY02 (WK1), have any relevance to this heritage study. As stated above these remains either occur outside the Project Area; did not have any heritage significance when they still existed and now have fallen into total disrepair and/or have been demolished. A map illustrates the former presence of these heritage resources (Figure 7a).

9.3 Types and ranges of heritage resources

The Phase I HIA study for the proposed Pit 2A Extension Project 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 (Figure 7b):

- One graveyard in the Project Area (GY01).
- Two graveyards directly outside the Project Area (GY02, GY03).

The graveyards were geo-referenced and mapped (Figure 7b; Table 1). The significance of the graveyards is indicated as well as the significance of any impact on these graveyards (Table 2). Mitigation measures are outlined for those graveyards which will be affected by the proposed mine development project. Management measures are proposed for the graveyard which remains unaffected outside the mining area.

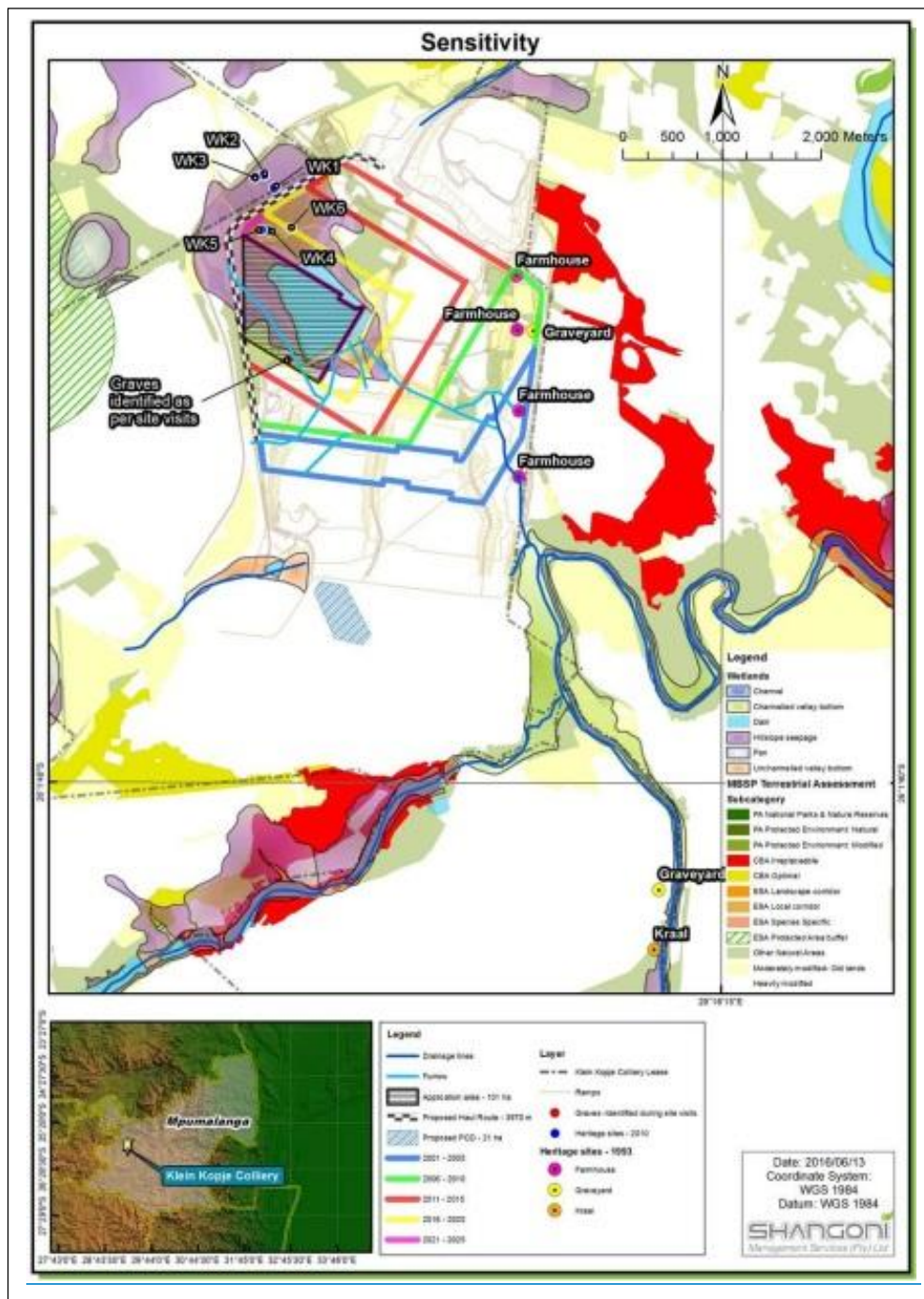


Figure 7a – Heritage resources which used to exist in and close to the Project Area. These heritage resources (except WK1 which represents GY02) either occur outside the Project Area; did not have any heritage significance when they were recorded and have fallen into total disrepair and/or have been demolished (above)

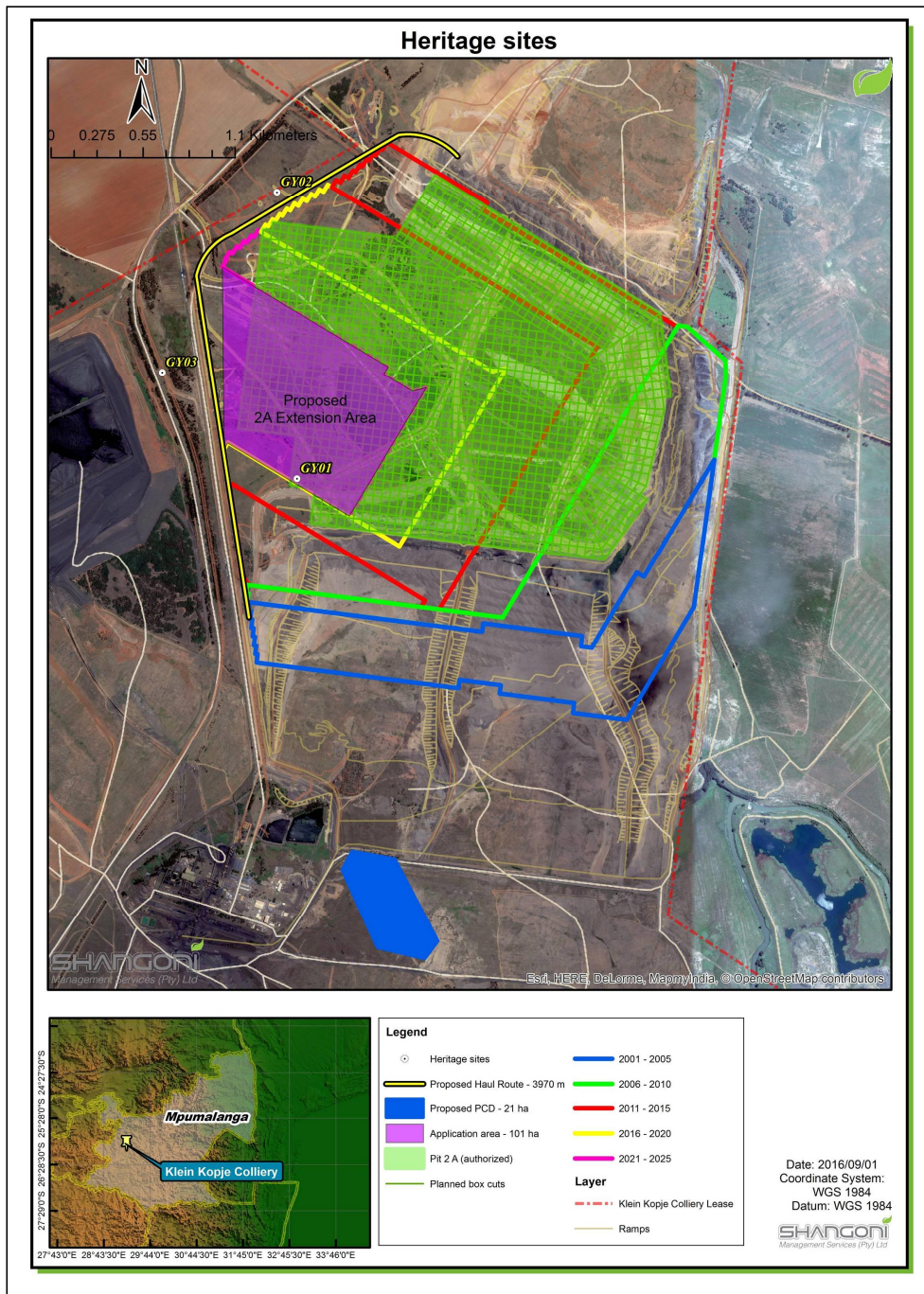


Figure 7b- The Kleinkopje Pit 2A Extension Project Area (demarcated in purple and blue). Note the presence of three graveyards in and near the Project Area (above).

9.4 Graveyards

One graveyard was recorded in the Project Area (GY01) and two graveyards (GY02, Gy03) in close proximity of the Project Area, namely:

9.4.1 Graveyard 01

This graveyard (GY01) is located in open veld in the Project Area. It is demarcated with a fence which has collapsed. GY01 holds five visible graves which are all covered with bricks and ferricrete stone. Four are fitted with sandstone headstones with no decipherable inscriptions. Some of the graves are edged with cement strips.

It is highly likely that all the graves are older than sixty years.



Figure 9 - GY01 is located in open veld and holds at least five visible graves (above).

9.4.2 Graveyard 02

Graveyard 02 (GY02) is located under Eskom's existing power lines outside the Project Area. It is a large graveyard which holds as many as 150 individual graves.

Many of the graves are decorated with cement, sandstone or granite headstones and other trimmings.

It is most likely that most of the graves in GY02 are older than sixty years. The graveyard may have been associated with a small village which has now disappeared as it was abandoned long ago and its remains have disintegrated. It is also possible that the remains have deliberately been demolished for security purposes.



Figure 10 - GY02 is located under Eskom's existing power lines (outside of the Project Area) and holds as many as 150 graves many of which are older than sixty years (above).

Inscriptions on some of the headstones read as follow:

- 'In loving memory of Vusi 15-03-1979, 08-07-1979 lala ngoxolo'
- 'Jan Mkwisi Died 26-10-69 Rip Mahlangu'
- 'Lala ngoxolo baba Lucas M Shoba 1869-1974'
- 'M SS Mlokika Paulina Mahlangu 22-11-1911'

9.4.3 Graveyard 03

Graveyard 03 (GY03) is located outside the Project Area and next to a national road. GY03 holds approximately ten graves (one of which is a double grave). The majority of the graves are decorated and fitted with granite headstones and trimmings. The double grave is fitted with a marble headstone and marble strips.

The graveyard is fenced in and fitted with an access gate but is in a neglected state.

Inscriptions on some of the headstones read as follow:

- 'Ter nagedagtenis aan PDG Coetzer Geb 3-02-1870 Oorl 16-09-1942 Rus in vrede'
- 'Hier rus vader Johannes Janubus du Toit Geb 3 Okt 1872 Oorl 14 Okt 1926 Hier rus moeder Maria Cornelia du Toit Weduwe van Wyk Geb Jacobs Geb 23 Jun 1874 Oorl 22 Maart 1933'
- 'Rus sag Dionisius Tot Jesus ons kom haal Du Toit familie 1 Des 1950'



Figure 11 - GY03 is located outside the Project Area and holds at least ten graves most of which are decorated. This graveyard is older than sixty years (above).

Most of the graves in GY03 are older than sixty years.

9.5 Coordinates and level of significance

The coordinates and levels of significance for the graveyards which were recorded in and outside the Project Area are as follow:

Table 1 - Coordinates and significance rating for graveyards in and outside the Project Area (above).

Graveyards	Coordinates	Significance
Inside the project area		
GY01.Small graveyard with five graves in open veld.	25° 59.358'S 29° 13.615'E	HIGH
GY02.Large graveyard with approximately 150 graves under Eskom's existing power lines. Associated with demolished remains of a former village.	25° 58.427'S 29° 13.542'E	HIGH
Outside the Project Area		
GY03. Located next to national road. Approximately 10 graves	25° 59.013'S 29° 13.131'E	HIGH

9.6 Possible impact on the heritage resources

GY01 will be affected by the proposed Pit 2A Extension Project as it falls within the footprint of the proposed Pit 2A extension area (Figure 7b).

GY02 and GY03 fall outside the footprint of the Pit 2A Extension Project and will not be affected by the proposed project (Figure 7b).

9.7 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. It seems as if all the graveyards hold graves which 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).

9.8 The significance of the impact 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	Duration: 5 – Permanent 4 - Long-term (ceases with the operational life) 3 - Medium-term (5-15 years) 2 - Short-term (0-5 years)
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0 – None	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 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 GY01 is very high (Table 2).

Table 2: The significance of potential impacts on the graveyards before and after mitigation (below).

Grave-yard	Probability of impact	Magnitude of impact	Duration of impact	Scale	Significance points	Significance rating	Significance after mitigation
GY01	5	10	5	1	90	Very High	Low
Outside the Project Area (management measures outlined in report)							
GY02	-	-	-	-	-	-	-
GY03	-	-	-	-	-	-	-

9.9 Mitigating the graveyard impacts

The impacts to the graveyard (GY01) can be mitigated by means of exhumation and relocation. The exhumation of human remains and the relocation of graveyards are regulated by various laws, regulations and administrative procedures. This task is undertaken by forensic archaeologists or by reputed undertakers who are acquainted with all the administrative procedures and relevant legislation that have to be adhered to whenever human remains are exhumed and relocated. This process also includes social consultation with a 60 days statutory notice period for graves older than sixty years. Permission for the exhumation and relocation of human remains have to be obtained from the descendants of the deceased (if known), the National Department of Health, the Provincial Department of Health, the Premier of the Province and the local police.

The significance of the impact on the graveyard will be low after mitigation, i.e. after the graveyard has been relocated (Table 2).

9.9 Managing graveyards that remain unaffected

Graveyards that remain unaffected should be managed (by Anglo Operations) to ensure their future unaffected existence during the construction, operation and decommissioning phases of its mining operations. The following mitigation measures are recommended:

- Graveyards must be demarcated with fences or with walls and should be fitted with access gates.
- Regulated visitor hours should be implemented that is compatible with mine safety rules. This will not be necessary when graveyards are located next to national roads.
- Corridors of at least 20m should be maintained between graveyard's fences and any developmental components such as roads or other infrastructure that may be developed in the future.
- Graveyard should be inspected every three months. Inspections should be noted in an inspection register. The register should outline the state of the graveyards during each inspection. Reports on damages to any of the graves or to the graveyards (fences, walls, gates) should be followed with the necessary maintenance work. Maintenance work should be recorded in in the inspection register.
- Graveyards should be kept tidy from any invader weeds and any other refuse.

9.11 Consultation process undertaken and comments received from stakeholders

No specific consultation process was undertaken for the purposes of the HIA as the stakeholder consultation for the project is being done by Shangani as part of the overall EIA process.

Should any heritage resources of significance others than those which were identified during this heritage study be exposed during the Pit 2A Extension 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.

10 CONCLUSION AND RECOMMENDATIONS

The Phase I HIA study for the proposed Pit 2A Extension Project 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 (Figure 7b):

- One graveyard in the Project Area (GY01).
- Two graveyards directly outside the Project Area (GY02, GY03).

The graveyards were geo-referenced and mapped (Figure 7b; Table 1). The significance of the graveyards is indicated as well as the significance of any impact on these graveyards (Table 2). Mitigation measures are outlined for those graveyards which will be affected by the proposed mine development project. Management measures are proposed for the graveyard which remains unaffected outside the mining area.

Possible impact on the heritage resources

GY01 will be affected by the Pit 2A Extension Project.

GY02 and GY03 fall outside the footprint of the Pit 2A Extension Project and will not be affected by the proposed Pit 2A Extension Project.

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. It seems as if all the graveyards hold graves which 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).

The significance of the impact 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 GY01 is very high (Table 2).

Mitigating the graveyard impacts

The impacts to the graveyard (GY01) can be mitigated by means of exhumation and relocation. The exhumation of human remains and the relocation of graveyards are regulated by various laws, regulations and administrative procedures. This task is undertaken by forensic archaeologists or by reputed undertakers who are acquainted with all the administrative procedures and relevant legislation that have to be adhered to whenever human remains are exhumed and relocated. This process also includes social consultation with a 60 days statutory notice period for graves older than sixty years. Permission for the exhumation and relocation of human remains have to be obtained from the descendants of the deceased (if known), the National Department of Health, the Provincial Department of Health, the Premier of the Province and the local police.

The significance of the impact on the graveyard will be low after mitigation, i.e. after the graveyard has been relocated (Table 2).

Managing graveyards that remain unaffected

Graveyards that remain unaffected should be managed (by Anglo Operations) to ensure their future unaffected existence during the construction, operation and decommissioning phases of its mining operations. The following mitigation measures are recommended:

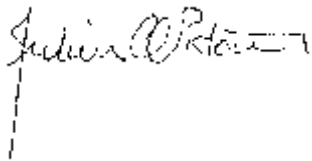
- Graveyards must be demarcated with fences or with walls and should be fitted with access gates.
- Regulated visitor hours should be implemented that is compatible with mine safety rules. This will not be necessary when graveyards are located next to national roads.
- Corridors of at least 20m should be maintained between graveyard's fences and any developmental components such as roads or other infrastructure that may be developed in the future.
- Graveyard should be inspected every three months. Inspections should be noted in an inspection register. The register should outline the state of the

graveyards during each inspection. Reports on damages to any of the graves or to the graveyards (fences, walls, gates) should be followed with the necessary maintenance work. Maintenance work should be recorded in in the inspection register.

- Graveyards should be kept tidy from any invader weeds and any other refuse.

Summary

There is consequently no reason from a heritage point of view why Anglo's proposed Pit2A Extension Project cannot proceed after the appropriate mitigation measures outlined in this report have been implemented.

A handwritten signature in black ink, appearing to read "Julius CC Pistorius". The signature is written in a cursive style and is positioned above a vertical dashed line that extends downwards.

Dr Julius CC Pistorius

Archaeologist & Heritage Consultant

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