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**A PHASE I HERITAGE IMPACT ASSESSMENT (HIA) STUDY FOR
SOUTH32 SA COAL HOLDINGS (PTY) LIMITED'S (SOUTH32 CSA)
PROPOSED EXTENSION OF OPENCAST OPERATIONS AND
ASSOCIATED CLOSURE OF A SECTION OF THE D253 PROVINCIAL
ROAD AT THE KLIPFONTEIN SECTION OF THE MIDDELBURG MINE
ON THE EASTERN HIGHVELD IN THE MPUMALANGA PROVINCE**

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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 South32 SA Coal Holdings (Pty) Limited (South32 CSA) formerly known as BHP Billiton Energy Coal South Africa (Pty) Limited (BECSA) proposed extension of opencast coal mining operations and the associated closure of a section of the D253 road at the Klipfontein Section of the Middelburg Mine on the Eastern Highveld in the Mpumalanga Province.

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 mine development project.

The Phase I HIA study for the proposed mine development 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:

- Eight graveyards.

The graveyards were geo-referenced and mapped (Figure 11; Table 1). The significance of the graveyards is indicated as well as the significance of any impact on some of these graveyards (Table 2). Mitigation measures are outlined for graveyards which will be affected by the proposed Klipfontein Project and management measures for those graveyards which remain unaffected in the project area.

Possible impact on the heritage resources

The Life of Mine (LOM) Alternative 01 will affect GY01, GY02, GY05 and GY06 as they occur in the proposed open cast mining area.

The LOM Alternative 02 will affect GY01, GY02, GY05 and GY06 as they occur in the proposed open cast mining area.

The LOM Alternative 03 will affect GY01 and GY02 as they occur in the proposed open cast mining area.

Road Alternative 01 occurs approximately 40m from GY04 and need not to affect the graveyard (as the road can slightly be deviated if it collides with GY04).

GY03 falls outside the footprint of the Klipfontein Project whilst GY07 and GY08 fall outside the mine lease area. As these graveyards will not be affected by the proposed Klipfontein Project they are not included in any further discussions in this report.

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 any possible impact on the graveyards is very high before mitigation (Tables 2-4).

Mitigating the graveyard impacts

The impacts to the graveyards 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 graveyards will be low after mitigation (Tables 2-4).

Managing graveyards that remain unaffected

Graveyards that remain unaffected within the Klipfontein Section of the Middelburg Mine such as GY03 and GY04 should be managed to ensure its future unaffected existence during the construction, operation and decommissioning phase of the Klipfontein Project, namely:

- Graveyards must be demarcated with fences or with walls and must 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.
- Graveyards 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 the inspection register.
- Graveyards should be kept tidy from any invader weeds and any other refuse.

Summary

The LOM Alternative 03 is preferred for the Klipfontein Project considered from a heritage point of view as this alternative will only affect GY01 and GY02 as they occur in the proposed open cast mining area.

Road Alternatives 01 or 02 are suitable for construction considered from a heritage point of view as both roads do not collide with any graveyards. Road Alternative 01 will avoid GY04 with approximately 40m clearance distance between the road and the graveyard. This distance can be increased if the road is deviated slightly further to the west. Dust pollution may require that the graveyard be maintained on a more regular basis than the three month period recommended. Road Alternative 02 will affect none of the graveyards.

The LOM Alternative 03 option in conjunction with Road Alternative 02 therefore are suitable options for the Klipfontein Project considered from a heritage point of view.

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 project the South African Heritage Resources Act (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

This document contains the report on a Phase I Heritage Impact Assessment (HIA) study which was done for South32 SA Coal Holdings (Pty) Limited (South32 CSA) [formerly known as BHP Billiton Energy Coal South Africa (Pty) Limited (BECSA)] proposed extension of opencast coal mining operations and the associated closure of a section of the D253 road at the Klipfontein Section of the Middelburg Mine 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

2 TERMS OF REFERENCE

South32 CSA's proposed extension of opencast coal mining operations at the Middelburg Mine (Klipfontein Section) and the closure of a section of the D253 provincial road on the farms Klipfontein 470JS and Wolvenfontein 471JS near Middelburg 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), South32 CSA 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).

South32 CSA 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. Jones & Wagener (Pty) Ltd, the company who is 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.

The aims with 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 mine development project.

3 THE PROJECT AREA

3.1 Location

The Klipfontein Section of Middelburg Mine is an operational open cast coal mine which is located 25km south of Middelburg and 35km south-east of eMalahleni on the Eastern Highveld in the Mpumalanga Province. The Klipfontein Section is located in the Steve Tshwete Local Municipality which in turn is located within the Nkangala District Municipality. The mine is located in the uppermost reached of the Spookspruit catchment (2529CD Middelburg; 1:50 000 topographical map; 2528 Pretoria; 1: 250 000 map and Google imagery [Figures 1 to 3]).



Figures 1 & 2- The project area on the Eastern Highveld in the Mpumalanga Province is characterised by an outstretched undulating grass plain which is predominantly used as grazing for cattle and dry-land agriculture (top image). Disturbed patches of land such as old agricultural fields do occur and were covered with weeds and other invasive species when the survey was done (bottom image).

3.2 The nature of the project area

The project area is characterised by an outstretched undulating plain with pristine stretches of grass veld and large surface areas which are covered with dry-land agricultural fields. Agricultural fields that are not planted with crops currently serve as fertile footholds for a variety of invasive weeds which in places grow as high as one and a half meters, which at times hamper archaeological visibility during foot surveys.

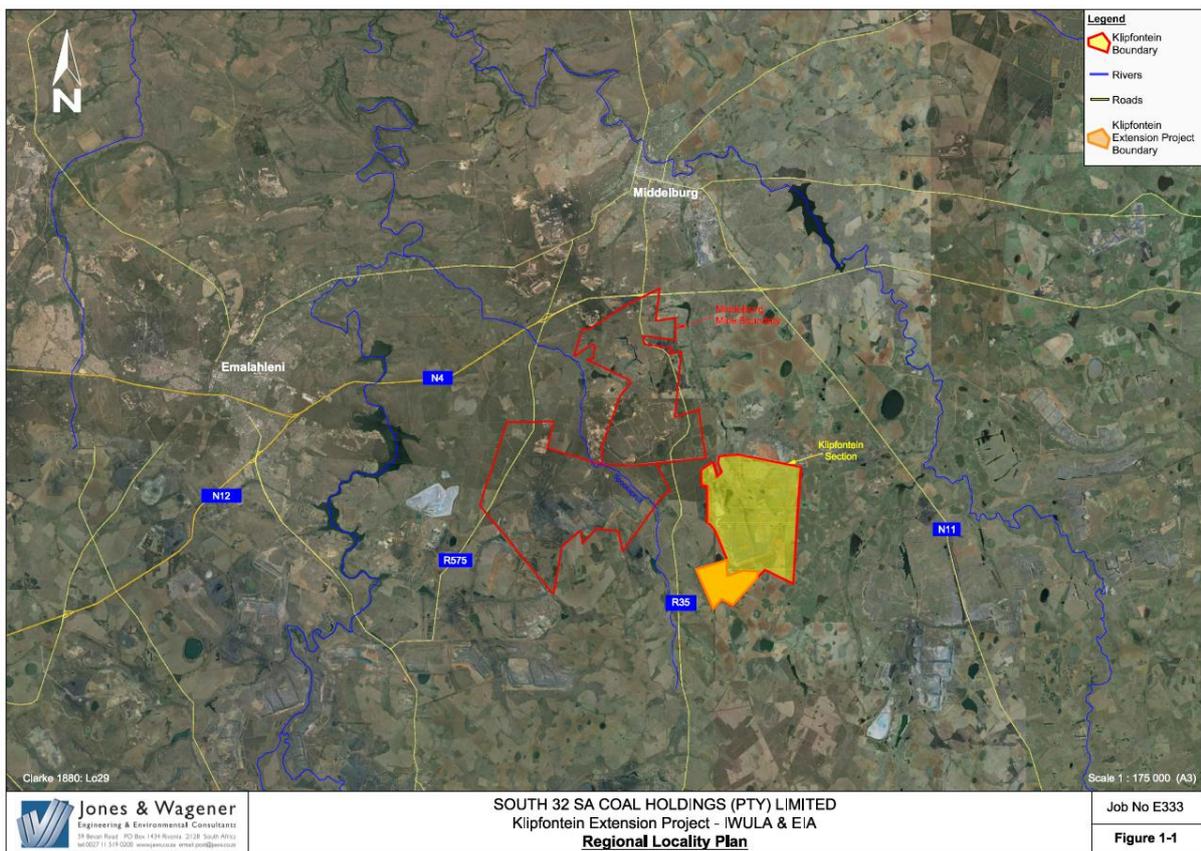


Figure 3- The Klipfontein Section of Middelburg Mine on portions of the farms Klipfontein 470JS and Wolvenfontein 471JS within SOUTH32 CSA’s coal mining complex near Middelburg (yellow shaded block). The project area is characterised by an outstretched, undulating plain with grass veld, agricultural fields, grazing areas and coal mining related infrastructure.

Eskom’s large transmission lines, as well as several rural power lines cross the project area. A pan is located to the north of the proposed open cast pit. Mining and farming related activities have scarred large surface areas of the Project Area whilst dirt roads,

a mine vehicle storage yard, trenches and dammed water contribute to the non-pristine character of the project area.

The larger project area 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 Mpumalanga Province. The archaeological and historical significance of this cultural landscape is briefly outlined in this report (see Part 5, 'Contextualising the Project Area').

3.3 The nature of the Klipfontein Project

South32 CSA produces thermal coal for the South African domestic and export markets. The company comprises of four primary coal-mining operations namely Khutala Colliery, Klipspruit Colliery, Middelburg Mine Complex. They also have coal processing facilities. All these operations are located near the towns of eMalahleni (Witbank) and Middelburg in the coalfields of Mpumalanga Province.

South32 CSA is proposing to expand the Klipfontein Section of Middelburg Mine. There is currently an approved EMPR for opencast mining at the Klipfontein Section. Mining has commenced in the north and central sections of Klipfontein in accordance with the submitted plan. South32 CSA plans on extending these opencast operations to include the remaining Klipfontein reserve in the south. Although sections of the approved extension fall within the approved EMPR boundary, these sections do not have approval for the listed activities associated with the proposed mining in terms of the National Environmental Management Act (Act No 107 of 1998), as amended, (NEMA). Additionally, some sections of the proposed mining extensions are outside of the existing EMPR boundary. As a result the EMPR needs to be amended in terms of the MPRDA to include the proposed mine plan areas. In order to obtain the authorisations and licences, a Scoping and Environmental Impact Reporting (S&EIR) process in terms of the NEMA as amended, as well as the Integrated Water Use Licence Application (IWULA) process in terms of National Water Act, (Act 36 of 1998), (NWA) need to be followed.

Mine plan alternatives

South32 CSA has finalised the proposed Klipfontein Life of Mine (LOM) mine plan alternatives based on the inputs it has received from the Department of Water and Sanitation (DWS), inputs from stakeholders and the design engineers. The Life of Mine (LOM) alternatives include the following:

- LOM Alternative 01: Full Extent – mining up to the mining rights boundary including mining through an Eskom power line and through a Rand Water pipeline (requires relocating the power line and the Rand Water pipeline), as well as mining through a section of a tributary of the Spookspruit (requires a partial stream diversion). Mining from east to west, towards the tributary.
- LOM Alternative 02: Go Forward Option 01 (GF01) – mining up to a distance of 100 m away from the centreline of the Spookspruit tributary, including mining through an Eskom power line and through a Rand Water pipeline (requires relocating the power line and the Rand Water pipeline), as well as mining through the eastern upper tributary feeding into Spookspruit. Mining from east to west, towards the tributary.
- LOM Alternative 03: Go Forward Option 02 – (GF02) mining up to a distance of 100 m away from the 1:100 flood line of the Spookspruit tributary and exclusion of mining through the Eskom power line and Rand Water pipeline (therefore no infrastructure relocation required). Mining from west to east, away from the tributary (Figure 11).

Road alternatives

- Should LOM Alternative 01 or 02 be approved the proposed road to be upgraded and/or constructed is the following:

Road Alternative 01: A gravel road deviating from the D253 within the mine boundary to the west of the Spookspruit tributary and the upgrade of the Anglo road - not along its full extent but to the proposed farmers' road junction.

- Should LOM Alternative 03 be approved the proposed road to be upgraded and/or constructed is the following:

Road Alternative 02: A gravel road deviating from the D253 around the mine boundary on the eastern side of the Spookspruit tributary within the Eskom power line corridor

and the upgrade of the Anglo road - not along its full extent but to the proposed farmers' road junction.

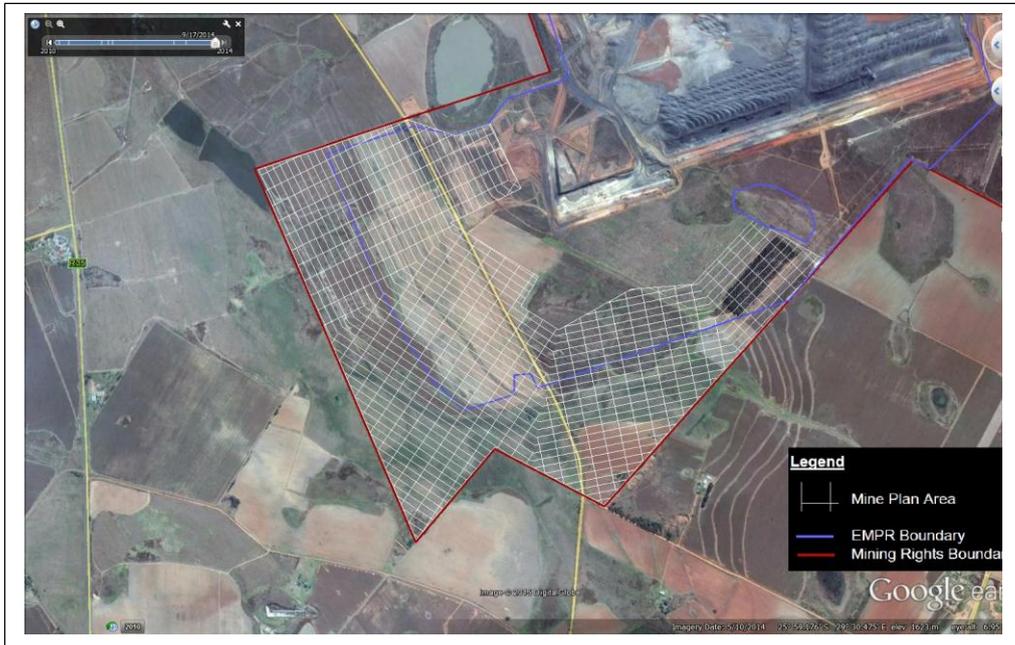


Figure 4- LOM Alternative 01 or Full Extent entails mining up until the mining right boundary (above).



Figure 5- Go Forward Option 01 (GF01) entails mining up until 100m from the centreline of the Spookspruit tributary, including mining under the Eskom power line (requires relocating the power line and the Rand Water pipe line) and mining through the right upper tributary feeding into the Spookspruit (above).

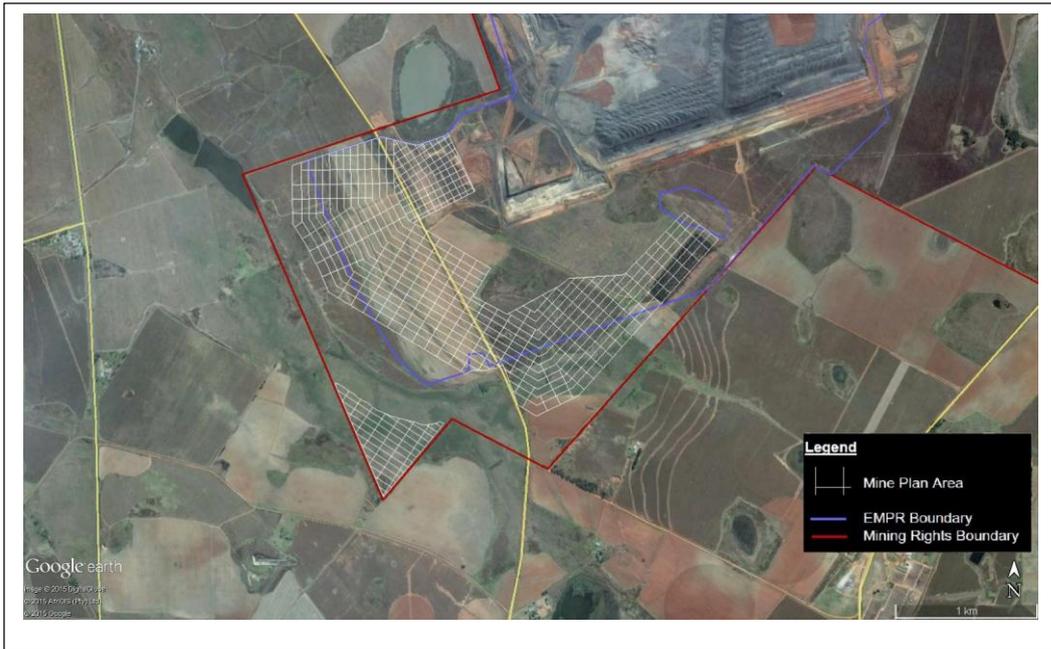


Figure 6- Go Forward Option 02 (GF02) entails mining up until 100m from the 1:100 flood line of the Spookspruit tributary, but not mining under the Eskom power line (therefore no infrastructure relocation required, except district road D253) (above).



Figure 7- Road Alternative 01 comprises a gravel road deviating from the D253 around the mine boundary to the west of the Spookspruit tributary (green line) and the upgrade of the Anglo and private owned road which connects the D253 with the R35 (brown line, above).



Figure 8- Road Alternative 02 comprises a gravel road deviating from the D253 around the mine boundary on the eastern side of the Spookspruit tributary (green line) within the Eskom power line corridor and the upgrade of the Anglo and private owned road which connects the D253 with the R35 (brown line, above).

The proposed extension of the opencast mining operations at the Klipfontein Section will include, but will not be limited to, developmental components such as the following:

- A section of the D253 provincial road has to be closed as it is located within the footprint of the proposed opencast pit.
- New dewatering pipelines are required in order to ensure that dirty water which accumulates during operations is diverted to the existing Rondebosche Pollution Control dam.
- New haul roads are required to extend into the new mining operations.
- A new power line (33 kV) will be required in order to operate the dragline.
- Roads may need to be upgraded or new roads may be required.
- Vegetation will be cleared.

The various developmental components are referred to as the mine development project whilst the footprint of the developmental components refers to the project area.

4 APPROACH AND METHODOLOGY

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

4.1 Field survey

The field survey for the proposed new open cast area and for the various road alternatives 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 4).

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



Figure 9- 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. The last stretch for the southern provincial road (bottom of image) was not recorded as a result of a loss of signal.

Fieldwork was done from 17 to 19 February 2014 and the author was assisted on two days by Goodness Bopape (Environmental Specialist) and Pule Monyane (Environmental Technician) of Middelburg Mine. More fieldwork was done on 4 and 5 December 2014 to investigate proposals that were put forward for the mine plan alternatives as well as the alternatives for the roads.

The proposed new open cast pit was surveyed following two track roads through the veld and by means of roads that occur between maize fields. Pedestrian surveys were conducted from these roads across the proposed open cast pit area. The south-western and central parts of the proposed open cast pit, where no maize was planted, is currently covered with khaki bush and other invader plants, which are as high as a meter and a half.

Agricultural fields were not surveyed other than using roads that occur between the maize fields. Google imagery was also studied to determine the possible presence of graves or the remains of structures which may still exist in agricultural fields as they are avoided during the planting and harvesting of crops. A clump of wattle trees, which was surveyed, revealed a graveyard along its western perimeter.

The fieldwork survey (Part 6.1) illuminates the nature and character of the Project Area by means of a few photographs.

4.2 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.

The most common heritage resources which occur in the immediate area include:

- Historical farmstead complexes associated with main residences and different types of outbuildings.

- Formal and informal graveyards.

A number of heritage impact assessment studies have been done near the Project Area (see 'Part 8 Select Bibliography'), namely:

- Birkholtz, P. 2003. Cultural heritage scoping assessment as part of the environmental management programme report for the proposed Boschmanspoort Mining Development on the farms Boschmanspoort 159IS, Bankvallei 160IS, Vlakfontein 179IS, Bosmanslaagte 181IS, Bosmanspan 180IS, Boschmansfontein 182IS and Kromdraai 486JS in Mpumalanga, South Africa. Unpublished report for Helio Alliance.
- Pistorius, J.C.C. 2004. A Heritage Impact Assessment (HIA) study for the proposed new Optimum Colliery on the farm Schoonoord 164IS in the Mpumalanga Province of South Africa. Unpublished report done for African EPA.
- De Jongh, R. 2006. Archaeological and Heritage Assessment for Optimum Mine EMP: Routes of conveyor belts, pipelines and associated infrastructure. Unpublished report for Optimum Colliery.
- Pistorius, J.C.C. 2009. A Phase I Heritage Impact Assessment (HIA) study for the proposed new Emmerentia Coal Mine on the Eastern Highveld in the Mpumalanga Province of South Africa. Unpublished report done for Jaco- K Consulting.
- Pistorius, J.C.C. 2010. An (updated) Heritage Impact Assessment (HIA) study for the proposed new Optimum Colliery on the farm Schoonoord 164IS in the Mpumalanga Province of South Africa. Unpublished report done for Chanzo Investment Holdings.
- Pistorius, J.C.C. 2012. A Phase I Heritage Impact Assessment (HIA) study for the proposed new Boschmanspoort Colliery on the Eastern Highveld in the Mpumalanga Province of South Africa. Unpublished report done for Jones and Wagener Consulting Engineers.
- Pistorius, J.C.C. 2013. A Phase I Heritage Impact Assessment (HIA) study for the proposed construction of a clean water pipeline from the Middelburg Water Reclamation Project to the Middelburg Colliery Reservoir in the

Mpumalanga Province. Published report as part of a Basic Assessment study done for Jones and Wagener Consulting Engineers.

Literature relating to the pre-historical and the historical unfolding of the Eastern Highveld where the Project Area is located was reviewed (see Part 5, 'Contextualising the Project Area').

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).

4.3 Spokespersons consulted

Two employees of Middelburg Mine, namely Goodness Bopape (Environmental Specialist) and Pule Monyane (Environmental Technician) who are acquainted with the Klipfontein Section of Middelburg Mine assisted the author on two days with fieldwork (See 'Part 9, Spokespersons consulted').

4.4 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.

4.5 Some remarks on terminology

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

- **Conservation:** The act of maintaining all or part of a resource (whether renewable or non-renewable) in its present condition in order to provide for its continued or future use. Conservation includes sustainable use, protection, maintenance, rehabilitation, restoration and enhancement of the natural and cultural environment.
- **Cultural resource management:** A process that consists of a range of interventions and provides a framework for informed and value-based decision-making. It integrates professional, technical and administrative functions and interventions that impact on cultural resources. Activities include planning, policy development, monitoring and assessment, auditing, implementation, maintenance, communication, and many others. All these activities are (or will be) based on sound research.
- **Cultural resources:** A broad, generic term covering any physical, natural and spiritual properties and features adapted, used and created by humans in the past and present. Cultural resources are the result of continuing human cultural activity and embody a range of community values and meanings. These resources are non-renewable and finite. Cultural resources include traditional systems of cultural practice, belief or social interaction. They can be, but are not necessarily identified with defined locations.
- **Heritage resources:** The various natural and cultural assets that collectively form the heritage. These assets are also known as cultural and natural resources. Heritage resources (cultural resources) include all 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.

5 CONTEXTUALISING THE PROJECT AREA

The Project Area is located in the midst of a cultural landscape that is marked by heritage remains dating from the pre-historical to the historical period (see Part 9 'Select Bibliography'). Heritage resources which are quite common in the larger Project Area include:

- 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.

However, the following overview of pre-historical, historical and cultural evidence indicates the wide range of heritage resources which do occur across the Mpumalanga Province.

5.1 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 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 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).

5.2 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.

5.3 The Historical Period

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

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 temporary 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.

Hendrina is best known as the village nearest to two of Eskom's large power stations, namely the Arnot and Hendrina power stations. Hendrina's history can be traced to 1924 when the farm Garsfontein ('barley spring') was purchased from Gert Beukes. The new town was named for his wife. Apart from the power stations and

coal mines, the local economy of the district is based on dairy farming, vegetables and maize.

Belfast was founded on 30 June 1890. Farmer Richard O' Neil bought the farm Tweefontein near where the expected railway line between Pretoria and Lourenço Marques in Mozambique would run. He set up a store and applied for permission to lay out a village. He named it Belfast in honour of the city in Ireland from where his father had immigrated. The railway reached the village in 1894 and the first village council took office in 1902 (Erasmus 1995).

5.4 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.

5.5 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 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.

6 THE PHASE I HERITAGE IMPACT ASSESSMENT

6.1 The fieldwork survey

The fieldwork survey incorporated the footprints for all the alternatives for the proposed open cast mining areas, the proposed road alternatives and for all other infrastructure which is associated with the mine development project. The survey also provided for a survey of road D253 and its alternatives as well as for the Anglo and private owned road.

The following photographs illuminate the nature and character of the Project Area as well as some of the footprints of the proposed mine development project.



Figure 10- The proposed open cast mining areas incorporates agricultural fields, disturbed patches of land with invader weeds and infrastructure such as Eskom's power lines (above).



Figure 11- The larger part of the proposed mining areas includes outstretched fields with planted crops (above). At least one graveyard was observed in these agricultural fields otherwise these areas have been disturbed and hold no heritage resources of significance.



Figure 12- Agricultural fields in the proposed mining areas extent up to the banks and beyond the Spookspruit tributary to the shoulders of the R35 in the west and Road 253 in the east (above).



Figure 13- The proposed open cast mining areas include patches of land which have intensely been disturbed in the past. This quarry or soil dam which is filled with water is located in a maize field neat to Road 253 (above).



Figure 14- Anglo's private owned road may be one of the road alternatives which may be upgraded (above). An informal graveyard wedged between two maize fields was observed near this road.

6.2 Types and ranges of heritage resources

The Phase I HIA study for the proposed mine development 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:

- Eight graveyards.

The graveyards were geo-referenced and mapped (Figure 11; Table 1). The significance of the graveyards is indicated as well as the significance of any impact on some of these graveyards (Table 2). Mitigation measures are outlined for those graveyards will be affected by the proposed mining development project and management measures for those which remain unaffected in the mining area.

The Phase I HIA study is now briefly discussed and illustrated with photographs.



Figure 15- The Project Area on the Eastern Highveld in the Mpumalanga Province noting the three options for the mine development project. Note the presence of graveyards in and near the Project Area (above).

6.3 Graveyards

Eight graveyards were recorded in the Project Area, namely:

6.3.1 Graveyard 01

This graveyard (GY01) is located on the edge of a wattle bush and is covered with dense bush and other vegetation. At least twelve graves are visible. However, the graveyard may hold many more graves according to mine personnel who have observed the graveyard during the winter when the vegetation has receded.

Most of the graves are covered with piles of stone. At least one grave is fitted with a granite headstone and trimmings and two are decorated with cement head stones. It seems as if the majority are fitted with short iron pegs to which iron tags were welded. Inscriptions occur on some of the iron tags. The majority, however, have disappeared.



Figure 16 - GY01 is located on the edge of a wattle bush and is obscured by dense vegetation cover. At least twelve graves are visible. However, many more graves may exist according to mine personnel.

The graves with head stones and iron tags with decipherable inscriptions read as follow:

- 'Motsepe Masilela Marhobodlha Died 09-10-1931'
- 'Koos Masilela 1969-25 October'
- 'Sylvia Moitshwe 090494'
- 'Mzobe Zulu Simangele Josephina Born 160725 Died 150495' Rest in peace'
- 'Mlotya Loloi Amos Geb 040719 Dood 010197'

It is highly likely that most of the graves in GY01 are older than sixty years although younger graves do occur.

6.3.2 Graveyard 02

Graveyard 02 (GY02) is located in the midst of an agricultural field which is currently not being cultivated. It is covered with a sturdy patch of kikuyu grass and circumscribed with thick vegetation.



Figure 17 - GY02 is covered with a thick mat of kikuyu grass and holds a single visible cement headstone.

GY02 probably comprises at least three large patches with kikuyu grass which join each other although no graves could be observed in two of these patches of grass. According to mine personnel who have seen the graveyard when it was not covered with vegetation during the winter it may hold as many as 75 to 100 graves.

At least three graves and twenty iron pegs are visible in the main patch of kikuyu grass. One of these graves is fitted with a cement headstone with the following inscription.

- 'Lala ngogolo Makomani Tshena Budala 80 Walala June 1932'



Figures 18 & 19 - GY02 is located in a patch of kikuyu grass and only graves which are marked with short iron pegs can be observed. It is highly likely that iron pegs which may identify graves have been removed or have disappeared under the grass cover (above and below).

It is highly likely that most of the graves in GY02 are older than sixty years.

6.3.3 Graveyard 03

This graveyard (GY03) is located in the midst of an active maize field near Road 253. It is demarcated with a dilapidated fence and holds at least eleven graves.

Two of the graves with cement headstones bore decipherable inscriptions, namely:

- 'Witbooi Mabhena 9 Desember 1966'
- '1948' (On the headstone of a child's grave)

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



Figure 20- GY03 is located in the midst of an active maize field and holds eleven graves (above).

6.3.4 Graveyard 04

Graveyard 04 is located between maize fields near Anglo's private owned road that links the R38 with Road 253. The graveyard holds approximately 25 graves. More graves may exist as the graveyard is in a severe neglected state whilst the majority of the graves are undecorated.

Most of the graves are covered with piles of stone. At least one grave is fitted with a granite headstone and trimmings. The headstone bears the following inscription:

- 'Nthombizi Kuphi Tryphina Nkosi B 11-11-1914 D 06-10-1998 May your soul rest in peace mother'.

It can be assumed that a substantial number of the graves are older than sixty years.



Figure 21- GY04 is hemmed between two maize fields and is located on a patch of disturbed ground where a former rural village may have existed. The mud houses in this village have been demolished. GY04 holds at least twenty five graves (above).

6.3.5 Graveyard 05

Graveyard 05 is located near a small rural hamlet and is situated on the edge of a maize field near Eskom' power lines. The graveyard holds approximately six visible graves which are demarcated with palisade fencing. The majority of the graves are decorated with either granite or cement headstones with trimmings.

Inscriptions on some of the headstone read as follow:

- 'Hier rus ons liewe eggenoot en pappie Gerhardus Venter Geb 3 Okt 1908 Oorl 3 Apr 1939 Eggenote Susanna Venter Kindjie Gerhardus Venter'
- 'Hier rus ons liefing Johannes van Rensburg Geb 26 Mei 1941 Ovl 29 Mei Veilig in Jesus arms'
- 'Hier rus ons moeder Judith Johanna Dorothea Erasmus Geb van der Merwe Ge 24 Nov 1866 Ovl 30 Jan 1928 Ges 20 V8

It can be assumed that the remaining graves without decipherable inscriptions are also older than sixty years.



Figure 22- GY05 is located near maize fields and Eskom's power lines and holds six visible graves (above).

6.3.6 Graveyard 06

Graveyard 06 is located near a small rural hamlet and is situated on the edge of a maize field near Eskom' power lines. The graveyard holds approximately four visible graves but more graves may occur. One of the graves is decorated with a granite headstone and trimmings.

The inscription on the headstone reads as follow:

- 'Mkhokwana Roselinah Mokwena B 15101925 D 05021965 Siyohlala Sikukhumbula Njalo'.

It can be assumed that the remaining graves may be older than sixty years.



Figure 23- GY06 is located near a rural hamlet between maize fields and in close proximity of Eskom's power lines. It holds at least four visible graves (above).

6.3.7 Graveyard 07

Graveyard 07 is located near the shoulder of the R35 to the north of the Klipfontein Project Area and as such falls outside the project area.

The graveyard is located on the edge of a maize field and holds approximately seven visible graves. However, more graves may occur. Although some of the graves are decorated no inscriptions are visible or decipherable on any of the cement headstones.

It can be assumed that the majority of the graves are older than sixty years.



Figure 24- GY07 is located near the shoulder of the R38 and on the edge of a maize field. This graveyard holds approximately seven visible graves and occurs outside the project area (above).

6.3.8 Graveyard 08

Graveyard 08 is located near the shoulder of the R35 to the north of the Klipfontein Project Area and as such falls outside the project area. The graveyard is located directly next to GY07 on the edge of a maize field.

GY08 is demarcated with a fence and fitted with an entrance gate.

GY08 holds approximately ten visible graves but more graves may occur. Two of the graves are decorated with granite headstones and trimmings whilst another two are fitted with cement headstones. The remainder of the graves are undecorated.

The inscriptions on two of the headstones read as follow:

- 'Selby Themba Lala Ngomusa Kankulunkhulu 24091967'.
- 'Mrs Cathrne Skhosana'

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



Figure 25- GY08 is located near the shoulder of the R38 and on the edge of a maize field. This graveyard holds approximately ten visible graves, is demarcated with a fence and fitted with a gate. GY08 occurs outside the project area (above).

6.4 Tables

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 near the Project Area (above).

Graveyards	Coordinates	Significance
Inside the project area		
GY01. Graveyard on the edge of a wattle bush holding at least twelve graves. Older than sixty years. Many more inconspicuous graves may occur.	25° 59.134'S 29° 31.154'E	HIGH
GY02. Located in the midst of an inactive maize field. Older than sixty years. Approximately 100 graves.	25° 59.273'S 29° 30.587'E	HIGH
GY03. Located in the midst of an active maize field. Older than sixty years. Approximately 11 graves.	25° 58.346'S 29° 29.879'E	HIGH
GY04. Located between maize fields near Anglo road. Older than sixty years. Approximately 25 graves.	25° 59.937'S 29° 29.981'E	HIGH
GY05. Located near rural dwellings on edge of maize field. Older than sixty years. Six (6) visible graves.	25° 59.581'S 29° 30.951'E	HIGH
GY06. Located near rural dwellings on edge of maize field. Older than sixty years. Six (4) visible graves but probably more in existence.	25° 59.592'S 29° 30.947'E	HIGH
GY07. Located on edge of maize field near the R35. Older than sixty years. Approximately 7 graves.	25° 57.047'S 29° 28.909'E	HIGH
GY08. Located on edge of maize field near the R35. Ten (10) visible graves but more may occur. Older than sixty years.	25° 57.054'S 29° 28.919'E	HIGH

6.5 Possible impact on the heritage resources

The LOM Alternative 01 will affect GY01, GY02, GY05 and GY06 as they occur in the proposed open cast mining area.

The LOM Alternative 02 will affect GY01, GY02, GY05 and GY06 as they occur in the proposed open cast mining area.

The LOM Alternative 03 will affect GY01 and GY02 as they occur in the proposed open cast mining area.

Road Alternative 01 occurs approximately 40m from GY04 and need not to affect the graveyard (as the road can slightly be deviated if it collides with GY04).

GY03 falls outside the footprint of the Klipfontein Project whilst GY07 and GY08 fall outside the mine lease area. As these graveyards will not to be affected by the proposed Klipfontein Project they are not included in any further discussions in this report.

6.6 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).

6.7 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 0 – None	Duration: 5 – Permanent 4 - Long-term (ceases with the operational life) 3 - Medium-term (5-15 years) 2 - Short-term (0-5 years) 1 – Immediate
Scale: 5 – International 4 – National 3 – Regional 2 – Local 1 – Site only 0 – None	Magnitude: 10 - Very high/don't know 8 – High 6 – Moderate 4 – Low 2 – Minor

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

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

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

- More than 80 significance points indicates VERY HIGH environmental significance.
- Between 60 and 80 significance points indicates HIGH environmental significance.
- Between 40 and 60 significance points indicates MODERATE environmental significance.
- Between 20 and 40 significance points indicates LOW environmental significance.
- Less than 20 significance points indicates VERY LOW environmental significance.

The significance of any possible impact on the graveyards is very high (Tables 2-4).

Table 2: The significance of potential impacts on the graveyards during the LOM Alternative 01 or Full Extent option for the mine development (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
GY02	5	10	5	1	90	Very High	Low
GY05	5	10	5	1	90	Very High	Low
GY06	5	10	5	1	90	Very High	Low

Table 3: The significance of potential impacts on the graveyards during the Go Forward Option 01 (GF01) for the mine development (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
GY02	5	10	5	1	90	Very High	Low
GY05	5	10	5	1	90	Very High	Low
GY06	5	10	5	1	90	Very High	Low

Table 4: The significance of potential impacts on the graveyards during the Go Forward Option 02 (GF02) for the mine development (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
GY02	5	10	5	1	90	Very High	Low

6.8 Mitigating the graveyard impacts

The impacts to the graveyards 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 graveyards will be low after mitigation (Tables 2-4).

6.9 Managing graveyards that remain unaffected

Graveyards that remain unaffected within the Klipfontein Section of the Middelburg Mine such as GY03 and GY04 should be managed to ensure their future unaffected existence during the construction, operation and decommissioning phase of the Klipfontein Project, namely:

- 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.

6.10 Summary

The LOM Alternative 03 is preferred for the Klipfontein Project considered from a heritage point of view as this alternative will only affect GY01 and GY02 as they occur in the proposed open cast mining area.

Road Alternatives 01 or 02 are suitable for construction considered from a heritage point of view as both roads do not collide with any graveyards. Road Alternative 01 will avoid GY04 with approximately 40m clearance distance between the road and the graveyard. This distance can be increased if the road is deviated slightly further to the west. Dust pollution may require that the graveyard be maintained on a more regular basis than the three month period recommended.

The LOM Alternative 03 option in conjunction with Road Alternative 02 therefore are suitable options for the Klipfontein Project considered from a heritage point of view.

7 CONCLUSION AND RECOMMENDATIONS

The Phase I HIA study for the proposed mine development 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:

- Eight graveyards.

The graveyards were geo-referenced and mapped (Figure 11; Table 1). The significance of the graveyards is indicated as well as the significance of any impact on some of these graveyards (Table 2). Mitigation measures are outlined for graveyards which will be affected by the proposed Klipfontein Project and management measures for those graveyards which remain unaffected in the project area.

Possible impact on the heritage resources

The LOM Alternative 01 will affect GY01, GY02, GY05 and GY06 as they occur in the proposed open cast mining area.

The LOM Alternative 02 will affect GY01, GY02, GY05 and GY06 as they occur in the proposed open cast mining area.

The LOM Alternative 03 will affect GY01 and GY02 as they occur in the proposed open cast mining area.

Road Alternative 01 occurs approximately 40m from GY04 and need not to affect the graveyard (as the road can slightly be deviated if it collides with GY04). Road Alternative 02 will affect none of the graveyards.

GY03 falls outside the footprint of the Klipfontein Project whilst GY07 and GY08 fall outside the mine lease area. As these graveyards will not to be affected by the proposed Klipfontein Project they are not included in any further discussions in this report.

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 any possible impact on the graveyards is very high. The significance of potential impacts on the graveyard before mitigation is high (Tables 2-4).

Mitigating the graveyard impacts

The impacts to the graveyards 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 graveyards will be low after mitigation (Tables 2-4).

Managing graveyards that remain unaffected

Graveyards that remain unaffected within the Klipfontein Section of the Middelburg Mine such as GY03 and GY04 should be managed to ensure its future unaffected existence during the construction, operation and decommissioning phase of the Klipfontein Project, namely:

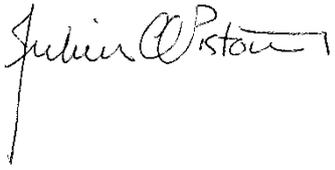
- Graveyards must be demarcated with fences or with walls and must be fitted with access gates.
- Regulated visitor hours should be implemented that is compatible with mine safety rules. This will not be necessary when graveyards are located next to national roads.
- Corridors of at least 20m should 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.
- Graveyard should be kept tidy from any invader weeds and any other refuse.

Summary

The LOM Alternative 03 is preferred for the Klipfontein Project considered from a heritage point of view as this alternative will only affect GY01 and GY02 as they occur in the proposed open cast mining area.

Road Alternatives 01 or 02 are suitable for construction considered from a heritage point of view as both roads do not collide with any graveyards. Road Alternative 01 will avoid GY04 with approximately 40m clearance distance between the road and the graveyard. This distance can be increased if the road is deviated slightly further to the west. Dust pollution may require that the graveyard be maintained on a more regular basis than the three month period recommended. Road Alternative 02 will affect none of the graveyards.

The LOM Alternative 03 option in conjunction with Road Alternative 02 therefore are suitable options for the Klipfontein Project considered from a heritage point of view.

A handwritten signature in black ink, reading "Julius CC Pistorius". The signature is written in a cursive style with a long vertical line extending downwards from the first letter 'J'.

Dr Julius CC Pistorius

Archaeologist & Heritage Consultant

8 SELECT BIBLIOGRAPHY

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9 SPOKESPERSONS CONSULTED

Goodness Bopape (Environmental Specialist) Middelburg Mine

Pule Monyane (Environmental Technician) Middelburg Mine.

APPENDIX A: 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)

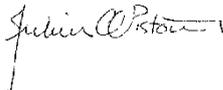
Independent Archaeologist and Heritage Consultant (2003-)

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 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 etc. as well as with several environmental companies.

APPENDIX B: DECLARATION OF INDEPENDENCE

<p>I, Julius CC Pistorius, declare that:</p> <ul style="list-style-type: none"> • I act as the independent environmental practitioner in this application • I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant • I declare that there are no circumstances that may compromise my objectivity in performing such work; • I have expertise in conducting environmental impact assessments, including knowledge of the National Heritage Resources Act (No 25 of 1999) and any guidelines that have relevance to the proposed activity; • I will comply with the Act, regulations and all other applicable legislation; • I will take into account, to the extent possible, the matters listed in regulation 8 of the regulations when preparing the application and any report relating to the application; • I have no, and will not engage in, conflicting interests in the undertaking of the activity; • I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority; • I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application; • I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report; • I will keep a register of all interested and affected parties that participated in a public participation process; and • I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not • all the particulars furnished by me in this form are true and correct; • will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and • I realise that a false declaration is an offence in terms of regulation 71 and is punishable in terms of section 24F of the Act. <p>Disclosure of Vested Interest</p> <p>I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2010.</p>
<p></p> <p>_____ Signature of the environmental practitioner: Private Consultant</p> <p>_____ Name of company: 15 December 2014</p> <p>_____ Date:</p>
<p>_____ Signature of the Commissioner of Oaths:</p> <p>_____ Date:</p> <p>_____ Designation:</p>



the **dedet**

Department:
Economic Development, Environment and Tourism
MPUMALANGA PROVINCIAL GOVERNMENT

Details of specialist and declaration of interest in respect of an application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2010

PROJECT TITLE

Middelburg Mine Klipfontein Section proposed extension of opencast operations and associated relocation of road D253

Specialist:
Nature of specialist study compiled:
Contact person:
Postal address:
Postal code:
Telephone:
E-mail:
Qualifications & relevant experience:
Professional affiliation(s) (if any)

Julius Pistorius		
Heritage Impact Assessment		
Dr Julius C Pistorius		
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juliuscc@absmail.co.za		
ASAPA member		
D Phil Archaeology (UP, 1989)		
ASAPA		

The specialist appointed in terms of the Regulations

I, DR JCC Astorini declare that -

General declaration:

- I act as the independent specialist 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 the specialist report relevant to this application, including knowledge of the Act, regulations 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;
- 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;
- All the particulars furnished by me in this form are true and correct; 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.

Julian Astorini
Signature of specialist:

Name of company:
24-1-2014

Date:
[Signature]
Signature of Commissioner of Oaths

Date:
24/03/2014

Designation:
Official stamp (below)

GARETH SIMPSON
COMMISSIONER OF OATHS
AND MARRIAGE OFFICER
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