Prepared for:

Renee Janse van Rensburg & Jane Mahaba
Ground Water Consulting Services
PO Box 2597 Rivonia 2128
Tel 011 8035726 & Fax 0118035745

A PHASE I HERITAGE IMPACT ASSESSMENT STUDY FOR KANGRA COAL'S (PTY) LTD (KANGRA COAL) PROPOSED NEW MINING AREAS AND ROADS FOR THE MAQUASA EAST AND THE NOOITGESIEN OPEN CAST MINING OPERATIONS NEAR THE HEYSHOPE DAM BETWEEN ERMELO AND PIET RETIEF IN THE MPUMALANGA PROVINCE OF SOUTH AFRICA

Prepared by:

DR JULIUS CC PISTORIUS
Archaeologist & Heritage Consultant
Member ASAPA
Rosemary Street 352 Lynnwood 0082
PO Box 1522 Roodekuil Bela Bela 0480
Tel and fax 0147362115
Cell 0825545449
March 2013

EXECUTIVE SUMMARY

Kangra Coal (Pty) Ltd (Kangra Coal) intends to establish eight new open cast mining areas and haul roads in the Maquasa East and the proposed Nooitgesien Mining Areas to the west of the Heyshope Dam between Ermelo and Piet Retief along the escarp in the Mpumalanga Province of South Africa. The footprints of the proposed new open cast mining areas and and haul roads are collectively referred to as the Project Area whilst the proposed mining development project is referred to as the Kangra Project.

The proposed Kangra Project may have an influence on any of the types and ranges of heritage resources which are outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999). Consequently, a Phase I Heritage Impact Assessment (HIA) study was conducted for the Kangra Project as required by Section 38 of the National Heritage Resources Act (No 25 of 1999).

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

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

The Phase I HIA for the proposed Project Area revealed the following types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999), namely:

- Remains from the historical period in and near the Project Area.
- Informal graveyards and graves in and near the Project Area.

No pre-historical remains were recorded. This study also did not provide for a paleontological study.

The graveyards and historical remains were geo-referenced and mapped (Figures 8, 9 & 20).

The significance of the heritage resources

The historical remains and graveyards will be negatively affected when the proposed Kangra Project is implemented during the construction phase.

The significance of the heritage resources therefore has to be indicated as well as mitigation measures for those heritage resources which will be affected by the proposed Kangra Project.

The significance of the impacts on the heritage resources was determined using a ranking scale.

The historical remains

All buildings and features older than sixty years are considered to be of historical significance and are protected by Section 34 and Section 38 of the National Heritage Resources Act (No 25 of 1999).The historical remains can be considered to be of low significance when considering criteria such as the following (Table 1):

- These remains are common across the Eastern Highveld (although being threatened on an increasing scale due to general development).
- These remains do not have any educational, research, aesthetical or any other significance which warrants their continued existence, conservation or even future use (e.g. as a historical site [open air museum]).
- The remains have been adequately documented for future reference during the Phase I HIA study.

The graveyards

All graveyards and graves can be considered to be of high significance and are protected by various laws (Table 2). Legislation with regard to graves includes Section 36 of the National Heritage Resources Act (No 25 of 1999) whenever graves are older than sixty years. The act also distinguishes various categories of graves and burial grounds. Other legislation with regard to graves includes those which apply when graves are exhumed and relocated, namely the Ordinance on Exhumations (No 12 of 1980) and the Human Tissues Act (No 65 of 1983 as amended).

Possible impact on the heritage resources

It is highly likely that historical remains DC03 to DC07 and graveyards GY05, GY07, GY09, GY0110 and GY11 will be directly affected (destroyed) by the Kangra Project whilst the historical remains DC01, DC02 and DC03 and graveyards GY01, GY02, GY03, G04, GY06 and GY08 may only be impacted indirectly by the Kangra Project.

The impact on the heritage resources will occur during the construction phase as the removing of top soil to commence with mining occur at the onset of the Kangra Project.

The significance of the impact on the heritage resources therefore has to be indicated.

The historical remains

The significance of the impact on the historical remains is outlined in Tables 4(a) and 4(b).

The graveyards

The significance of the impacts on the graveyards and graves is outlined in Tables 5(a) and 5(b).

Mitigating the heritage resources

The following mitigation measures have to be applied to the historical remains and graveyards and graves which will be affected directly or indirectly during the construction phase for the proposed Kangra Project, namely:

The historical remains

These remains have low significance and have been described; geo-referenced; tabulated; mapped on a 1:50 000 topographical map and have been photographed, the evidence of which is provided in this report. These remains therfore have been adequately documented for future reference by any researcher or interested person seeking knowledge about the early occupation, life-ways, settlement patterns and traditions on the Eastern Highveld during the early twentieth century.

As these remains have been documented in this Phase I HIA study Kangra Coal needs not to apply for a demolishing permit from SAHRA for these remains that will be directly (destroyed) or indirectly affected in order to make way for the proposed Kangra Project.

The graveyards

It seems as if some or all of the graveyards and graves may hold graves which are older than sixty years. The graveyards and graves can be mitigated in two ways depending on whether they may be affected, directly or indirectly, namely:

- By means of exhumation and relocation when graveyards are affected directly (GY05, GY07, GY09, GY10 and GY11). 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.

- Graveyards can be demarcated with brick walls or with fences when they are affected indirectly and not in any physical way (GY01, GY02, GY03, G04, GY06, GY08). Conserving graveyards *in situ* in mining areas create the risk and responsibility that they may be damaged, accidentally, that the mine remains responsible for the graveyards' future unaffected existence, maintenance and that controlled access must exist for any relatives or friends who wish to visit the deceased. Safe corridors not less than 15m wide therefore must be maintained between graveyards and mining related activities and the graveyards and graves must be fenced-off. A Conservation Management Plan for the ongoing protection of these graveyards and graves must be included in the Environmental Management Plan for the mine.

General (general disclaimer)

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

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

CONTENTS

1 INTRODUCTION

Kangra Coal (Pty) Ltd (hereafter referred to as Kangra Coal) intends to establish eight new open cast mining areas (Block A to Block G) and haul roads at the Maquasa East

and the Nooitgesien Mining Areas near the Heyshope dam between Ermelo and Piet Retief along the escarp in the Mpumalanga Province of South Africa. The footprints of the proposed new open cast mining areas and the haul roads are collectively referred to as the Project Area whilst the proposed mining project is referred to as the Kangra Project.

Focused archaeological research along the escarp in the Mpumalanga Province has indicated that this region has a rich heritage comprised of remains dating from the pre-historical and from the historical (or colonial) periods of South Africa. These pre-historical and historical remains form a record of the heritage of most groups living in South Africa today (see Box 1).

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

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

a. Places, buildings structures and equipment of cultural significance;
b. Places to which oral traditions are attached or which are associated with living heritage;
c. Historical settlements and townscapes;
d. Landscapes and natural features of cultural significance;
e. Geological sites of scientific or cultural importance;
f. Archaeological and palaeontological sites;
g. Graves and burial grounds including

2 TERMS OF REFERENCE

Kangra Coal's proposed mining project involves the establishment of eight new open cast pits and haul roads at the Maquasa East and Nooitgesien Mining Areas The

Kangra Project may impact on any of the types and ranges of heritage resources ('national estate') which are outlined in Section 3 of the National Heritage Resources Act (No. 25 of 1999) (see Box 1). Consequently, Ground Water Consulting Services commissioned the author to undertake a Phase I HIA study for the proposed Project Area.

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

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

3 THE PROJECT AREA

3.1 Location

Kangra Coal's Project Area is located on the farms Maquasa 19HT, Roodekraal 21HT and Rooikop 18HT which is part of a swath of land which stretches along an undulating grassland between the extensive Mantshangwe mountain range in the west and the village of Driefontein and the Heyshope Dam in the east. The Project Area is bisected from the north to the south by the Gude River with numreous small streams feeding into this river. Patches with agricultural fields occur across the Project Area.

The larger part of the Project Area is relatively pristine. Small, scattered villages occupied by Sotho and Swazi speaking communities with varying numbers of individuals which are sometimes associated with graveyards occur across the Project Area (2630 CD Panbult & 2730 Dirkiesdorp; 1:50 000 topographical map) (Figures 1-7).

Figure 1- Kangra Coal's Project Area stretches from the extensive Mantshangwe mountain range in the west towars the village of Driefontein and the Heyshope dam in the east (above).

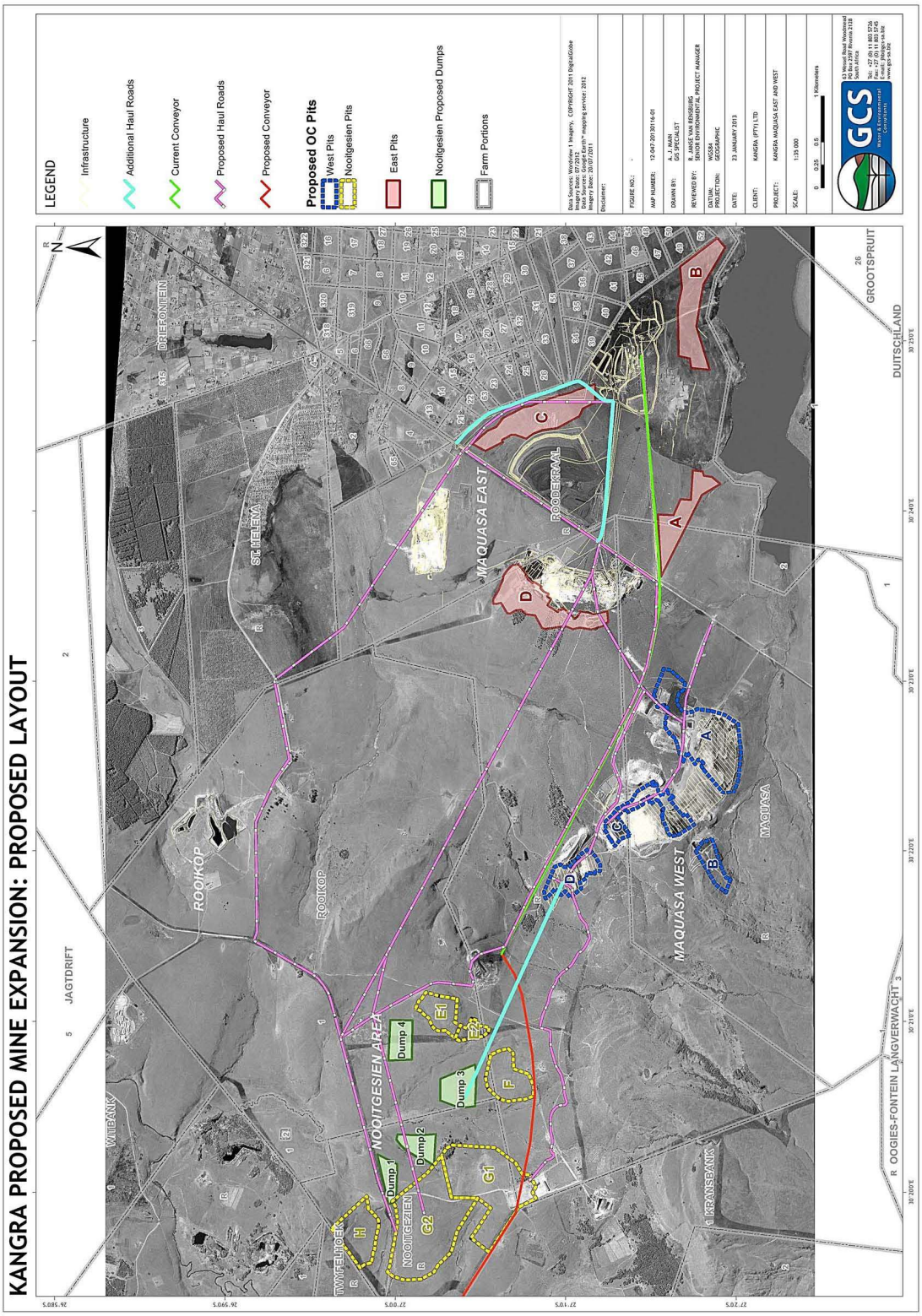

Figure 2- Kangra Coal's proposed expansion project involves the development of eight open cast pits and haul roads (above).

3.2 The nature of the Kangra Project Area

The Kangra Project Area is part of the Mpumalanga Escarpment and is characterised by extensive mountain ranges composed of sandstone with some dolerite outcrops and dykes which manifest as low kopjes and inconspicuous randjes. In between the massive sandstone mountains an outstretched grass veld runs across undulating plains. The larger project area is pristine and is characterised by the absence of any trees except for the occurrence of exotics such as Blue Gum plantations and dense stands with wattle trees. Scattered human settlements occur across the area. Agricultural fields are limited and small in extent whilst the only evidence for the large scale alteration of the environment is confined to abandoned coal mining activities as well as current coal mining operations.

3.3 The nature of the Kangra Project

Kangra Coal intends to expand its opencast operations with the addition of eight new opencast pits and the construction of new haul roads. A proposed new conveyer route indicated in all figures is no longer part of this project (Figure 2).

3.3.1 The Mining Areas

3.3.1.1 The Maquasa East Mining Area

The following open cast mines are planned in the Maquasa East Mining Area, namely (Figure 3):

Block A

Block A (Figure 3, bottom left) is located on the eastern end of Maquasa 19HT and the western edge of Roodekraal 21HT. The mine is located to the south of an existing conveyer belt and on the higher banks of the western end of the Heyshope Dam. The terrain is characterized by grass veld which slopes towards the Heyshope Dam in the south.

Figures 3 & 4- Kangra Coal's proposed four open cast mining pits near the in the Maquasa East Mining Area (above). The proposed Block B on Roodekraal 19HT near the banks of the Heyshope Dam (below).

Block B

This proposed mine is located on Roodekraal 21HT near the northern banks of the Heyshope Dam and is wedged between the dam and the village of Driefontein (Figure 3, bottom right). Block B is located on a stretch of grass veld that slopes southwards into the dam. The southern sloping parts of the mining area is characterised by outcrops of ferricrete along the banks of the Heyshope dam.

Block C

This proposed mining area is located on Roodekraal 21HT adjacent (north) of a waste dump (Figure 3, top right). It is situated on a level grass veld and is wedged between the waste dump and the road that runs to Kangra Coal's processing plant. This area has largely been disturbed as a result of earth moving activities and the dumping of soil in the past.

Figure 5- Kangra Coal's proposed Block C is a disturbed area where quarrying is taking place next to a dump (above)

Block D

This proposed mining area is located on Rooikop 18HT on a piece of grass veld and a stretch of land which has been mined in the past. Block D is situated between two dirt roads, one in the north and the other in the south (Figure 3, top left). This mining area slopes towards the Gude stream in the west. Block D is disturbed as a result of earlier mining activities. Wattle bush encroachment occurs along the northern edge of this piece of land.

3.3.1.2 The Nooitgesien Mining Area

The following open cast mines are planned in the Nooitgesien Mining Area, namely:

Figure 6- Kangra Coal's proposed four open cast mine pits in the Nooitgesien Mining Area which is located to the western of the Maquasa Mining Area (above).

Block E

This proposed mining area is situated near one of Kangra's operating shafts on Rooikop 18HT (Figure 5, top right). This piece of land stretches around the southern and western base a low rise which slopes towards the south and the west.

Block F

Block F is located on Rooikop 18HT and is situated on an outstretched piece of grass veld that slopes towards the west and towards Block G (Figure 5, bottom east). This piece of land is characterised by grass veldt with a small Blue Gum lot where a village occupied by a few families and their homesteads occur.

Figure 7- Block G on Rooikop 18HT stretches towards a low rise in the north-west where Block H is located above the Hlelo River (above).

Block G

Block G is situated on Rooikop 18HT in an area that is generally lower than the surrounding landscape. Stands with Blue Gum trees occur towards the central part of this piece of land (Figure 5, bottom west).

Block H

This proposed open cast mining area is located in grass veld along the southern and western slope of a low rise on Rooikop 18HT. The proposed new mine is located above the Hlelo River in close proximity of earlier abandoned mining activities (Figure 5, north).

3.3.2 The haul roads

At least five new haul roads are planned, namely (Figure 2):

- Road 1 (bright blue): Runs from Pit D (Maquasa West) to Dump 3 (Nooitgesien).
- Road 2 (pink & white): Runs from Pit D (Maquasa West) to Pit G1 (Nooitgesien).
- Road 3 (pink & white): Runs between Pit D (Maquasa East) to the existing Road north of Dump 4 (Nooitgesien).
- Road 4 (pink & white): Runs between the point where the new conveyor route starts (red line) to the existing dirt road north of Dump 4 (Nooitgesien).
- Road 5 (pink & white): Runs between Road 3 (Nooitgesien) to Pit G2 (Nooitgesien).

These haul roads are not illuminated with photographs as the majority cross landscape close to the open cast pits which are illustrated in Figures 3-7.

4 APPROACH AND METHODOLOGY

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

4.1 Fieldwork

The larger Project Area was surveyed with a vehicle considering the size and extent of the area. The aim with the survey was to geo-reference, describe and photograph heritage resources whenever they existed. Not all Blue Gum plantations or disturbed parts of the Project Area were traversed or surveyed on foot. Disturbed areas included Block C and Block D of Maquasa East of which the latter was not accesible as mining relating activities are taking place.

Figure 00- The main track pathway which was followed during the survey and which was recorded with a mounted GPS. Smaller detailed pedestrian surveys were conducted from the main track route (above).

A GPS track pathway was registered with a mounted GPS instrument which outlines the main track for the survey. More detailed pedestrian surveys were conducted from this main track. All the open cast mining areas were traversed on foot. The pedestrian survey also included stretches of the new haul roads. Parts of the Project Area were also surveyed on at least two occasions in the past (Pistorius 2008, 2012). Tracks of land around the Project Area was also surveyed by the author (Pistorius 2011).

Photographs illuminate the characteristic features of the Project Area (see Part 3.2 **'**The nature of the Kangra Project', Figures 3 –7).

4.2 Databases, literature survey and maps

Literature relating to the pre-historical and the historical unfolding of the Eastern Highveld was reviewed. This review focused primarily on the pre-history as well as the Historical Period on the Eastern Highveld. It also provided a broad outline of the coal mining history of the region as well as its indigenous architecture. The literature research contextualises the pre-historical and historical background of the Eastern Highveld which again contributes to a better understanding of the identity and meaning of heritage sites which occur in and near the Project Area.

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

In addition, the Project Area was studied by means of maps on which it appears (2630 CD Panbult & 2730 Dirkiesdorp; 1:50 000 topographical maps & 2628 East Rand 1: 250 000 map).

4.3 Assumptions and limitations

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

If any heritage resources of significance is exposed during the construction, operation or closure of the mining project the South African Heritage Resources Authority (SAHRA) should be notified immediately, all development activities must be stopped and an archaeologist accredited with the Association for Southern African Professional

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

4.4 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.
- Conservation (*in-situ*): The conservation and maintenance of ecosystems, natural habitats and cultural resources in their natural and original surroundings.
- Cultural (heritage) resources: A broad, generic term covering any physical, natural and spiritual properties and features adapted, used and created by humans in the past and present. Cultural resources are the result of continuing human cultural activity and embody a range of community values and meanings. These resources are non-renewable and finite. Cultural resources include traditional systems of cultural practice, belief or social interaction. They can be, but are not necessarily identified with defined locations.
- Cultural (heritage) resource management: A process that consists of a range of interventions and provides a framework for informed and value-based decision-making. It integrates professional, technical and administrative functions and interventions that impact on cultural resources. Activities include planning, policy development, monitoring and assessment, auditing, implementation, maintenance, communication, and many others. All these activities are (or will be) based on sound research.
- Heritage resources: The various natural and cultural assets that collectively form the heritage. These assets are also known as cultural and natural resources. Heritage (cultural) resources include all human-made phenomena and intangible products that are the result of the human mind. Natural, technological

or industrial features may also be part of heritage resources, as places that have made an outstanding contribution to the cultures, traditions and lifestyles of the people or groups of people of South Africa.

- Stone Age: Refers to the prehistoric past, although Late Stone Age peoples lived in South Africa well into the Historical Period. The Stone Age is divided into an Earlier Stone Age (3 million years to 150 000 thousand years ago) the Middle Stone Age (150 000 years to 40 000 years ago) and the Late Stone Age (40 000 years to 300 years ago).
- Iron Age: Refers to the last two millennia and 'Early Iron Age' to the first thousand years AD. 'Late Iron Age' refers to the period between the 16th century and the 19th century and can therefore include the Historical Period.
- Historical period: Refers to the first appearance or use of 'modern' Western writing in a particular area or region of the world.
- Pre-historical: Refers to the time before any historical documents were written or any written language developed in a particular area or region of the world.
- Recent past: Refers to the 20th century. Remains from this period are not necessarily older than sixty years and therefore may not qualify as archaeological or historical remains. Some of these remains, however, may be close to sixty years of age and may, in the near future, qualify as heritage resources.
- Maintenance: Keeping something in good health or repair.
- Preservation: Conservation activities that consolidate and maintain the existing form, material and integrity of a cultural resource.
- Protected area: A geographically defined area designated and managed to achieve specific conservation objectives. Protected areas are dedicated primarily to the protection and enjoyment of natural or cultural heritage, to the maintenance of biodiversity, and to the maintenance of life-support systems.
- Reconstruction: Re-erecting a structure on its original site using original components.
- Replication: The act or process of reproducing by new construction the exact form and detail of a vanished building, structure, object, or a part thereof, as it appeared at a specific period.
- Restoration: Returning the existing fabric of a place to a known earlier state by removing additions or by reassembling existing components.

- Sustainability: The ability of an activity to continue indefinitely, at current and projected levels, without depleting social, financial, physical and other resources required to produce the expected benefits.
- Translocation: Dismantling a structure and re-erecting it on a new site using original components.
- Project Area: refers to the area (footprint) where the developer wants to focus its development activities (refer to plan).
- Phase I studies refer to surveys using various sources of data in order to establish the presence of all possible types and ranges of heritage resources in any given Project Area.
- Phase II studies include in-depth cultural heritage studies such as archaeological mapping, excavating and sometimes laboratory work. Phase II work may include the documenting of rock art, engraving or historical sites and dwellings; the sampling of archaeological sites or shipwrecks; extended excavations of archaeological sites; the exhumation of human remains and the relocation of graveyards, etc. Phase II work involve permitting processes, require the input of different specialists and the co-operation and approval of SAHRA.

5 CONTEXTUALISING THE PROJECT AREA

The following brief overview of pre-historical, historical, cultural and economic evidence will help to contextualise the Project Area.

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.

The following overview of pre-historical, historical and cultural evidence indicates the wide range of heritage resources which do occur across the larger Project Area and 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) (covers the period from 2.5 million years ago to 250 000 years ago), the Middle Stone Age (MSA) (refers to the period from 250 000 years ago to 22 000 years ago) and the Late Stone Age (LSA) (the period from 22 000 years ago to 200 years ago).

Dongas and eroded areas at Maleoskop near Groblersdal is one of only a few places in Mpumalanga where ESA Olduwan and Acheulian artefacts have been recorded. Evidence for the MSA has been excavated at the Bushman Rock Shelter near Ohrigstad. This cave was repeatedly visited over a prolonged period. The oldest layers date back to 40 000 years BP 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 farmers (Maggs 1983, 2008).

Approximately 400 rock art sites are distributed throughout Mpumalanga, note-ably 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 paintings (thin scattering from the Limpopo Valley) through the Lydenburg district into the Nelspruit area) and localised late white farmer paintings. Farmer paintings can be divided into Sotho-Tswana finger paintings and Nguni engravings (Only 20 engravings occur at Boomplaats, north-west of Lydenburg). Farmer paintings are more localised than San or herder paintings and were mainly used by the painters for instructional purposes (Smith & Zubieta 2007).

During the LSA and Historical Period, San people called the Batwa lived in sandstones caves and rock shelters near Lake Chrissie in the Ermelo area. The Batwa are descendants of the San, the majority of which intermarried with Bantu-Negroid people such as the Nhlapo from Swazi-descend and Sotho-Tswana clans such as the Pai and Pulana. Significant intermarriages and cultural exchanges occurred between these groups. The Batwa were hunter-gatherers who lived from food which they collected from the veldt as well as from the pans and swamps in the area. During times of unrest, such as the *difaqane* in the early nineteenth century, the San would converge on Lake Chrissie for food and sanctuary. The caves, lakes, water pans and swamps provided relatively 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 for 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 Late Iron Age 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 Piet Retief and Ermelo.

Long before Ermelo came into being the area was frequented by travellers moving between Lydenburg and Natal. The area was well watered and dotted with lakelets and attracted settlers from Lydenburg and elsewhere. The reverend Lion Cachet of Utrecht began to hold regular services on several of the new farms.

In AD1880 a village was proclaimed on the farm Nooitgedacht. The town was named for Ermelo in Gelderland, Holland and was managed by the Dutch Reformed Church until 1895 when the Transvaal government took over. In 1901, during the Anglo-Boer War, the town was completely destroyed by the British. The town was rebuilt from scratch after 1903. Today Ermelo is the educational, communications, industrial and commercial centre for an intensely farmed district. Coal is mined by several large mines and Ermelo lies on the railway line between the Highveldt coal fields and the bulk export harbour of Richards Bay on Kwa Zulu-Natal's north coast.

Heritage sites in Ermelo include: a memorial near the Dutch Reformed Church in honour of the men from the town and district who fought and died in the Anglo Boer War; rock paintings in caves and rock shelters and the Paul Kruger Bridge across the Vaal River which was built in 1897 by the celebrated architect, Sytze Wierda.

5.4 A coal mining heritage

Coal mining on the Eastern Highveld is now older than one century and has become the most important coal mining region in South Africa**.** Whilst millions of tons of high-grade coal are annually exported overseas more than 80% of the country's electricity is generated on low-grade coal in Eskom's power stations such as Duvha, Matla and Arnot situated near coalmines 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-1830 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 has 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 colliers in South Africa attained an annual figure of 9,5million tonnes. Total in-situ reserves were estimated to be 23 billion tonnes in Witbank-Springs, Natal and Vereeniging. The total in situ reserves today are calculated to be 121 billion tonnes. The largest consumers of coal are Sasol, Iscor 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.

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 were 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 utilize the same resources to construct dwellings and shelters. Farmers from Scottish, Irish, Dutch, German and Scandinavian descend settled and farmed in the Eastern Highveld. They brought the knowledge of stone masonry from Europe. This compensated for the lack of fire wood on the eastern Highveld which was necessary to bake clay bricks.

6 THE PHASE I HERITAGE IMPACT ASSESSMENT

6.1 Types and ranges of heritage resources

The Phase I HIA for the proposed Project Area revealed the following types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999), namely:

- Remains from the historical period in and near the Project Area.
- Informal graveyards and graves in and near the Project Area.

No pre-historical remains were recorded. This study also did not provide for a paleontological study.

The graveyards and historical remains were geo-referenced and mapped (Figures 8, 9 & 20).

The significance of these heritage resources is indicated as well as mitigation measures should any of these heritage resources be affected by the proposed Kangra Project (Tables 3-5).

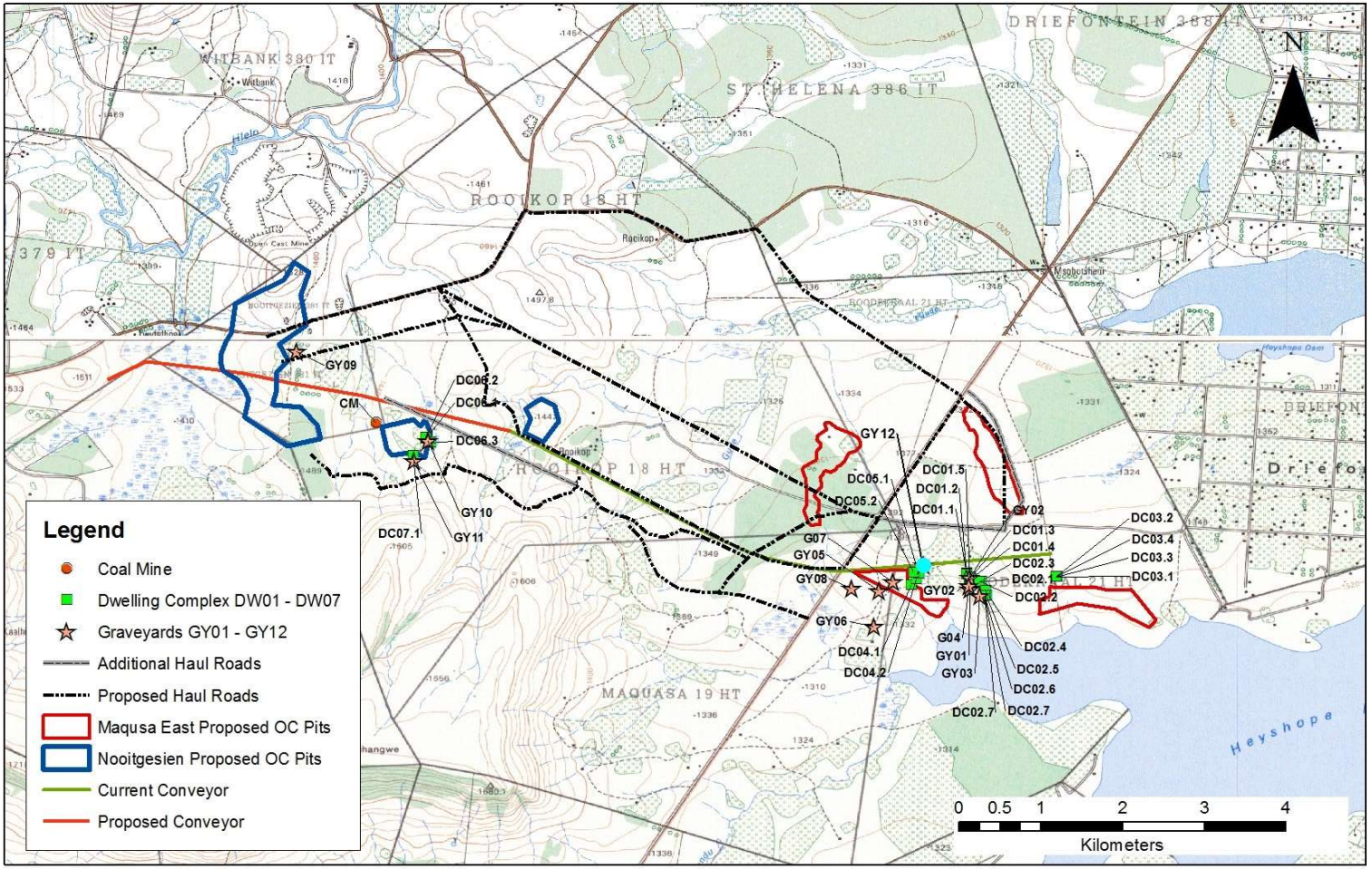

Figure 8 - Kangra Coal's Project Area between Ermelo and Piet Retief near the Heyshope Dam in the Mpumalanga Province.

Note the presence of heritage resources such as graveyards, graves and historical remains in and near the Project Area (above).

6.2 Historical remains

Historical remains consisting of small villages occur in and near the Project Area. These villages comprise of remains consisting of dwellings and enclosures for stock such as cattle kraals and enclosures for smaller stock (sheep and/or goat).

These dwellings and enclosures were constructed with dolerite stone which was collected from dolerite dykes as well as from outcrops of ferricrete. These dwelling complexes cover small surface areas and in most instances are associated with one or more informal graveyard.

It seems as if these villages were occupied by one or more extended families, probably during the latter part of the nineteenth century well into the twentieth century.

The following historical remains were recorded, namely) (Figure 9):

6.2.1 Dwelling Complex 01

This complex of structures include the following remains, namely:

- A foundation consisting of dolerite and ferricrete stone with an elongated ground plan which measures 5x2m (DC01.1).
- A rectangular foundation measuring 9mx9m which was constructed with a double row of dolerite stone with rubble as infill material between these walls (DC01.2). A monolith was erected inside one of the walls of this structure.
- A large cattle enclosure which was constructed with dolerite stone and with a diameter of 40m (DC01.3).
- A circular house foundation which was constructed with a double row of sandstone and with rubble as infill material between these walls. The diameter of the dwelling is 6m (DC01.4).
- A second circular foundation which was constructed with upright stones of which one half of the foundation was robbed. The diameter of this dwelling is approximately 6m (DC01.5).

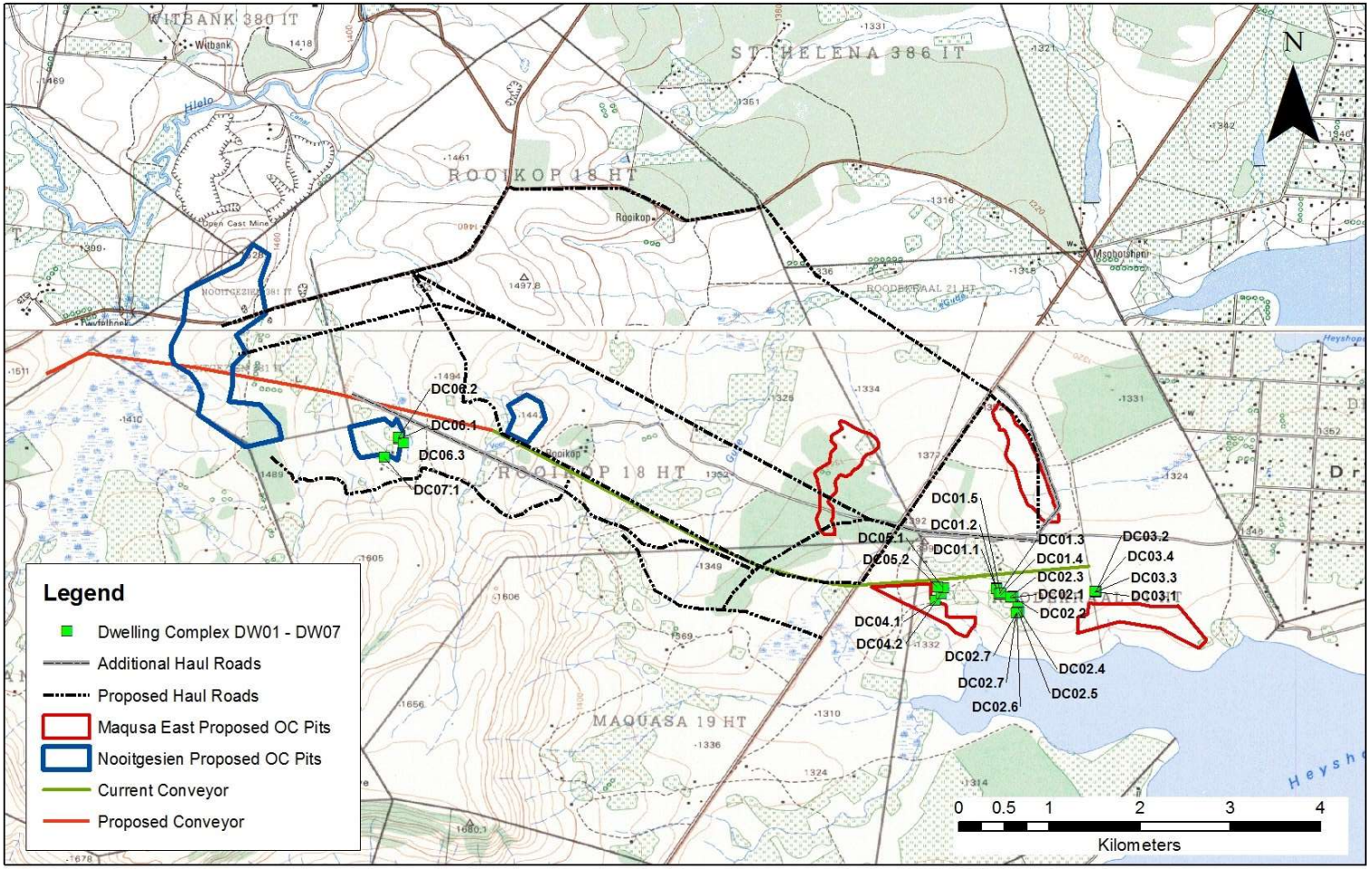

Figure 9 - Note the presence of historical remains such as the foundations for dwellings and enclosures in and near the Project Area (above).

Figures 10 & 11– An elongated foundation for a possible dwelling which was constructed with dolerite and ferricrete (above). A large circular stone-built enclosure in which cattle was penned (below).

6.2.2 Dwelling Complex 02

This complex of structures include the following remains, namely:

- One half of the remains of an enclosure which was constructed with dolerite stone. The diameter of the enclosure is 35m (DC02.1).

Figure 12 & 13- Circular enclosure constructed with dolerite stone of which one half is missing (above).

- Stones which are randomly scattered and which possibly represents the disturbed remains of a dwelling's foundation (DC02.2).
- One half of the remains of an enclosure which was constructed with dolerite stone. The enclosure was constructed with a double row of dolerite stones and was filled in with rubble. The enclosure's diameter is 30m (DC02.3).
- Randomly scattered stones which probably represents the disturbed remains of a dwelling's foundation (DC02.4).
- Part of a cattle enclosure which was constructed with dolerite stone (DC02.5).
- Circular hut foundation constructed with upright ferricrete stones and with a diameter of 4.5m (DC02.6).

Figure 14- Circular foundations for dwellings such as huts which were constructed with ferricrete stone (above).

- Circular hut foundation constructed with upright ferricrete stones and with a diameter of 4,5m (DC02.7).

6.2.3 Dwelling Complex 03

This dwelling complex consits of structures which was constructed with small stones. The structures are not well preserved and in several instances not interpretable. The following structures were distinguished, namely:

- Possible cattle enclosure with a diameter of 20m (DC03.1).
- Piles of stones (DC03.2).
- Pile of stones (DC03.3).
- Pile of stones (DC03.4).

Figure 15- Piles of stone which were part of a dwelling which occurred in a dwelling complex (above).

6.2.4 Dwelling Complex 04

Structures in this dwelling complex was constructed with small stones. The structures are not well preserved and in most instances not interpretable, namely:

- Dilapidated small enclosure with a diameter of 1,5m (DC04.1).
- Small enclosure with a diameter of 0,5m (DC04.2).

6.2.5 Dwelling Complex 05

Structures in this dwelling complex was constructed with small stones and the structures are not well preserved, namely:

- Pile of stones (DC05.1)
- Small dolerite enclosure with a diameter of 5,0m (DC05.2).

6.2.6 Dwelling Complex 06

This dwelling complex is associated with GY10 and the following structures, namely:

- A large cattle enclosure which was constructed with dolerite stone and which was partly sunk into the earth. The diameter of this enclosure is approximately 40m (DC06.1)
- A smaller enclosure which is also partly sunk into the surface. The diameter of this enclosure is 6,0m (DC06.1).
- A circular foundation for a dwelling consisting of a double row of stones. The double wall was filled in with rubble. The diameter of this structure is 3,0m (DC06.3).

Figure 16- A large enclosure which was constructed with dolerite stone. Its double wall was filled-in with rubble. This structure is partly sunk into the surface of the land (above).

6.2.7 Dwelling Complex 07

The remains of this dwelling complex is limited to GY11 and a dolerite enclosure (DC07.1). The enclosure's diameter is approximately 40m.

6.2.8 Possible historical coal mine

The remains of what seems to be a possible coal mine (CM) was recorded against a steep slope in the Project Area. Several shallow excavations next to a sandstone bank suggest that coal may have been mined here at an early period, perhaps during the early 20th century and possibly earlier as well. At least two lower grinding stones occur near one of these excavations.

Figure 17- Two shallow excavations where coal was mined against a sandstone embankment in the Project Area (above).

It is not clear when these mining activities occurred. However, the presence of lower grinding stones emphasises the possibility that these activities ocurred a long time ago and that the mining activities most likely have historical significance.

Figure 18- Lower grinding stones which occur next to the shallow excavations where coal was mined against a steep slope in the Project Area (above).

6.2.9 Table

Table outlining the coordinates and significance rating for historical remains.

Historical remains	Coordinates	Significance
Dwelling Complex 01		
(DC01.1) Elongated ferricrete foundation	27º 01.549' 30º 24.373'	**Low**
(DC01.2) Dolerite foundation for a possible dwelling	27º 01.555' 30º 24.377'	
(DC01.3) Cattle enclosure	27º 01.586' 30º 24.391'	
(DC01.4) Circular house foundation	27º 01.590' 30º 24.402'	
(DC01.5) Upright stones on half circle circumference (dwelling foundation?)	27º 01.579' 30º 24.398'	
Dwelling Complex 02		**Low**
(DC02.1) Half circular structure such as a possible house foundation?	27º 01.603' 30º 24.459'	
(DC02.2) Few scattered dolerite stones	27º 01.602' 30º 24.475'	

(DC02.3) Cattle enclosure (part of wall robbed) (DC02.4) Scattered stones (DC02.5) Cattle enclosure (parts of wall robbed) (DC02.6) Circular ferricrete hut foundation (DC02.7) Circular ferricrete hut foundation	27º 01.118' 30º 24.489' 27º 01.663' 30º 24.503' 27º 01.696' 30º 24.506' 27º 01.695' 30º 24.498' 27º 01.697' 30º 24.495'	
<u>Dwelling Complex 03</u> (DC03.1) Possible cattle enclosure or circular dwellings foundation (DC03.2) Pile of small stones (DC03.3) Pile of small stones (DC03.4) Pile of small stones	 27º 01.571' 30º 23.975' 27º 01.574' 30º 24.966' 27º 01.572' 30º 24.968' 27º 01.571' 30º 24.964'	**Low**
<u>Dwelling Complex 04</u> (DC04.1) Dilapidated small enclosure (DC04.2) Small dolerite enclosure (associated with random occurring small piles of stone)	 27º 01.625' 30º 24.012' 27º 01.587' 30º 24.044'	**Low**
<u>Dwelling Complex 05</u> (DC05.1) Pile of stones (DC05.2) Small dolerite enclosure	 27º 01.550' 30º 24.057' 27º 01.546' 30º 24.025'	**Low**
<u>Dwelling Complex 06</u> (DC06.1) Large enclosure sunk into ground (DC06.2) Small enclosure sunk into ground (DC06.3) Circular dwelling foundation	 27º 00.661' 30º 20.806' 27º 00.654' 30º 20.806' 27º 00.686' 30º 20.838'	**Low**
<u>Dwelling Complex 07</u> (DC07.1) Large dolerite enclosure	 27º 00.773' 30º 20.724'	**Low**
<u>Coal Mine</u> (CM)	 27º 00.557' 30º 20.476'	**Low**

Table 1- Coordinates for historical farmstead complexes in and near the Project Area (above).

6.3 Graveyards

At least twelve graveyards were recorded in and near the Project Area (Figure 20).

It seems as if all or most of the graveyards hold graves older than sixty years.

6.3.1 Graveyard 01

This graveyard (GY01) is associated with historical remains comrising the foundations of structures such as dwellings. GY01 holds approximately fifteen graves which are all covered with piles of dolerite stone. One grave is edged with cement strips and is fitted with a cement slab with the following inscriprtion:

- 'Nthobane Lienn Mabnang Wazaalwa 1914 Washona 02-12-1993'

Figure 19- GY01 holds fifteen graves which are covered with piles of dolerite stone (above).

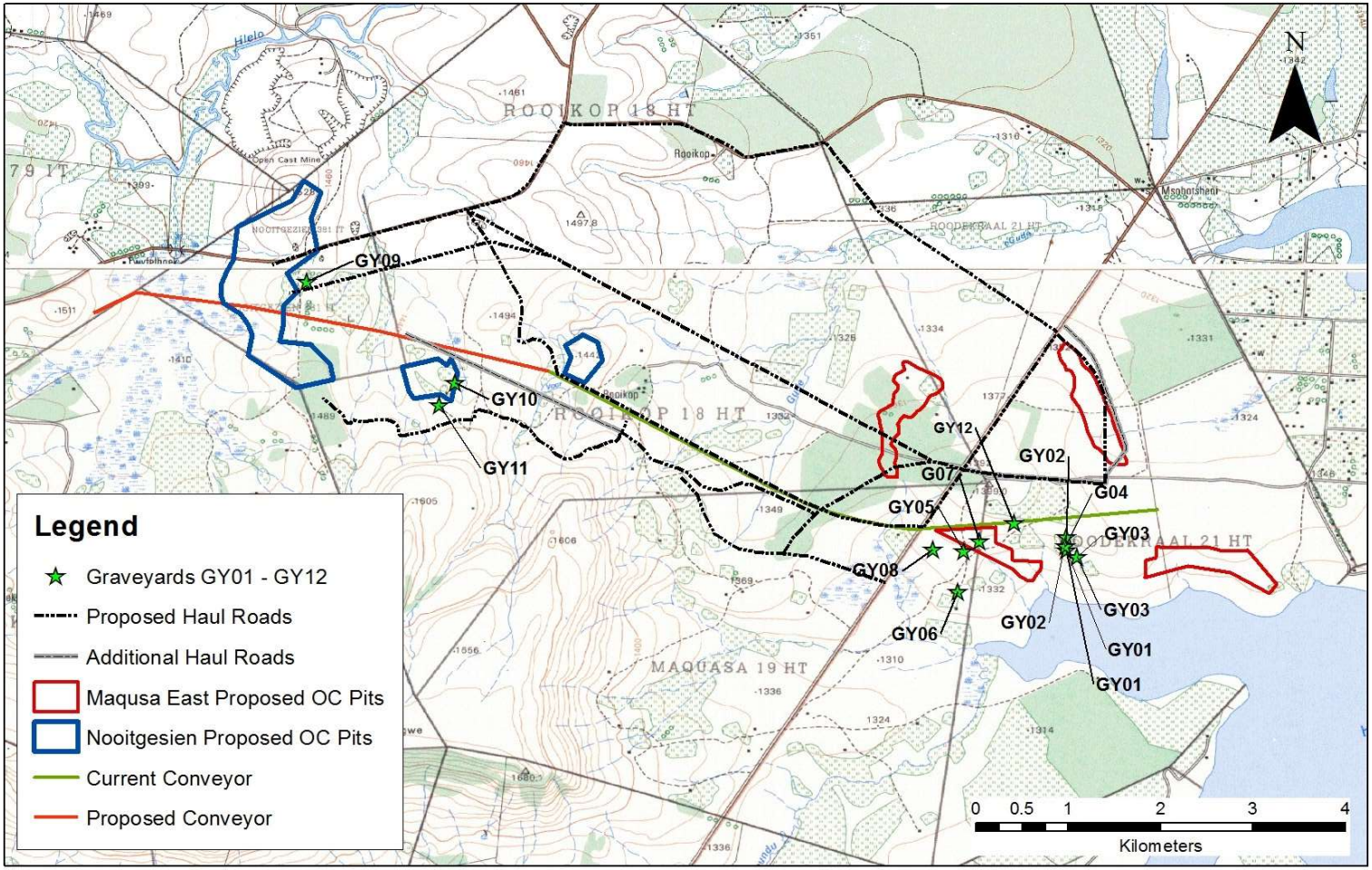

Figure 20 - Kangra Coal's Project Area between Ermelo and Piet Retief near the Heyshope Dam in the Mpumalanga Province.

Note the presence of heritage resources such as historical remains and graveyards and graves recorded in the Project Area (above).

6.3.2 Graveyard 02

This graveyard (GY02) holds approximately eleven graves which are all covered with piles of stone.

Figure 21- GY02 holds eleven graves which are covered with piles of dolerite stone (above).

6.3.3 Graveyard 03

GY03 comprises five graves which are covered with piles of ferricrete stone.

6.3.4 Grave 04

This single grave (G04) is probably part of the complex of historical remains and graveyards which occur in an area up the higher banks of the Heyshope dam.

6.3.5 Graveyard 05

This isolated graveyard (GY05) holds six graves of which one is fitted with a granite headstone. This grave was relocated some time in the past by Kangra Coal.

The inscription on the headstone reads as follow:

- ‘ In loving memory of Kanyesile Madonsela R.I.P Relocated by Kangra Coal’

Figure 22- GY05 holds eleven graves which are covered with piles of dolerite stone (above).

6.3.6 Graveyard 06

This isolated graveyard (GY06) holds twenty seven graves of which four are fitted with granite headstones. These graves were all relocated by Kangra Coal somtime in the past. The inscription on one of the headstone reads as follow:

- ‘ In loving memory of grandfather Yende RIP Relocated by Kangra Coal’

6.3.7 Grave 07

This single grave (G07) comprises an elongated pile of dolerite stones.

6.3.8 Graveyard 08

GY08 is demarcated with a heavy dolerite stone wall. It holds approximately sixteen graves of which only one grave is fitted with a cement head stone.

Figure 23- GY08 holds approximately sixteen graves which are covered with piles of dolerite stone. This graveyard is demarcated with a heavy dolerite stone wall (above).

6.3.9 Graveyard 09

This graveyard (GY08) is demarcated with a heavy dolerite stone wall. It holds six graves of which four are fitted with granite head stones.

The inscription on one of these head stones read as follows:

- ‘ Isikhunbozo Sila Goso Ugotshwayo Phakathi Washona 1954 Lala ngoxolo’

Figures 24 & 25- GY09 holds six graves of which four are fitted with granite headstones and trimmings (above). GY10 holds four graves which are all covered with piles of stone (below).

6.3.10 Graveyard 10

This graveyard (GY10) is associated with historical remains such as a large and smaller enclosure which both are buried beneath the surface.

GY10 holds four graves which are all covered with piles of stone.

6.3.11 Graveyard 11

This graveyard (GY11) is associated with an informal dwelling that is currently being occupied as well as with historical remains such as a large enclosure.

GY11 comprises of at least fifteen graves which are all covered with piles of stone.

Figure 26- GY11 is located near a hamlet. It comprises of at least fifteen graves which are covered with piles of stone (above).

6.3.12 Graveyard 12

GY12 is located directly adjacent (south) of the conveyer which runs between the Maquasa East Mining Area and the Maquasa West Mining Area.

This graveyard holds eight graves which are all covered with piles of stone.

6.3.13 Tables

Table outlining the coordinates and significance rating for graveyards.

Graveyards	Coordinates	Significance
GY01. Approximately 15 graves covered with dolerite stones	27º 01.655' 30º 24.397'	**HIGH**
GY02. Approximately 11 graves covered with dolerite stones	27º 01.579' 30º 24.398'	**HIGH**
GY03. Approximately 5 graves covered with ferricrete stones	27º 01.696' 30º 24.462'	**HIGH**
G04. Single grave edged with large upright dolerite stones	27º 01.633' 30º 24.392'	**HIGH**
GY05. Isolated graveyard with 6 graves. Holds one relocated grave with granite headstone	27º 01.662' 30º 23.795'	**HIGH**
GY06. Isolated graveyard with 27 graves. Holds four relocated graves with granite headstones	27º 01.899' 30º 23.764'	**HIGH**
G07. Single grave covered with elongated pile of dolerite stones	27º 01.605' 30º 23.891'	**HIGH**
GY08. Holds approximately 16 graves which are demarcated with stone wall	27º 01.650' 30º 23.617'	
GY09. Holds 6 graves of which 4 are fitted with granite headstones. Demarcated with dolerite stone wall	27º 00.087' 30º 19.956'	**HIGH**

GY10. Holds 4 graves covered with dolerite stones	27º 00.676' 30º 20.825'	**HIGH**
GY11. Holds approximately 15 graves which are covered with dolerite stones	27º 00.810' 30º 20.731'	**HIGH**
GY12. Next to conveyer. Holds 8 graves covered with dolerite stone	27º 01.512' 30º 24.108'	**HIGH**

Table 2- Coordinates for graveyards in the Project Area (above).

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

7.1 The significance of the heritage resources

The historical remains and graveyards will be negatively affected when the proposed Kangra Project is implemented during the construction phase.

The significance of the heritage resources therefore has to be indicated as well as mitigation measures for those heritage resources which will be affected by the proposed Kangra Project.

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

- Occurrence
  - Probability of occurrence (how likely is it that the impact may/will occur?), and
  - Duration of occurrence (how long may/will it last?)
- Severity
  - Magnitude (severity) of impact (will the impact be of high, moderate or low severity?), and
  - Scale/extent of impact (will the impact affect the national, regional or local environment, or only that of the site?).

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

Probability:	Duration:
5 – Definite/don't know 4 – Highly probable 3 – Medium probability 2 – Low probability	5 – Permanent 4 - Long-term (ceases with the operational life) 3 - Medium-term (5-15 years)

1 – Improbable 0 – None	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:

Significance Points (SP) = (Magnitude + Duration + Scale) x Probability

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

- More than 80 significance points indicates VERY HIGH 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.

7.1.1 The historical remains

All buildings and features older than sixty years are considered to be of historical significance and are protected by Section 34 and Section 38 of the National Heritage

Resources Act (No 25 of 1999).The historical remains can be considered to be of low significance when considering criteria such as the following (Table 1):

- These remains are common across the Eastern Highveld (although being threatened on an increasing scale due to general development).
- These remains do not have any educational, research, aesthetical or any other significance which warrants their continued existence, conservation or even future use (e.g. as a historical site [open air museum]).
- The remains have been adequately documented for future reference during the Phase I HIA study.

Significance rating	**Criteria for significance rating**	**Mitigation/Management Measures**
High (3)	National/provincial value Educational, research, aesthetical conservation value Future use	Conserve unaffected for posterity (preferably) *in situ*
Medium (2)	Provincial value Medium educational, research, aesthetical conservation value No future use	Phase II investigation before demolishing. Permitting required
Low (1)	Local and site specific value Low educational, research, aesthetical conservation value No future use	Document during Phase I HIA Demolish during construction. No permitting required

Table 3- Significance rating for historical remains in the Project Area (above).

7.1.2 The graveyards

All graveyards and graves can be considered to be of high significance and are protected by various laws (Table 2). Legislation with regard to graves includes Section 36 of the

National Heritage Resources Act (No 25 of 1999) whenever graves are older than sixty years. The act also distinguishes various categories of graves and burial grounds. 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).

7.2 Possible impact on the heritage resources

It is highly likely that historical remains DC03 to DC07 and graveyards GY05, GY07, GY09, GY0110 and GY11 will be directly affected (destroyed) by the Kangra Project whilst the historical remains DC01, DC02 and DC03 and graveyards GY01, GY02, GY03, G04, GY06 and GY08 may only be impacted indirectly by the Kangra Project.

The impact on the heritage resources will occur during the construction phase as the removing of top soil to commence with mining occur at the onset of the Kangra Project.

The significance of the impact on the heritage resources therefore have to be indicated.

7.2.1 The historical remains

The significance of the impact on the historical remains is outlined in Tables 4(a) and 4(b).

Historical Remains	Probability of project impacting on site(s)	Magnitude if project impacts on site(s)	Duration if project impacts on site(s)	Scale if project impacts on site(s)	Significance points	Significance rating
DC03 to DC07 and CM	**5**	**10**	**5**	**1**	**90**	**VERY HIGH**

Table 4(a)- The significance of the impact on historical remains that will be directly affected (destroyed) by the Kangra Project.

Historical Remains	Probability of project impacting on site(s)	Magnitude if project impacts on site(s)	Duration if project impacts on site(s)	Scale if project impacts on site(s)	Significance points	Significance rating
DC01-DC02	**5**	**8**	**5**	**1**	**70**	**HIGH**

Table 4(b)- The significance of the impact on historical remains that will be indirectly affected by the Kangra Project.

7.2.2 The graveyards

The significance of the impacts on the graveyards and graves is outlined in Tables 5(a) and 5(b).

Graveyards and graves	Probability of project impacting on this site	Magnitude if project impacts on this site	Duration if project impacts on this site	Scale if project impacts on this site	Significance points	Significance rating
GY05, GY07 GY09 GY10, GY11	**5**	**10**	**5**	**1**	**90**	**VERY HIGH**

Table 5(a)- The significance of the impact on graveyards that will be directly affected (destroyed) by the Kangra Project.

Graveyards and graves	Probability of project impacting on this site	Magnitude if project impacts on this site	Duration if project impacts on this site	Scale if project impacts on this site	Significance points	Significance rating
GY01, GY02 GY03, G04 GY06	**5**	**8**	**5**	**1**	**70**	**HIGH**

Table 5(b)- The significance of the impact on graveyards and graves that will be indirectly affected by the Kangra Project.

7.3 Mitigating the heritage resources

The following mitigation measures have to be applied to the historical remains and graveyards and graves which will be affected directly or indirectly during the construction phase for the proposed Kangra Project, namely:

7.3.1 The historical remains

These remains have low significance and have been described; geo-referenced; tabulated; mapped on a 1:50 000 topographical map and have been photographed, the evidence of which is provided in this report. These remains therfore have been adequately documented for future reference by any researcher or interested person seeking knowledge about the early occupation, life-ways, settlement patterns and traditions on the Eastern Highveld during the early twentieth century.

As these remains have been documented in this Phase I HIA study Kangra needs not to apply for a demolishing permit from SAHRA for these remains that will be directly (destroyed) or indirectly affected in order to make way for the proposed Kangra Project.

7.3.2 The graveyards

It seems as if some or all of the graveyards and graves may hold graves which are older than sixty years. The graveyards and graves can be mitigated in two ways depending on whether they may be affected, directly or indirectly, namely:

- By means of exhumation and relocation when graveyards are affected directly (GY05, GY07, GY09, GY10 and GY11). 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.

- Graveyards can be demarcated with brick walls or with fences when they are affected indirectly and not in any physical way (GY01, GY02, GY03, G04, GY06, GY08). Conserving graveyards *in situ* in mining areas create the risk and responsibility that they may be damaged, accidentally, that the mine remains responsible for the graveyards' future unaffected existence, maintenance and that controlled access must exist for any relatives or friends who wish to visit the deceased. Safe corridors not less than 15m wide therefore must be maintained between graveyards and mining related activities and the graveyards and graves must be fenced-off. A Conservation Management Plan for the ongoing protection of these graveyards and graves must be included in the Environmental Management Plan for the mine.

8 CONCLUSION AND RECOMMENDATIONS

The Phase I HIA for the proposed Project Area revealed the following types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999), namely:

- Remains from the historical period in and near the Project Area.
- Informal graveyards and graves in and near the Project Area.

No pre-historical remains were recorded. This study also did not provide for a paleontological study.

The graveyards and historical remains were geo-referenced and mapped (Figures 8, 9 & 20).

The significance of the heritage resources

The historical remains and graveyards will be negatively affected when the proposed Kangra Project is implemented during the construction phase.

The significance of the heritage resources therefore has to be indicated as well as mitigation measures for those heritage resources which will be affected by the proposed Kangra Project.

The significance of the impacts on the heritage resources was determined using a ranking scale.

The historical remains

All buildings and features older than sixty years are considered to be of historical significance and are protected by Section 34 and Section 38 of the National Heritage Resources Act (No 25 of 1999).The historical remains can be considered to be of low significance when considering criteria such as the following (Table 1):

- These remains are common across the Eastern Highveld (although being threatened on an increasing scale due to general development).

- These remains do not have any educational, research, aesthetical or any other significance which warrants their continued existence, conservation or even future use (e.g. as a historical site [open air museum]).
- The remains have been adequately documented for future reference during the Phase I HIA study.

The graveyards

All graveyards and graves can be considered to be of high significance and are protected by various laws (Table 2). Legislation with regard to graves includes Section 36 of the National Heritage Resources Act (No 25 of 1999) whenever graves are older than sixty years. The act also distinguishes various categories of graves and burial grounds. Other legislation with regard to graves includes those which apply when graves are exhumed and relocated, namely the Ordinance on Exhumations (No 12 of 1980) and the Human Tissues Act (No 65 of 1983 as amended).

Possible impact on the heritage resources

It is highly likely that historical remains DC03 to DC07 and graveyards GY05, GY07, GY09, GY0110 and GY11 will be directly affected (destroyed) by the Kangra Project whilst the historical remains DC01, DC02 and DC03 and graveyards GY01, GY02, GY03, G04, GY06 and GY08 may only be impacted indirectly by the Kangra Project.

The impact on the heritage resources will occur during the construction phase as the removing of top soil to commence with mining occur at the onset of the Kangra Project.

The significance of the impact on the heritage resources therefore has to be indicated.

The historical remains

The significance of the impact on the historical remains is outlined in Tables 4(a) and 4(b).

The graveyards

The significance of the impacts on the graveyards and graves is outlined in Tables 5(a) and 5(b).

Mitigating the heritage resources

The following mitigation measures have to be applied to the historical remains and graveyards and graves which will be affected directly or indirectly during the construction phase for the proposed Kangra Project, namely:

The historical remains

These remains have low significance and have been described; geo-referenced; tabulated; mapped on a 1:50 000 topographical map and have been photographed, the evidence of which is provided in this report. These remains therfore have been adequately documented for future reference by any researcher or interested person seeking knowledge about the early occupation, life-ways, settlement patterns and traditions on the Eastern Highveld during the early twentieth century.

As these remains have been documented in this Phase I HIA study Kangra Coal needs not to apply for a demolishing permit from SAHRA for these remains that will be directly (destroyed) or indirectly affected in order to make way for the proposed Kangra Project.

The graveyards

It seems as if some or all of the graveyards and graves may hold graves which are older than sixty years. The graveyards and graves can be mitigated in two ways depending on whether they may be affected, directly or indirectly, namely:

- By means of exhumation and relocation when graveyards are affected directly (GY05, GY07, GY09, GY10 and GY11). 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.

- Graveyards can be demarcated with brick walls or with fences when they are affected indirectly and not in any physical way (GY01, GY02, GY03, G04, GY06, GY08). Conserving graveyards *in situ* in mining areas create the risk and responsibility that they may be damaged, accidentally, that the mine remains responsible for the graveyards' future unaffected existence, maintenance and that controlled access must exist for any relatives or friends who wish to visit the deceased. Safe corridors not less than 15m wide therefore must be maintained between graveyards and mining related activities and the graveyards and graves must be fenced-off. A Conservation Management Plan for the ongoing protection of these graveyards and graves must be included in the Environmental Management Plan for the mine.

9 SELECT BIBLIOGRAPHY

Bergh, J.S. (red.) 1998. *Geskiedenisatlas van Suid Afrika. Die vier noordelike provinsies*. J.L. van Schaik: Pretoria.

Delius, P. 1984. The land belongs to us. Raven Press: Johannesburg.

Delius, P. 2007. Mpumalanga. History and Heritage. CTP Book Printers: Cape Town.

Delius, P. & Hay, M. 2009. *Mpumalanga: an illustrated history*. Johannesburg: The Highveld Press.

Delius, P & Schoeman, A. Revisiting Bokoni: Populating the stone ruins of the Mpumalanga Escarpment. In Swanepoel, N., Esterhuisen, A. & Bonner, P. (eds.) *Five hundred years rediscovered. South African precedents and prospects,* 135-167.

Erasmus, B.P.J. 1995. *Oppad in Suid Afrika. 'n Gids tot Suid Afrika, Streek vir Streek*. Jonathan Ball Uitgewers Bpk.

Esterhuizen A. & Smith J. 2007. Stories in Stone. In Delius, P (ed). *Mpumalanga History and Heritage*. 41-64. Pietermaritzburg Kwa Zulu/Natal University Press.

Evers, T.M. 1981. The Iron Age in the Eastern Transvaal, South Africa. In Voight, E.A. (ed). *Guide to archaeological sites in Northern and Eastern Transvaal.* Pretoria: South African Association of Archaeologists, 64-109.

Grové, G. 1999. *Mapochseland en sy mense*. Published by Grietjie Grove: Roossenekal.

Hoernle, R,F. 1930. The stone hut settlements on Tafelkop near Bethal. *Bantu Studies*. 4, pp217-233.

Maggs, T.M. 2008. The Mpumalanga Escarpment settlements. In (Swanepoel, N., Esterhuisen, A. & Bonner, P. eds.) *Five hundred years rediscovered. South African precedents and prospects*. 169-182.

Makhura, T. 2007. Early inhabitants. In Delius, P. (ed). Mpumalanga. History and Heritage. University of Kwa Zulu Natal Press: Scottsville.

Makura, T. 2007. The pre-colonial histories of Mpumalanga communities. In Delius, P (ed). *Mpumalanga History and Heritage*. 91-136. Pietermaritzburg Kwa Zulu/Natal University Press.

Mason, R.J. 1968. Transvaal and Natal Iron Age settlement revealed by aerial photography and excavation. *African Studies*. 27:167-180.

Naude, M. 1993. The use of stone on farmsteads on the eastern Transvaal. *Africana Society of Pretoria* (11): 49-55.

Naude, M. 2000. Vernacular stone buildings and structures on farmsteads in the southern districts of the Mpumalanga Province. *South African Journal of Cultural History*. 14(2): 31-64.

Pistorius, J.C.C. 2008. A Phase I Heritage Impact Assessment (HIA) study for the proposed new Maquasa West open cast mine between Ermelo and Piet Retief in the Mpumalanga Province of South Africa. *Unpublished report prepared for Kangra Coal (Pty) Ltd.*

Pistorius, J.C.C. 2011. Kusipongo Expansion Project: A heritage base line study for proposed adit positions in a project area near the Heyshope Dam to the west of Piet Retief in the Mpumalanga Province of South Africa. *Unpublished report prepared for Kangra Coal (Pty) Ltd.*

Pistorius, J.C.C. 2012. A Phase I Heritage Impact Assessment (HIA) study for Kangra Coal's (Pty) Ltd (Kangra Coal Coal) proposed new Mining Areas for the Maquasa East and the Maquasa West Open Cast Minin operations near the Heyshope Dam between Ermelo and Piet Retief in the Mpumalanga Province of South Africa. *Unpublished report prepared for Ground Water Consulting Services.*

Potgieter, E.F. 1955. *The disappearing Bushmen of Lake Chrissie: A preliminary survey*. J. L. Van Schaik: Pretoria.

Prins, F.E. 2001. Rock art and motivation: the evidence from Magageng. *Pictogram*. 12: 14-18.

Pretorius, Fransjohan. 1999. *Life on commando during the Anglo Boer War 1899-1902*. Human & Rousseau: Cape Town.

Schoeman, M.H. 1997. *The Ndzundza archaeology of the Steelpoort river valley*. Unpublished MA dissertation. University of the Witwatersrand: Johannesburg.

Smith, B.W. & Zubieta, L. 2007. The power of ancient art. In Delius, P. (ed.) *Mpumalanga. History and Heritage*. University of Kwa Zulu Natal Press: Scottsville.

Schoonraad, M. & Beaumont, P. 1971. The Welgelegen Shelter, Eastern Transvaal. In Schoonraad M. (ed.). Rock paintings of Southern Africa (*Supplement to the South African Journal of Science*. Special Publication No. 2).

Schoonraad, M. & Schoonraad, E. 1975. Rotsskilderinge in die Oos Transvaalse Laeveld. In Barnard, C. (ed.) *Die Transvaalse Laeveld*. Cape Town: Tafelberg.

The Ndzundza-Ndebele and the Mapoch caves. Report issued by the KwaNdebele Monuments Commission (KMC), 1983. Cyro Print: Pretoria.

Van Jaarsveld, F.A. 1985. *Die Ndzundza-Ndebele en die Blankes in Transvaal 1845-1883*. Ongepubliseerde M.A. verhandeling. Rhodes Universiteit: Grahamstad.

Van Vuuren, C.J. 1983. *Die vestigingspatroon van die Suid-Ndebele*. Ongepubliseerde M.A. verhandeling. Universiteit van Pretoria: Pretoria.

Van Vuuren, C.J. 1992. *Die aard en betekenis van 'n eie etnisiteit onder die Suid-Ndebele*. Ongepubliseerde D.Phil proefskrif. Universiteit van Pretoria: Pretoria.

Whitelaw, G. 1996. Lydenburg revisited. Another look at the Mpumalanga Early Iron Age sequence. *South African Archaeological Bulletin*. 51.

Schapera, I. 1927. The Tribal Divisions of the Bushmen. *Man*. Published by the Royal Anthropological Institute of Great Britain and Ireland. 27, 68-73.

Van Hoepen, E.C.N. 19 1939. A pre-European Bantu culture in the Lydenburg district. *Argeologiese navorsing van die Nasionale Museum, Bloemfontein* 11(5):47-74.

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 Ekhurhuleni, Hartebeespoort and heritage management plans for the Magaliesberg and Waterberg. Since acting as an independent consultant he has done approximately 800 large to small heritage impact assessment reports. He has a longstanding working relationship with Eskom, Rio Tinto (PMC), Rio Tinto (EXP), Impala Platinum, Angloplats (Rustenburg), Lonmin, Sasol, PMC, Foskor, Kudu and Kelgran Granite, Bafokeng Royal Resources etc. as well as with several environmental companies.