

**A PHASE I HERITAGE IMPACT ASSESSMENT (HIA) STUDY FOR THE
CONSOLIDATED ENVIRONMENTAL MANAGEMENT PROGRAMME
REPORT (CONSOLIDATED EMPR) FOR ARNOT COAL ON THE
EASTERN HIGHVELD IN THE MPUMALANGA PROVINCE**

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EXECUTIVE SUMMARY

This Phase I Heritage Impact Assessment (HIA) study for Arnot Coal's proposed Consolidated Environmental Management Program Report (Consolidated EMPR) was undertaken according to Section 38 of the National Heritage Resources Act (No 25 of 1999). Arnot Coal is located between Middelburg and Belfast on the Eastern Highveld in the Mpumalanga Province of South Africa.

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

- To establish whether any of the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) (see Box 1) occur in the Project Area and, if so, to determine the nature, the extent and the significance of these remains; and
- To establish if any of these heritage resources will be affected by the expansion of open cast coal mining activities 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 expansion of the open cast coal mining activities.

The Phase I HIA study for the 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:

- Historical farmstead complexes consisting of various structures such as houses, wagon sheds, rondavels and cattle kraals which are spatially and functionally associated with each other in order to constitute cultural landscapes of small proportions;
- Individual historical structures such as houses, wagon sheds, rondavels, etc. which in most instances once used to be part of farm complexes but who now represent are now the only remains of these complexes; and
- Graveyards and graves, some of which can be classified as historical as they are older than sixty years.

These heritage resources were mapped and geo-referenced according to their presence on the various farms in the Arnot Coal Mine's mining right area (Figure 3, Tables 1-8).

The heritage resources that may be impacted by the Arnot Project are indicated; their significance is determined and mitigation measures are outlined should these heritage resources be negatively affected by the Arnot Project (Table 11).

It is possible that a number of historical structures such as farmstead complexes, houses and other historical structures as well as graves and graveyards may be negatively affected when new open cast mines are developed, or when they are in operation or when these mines are eventually closed. It is therefore necessary to indicate the significance of these heritage resources as well as to outline mitigation measures should any of these resources be negatively affected by future proposed open cast mining activities and associated infrastructure developments.

The farmstead complexes, historical houses and other historical structures

The farmstead complexes, historical houses and other historical structures are older than sixty years and therefore qualify as historical remains. All remains older than sixty years are protected by the National Heritage Resources Act (Act No 25 of 1999).

The significance of these historical remains can be described as medium to high when considering criteria such as the following (Tables 1, 3, 5 & 7):

- Historical farmstead complexes, houses and other historical remains on the Eastern Highveld are rapidly disappearing as a result of coal mining activities, farming and general modernisation; and
- These historical remains have value in terms of education, research, tourism and new usages in a mining context (e.g. to be used as offices, etc).

The graveyards

All graveyards and graves can be considered to be of high significance and are protected by various laws (Tables 2, 4, 6 & 8). 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. 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 (Act No 12 of 1980) and the Human Tissues Act (Act No 65 of 1983 as amended).

Mitigating the heritage resources

It is highly likely that a number of farmstead complexes, historical houses and other historical structures as well as graves and graveyards may be negatively affected during the development, operation or closure of any new open cast mining activities (Table 11). The following mitigation measures have to be applied if any of these farmstead complexes, historical houses and other historical structures or the graveyards and graves may be negatively affected, namely:

The farmstead complexes, historical houses and other historical structures

The farmstead complexes, historical houses and other historical structures have to be

documented by a conservation architect before they may be destroyed. A letter issuing approval for the destruction of these structures has to be issued by the South African Heritage Resources Agency (SAHRA) after these structures have been documented by the conservation architect.

The graveyards

Graves and graveyards can be mitigated in two ways depending whether they are to be affected, directly or indirectly, namely:

- By means of exhumation and relocation when they are affected directly. 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. Conserving graveyards *in situ* in mining areas create the risk and responsibility that they may be damaged, accidentally, that the mine remains responsible for its future unaffected existence, maintenance and that controlled access must exist for any relatives or friends who wish to visit the deceased.

General

It is possible that this Phase I HIA study may have missed heritage resources in the Project Area as heritage sites may occur in thick clumps of vegetation 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 any current and future mining and mining related developments within the mining right area of Arnot Coal Mine the South African Heritage Resources Authority (SAHRA) should be notified immediately, all development activities must be stopped and an archaeologist accredited with the Association for Southern African Professional Archaeologist (ASAPA) should be notified in order to determine appropriate mitigation measures for the discovered finds. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.

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1. INTRODUCTION

This document contains the Phase I Heritage Impact Assessment (HIA) study for Arnot Coal Mine's Consolidated Environmental Management Program Report (EMPR). Arnot Coal Mine is located on the Eastern Highveld between Middelburg and Belfast in the Mpumalanga Province of South Africa.

The Mpumalanga Province of South Africa has a rich heritage comprised of remains dating from the pre-historic and from the historical (or colonial) periods of South Africa. Pre-historic and historical remains in the Mpumalanga Provinces present 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' (outlined in Section 3 of the National Heritage Resources Act, Act No 25 of 1999) occur in this province (see Box 1).

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) (c) historical settlements and townscapes;
- d) landscapes and natural features of cultural significance;
- e) geological sites of scientific or cultural importance;
- f) archaeological and palaeontological sites;
- g) graves and burial grounds including-
 - (i) ancestral graves;
 - (ii) royal graves and graves of traditional leaders;
 - (iii) graves of victims of conflict;(iv) graves of individuals designated by the Minister by notice in the Gazette;
 - (iv) historical graves and cemeteries; and
 - (v) 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 -
- j) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
 - (ii) objects to which oral traditions are attached or which are associated with living heritage;
 - (iii) ethnographic art and objects;
 - (iv) military objects;
 - (v) objects of decorative or fine art;
 - (vi) objects of scientific or technological interest; and
 - (vii) books, records, documents, photographs, positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No 43 of 1996).

The National Heritage Resources Act (Act No 25 of 1999, Art 3) also distinguishes nine criteria for places and objects to qualify as 'part of the national estate if they have cultural significance or other special value ...'. These criteria are the following:

- a) its importance in the community, or pattern of South Africa's history;
- 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)
- 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. AIMS WITH THIS REPORT

Arnot Coal Mine intends expanding opencast coal mining activities on various farms in the Arnot Coal Mine's mining right area, including the additional sections of Strathrae Coal Mine that will be incorporated into the mining right area of Arnot Coal Mine through a Section 102 Application, on the Eastern Highveld in the Mpumalanga Province of South Africa. The existing and future proposed open cast and underground coal mining activities may impact on any of the types and ranges of heritage resources as set out in Section 3 of the National Heritage Resources Act (No 25 of 1999). Consequently, Golder Associates Africa (Pty.) Ltd. therefore commissioned the author to undertake a Phase I Heritage Impact Assessment (HIA) study within the entire mining right area of Arnot Coal Mine to identify and map any heritage sites as part of the Consolidated EMPR for Arnot Coal Mine.

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) occur in the Arnot Coal Mine's mining right 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 current and potential coal mining activities 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 existing mining and mining related activities (open cast and underground) associated with Arnot Coal Mine's activities within the mining right area of Arnot Coal as part of the Consolidated EMPR project.

3. METHODOLOGY

This Phase I HIA study was conducted by:

- Surveying the proposed Project Area with a vehicle and selected spots in the Project Area on foot as well as surveying, where possible, areas adjoining the Project Area which need not to be affected by the expansion project;
- Briefly surveying literature relating to the pre-historical and historical context of the Project Area;
- Consulting maps of the proposed Project Area;
- Consulting archaeological (heritage) data bases;

- Consulting spokespersons regarding the possible presence of heritage resources such as graveyards; and
- Synthesising all information obtained from the fieldwork survey, literature review, maps, heritage data bases and spokespersons into this report.

3.1. Fieldwork

The Arnot Coal Mine's mining right area – with the focus on existing and proposed future mining areas, was surveyed with a vehicle where accessible routes existed while selected, sensitive spots in the Arnot Coal Mine's mining right area were surveyed on foot.

3.2. Databases, literature survey and maps

Databases kept and maintained at institutions such as the Provincial Heritage Resources Agency and the Archaeological Data Recording Centre at the National Flagship Institute (Museum Africa) in Pretoria were consulted to determine whether any heritage resources of significance has been identified during earlier heritage surveys in or near the mining right area of Arnot Coal Mine.

The author is not unacquainted with the Mining right area of Arnot Coal Mine and the adjacent Strathrae Coal Mine at large as he had done several heritage impact assessment studies near the immediate surroundings of Arnot Coal Mine (see 'Select Bibliography', Part 9).

It is important to contextualise the pre-historical and historical background of the mining right area of Arnot Coal Mine and the adjacent Strathrae Coal Mine in order to comprehend the identity, meaning and significance of heritage resources in and near the Project (see Parts 5 & 9). Literature relating to the pre-historical and the historical unfolding of the Eastern Highveld for the Arnot Coal Mine mining rights area was reviewed (see Part 5, 'Contextualising the Project Area').

In addition, the Project Area was studied by means of the 1:50 000 topographical maps on which the Project Area appears (2529DD Arnot; 1: 50 000 topographical map and 2528 Pretoria; 1:250 000 map).

3.3. Spokespersons consulted

Spokespersons living in rural homesteads in the Arnot Coal Mine's mining right area

and immediate surroundings are usually intimately acquainted with the area, particularly if they were born there. Consequently, some spokespersons were therefore consulted with regard to the possible presence of graveyards and abandoned farm homesteads (see Part 10, 'Spokespersons consulted').

3.4. Mapping heritage resources

The most significant types and ranges of heritage resources found in the Arnot Coal Mine's mining right area were geo-referenced using a GPS instrument and thereafter mapped in Arch View (Figure 2; Tables 1-3).

3.5. 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 thick clumps of vegetation 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 current, future and proposed future mining and mining related activities within the mining right area Arnot Coal Mine the South African Heritage Resources Authority (SAHRA) should be notified immediately, all 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.

3.6. 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 human-made phenomena and intangible products that are the result of the human mind. Natural, technological or industrial features may also be part of heritage resources, as places that have made an outstanding contribution to the cultures, traditions and lifestyles of the people or groups of people of South Africa;
- In-Situ Conservation: The conservation and maintenance of ecosystems, natural habitats and cultural resources in their natural and original surroundings;
- Iron Age: Refers to the last two millennia and 'Early Iron Age' to the first thousand years AD. 'Late Iron Age' refers to the period between the 16th century and the 19th century and can therefore include the Historical Period;
- Maintenance: Keeping something in good health or repair;
- Pre-historical: Refers to the time before any historical documents were written or any written language developed in a particular area or region of the world. The historical period and historical remains refer, for the Project Area, to the first appearance or use of 'modern' Western writing brought to the Eastern Highveld by the first Colonists who settled here from the 1840's onwards;
- Preservation: Conservation activities that consolidate and maintain the existing form, material and integrity of a cultural resource;
- Recent past: Refers to the 20th century. Remains from this period are not necessarily older than sixty years and therefore may not qualify as archaeological or historical remains. Some of these remains, however, may be close to sixty years of age and may, in the near future, qualify as heritage resources;

- Protected area: A geographically defined area designated and managed to achieve specific conservation objectives. Protected areas are dedicated primarily to the protection and enjoyment of natural or cultural heritage, to the maintenance of biodiversity, and to the maintenance of life-support systems. Various types of protected areas occur in South Africa;
- Reconstruction: Re-erecting a structure on its original site using original components;
- Replication: The act or process of reproducing by new construction the exact form and detail of a vanished building, structure, object, or a part thereof, as it appeared at a specific period;
- Restoration: Returning the existing fabric of a place to a known earlier state by removing additions or by reassembling existing components;
- Stone Age: Refers to the prehistoric past, although Late Stone Age 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 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); and
- 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.

4. THE PROJECT AREA

4.1. Location

Arnot Coal Mine is located between Middelburg and Belfast on the Eastern Highveld in the Mpumalanga Province of South Africa. The Arnot Coal Mine lease area covers several farms to the east of the road running from the N4 in the north to Hendrina in the south. The mine lease area mainly involves open cast and underground mining areas with associated infrastructure and is situated on an undulating piece of land which stretches from the farm Mooifontein 448JS in the north to Rietkuil 491JS and Schoonoord 64JS in the south. It also incorporates portions of the farms Grootlaagte 449JS, Tweefontein 458JS, Leeuwpan 494JS, Klippan 452JS, Nooitgedacht 493JS and Arnot East 984JS. All of these farms are located to the east of the road running between the N4 in the north and Hendrina in the south (2529DD Arnot; 1: 50 000 topographical map and 2528 Pretoria; 1:250 000 map) (Figure 1).

Arnot Coal Mine is located on the Highveld which, geographically, comprises a large part of the country. The Highveld is situated between 1 200m to 1 800m above sea level. The vegetation is mainly treeless savannah with annual rainfall measured varies between 315 mm per year and 1 105 mm per year. Most of the rain falls in summer, often in the form of thunder storms. Winter is a succession of balmy, cloudless days but it can be very cold at night, especially in the south.

The Highveld is the country's most productive region. Whilst most of its maize crop is grown here it also contributes products such as sunflower seed, groundnuts, potatoes and other vegetables to the national pantry. Cattle and sheep ranching also make a significant contribution to the local economy. The Highveld is also the country's best mineralised region. Gold and silica mines occur in the area whilst the world's richest gold reefs are mined in the Gauteng Province and in the Free State Province. The country's largest coal mines are located in Mpumalanga where the coal is used to drive a number of Eskom's giant power stations on the Highveld.

4.2. Focus areas for the Phase I HIA study

Arnot Coal Mine's lease area covers several farms which have been outlined above. The focus areas for the Phase I HIA are the entire Arnot Coal Mine's mining right area for the Consolidated EMPR with the focus on potential proposed future open cast and underground mining areas, namely:

- Portions 4 and 5 of the farm Mooifontein 448JS;.
- The proposed future open cast mining area on Grootlaagte 449JS;

- The farms Rietkuil 491JS and Schoonoord 164IS in the Schoonoord mining area;
- The existing No 8 and No 10 underground mining areas situated respectively on Portion 18 of the farm Nootgedacht 493JS and Arnot East 984JS;
- The underground mining areas at Strathrae Coal Mine that will be included in the mining right area of Arnot Coal Mine through a section 102 application on Leeuwpan 494JS; and
- Other areas of focus such as the Plant Area, Ehlers dam and Eskom's ash dam.

4.3. The nature of the Project Area

The Project Area covers an undulating piece of land that is marked by vast outstretched agricultural fields, pieces of grass veldt and a number of pans towards the central and southern part of the Project Area.

Few trees occur, the majority of which are exotics such as Blue Gums and Wattles. No Oak trees were observed. Blue Gum and Oak trees are usually associated with historical farmsteads where they were planted by the first colonists who settled on the Eastern Highveld during the first part of the nineteenth century.

4.4. Within a cultural landscape

The Project Area is part of a cultural landscape that is marked by heritage remains dating from the pre-historical into the historical (colonial) period. Stone Age sites, Iron Age remains and colonial remains therefore do occur on the Eastern Highveld (see Part 5, 'Contextualising the Project Area'). The archaeological and historical significance of this landscape therefore must be described in more detail before the results of the Phase I HIA study is discussed.



Figure 1 - Part of the Project Area which amongst other include the farms Mooifontein 448JS, Grootlaagte 449JS, Nooitgedacht 493JS, Leeuwpan 494JS and Schoonoord 1641IS on the Eastern Highveld in the Mpumalanga Province (above). The area is characterised by outstretched agricultural fields, natural occurring grassland, scarcely scattered plantations with Blue Gum and Wattle trees and scattered pans which area more prominent towards the eastern part of the Project Area (above).

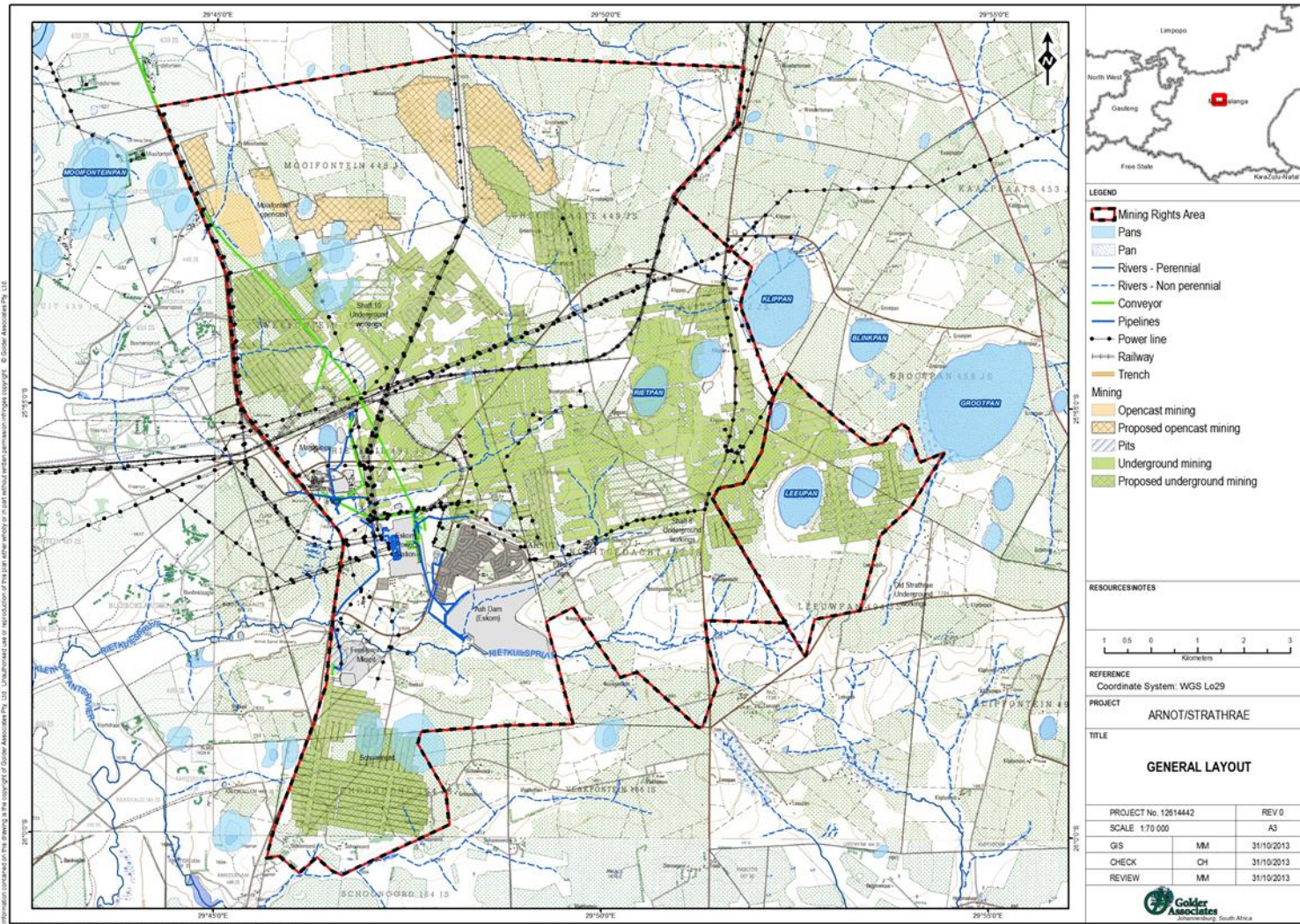


Figure 2 - The Arnot Coal Mine are on the Eastern Highveld in the Mpumalanga Province. The Project Area mainly entails open cast mining areas with the perimeters of the mine area (above).

5. CONTEXTUALISING THE PROJECT AREA

The following brief overview of pre-historical and historical evidence relating to the Mpumalanga Province will help to contextualise the Project Area.

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 27 000 BP.

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

The LSA is also associated with rock paintings and engravings which were done by San hunter-gatherers, Khoi Khoi herders and EIA farmers. 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 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.

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 Honingnest 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).

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 1200 AD.

EIA sites were also investigated at Sterkspruit near Lydenburg (AD 720) 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 AD 600 and from AD 900 to AD 1100. At this site the Lydenburg terracotta heads were brought to light. Doornkop, located south of Lydenburg, dates from AD 740 and AD 810.

The Late Iron Age is well represented in Mpumalanga and stretches from AD 1500 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 include the following:

- Early arrivals in the Mpumalanga Province such as Bakone clans who lived between Lydenburg and Machadodorp and Eastern Sotho clans such as the Pai, Pulana and Kutswe who established themselves in the eastern parts of the province;
- 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;
- The Ndzundza-Ndebele established settlements at the foot of the Bothasberge

(Kwa Maza and Esikhunjini) in the 1700's and lived at Erholweni from AD 1839 to AD 1883 where the Ndzundza-Ndebele's sphere of influence became known as KoNomthjarhelo which stretched across the Steenkampsberge;

- Corbelled stone huts which are associated with ancestors of the Sotho on Tafelkop near Davel which date from the AD 1700's into the nineteenth century;
- 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;
- 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; and

5.3. Swazi expansion into the Highveld and Lowveld of the Mpumalanga Province occurred during the reign of Sobhuza (AD 1815 to 1836/39) and Mswati (AD 1845 to 1868) while Shangaan clans entered the province across the Lembombo Mountains in the east during the second half of the nineteenth century. The Historical Period

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

Middelburg is one of the oldest towns that were 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 electricity generation and coal mining, light and heavy industries as well as steel and vanadium operations.

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.

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 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-1830 when coal was mined in KwaZulu-Natal.

The first exploitation for coal was probably in KwaZulu-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 *insitu* 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 architecture

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

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.

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 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.

5.6. Farmsteads and graveyards from the recent past

Farm homesteads with outbuildings that date from the more recent past occur throughout the Eastern Highveld. Many of these farm homesteads hold little historical significance. However, buildings and other infrastructure which are part of these farm homesteads may be older than sixty years or may approach this age.

All, structures and buildings older than sixty years are protected by Section 34 of the National Heritage Resources Act (Act no 25 of 1999).

Many of these farm homesteads are associated with formal and informal graveyards. Dwellings which have been used by farm labourers and which have disintegrated over time are in many instances associated with informal graves and sometimes with informal cemeteries. These informal graves and cemeteries may occur in the most unexpected places - such as in maize fields where they have not been ploughed over time.

6. THE PHASE I HERITAGE IMPACT ASSESSMENT

6.1. Types and ranges of heritage resources

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

- Historical farmstead complexes consisting of various structures such as houses, wagon sheds, rondavels and cattle kraals which are spatially and functionally associated with each other in order to constitute cultural landscapes of small proportions;
- Individual historical structures such as houses, wagon sheds, rondavels, etc. which in most instances once used to be part of farm complexes but who now represent are now the only remains of these complexes; and
- Graveyards and graves, some of which can be classified as historical as they are older than sixty years.

These heritage resources were mapped and geo-referenced according to their presence on the various farms in the Project Area (Figure 3, Tables 1-8).

The heritage resources that may be impacted by the Arnot Project are indicated; their significance is determined and mitigation measures are outlined should these heritage resources be negatively affected by the existing and proposed future mining and mining related activities.

The different types and ranges of heritage resources that were recorded in the Project Area are now briefly discussed and illuminated with photographs.

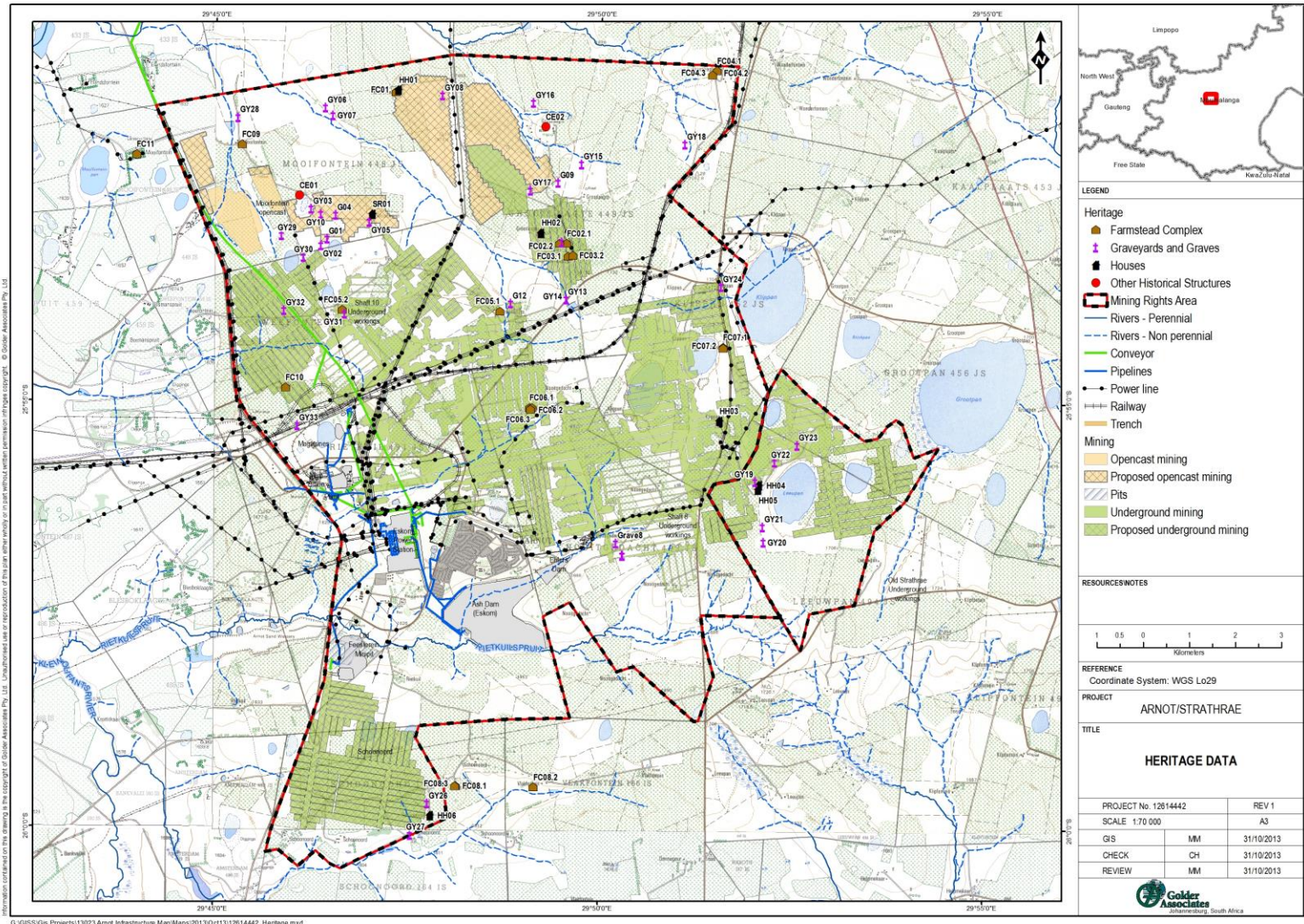


Figure 3 - The Project Area near Arnot on the Eastern Highveld of the Mpumalanga Province. Note the presence of remains such as farmstead complexes and houses dating from the historical periods as well as graves and graveyards (above).

6.2. Heritage resources on Mooifontein 448JS

The remains of at least one farmstead complex and several other individual historical structures such as residences, outbuildings (rondavels and wagon sheds) and cattle enclosures occur on Mooifontein 448JS. They include the following:

6.2.1. Farmstead complexes

6.2.1.1. Farmstead complex 01

The remains of what seems like a residence and a wagon shed which were constructed with sandstone is situated next to each other on the Remaining Extent of the farm Mooifontein 448JS. Only part of the foundations and lower parts of some of the walls of these two structures still exist.



Figure 4 - The remains of a possible residence and wagon shed on the farm Mooifontein 448JS which were linked with each other in more recent times to be used as a cattle enclosure (above).

It seems as if the two structures were linked with each other in more recent times in order to construct something like a large rectangular structure which could have been used as a cattle enclosure.

6.2.2. Historical Houses

6.2.2.1. Historical House 01

A historical residence (HH01) which has disintegrated and its remains vandalised occurs in a wattle bush on the Remaining Extent of the farm Mooifontein 448JS. The lower walls of this residence were constructed with sandstone whilst the upper parts of the walls were built with clay bricks which were plastered. The residence was extended in the past.



Figure 5 - A partly destroyed historical house (HH01) on the Remining Extent of the farm Mooifontein 448JS (above).

6.2.3. Other historical structures

6.2.3.1. Rondavel

This structure on Portion 07 consists of a rondavel (SR01) which was constructed with sandstone walls. However, it is doubtful whether this structure represents an original rondavel. It is highly likely that this structure was reconstructed with material (sandstone) which is derived from a former historical homestead or its associated outbuildings (rondavel, wagon shed) which have been demolished elsewhere in the area.



Figure 6 - A rondavel on Portion 07 of the farm Mooifontein 448JS which was constructed with sandstone. It is possible that this structure was reconstructed with the material from a former farmstead (or its associated outbuildings) which has disintegrated in the past (above).

6.2.3.2. Cattle enclosure

A cattle enclosure (CE01) with a rectangular ground plan occurs on Portion 06 of the farm Mooifontein 448JS. This structure was constructed with ferricrete stone.

The cattle enclosure dates from the late nineteenth century or from the early twentieth century. Cattle enclosures are usually associated with farmstead complexes constructed with sandstone and ferricrete.



Figure 7 - A cattle enclosure (CE02) on Portion 06 of the farm Mooifontein 448JS constructed with ferricrete. It is highly likely that this structure was associated with a farmstead complex which was constructed with identical building material and with sandstone (above). The farmstead complex to which the cattle enclosure belonged may have been demolished in the past.

6.2.4. Graveyards and graves

The following eight graveyards and a single grave were recorded on the farm Mooifontein 448JS, namely:

6.2.4.1. Grave 01

This single grave (G01) on Portion 07 of the farm Mooifontein 448JS is located near one of the pans in the Mooifontein 448JS. The grave is covered with a heap of stones.

6.2.4.2. Graveyard 02

GY02 on Portion 07 of the farm Mooifontein 448JS belongs to the Rossouw family and includes the graves of two children. The two graves are demarcated with sandstone strips while the graves are fitted with headstones manufactured from sandstone.

The inscriptions on the two headstones of the graves read as follow:

- 'Hier rus Johannes Rossouw Geb 19 Jul 1928 Ovl 4 Jun 1929 Daar is beminde in die hemel'
- 'Hier rus Hanna M Rossouw Geb 2 Jun 1917 Ovl 28 – 1920 Hy wag op jou in die hemel daarbo'



Figure 8 - A single grave (G01) near a pan on the farm Mooifontein 448JS (above).



Figure 9 - The graveyard of the Rossouw family (GY02) near a pan on the farm Mooifontein 448JS (above).

6.2.4.3. Graveyard 03

GY03 on Portion 07 consists of two graves located near a pan. One of the graves is covered with stones whilst the second is fitted with a granite headstone and edged with granite strips.

The inscription on the headstone reads as follow:

- 'April Leshoka Mokwana Died 1902'



Figure 10 – Two graves (GY03) near a pan on Portion 07 of the farm Mooifontein 448JS. One of the graves is fitted with a granite headstone whilst the second is covered with stones (above).

6.2.4.4. Grave 04

G04 on Portion 07 of the farm Mooifontein 448JS is buried beneath a heap of soil which resulted from the burrowing activities of porcupines.

6.2.4.5. Graveyard 05

GY05 on Portion 07 of the farm Mooifontein 448JS is a second graveyard belonging to the Rossouw family.

It holds two graves, one edged with sandstone strips and fitted with a sandstone headstone whilst the second grave is decorated with a granite headstone.



Figure 11 - A second graveyard (GY05) belonging to the Rossouw family on the farm Mooifontein 448JS (above).

The inscriptions on the two graves read as follow:

- 'Hier rus Thomas la Rossouw Geb 30 Sep 1936 Ovl 3 Jun 1944 Want aan hulle behoort die hemel'
- 'Hier rus my geliefde eggenoot en ons vader Frans Pieter Rossouw Geb 10 Jul 1883 Ovl 12 Des 1962'

6.2.4.6. Graveyard 06

GY06 is located on the REM of the farm Mooifontein 448JS and is situated near a border fence. This graveyard hold approximately ten graves which are all covered with heaps of stone.



Figure 12 – GY06 is located in open veld and holds ten graves which area covered with piles of stone located on the REM of the farm Mooifontein 448JS (above).

6.2.4.7. Graveyard 07

GY07 is located on Portion 01 of the farm Mooifontein 448JS, in close proximity of GY06 and is situated near the border fence between the REM and Portion 01 of the farm Mooifontein 448JS.

GY07 holds approximate thirteen graves, the majority of which are demarcated with upright lines of stones while several are fitted with larger upright stones which serve as headstones for the graves.



Figure 13 - GY07 on Portion 01 of the farm Mooifontein 448JS holds approximately thirteen graves which are demarcated with upright stones (above).

6.2.4.8. Graveyard 08

GY08 on the REM of the farm Mooifontein 448JS is located in a wattle bush near a pan and holds four graves,

Two of the graves are covered with ferricrete stone heaps whilst the third is covered with a pile of stones and the fourth is merely marked with an upright stone.



Figure 14 - GY08 on REM of the farm Mooifontein 448JS holds four graves which are located in a wattle bush (above).

6.2.5. Tables

Table 1 - Coordinates for farmstead complexes, historical houses and other historical structures on the farm Mooifontein 448JS (below).

Historical structures	Coordinates	Significance
Farmstead complexes		
(FC01) Residence and wagon shed	25° 51.369' 29° 47.325'	Med-high
Historical houses		
(HH01) Historical House	25° 51.340' 29° 47.360'	Med-high
Other historical structures		
(SR01) Rondavel (sandstone)	25° 52.804' 29° 47.034'	Med-high
(CE01) Cattle enclosure (ferricrete)	25° 52.581' 29° 46.084'	Med-high

Table 2 - Coordinates for graves and graveyards on the farm Mooifontein 448JS (below).

Graveyards and graves	Coordinates	Significance
(G01) Single grave on Portion 07 near pan.	25° 53.093' 29° 46.442'	HIGH
(GY02) Two graves of the Rossouw family (children) located near a pan on Portion 07.	25° 53.170' 29° 46.360'	HIGH
(GY03) Mkwana grave plus second individual's grave near a pan on Portion 07.	25° 52.748' 29° 46.239'	HIGH
(G04) Single grave buried under heap of soil on Portion 07.	25° 52.815' 29° 46.550'	HIGH
(GY05) Second graveyard belonging to the Rossouw family on Portion 07.	25° 52.899' 29° 46.991'	HIGH
(GY06) Ten graves in REM area next to a border fence.	25° 51.551' 29° 46.418'	HIGH
(GY07) Thirteen graves in REM area next to a border fence	25° 51.646' 29° 46.513'	HIGH
(GY08) Four graves in REM area in a wattle bush	25° 51.406' 29° 47.937'	HIGH

6.3. Heritage resources on Grootlaagte 449JS

6.3.1. Farmstead complexes

The following farmstead complexes occur on the farm Grootlaagte 449JS, namely:

6.3.1.1. Farmstead Complex 02

FC02 on the farm Grootlaagte 449JS is composed of a dwelling and rondavel which were both constructed with sandstone. One is fitted with a slanted corrugated iron roof (residence) and the rondavel's roof was thatched with grass. The third structure in this complex comprises of a dilapidated building which was constructed with ferricrete. It is highly likely that this building used to be a wagon shed.



Figure 15 - FC02 on the farm Grootlaagte 449JS is composed of a house and rondavel constructed with sandstone. A dilapidated ferricrete structure, with probably served as a wagon shed, is part of this complex (above).

6.3.1.2. Farmstead Complex 03

FC03 on the farm Grootlaagte 449JS is composed of a dwelling, wagon shed and two cattle kraals. Some of the original structures in this complex have been demolished and the existing structures probably did not exist contemporaneously in the past.

The house in this complex is a large structure which probably dates from the 1940's or the 1950's whilst the wagon shed (white-washed) was constructed with sandstone.

The two cattle enclosures were constructed with dolerite stone. These structures and the sandstone wagon shed were older than the main residence in the complex. The earliest core of this farmstead complex dates from the middle of the 19th century.

6.3.1.3. Farmstead Complex 04

FC04 is a complex in the north-eastern corner of the farm Grootlaagte 449JS which includes a house and wagon shed both of which were constructed with sandstone.

The cattle kraal was constructed with dolerite and is located in close proximity of the residence and wagon shed.

Whilst the house is still in a relative good condition the wagon shed incorporates additional extensions, some of which were built during more recent times with face bricks.



Figure 16 - This sandstone residence in FC04 on the farm Grootlaagte 449JS is part of a complex which also includes a wagon shed and cattle enclosures (above).

6.3.1.4. Farmstead Complex 05

FC05 is located in the central part of the farm Grootlaagte 449JS. It incorporates a residence and or a wagon shed and a cattle enclosure. One of the main structures in this complex cannot be firmly identified as either a house or a wagon shed. This building was constructed with sandstone but was altered to such an extent that it's original function and appearance cannot be identified with certainty.

The cattle kraal in this complex was constructed with dolerite and was renovated in the more recent past.



Figure 17 - A sandstone structure which represents the remains of a residence or a wagon shed and which is part of FC05 in the central part of the farm Grootlaagte 449JS (above).

6.3.2. Historical Houses

6.3.2.1. Historical House 02

HH02 on the farm Grootlaagte 449JS is an excellently preserved square house which was constructed with sandstone. It is fitted with a corrugated iron roof.

HH02 is still in an excellent condition and is occupied by farm labourers.



Figure 18 - HH02 is a square house which was constructed with sandstone on the farm Grootlaagte 449JS (above).

6.3.3. Other historical structures

6.3.3.1. Cattle enclosure

This cattle enclosure (CE02) on the farm Grootlaagte 449JS is a large rectangular structure which was constructed with sandstone

6.3.4. Graveyards and graves

6.3.4.1. Grave 09

A single grave (G09) with the remains of the Visser couple occurs in the midst of a maize field on the farm Grootlaagte 448JS. The dual grave is fitted with a granite headstone with the following inscription:

- ‘*LJL Visser 18-6-1882 †4-9-1994 EMM Visser (geb) Bruwer *18-1-1881 †14-6-1944 Rus sag liewe ouers Visser’



Figure 19 - G09 in the midst of a maize field on the farm Grootlaagte 449JS holds the remains of the Visser couple (above).

6.3.4.2. Graveyard 10

This graveyard (GY10) on the farm Grootlaagte 449JS hold the remains of approximately forty-five labourers. Most of the graves are demarcated with dolerite stones. The single granite headstone on one of the graves bears the following inscription:

- 'Johannes K Khambule Died 22-1-1961 Age 99 years Rest in peace'

Two cement headstones have the following inscriptions:

- 'M Samson Nkhambule'
- 'Petrus Hlope'



Figure 20 - GY10 on the farm Grootlaagte 449JS holds the remains of approximately forty-five individuals (above).

6.3.4.3. Grave 11

This single grave (G11) under a few oak trees on the farm Grootlaagte 449JS contains the remains of two individuals.

The polished granite headstone's inscription is undecipherable and only the following can be read 'Hier rus ons ouers'



Figure 21 - A single grave (G11) with the remains of two individuals on the farm Grootlaagte 449JS (above).

6.3.4.4. Graveyard 12

This graveyard (G12) on the farm Grootlaagte 449JS hold the remains of the Schmahl couple which is demarcated with a low brick wall.

The inscription on the granite headstone read as follows:

- 'Hier rus my eggenoot en ons vader Johannes Paulus Jacobus Geb 19-6-1885 Oorl 10-9-1961 Hier rus ons moeder en grootmoeder Martha Johanna Luoisa Geb 19-6-1890 Oorl 3-12-1971 Schmahl'

6.3.4.5. Graveyard 13

Part of this graveyard (GY13) on the farm Grootlaagte 449JS is covered with tall grass. However, it probably holds the remains of approximately fifteen individuals. At least two of the graves are fitted with cement headstones and are demarcated with bricks or stones. The other graves are merely covered with piles of stone.



Figure 22 - Part of GY13 on the farm Grootlaagte 449JS is covered with tall grass (behind trees) but probably holds as many as fifteen graves (above).

6.3.4.6. Graveyard 14

This informal graveyard (GY14) on the farm Grootlaagte 449JS is situated some distance from a tar road and was not accessible when the fieldwork was done.

It holds the remains of approximately forty individuals.

6.3.4.7. Graveyard 15

This informal graveyard (GY15) on the farm Grootlaagte 449JS is situated in a piece of land which has not been ploughed before. It holds the remains of approximately twenty graves all of which are demarcated or covered with piles of ferricrete.

One of the graves is fitted with a piece of plate with the following inscription:

- 'Sidudla Lena Skosana Born 1926-11-14 Died 2010-01-21 May your soul rest in peace'



Figure 23 - GY15 on the farm Grootlaagte 449JS holds approximately twenty graves which are all covered with piles of ferricrete (above).

6.3.4.8. Graveyard 16

This informal graveyard (GY16) on the farm Grootlaagte 449JS is situated in a patch with tall grass between maize fields. It holds seven graves which are all covered with piles of stone.

6.3.4.9. Graveyard 17

GY17 on the farm Grootlaagte 449JS is situated in the midst of maize fields. It is demarcated with a dilapidated fence and contains ten graves, the majority of which are demarcated with ferricrete.



Figure 24 - GY17 on the farm Grootlaagte 449JS holds approximately ten graves and is located in the midst of maize fields (above).

One of the graves is fitted with a headstone with the following inscription:

- 'Mgayi Nrobela Mahlangu Washona ngezi 12-08-1929'

6.3.4.10. Graveyard 18

This graveyard (GY18) on the farm Grootlaagte 449JS holds the remains of approximately twenty individuals.

Some of the graves are relatively fresh.

Inscriptions on small headstones of two of the graves read as follow:

- 'Shabangu Sarah Mosebuthu †1991-06-07'
- 'Sindane William Magenelwa †1995-05-21'



Figure 25 - GY18 on the farm Grootlaagte 449JS hold approximately twenty graves and is located against the soft slope of a hill (above).

6.3.5. Tables

Table 3 - Coordinates for farmstead complexes, historical houses and other historical structures on Grootlaagte 449JA (below).

Historical structures	Coordinates	Significance
Farmstead complexes		
(FC02) On Grootlaagte 449JS composed of a house, rondavel and possible wagon shed FC02.1 House FC02.2 Rondavel FC02.3 Wagon shed	25° 53.133' 29° 49.556' 25° 53.133' 29° 49.465' 25° 50.126' 29° 49.550'	Med-high
(FC03) On Grootlaagte 449JS composed of a house, wagon shed and cattle kraals FC03.1 House FC03.2 Wagon shed FC03.3 Cattle kraals	25° 53.286' 29° 49.577' 25° 53.276' 29° 49.630' 25° 50.279' 29° 49.603'	Med-high
(FC04) on Grootlaagte 449JS composed of a house, wagon shed and cattle kraal FC04.1 House FC04.2 Wagon shed FC04.3 Cattle kraals	25° 51.097' 29° 51.496' 25° 51.097' 29° 51.496' 25° 51.149' 29° 51.438'	Med-high
(FC05) On Grootlaagte 449JS composed of a house/wagon shed and cattle kraal FC05.1 House/wagon shed FC05.2 Cattle kraal	25° 53.931' 29° 48.695' 25° 53.924' 29° 46.640'	Med-high
Historical houses		
(HH02) On Grootlaagte 449JS constructed with sandstone	25° 53.018' 29° 49.220'	Med-high
Other historical structures		
(CE02) Rectangular cattle enclosure on Grootlaagte 494JS constructed with sandstone	25° 51.766' 29° 49.277'	Med-high

Table 4 - Coordinates for graves and graveyards on the farm Grootlaagte 449JS (below).

Graveyards and graves	Coordinates	Significance
(G09) Grave of the Visser couple in the midst of a maize field on Grootlaagte 449JS	25° 52.426' 29° 48.465'	HIGH
(GY10) Graveyard with approximately forty five graves on Grootlaagte 449JS	25° 52.808' 29° 49.441'	HIGH
(G11) Single grave with the remains of two individuals on Grootlaagte 449JS	25° 53.123' 29° 49.499'	HIGH
(G12) Single grave with the remains of the Schmahl couple on Grootlaagte 449JS	25° 53.844' 29° 48.831'	HIGH
(GY13) Graveyard in wattle bush with approximately fifteen graves on Grootlaagte 449JS	25° 53.799' 29° 49.550'	HIGH
(GY14) Graveyard in open veld with approximately thirty five graves on Grootlaagte 449JS.	25° 53.799' 29° 49.550'	HIGH
(GY15) Graveyard on a piece of undisturbed veld with approximately twenty graves on Grootlaagte 449JS	25° 52.209' 29° 49.747'	HIGH
(GY16) Graveyard with seven graves between maize fields on Grootlaagte 449JS.	25° 51.489' 29° 49.113'	HIGH
(GY17) Graveyard with ten graves between maize fields on Grootlaagte 449JS	25° 52.516' 29° 49.081'	HIGH
(GY18) Graveyard with twenty graves against soft slope of hill on Grootlaagte 449JS	25° 51.966' 29° 51.080'	HIGH

6.4. Heritage resources on the farms Nooitgedacht 483JS, Klippan 452JS and Leeuwpans 449JS

6.4.1. Farmstead complexes

6.4.1.1. Farmstead Complex 06

This farmstead complex (FC06) is situated on the farm Nooitgedacht 483JS and is composed of a house and two wagon sheds. The house was constructed with sandstone but has been renovated in the more recent past and is barely recognisable as a historical structure.

The two sheds were respectively built with bricks and cement and the second shed with sandstone.

Several additions and extensions were made to the second shed and the material which was used consisted of bricks and cement.

6.4.1.2. Farmstead Complex 07

FC07 on the farm Klippan 452JS consists of a house and wagon shed which were constructed with sandstone.

This farmstead complex probably dates from the middle of the 19th century. The wagon shed has been restored whilst the house has fallen into disrepair.



Figure 26 - The sandstone house in FC07 on the farm Nooitgedacht 483JS which has fallen into disrepair (above).

6.4.2. Historical Houses

6.4.2.1. Historical House 03

This residence (HH03) on the farm Klippan 452JS was constructed with red face bricks and is fitted with steel window frames. Its roof was constructed with cement tiles.

HH03 probably dates from the 1950's or from the 1960's and is still in an excellent condition.

6.4.2.2. Historical House 04

HH04 on the farm Leeuwpan 494JS was constructed with sandstone. It is fitted with a corrugated iron roof and a verandah which is covered with the same material.

HH04 dates from the early 19th century.



Figure 27 - HH04 is a sandstone structure on the farm Leeuwpan 494JS. It dates from the early 19th century (above).

6.4.2.3. Historical House 5

HH05 on the farm Leeuwpan 494JS was constructed with ferricrete and sandstone. It is fitted with a corrugated iron roof. It is still in an excellent condition and dates from the early 19th century.



Figure 28 - HH05 was constructed with sandstone and ferricrete. It was extended with a lean-to which was also built with ferricrete whilst the corner posts of the structure were decorated with blocks of sandstone. The residence was built in the early 19th century (above).

6.4.3. Graveyards and graves

6.4.3.1. Graveyard 19

This historical graveyard (GY19) on the farm Leeuwpan 494JS hold the remains of three individuals. All three graves are decorated with granite trimmings and headstones.

Inscriptions on two of the headstones read as follow:

- 'In liefdevolle herinnering aan my eggenoot ons pa en oupa Jacob Coenraad *05-02-1925 †26-02 2000 Na waters waar rus is lei Hy my heen Breytenbach'

- 'In liefdevolle herinnering aan ons dierbare eggenoot en ons vader Johan Hendrik Breytenbach Geb 12 Okt 1897 Oorl 1 Julie 1942 Wat Ek doen begryp jy nou nie maar jy sal dit hierna verstaan Joh 19 V7'

6.4.3.2. Graveyard 20

This graveyard (GY20) on the edge of a maize field on the farm Leeuwpan 494JS hold the graves which are all demarcated with dolerite stones. It is highly likely that more graves may occur in GY20.

6.4.3.3. Graveyard 21

Graveyard GY21 is situated in open veldt on the farm Leeuwpan 494JS. All four graves are decorated in the same fashion.

The graves are demarcated with cement strips and fitted with small cement headstones with inscriptions. However, only one of these is decipherable. It has the following inscription:

- 'Mr Magega Mthimunye wasishya ngom hlaka' October 1950 lalango xolo'

6.4.3.4. Graveyard 22

Graveyard GY22 on the farm Leeuwpan 494JS hold the remains of approximately twelve individuals. At least ten of these graves are covered with piles of rock.

Inscriptions on two graves fitted with cement strips and headstones are as follow:

- 'Johannes Ntuli Mabellari 20-4-1994'
- 'Witbooi Ntuli walala ngohlaka 31 July 1962 wabekwa ngomhlaka 2 Aug 1962'



Figure 29 - GY22 on the farm Leeuopan 494JS holds the remains of approximately twelve individuals in a small graveyard demarcated with a fence (above).

6.4.3.5. Graveyard 23

Graveyard GY23 near an informal village on the farm Leeuwpan 494JS hold the remains of more than forty individuals.

Most of the graves are covered with piles of stone or demarcated with dolerite stones. One of the graves which is fitted with a granite headstone contains the following inscription:

- 'Ngozi Phillip 22-11-1954 21-08-2004 Rest in peace Psalm 23 Mthimunye'

6.4.3.6. Graveyard 24

GY24 on the farm Klippan 452JS is located near the eastern shoulder of the dirt road running from Wonderfontein (north) to Hendrina (south).

This historical graveyard is demarcated with a stone wall and is situated against a slope

running down to Klippan. It holds the remains of approximately twenty individuals. All the graves are decorated with granite and marble stone.



Figure 30 - Historical GY24 on the farm Klippan 453JS holds the remains of approximately twenty individuals in a small graveyard which is demarcated with a rectangular stone wall (above).

Inscriptions on some of the granite headstones read as follow:

- 'In liefdevolle herinnering aan ons vader Christiaan F Geb 5-4-1882 My dierbare eggenoot en ons moeder Andriette WJ Geb Botha Geb 5-8-1892 Oorl 17-7-1964 Mathuizen'
- 'Hier rus Louis A Fourie Geb Julie 1894 Ovl 28 Okt 1951 Joh 15 Vers 16 Ges 21 Vers 2 Eggenoot van AC Fourie'
- 'In herinnering aan ons geliefde seun Hermanus J P Fourie Geb 23 Maart 1931 Oorl 27 April 1944 Lied 423 Jesus roep my as 'n sonstraal Hebreurs 11 Vers 16 Pappie en Mammie'

6.4.4. Tables

Table 5 - Coordinates for farmstead complexes, historical houses and other structures on the farms Nooitgedacht 483JS, Klippan 452JS and Leeuwpan 449 JS (below).

Farmstead complexes	Coordinates	Significance
(FC06) On Nooitgedacht 483JS and consists of a renovated sandstone house and two wagon sheds FC06.1 House FC06.2 Wagon shed FC06.3 Wagon shed	25° 55.067' 29° 49.088' 25° 55.064' 29° 49.116' 25° 55.080' 29° 49.091'	Med-high
(FC07) On Klippan 452JS and consists of a sandstone house and wagon shed FC07.1 House FC07.2 Wagon shed	25° 54.343' 29° 51.598' 25° 54.357' 29° 51.597'	Med-high
Historical houses		
(HH03) On Klippan 452JS and dates from the 1950's or 1960's	25° 55.210' 29° 51.555'	Med-high
(HH04) On Leeuwpan 494JS and is a sandstone residence	25° 55.963' 29° 52.070'	Med-high
(HH05) On Leeuwpan 494JS and is a ferricrete and sandstone residence	25° 56.010' 29° 52.061'	Med-high

Table 6 - Coordinates for graves and graveyards on the farms Nooitgedacht 483JS, Klippan 452JS and Leeuwpán 449JS (below).

Graveyards	Coordinates	Significance
(GY19) Graveyard with three graves near historical houses on Leeuwpán 494JS.	25° 55.920' 29° 52.022'	HIGH
(GY20) Graveyard with three or more graves on the edge of a maize field on Leeuwpán 494JS.	25° 56.630' 29° 52.138'	HIGH
(GY21) Graveyard with four graves in the veld on Leeuwpán 494JS.	25° 56.450' 29° 52.129'	HIGH
(GY22) Graveyard with approximately twelve graves near informal village on Leeuwpán 494JS.	25° 55.692' 29° 52.275'	HIGH
(GY23) Graveyard with approximately forty graves near informal village on Leeuwpán 494JS.	25° 55.493' 29° 52.563'	HIGH
(GY24) Historical graveyard with approximately twenty graves on Klippan 452JS	25° 53.635' 29° 51.569'	HIGH

6.5. Heritage resources on the farm Schoonoord 164IS

6.5.1. Farmstead complexes

6.5.1.1. Farmstead complex 08

FC08 is located near the southern border of the Project Area on the farm Schoonoord 164IS and is associated with GY26. It is composed of a farm house, wagon shed and a rondavel. The wagon shed was built with sandstone and ferricrete, the farm house with clay bricks and with cement whilst the rondavel was constructed with ferricrete.

Both the wagon shed and the rondavel have fallen into disrepair.

The farm house has several rooms and is fitted with a pitched corrugated iron roof. It's more recent origin is reflected by its steel window panes. The core of the house is historical but can no longer be recognised as the house has been altered in the more recent past.



Figure 31 - The farm house which is part of FC08 is associated with a wagon shed and a rondavel located on the farm Schoonoord 164IS (above). This house dates from the 1930's or 1940's and is younger than the wagon shed and rondavel.

The farm house is currently being used as a store room. It has no outstanding architectural features or any other outstanding historical significance. It has been abandoned for some time.



Figure 32 - A rondavel which was constructed with ferricrete is part of FC08 on the farm Schoonoord 164IS. It was probably fitted with a pitched corrugated iron roof (above).

6.5.2. Historical houses

6.5.2.1. Historical House 06

HH06 is part of a modern farm complex on the farm Schoonoord 164IS.

This farm house was built with sandstone and was fitted with a pitched corrugated iron roof and is located in the middle of other modern structures.



Figure 33 - HH06 is located in the middle of a modern farmstead complex on the farm Schoonoord 164IS. This house is situated next to a modern residence (not visible in the photograph) and is linked to a double garage (left).

6.5.3. Graveyards and graves

6.5.3.1. Grave 26

This is a single grave in a strip of weed between maize fields on the farm Schoonoord 164IS.

No inscription is visible on the headstone as the grave is covered with weed and tall grass.

6.5.3.2. Graveyard 27

GY27 is a formal graveyard with four graves that are demarcated with a brick wall recorded on the farm Schoonoord 164IS. The grave of Martha Oosthuysen is marked by granite edgings and a granite headstone with the following inscription:

- 'Hier rus ons dogtertjie Martha Oosthuysen Geb 19.9.1995 Oorl 23.9.1955 Ps. 131 Vers 2'



Figure 34 - GY27 on the farm Schoonoord 164IS belongs to the Oosthuizen family and holds four graves (above).

6.5.4. Tables

Table 7 - Coordinates for farmstead complexes, historical houses and other historical structures on the farm Schoonoord 164IS (below).

Farmstead complex	Coordinates	Significance
FC08 On Schoonoord 164IS consisting of a house, wagon shed and rondavel		
(FC08.1) House constructed with cement and clay bricks	25° 59.518' 29° 48.157'	Med-high
(FC08.2) Wagon shed constructed with sandstone	25° 59.528' 29° 49.161'	
(FC08.3) Rondavel constructed with ferricrete	25° 59.515' 29° 48.143'	
Historical houses		
(HH06) Harm house which is now part of modern farmstead complex constructed with sandstone	25° 59.861' 29° 47.822'	Med-high

Table 8 - Coordinates for graves and graveyards on the farm Schoonoord 164IS (below).

Graveyards	Coordinates	Significance
(G26) Single grave in a strip of weed between maize fields	25° 59.728' 29° 47.789'	HIGH
(GY27) Historical graveyard of the Oosthuizen family	26° 00.095' 29° 47.563'	HIGH

6.6. Heritage resources on the farms Tweefontein 458JS and Mooifontein 448JS

The following heritage resources were recorded during an earlier Heritage Impact Assessment study on Portions 3 and 4 of the farm Tweefontein 458JS and Portions 4 &

5 of the farm Mooifontein 448JS.

6.6.1. Farmstead complexes

6.6.1.1. Farmstead complex 09

This farmstead complex (FC09) consists of a stone kraal, reservoir and the foundations of a former farm house and was recorded on Portion 4 of farm Mooifontein 448JS.

6.6.1.2. Farmstead complex 10

This farmstead complex (FC10) consists of a stone kraal and the foundations of a former farm house and was recorded on Portion 4 of farm Tweefontein 458JS.

6.6.1.3. Farmstead complex 11

This farmstead complex (FC11) on Portion 2 of the farm Mooifontein 448JS consists of the main house with associated outbuildings. This complex dates from AD1900 to AD1930. It is still being used by the Cass family.

6.6.2. Graveyards and graves

6.6.2.1. Graveyard 28

GY28 on Portion 2 of the Mooifontein 448JS holds the remains of eleven family members of the Tombeni family.

6.6.2.2. Graveyard 29

This graveyard on Portion 5 of the farm Mooifontein 448JS holds three graves. One of the headstones bear the following inscription:

- 'Andries Motswedi'

6.6.2.3. Graveyard 30

GY30 on Portion 3 of the farm Tweefontein 458JS holds the remains of six individuals with one of the headstones bearing the following inscription:

- 'Shabambo'

6.6.2.4. Graveyard 31

This graveyard (GY31) on Portion 3 of the farm Tweefontein 458JS holds the remains of three individuals.

One of the sandstone headstones holds the following inscription:

- 'Nuwenhysen Gebore 1879 Oorl 1924'

6.6.2.5. Graveyard 32

This graveyard (GY32) situated on Portion 3 of farm Tweefontein 458JS holds an unknown number of graves and is located in a maize field.

6.6.2.6. Graveyard 33

This graveyard (GY33) situated on Portion 4 of farm Tweefontein 458JS also holds an unknown number of graves.

6.6.3. Tables

Table 9 - Coordinates for farmstead complexes on the farms Tweefontein 458JS and Mooifontein 448JS (below).

Farmstead complexes	Coordinates	Significance
(FC09) Stone kraal, reservoir and house foundation	25.86639 29.75548	Med-high
(FC10) Stone kraal and house foundation	25.91395 29.76516	Med-high
Cass family homestead with associated buildings. Mooifontein 448JS Portion 2	See 1: 50 000 topo map of Arnot	Med-high

Table 10 - Coordinates for the graves and graveyards on Portions 4 & 5 of the farm Tweefontein 458JS and Portions 4 &5 of the farm Mooifontein 448JS (below).

Graveyards	Coordinates	Significance
(GY28). With eleven graves of the Tombeni clan	25.86115 29.75461	HIGH
(GY29) Graveyard with three graves on Mooifontein 448JS	25.88423 29.76413	HIGH
(GY30) Graveyard with six graves on Tweefontein	25.88791 29.76916	HIGH
(GY31) Graveyard with three graves on Tweefontein	25.89949 29.77780	HIGH
(GY32) Graveyard with unknown number of graves in maize field	25.89888 29.76470	HIGH
(GY33) Graveyard with unknown number of graves	25.92141 29.76779	HIGH

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

It is possible that a number of historical structures such as farmstead complexes, houses and other historical structures as well as graves and graveyards may be negatively affected when new open cast and / or underground mines and mining related infrastructure are developed, or when they are in operation or when these mines are eventually closed. It is therefore necessary to indicate the significance of these heritage resources as well as to outline mitigation measures should any of these resources be negatively affected by the new proposed open cast mining activities.

7.1. The farmstead complexes, historical houses and other historical structures

The farmstead complexes, historical houses and other historical structures are older than sixty years and therefore qualify as historical remains. All remains older than sixty years are protected by the National Heritage Resources Act (Act No 25 of 1999).

The significance of these historical remains can be described as medium to high when considering criteria such as the following (Tables 1, 3, 5 & 7):

- Historical farmstead complexes, houses and other historical remains on the Eastern Highveld are rapidly disappearing as a result of coal mining activities, farming and general modernisation.
- These historical remains have value in terms of education, research, tourism and new usages in a mining context (e.g. to be used as offices, etc).

7.2. The graveyards

All graveyards and graves can be considered to be of high significance and are protected by various laws (Tables 2, 4, 6 & 8). 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. 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 (Act No 12 of 1980) and the Human Tissues Act (Act No 65 of 1983 as amended).

7.3. Mitigating the heritage resources

It is highly likely that a number of farmstead complexes, historical houses and other historical structures as well as graves and graveyards may be negatively affected during the development, operation or closure of any new open cast mining activities (Table 11). The following mitigation measures have to be applied if any of these farmstead complexes, historical houses and other historical structures or the graveyards and graves may be negatively affected, namely:

7.3.1. The farmstead complexes, historical houses and other historical structures

The farmstead complexes, historical houses and other historical structures have to be documented by a conservation architect before they may be destroyed. A letter issuing approval for the destruction of these structures has to be issued by the South African Heritage Resources Agency (SAHRA) after these structures have been documented by the conservation architect.

7.3.2. The graveyards

Graves and graveyards can be mitigated in two ways depending whether they are to be affected, directly or indirectly, namely:

- By means of exhumation and relocation when they are affected directly. 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. Conserving graveyards *in situ* in mining areas create the risk and responsibility that they may be damaged, accidentally, that the mine remains responsible for its future unaffected existence, maintenance and that controlled access must exist for any relatives or friends who wish to visit the deceased.

Table 11 - Farmstead complexes, historical houses and other historical structures as well as graves and graveyards which may be negatively affected within the mining right area of Arnot Coal Mine.

Farmstead complexes	Historical houses	Other historical structures	Graves and graveyards
FC01	HH01	CE01	G04
FC02	HH02	R01	GY05
FC03			GY08
FC07			GY09
			GY11
			GY17

8. CONCLUSION AND RECOMMENDATIONS

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

- Historical farmstead complexes consisting of various structures such as houses, wagon sheds, rondavels and cattle kraals which are spatially and functionally associated with each other in order to constitute cultural landscapes of small proportions;
- Individual historical structures such as houses, wagon sheds, rondavels, etc. which in most instances once used to be part of farm complexes but who now represent are now the only remains of these complexes; and
- Graveyards and graves, some of which can be classified as historical as they are older than sixty years.

These heritage resources were mapped and geo-referenced according to their presence on the various farms in the Project Area (Figure 3, Tables 1-8).

The heritage resources that may be impacted by the Arnot Project are indicated; their significance is determined and mitigation measures are outlined should these heritage resources be negatively affected by the Arnot Project (Table 11).

It is possible that a number of historical structures such as farmstead complexes, houses and other historical structures as well as graves and graveyards may be negatively affected when new open cast mines are developed, or when they are in operation or when these mines are eventually closed. It is therefore necessary to indicate the significance of these heritage resources as well as to outline mitigation measures should any of these resources be negatively affected by new proposed open cast mining activities.

The farmstead complexes, historical houses and other historical structures

The farmstead complexes, historical houses and other historical structures are older than sixty years and therefore qualify as historical remains. All remains older than sixty years are protected by the National Heritage Resources Act (Act No 25 of 1999).

The significance of these historical remains can be described as medium to high when considering criteria such as the following (Tables 1, 3, 5 & 7):

- Historical farmstead complexes, houses and other historical remains on the Eastern Highveld are rapidly disappearing as a result of coal mining activities,

- farming and general modernisation; and
- These historical remains have value in terms of education, research, tourism and new usages in a mining context (e.g. to be used as offices, etc).

The graveyards

All graveyards and graves can be considered to be of high significance and are protected by various laws (Tables 2, 4, 6 & 8). 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. 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 (Act No 12 of 1980) and the Human Tissues Act (No 65 of 1983 as amended).

Mitigating the heritage resources

It is highly likely that a number of farmstead complexes, historical houses and other historical structures as well as graves and graveyards may be negatively affected during the development, operation or closure of any new open cast mining activities (Table 11). The following mitigation measures have to be applied if any of these farmstead complexes, historical houses and other historical structures or the graveyards and graves may be negatively affected, namely:

The farmstead complexes, historical houses and other historical structures

The farmstead complexes, historical houses and other historical structures have to be documented by a conservation architect before they may be destroyed. A letter issuing approval for the destruction of these structures has to be issued by the South African Heritage Resources Agency (SAHRA) after these structures have been documented by the conservation architect.

The graveyards

Graves and graveyards can be mitigated in two ways depending whether they are to be affected, directly or indirectly, namely:

- By means of exhumation and relocation when they are affected directly. 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. Conserving graveyards *in situ* in mining areas create the risk and responsibility that they may be damaged, accidentally, that the mine remains responsible for its future unaffected existence, maintenance and that controlled access must exist for any relatives or friends who wish to visit the deceased.

A handwritten signature in black ink, appearing to read '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
Member ASAPA

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10. SPOKESPERSONS CONSULTED

Gerhard Grobler. Farm foreman for ALZU.

Laurence Sedikwe. Farm labourer on Mooifontein 448JS.

Willie Ntuli. Resident (schoolboy) living on Mooifontein 448JS.

Van Eeden. Farm owner Mooifontein 448JS.

Karl Wedemeyer. Farm owner Mooifontein 448JS.

Kleinbooi Mgoma. Resident on Mooifontein 448JS.

Lisa Thukwane. Resident on Mooifontein 448JS.

Michael Mokoni. Environmental Officer. Arnot Coal.

Andre Walkov. Environmental Superintendent and Sustainable Development, Arnot Coal.

Gawie Janse van Rensburg (snr). Farm owner Grootlaagte 449JS.

Gawie Janse van Rensburg (jnr). Son of farm owner Grootlaagte 449JS.

Mabuthi Skosana. Farm worker on Grootlaagte 449JS.

Helena Mahlangu. Resident on Grootlaagte 449JS.

LJV Breytenbach. Farm owner on Leeuwpan.

Coenraad Visagie, Son of farm owner on Klippan.

Flip Ehlers. Farm owner Mooifontein and Nooitgedacht.

Liezel Kotze. Farm owner Vlaklaagte 166IS.

APPENDIX A – Coordinates of all Farmstead complexes, graves, graveyards and other Historical Structures.

TYPE	NAME	LATITUDE	LONGITUDE	SIGNIFICANCE	ID
Other Historical Structures	(CE01) - Ferricrete Cattle Enclosure	25° 52' 34.800" S	29° 46' 4.800" E	Medium - Low	CE01
Other Historical Structures	(CE02) – Rectangular Cattle enclosure	25° 51' 45.600" S	29° 49' 16.200" E	Medium - Low	CE02
Farmstead Complex	(FC01) - Residence and wagon shed	25° 51' 21.600" S	29° 47' 19.200" E	Medium - Low	FC01
Farmstead Complex	(FC02.1) - House	25° 53' 7.800" S	29° 49' 33.000" E	Medium - Low	FC02.1
Farmstead Complex	(FC02.2) - Rondavel	25° 53' 7.800" S	29° 49' 27.600" E		FC02.2
Farmstead Complex	(FC02.3) - Possible Wagon Shed	25° 50' 7.200" S	29° 49' 33.000" E		FC02.3
Farmstead Complex	(FC03.1) - House	25° 53' 16.800" S	29° 49' 34.200" E	Medium - Low	FC03.1
Farmstead Complex	(FC03.2) - Wagon Shed	25° 53' 16.200" S	29° 49' 37.800" E		FC03.2
Farmstead Complex	(FC03.3) - Cattle Kraals	25° 50' 16.200" S	29° 49' 36.000" E		FC03.3
Farmstead Complex	(FC04.1) House	25° 51' 5.400" S	29° 51' 29.400" E	Medium - Low	FC04.1
Farmstead Complex	(FC04.2) Wagon Shed	25° 51' 5.400" S	29° 51' 29.400" E		FC04.2
Farmstead Complex	(FC04.3) - Cattle Kraals	25° 51' 8.400" S	29° 51' 25.800" E		FC04.3
Farmstead Complex	(FC05.1) - House / Wagon Shed	25° 53' 55.800" S	29° 48' 41.400" E	Medium - Low	FC05.1
Farmstead Complex	(FC05.2) - Cattle Kraal	25° 53' 55.200" S	29° 46' 38.400" E		FC05.2
Farmstead Complex	(FC06.1) House	25° 55' 3.600" S	29° 49' 4.800" E	Medium - Low	FC06.1
Farmstead Complex	(FC06.2) - Wagon Shed	25° 55' 3.600" S	29° 49' 6.600" E		FC06.2
Farmstead Complex	(FC06.3) - Wagon Shed	25° 55' 4.800" S	29° 49' 5.400" E		FC06.3
Farmstead Complex	(FC07.1) - House	25° 54' 20.400" S	29° 51' 35.400" E	Medium - Low	FC07.1
Farmstead Complex	(FC07.2) - Wagon Shed	25° 54' 21.000" S	29° 51' 35.400" E		FC07.2
Farmstead Complex	(FC08.1) House	25° 59' 30.600" S	29° 48' 9.000" E	Medium - Low	FC08.1
Farmstead Complex	(FC08.2) - Wagon Shed	25° 59' 31.200" S	29° 49' 9.600" E		FC08.2
Farmstead Complex	(FC08.3) - Rondavel	25° 59' 30.600" S	29° 48' 8.400" E		FC08.3
Farmstead Complex	(FC09) - Stone kraal, Reservoir, and House foundation	25° 51' 59.004" S	29° 45' 19.728" E	Medium - Low	FC09

Farmstead Complex	(FC10) - Stone Kraal and House foundation	25° 54' 50.220" S	29° 45' 54.576" E	Medium - Low	FC10
Farmstead Complex	(FC11) - Homestead with associated buildings	25° 52' 6.256" S	29° 43' 57.757" E	Medium - Low	FC11
Graveyards and Graves	(G01) – Single Grave	25° 53' 5.400" S	29° 46' 26.400" E	HIGH	G01
Graveyards and Graves	(G04) - Single Grave	25° 52' 48.600" S	29° 46' 33.000" E	HIGH	G04
Graveyards and Graves	(G09) – Single grave with 2 Remains	25° 52' 25.200" S	29° 49' 26.400" E	HIGH	G09
Graveyards and Graves	(G11) – Single grave with 2 Remains	25° 53' 7.200" S	29° 49' 29.400" E	HIGH	G11
Graveyards and Graves	(G12) - Single grave with 2 Remains	25° 53' 50.400" S	29° 48' 49.800" E	HIGH	G12
Graveyards and Graves	Grave1	25° 56' 47.816" S	29° 50' 17.800" E		Grave1
Graveyards and Graves	Grave2	25° 56' 47.688" S	29° 50' 17.821" E		Grave2
Graveyards and Graves	Grave3	25° 56' 54.438" S	29° 23' 20.561" E		Grave3
Graveyards and Graves	Grave4	25° 56' 47.635" S	29° 50' 17.968" E		Grave4
Graveyards and Graves	Grave5	25° 56' 47.829" S	29° 50' 17.920" E		Grave5
Graveyards and Graves	Grave6	25° 56' 47.900" S	29° 50' 17.804" E		Grave6
Graveyards and Graves	Grave7	25° 56' 47.894" S	29° 50' 17.893" E		Grave7
Graveyards and Graves	Grave8	25° 56' 38.931" S	29° 50' 12.786" E		Grave8
Graveyards and Graves	(GY02) – 2 Graves	25° 53' 10.200" S	29° 46' 21.600" E	HIGH	GY02
Graveyards and Graves	(GY03) – 2 Graves	25° 52' 44.400" S	29° 46' 13.800" E	HIGH	GY03
Graveyards and Graves	(GY05) - Graveyard	25° 52' 53.400" S	29° 46' 59.400" E	HIGH	GY05
Graveyards and Graves	(GY06) - Graveyard	25° 51' 33.000" S	29° 46' 24.600" E	HIGH	GY06
Graveyards and Graves	(GY07) - 13 Graves	25° 51' 38.400" S	29° 46' 30.600" E	HIGH	GY07
Graveyards and Graves	(GY08) – 4 Graves	25° 51' 24.000" S	29° 47' 55.800" E	HIGH	GY08
Graveyards and Graves	(GY10) – 45 Graves	25° 52' 48.000" S	29° 46' 21.600" E	HIGH	GY10
Graveyards and Graves	(GY13) – 15 Graves	25° 53' 47.400" S	29° 49' 33.000" E	HIGH	GY13
Graveyards and Graves	(GY14) – 35 Graves	25° 53' 47.400" S	29° 49' 33.000" E	HIGH	GY14
Graveyards and Graves	(GY15) – 20 Graves	25° 52' 12.000" S	29° 49' 44.400" E	HIGH	GY15
Graveyards and Graves	(GY16) - 7 Graves	25° 51' 28.800" S	29° 49' 6.600" E	HIGH	GY16

Graveyards and Graves	(GY17) – 10 Graves	25° 52' 30.600" S	29° 49' 4.800" E	HIGH	GY17
Graveyards and Graves	(GY18) – 20 Graves	25° 51' 57.600" S	29° 51' 4.800" E	HIGH	GY18
Graveyards and Graves	(GY19) – 3 Graves	25° 55' 55.200" S	29° 52' 1.200" E	HIGH	GY19
Graveyards and Graves	(GY20) – 3 or more Graves	25° 56' 37.800" S	29° 52' 7.800" E	HIGH	GY20
Graveyards and Graves	(GY21) – 4 Graves	25° 56' 27.000" S	29° 52' 7.200" E	HIGH	GY21
Graveyards and Graves	(GY22) - 12 Graves	25° 55' 41.400" S	29° 52' 16.200" E	HIGH	GY22
Graveyards and Graves	(GY23) – 40 Graves	25° 55' 29.400" S	29° 52' 33.600" E	HIGH	GY23
Graveyards and Graves	(GY24) – 20 Graves	25° 53' 37.800" S	29° 51' 33.600" E	HIGH	GY24
Graveyards and Graves	(GY26) – Single Grave	25° 59' 43.200" S	29° 47' 46.800" E	HIGH	GY26
Graveyards and Graves	(GY27) – 4 Graves	26° 0' 5.400" S	29° 47' 33.600" E	HIGH	GY27
Graveyards and Graves	(GY28) – 11 Graves	25° 51' 40.140" S	29° 45' 16.596" E	HIGH	GY28
Graveyards and Graves	(GY29) – 3 Graves	25° 53' 3.228" S	29° 45' 50.868" E	HIGH	GY29
Graveyards and Graves	(GY30) – 6 Graves	25° 53' 18.545" S	29° 46' 8.034" E	HIGH	GY30
Graveyards and Graves	(GY31) - 3 Graves	25° 53' 58.164" S	29° 46' 40.080" E	HIGH	GY31
Graveyards and Graves	(GY32) – Unknown number of graves	25° 53' 55.968" S	29° 45' 52.920" E	HIGH	GY32
Graveyards and Graves	(GY33) – Unknown number of graves	25° 55' 17.076" S	29° 46' 4.044" E	HIGH	GY33
Houses	(HH01) - Historical House	25° 51' 20.400" S	29° 47' 21.600" E	Medium - Low	HH01
Houses	(HH02) - Historical House	25° 53' 0.600" S	29° 49' 13.200" E	Medium - Low	HH02
Houses	(HH03) - Historical House	25° 55' 12.600" S	29° 51' 33.000" E	Medium - Low	HH03
Houses	(HH04) - Historical House	25° 55' 57.600" S	29° 52' 4.200" E	Medium - Low	HH04
Houses	(HH05) - Historical House	25° 56' 0.600" S	29° 52' 3.600" E	Medium - Low	HH05
Houses	(HH06) - Historical House	25° 59' 51.600" S	29° 47' 49.200" E	Medium - Low	HH06
Houses	(SR01) - Sandstone Rondavel	25° 52' 48.000" S	29° 47' 1.800" E	Medium - Low	SR01