

PAARDEKOP COAL MINE
Phase I Cultural Heritage Impact Assessment

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Prepared for



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S T R A T E G I C E N V I R O N M E N T A L F O C U S

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03 June 2013

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Date

EXECUTIVE SUMMARY

The aim of the cultural heritage survey (Phase I Heritage Survey, in accordance with the National Heritage Resources Act, 1999 (Act No. 25 of 1999)) was to locate, identify, document and assess sites of cultural heritage, architectural and archaeological significance that may occur within the proposed footprint for the establishment of the Paardekop Coal Mine and associated linear infrastructure. An assessment of the impact of the establishment of the mine on such resources will be provided. Where the impact is negative, alternatives and/or mitigation plans will be considered.

The heritage investigation focused on the footprint of the main mine infrastructure, including the two railway line alternatives for the transportation of coal as well as the area where construction site layouts are being proposed. The study area is mainly farmlands, and as such the heritage resources revealed by the study conform to agricultural land heritage and archaeology. The two major types of heritage resources found on site constitute graves and various farm buildings/structures and ruins.

The heritage survey revealed the following:

- 8 structures constituting farm buildings/ structures and ruins of various ages; and
- 8 grave sites containing about 170 graves of various ages.

The following heritage features would need to be demolished/relocated as they occur in the way of the development if the infrastructure cannot be shifted in order to allow the recommended 20 m buffer from heritage resource to the edge of the construction boundary:

- Structures A (Plate 11);
- Structure B (Plate 12);
- Structure H (Plate 18); and
- Gravesite 7 (Plate 9).

It is however recommended that the proposed Paardekop Underground Coal Mine Project proceeds from a heritage point of view with the acceptance of the conditions stated in Sections 8, 9 and 10 of this report.

It is advised that in the event that new evidence of heritage, historical or archaeological resources are unearthed either during the establishment of the mine or the installation of the railway line, work must stop immediately, pending investigation by a heritage professional from the relevant heritage authority. The table below summarizes the development constraints of the heritage features identified on the Paardekop Coal Mine site and is based on the proposed development layout plan.

Heritage Feature	Distance from proposed infrastructure – will feature be impacted upon negatively?	Location	No of graves and age/ Age of structure	Risk Level before mitigation	Permit from SAHRA required for relocation of graves/demolition of structures?	Proposed mitigation measure	Risk Level after mitigation
Grave Site 1	270 m east of Alternative 1 – no impact	27° 10'18.8"S; 29°31'55.1"E	At least 60 graves – some less than 60 years, some more than 60 years old	Low	No	None	Low
Grave Site 2	145 m north of Alternative 1 – no impact	27° 10'35.7"S; 29°34'28.3"E	At least 35 graves of undetermined age	Low	No	None	Low
Grave Site 3	46 m north of Alternative 1 – no impact	27° 10'39.7"S; 29°34'25.9"E	At least 15 graves – Between 40 - 50 years	Medium-Low	No as there is enough 20 m buffer from the graves to the outer edge of the construction corridor	<p>The construction activities must be limited to the proposed construction corridor and no heavy drilling or other construction activities to take place within a distance of 20 m from the edge of the grave site</p> <p>No construction equipment should be placed within 20 m from graves</p> <p>The grave site must be fenced off at 1 m from the edge of the outermost grave and a lockable gate installed</p> <p>Access to the grave site</p>	Low

						by the construction crew must be prohibited.	
Grave Site 4	185 m north of Alternative 2 – no impact	27°10'34.3"S; 29°35'05.9"E	Less than 10 graves which appear to be older than 60 years	Low	No	None	Low
Grave Site 5	67 m south of Alternative 2 – no impact	27°10'44.5"S; 29°35'35.0"E	At least 30 graves of undermined age	Low	No	None	Low
Grave Site 6	111 m north of Alternative 2 – no impact	27°10'36.3"S; 29°32'20.7"E	At least 4 graves of undetermined age	Low	No	None	Low
Grave Site 7	0 m – occurs within infrastructure foot print – negative impact	27°10'36.3"S; 29°32'20.7"E	At least 10 graves of undetermined age	High	Yes if the intention is to relocate this graves	Shift the infrastructure such that there is a 20m buffer from the edge of the grave site to the outer edge of the construction boundary or development boundary. Fence off the site if the infrastructure only shifted less than 50m away from the grave site and prohibit access by construction crew to the grave site. If the infrastructure cannot be shifted, the gravesite should be relocated through SAHRA's grave relocation policy and permit application. This will constitute a Phase II Heritage Assessment to be undertaken by an archaeologist.	Low

Grave Site 8	288 m east of Alternative 1 – No impact	27° 10'30.9"S; 29° 32'00.6"E	At least 6 graves – less than 60 years old	Low	No	None	Low
Structure A (Botes' farm house)	0 m – Negative impact	27° 10'32.8"S; 29° 31'36.56"E	Over 60 years old	High	Yes if the intention is to demolish the house and its out buildings	Shift the infrastructure such that there is a 20 m buffer from the farm house and its out buildings to the outer edge of the construction/development boundary. If the infrastructure cannot be shifted, a permit application to demolish the farm house and its out buildings should be lodged with the MPHRA. This will constitute a Phase II Heritage Assessment undertaken by a Built Heritage Specialist	Low
Structure B (Old farm dairy, stapples, kraal)	0 m – Negative impact	27° 10'34.5"S; 29° 31'47.3"E	Over 60 years old	High	Yes if the intention is to demolish the structures	Shift the infrastructure such that there is a 20 m buffer from these structures to the outer edge of the construction/development boundary. If the infrastructure cannot be shifted, a permit application to demolish the structures should be lodged with the MPHRA. This will constitute a Phase II Heritage Assessment undertaken by a Built Heritage Specialist	Low
Structure	43 m south of	27° 10'44.9"S;	Younger than	Low	No	None	Low

C (Kraal ruin)	Alternative 2 – No impact	29°35'37.2"E	60 years old				
Structure D (Circular structure ruins)	182 m south of Alternative 2	27°10'49.3"S; 29°35'37.2"E	Younger than 60 years	Low	No	No	Low
Structure E (Kraal)	245 m south west of proposed building contractor yard	27°11'51.0"S; 29°30'42.2"E	Possibly over 60 years	Low	No	No	Low
Structure F (Brick ruin)	257 m east of Alternative 1 – No impact	27°10'28.8"S; 29°31'59.1"E	Younger than 60 years	Low	No	No	Low
Structure G (Stone walls)	59 m north of Alternative 2 – No impact	27°10'43.16"S; 29°35'49.52"E	Age could not be determined	Low	No	No	Low
Structure H (Farm house and stores)	0 m – Negative impact	27°11'36.3"S; 29°31'19.1"E	Possibly over 60 years	High	Yes if the intention is to demolish the buildings	Shift the infrastructure such that there is a 20 m buffer from these structures to the outer edge of the construction/development boundary. If the infrastructure cannot be shifted, a permit application to demolish the structures should be lodged with the MPHRA. This will constitute a Phase II Heritage Assessment undertaken by a Built Heritage Specialist	Low

ACRONYMS AND ABBREVIATIONS

DMR	Department of Mineral Resources
EIAge	Early Iron Age
ESA	Early Stone Age
HIA	Heritage Impact Assessment
LIA	Late Iron Age
LSA	Later Stone Age
MIA	Middle Iron Age
MSA	Middle Stone Age
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
MPHRA	Mpumalanga Provincial Heritage Resources Authority
SAHRA	South African Heritage Resources Agency
SEF	Strategic Environmental Focus (Pty) Ltd
S&EIR	Scoping and Environmental Impact Reporting

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1 INTRODUCTION

Strategic Environmental Focus (Pty) Ltd (SEF) was commissioned by Xstrata Coal South Africa to undertake a Heritage Impact Assessment (HIA) for the proposed footprint of the Paardekop Coal Mine infrastructure and the footprint for the construction facilities. This HIA was carried out in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended, (NEMA), and it is based on the requirements of the National Heritage Resources Act, 1999 (Act No 25 of 1999) (NHRA). This HIA is a specialist study that forms part of the Scoping and Environmental Impact Reporting (S&EIR) process for the proposed development on heritage resources within the proposed study area.

A larger study area (approximately 24 000 ha) was considered during the Baseline Phase of the proposed Paardekop Underground Coal Mine. The Heritage Baseline Studies were completed in 2011 by the author of this current report. The Heritage Baseline Survey revealed the heritage potential of the entire study area. The purpose of the HIA investigation is to assess the impacts that the proposed mine infrastructure and rail way line will have on the identified heritage resources and focuses on the footprint proposed for the erection of the mine infrastructure and the rail way line alternatives for both the construction and the operational phases of the mine. The proposed construction and operational corridors (calculated from the centre of the proposed route) for the rail way line are 20 m and 5 m on either side respectively. Hence the total construction and operational corridors is 50 m.

Xstrata are proposing to establish an underground coal mine which will have both surface and underground infrastructure facilities including but not limited to:

- mine buildings (offices, stores, warehouse) and yards;
- shafts;
- electrical facilities;
- explosive stores;
- access roads, haul roads and rail way line;
- construction camps;
- underground services workshop and yard;
- underground storage units;
- ventilation workshop.

According to Section 3 (2) of the NHRA, the heritage resources of South Africa include:

- “a. places, buildings, structures and equipment of cultural significance;*
- b. places to which oral traditions are attached or which are associated with living heritage;*

- c. historical settlements and townscapes;*
- d. landscapes and natural features of cultural significance;*
- e. geological sites of scientific or cultural importance;*
- f. archaeological and palaeontological sites;*
- g. graves and burial grounds, including-*
 - i. ancestral graves;*
 - ii. royal graves and graves of traditional leaders;*
 - iii. graves of victims of conflict;*
 - iv. graves of individuals designated by the Minister by notice in the Gazette;*
 - v. historical graves and cemeteries; and*
 - vi. other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);*
- h. sites of significance relating to the history of slavery in South Africa;*
- i. movable objects, including-*
 - i. objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;*
 - ii. objects to which oral traditions are attached or which are associated with living heritage;*
 - iii. ethnographic art and objects;*
 - iv. military objects;*
 - v. objects of decorative or fine art;*
 - vi. objects of scientific or technological interest; and*
 - vii. books, records, documents, photographic 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)."*

In terms of Section 3 (3) of the NHRA, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of:

- "a. its importance in the community, or pattern of South Africa's history;*
- b. its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;*
- c. its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;*
- d. its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;*
- e. its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;*
- f. its importance in demonstrating a high degree of creative or technical achievement at a particular period;*

- g. its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;*
- h. its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and*
- i. sites of significance relating to the history of slavery in South Africa.”*

The aim of the investigation was to identify, verify and analyse heritage issues and to recommend how to manage them within the context of the proposed establishment of the Paardekop Underground Coal Mine and associated infrastructure.

The objectives of the investigation were:

- Identifying and analysing heritage places, objects, buildings, structures, graves etc.;
- Assessing broad cultural significance of identified sites, places, buildings, structures, graves and objects within the study area;
- Surveying and mapping of significance/sensitivity issues and opportunity/constraint issues;
- Reviewing of the general compatibility of the proposed Paardekop Underground Coal Mine and associated activities with heritage policy planning frameworks;
- Undertaking a preliminary assessment of the acceptability of the proposed establishment of the underground mine from a heritage perspective;
- Identifying the need for alternatives, if necessary; and
- Recommending appropriate initial management measures to conserve significant heritage elements and reduce the impact on heritage resources.

2. BACKGROUND INFORMATION TO THE PROJECT

Table 1: Background Information

Consultant:	Mamoluoane Seliane
Type of development:	Establishment of an underground coal mine
Rezoning or subdivision:	Rezoning (i.e. change in land use)
Terms of reference	Phase 1 HIA Study
Legislative requirements:	The HIA was carried out in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended, (NEMA), and following the requirements of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).

2.1 Details of the study area

The Department of Mineral Resources (DMR) granted Xstrata Prospecting Right on an area covering approximately 24 000 ha. The proposed Paardekop Underground Coal

Mine infrastructure will only have a footprint of 600 ha (excluding associated linear infrastructure) within the bigger study area. The bulk of the main infrastructure is located within Portion 2 of the Farm Zwartkop 103 HS and will extend into Portions 9 and 13 of farm Roodewal 102 HS (Figure 1). Part of the main infrastructure and the proposed railway line alternatives are situated on Portions 13 and 17 of Farm Zandfontein 74 HS and as well as Portions 2, 10, 15 and 36 of Farm Kopje Alleen 75 HS (Figure 1). Two rail way line alternatives are proposed; Alternative 1 (the north south alignment) and Alternative 2 (the east west alignment) (see Figure 1).

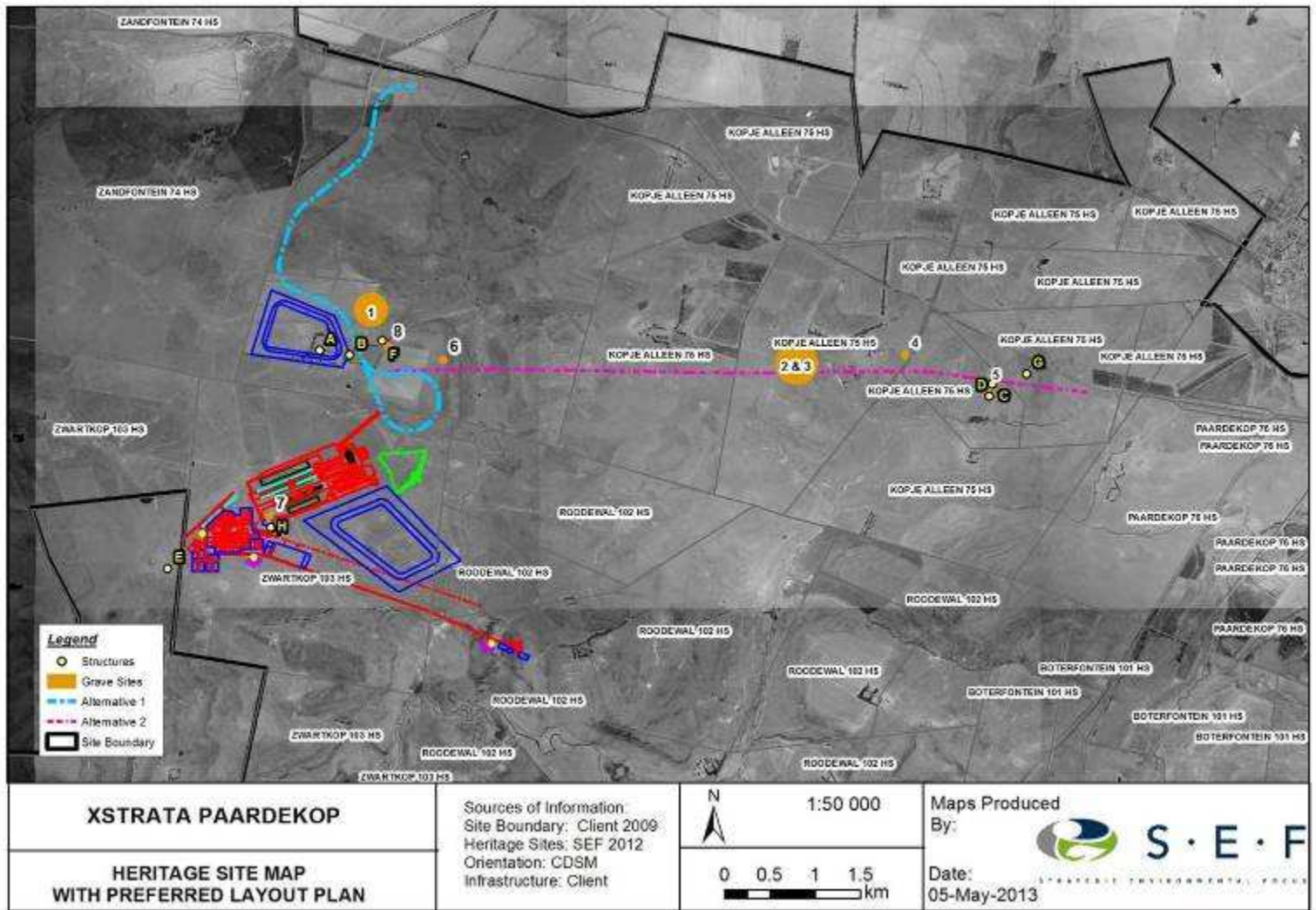


Figure 1: Location of main infrastructure for Paardekop Underground Coal Mine

Current Land-use

The site earmarked for the Paardekop Underground Coal Mine infrastructure is largely rural and is characterised by large stock (Plate 1) and crop farms.



Plate 1: Land-use within the study area (Photo taken from a farm adjacent to the main infrastructure site)

2.2 Locational Data

- Province: Mpumalanga;
- District Municipality: Gert Sibande;
- Local Municipality: Seme Lekwa
- General Coordinates: 27°11'13.9"S; 29°31'35.6"E

3 BACKGROUND INFORMATION OF THE SURVEY

3.1 Methodology

3.1.1 Details of the site visit

The site visit for the proposed Paardekop Underground Coal Mine was conducted on the 29 – 30 January 2013. The survey was undertaken by means of walking and driving throughout the site to:

- Search for, locate and identify objects and structures of heritage and/or archaeological significance in accordance with accepted archaeological practices;
- Document all heritage/ archaeological sites, objects and structures according to minimum standards and procedures accepted by the archaeological profession; and
- A corridor of about 300 m on either side of the two rail way line alternatives was investigated to accommodate possible shifts that could be suggested. The total rail way line (and associated infrastructure) corridor itself will cover approximately be 10 m during the operational phase. During the construction phase however, at least 20 m of construction space on either side of the line will be required. Therefore the rail way line corridor during construction phase will cover about 50 m in total.

3.1.2 Literature Review

A brief literature review pertaining to the prehistory of the Mpumalanga Province was undertaken.

3.2 Restrictions to the survey

3.2.1 Visibility

Visibility for the most part of the study area was fair for the identification of the robust-type heritage resources such as buildings/structures and graves with high white washed tombstones (Plate 2). The identification of Stone Age or Iron Age tools and unmarked graves for example was not possible largely due to vegetation cover.



Plate 2: Typical vegetation found on site. Marked graves with white head stones readily identifiable

3.2.2 Disturbance

There is no disturbance of any potential archaeological stratigraphy noted.

3.3 Details of the equipment used in the survey

- GPS: Garmin eTrek Camo; and
- Digital cameras: Canon Powershot A460.

All readings were taken using the GPS. Accuracy was to a margin of error of 4 m.

4 BRIEF ARCHAEOLOGICAL HISTORY OF THE MPUMALANGA PROVINCE

The Mpumalanga Province has a rich landscape which has provided people with resources for utilization and exploitation for more than 1,7 million years. Archaeological evidence indicates that people were initially attracted to the region by its diverse and abundant plants and animals and later on by the exploitation of the rich variety of minerals such as ochre, copper and iron, which is a practice that can be traced back thousands of years (Esterhuysen and Smith, 2007).

4.1 Stone Age

The Stone Age of Southern Africa has been divided into, the Early Stone Age (ESA) dating from about 2.5 million years ago to 250 000 years ago, the Middle Stone Age (MSA) dating from 250 000 and 25 000 years ago and the Later Stone Age (LSA) which dates from about 25 000 and 2 000 years ago (Esterhuysen and Smith 2007; Mitchell, 2000).

The ESA of Mpumalanga has not been thoroughly researched but the available data has enabled archaeologists to make interpretations based on evidence from other parts of South Africa that are more extensively studied. The ESA is a period during which human ancestors began the usage of stone tools. The stone tools from this earlier period consist of simply modified tools such as hand axes, scraping tools as well as choppers. These tools were, among other things, used to chop and butcher meat, de-skin animals and probably to smash animal bones to obtain bone marrow. Most ESA sites are open air tool scatters. However, these sites were not found on the footprint of the mine as visibility was not good for the identification of tools.

The MSA stone tools are, in general, smaller than those of the ESA. A variety of MSA tools include blades, flakes, scrapers and pointed tools that may have been hafted onto shafts or handles and used as spearheads. No MSA tools were discovered at the site of the footprint of the mine due to vegetation cover.

The LSA tools are even smaller than those of the MSA and display rapid stylistic change, particularly in the last 10 000 years. During this time, the hunting apparatus was improved and new technology was employed to make more effective tools. These included 'link-shaft arrows constructed with a poisoned bone tip, a link and shaft that fell away on impact, leaving the poison tip imbedded in the animal. Other innovations included bored stones, used as digging-stick weights to aid in uprooting tubers and roots; small stone tools, often less than 25 mm in length, used for cutting meat and scraping hides; polished bone tools such as needles; twine made from plant fibre or

leather; tortoiseshell bowls; fishing equipment, including hooks and sinkers; bone tools with decoration; high frequencies of ostrich eggshell beads and an increase in ornaments and artwork.' (Esterhuysen and Smith, 2007, p 10).

Along with the marked social transformation and technological innovation of the LSA people is the associated Rock Art panels that occur on cave walls or rock faces. Rock Art can be in the form of rock paintings or rock engravings, depending on the geology of a region. No Stone Age or rock art sites (cave or rock shelter sites) were found within the footprint of the main infrastructure or along any of the corridors for railway line alternatives.

4.2 Iron Age

A farming way of life was introduced to southern Africa about 2 000 years ago by Bantu-speaking people coming from the north. They brought with them crops such as sorghum, millet, ground beans and cow peas to be cultivated for the first time in this part of the world (Huffman, 2007, Mitchell, 2000). Domestic animals such as cattle, sheep and goats were also part of the newly introduced farming way of life. Unlike the hunter-gatherers and herders who lived in temporary camps and led a nomadic way of life, farming necessitated sedentary life styles (Huffman, 2007). Some features of the permanent settlements of these early mixed farming communities are houses, raised grain bins, underground storage pits and stock enclosures. An important feature of this time period was that they also made their own iron implements, hence the name Iron Age (Huffman, 2007). The Iron Age has been divided into three periods, namely the Early Iron Age (EIA Period) (AD 200 – 900), the Middle Iron Age (MIA) (AD 900 – 1300) and the Late Iron Age (LIA) (AD 1300 – 1820) (Huffman, 2007).

5 DESCRIPTION OF THE STUDY AREA HERITAGE

The investigation revealed the following heritage resources:

- 8 Grave Sites; and
- 8 Structures.

These heritage resources are discussed below in detail, followed by a summary table highlighting the construction constraints and opportunities as well as the author's recommended mitigation measures.

5.1 Description of the grave sites observed

The majority of the graves identified on the several farms belonged to families whose relatives have relocated elsewhere in the surrounding or faraway places, which made it impossible for the author to have had any contact with the relatives during the investigation. Although some of the graves have inscriptions, most of them are not inscribed and in most cases the age and the name of the deceased cannot be known. The eight identified grave sites together contained at least 170 graves in total.

5.1.1 Grave Site 1

This Grave Site is located at 27°10'18.8"S; 29°31'55.1"E (Plate 3). The site contains approximately sixty (60) graves. Some of the graves do have head stones and are inscribed. The site has graves that are both older and younger than 60 years. This site is located about 270 m east from Alternative 1 rail way line. This site will not be impacted upon by the proposed installation of this rail way line as it occurs over 20 m away from the edge of the proposed construction corridor of rail way line Alternative 1. Therefore no mitigation measures are required for this site.



Plate 3: Grave Site 1 (Portion 13 of the farm Zandfontein 74 HS)

5.1.2 Grave Site 2

This grave site is located at approximately 27°10'35.7"S; 29°34'28.3"E (Plate 4). There are about thirty five (35) graves at this site. Most of the graves do not have inscriptions and therefore their ages are unknown. The grave site occurs about 145 m north of rail way line Alternative 2. This site will not be impacted upon negatively by the proposed installation of this rail way line as it occurs more than 20 m from the edge of the proposed construction corridor of Alternative 2 rail way line. Therefore no mitigation measures are required for this site.



Plate 4: Grave Site 2 (Portion 10 of farm Kopje Alleen 75 HS)

5.1.3 Grave Site 3

This grave site is located at approximately 27°10'39.7"S; 29°34'25.9"E (Plate 5). There are about fifteen (15) graves at this site. This site is approximately 46 m to the north of Alternative 2 rail way line. The site however will still be over 20 m away from the edge of the construction corridor (total of about 25 m including the width of the line during operational phase) of the rail way line. Given the large scale of the proposed project, the author recommends that if Alternative 2 rail way line is chosen, the grave site should be fenced off and a lockable gate installed for ease of identification of the site during both construction and operational phases. The ages of the graves are not known but according to a local informant – Mr Richard Mphikele Sibeko who arrived on this farm (Kopje Alleen 75 HS) at the age of 15 (now he is 59 years old), this grave site could be about 40 – 50 years old.



Plate 5: Grave Site 3 (Portion 10 of farm Kopje Alleen 75 HS)

5.1.4 Grave Site 4

This grave site is located at approximately 27°10'34.3"S; 29°35'05.9"E (Plate 6). There are at least ten (10) graves at the site. The informant Mr Sibeko believes the grave site to be about 60 years old. The grave site occurs at 185 m to the north of Alternative 2 railway line. This site will not be impacted upon negatively by the construction and/ or operational activities of the railway line as it occurs more than 20 m away from the edge of the construction corridor of the proposed rail way line. Therefore no mitigation measures are required for this site.



Plate 6: Grave Site 4 (Portion 10 of farm Kopje Alleen 75 HS)

5.1.5 Grave Site 5

This grave site is located at approximately 27°10'44.5"S; 29°35'35.0"E (Plate 7). This grave site contains at least thirty (30) graves. The site occurs about 67 m south of the proposed Alternative 2 rail way line. Hence this site will not be impacted upon negatively by the proposed construction of the rail way line as it is over 20 m away from the edge of the proposed construction corridor.



Plate 7: Grave Site 5 (Portion 2 of farm Kopje Alleen 75 HS)

5.1.6 Grave Site 6

This grave site is located at approximately 27°10'36.3"S; 29°32'20.7"E (Plate 8). There are at least four (4) graves at this site. The grave site is situated at about 111 m north of the rail way line Alternative 2. This grave site will not be impacted upon by the installation of the proposed rail way line Alternative 2 as it occurs over 20 m from the outer edge of the proposed construction corridor for the proposed railway line.



Plate 8: Grave Site 6 (Portion 13 of farm Zandfontein 74 HS)

5.1.7 Grave Site 7

This grave site is located at approximately 27°11'32.6"S; 29°31'18.6"E (Plate 9). There are at least ten (10) graves at this site. The grave site is situated at about 18 m south of the southern corner of the washing plant and is just to the north of the materials handling contractor construction camp. This grave site will be impacted upon negatively by the erection of the proposed coal mine infrastructure as it occurs on the footprint of the proposed infrastructure. A 20 m buffer is recommended by the South African Heritage Resources Agency (SAHRA) around a grave site to the outer edge of the construction boundary or development. Given the scale and the magnitude of earth works that the proposed project will undergo, it would not be an option to suggest as a mitigation measure to reduce the buffer from the graves to the infrastructure to less than 20 m as intrusive machines and equipment will be utilised in the erection of the infrastructure. Hence the following two mitigation measures are proposed by the author:

(i) Mitigation Measure 1

It is proposed that the main infrastructure be shifted out of the way of the grave site such that there is at least a 20 m buffer from the outer edge of the grave site to the outer edge of the construction boundary or the development.

(ii) Mitigation Measure 2

If the infrastructure cannot be shifted in anyway, it is recommended that the grave site be relocated. This process would involve permit applications with SAHRA if the said graves are older than 60 years or their age is unknown (see Appendix 1 for SAHRA's

grave relocation policy). The permit application process could take over 6 months before a decision can be issued (Appendix 2). This process would constitute a Phase II Heritage Impact Assessment to be undertaken by an archaeologist.



Plate 9: Grave Site 7 (Portion 2 of farm Zwartkop 103 HS)

However, if the grave site is younger than sixty years, the provisions of the Human Tissue Act 1983 (Act No. 65 of 1983 as amended) will be followed.

5.1.8 Grave Site 8

This grave site is located at approximately 27°10'30.9"S; 29°32'00.6"E (Plate 10). There are at least six (6) graves at this site. The grave site is situated at about 288 m east of the rail way line Alternative 1. This grave site will not be impacted upon negatively by the installation of the proposed rail way line Alternative 1 as it occurs over 20 m from the outer edge of the construction corridor for the proposed railway line installation.



Plate 10: Grave Site 8 (Portion 13 of farm Zandfontein 74 HS)

5.2 Description of the structures observed

The observed structures consist of various farm buildings, or part thereof, ruins and other man-made built structures. Some of the structures are older than 60 years and others are not.

5.2.1 Structure A

Structure A represents Dawie (DHJ) Botes's farm house and it is located at approximately 27°10'32.8"S; 29°31'36.6"E (Plate 11). The current owner, Mr Botes indicated that the farm house is about 105 years old. This farm house occurs within the footprint of the proposed mine residue facility. Since the farm house is older than 60 years, it is protected by the NHRA's 60 year rule which stipulates that a permit

application would be required to be lodged with the relevant heritage authority in order to alter or demolish any building that is older than 60 years. Two mitigation measures are suggested by the author:

(i) Mitigation Measure 1

The infrastructure should be shifted such that there is a 20 m buffer from the farm house and its outbuildings.

(ii) Mitigation Measure 2

If the infrastructure cannot be shifted, a permit application to demolish the farm house and its associated out buildings should be lodged with the Mpumalanga Provincial Heritage Resources Authority (MPHRA). This will constitute a Phase II Heritage Study to be undertaken by a Built Heritage Specialist.



Plate 11: Structure A – Botes Farm House (Portion 13 of farm Zandfontein 74 HS)

5.2.2 Structure B

Structure B represents a group of structures including an old farm dairy, staples, kraal and a circular wall structure located at approximately 27°10'34.5"S; 29°31'47.3"E (Plate 12). These structures appear to be older than 60 years and hence would be protected by the NHRA. As a group, these structures occur on the footprint of the proposed mine residue plant. Two mitigation measures are suggested by the author:

(i) Mitigation Measure 1

The infrastructure should be shifted such that there is a 20 m buffer from all of these buildings to the outer edge of the construction boundary or the development.

(ii) Mitigation Measure 2

If the infrastructure cannot be shifted, a permit application to demolish the buildings which would be in the way of the development and/ or construction boundary should be lodged with the Mpumalanga Provincial Heritage Resources Authority (MPHRA). This will constitute a Phase II Heritage Study to be undertaken by a Built Heritage Specialist.



Plate 12: Structure B (Kraal, dairy, round structure wall and staples (Portion 13 of farm Zandfontein 74 HS)

5.2.3 Structure C

Structure C represents a kraal ruin located at approximately 27°10'44.9"S; 29°35'37.2"E (Plate 13). The ruin is situated at about 43 m south of Alternative 2 rail way line. Only some foundation stones is what remains of this structure as the rest has fallen down making it a dilapidated structure. The structure is about 18 m from the edge of the proposed construction corridor for the rail way line Alternative 2. Due to the fact that the ruin are in a very disturbed state resulting in no heritage value, there will not be any negative impacts upon this structure and no further mitigation measures are required.



Plate 13: Structure C - kraal ruin (Portion 2 of farm Kopje Alleen 75 HS)

5.2.4 Structure D

Structure D represents the ruins of a circular structure which is located at 27°10'49.3"S; 29°35'36.2"E (Plate 14). The ruin is situated at about 182 m south of Alternative 2 rail way line. Only some foundation stones is what remains of this structure as the rest has fallen down making it a dilapidated structure. The structure is over 20 m from the edge of the proposed construction corridor for the rail way line Alternative 2. Therefore there will not be any negative impacts upon this structure and no further mitigation measures are required.



Plate 14: Structure D - circular structure (Portion 2 of farm Kopje Alleen 75 HS)

5.2.5 Structure E

Structure E represents a big kraal located at approximately 27°11'51.0"S; 29°30'42.2"E (Plate 15). This kraal is situated at about 245 m to the south west of the proposed building contractor yard. The kraal is over 20 m from the edge of the proposed construction boundary of the contractor yard. Therefore there will not be any negative impacts upon this structure and no further mitigation measures are required.



Plate 15: Structure E - kraal (Portion XX of farm Zwartkop 103 HS)

5.2.6 Structure F

Structure F represents a brick ruin located at approximately 27°10'28.8"S; 29°31'59.1"E (Plate 16). The ruin is situated at about 257 m east of Alternative 1 rail way line. This structure is not older than 60 years and it is over 20 m from the edge of the proposed construction corridor for the rail way line Alternative 1. Therefore there will not be any negative impacts upon this structure and no further mitigation measures are required.



Plate 16: Structure F - Brick ruin (Portion 13 of farm Zandfontein 74 HS)

5.2.7 Structure G

Structure G represents stone walls located at approximately 27°10'43.2"S; 29°35'49.5"E (Plate 17). The stone walls are situated at about 59 m north of Alternative 2 rail way line. The stone walls are situated over 20 m from the edge of the proposed construction corridor for the rail way line Alternative 2. Therefore there will not be any negative impacts upon these structures and no further mitigation measures are required.



Plate 17: Structure G - stone walls (Portion 36 of farm Kopje Alleen 75 HS)

5.2.8 Structure H

Structure H represents farm stores, a farm house and an associated dilapidated kraal which are located at approximately 27°11'36.3"S; 29°31'19.1"E (Plate 18). These set of structures occur on the footprint of the infrastructure. The farm house and the stores appear to be older than 60 years and hence are protected under the 60 year rule of the NHRA. The author recommends the following:

(i) Mitigation Measure 1

The infrastructure should be shifted such that there is a 20 m buffer from all of these buildings to the outer edge of the construction boundary or the development.

(ii) Mitigation Measure 2

If the infrastructure cannot be shifted, a permit application to demolish the buildings which would be in the way of the development and/ or construction boundary should be lodged with the Mpumalanga Provincial Heritage Resources Authority (MPHRA). This will constitute a Phase II Heritage Study to be undertaken by a Built Heritage Specialist.



Plate 18: Structure H - farm house and stores (Portion 13 of farm Zandfontein 74 HS)

5.3 Summary of the findings

A summary of the findings and the development/construction constraints associated with the identified features in view of the proposed infrastructure for the Paardekop Underground Coal Mine are given in Table 2.

Table 2: Summary of heritage features and their construction/development constraints/opportunities in line with the proposed Paardekop Underground Coal Mine infrastructure

Heritage Feature	Distance from proposed infrastructure – will feature be impacted upon negatively?	Location	No of graves and age/ Age of structure	Risk level before mitigation	Permit from SAHRA required for relocation of graves/demolition of structures?	Proposed mitigation measure	Risk level after mitigation
Grave Site 1	270 m east of Alternative 1 – no impact	27° 10'18.8"S; 29°31'55.1"E	At least 60 graves – some less than 60 years, some more than 60 years old	Low	No	None	Low
Grave Site 2	145 m north of Alternative 2 – no impact	27° 10'35.7"S; 29°34'28.3"E	At least 35 graves of undetermined age	Low	No	None	Low
Grave Site 3	46 m north of Alternative 2 – no impact	27° 10'39.7"S; 29°34'25.9"E	At least 15 graves – Between 40 - 50 years	Medium - low	No as there is enough 20 m buffer from the graves to the outer edge of the construction corridor	<p>The construction activities must be limited to the proposed construction corridor and no heavy drilling or other construction activities to take place within a distance of 20 m from the edge of the grave site</p> <p>No construction equipment should be placed within 20 m from graves</p> <p>The grave site must be fenced off at 1 m from the edge of the outermost grave and a lockable gate installed</p>	Low

						Access to the grave site by the construction crew must be prohibited.	
Grave Site 4	185 m north of Alternative 2 – no impact	27°10'34.3"S; 29°35'05.9"E	Less than 10 graves which appear to be older than 60 years	Low	No	None	Low
Grave Site 5	67 m south of Alternative 2 – no impact	27°10'44.5"S; 29°35'35.0"E	At least 30 graves of undermined age	Low	No	None	Low
Grave Site 6	111 m north of Alternative 2 – no impact	27°10'36.3"S; 29°32'20.7"E	At least 4 graves of undetermined age	Low	No	None	Low
Grave Site 7	0 m – occurs within infrastructure foot print – negative impact	27°10'36.3"S; 29°32'20.7"E	At least 10 graves of undetermined age	High	Yes if the intention is to relocate this graves	Shift the infrastructure such that there is a 20m buffer from the edge of the grave site to the outer edge of the construction boundary or development boundary. Fence off the site if the infrastructure only shifted less than 50m away from the grave site and prohibit access by construction crew to the grave site. If the infrastructure cannot be shifted, the gravesite should be relocated through SAHRA's grave relocation policy and permit application.	Low
Grave Site 8	288 m east of Alternative 1–	27°10'30.9"S; 29°32'00.6"E	At least 6 graves – less	Low	No	None	Low

	No impact		than 60 years old				
Structure A (Botes' farm house)	0 m – Negative impact	27°10'32.8"S; 29°31'36.56"E	Over 60 years old	High	Yes if the intention is to demolish the house and its out buildings	Shift the infrastructure such that there is a 20 m buffer from the farm house and its out buildings to the outer edge of the construction/development boundary. If the infrastructure cannot be shifted, a permit application to demolish the farm house and its out buildings should be lodged with the MPHRA.	Low
Structure B (Old farm dairy, stapples, kraal)	0 m – Negative impact	27°10'34.5"S; 29°31'47.3"E	Over 60 years old	High	Yes if the intention is to demolish the structures	Shift the infrastructure such that there is a 20 m buffer from these structures to the outer edge of the construction/development boundary. If the infrastructure cannot be shifted, a permit application to demolish the structures should be lodged with the MPHRA.	Low
Structure C (Kraal ruin)	43 m south of Alternative 2 – No impact	27°10'44.9"S; 29°35'37.2"E	Younger than 60 years old	Low	No	None	Low
Structure D (Circular structure ruins)	182 m south of Alternative 2	27°10'49.3"S; 29°35'37.2"E	Younger than 60 years	Low	No	None	Low
Structure E(Kraal)	245 m south west of proposed	27°11'51.0"S; 29°30'42.2"E	Possibly over 60 years	Low	No	None	Low

	building contractor yard						
Structure F (Brick ruin)	257 m east of Alternative 1 – No impact	27°10'28.8"S; 29°31'59.1"E	Younger than 60 years	Low	No	None	Low
Structure G (Stone walls)	59 m north of Alternative 2 – No impact	27°10'43.16"S; 29°35'49.52"E	Age could not be determined	Low	No	No	Low
Structure H (Farm house and stores)	0 m – Negative impact	27°11'36.3"S; 29°31'19.1"E	Possibly over 60 years	Low	Yes if the intention is to demolish the buildings	Shift the infrastructure such that there is a 20 m buffer from these structures to the outer edge of the construction/development boundary. If the infrastructure cannot be shifted, a permit application to demolish the structures should be lodged with the MPHRA.	Low

Notes

- **During the construction/installation phase** of the proposed project, the proposed **mitigation** measures should be applied to all the significant heritage **features that occur less than 20 m to the edge of the construction/development boundary or as stated in the table above.**
- SAHRA's grave relocation policy is presented in Appendix 1;
- The SAHRA's and MPHRA's permitting procedure is presented in Appendix 2 and 3 respectively;
- The average time required for grave relocation and alteration and demolishment permit applications is about six (6) months;
- Permit applications for grave exhumation and relocation are lodged with SAHRA's Burial Grounds and Graves Unit (BGG) in Pretoria;
- Permit applications for the alteration and demolition of structures are lodged with the Mpumalanga PHRA.
- The permitting application is facilitated by an independent heritage consultant.

6 STATEMENT OF SIGNIFICANCE

The statement of significance outlines the principal value that a site or object holds to a community or sections of a community. The significance of the buildings is determined using the following rating and grading (Table 3) as recommended by SAHRA (2005).

6.1 Significance of the graves

In terms of Section 3 (3) of the NHRA, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of: “its importance in the community...” The identified graves are ancestral graves that belong to the communities and relatives whose members were once farm workers or lived on farmlands and are regarded as of high to medium significance in terms of the SAHRA’s (2005) recommended field rating for sites. As observed during the investigation and as indicated by the informant, some graves could be older than 60 years. The NHRA protects graves older than 60 years. However, the Human Tissue Act, 1983 (No 65 of 1983 as amended) takes precedence whenever graves are younger than 60 years. The age of the majority of the identified graves is not known as most graves were not inscribed and the relatives are not known.

The South African Heritage Resource Agency (SAHRA) has a policy for the relocation of graves older than 60 years (Appendix 1). This process would be employed if the grave(s) are of an undetermined age or are older than 60 years and if the proposed project intends to disturb the grave. A permit would have to be applied for from SAHRA. However, if the project does not intend to disturb the grave, risk preventative measures must be employed during construction as provided in Section 10.

6.2 Significance of the structures

The following structures are thought to be over 60 years:

- Structure A (Plate 11)
- Structure B (Plate 12)
- Structure E (Plate 15)
- Structure H (Plate 18)

The NHRA protects all structures that are over 60 years in terms of the 60 year rule which stipulates that no one can alter, disturb and or damage any structure or part of a structure without a permit from a relevant heritage authority. These structures are rated as high to medium significance according to SAHRA’s recommended field rating for sites. Of the protected structures, A, B and H occur on the footprint of the infrastructure and would require that permits be applied for in order to demolish the buildings should the option of shifting the infrastructure not be feasible.

Table 3: Field rating and recommended grading of sites (SAHRA 2005)

Level	Details	Action
National (Grade I)	The site is considered to be of National Significance	Nominated to be declared by SAHRA
Provincial (Grade II)	This site is considered to be of Provincial significance	Nominated to be declared by Provincial Heritage Authority
Local Grade IIIA	This site is considered to be of HIGH significance locally	The site should be retained as a heritage site
Local Grade IIIB	This site is considered to be of HIGH significance locally	Mitigation necessary, and part retained as a heritage site
Generally Protected A	High to medium significance	Mitigation necessary before destruction
Generally Protected B	Medium significance	The site needs to be recorded before destruction
Generally Protected C	Low significance	No further recording is required before destruction

7 PREFERRED ROUTE DETERMINATION

Two alternative routes were suggested for the installation of the railway line for the transportation of coal. For both these routes the proposed operational and construction corridors add up to 50 m. Since there are no significant heritage resources occurring less than 20 m (i.e. which would be negatively impacted upon) to the outer edge of the construction corridor of either of the alternative routes, both routes are preferred from a heritage perspective. However, if the construction and /or operational corridors changed (increased) to about 60 m in all, Alternative 1 would be the preferred.

8 MITIGATION MEASURES

Two options are suggested as mitigation measures:

- To shift the infrastructure in order to create a 20 m buffer from graves and protected structures to the outer edge of the construction/development boundary; and
- To relocate and demolish all the graves and significant structures respectively which occur within the footprint of the infrastructure. These processes would involve permit applications.

9 RECOMMENDATIONS

It is recommended that the proposed Paardekop Underground Coal Mine proceed from a heritage point of view, with acceptance of the following conditions:

- Construction activities should be limited to the proposed development boundary for the main infrastructure and to the proposed construction corridors for the railway line. If the size of the footprint, its orientation or the construction corridors of the railway line is increased at a later stage, a heritage specialist should be involved in order to assess how the changes will affect heritage resources.
- The infrastructure must be shifted such that there is a 20 m buffer from significant heritage resources to the outer edge of the construction / development boundary. However, a heritage specialist must still be involved after the suggested shift in order to assess how the new shift might affect new and other existing sites of significance.

- If the infrastructure cannot be shifted, then a permitting process either for grave relocation or structure demolition will be required for heritage resources found within the infrastructure footprint.
- All grave sites that are found within 50 m from the construction corridors should be demarcated as stipulated under each site for ease of identification during construction and operational phases.
- Access by the construction crew must be prohibited and the relatives of the deceased must be allowed access as and when they would like to visit the grave site.

10 RISK PREVENTATIVE MEASURES ASSOCIATED WITH CONSTRUCTION

Archaeological material, by its very nature, occurs below ground. The developer should therefore keep in mind that archaeological sites including graves might be exposed during the construction work. If anything is noticed, work in that area should be stopped and the occurrence should immediately be reported to the SAHRA at 021 462 4502 or a museum, preferably one at which an archaeologist is available. The find should then be investigated and evaluated by the archaeologist, who will provide recommendations on when construction activities in the area where the discovery was made can resume.

11 PREVIOUS HERITAGE WORK IN THE AREA

A Phase 1 heritage resources investigation was undertaken in 2008 in the vicinity of the Paardekop Coal Mine Site for Eskom transmission lines starting at the Majuba Power Station and ending at Ladysmith. The Eskom study identified farm graves to the south of the Majuba Power station. This find is in line with what has been identified within the Paardekop Coal Mine infrastructure footprint, confirming the prevalence of grave sites within the farmlands in this region.

12 CONCLUSION

The heritage survey for the proposed Paardekop Underground Coal Mine revealed grave sites and structures. Although some heritage resources appear to be in the way of the development, with the implementation of the suggested mitigation measures and recommendations, the said heritage resources can be protected against adverse

impacts. Therefore from a heritage point of view, the proposed Paardekop Mine and associated linear infrastructure can proceed.

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APPENDIX 1: RELOCATION OF GRAVES

Burial grounds and graves are dealt with in Article 36 of the NHR Act, no 25 of 1999. Below follows a broad summary of how to deal with grave in the event of proposed development.

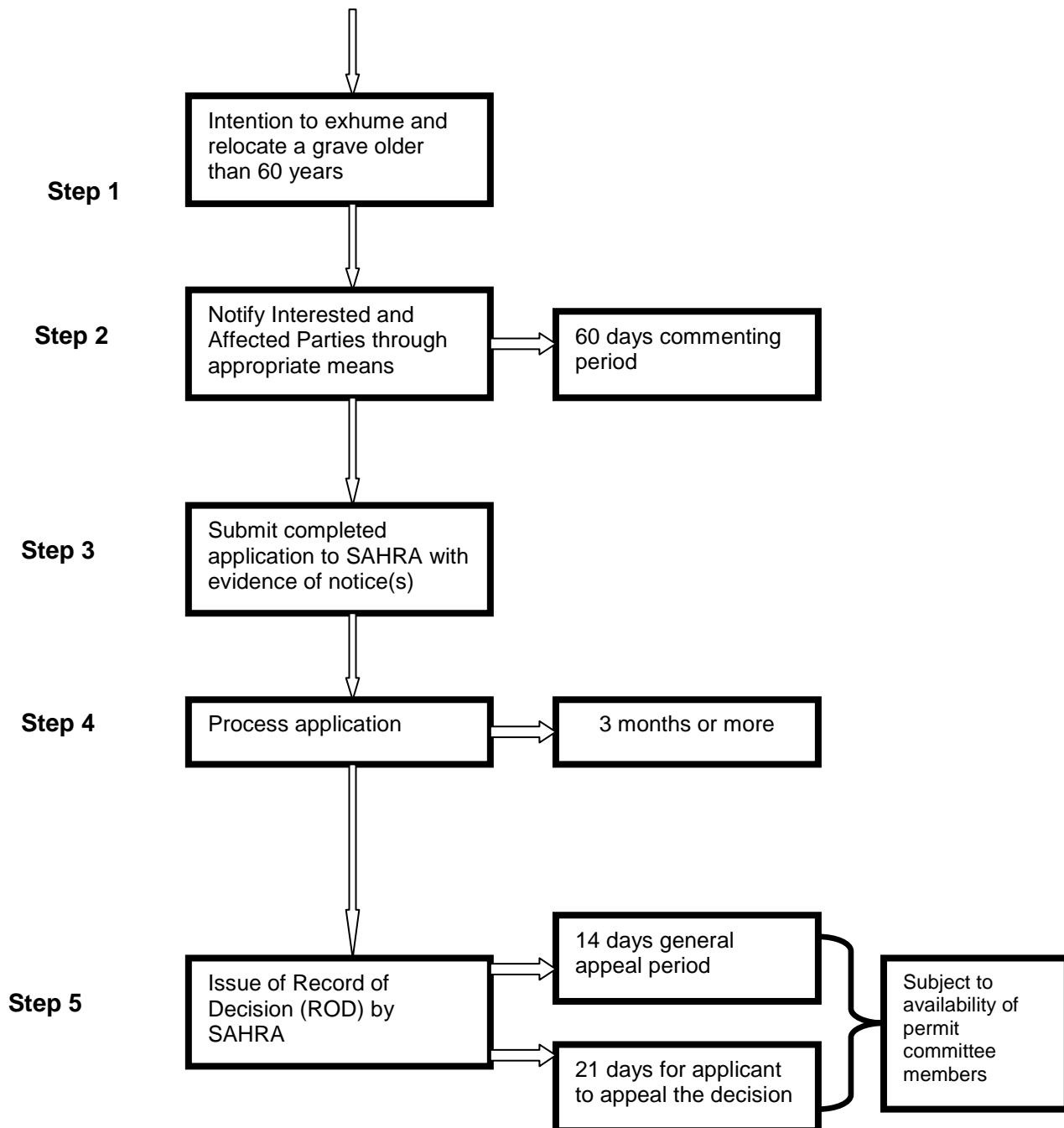
If the graves are younger than 60 years, an undertaker can be contracted to deal with the exhumation and reburial. This will include public participation, organising cemeteries, coffins, etc. as they need permits and have their own requirements that must be adhered to.

If the graves are older than 60 years old or of undetermined age, an archaeologist must be in attendance to assist with the exhumation and documentation of the graves. This is a requirement by law.

Once it has been decided to relocate particular graves, the following steps should be taken:

- Notices of the intention to relocate the graves need to be put up at the burial site for a period of 60 days. This should contain information where communities and family members can contact the developer/archaeologist/public-relations officer/undertaker. All information pertaining to the identification of the graves needs to be documented for the application of a SAHRA permit. The notices need to be in at least 3 languages, English, and two other languages. This is a requirement by law.
- Notices of the intention needs to be placed in at least two local newspapers and have the same information as the above point. This is a requirement by law.
- Local radio stations can also be used to try contact family members. This is not required by law, but is helpful in trying to contact family members.
- During this time (60 days) a suitable cemetery need to be identified close to the development area or otherwise one specified by the family of the deceased.
- An open day for family members should be arranged after the period of 60 days so that they can gather to discuss the way forward, and to sort out any problems. The developer needs to take the families requirements into account. This is a requirement by law.
- Once the 60 days has passed and all the information from the family members have been received, a permit can be requested from SAHRA. This is a requirement by law.
- Once the permit has been received, the graves may be exhumed and relocated.
- All headstones must be relocated with the graves as well as any items found in the grave

APPENDIX 2: SAHRA PERMITTING PROCEDURE FOR RELOCATION OF GRAVES



APPENDIX 3: MPHRA PERMITTING PROCEDURE FOR DEMOLITION OF STRUCTURES

