

# **HERITAGE IMPACT ASSESSMENT**

**for**

## **THE PROPOSED ZAMOKUHLE DISTRIBUTION SUBSTATION AND 132KV DISTRIBUTION POWER LINE NEAR HENDRINA, MPUMALANGA PROVINCE**

**(Forms part of the EIA phase of the Environmental Impact Assessment  
for the project)**



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**Prepared for:  
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## **ABOUT THIS REPORT**

*This heritage assessment has built on the study undertaken during the scoping phase of the EIA that considered the history and heritage significance of the area that the proposed power line will cross and assesses and recommends the preferred route alternative from a heritage perspective. This assessment forms part of the EIA phase of the project.*

*The archaeological assessment of the sites for the proposed Zamokuhle substation was undertaken by two archaeologists in February 2010 and their findings and report are attached as an appendix to this report so that the impact on all heritage resources in the study area can be read in one document.*

*The requirements of the National Heritage Resources Act (Act No. 25 of 1999) and the National Environmental Management Act (Act No. 107 of 1998) were used as guidelines for this report.*

## **EXECUTIVE SUMMARY**

### **Introduction:**

A heritage study was undertaken in March 2009 for the scoping phase of the EIA and this report that forms part of the next phase of the EIA, investigates the actual route options proposed by the client for the 132kV Distribution power line between Hendrina Main Transmission Substation (MTS) and the proposed new Zamokuhle substation to be located on the northern outskirts of the town of Hendrina in the Mpumalanga province. The conclusion of the initial scoping assessment was that the study area in general had a low heritage significance that was attributed to the highly disturbed nature of the area and that conclusion is supported again with this assessment.

An archaeological assessment of the three substation sites proposed for the Zamokuhle substation was undertaken by an archaeologist and a separate report compiled that concluded that there were no significant archaeological or historical artifacts, features or structures identified during the archaeological assessment. The archaeological assessment has been attached to this report as **Appendix 1.**

### **Description of Project Area and Motivation for Project:**

The project area is situated between the Hendrina MTS and the town of Hendrina where the proposed Zamokuhle substation is to be built. The substation and power station will be linked by a single 132kV distribution power line. The study area is situated in the Mpumalanga province, south of the towns of Witbank and Middelburg.

In recent years, power outages and load shedding have become a common occurrence primarily due to declining electricity supply reserves, failing and inadequate infrastructure. Eskom has embarked on a Capital Expansion Programme during which it will spend over R300 billion on building new power stations, substations, transmission lines, distribution power lines and the reinstatement of out of service coal power stations. Zamokuhle substation and 132kV distribution power line project forms part of the programme.

### **History of Study Area**

The village of Hendrina was proclaimed in 1923 and was named after Hendrina Beukes, the wife of the original owner of the land on which the village was laid out. Hendrina power station is the oldest operational power station in South Africa and came into operation between June 1970 and December 1976. The Hendrina area has been intensively utilised for crop farming and the presence of coal in the area has also led it to being part of the power generation centre of the Highveld.

Information concerning the pre-colonial history of the area is sparse. An internet search of archaeological and historical investigations of the larger study revealed no information as did a search on the database compiled by the archaeology department of the National Cultural Heritage Museum of archaeological investigations undertaken in the area previously known as the Transvaal. Broad

assumptions have been made from the information known about the pre-colonial history of the Mpumalanga region in relation to the study area.

The first written archival records date from 1899 when mention is made of a school situated on the farm Boschmanslaagte being moved to Boschmanskraal on 1 July 1899. The archival records reveal an active community who took responsibility for their education even before the establishment of the town as well as a town that must have been big enough for an individual to be prepared to build a Drive-In for the community.

Structures in the study area older than 60 years are avoided by the proposed options apart from the farm house and old barn on portion 8 of the farm Boschmansfontein 562IS that Option 3 will cross. Oral information is that the two buildings are over 80 years old. There is sufficient space for the power line to be re-aligned to the west of (and behind) the structures to avoid impacting on them. If Option 3 is the authorised alignment and the power line cannot be re-aligned, then application will have to be made to the provincial heritage body for permission to demolish said structures.

A small cemetery was found on the same farm in close vicinity to the buildings discussed above. The cemetery is fenced and there are about 5 graves in the cemetery. Inscriptions on the headstones have weathered off making identification impossible but the specialist is confident that the graves older than 60 years old. The site is therefore protected by Section 36 (2) (b) of the NHRA that states that the relevant heritage agency has to approve the destruction or removal of graves and grave sites older than 60 years.

It is recommended that the cemetery be left intact as the impact of the proposed power line can be very low by ensuring that the pylons are not built directly on the graves or by a slight re-alignment of the route to avoid the cemetery.

#### **Assessment of Route Options:**

The four power line route options were assessed using a methodology of assessing identified impacts that take into consideration the nature, extent, duration, intensity and probability of each potential impact including the destruction of significant and protected heritage resources. The tables can be found on pages 19 - 24 in Section 8.1 of this report.

The results of the assessment of the identified impacts on heritage resources along the four options indicate that the impacts will have a **low to medium** significance and that if recommended mitigation measures are adhered to, these impacts will be reduced to **low** impact significance.

Three of the options, namely Options 1, 2 and 4 have the same impact significance rankings whilst Option 3 has a higher impact ranking because it will impact on the protected structures and cemetery on portion 8 of Boschmansfontein 562IS. With mitigation, the impact is reduced from a low-moderate

ranking to a low ranking. The reasons for Options 1, 2 and 4 having the same rankings is due to the fact that the options cross areas that are very similar such as crossing large sections of cultivation.

When considering which of the four options should be recommended for the proposed 132kV power line, Option 3 was excluded due to the above reasons that led the option being ranked higher than the other options. Options 1, 2 and 4 are very similar but the shorter length of Option 4 makes it the preferred option because the longer the length, the higher the risk that unidentified heritage resources could be impacted on. Option 4 also runs parallel to an existing power line and this is seen as advantageous as existing access roads can be used for both the construction and operational phase of the project resulting in minimum disturbance to surrounding areas.

**Conclusion:**

From the above assessment, it is the opinion of the specialist that the area has low heritage significance. No sites of high significance were observed. The areas crossed by the power line options are all extensively cultivated that would have led to the destruction of heritage resources that may have existed along these route options and it is therefore the opinion of the specialist that the impact of the power line project on the heritage of the area will be low and that the project can therefore proceed.

**Recommendations:**

- Option 4 is the preferred option from a heritage perspective
- A 'walk down' of the authorised route option by a heritage specialist be undertaken once the position of the pylons have been determined to ensure that no graves, archaeological or other heritage sites are impacted on. Those sections of authorised route that cross cultivated fields need not be included in the walk down.
- The removal of graves is not undertaken as most graves can be avoided by overhead power lines and removal is time consuming, costly and can be highly sensitive.
- Graves situated inside or close to the servitude must be cordoned off and marked to protect them against damage during the construction of the power line
- If heritage sites are discovered, work in the immediate vicinity must be stopped, the provincial heritage agency must be informed and the services of an accredited heritage professional be obtained to assess the find and recommend mitigation measures. All mitigation measures recommended by the heritage professional must be adhered to.

## Table of Contents

1	INTRODUCTION.....	7
2	LEGISLATIVE REQUIREMENTS.....	8
3	DETAILS OF HERITAGE SPECIALIST .....	9
4	STUDY AREA.....	9
5	PROJECT MOTIVATION.....	11
6	METHODOLOGY.....	11
7	HISTORICAL BACKGROUND AND ASSESSMENT .....	12
8	ASSESSMENT OF ROUTE ALTERNATIVES .....	18
8.1	Assessment Tables.....	18
8.2	Discussion of Impact Significance Ranking .....	26
9	CONCLUSIONS.....	26
10	RECOMMENDATIONS.....	27
11	SOURCES CONSULTED .....	28

### Maps

Map 1: Location of Study Area within Mpumalanga Province	Page 10
Map 2: Land Use Map	Page 10
Map 3: Route Options within Study Area	Page 19

### Photographs

Photograph 1: Farm House	Page 15
Photograph 2: Land Use Map	Page 16
Photograph 3: Unmarked Grave	Page 17
Photograph 4: Unmarked Grave with Headstone	Page 17

### Tables

Table 1: Impact Assessment – Option 1	Page 20
Table 2: Impact Assessment – Option 1-Diversion	Page 21
Table 1: Impact Assessment – Option 2	Page 22
Table 1: Impact Assessment – Option 3	Page 23
Table 1: Impact Assessment – Option 3-Diversion	Page 24
Table 1: Impact Assessment – Option 4	Page 25

## 1 Introduction

The writer was appointed by PBA International at the end of 2008 to undertake the heritage assessment of the project that will be described below in more detail. A heritage study was undertaken in March 2009 and included in the scoping report submitted to the Department of Environmental Affairs (DEA) for approval. Approval to continue with the next phase of the EIA was received in 2009 and this report will be included in the environmental impact report to be submitted to the DEA for project authorization after public review of the report.

From the initial assessment undertaken for the scoping phase of the EIA study in 2009, it was concluded that the project area appeared have a low heritage significance that was attributed to the highly disturbed nature of the area. The following recommendations were made:

- An intention to develop notice in terms of Section 38 of Act 25 of 1999 be submitted to the relevant heritage authority.
- A copy of the draft scoping report be made available to both the Mpumalanga and National offices of the South African Heritage Resources Agency, the body responsible for the conservation of South Africa's heritage.
- Access to all the routes is made possible during the technical EIA phase of the project so on-site inspections can take place.
- The location/s of the substation site will be investigated in more detail to determine if archaeological resources are present.

Letters informing the national and provincial offices of the South African Heritage Resources Agency and the Mpumalanga Provincial Heritage Agency of the proposed development were sent in May 2010. In this letter, it was enquired whether the complete Draft Environmental Impact Report (DEIR) was required or if the heritage assessment report would provide sufficient information for the authorities. As yet, there has been no response from the above parties.

Access to the route options as mentioned in the third bullet point above is discussed in Section 6 under Methodology. It should be noted that the impact of overhead power lines on heritage sites can be limited as identified sites can usually be avoided either by the re-alignment of the power line or by increasing the span lengths between pylons so that pylons do not impact directly on identified sites..

With regard to the last bullet point, the proposed substation sites were inspected in February 2010 by archaeologists who confirmed that no significant archaeological or historical artefacts, features or structures were identified during the archaeological assessment of the proposed Zamokuhle substation sites A, B and C. (See **Appendix 1** for the archaeological assessment report).

## 2 Legislative Requirements

Heritage resources are protected in South Africa by the National Heritage Resources Act, No. 25 of 1999. A heritage resource is defined in the Act as any place or object of cultural significance. Cultural significance is defined as a place or object as having aesthetic, architectural, historical, scientific, social, spiritual, linguistic and technological value.

The above mentioned Act states that heritage resources that are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of the heritage resources authorities

The national estate may include-

- places, buildings, structures and equipment of cultural significance;
- places which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features of cultural significance;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds;
- sites of significance relating to the history in South Africa;
- movable objects, including-
  - objects recovered from the soil or waters of South Africa including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
  - objects to which oral traditions are attached or which are associated with living heritage; etc.

This assessment forms part of the EIA as required by the National Environmental Management Act (No. 107 of 1998) and is performed in accordance with Section 38 of the NHRA that refers to the management of heritage resources. The necessity for a heritage impact assessment (HIA) is because the activity falls within the definition contained in Section 38(1) (a) of the NHRA namely: *the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length.*

In Section 38 (3) reference is made what the reports should include such as:

- The identification and mapping of all heritage resources in the area affected;
- An assessment of the significance of any resources found (if any);
- As assessment of the impact of the development on such heritage resources;

### 3 Details of Heritage Specialist

The CV of the specialist, Jean Beater, was included in the Final Scoping Report (FSR) that was submitted to and approved by DEA. However a brief overview is included for readers who may not have seen the FSR.

- She managed the Burial Sites Unit of the South African Heritage Resources Agency (SAHRA) for 11 years (1991 – 2002)
- She established her own heritage consulting company (2003) before joining the Gauteng Department of Agriculture, Environment and Conservation (GDACE) (2003 - 2005) for two years working specifically for the Management Authority of the Cradle of Humankind World Heritage Site.
- In 2005, she joined PBA International, Consulting Engineers, where she project managed many Environmental Impact Assessments (EIAs) including power line projects and also undertook heritage impact assessments (HIAs).
- She left PBAI at the end of February 2010 and continues to undertake HIAs as an independent consultant.

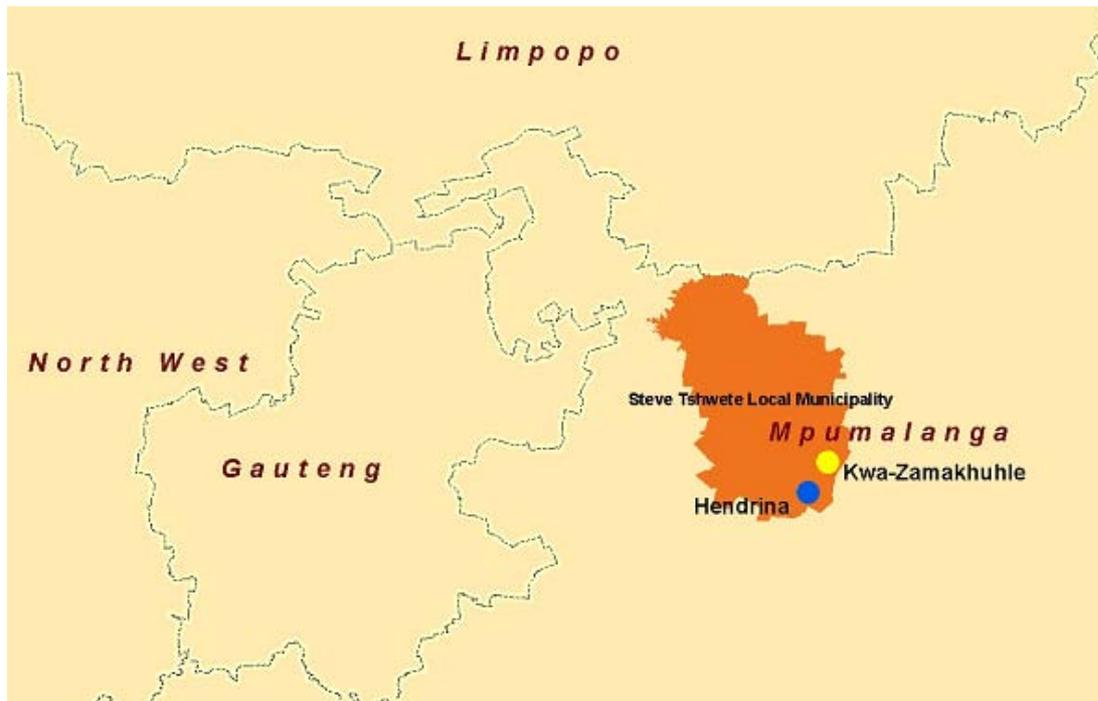
### 4 Study Area

The project area is situated between the Hendrina Main Transmission Substation (MTS) and the small town of Hendrina where the proposed Zamokuhle substation is to be built. The substation and Hendrina MTS will be linked by a single 132kV distribution power line.

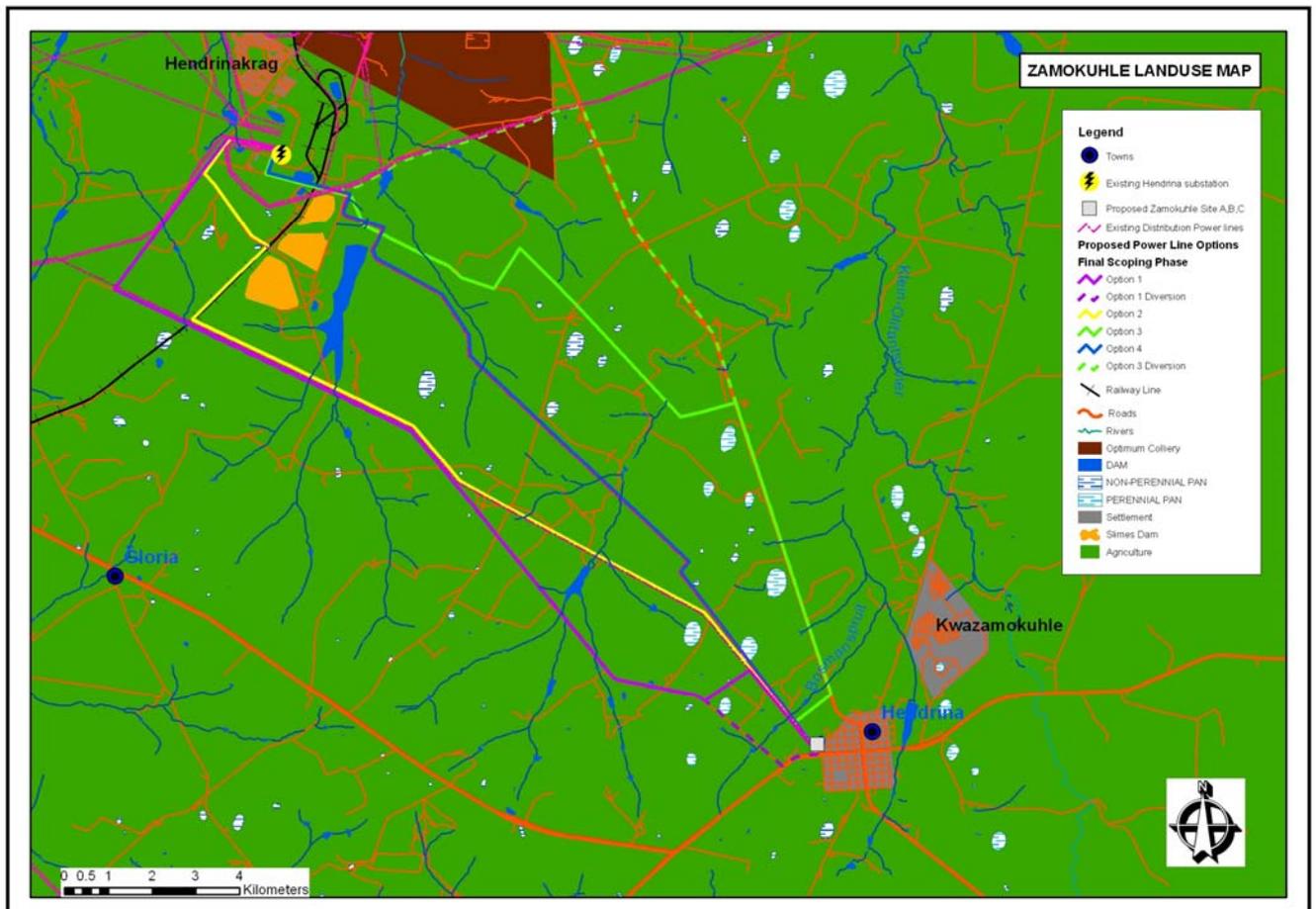
The study area is situated in the Mpumalanga province south of Witbank and Middelburg and falls within the Steve Tshwete Local Municipality. See **Map 1** below.

The land use activities in the study area are predominantly, agriculture, mining and electricity generation, transmission and distribution. **Map 2** (provided by the client), as shown below, shows the land uses of the area with agriculture (the green colour) the predominant land use.

Map 1: Location of study area within Mpumalanga province



Map 2: Land Use Map



## 5 Project Motivation<sup>1</sup>

The 20-year period load forecasts for the Hendrina/Kwazamokuhle area indicated that the demand for electricity would start to exceed the relevant design limit by 2008. This is a reflection that the current network is under tremendous pressure. Eskom proposes to strengthen the power supply as means of addressing the existing shortcomings.

Currently the distribution network has capacity problems and therefore cannot accommodate much load growth. As it is, the voltage available for the customers use is not of the required standards in some of the 11kV power lines, the current substation operation is near maximum at peak times and there is not adequate space in the substation yard to expand to accommodate bigger capacity equipment required to meet medium term and future power supply demands for the area.

In recent years, power outages and load shedding have become a common occurrence primarily due to declining electricity supply reserves, failing and inadequate infrastructure. Eskom has therefore embarked on a Capital Expansion Programme; a five-year programme during which it will spend over R300 billion on building new power stations, substations, transmission lines, distribution power lines and the reinstatement of out of service coal power stations. **Zamokuhle substation and 132kV distribution power line project forms part of the programme.**

## 6 Methodology

A search of the records held in the National Archives in Tshwane was undertaken to establish what information could be found regarding the larger study area. Various sources of information found that will be referred to in more detail in Section 7 of this report

A site visit of the study area and route options took place on 6 May 2010 and was done not only to identify heritage sites that could be affected by the project but also to establish the significance of these impacts.

Section of Options 1, 2 and 3 and their diversions were inspected. However, it should be noted that access the gravel roads to inspect Option 4 was limited due to the condition of the roads after the continuous rain previous to the site visit. Many of the roads were not passable and only limited sections of Option 4 were seen as well as that section of Option 2 where it deviates from Option 1 to join Option 4 before terminating at the proposed new substation.

Another limitation that was encountered was the long grass and dense vegetation due to the heavy rains experienced in the area that made it difficult to find sites such as graves.

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<sup>1</sup> As provided by the Client

Discussions were held with a landowner (Mr Jan Uys) and a tenant (Mrs Debbie Hattingh) on the farms Boschmanskop 154IS (portions 4 and 5) and Boschmansfontein 562 (portions 8 and Remainder) respectively and from these discussions it was ascertained that some of the farm houses are older than 60 years. However, the structures and graves on portion 8 of the farm Boschmansfontein appear to be directly affected if the present alignment of Option 3 is the recommended route alignment for the proposed 132kV power line.

In order to establish the pre-colonial history of the area, a database of archaeological studies undertaken throughout the area previously known as the Transvaal was consulted.

An internet search revealed that one of the farms affected by the project has a land claim on it, namely the farm Boschmansfontein 182IS<sup>2</sup>. It appears from the Notice that the entire farm is under claim. It is unclear whether the matter has been resolved and if so, what the outcome is. No archival records were found regarding the eviction or removal of black families from this farm.

It should be noted, however, that the land claim has little impact on the status of the heritage sites identified on portion 8 of the farm.

## **7 Historical Background and Assessment**

Information regarding the history of the study area is limited. The village of Hendrina was proclaimed in 1923 and was named after Hendrina Beukes, the wife of the original owner of the land on which the village was laid out.<sup>3</sup>

Hendrina power station is the oldest operation power station in South Africa. It is 32 years old and came into operation between June 1970 and December 1976.<sup>4</sup>

The Hendrina area is intensively utilised for crop farming and appears to be one of the centres of maize farming in the Mpumalanga province. The presence of coal in the area has also led to the area being part of the power generation centre that includes Witbank and Middelburg.

Information concerning the pre-colonial history of the area is sparse. An internet search of archaeological and historical investigations of the larger study revealed no information therefore the specialist approached the Archaeological Department of the National Cultural Heritage Museum in Tswane to see if any information could be found on the heritage database that contains records of archaeological investigations undertaken mainly in the area previously known as the Transvaal. A

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<sup>2</sup> [www.greengazette.co.za/docs/2007/01](http://www.greengazette.co.za/docs/2007/01), Notice No. 18 of 2007, Government Gazette, 19 January 2007

<sup>3</sup> [www.sameanders.co.za/pubphp/town](http://www.sameanders.co.za/pubphp/town) p. 1

<sup>4</sup> [www.absoluteastronomy.com/topics/Hendrina\\_Power\\_Station](http://www.absoluteastronomy.com/topics/Hendrina_Power_Station) p. 1

search of the database revealed no information about any archaeological investigations in the study area and was therefore unable to supply any information regarding the pre-history of the area.

Hence the history of development and history in the Mpumalanga province prior to the written record has been used to provide a picture of the history of the area. Earliest recorded evidence of humanoid settlement include Early and Middle Stone Age implements dating to 100,000BC, followed by evidence of large scale mining of red ochre in the Ngwenya Mountains 46,000 years ago.<sup>5</sup>

The movement of Nguni-speaking groups into the former north-eastern Transvaal from the 16<sup>th</sup> century and of Kgathla groups from the 17<sup>th</sup> century resulted in the rise of the powerful Pedi kingdom in the 18<sup>th</sup> century that was centred in the Steelpoort Valley and held sway over large parts of the former Transvaal.<sup>6</sup>

From archaeological evidence, it is known that subsistence farming and keeping cattle herds were some of the main activities that took place. Some people also mined iron ore and smelted the ore to fashion blades and spears and extensive trading took place between the suppliers of food and the suppliers of goods.<sup>7</sup>

The extended family was the basic social unit and archaeological evidence (still found today in undisturbed areas) show that stone walling was used by some tribes to demarcate residences and surround villages in order not only to indicate the hierarchy of those residing in the villages but also as a means of protecting the villages.<sup>8</sup>

As populations grew and kingdoms vied for control of areas, there was increasing strife around the availability of land and grazing which was exacerbated by the arrival of Boer trekkers in the early 1800s. Numerous skirmishes took place as well as treaties between black and white groups. The study area was possibly affected by the advancing army under Mzilikazi who fled Natal with about 300 followers after disobeying Shaka's orders by keeping plundered cattle. His passage northwards led to large-scale disruption to communities and clans and by the mid 1820s, Mzilikazi and his army controlled the area between the Limpopo, Vaal, Crocodile and Molopo Rivers.<sup>9</sup>

Once Mzilikazi had moved far north, a vacuum of power was left in the area north of the Vaal that the Voortrekkers' used to their advantage to secure, subjugate communities and eventually taking control of large areas of the former Transvaal.<sup>10</sup>

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<sup>5</sup> [www.mpumalanga.com/what\\_to\\_do=historical](http://www.mpumalanga.com/what_to_do=historical), p 1

<sup>6</sup> Ditto, p. 3

<sup>7</sup> Illustrated History of South Africa. The Real Story. Reader's Digest Association, Cape Town, 1992, p. 63

<sup>8</sup> Ditto

<sup>9</sup> Ditto, p. 89

<sup>10</sup> Ditto, p. 144

The first written archival records date from 1899 when mention is made of a school situated on the farm Boschmanslaagte being moved to the farm Boschmanskraal on 1 July 1899. The record is contained in a letter to the Department of Education in Pretoria dated 26 June 1899 that was signed by G.J.F Beukes (Chairman), P.H.S. Terblanche and C.E. or G.E. Veljoen (spelling unclear on letter).<sup>11</sup>

The Chairman who signed the letter to the Department of Education referred to above, Mr. Beukes, may have been the same individual who owned the farm on which the village of Hendrina was proclaimed in 1923 and whose wife the village was named after.

A summary of the documentation found in the National Archives is as follows:

- Several files in source TPB that related to the Administrator of the Transvaal that relate to correspondence between the Hendrina Village Council (the Municipality) and the Provincial Secretary about expenditure incurred and funds required for Union Day celebrations, moving of the Kruger Statue in the town, the Mayor's Christmas Tree fund, etc. The records date from approximately 1928 to 1955 and make contribution to the day to day functioning of the town.<sup>12</sup>
- Correspondence found in a source titled *Gemeenskapontwikkeling* (community development) that relate to the application and establishment of a Drive-In in 1976 on the farm Bosmanslaagte 1811S just outside Hendrina. Option 3 runs fairly close to this site and visit to the site reveals no clues that the area was a Drive-in previously. Additional correspondence found relates to the demise of the Drive-In due to the advent of television and an application in 1987 by the local vet to establish a animal hospital on the grounds of the Drive-In.<sup>13</sup>
- Various sources relating to the imposition of the Group Areas Act.<sup>14</sup> The correspondence relates to the administration of enacting the above Act and stretches over the 1960s.

The archival records reveal an active community who were taking responsibility of their education even before the formal establishment of the town. The records also suggest Hendrina must have been a big enough town for an individual to be prepared to establish a Drive-In in the community. The records also reveal a town that imposed the laws of the day such as the Group Areas Act.

From oral testimony and the site visit, it was determined that there are structures in the study area that are older than 60 years (and therefore protected by Section 34 (1) of the NHRA) as mentioned in Section 6 of this report. Most of the structures are either not affected by the four route options or can be avoided by them apart from the buildings on portion 8 of the farm Boschmansfontein 562 that

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<sup>11</sup> TAB Archival Collection, Source OD (Onderwys Departement), Vol. 317, Ref. No. OR10466/99

<sup>12</sup> TAB Archival Collection, TPB 2746 TA4/14280

<sup>13</sup> TAB Archival Collection, CDB 15102, PB.4-19-2-29-181-1 and CDB 14805, PB.4-18-2-29-181-1

<sup>14</sup> Sources TPB, URU and BEP

Option 3 will cross. There is sufficient space for the power lines to be re-aligned to the west of (and behind) the structures to avoid impacting on them.

Section 34 (1) states that *'no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority'*.

Therefore, if Option 3 is the alignment authorised for the construction of the proposed power line and the power lines cannot be re-aligned to avoid them, then application will have to be made by the applicant to the Mpumalanga provincial heritage body for permission to demolish said structures.

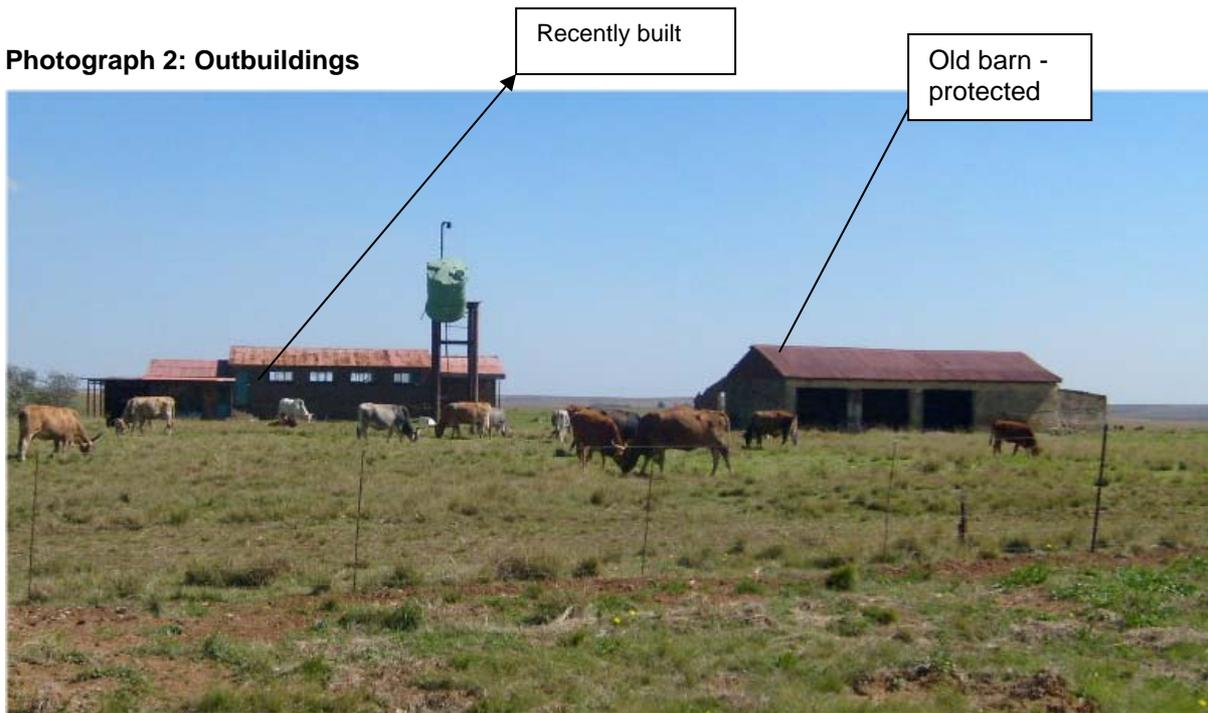
Photographs 1 and 2 below show the farm house and two other structures situated north of the farm house respectively. According to the tenant who lives in the farm house, she was told that the farm house and the old barn are about 80 years old. The structure between the house and the old barn is a recent development that has been abandoned and is of no heritage or aesthetic significance.

#### **Photograph 1: Farm House**



Although protected by the NHRA, both the farm house and barn have been changed over the years thereby impacting negatively on the architectural integrity and heritage significance of the structures. The farm house especially has been added to with the extension of the back area. The barn is in poor condition with a section of the western wall having collapsed over the years and additions made to the original building. Hence, the demolition of the buildings would not be a high impact in terms of heritage significance but the dislocation of those living in the farm house would probably be highly negative.

**Photograph 2: Outbuildings**



In addition, a small cemetery was pointed out which is situated south east of the farm house. The cemetery is fenced and there are about 5 graves in the cemetery, 3 of which have headstones. The inscriptions on the headstones have weathered off making identification impossible but the specialist is confident that the graves older than 60 years old. The cemetery could contain the graves of previous owners or labourers but this is impossible to verify.

According to Section 36 (2)(b) of the NHRA, *no person may, without a permit issued by SAHRA or a provincial heritage resources authority, destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority.*

Although the cemetery could be impacted by Option 3, the impact can be very low as overhead power lines can avoid sites by either adjusting the route alignment to avoid the cemetery or by ensuring that the pylons are not built directly on the graves and that the site is protected (fenced off and clearly marked with construction tape) during the construction process if this option is the approved route alignment. The removal of graves is a long and time-consuming process and can be a highly sensitive issue and is therefore not recommended.

The photographs below are of some of the graves in the cemetery.

**Photograph 3: Unmarked grave**



**Photograph 4: Unmarked grave with Headstone**



Due to the long grass and overgrown state of some sections of the four power line options as well as access issues due to the condition of the roads, it is possible that more graves exist that could not be seen during the site visit. Hence, it is recommended that whatever option is authorised, a 'walk down' by a heritage specialist be undertaken once the position of the pylons have been determined to ensure that no graves or other heritage sites are impacted on. Those sections of authorised route that cross cultivated fields need not be included in the walk down.

An inspection of the three proposed locations for the new Zamokuhle substation on the outskirts of Hendrina was undertaken by two archaeologists in February 2010 (see **Appendix 1** for the complete Archaeological Assessment report). The site visit and assessment did not reveal any archaeological or other sites. As stated in the Executive Summary of the archaeological assessment: *no significant archaeological or historical artefacts, features or structures (inclusive of graves, cemeteries and structures older than 60 years) were identified or recorded during an archaeological assessment of the proposed Zamokuhle Substation Sites.*

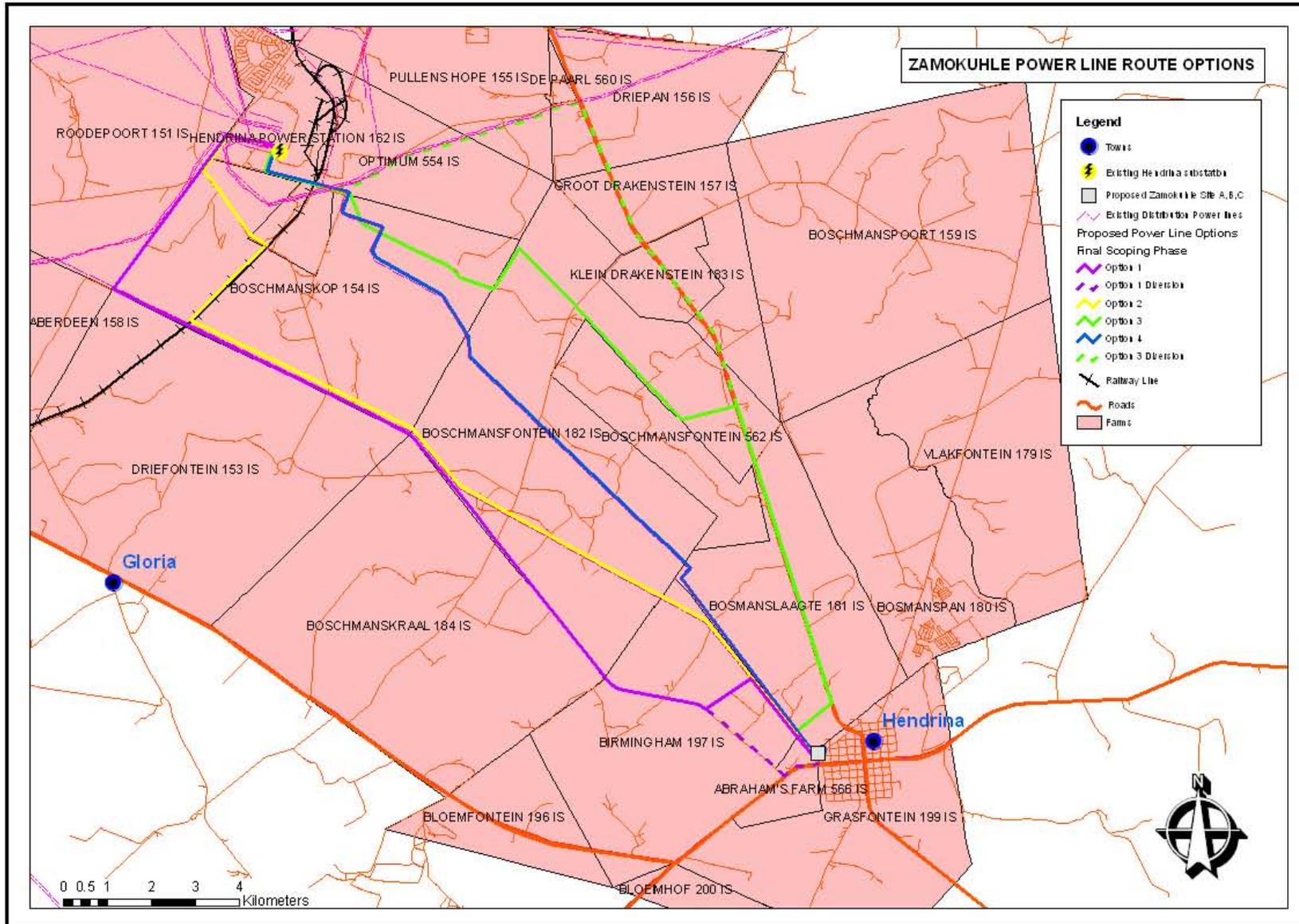
## **8 Assessment of Route Alternatives**

### **8.1 Assessment Tables**

It was requested by the EAP that the four power line route options be assessed using a methodology for the assessment of identified impacts that considers impacts arising from the construction and operation phases for the proposed 132kV power line project as well as determining before and after impacts with the implementation of recommended mitigation measures. The levels of significance of each identified impact will be quantified by taking into consideration the nature, extent, duration, intensity and probability of each potential impact.

The identified impacts that could occur on heritage sites are the destruction of protected and significant structures and graves. The tables below reflect the assessment of impacts that could result from the proposed project. **Map 3** below indicates the various route options, namely Option 1 (and deviation), Option 2, Option 3 (and deviation) and Option 4.

It should be noted that the post – mitigation levels of significance are included in the tables and can be identified as the numbers in red in brackets ( ).



**Table 1: Impact Assessment of Option 1 (Purple Line on above map)**

	OPTION 1	
<b>Theme</b>	<i>Heritage</i>	
<b>Nature of issue</b>	<i>Destruction of protected or significant heritage sites such as buildings and graves</i>	
Legal requirements	<i>Sections 34 and 36 of the National Heritage Resources Act, No. 25 of 1999</i>	
Stage	<i>Construction and Decommissioning: {these are assumed to have similar impacts}</i>	<i>Operation:</i>
Extent of impact	<i>2</i>	<i>1</i>
Duration of impact	<i>2 (short-term) (1-5 yrs)</i>	<i>4</i>
Intensity	<i>2 (Low)</i>	<i>2 (1)</i>
Probability of occurrence	<i>3 (Medium) (2)</i>	<i>2</i>
Status of the impact	<i>Negative</i>	<i>Negative</i>
Cumulative Impact	<i>Negligible</i>	<i>Negligible</i>
<b>Level of significance</b>	<i>18 (Low-Moderate)</i>	<i>14 (Low)</i>
Mitigation measures	<ul style="list-style-type: none"> <li><i>• Walk down of undisturbed areas of power line route</i></li> <li><i>• Structures and graves to be avoided by power lines where possible by re-alignment of route</i></li> <li><i>• If sites are discovered during construction, work in immediate vicinity be stopped &amp; a professional consulted</i></li> </ul>	<i>Ensure that any heritage sites left in the servitude are not damaged during maintenance of both the power line and servitude; Either permanently fence or mark such sites</i>
<b>Level of significance after mitigation</b>	<i>12 (Low)</i>	<i>12 (Low)</i>
EMP requirements	<i>As above</i>	<i>As above</i>
<u>Discussion {use this box to expand on issues that need clarity, explanation, etc.}</u>		
<p>Although this alignment crosses only few undisturbed areas, there is a possibility that along the undisturbed areas heritage sites may exist such as where Options 1 and 2 separate and Option 1 no longer follows an existing power line. There were a number of sites seen when using Google Earth that could be stone walled sites on portion 1 of farm Boschmansfontein 182IS but this could not be determined as access to this area was not possible due to poor road conditions and long grass. However, with the walk down of undisturbed areas, the possible impact can be reduced to a low significance as heritage sites should be identified during this stage and steps can be taken to mitigate impacts on sites discovered.</p>		

**Table 2: Option 1 – Diversion (Purple broken line)**

	Option 1 – Deviation	
<b>Theme</b>	<b>Heritage</b>	
<b>Nature of issue</b>	<i>Destruction of protected or significant heritage sites such as structures and graves</i>	
Legal requirements	<i>Sections 34 and 36 of the National Heritage Resources Act, No. 25 of 1999</i>	
Stage	<i>Construction and Decommissioning: {these are assumed to have similar impacts}</i>	<i>Operation:</i>
Extent of impact	2	1
Duration of impact	2	4
Intensity	2	2 (1)
Probability of occurrence	3 (2)	2
Status of the impact	<i>Negative</i>	<i>Negative</i>
Cumulative Impact	<i>Negligible</i>	<i>Negligible</i>
<b>Level of significance</b>	18	14 (Low)
Mitigation measures	<ul style="list-style-type: none"> <li>• <i>Walk down of undisturbed areas of power line route</i></li> <li>• <i>Structures and graves to be avoided by power lines where possible by re-alignment of route</i></li> <li>• <i>If sites are discovered during construction, work in immediate vicinity be stopped &amp; a professional consulted</i></li> </ul>	<i>Ensure that if any heritage sites remain in the servitude, they are not damaged during maintenance of both the power line and servitude by either permanently fencing or clearly marking such sites</i>
<b>Level of significance after mitigation</b>	<b>12 (Low)</b>	12 (Low)
EMP requirements	<i>As above</i>	<i>As above</i>
<u>Discussion {use this box to expand on issues that need clarity, explanation, etc.}</u>		
Option 1 with deviation is not markedly different to Option 1. However, the deviation makes the option shorter than Option 1 and is therefore preferred as the longer an option the higher the risk that the power line may impact on undiscovered heritage resources.		

**Table 3: Option 2 (Yellow Line)**

	Option 2	
<b>Theme</b>	<b><i>Heritage</i></b>	
<b>Nature of issue</b>	<i>Destruction of protected or significant heritage sites such as structures and graves</i>	
Legal requirements	<i>Sections 34 and 36 of the National Heritage Resources Act, No. 25 of 1999</i>	
Stage	<i>Construction and Decommissioning: {these are assumed to have similar impacts}</i>	<i>Operation:</i>
Extent of impact	<i>2</i>	<i>1</i>
Duration of impact	<i>2</i>	<i>4</i>
Intensity	<i>2</i>	<i>2 (1)</i>
Probability of occurrence	<i>3 (2)</i>	<i>2</i>
Status of the impact	<i>Negative</i>	<i>Negative</i>
Cumulative Impact	<i>Negligible</i>	<i>Negligible</i>
<b>Level of significance</b>	<i>18</i>	<i>14 (Low)</i>
Mitigation measures	<ul style="list-style-type: none"> <li><i>• Walk down of undisturbed areas of power line route</i></li> <li><i>• Structures and graves to be avoided by power line where possible by re-alignment of route</i></li> <li><i>• If sites are discovered during construction, work in immediate vicinity be stopped &amp; a professional consulted</i></li> </ul>	<i>Ensure that if any heritage sites remain in the servitude, they are not damaged during maintenance of both the power line and servitude by either permanently fencing or clearly marking such sites</i>
<b>Level of significance after mitigation</b>	<i>12 (Low)</i>	<i>12 (Low)</i>
EMP requirements	<i>As above</i>	<i>As above</i>
<u>Discussion {use this box to expand on issues that need clarity, explanation, etc.}</u>		
<p><i>This alignment runs parallel to an existing power line as well as an existing railway line and follows the same route as Option 1 before diverting on portion 1 of the farm Boschmansfontein 182IS to follow the existing power line all the way to the new substation. The same concerns remain regarding the sites seen when using Google Earth that could be stone walled sites on portion 1 of farm Boschmansfontein 182IS. However as this option is located parallel to existing linear infrastructure for much of its length and therefore crossing areas already disturbed, it is preferred to Option 1.</i></p>		

**Table 4: Option 3 (Green Line)**

Option 3		
<b>Theme</b>	<b>Heritage</b>	
<b>Nature of issue</b>	<i>Destruction of protected or highly significant heritage sites such as structures and graves</i>	
Legal requirements	<i>Sections 34 and 36 of the National Heritage Resources Act, No. 25 of 1999</i>	
Stage	<i>Construction and Decommissioning: {these are assumed to have similar impacts}</i>	<i>Operation:</i>
Extent of impact	2	2 (1)
Duration of impact	2	4
Intensity	3 (2)	2
Probability of occurrence	4 (3)	2
Status of the impact	<i>Negative</i>	<i>Negative</i>
Cumulative Impact	<i>Negligible</i>	<i>Negligible</i>
<b>Level of significance</b>	<i>28 (Low-Medium)</i>	<i>16 (Low-Medium)</i>
Mitigation measures	<ul style="list-style-type: none"> <li>• <i>Walk down of undisturbed areas of power line route</i></li> <li>• <i>Structures and graves on portion 8 Boschmansfontein 562IS to be avoided by re-alignment of route behind buildings &amp; cemetery;</i></li> <li>• <i>If sites are discovered during construction, work in immediate vicinity be stopped &amp; a professional consulted</i></li> </ul>	<i>Ensure that if any heritage sites remain in the servitude, they are not damaged during maintenance of both the power line and servitude by either permanently fencing or clearly marking such sites</i>
<b>Level of significance after mitigation</b>	<b>18 (Low - Medium)</b>	14 (Low)
EMP requirements	<i>As above</i>	<i>As above</i>
<u>Discussion {use this box to expand on issues that need clarity, explanation, etc.}</u>		
<p>Option 3 crosses cultivated areas for much of its length and it will also be situated parallel to the N11 highway for a distance of approx. 7km. It is along the N11 that the proposed power line will cross structures and graves on portion 8 on the farm Boschmansfontein 562IS that are older than 60 years and therefore protected by the NHRA hence the higher significance ranking than the other route options. However, if the alignment of the route in this area is re-aligned to the west and behind the buildings and cemetery then the impact should be mitigated significantly.</p>		

**Table 5: Option 3 – Deviation (Turquoise line)**

Option 3 – Deviation		
<b>Theme</b>	<b>Heritage</b>	
<b>Nature of issue</b>	<i>Destruction of protected or highly significant heritage sites such as structures and graves</i>	
Legal requirements	<i>Sections 34 and 36 of the National Heritage Resources Act, No. 25 of 1999</i>	
Stage	<i>Construction and Decommissioning: {these are assumed to have similar impacts}</i>	<i>Operation:</i>
Extent of impact	2	2 (1)
Duration of impact	2	4
Intensity	3 (2)	2
Probability of occurrence	4 (3)	2
Status of the impact	<i>Negative</i>	<i>Negative</i>
Cumulative Impact	<i>Negligible</i>	<i>Negligible</i>
<b>Level of significance</b>	<b>28 (Low-Medium)</b>	<b>16 (Low-Medium)</b>
Mitigation measures	<ul style="list-style-type: none"> <li><i>Walk down of undisturbed areas of power line route</i></li> <li><i>Structures and graves on portion 8 Boschmansfontein 562IS to be avoided by re-alignment of route behind buildings &amp; cemetery;</i></li> <li><i>If sites are discovered during construction, work in immediate vicinity be stopped &amp; a professional consulted</i></li> </ul>	<i>Ensure that if any heritage sites remain in the servitude, they are not damaged during maintenance of both the power line and servitude by either permanently fencing or clearly marking such sites</i>
<b>Level of significance after mitigation</b>	<b>18 (Low - Medium)</b>	<b>14 (Low)</b>
EMP requirements	<i>As above</i>	<i>As above</i>
<u>Discussion {use this box to expand on issues that need clarity, explanation, etc.}</u>		
<p>Option 3 deviation runs parallel with the N11 for approx. 15km and as with Option 3 will cross structures and graves on portion 8 on the farm Boschmansfontein 562IS that are older than 60 years and therefore protected by the NHRA hence the higher significance ranking than the other route options. Just before the option turns westwards away from the N11 and towards Hendrina MTS, the proposed power line will cross some kraals that are recently built. The area towards the MTS is highly disturbed with existing mining activities and power lines with <u>little room</u> for an additional power line and although the possibility of finding heritage resources in this area unlikely, the option is not supported.</p>		

**Table 6: Option 4 (Blue line)**

	<b>Option 4</b>	
<b>Theme</b>	<b><i>Heritage</i></b>	
<b>Nature of issue</b>	<i>Destruction of protected or highly significant heritage sites such as structures and graves</i>	
Legal requirements	<i>Sections 34 and 36 of the National Heritage Resources Act, No. 25 of 1999</i>	
Stage	<i>Construction and Decommissioning: {these are assumed to have similar impacts}</i>	<i>Operation:</i>
Extent of impact	<i>2</i>	<i>1</i>
Duration of impact	<i>2</i>	<i>4</i>
Intensity	<i>2</i>	<i>2 (1)</i>
Probability of occurrence	<i>3 (2)</i>	<i>2</i>
Status of the impact	<i>Negative</i>	<i>Negative</i>
Cumulative Impact	<i>Negligible</i>	<i>Negligible</i>
<b>Level of significance</b>	<i>18 (Low-Medium)</i>	<i>14 (Low)</i>
Mitigation measures	<ul style="list-style-type: none"> <li><i>• Walk down of undisturbed areas of power line route</i></li> <li><i>• Structures and graves to be avoided by power line where possible by re-alignment of route</i></li> <li><i>• If sites are discovered during construction, work in immediate vicinity be stopped &amp; a professional consulted</i></li> </ul>	<i>Ensure that if any heritage sites remain in the servitude, they are not damaged during maintenance of both the power line and servitude by either permanently fencing or clearly marking such sites</i>
<b>Level of significance after mitigation</b>	<i>12 (Low)</i>	<i>12 (Low)</i>
EMP requirements	<i>As above</i>	<i>As above</i>
<u>Discussion {use this box to expand on issues that need clarity, explanation, etc.}</u>		
<p>For most of its length, Option 4 runs parallel to an existing power line as well as crossing cultivated land. The cultivated areas imply that it will be unlikely that heritage sites will be impacted on and by following the existing power line the use of existing access roads limits the need for the construction of additional roads that could lead to the destruction of heritage resources. In addition, this option is the straightest option hence the shortest in length making it attractive in that the risk of the option impacting on heritage resources is lower than the other options. However, there are undisturbed areas that will be crossed on portions 9 and 2 of the farms Boschmanskop154IS and Boschmansfontein 182IS that may contain unidentified heritage sites hence the importance of the proposed walk down.</p>		

## **8.2 Discussion of Impact Significance Ranking**

The results of the assessment of the identified impacts on heritage resources along the four options indicate that the impacts will have a **low to medium** significance and that if mitigation measures, as listed in the above tables, are implemented these impacts will be reduced to a **low** impact significance. This result confirms the general assessment that the study area has a low heritage significance that can be attributed to the highly disturbed nature of the area through large scale cultivation practices and mining activities.

Three of the options, namely Options 1, 2 and 4 have the same impact significance rankings whilst Option 3 has a higher impact ranking because the proposed alignment of Option 3 will impact on the protected structures and cemetery on portion 8 of Boschmansfontein 5621S. With mitigation, this impact is reduced from a low-moderate ranking to a low ranking

The reasons for Options 1, 2 and 4 having the same rankings is based on the fact that the options cross areas that are very similar such as large areas of cultivated land, they follow existing power lines for varying distances and they also all cross undisturbed areas where heritage resources may be found. The same could be said about Option 3 however protected heritage sites have been identified that will be impacted by this alignment hence the higher impact rating.

When considering which of the four options should be recommended for the proposed 132kV Distribution power line, Option 3 was excluded due to the reasons provided above.

Options 1, 2 and 4 are very similar but the shorter distance crossed by **Option 4** makes it the preferred option because the longer a power line the higher the risk that unidentified heritage resources are impacted on.

In addition, **Option 4** runs parallel to an existing power line for most of its distance and this is seen as advantageous as existing access roads can be used for both the construction and operational phase of the project. The building of access roads normally includes the clearing and scraping of areas that could result in the destruction of heritage sites including archaeological sites that may be situated below the surface. No access roads will be required for Options 1 and 2; however they are substantially longer than Option 4 hence the preference for this option.

## **9 Conclusions**

From the above assessment and having undertaken a more in-depth investigation of the history and heritage of the study area and power line options, it is the opinion of the specialist that the area has low heritage significance. No sites of high significance were observed and the areas crossed by the power line options are all extensively cultivated that would have led to the destruction of heritage

resources that may have existed along these route options before the area was subjected to such intensive farming practices.

Additionally, the immediate area to the south of Hendrina MTS is disturbed by mining activities making the possibility of finding heritage sites in that area unlikely. It is possible that graves sites were not identified during the site visits and could still be found during the construction of the power lines hence the recommendation that a walk down be undertaken in undisturbed (uncultivated) sections of the authorised option.

It is the opinion of the specialist that the impact of the power line project on the heritage of the area will be low and that the project can therefore proceed.

## **10 Recommendations**

The following is recommended:

- Option 4 is the preferred option from a heritage perspective
- A 'walk down' of the authorised route option by a heritage specialist be undertaken once the position of the pylons have been determined to ensure that no graves, archaeological or other heritage sites are impacted on. Those sections of authorised route that cross cultivated fields need not be included in the walk down.
- The removal of graves is discouraged as most graves can be avoided by overhead power lines and the disinterment of graves is time consuming, costly and can be a highly sensitive issue.
- Graves situated inside or close to the power line servitude should be well cordoned off and marked to protect them against damage during the construction of the proposed power line.
- If heritage sites are discovered during the construction process, work in the immediate vicinity of the find should be stopped, the Mpumalange Provincial Heritage Agency must be informed and the services of an accredited heritage professional be obtained to assess the find and recommend mitigation measures.
- All mitigation measures recommended by the heritage professional after investigation of heritage sites discovered are adhered to.

## **11 Sources Consulted**

### **Archival Records**

Various sources held in the Transvaal Archives Collection (TAB): National Archives of South Africa, Tshwane

Various sources held in the South African Archives Collection (SAB): National Archives of South Africa, Tshwane

### **Internet Search**

[www.greengazette.co.za/docs/2007/01](http://www.greengazette.co.za/docs/2007/01), Notice No. 18 of 2007, Government Gazette, 19 January 2007

[www.sameanders.co.za/pubphp/town](http://www.sameanders.co.za/pubphp/town)

[www.absoluteastronomy.com/topics/Hendrina\\_Power\\_Station](http://www.absoluteastronomy.com/topics/Hendrina_Power_Station)

[www.mpumalanga.com/what\\_to\\_do=historical](http://www.mpumalanga.com/what_to_do=historical)

### **Databases**

Mr J. van Schalkwyk, National Cultural Heritage Museum: Database of Archaeological Investigations

### **Publications**

Reader's Digest Illustrated History of South Africa. The Real Story. The Reader's Digest Association Limited, Cape Town, 1992.

## **Appendix 1**

### **ARCHAEOLOGICAL ASSESSMENT ZAMOKUHLE SUBSTATION, HENDRINA, MPUMALANGA PROVINCE**

**Zamokuhle Substation, Hendrina, Mpumalanga Province  
Archaeological Assessment**

Report prepared for

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## CONTENTS

	<b>Page Number</b>
Executive Summary	3
Introduction	4
Terms of Reference	4
Definitions and Approach	4
Methodology	6
- Maps	
- Fieldwork	
Site Descriptions and Assessments	6
Acknowledgements	7
References	8
Figures	9-15

## **EXECUTIVE SUMMARY**

No significant archaeological or historical artefacts, features or structures (inclusive of graves, cemeteries and structures older than 60 years) were identified or recorded during an archaeological assessment of the proposed Zamokuhle Substation Sites A, B and C.

Eskom's proposed Site A is considered preferable to Sites B and C as the impact on adjacent properties and cultural resources will be lowest.

Also note the following:

Archaeological deposits typically occur below ground level. Should archaeological artefacts or skeletal material be uncovered during construction of the substation all activities should be halted; the provincial office of the South African Heritage Resources Agency should be informed and a university or museum notified to facilitate an investigation and evaluation of the find(s) (*cf.* National Heritage Resources Act, Act No.25 of 1999, Section 36(6)).

## **INTRODUCTION**

An archaeological assessment of Eskom's proposed sites for the Zamokuhle Substation, Hendrina, was undertaken at the request of PBA International (SA). Three alternative sites, designated Site A, Site B and Site C, were surveyed using coordinates provided by PBA personnel (Figure 1).

The aim of the assessment was to provide an evaluation of the proposed location options for construction of the new substation and to offer a professional recommendation for a preferred option or options. Any identified archaeological and historical artefacts and structures (including graves and historic structures older than 60 years), or settlements of cultural significance were to be appropriately documented and assessed.

## **TERMS OF REFERENCE**

The terms of reference for this survey are as follows:

- A description of all archaeological resources identified through surface survey at the sites designated as Site A, Site B and Site C.
- Mapping and photographing of archaeological structures and/or artefacts identified during the field visit.
- A basic assessment of archaeological resources and recommendations for any further work deemed necessary.

## **DEFINITIONS AND APPROACH**

- Archaeological remains can be defined as human-made objects, which reflect past ways of life, deposited on or in the ground.
- All archaeological remains, artificial features and structures older than 100 years and historic structures older than 60 years are protected by the National Heritage Resources Act (NHRA) (Act No.25 of 1999). The Act mandates an Archaeological Impact Assessment as part of an Environmental and/or Heritage Impact Assessment.
- No archaeological artefact, assemblage or settlement (site) may be moved or destroyed without approval from the South African Heritage Resources Agency (SAHRA). Recommendations made in this report comply with SAHRA requirements and guidelines.
- Human remains older than 60 years are protected by the National Heritage Resources Act (Section 36). Human remains less than 60 years old are protected by the Human Tissue Act (Act 65 of 1983 as amended).
- Cultural resources are non-renewable.

- Guidelines provided by the NHRA (Section 3, subsection 3) and the Australian ICOMOS Charter (also known as the Burra Charter) are used when determining the significance or special value of archaeological and historical sites. If the significance of a site is rated ‘high’, the significance of the impact will be concomitantly high. Similarly, if the significance rating of a site is ‘low’, the significance of impact will also be low.

#### MITIGATION GUIDELINES

<b>Significance Rating</b>	<b>Action</b>
Not protected	1. None
Low	2a. Recording and documentation (Phase 1) of site adequate; no further action required
	2b. Controlled monitoring and/or sampling (shovel test pits, augering), mapping and documentation (Phase 2 investigation); permit required for sampling and destruction
Medium	3. Excavation of representative sample, C14 dating, mapping and documentation (Phase 2 investigation); permit required for sampling and destruction [including 2a & 2b]
High	4a. Nomination for listing on Heritage Register (National, Provincial or Local) (Phase 2 & 3 investigations); site management plan; permit required if utilised for education or tourism
	4b. Graves: Locate demonstrable descendants through social consulting; obtain permits from applicable legislation, ordinances and regional by-laws; exhumation and reinterment [including 2a, 2b & 3]

- It must be borne in mind that archaeological deposits usually occur below ground level. Should archaeological artefacts or skeletal material be uncovered during construction activities, such activities should be halted, and a university or museum notified to facilitate an investigation and evaluation of the find(s) (*cf.* National Heritage Resources Act, Act No.25 of 1999, Section 36(6)).
- No person may demolish any structure or part thereof which is older than 60 years without a permit. No person may, without the necessary permit, destroy, damage, exhume, remove or alter graves as specified in section 36 (3)(a)(b) and (c).
- Note that the final decision for the approval of permits, or the removal or destruction of sites, structures and artefacts identified in this report, rests with the South African Heritage Resources Agency (SAHRA) (or relevant PHRA).

- A copy of this report will be lodged with SAHRA as stipulated by the NHRA (section 38, subsection 4).

## **METHODOLOGY**

### **Maps**

The proposed substation sites are located on the 1:50 000 map 2629BA Hendrina and are indicated on a detailed map provided by the client (Figure 1). Sites A and B are located on municipal land while Site C falls within the boundary of Abraham's Farm 566 IS. All sites are proximate to the existing substation.

### **Fieldwork**

An on-site investigation was conducted on 20 February 2010. The proposed sites were surveyed on foot using the co-ordinates provided as the centre of 100m x 100m areas, the substation plot size specified in the scoping report prepared by PBA International (p.ix).

## **SITE DESCRIPTIONS AND ASSESSMENTS**

### **Site A**

S 26 09 38.74 (26.157640)

E 29 42 39.33 (29.707331)

Site A lies approximately 70m north of the existing substation on open ground between the boundary of Abraham's Farm and the western limit of Hendrina (Figure 1). The area is burned annually (Schmahl 2010 personal communication) and the vegetation is low and open, which facilitated easy survey. The land has been used for illegal dumping and a number of modern trash middens composed principally of glass (window glass and crown top bottles) were noted (Figure 2). The partial foundation of a prefabricated concrete wall was also noted (Figure 3) suggesting the area may have been walled or partially walled in the recent past. All materials identified through surface survey post-date 1950 and are of low archaeological significance.

Surface survey indicates that Site A contains no sites of archaeological significance. The site is suitable for construction of the proposed substation and requires no further archaeological mitigation.

**Significance Rating: Low 2a**

### **Site B**

S 26 09 25.34 (26.157040)

E 29 42 28.51 (29.707920)

Site B is located approximately 150m north-east of the existing substation and is close to the southern boundary of Bosmanslaagte 181 IS (Figure 1). Vegetation at the site is low and has been cleared in places to accommodate the construction of an access

road between Bosmanslaagte and the western side of Hendrina (Figures 4 and 5). Site B contains dumps of modern building rubble (bricks, wood and plaster) and firewood (Figure 6). The latter results principally from the clearing of trees and is left by local farmers for farm workers and Hendrina residents to collect for fuel (Schmahl 2010 personal communication). Immediately north of the centre of Site B is a gently mounded area, approximately 15m x 10m, covered in kikuyu grass (Figure 7). This may mark a disused stock enclosure or paddock as animal dung favours kikuyu growth (Hall 1997:15). There is no evidence at surface level to indicate a structure or foundation but this cannot be discounted and the area should be monitored during ground-breaking activities.

Surface survey indicates that Site B contains no sites of archaeological significance. The site is suitable for construction of the proposed substation although the kikuyu mound should be monitored during ground-breaking activities.

**Significance Rating: Low 2b**

### **Site C**

S 26 09 29.3 (26.158140)

E 29 42 24.44 (29.706789)

Site C is located north-west of the existing substation and falls within the boundary of Abraham's Farm 566 IS (Figure 1). The area has been cleared recently of stands of blue gum trees and planted with grass for the grazing of cattle. Prior to this the land was used for maize cultivation and was ploughed annually (Schmahl 2010 personal communication). No archaeological sites or artefacts were located in the 100m x 100m 'footprint' of the proposed substation but a number of graves are located west and north-west of the site. A single marked and fenced grave dated 1936 is located at S 26 09 31.1; E 29 42 17.5 (Figure 9) while a number of graves (five or more), marked by packed stone mounds, are located at S 26 09 24.9; E 29 42 18.9 (Figure 10). Although the graves will not be impacted directly by the location of a new substation at Site C some community consultation will be required to ensure continued unhindered access for the descendants who visit the graves (Schmahl 2010 personal communication).

Surface survey indicates that Site C contains no sites of archaeological significance. The site is suitable for construction of the proposed substation but the proximity of graves renders this the least preferred option.

**Significance Rating: Low 2a**

## **ACKNOWLEDGEMENTS**

Thanks to Jan Schmahl, who facilitated our access to Site C.

## **REFERENCES**

Eskom Zamokuhle Substation and 132KV Powerline in Hendrina District. Final Scoping Report prepared by PBA International.

Hall, S. 1997. A Phase I Archaeological Assessment of Modderfontein. Unpublished report prepared for AECI Operations Services.

