
Heritage Scoping Report for the proposed Merensky Foskor Power Line, Limpopo Province.

Prepared For

Nsovo Environmental Consulting

By



HERITAGE

Contracts and Archaeological Consulting

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VERSION 1.2

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ACKNOWLEDGEMENT OF RECEIPT

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EXECUTIVE SUMMARY

Site name and location: Proposed Foskor Merensky 275kv ±130km Line and Associated Substation Works located in the Limpopo province.

1: 50 000 Topographic Maps: 2430 AD, 2430 AC, 2430 CA, 2430 CB, 2430 DA, 2430 BC, 2430 BA, 2430 BB, 2430 BD, 2431 AA

EIA Consultant: Nsovo Environmental Consulting

Developer: Eskom Holdings Soc Limited

Heritage Consultant: Heritage Contracts and Archaeological Consulting CC (HCAC).

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Date of Report: 23 November 2012

Findings of the Assessment: This scoping study revealed that a range of heritage sites occur in the larger region and similar sites can be expected within the study area. Every site is relevant to the Heritage Landscape, and based on preservation etc. it is anticipated that some sites on route option 3 might have conservation value but will have to be verified by a site visit.

Based on the findings of the desktop study **route option 3** is the least preferred option from a heritage point of view. From the other alternatives route 4 and the public alternative are the preferred options while route 1, 2 and is satisfactory. Route 2 would be the better option of the four.

In order of preference from best to worst it would be Route 4 and the public alternative, Route 2, Route 1 and then Route 3.

In order to comply with the National Heritage Resources Act (Act 25 of 1999) a walkthrough of the power line focussing on pylon positions must be done before development starts. During this study sites of archaeological, historical or places of cultural interest must be located, identified, recorded, photographed and described. During this study the levels of significance of recorded heritage resources must be determined and mitigation proposed should any significant sites be impacted upon, ensuring that all the requirements of SAHRA are met.

Disclaimer: *Although all possible care is taken to identify sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. Heritage Contracts and Archaeological Consulting CC and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.*

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- The results of the project;
- The technology described in any report
- Recommendations delivered to the Client.

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Abbreviations

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BIA: Basic Impact Assessment
CRM: Cultural Resource Management
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Plan
ESA: Early Stone Age
GPS: Global Positioning System
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA: National Environmental Management Act
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

Glossary

Archaeological site (remains of human activity over 100 years old)

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

1. INTRODUCTION

Heritage Contracts and Archaeological Consulting CC was contracted by Nsovo Environmental Consulting to conduct a Heritage Scoping Report for the Proposed Foskor Merensky 275kv ±130km Line. The proposed project is located in the Limpopo province and initially consisted of four alternatives, however a fifth alternative was added after the public participation process (called the public alternative) (Figure1). The heritage scoping report forms part of the environmental impact assessment for the proposed project.

The aim of the scoping report is to conduct a desktop study to identify possible heritage resources within the project area and to assess their importance within a Local, Provincial and National context. The study furthermore aims to assess the impact of the proposed project on non - renewable heritage resources and to submit appropriate recommendations with regards to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve and develop them within the framework provided by Heritage legislation.

The report outlines the approach and methodology utilized for the scoping phase of the project. The report includes information collected from various sources and consultations. Possible impacts are identified and mitigation measures are proposed in the following report. It is important to note that no field work was conducted as part of the scoping phase but should be conducted as part of the Impact Assessment phase of the EIA.

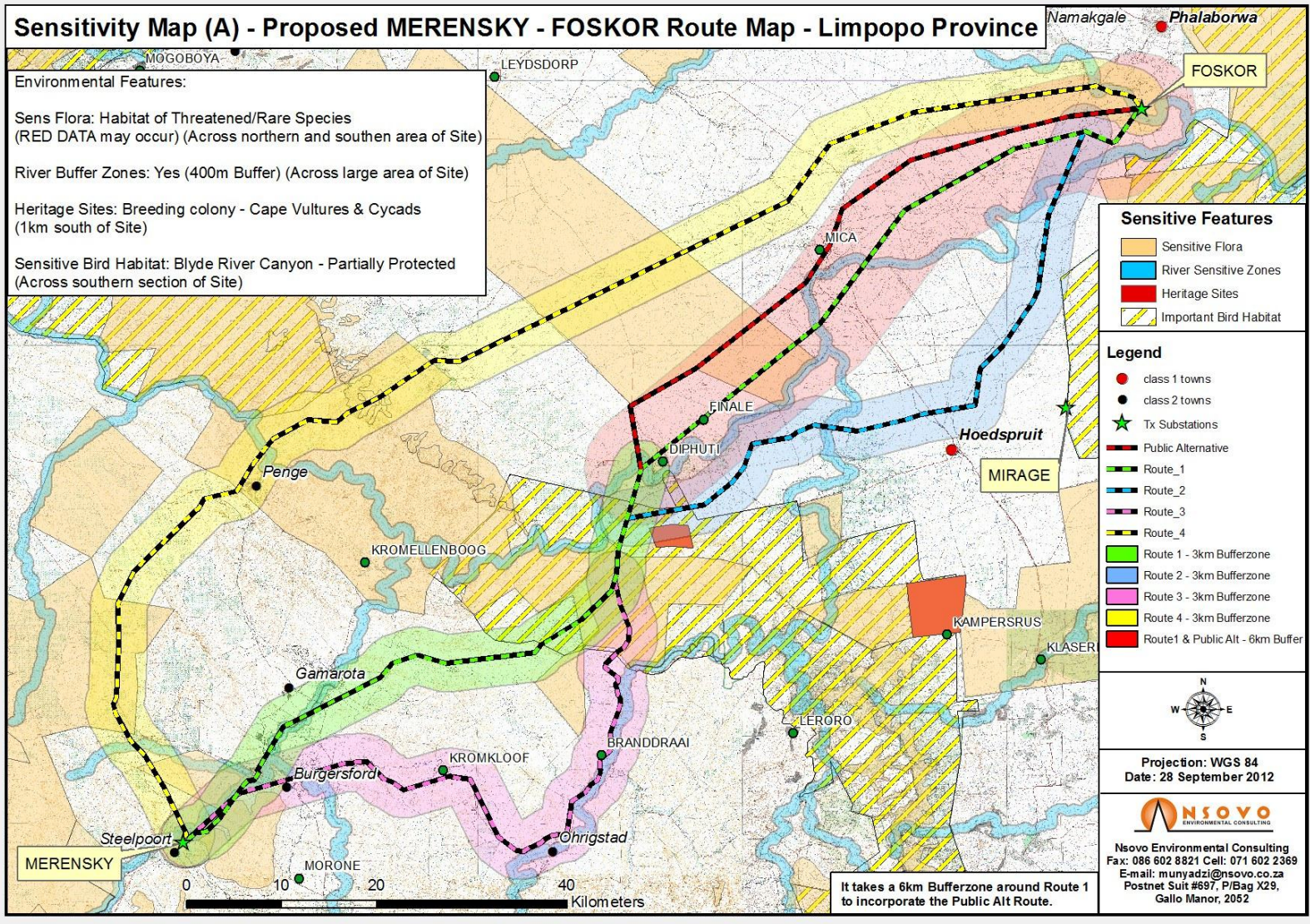


Figure 1: Locality map provided by Nsovo Environmental Consultants

1.2 Terms of Reference

The main aim of this scoping report is to determine if any known heritage resources occur within the study area and to predict the occurrence of any possible heritage significant sites that might present a fatal flaw to the proposed project. The objectives of the scoping report were to:

- » Conduct a desktop study:
 - * Review available literature, previous heritage studies and other relevant information sources to obtain a thorough understanding of the archaeological and cultural heritage conditions of the area;
 - * Gather data and compile a background history of the area;
 - * Identify known and recorded archaeological and cultural sites;
 - * Determine whether the area is renowned for any cultural and heritage resources, such as Stone Age sites, Iron Age sites, informal graveyards or historical homesteads.

- » Report

The reporting of the scoping component is based on the results and findings of the desk-top study, wherein potential issues associated with the proposed project will be identified, and those issues requiring further investigation through the IA Phase highlighted. Reporting will aim to identify the anticipated impacts, as well as cumulative impacts, of the operational units of the proposed project activity on the identified heritage resources for all 3 development stages of the project, i.e. construction, operation and decommissioning. Reporting will also consider alternatives should any significant sites be impacted on by the proposed project. This is done to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve and develop them within the framework provided by the National Heritage Resources Act.

1.3 Nature of the development

The proposed project will ensure the following:

- The power line will form part of the link to strengthen the supply network between Foskor and Merensky Substations.
- Improvement in the reliability of electricity supply which will benefit users in the region and country at large.
- Improve the economic status of the country

The following infrastructure is envisaged:

- Upgrading of the Foskor 275/132kV transformation by installing a 3rd 250MVA275/132Kv.
- Establish a spare 275kV feeder bay at Merensky MTS to create space for the proposed 2nd Merensky-Foskor 275kV line.
- Install and equip 1x 275kV feeder bay for the proposed 2nd Merensky-Foskor 275kV line at Foskor Substation.
- Construct the 2nd Foskor–Merensky 150km Kingbird 275kV line
- Equip and commission all new infrastructures with all associated primary and secondary plant equipment.
- Upgrade under-rated switchgear at Merensky Substation
- Install Capacitor Bank at Foskor Substation
- Extend Foskor Substation to accommodate all the work associated with the new power line.
- Relocation of Acornhoek-Foskor terminal tower to accommodate the new power line
- Relocation of the existing oil holding dam to accommodate the new power line

1.4 The receiving environment

According to the draft environmental scoping report (2012) the proposed 275kV Foskor Merensky power line stretches a distance of approximately 130 kilometres across various farms between Phalaborwa and Steelpoort in the jurisdiction of Greater Sekhukhune, Capricorn and Mopani District municipalities in the Limpopo Province of South Africa.

The lines will furthermore transverse various farms, predominantly game farms that are privately owned as well as tribal authorities and council owned land. The study area is situated in the Lowveld region of the Limpopo Province between the Drakensberg escarpment and the Lebombo Mountains, on the eastern border of the province. The Lowveld area lies at approximately 360 metres above sea level.

The area is characterised by a flat to gentle undulating Bushveld landscape, densely covered with indigenous trees and shrubs. In the vicinity of Phalaborwa the monotony is broken by the appearance of unevenly spread conical shaped hills, rising 50 to 90 metres above the Bushveld landscape.

1.5 Route Options

The following route options and area description are considered as per the draft environmental scoping report (2012).

Alternative 1 (Green Route)

This line will loop out of the existing Foskor substation in Phalaborwa in a North Easterly direction along the secondary Road 530 towards Mica. It crosses the R40 and continues towards the same direction within the Phuza Moya Game Farm. It then passes within the Diphuti and Finale villages in Maruleng and then cross the R36 towards the Orchards. Shortly after that it crosses the R36 twice then continues in the mountainous areas that are prone to lightning. After the mountainous areas the line descends in a south westerly direction towards the low lying Burgersfort villages until it passes the R37 to Burgersfort town where it continues along the Secondary Road 555 to Steelpoort, which it eventually crosses and enters the substation. This line has approximately 15 bends and it crosses river sensitive zones approximately 7 times.

Alternative 2 (Blue Route)

The line loops out of the existing Foskor substation in Phalaborwa in a North Easterly direction; for approximately 5km, it bends westward for another 5km and then bends southward towards Hoedspruit following the existing 132kV line. Just before Hoedspruit town it crosses the R40 and bends westwards and moves between the existing 275kV and secondary road 527 on the eastern side of Diphuti and Finale villages. It then cross the secondary road 531 and head for the mountainous area that are lightning prone. After the mountainous areas the line descends towards the low lying Burgersfort villages until it passes the R37 to Burgersfort town where it continues along the Secondary Road 555 to Steelpoort, which it eventually crosses and enters the substation.

Alternative 3 (Pink Route)

This line will loop out of the existing Foskor substation in Phalaborwa in a North Easterly direction along the secondary Road 530 towards Mica. It crosses the R40 and continues towards the same direction within the Phuza Moya Game Farm. It then passes within the Diphuti and Finale villages in Maruleng and then cross the R36 towards the Orchards. Shortly after that it crosses the R36 twice then continues in a southerly direction along the R36 in the mountainous areas that are lightning prone. After the mountainous areas the line descends in a southerly direction towards Orighstad along a river and bends westwards along the secondary road 555 pass Kromkloof and Burgersfort until it enters the Merensky substation in Steelpoort. This line has approximately 26 bends and it crosses river sensitive zones approximately 6 times and stretches a long distance along river sensitive zones.

Alternative 4 (Yellow Route)

This line will loop out of the existing Foskor substation in Phalaborwa in a Northerly direction and bends towards a North-westerly direction along the secondary road 530 it passes the R40 15km before Mica and transverses villages and farmlands until it crosses the R36, it continues in the mountainous areas towards Penge a class 2 town in the western side of the study area. From Penge it bends southwards passing the R37 to Burgersfort and enters the Merensky substation on the Western side. This route stretches for a long distance in mountainous areas, and crosses river sensitive zones 4 times.

Public Alternative (Red Route)

This line will loop out of the existing Foskor substation in Phalaborwa in a south westerly direction along the secondary Road 530 towards Mica. It crosses the R40 and continues in the same direction linking up with alternative 1.

2. APPROACH AND METHODOLOGY

The assessment should be undertaken in two phases, a desktop study as part of the Scoping phase and an Archaeological Impact Assessment (walk down) as part of the Environmental Impact Assessment phase. This report concerns the scoping phase. The aim of the scoping phase is to cover archaeological data available to compile a background history of the study area. In order to try and identify possible heritage issues or fatal flaws that should be avoided during development.

This was accomplished by means of the following phases:

2.1 Literature search

Utilising data for information gathering stored in the archaeological database at Wits and published articles on the archaeology and history of the area. The aim of this is to extract data and information on the area in question, looking at archaeological sites, historical sites and known graves.

2.2 Information collection

The SAHRA report mapping project (Version 1.0) was consulted to further collect data from CRM practitioners who undertook work in the area to provide the most comprehensive account of the history of the area where possible.

2.3 Consultation

Consultation with CRM practitioners who worked in the area was conducted as well as the curator of the Lydenburg Museum.

2.4 Google Earth and mapping survey

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where archaeological sites might be located.

2.5 Genealogical Society of South Africa

The database of the genealogical society was consulted to collect data on any known graves in the area.

3. LEGISLATION

For this project the National Heritage Resources Act, 1999 (Act No. 25 of 1999) is of importance and the following sites and features are protected:

- a. Archaeological artefacts, structures and sites older than 100 years
- b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography
- c. Objects of decorative and visual arts
- d. Military objects, structures and sites older than 75 years
- e. Historical objects, structures and sites older than 60 years
- f. Proclaimed heritage sites
- g. Grave yards and graves older than 60 years
- h. Meteorites and fossils
- i. Objects, structures and sites of scientific or technological value.

The national estate that includes the following:

- 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 features of cultural significance
- e. Geological sites of scientific or cultural importance
- f. Archaeological and palaeontological importance
- g. Graves and burial grounds
- h. Sites of significance relating to the history of slavery
- i. Movable objects (e.g. archaeological, palaeontological, meteorites, geological specimens, military, ethnographic, books etc.)

Section 34 (1) of the act deals with structures which is older than 60 years. Section 35(4) of this act deals with archaeology, palaeontology and meteorites. Section 36(3) of the National Heritage Resources Act, deals with human remains older than 60 years. Unidentified/unknown graves are also handled as older than 60 until proven otherwise.

3.1 Heritage Site Significance and Mitigation Measures

The presence and distribution of heritage resources define a Heritage Landscape. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface.

This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. National and Provincial Monuments are recognised for conservation purposes. The following interrelated criteria were used to establish site significance:

- » The unique nature of a site;
- » The integrity of the archaeological/cultural heritage deposit;
- » The wider historic, archaeological and geographic context of the site;
- » The location of the site in relation to other similar sites or features;
- » The depth of the archaeological deposit (when it can be determined or is known);
- » The preservation condition of the site;
- » Potential to answer present research questions.

The criteria above will be used to place identified sites with in SAHRA's system of grading of places and objects which form part of the national estate, and which distinguishes between the following categories—

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
National Significance (NS)	Grade 1	-	Conservation; National Site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; Provincial Site nomination
Local Significance (LS)	Grade 3A	High Significance	Conservation; Mitigation not advised
Local Significance (LS)	Grade 3B	High Significance	Mitigation (Part of site should be retained)
Generally Protected A (GP.A)	-	High / Medium Significance	Mitigation before destruction

Generally Protected B (GP.B)	-	Medium Significance	Recording before destruction
Generally Protected C (GP.C)	-	Low Significance	Destruction

Sites with no significance do not require mitigation; low to medium sites may require limited mitigation; while high significance requires extensive mitigation. Outstanding sites should not be disturbed at all. Recognizable graves and living heritage sites have high social value regardless of their archaeological significance.

4. REGIONAL OVERVIEW

4.1 General Information

4.1.1. Literature search

No previously recorded sites exist in close proximity to the proposed power line (figure 2) with the Archaeological databases at Wits University (referenced 2009).

4.1.2. Information collection

Several previous CRM studies were conducted in the immediate vicinity of the proposed route alignments (SAHRA report mapping project V1.0) and is summarised in table 1. It is important to note that these surveys covered in most cases only small portions of the proposed routes. These surveys identified sites dating to the following time periods: MSA, EIA, LIA, Historical or recent past and graves.

Table 1: Previous studies that covered small portions of the proposed routes

Consultant	Date	Portion of:
Birkholtz	2005	Route 3
Coetzee	2008	Route 2
Fourie	2008	Route 4
Gaigher	2007	Route 3
Huffman & Calabrese	1997	Route 2
Murimbika	2006	Route 4 and Route 2
Pistorius	2005	Route 1
Pistorius	2003	Route 2
Pelser & van Vollenhoven	2008	Route 1
Roodt	2002	Route 1
Roodt	2007	Route 1
van Schalkwyk	2000	Route 4
van Schalkwyk	2001	Route 4

4.1 3. Consultation

The author consulted with the following people regarding known heritage sites in the study area.

1. Mr J.P Cilliers, Curator of the Lydenburg museum (Personal communication February 2012).
2. Doctor A. van Vollenhoven, Private consultant (E –mail correspondence: reports on the area. March 2012).
3. Mr A Pelser, Private consultant (Personal communication February 2012).
4. Professor T. Huffman. University of the Witwatersrand (Personal communication March 2012).
5. Mr. P Birkholtz, Private consultant (E –mail correspondence: reports on the area. March 2012).

4.1.4. Google Earth and mapping survey

Google Earth and 1:50 000 maps of the area was utilised to identify possible places where archaeological sites might be located and are discussed under Section 7.2.

4.1.5. Genealogical Society of South Africa

No grave sites are indicated within the study area although one grave site is located on the farm Doornbosch 294. This site is located approximately 750 meter from Route 1 and consists of at least three graves, co-ordinates available on request.

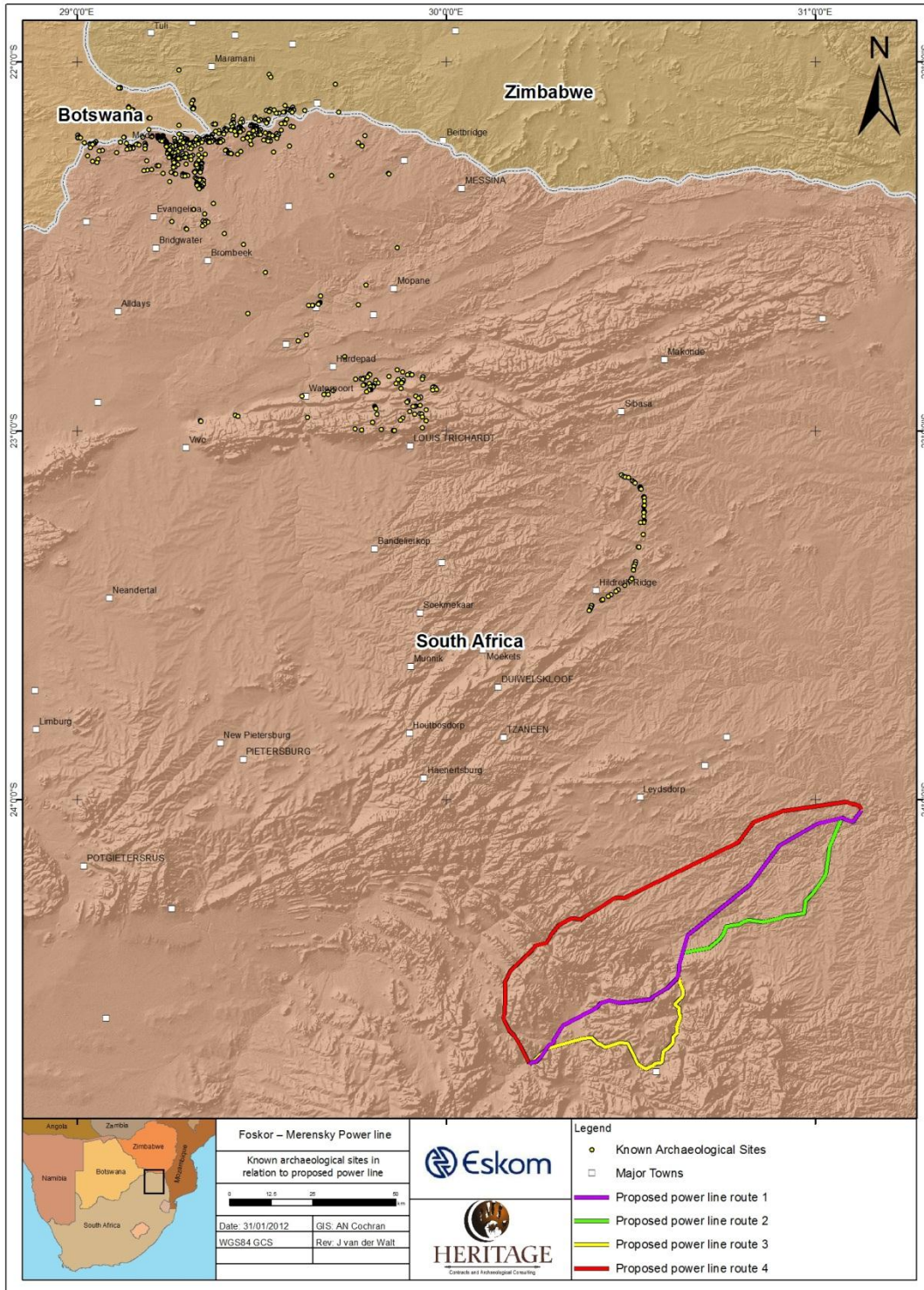


Figure 2: Known sites from the Wits archaeological database in reference to the proposed project

5. ARCHAEOLOGICAL BACKGROUND:

The proposed alignments traverse a vast area with a variety of heritage resources. It will therefore not be possible to give a detailed background of the entire area. However for the purposes of this scoping report a broad background of the archaeology that can be expected in the area will be provided.

The archaeology of the area can be divided into the Stone Age, Iron Age and Historical timeframe. These are described below.

6. STONE AGE

6.1 Introduction

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For Cultural Resources Management (CRM) purposes it is often only expected/ possible to identify the presence of the three main phases. Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable. Such finer-grained identifications may help to highlight the importance of some archaeological sites in a specific region. Table 1 provides a brief overview of the Stone Age phases and sub-phases/industrial complexes of South Africa, based on our current knowledge. The information is aimed at assisting the identification of Stone Age occurrences in the field by providing the main associated characteristics, and it provides the broadly associated age estimates. Users of this document should, however, remember that the outlines are broad, and any field interpretations can only be considered preliminary observations until further research is conducted (Lombaard 2011).

Table 1. *Outline of the Stone Age cultural sequence of South Africa. The information presented here provides a basic, simplified interpretation for the Stone Age sequence. Details may vary from region to region and from site to site. Most of the criteria such as dating, transitional phases, technological phenomena and recursions are currently being researched, so that the information cannot be considered static or final (Lombaard 2011)*

Cultural sequence	~ Associated ages	Associated characteristics
Later Stone Age; associated with Khoi and San societies and their immediate predecessors		
See sub-phases below for more detailed chronology	Recently to ~30 thousand years ago	<p>Include stone tools mostly < 25 mm, bored stones, grinding stones, grooved stones, ostrich eggshell beads, bone tools sometimes with decoration, decorated ostrich eggshell flasks and fishing equipment</p> <p>These are the general characteristics for the Later Stone Age. In the sub-divisions below I highlight differences or characteristics that may be used to refine interpretations depending on context.</p>
Broad overview of Later Stone Age sub-phases/industrial complexes		
Hunters-with-livestock/herders (e.g. Mitchell 2002; Lombard & Parsons 2008; Sadr 2008)	Mostly less than 2 thousand years ago	<p>Regular occurrence of blades and bladelets, but formal stone tools are rare, backed pieces mostly absent, grindstones are common, stone bowls and boat-shaped grinding grooves may occur</p> <p>Sheep, goat, cattle and dog bones along with wild species</p> <p>Pottery is mostly well-fired, thin-walled, sometimes with lugs, spouts and coned bases, sometimes with comb-stamping</p>
Post-Wilton (includes some Smithfield phases) (e.g. Deacon & Deacon 1999; Lombard &	~1 hundred -3 thousand years ago	<p>Mostly macrolithic (stone tools > 20 mm) and informal sometimes with blades and bladelets</p> <p>Characterised by large untrimmed flakes</p> <p>At some sites there are also small backed tools, scrapers and adzes</p>

Parsons 2008)		Sometimes includes thick-walled, grass-tempered potsherds
Wilton (includes some Smithfield phases) (e.g. Deacon & Deacon 1999; Wadley 2007)	~4-8 thousand years ago	Microlithic (stone tools < 20 mm) High incidence of backed bladelets and geometric shapes such as segments Include borers, small scrapers, double scrapers, polished bone tools
Oakhurst (includes Albany and Lockshoek) (e.g. Deacon & Deacon 1999; Wadley 2007)	~8-12 thousand years ago	Characterised by round, end and D-shaped scrapers, adzes and a wide range of polished bone tools Few or no microliths
Robberg (Deacon & Deacon 1999; Wadley 2007)	~12-22 thousand years ago	Characterised by few backed tools, few scrapers, significant numbers of unretouched bladelets
Early Later Stone Age	~30-40 thousand years ago	Described at some sites, but as yet unclear whether this represents a real archaeological phase or a mixture of LSA/MSA artefacts
Middle Stone Age; associated with <i>Homo sapiens</i> and archaic modern humans		
See sub-phases below for more detailed chronology	~30-300 thousand years ago	Mostly based on prepared core techniques, and the production of triangular flakes with convergent dorsal scars and faceted striking platforms Most pieces are in the region of 40-100 mm Often includes the deliberate manufacture of parallel-sided blades and flake-blades Sometimes produced using the Levallois technique Occasionally includes marine shell beads, bone points,

		<p>engraved ochre nodules and engraved ostrich eggshell fragments</p> <p>These are the general characteristics for the Middle Stone Age. In the sub-divisions below I highlight differences or characteristics that may be used to refine interpretations depending on context</p>
<i>Broad overview of Middle Stone Age sub-phases/industrial complexes</i>		
Final Middle Stone Age (informal designation partly based on the Sibudu sequence) (Jacobs et al. 2008; Wadley, 2005, 2010)	~30-40 thousand years ago	<p>Could include bifacially retouched, hollow-based points</p> <p>Small bifacial and unifacial points</p> <p>Could include backed geometric shapes such as segments, as well as side scrapers</p>
Late Middle Stone Age (informal designation partly based on the Sibudu sequence) (Jacobs et al. 2008; Wadley 2010)	~45-50 thousand years ago	<p>Most formal retouch aimed at producing unifacial points</p> <p>Sometimes includes bifacially retouched points</p>
Post-Howieson's Poort (also referred to as MSA III at Klasies River or MSA 3 generally) (e.g. Soriano et al. 2007; Jacobs et al. 2008:734)	~47-58 thousand years ago	<p>Most points are produced using Levallois technique, and many are unifacially retouched</p> <p>Some side scrapers are present</p> <p>Backed pieces are rare</p>
Howieson's Poort Industry (e.g. Jacobs et al. 2008:734)	~58-66 thousand years ago	<p>Characterized by blade technology and the presence of small (< 4 cm) backed tools (made on blades), including segments, trapezes and backed blades.</p>
Still Bay Industry (e.g. Jacobs et al. 2008; Lombard et al. 2010; Henshilwood & Dubreuil	~70-77 thousand years ago	<p>Characterised by thin (< 10 mm), bifacially worked foliate or lanceolate points with either a semicircular or wide-angled pointed butt</p>

2011)		Could include finely serrated points
Mossel Bay Industry (also referred to as MSA II at Klasies River or MSA 2b generally) (e.g. Wurz 2010, in press)	~85-105 thousand years ago	Characterised by a unipolar Levallois-type point reduction Products have straight profiles, percussion bulbs are prominent and often splintered or ring-cracked Formal retouch is infrequent, restricted to sharpening the tip or shaping the butt
Klasies River sub-stage (also referred to as MSA I at Klasies river or MSA 2a generally) (e.g. Wurz 2010, in press)	~105-115 thousand years ago	Mostly large blades, pointed flakes are elongated and thin, often with curved profiles Platforms are often diffuse and lack clear percussion marks Low frequencies of retouch, few denticulated pieces
MSA 1 (tentative, informal designation) (Volman 1984; Thompson et al. 2010)	Suggested age OIS 6 (~130-195 thousand years ago)	Platforms are mostly plain Very little formal retouch Flakes are mostly short and broad, few have denticulate retouch Rare scraper retouch
Sangoan Sometimes observed between MSA and ESA deposits, some researcher place this phase under the Middle Stone Age, others under the Earlier Stone Age, the designation is thus not yet clear (e.g. Kuman et al. 2005)	> 200 thousand years ago, but few sites in southern Africa have been dated	Contains small bifaces (< 100 mm), picks, heavy- and light-duty denticulated and notched scrapers

Earlier Stone Age; associated with early <i>Homo</i> groups such as <i>Homo habilis</i> and <i>Homo erectus</i>		
Fauresmith (e.g. Porat et al. 2010)	~400-600 thousand years ago	Generally includes small handaxes, long blades and convergent/pointed pieces
Acheulean (e.g. Kuman 2007; Mitchell 2002)	~300 thousand- 1.5 million years ago	Bifacially worked handaxes and cleavers, large flakes > 10 cm Some flakes with deliberate retouch, sometimes classified as scrapers Give impression of being deliberately shaped, but could indicate result of knapping strategy Sometimes shows core preparation Mostly found in disturbed open-air locations
Oldowan (e.g. Kuman 2007; d'Errico & Backwell 2009; Mitchell 2002)	~1.5 -> 2 million years ago	Cobble, core or flake tools with little retouch and no flaking to predetermined patterns Hammerstones, manuports, cores Polished bone fragments/tools

Various Stone Age sites have previously been identified within the larger geographical setting of the study area. Close to Ohrigstad sites from the Middle and Late Stone Age are known and Middle Stone Age sites are also known from the Polokwane area (Bergh 1999: 4). It includes the well-known site known as Boesmanrotsskuiling (Korsman & Meyer 1999: 94). Rock art are found in abundance in the Steelpoort valley including rock engravings close to the Steelpoort and Olifants River (Bergh 1999: 5).

Earlier Stone Age: Acheulian artefacts are usually found near the raw material from where they were quarried, at butchering sites, or as isolated finds. No Acheulian sites are on record near the project area, but isolated finds are possible. However, isolated finds have little value. Therefore, the project is unlikely to disturb a significant site. The presence and significance of finds will be determined by a field investigation.

Middle Stone Age: During the Middle Stone Age, significant changes start to occur in the evolution of the human species. These changes manifest themselves in the complexity of the stone tools created, as seen in the diversity of tools, the standardisation of these tools over a wide spread area, the introduction

of blade technology, and the development of ornaments and art. What these concepts ultimately attest to is an increase or development of abstract thinking. The repeated use of caves during this period indicates that MSA people had developed the concept of a home base and that they could make fire. These were two important steps in cultural evolution (Deacon & Deacon, 1999). Accordingly, if there are caves in the study area, they may be sites of archaeological significance.

MSA artefacts are common throughout southern Africa, but unless they occur in undisturbed deposits, they have little significance. Several MSA sites are on record close to the study area.

Later Stone Age: By the Late Stone Age, human beings are anatomically and culturally modern. Tools associated with this time period are specialised, and commonly associated with hunter-gatherer groups. It is also within this period that contacts with migrating groups occur throughout southern Africa. Initial contact was between hunter-gatherer groups and expanding Bantu farming societies, and secondly with the arrival of colonist along the coast.

San rock art has a well-earned reputation for aesthetic appeal and symbolic complexity (Lewis-Williams, 1981). Several rock art sites are on record to the south and east of the general project area.

In addition to art, LSA sites contain diagnostic artefacts, including microlithic scrapers and segments made from very fine-grained rock (Wadley, 1987). Spear hunting probably continued, but LSA people also hunted small game with bows and poisoned arrows. Sites in the open are usually poorly preserved and therefore have less value than sites in caves or rock shelters. If there are rock shelters or caves in the study area, they may contain LSA sites of significance.

Iron Age (general)

The Iron Age as a whole represents the spread of Bantu speaking people and includes both the pre-Historic and Historic periods. It can be divided into three distinct periods:

The Early Iron Age: Most of the first millennium AD.

The Middle Iron Age: 10th to 13th centuries AD

The Late Iron Age: 14th century to colonial period.

The Iron Age is characterised by the ability of these early people to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living.

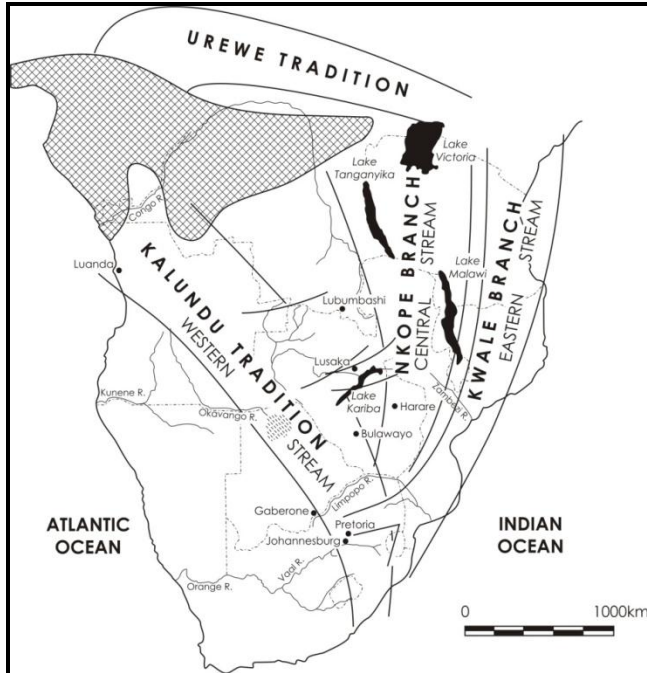


Figure 3: Movement of Bantu speaking farmers (adapted from Huffman 2007)

Early Iron Age

Early in the first millennium AD, there seem to be a significant change in the archaeological record of the greater part of eastern and southern Africa lying between the equator and Natal. This change is marked by the appearance of a characteristic ceramic style that belongs to a single stylistic tradition. These Early Iron Age people practised a mixed farming economy and had the technology to work metals like iron and copper. A meaningful interpretation of the Early Iron Age has been hampered by the uneven distribution of research conducted so far; this can be partly attributed to the poor preservation of these early sites.

Sites belonging to the EIA dating to between AD 450 and 700 were found in the area on the farm Harmony which the proposed power line will travers. The site covers an area of 8km² there is a central village, soapstone-bowl factory, salt factory and copper mine. The village has remains of hut floors, querns, pottery, copper ore and slag, soapstone bowls and animal food waste, incl. cattle (Evers 1975).

Pottery resembles that described by Van der Merwe (Van der Merwe and Scully 1971) for the Phalaborwa area and by Mason (1968b) for Nareng and the Venda village, Tshimbupfe. The site is on a rise about 1km north of the Makhutswi River. A salt factory is situated on both banks of the Makhutswi River near a mineral spring

Early Iron sites are recorded throughout the study area marked by Mzonjani, Happy Rest and Doornkop ceramics.

Mzonjani is the second phase of the Kwale branch of the Urewe Tradition. Mzonjani merged with Happy Rest of the Kalundu Tradition to produce Doornkop (Huffman 2007).

Early Iron Age sites can be expected in river valleys and floodplains.

Middle Iron Age

At about AD 1300, the first Sotho/Tswana speaking people, producing Icon pottery of the Urewe Tradition moved into southern Africa. Around the study area they interacted with earlier people in the area producing Eiland Pottery.

Late Iron Age

The Late Iron Age is very well represented around the surveyed area (Bergh 1999). It is also known that copper has been mined close to the study area (Bergh 1999). The early trade routes used by the indigenous tribes also went past the Steelpoort and Olifants River (Bergh 1999).

According to Bergh (1999) a number of Black farmers and agriculturists were settled in the wider region during the start of the nineteenth century. These groups were the Pedi, Roka, Koni and Tau. As confirmation of this, Schoeman (1997) indicates that when the BaPedi settled in the Sekhukhuneland region during the second half of the 17th century (Schoeman, 1997), a number of groups such as the Kwena, Roka, Koni and Tau had preceded them here.

The Kwena of Mongatane was the first of these groups to settle in this wider area. Upon reaching the Olifants River, they split up into two groups. The first of these was under the leadership of Masabela, who established the first permanent Sotho settlement in Sekhukhuneland. The second group under Kope decided to proceed upstream, and subsequently established themselves near present-day Groblersdal. It was this second group under Kope that later became known as the BaKopa.

With time the Phasa, related to the group of Masabela, also moved into the Sekhukhuneland region. Although both these groups referred to themselves as the Roka, other groups of a similar name were also found here. After the settlement of the Roka, and by approximately 1700, various Koni and Tau groups also moved into the area.

Khumalo Ndebele

The Khumalo Ndebele of Mzilikazi was a Northern-Nguni group, who during 1821, moved from KwaZulu-Natal to the confluence of the Vaal and Olifants Rivers where they settled down for a while. Of more importance for the present study is the period following on their settlement at the Vaal and Olifants confluence, during which they moved further north and fought with the Ndzundza-Ndebele of Magodongo who resided near present-day Stoffberg. The Ndzundza-Ndebele were defeated, and Mzilikazi and his followers settled down temporarily in these parts (Bergh, 1999).

During their short residence in the area, the Khumalo-Ndebele attacked the Koni of Makopole in the vicinity of present-day Lydenburg, before attacking the BaPedi of Maroteng during 1822.

Mzilikazi then turned his attention to the areas between the Olifants and Steelpoort Rivers, which were the heartland of the BaPedi. In the ensuing military activities, the Pedi paramount leader Phetedi as well as most of his brothers was killed. However, Sekwati, one of his brothers, managed to escape northwards.

It is worth noting that Delius (1983) is of the opinion that before the defeat of the BaPedi at the hands of the Khumalo-Ndebele, they were weakened by attacks from the Ndwandwe of Zwide.

Sekwati returned to the area in 1828 and settled at Phiring, from where he started to rebuild the Maroteng kingdom.

According to Smith (1969) the Khumalo-Ndebele stayed here for approximately a year, and during this time raided or destroyed much of the grain and livestock.

BaPedi

As mentioned before, the BaPedi settled in the Sekhukhuneland region during the second half of the 17th century (Schoeman, 1997).

During the later stages of the 1700s and early period of the 1800s the Morateng group of the BaPedi became the most dominant force in the area, subjecting many of the other communities and groups. The BaPedi reached their zenith during the rule of Thulare (ca. 1790 – ca. 1820).

Although the heartland of the BaPedi kingdom was the area between the Olifants and Steelpoort Rivers, their influence stretched much further than that. For example, the winter pasture of Sekwati was located in the areas directly to the east of the Steelpoort River.

After Sekwati's return to the area in 1828, he settled at Phiring, from where he started to rebuild the Maroteng kingdom.

Evidence for Iron Age activity will most likely be concentrated along water courses and rocky outcrops marked by ceramic clusters or dry stone walling.

Historic Timeframe

The historic timeframe sometimes intermingles with the later parts of the Stone and Iron Age, and can loosely be regarded as times when written and oral accounts of incidents became available. Therefore the accounts of early travellers are a valuable source of information.

During the brief desktop study evidence of some of these early travellers was found that closely visited the surrounding area namely Robert Scoon in 1836 (Bergh 1999). He passed through an area to the southwest of the surveyed area. The Voortrekkers under Louis Trichard also moved through this area in 1837 (Bergh 1999). The first white farmers only settled here after land had been traded from Sekwati in 1845 and the Swazi in 1846 (Bergh 1999). The following summary is taken from Birkholtz 2005.

Ohrigstad

In an effort to get further away from British influence, and at the same time closer to the market at Delagoa Bay, the voortrekker leader Andries Hendrik Potgieter together with a large following, moved from areas only recently established after the Great Trek of 1838 such as Potchefstroom, Pretoria and the Magaliesberg to the vicinity of Ohrigstad (Botha, 1958).

Although this movement did not take place all at the same time, by July 1845 most of the Voortrekkers had already reached the area where Ohrigstad was to be established. It is estimated that by August 1845 there were already a thousand voortrekker individuals resident in the area (Botha, 1958).

Attention focussed now on the establishment of a town. The name of the town was to be Andries-Ohrigstad (“Andries” as recognition for their leader and “Ohrig” for a Dutch trader by the name of George Gerhardus Ohrig. With time the town became known only as Ohrigstad (Botha, 1958).

On 30 July 1845 a meeting was held at Ohrigstad aimed at reorganising the Voortrekker government and to establish a new Volksraad (Botha, 1958).

As the town established the surrounding countryside was also increasingly settled. During the period between August 1845 and December 1847 a total of 406 individual farms were proclaimed in the area. This includes 95 farms proclaimed during the period 4 August 1845 to 10 August 1846 all along the Spekboom River from its source to its confluence with the Steelpoort River (Botha, 1958).

Three main factors led to the decline of the town of Ohrigstad. First of these was the discord which erupted between Potgieter (and his followers) and the *Volksraad*. In the end Potgieter, with his followers, moved to the Soutpansberg. The second factor was that the promise of good trade relations with the Portuguese (and Dutch) via Delagoa Bay proved unsuccessful. The third factor was the negative impact of Malaria. Especially during the summer of 1848 to 1849 many residents became ill and many died. On many of the farms which used to be resided in by the voortrekkers during this time, graves from this period can still be seen.

For example, Botha (1958) indicates that a voortrekker cemetery containing 46 graves is located near the confluence of the Spekboom en Steelpoort Rivers.

Fort Burger

After the unsuccessful attack on Sekhukhune’s capital during 1876, the decision was made to establish a number of fortifications in the area.

Captain von Schlickmann, a former Prussian officer and holder of the Iron Cross, commenced with the establishment of a volunteer force to man the different forts. His men were paid £5 a month, and at the end of their terms were to receive a farm (TAB, P69, 4331).

The first enlisted group consisting of 57 men from Pilgrimsrest were attacked at Kromkloof by a Pedi *impi*. The volunteers managed to repulse the attack. (TAB, P69, 4331). Although the exact location of Kromkloof is not certain, the sketch map on the farm inspection report shows a “Kromkloof” located on Aapiesdoorndraai, but to the north of the present study area.

While Von Schlickmann was still recruiting more men, a Pedi force under Umsotho captured 43 cattle and some horses in the vicinity of the fort. The commanding officers of the fort, Lieutenants Knapp and Robus, aided by some of their men, attacked the BaPedi force on foot. In the ensuing battle Lieutenant Knapp was killed and Lieutenant Robus wounded.

Although the Pedi force was repulsed, they subsequently moved around the fort and attacked it from Marone Mountain on its southern side. This attack on the fort was also eventually repulsed after its defenders used their 4-pounder Krupp canon against the attackers.

With time, Von Schlickmann arrived with reinforcements and assumed command of the fort (TAB, P69, 4331). He was killed during an attack on nearby kraals on 17 November 1876 (Smith, 1967).

On 14 November 1879, Fort Burger was attacked by a Pedi force of 5000 men. Although the attack was repulsed, 124 head of cattle were captured (SS, 1879, 371).

What is also relevant to the study area is the discovery of platinum near Steelpoort. Some sources attribute the discovery to Hans Merensky between 1924 and 1926. While other sources attribute the discovery to Frederic W. Blaine. Whatever the case may be, it can be expected to find historical mining or exploration in the study area dating after 1924.

Railway lines in the area should have been built between 1920 and 1930. For example the nearby railway line from Lydenburg to Burgersfort to Steelpoort, was built between 1920 and 1930 (TAB, P69, 4331).

7.1 Probability of Occurrence of Sites

Based on the above information, it is possible to determine the probability of finding archaeological and cultural heritage sites within the study area to a certain degree. For the purposes of this section of the report the following terms are used – low, medium and high probability. Low indicates that no known occurrences of sites have been found previously in the general study area, medium probability indicates some known occurrences in the general study area are documented and can therefore be expected in the study area and a high probability indicates that occurrences have been documented close to or in the study area and that the environment of the study area has a high degree of probability having sites.

» Palaeontological landscape

Fossil remains. Such resources are typically found in specific geographical areas, e.g. the Karoo and are embedded in ancient rock and limestone/calcrete formations exposed by road cuttings and quarry excavation: *Unknown*.

» Archaeological And Cultural Heritage Landscape

NOTE: *Archaeology is the study of human material and remains (by definition) and is not restricted in any formal way as being below the ground surface.*

Archaeological remains dating to the following periods can be expected within the study area:

» Stone Age finds

ESA: Medium Probability

MSA: Medium - High Probability

LSA: Medium Probability

LSA –Herder: Low Probability

» Iron Age finds

EIA: Medium – High Probability

MIA: Medium Probability

LIA: Medium – High Probability

» Historical finds

Historical period: Medium -High Probability

Historical dumps: Medium -High Probability

Structural remains: Medium -High Probability

Cultural Landscape: Medium probability

» Living Heritage

For example rainmaking sites: *Medium Probability*

» Burial/Cemeteries

Burials over 100 years: *Low -Medium Probability*

Burials younger than 60 years: *High Probability*

Subsurface excavations including ground levelling, landscaping, and foundation preparation can expose any number of these.

7.2 Sites of Significance

The sites on record for the proposed power line are mostly derived from the 150: 000 maps for the area and from Google earth. For the purposes of this report some areas where shacks or informal settlements occur were also recorded since these sites are known to be associated with informal grave yards and unmarked graves in or near dwellings. Without field verification of the recorded sites it is not possible to determine if the sites still exist and the state of preservation and it is therefore not possible to assign heritage significance to the sites. The well-known EIA site of Harmony is located on the farm Harmony 140 KT that route option 1 traverses. Although the proposed power line may not impact directly on the name site, sites dating to this period are not found in isolation and it is assumed that more Iron Age sites will be found on the farm and the Harmony name site are therefore recorded here. Due to the lack of information regarding the precise location of the public alternative besides the fact that it runs within the extended buffer zone of alternative 1 the Public Alternative was assessed together with Alternative 1.

Site Number	Landscape	Type Site	Cultural Markers	Co ordinates	Farm Name
Route 1 and Public Alternative					
Site 1	B – Archaeological and Cultural Heritage	Possibly Historical	Doornbosch Farmhouse	24 24 41.1648 30 14 3.1850	Sterkfontein 318 KT
Site 2	B – Archaeological and Cultural Heritage	Possibly Historical	Furrows and farm house	24 39 10,8778 30 17 30,7863 24 36 26,2577 30 19 24,7131	Bothashoek 276KT
Site 3	B – Archaeological and Cultural Heritage	Possibly Historical/re cent	Structure of an unknown age	24 31 3,3189 30 35 8,9196	Chorlton 405 KT
Site 3	B – Archaeological and Cultural Heritage	Recent Past	Shacks	24 30 4.5686 30 36 25,2887	Nooitgedacht 227 KT
Site 5	B – Archaeological and Cultural	Historical	Old Wagon Road	24 28 12,2093	Nooitgedacht 227 KT

	Heritage			30 37 47,5518	
Site 6	B – Archaeological and Cultural Heritage	Recent	Shacks	24 27 43,7433 30 37 51,1884	Nooitgedacht 227 KT
Site 7	B – Archaeological and Cultural Heritage	Possibly Historical and Recent Past	Settlement – kraal and shacks	24 22 1,2524 30 39 14,2461	Dublin 218 KT
Site 8	B – Archaeological and Cultural Heritage	Possibly Historical	Mines and kraal	24 05 16,7907 30 57 50,5754	Square 150 KT
Site 9	B – Archaeological and Cultural Heritage	Archaeo- logical	Ceramics		Harmony 140 KT

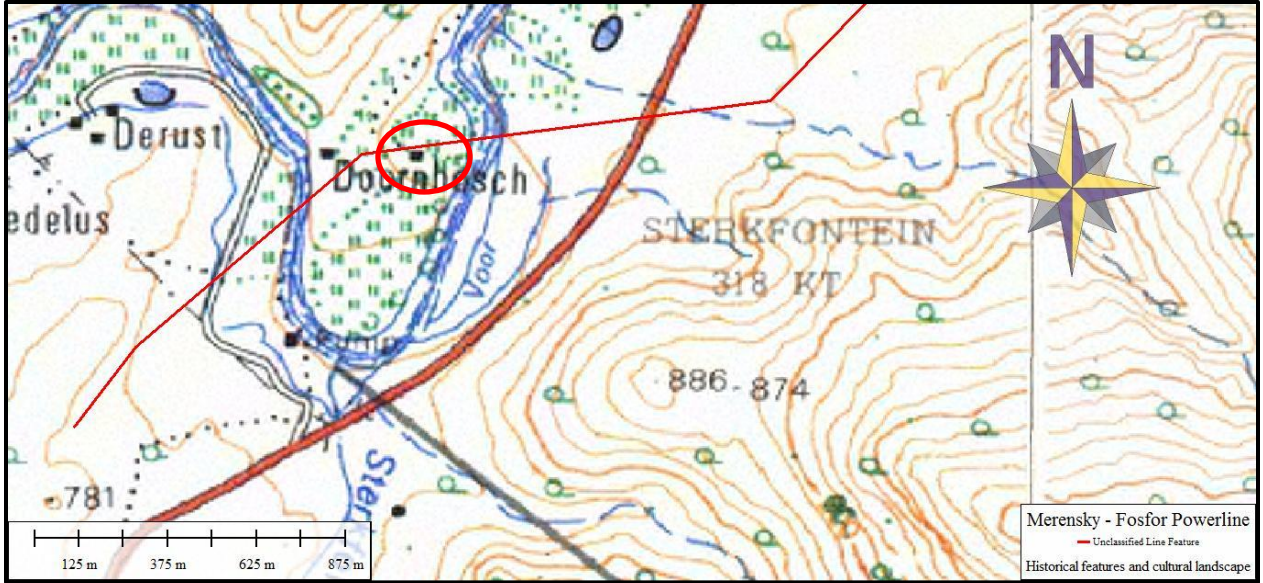


Figure 4: Proximity of site 1 to the proposed route option 1

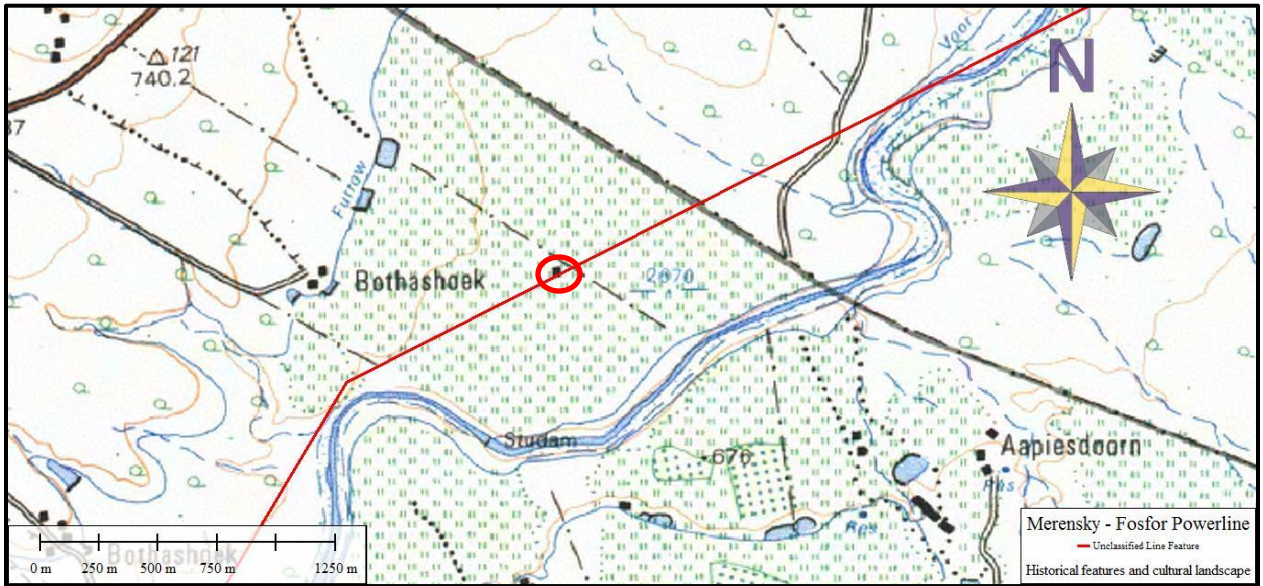


Figure 5: Proximity of site 2 to the proposed route option 1

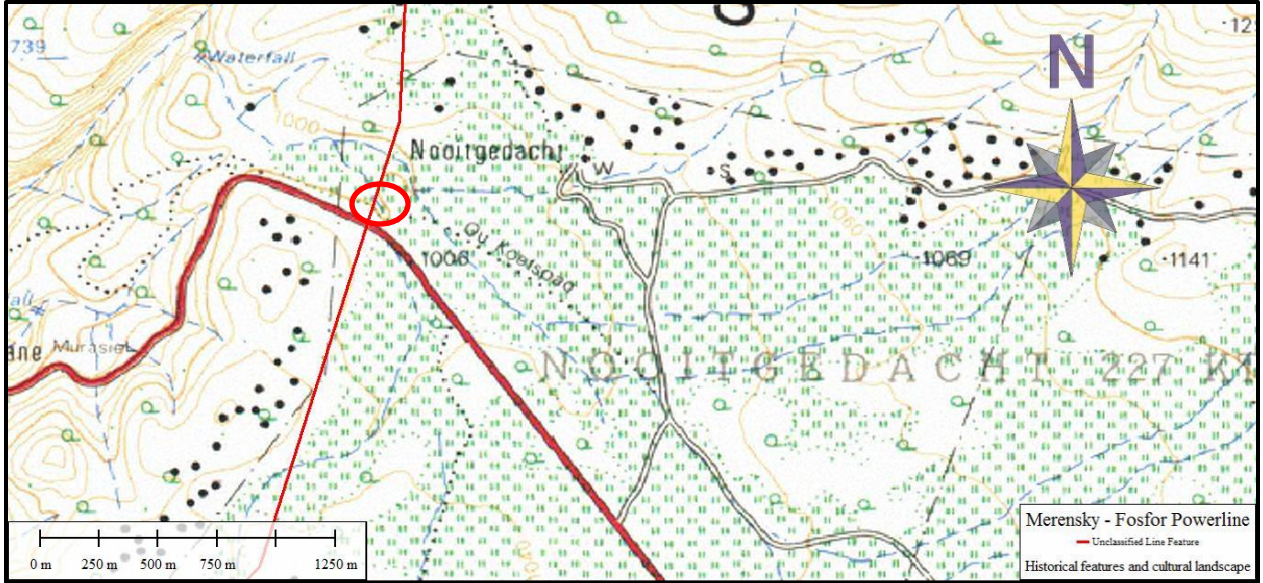


Figure 6: Proximity of site 2 to the proposed route option 1

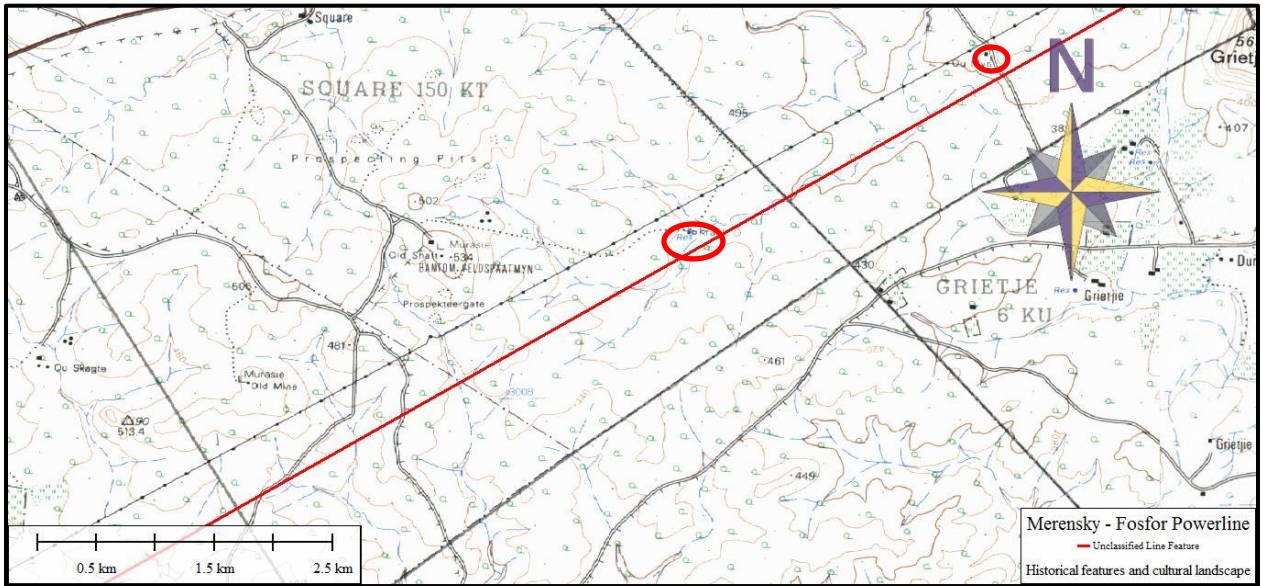


Figure 7: Proximity of site 8 to the proposed route option 1

Route 2					
Site 1	B – Archaeological and Cultural Heritage	Possibly Historical	Old Kraal	24 22 23,3505 30 44 45,3390	Portsmouth 215 KT
Site 2	B – Archaeological and Cultural Heritage	Recent	Houses/ shacks	24 19 36,0714 30 48 59,3869	Essex 204 KT
Site 3	B – Archaeological and Cultural Heritage	Possibly Historical	Railway line		Vienna 207 Kt Paris 206 KT Venice 40 KU Grootdraai 38 KK

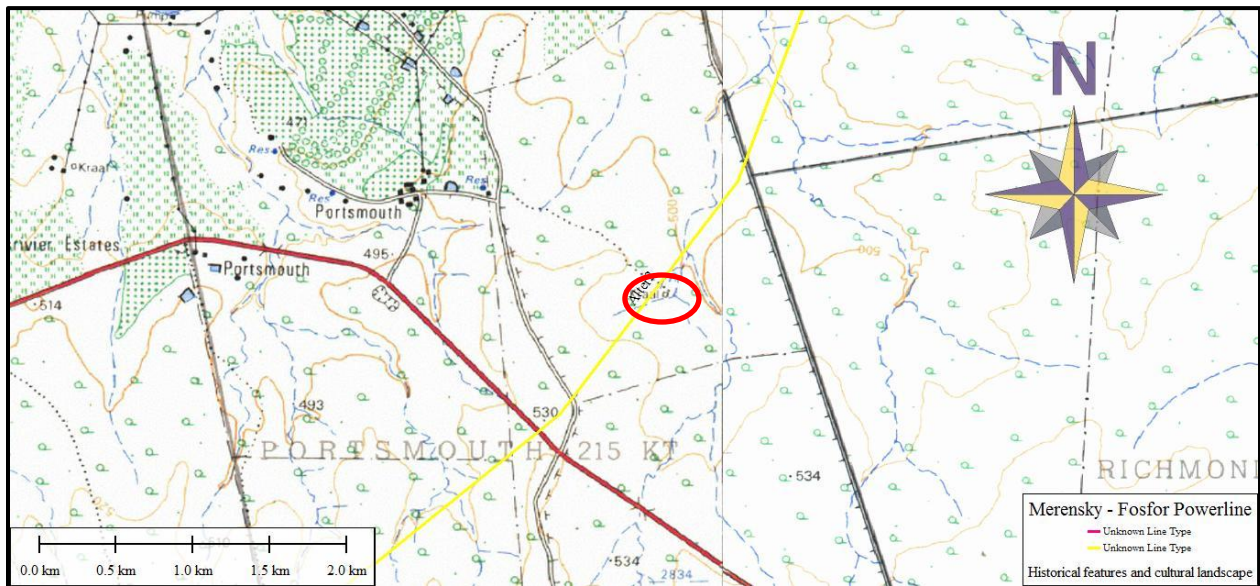


Figure 8: Proximity of site 1 to the proposed route option 2

Route 3					
Site 1	B – Archaeological and Cultural Heritage	Recent past	Shacks	24 39 37,8598 30 19 19,2879	Leeuvallei 297 KT
Site 2	B – Archaeological and Cultural Heritage	Possibly Historical	Apiesdoring stasie	24 38 59,5876 30 21 28,8016	Apiedoringdraai 298 KT
Site 3	B – Archaeological and Cultural Heritage	Historical	Old Voortrekker Road and house by Fort Faugh a Ballagh	24 39 32,5308 30 28 36,0939	Faugha Ballagh 306 KT
Site 4	B – Archaeological and Cultural Heritage	Historical	Voortrekker fort, houses on the line	24 43 5,5714 30 34 24,9847	Orighstad 443 KT
Site 5	B – Archaeological and Cultural Heritage	Possibly Historical	Dwellings	24 42 41,1466 30 13 55,0256	Sterkfontein 318 KT
Site 6	B – Archaeological and Cultural Heritage	Possibly Recent	Numerous dwellings	24 40 5,7162 30 36 16,4370	Strydfontein 442 KT
Site 7	B – Archaeological and Cultural Heritage	Unknown period	School and shop	24 37 44,7388 30 37 33,4659	Roodekrans 438 KT
Site 8	B – Archaeological and Cultural Heritage	Unknown Period	Houses	24 33 32,8204 30 37 29,4288	Klipfonteinhoek 407 KT

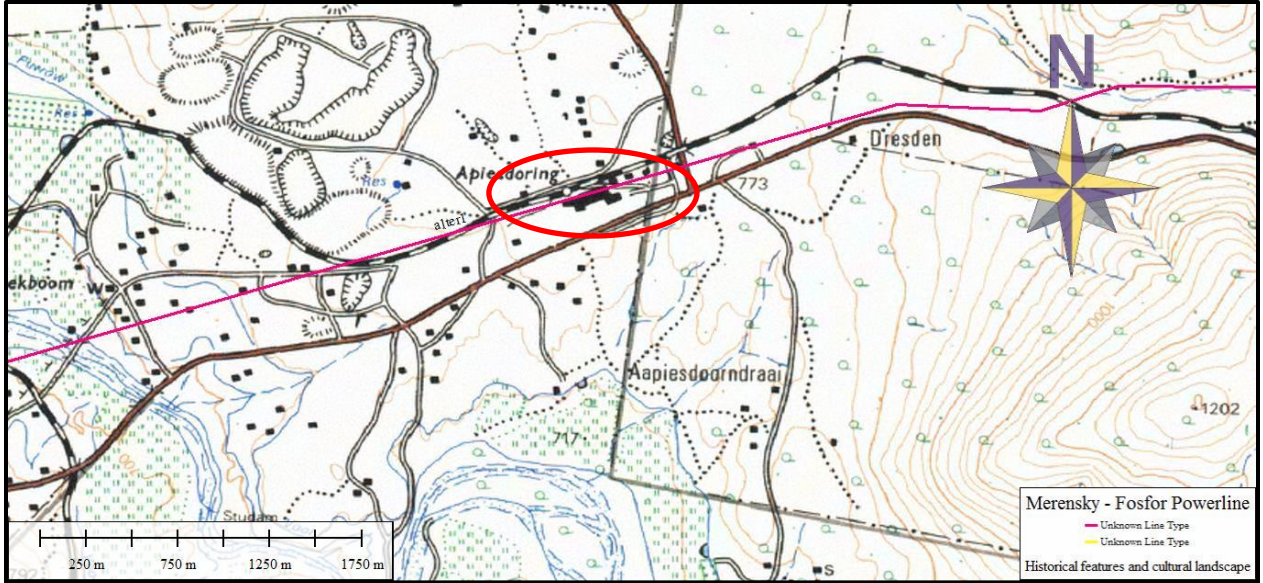


Figure 9: Proximity of site 2 to the proposed route option 3

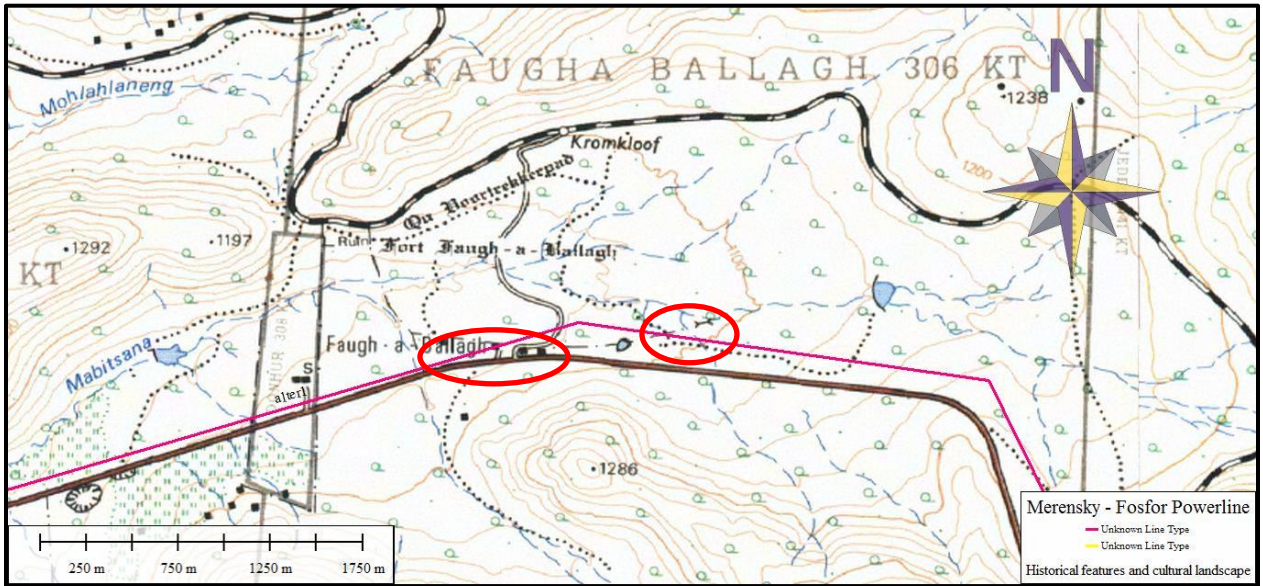


Figure 10: Proximity of site 3 to the proposed route option 3

Route 4					
Site 1	B – Archaeological and Cultural Heritage	Possibly recent	House/ shack	24 00 26,3482 31 04 30,0471	Chalk 3 KU
Site 2	B – Archaeological and Cultural Heritage	Possibly Historic	Old Mines	24 07 31,5968 30 46 15,5475	Lamula 162 KT
Site 3	B – Archaeological and Cultural Heritage	Possibly Historic	House and ruin	24 08 17,7443 30 44 39,1281	Manantji 166 KT
Site 4	B – Archaeological and Cultural Heritage	Recent	Many shacks	24 23 18,5407 30 16 17,0885 And also 24 24 41,0197 30 13 40,3663	Penge
Site 5	B – Archaeological and Cultural Heritage	Recent	Shacks	24 25 10,8946 30 13 10,1684	Wimbledon 122 KT
Site 6	B – Archaeological and Cultural Heritage	Possibly Recent	Shop	24 27 46,5404 30 10 31,3737	Shelter 121 KT
Site 7	B – Archaeological and Cultural Heritage	Recent	Shacks	24 41 48,7623 30 12 59,0079	Doornbosch 294 KT

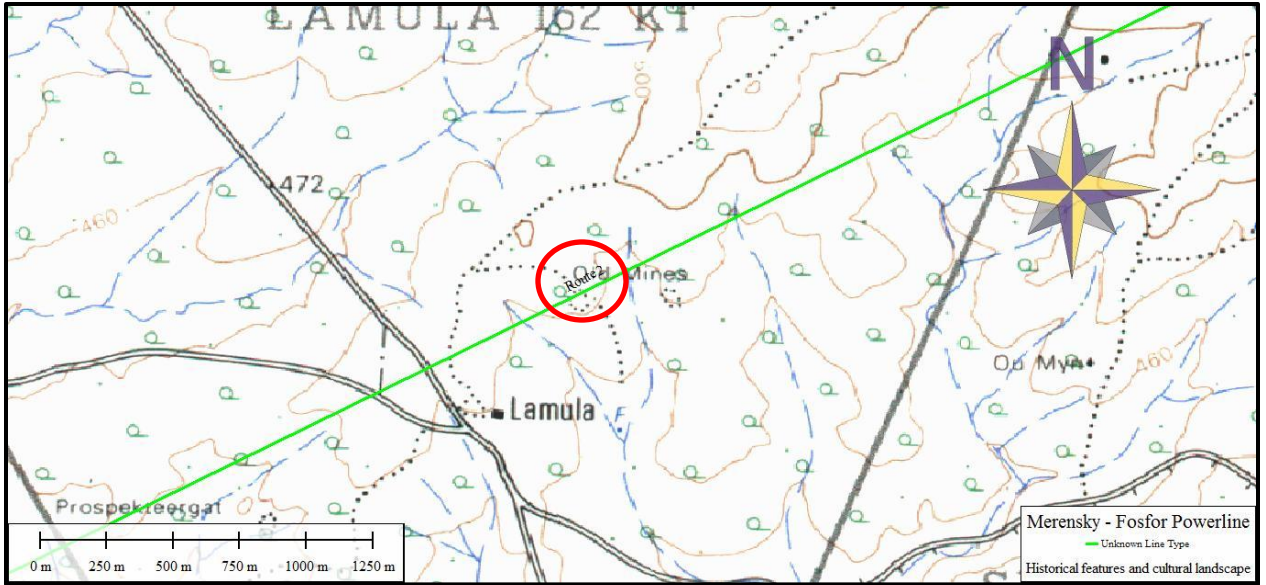


Figure 11: Proximity of site 2 to the proposed route option 4

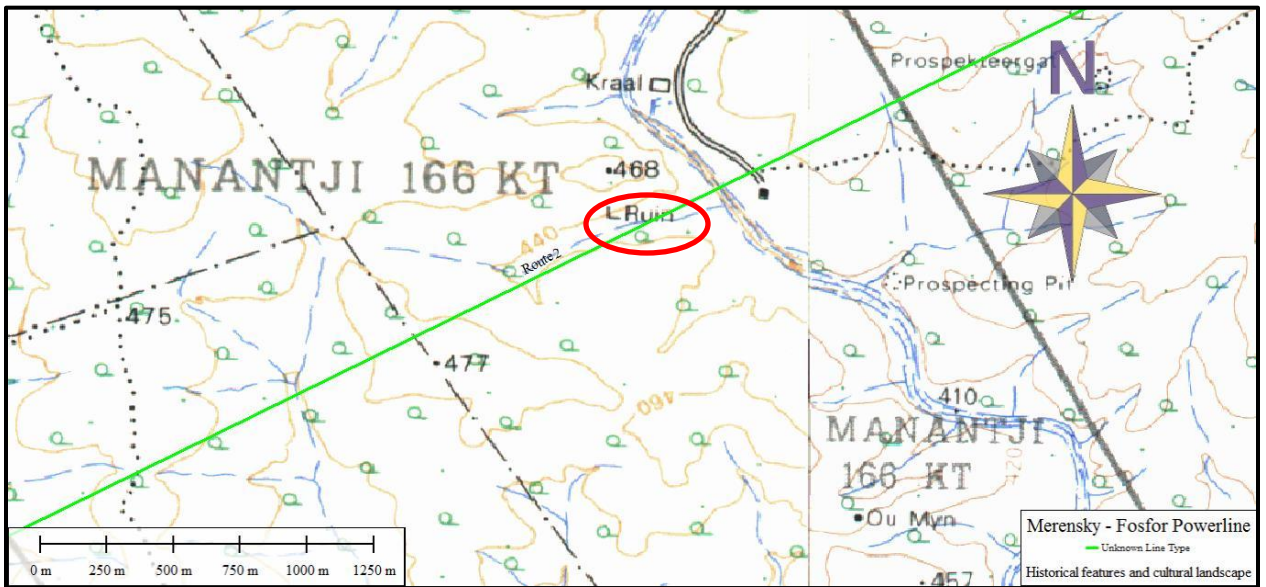


Figure 12: Proximity of site 3 to the proposed route option 4

8. ASSUMPTIONS AND LIMITATIONS

The study area was not subjected to field verification or survey of the proposed power lines as this must be done in the EIA or walk down phase. It is assumed that information obtained for the wider area is applicable to the study area. It is possible that some known sites have been omitted from this report.

Furthermore no shp files were available for the public alternative and this option was assessed at a very broad level.

9. FINDINGS

The heritage scoping study revealed that the following heritage sites, features and objects that can be expected within the study area.

9.1. Archaeology

9.1.1 Archaeological finds

There is a medium to high likelihood of finding Stone Age and Iron Age sites scattered over the study area. The area around the farm Harmony is well known in the literature for EIA sites. There is an increased likelihood of finding material near the foot hills, hill tops, erosion dongas and shelters if any occur within the study area.

9.1.2 Nature of Impact

The construction phase of the power line could directly impact on surface and subsurface archaeological sites.

9.1.3 Extent of impact

The construction of the power line could have a low to medium impact on a local scale.

9.2. Historical period

9.2.1 Historical finds and cultural landscapes: Including middens, structural remains and cultural landscape.

The desktop study highlighted the fact that the area was occupied at least from the late 1800's and features dating to this period associated with farming and military activities can be expected.

9.2.2 Nature of Impact

The construction of the power line can directly impact on both the visual context and sense of place of historical sites. Due to the visual nature of power lines it can also have a direct impact on the sense of place as well as the cultural landscape.

9.2.3 Extent of impact

The proposed power line will have a low to medium local impact due to the general physical nature of power lines. The sense of place of cultural sites and the cultural landscape will be impacted on a local scale and the impact is anticipated as medium.

9.3. Burials and Cemeteries

9.3.1 Burials and Cemeteries

Graves and informal cemeteries can be expected anywhere on the landscape.

9.3.2 Nature of Impact

The construction and operation of the power line could directly impact on marked and unmarked graves.

9.3.3 Extent of impact

The power line could have a low to medium impact on a local scale.

10. POTENTIAL SIGNIFICANCE OF HERITAGE RESOURCES

Based on the current information obtained for the area at a desktop level it is anticipated that sites that occur within the proposed development area will have Generally Protected A (GP.A) field rating. Depending on the preservation of sites 3 and 4 on Route 3 these sites can have a Grade III field rating.

11. CONCLUSIONS AND RECOMMENDATIONS

This scoping study revealed that a range of heritage sites occur in the larger region and similar sites can be expected within the study area. Every site is relevant to the Heritage Landscape, and based on preservation etc. it is anticipated that some sites on route option 3 might have conservation value. This will need to be verified by a site visit if route option 3 is used. The following conclusions are applicable to the following sites:

» Archaeological sites

All sites could be mitigated either in the form of conservation of the sites with in the development or by a Phase 2 study where the sites will be recorded and sampled before the client can apply for a destruction permit for these sites prior to development.

» Historical finds and Cultural landscape

Route option 3 contains historical sites that might be of high heritage value. Depending on the preservation of the sites the proposed power line can have a high n negative impact on option 3 of the power line. For the other route options it is not anticipated that the built environment will be severely impacted upon as very little structures occur directly under the powerlines and these sites could be mitigated in the form of conservation of the sites with in the development or by a Phase 2 study where the sites will be recorded. However, indirect impacts like the visual impact on the cultural landscape and can only be assessed during the survey of the area and suitable mitigation measures proposed.

» Burials and cemeteries

Formal and informal cemeteries as well as pre-colonial graves occur widely across Southern Africa. It is generally recommended that these sites are preserved with in a development. This can easily be accomplished by micro adjustments to the proposed alignment. These sites can how ever be relocated if conservation is not possible, but this option must be seen as a last resort. The presence of any grave sites must be confirmed during the field survey and the public consultation process.

Based on the findings of the desktop study **route option 3** is the least preferred option from a heritage point of view. From the other alternatives route 4 and the public alternative is the preferred option while route 1 and 2 is satisfactory. Route 2 would be the better option of the two.

In order of preference from best to worst it would be Route 4 and the public alternative, Route 2, Route 1 and then Route 3.

» General

It is recommended that as part of the public consultation process the presence of graves, archaeological and historical sites should be determined.

12. PLAN OF STUDY

In order to comply with the National Heritage Resources Act (Act 25 of 1999) a Phase 1 Archaeological Impact Assessment must be undertaken that includes a walkthrough of the power line focussing on pylon positions. During this study sites of archaeological, historical or places of cultural interest must be located, identified, recorded, photographed and described. During this study the levels of significance of recorded heritage resources must be determined and mitigation proposed should any significant sites be impacted upon, ensuring that all the requirements of SAHRA are met.

13. LIST OF PREPARERS

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14. STATEMENT OF COMPETENCY

The author of the report is a member of the Association of Southern African Professional Archaeologists and is also accredited in the following fields of the Cultural Resource Management (CRM) Section, member number 159: Iron Age Archaeology, Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation.

Jaco serves as a council member for the CRM Section of the Association of Southern African Association Professional Archaeologists and is also an accredited CRM Archaeologist with SAHRA and AMAFA.

Jaco has been involved in research and contract work in South Africa, Botswana, Mozambique, Zimbabwe and Tanzania and conducted well over 500 AIAs since he started his career in CRM in 2000. This involved several mining operations, Eskom transmission and distribution projects and infrastructure developments. The results of several of these projects were presented at international and local conferences.

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