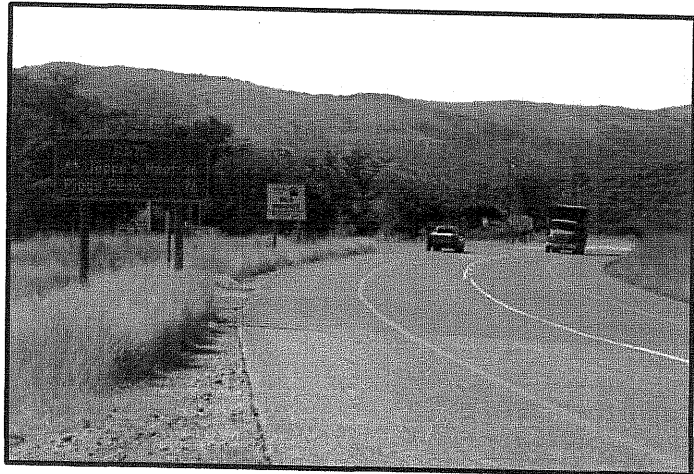


Recd: 25/05/2014

**Heritage impact assessment for the
PROPOSED UPGRADE OF ROAD R570, MALELANE TO JEPPEES REEF,
MPUMALANGA PROVINCE**



**HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED UPGRADE OF ROAD
R570, MALELANE TO JEPPEES REEF, MPUMALANGA PROVINCE**

Report No: 2011/JvS/017
Status: Final
Revision No: 0
Date: March 2011

Prepared for:

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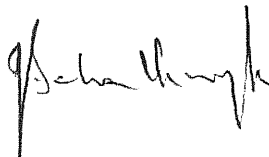
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Declaration:

I, J.A. van Schalkwyk, declare that I do not have any financial or personal interest in the proposed development, nor its developers or any of their subsidiaries, apart from the provision of heritage assessment and management services.



J A van Schalkwyk (D Litt et Phil)
Heritage Consultant
March 2011

EXECUTIVE SUMMARY

HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED UPGRADE OF ROAD R570, MALELANE TO JEPPEES REEF, MPUMALANGA PROVINCE

It is the intention of the South African National Roads Agency Limited (SANRAL) to upgrade the National Route R570 section 1 between the N4 (Malelane) interchange and the Joppes Reef border post. The roadwork includes the following:

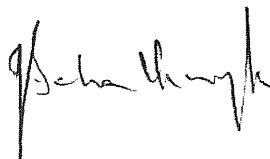
- Widening of culverts/bridges;
- Construction of additional climbing lanes;
- Borrow area and quarries are to be established for the sourcing of material for the upgrades.

South Africa's heritage resources, also described as the 'national estate', comprise a wide range of sites, features, objects and beliefs. According to Section 27(18) of the National Heritage Resources Act (NHRA), Act 25 of 1999, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site.

In accordance with Section 38 of the NHRA, an independent heritage consultant was therefore appointed by **Chameleon Environmental** to conduct a Heritage Impact Assessment (HIA) to determine if any sites, features or objects of cultural heritage significance occur within the boundaries of the area where it is planned to upgrade the road and develop the borrow pits, to assess the significance thereof and to consider alternatives and plans for the mitigation of any adverse impacts.

- As no sites, features or objects of cultural heritage significance were identified in the study area, there would be no impact from the proposed development.

Therefore, from a heritage point of view it is recommended that the proposed development be allowed to continue. However, it is requested that should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.



J A van Schalkwyk
Heritage Consultant
March 2011

TECHNICAL SUMMARY

Property details						
Province	Mpumalanga					
Magisterial district	Berberton/Kamhlushwa					
Local municipality	Nkomazi					
Topo-cadastral map	2531BC, 2531DA, 2531CB					
Closest town	Malelane					
Farm name	Various					
Portions/Holdings	-					
Coordinates	End points					
	No	Latitude	Longitude	No	Latitude	Longitude
	1	S 25.48064	E 31.55003	2	S 25.75088	E 31.46750

Development criteria in terms of Section 38(1) of the NHR Act	Yes/No
Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	Yes
Construction of bridge or similar structure exceeding 50m in length	No
Development exceeding 5000 sq m	Yes
Development involving three or more existing erven or subdivisions	No
Development involving three or more erven or divisions that have been consolidated within past five years	No
Rezoning of site exceeding 10 000 sq m	No
Any other development category, public open space, squares, parks, recreation grounds	No

Development	
Description	Upgrading of R570
Project name	R570 Upgrade

Land use	
Previous land use	Road
Current land use	Vacant

Heritage sites assessment		
Site type	Site significance	Site grading (Section 7 of NHRA)
None	-	-

Impact assessment		
Impact	Mitigation	Permits required
-	-	-

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GLOSSARY OF TERMS AND ABBREVIATIONS

TERMS

Study area: Refers to the entire study area as indicated by the client in the accompanying Fig. 1 & 2.

Stone Age: The first and longest part of human history is the Stone Age, which began with the appearance of early humans between 3-2 million years ago. Stone Age people were hunters, gatherers and scavengers who did not live in permanently settled communities. Their stone tools preserve well and are found in most places in South Africa and elsewhere.

Early Stone Age	2 000 000 - 150 000 Before Present
Middle Stone Age	150 000 - 30 000 BP
Late Stone Age	30 000 - until c. AD 200

Iron Age: Period covering the last 1800 years, when new people brought a new way of life to southern Africa. They established settled villages, cultivated domestic crops such as sorghum, millet and beans, and they herded cattle as well as sheep and goats. These people, according to archaeological evidence, spoke early variations of the Bantu Language. Because they produced their own iron tools, archaeologists call this the Iron Age.

Early Iron Age	AD 200 - AD 900
Middle Iron Age	AD 900 - AD 1300
Late Iron Age	AD 1300 - AD 1830

Historical Period: Since the arrival of the white settlers - c. AD 1840 - in this part of the country

ABBREVIATIONS

ADRC	Archaeological Data Recording Centre
ASAPA	Association of Southern African Professional Archaeologists
BP	Before Present
CS-G	Chief Surveyor-General
EIA	Early Iron Age
ESA	Early Stone Age
LIA	Late Iron Age
LSA	Later Stone Age
HIA	Heritage Impact Assessment
MSA	Middle Stone Age
NASA	National Archives of South Africa
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
SAHRA	South African Heritage Resources Agency

HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED UPGRADE OF ROAD R570, MALELANE TO JEPPEES REEF, MPUMALANGA PROVINCE

1. INTRODUCTION

It is the intention of the South African National Roads Agency Limited (SANRAL) to upgrade the National Route R570 section 1 between the N4 (Malelane) interchange and the Joppes Reef border post. The roadwork includes the following:

- Widening of culverts/bridges;
- Construction of additional climbing lanes;
- Borrow area and quarries are to be established for the sourcing of material for the upgrades.

South Africa's heritage resources, also described as the 'national estate', comprise a wide range of sites, features, objects and beliefs. According to Section 27(18) of the National Heritage Resources Act (NHRA), Act 25 of 1999, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site.

In accordance with Section 38 of the NHRA, an independent heritage consultant was therefore appointed by **Chameleon Environmental** to conduct a Heritage Impact Assessment (HIA) to determine if any sites, features or objects of cultural heritage significance occur within the boundaries of the area where it is planned to upgrade the road or develop the borrow pits/quarries, to assess the significance thereof and to consider alternatives and plans for the mitigation of any adverse impacts.

This HIA report forms part of the Environmental Impact Assessment (EIA) as required by the EIA Regulations in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and is intended for submission to the South African Heritage Resources Agency (SAHRA).

2. TERMS OF REFERENCE

The aim of this HIA, broadly speaking, is to determine if any sites, features or objects of cultural heritage significance occur within the boundaries of the area where it is planned to develop the transmission line.

The scope of work for this study consisted of:

- Conducting of a desk-top investigation of the area, in which all available literature, reports, databases and maps were studied;
- A visit to the proposed development area.

The objectives were to

- Identify possible archaeological, cultural and historic sites within the proposed development area;
- Evaluate the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources;

- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.

Type of study	Aim	SAHRA involved	SAHRA response
Screening	<p>The aim of the screening investigation is to provide an overview of possible heritage-related issues regarding the proposed development by an appropriate heritage specialist. It is based on the review and use of existing heritage data pertaining to the site.</p> <p>The result of this investigation is a brief statement indicating potential heritage impacts/issues and can assist the developer in preliminary planning.</p> <p>This report does grant the developer permission to proceed with the proposed development.</p>	Not necessary	
Scoping (basic assessment)	<p>The aim of the scoping investigation is to provide an informed heritage-related opinion about the proposed development by an appropriate heritage specialist. The objectives are to assess heritage sites and their significance (involving site inspections, existing heritage data), to review the general compatibility of the development proposals with heritage policy and possible heritage features on the site.</p> <p>The result of this investigation is a heritage scoping report indicating the presence/absence of heritage resources and what would be required to manage them in the context of the proposed development.</p> <p>This report does not grant the developer permission to proceed with the proposed development.</p>	Not compulsory	
Heritage Impact Assessment	<p>The aim of a full HIA investigation is to provide an informed heritage-related opinion about the proposed development by an appropriate heritage specialist. The objectives are to identify heritage resources (involving site inspections, existing heritage data and additional heritage specialists if necessary); assess their significances; assess alternatives in order to promote heritage conservation issues; and to assess the acceptability of the proposed development from a heritage perspective.</p> <p>The result of this investigation is a heritage impact assessment report indicating the presence/ absence of heritage resources and how to manage them in the context of the proposed development.</p> <p>Depending on SAHRA's acceptance of this report, the developer will receive permission to proceed with the proposed development, on condition of successful implementation of proposed mitigation measures.</p>	Provincial Heritage Resources Authority	Comments on built environment and decision to approve or not
		SAHRA Archaeology, Palaeontology and Meteorites Unit	Comments and decision to approve or not

Table 1: Applicable category of heritage impact assessment study and report.

3. HERITAGE RESOURCES

3.1 The National Estate

The NHRA (No. 25 of 1999) defines the heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations that must be considered part of the national estate to include:

- places, buildings, structures and equipment of cultural significance;
- places to 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, including-
 - ancestral graves;
 - royal graves and graves of traditional leaders;
 - graves of victims of conflict;
 - graves of individuals designated by the Minister by notice in the Gazette;
 - historical graves and cemeteries; and
 - other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- sites of significance relating to the history of slavery 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;
 - ethnographic art and objects;
 - military objects;
 - objects of decorative or fine art;
 - objects of scientific or technological interest; and
 - books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

3.2 Cultural significance

In the NHRA, Section 2 (vi), it is stated that "cultural significance" means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This is determined in relation to a site or feature's uniqueness, condition of preservation and research potential.

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

- its importance in the community, or pattern of South Africa's history;
- its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;

- its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
- sites of significance relating to the history of slavery in South Africa.

A matrix was developed whereby the above criteria were applied for the determination of the significance of each identified site (see Appendix 1). This allowed some form of control over the application of similar values for similar sites.

4. STUDY APPROACH AND METHODOLOGY

4.1 Extent of the Study

This survey and impact assessment covers the area as presented in Section 5 and as illustrated in Figures 1 - 2.

4.2 Methodology

4.2.1 Preliminary investigation

4.2.1.1 Survey of the literature

A survey of the relevant literature was conducted with the aim of reviewing the previous research done and determining the potential of the area. In this regard, various anthropological, archaeological, historical sources and heritage impact assessment reports were consulted (Barnard 1975; De Jong et al 1988; Van Schalkwyk 2002, 2007a, 2007b, 2007c).

- Information on events, sites and features in the larger region were obtained from these sources.

4.2.1.2 Data bases

The *Heritage Atlas Database*, the *Environmental Potential Atlas*, the *Chief Surveyor General (CS-G)* and the *National Archives of South Africa (NASA)* were consulted.

- Database surveys produced a number of sites located in the larger region of the proposed development.

4.2.1.3 Other sources

Aerial photographs and topocadastral and other maps were also studied - see the list of references below.

- Information of a very general nature was obtained from these sources.

4.2.2 Field survey

The area that had to be investigated was identified by **Chameleon Environmental** by means of maps. As this is a linear development the survey was done by travelling the total route as well as walking transects across the borrow pit sites.

4.3 Limitations

- In some areas the vegetation was very high and dense, limiting the archaeological visibility.

5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

5.1 Site location and description

The road that is to be upgraded is Section 1 of National Route R570 between the N4 (Malelane) interchange and the Jeppes Reef border post (Swaziland) (see Fig. 1, 8 & 9).



Fig. 1. Location of the study area in regional context.
(Maps 2530: Chief Surveyor-General)

The geology of the region is made up of lava and arenite in the north, changing to quartzite in the south. The topography is described as high mountains in the north, changing to moderately undulating plains in the south. The vegetation of the region is classified as Mixed Lowveld Bushveld, changing to Sour Lowveld Bushveld in the west.

The road that has to be upgraded has always served as a link between the Nelspruit region and Swaziland. It was probably last upgraded in 1970 as all the bridges date to that period. With the construction of the Driekoppies dam in the 1980s, a short section of the road had to be re-aligned as it was inundated by the water of the dam.

Two of the four borrow pits are existing ones that would be expanded. The hard rock quarry and the other two borrow pits are new.

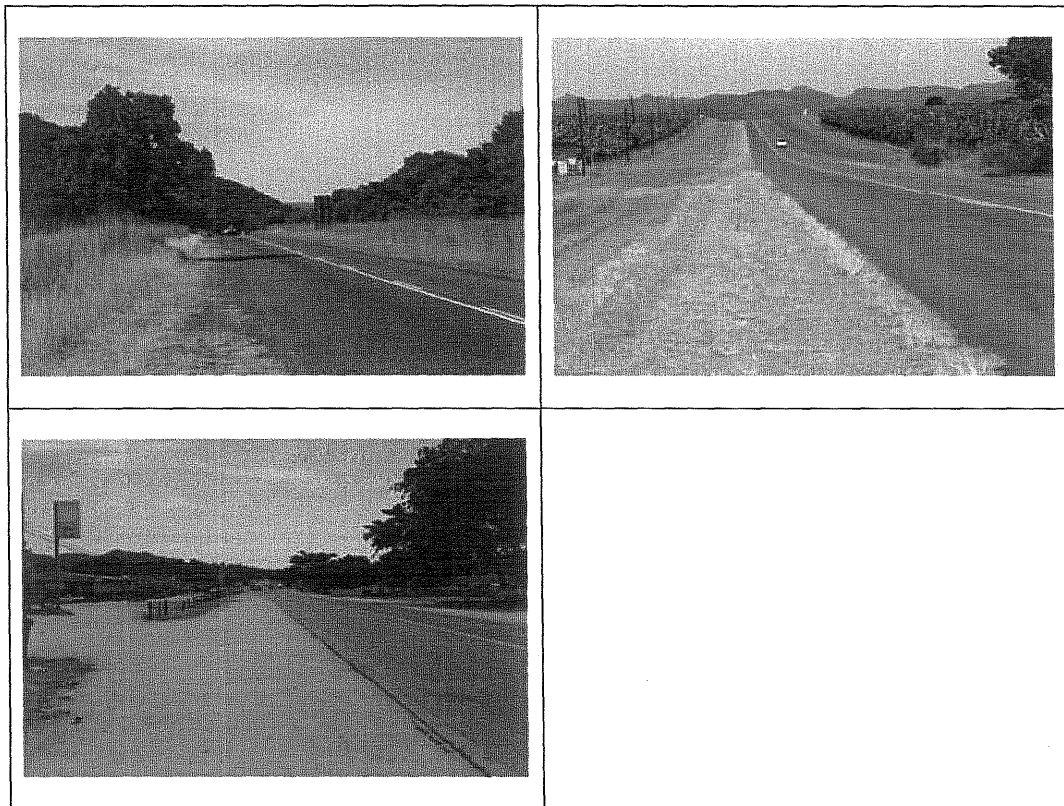


Fig. 2. Elements of the landscape through which the road pass.
(Natural vegetation, agricultural fields, urban landscape)

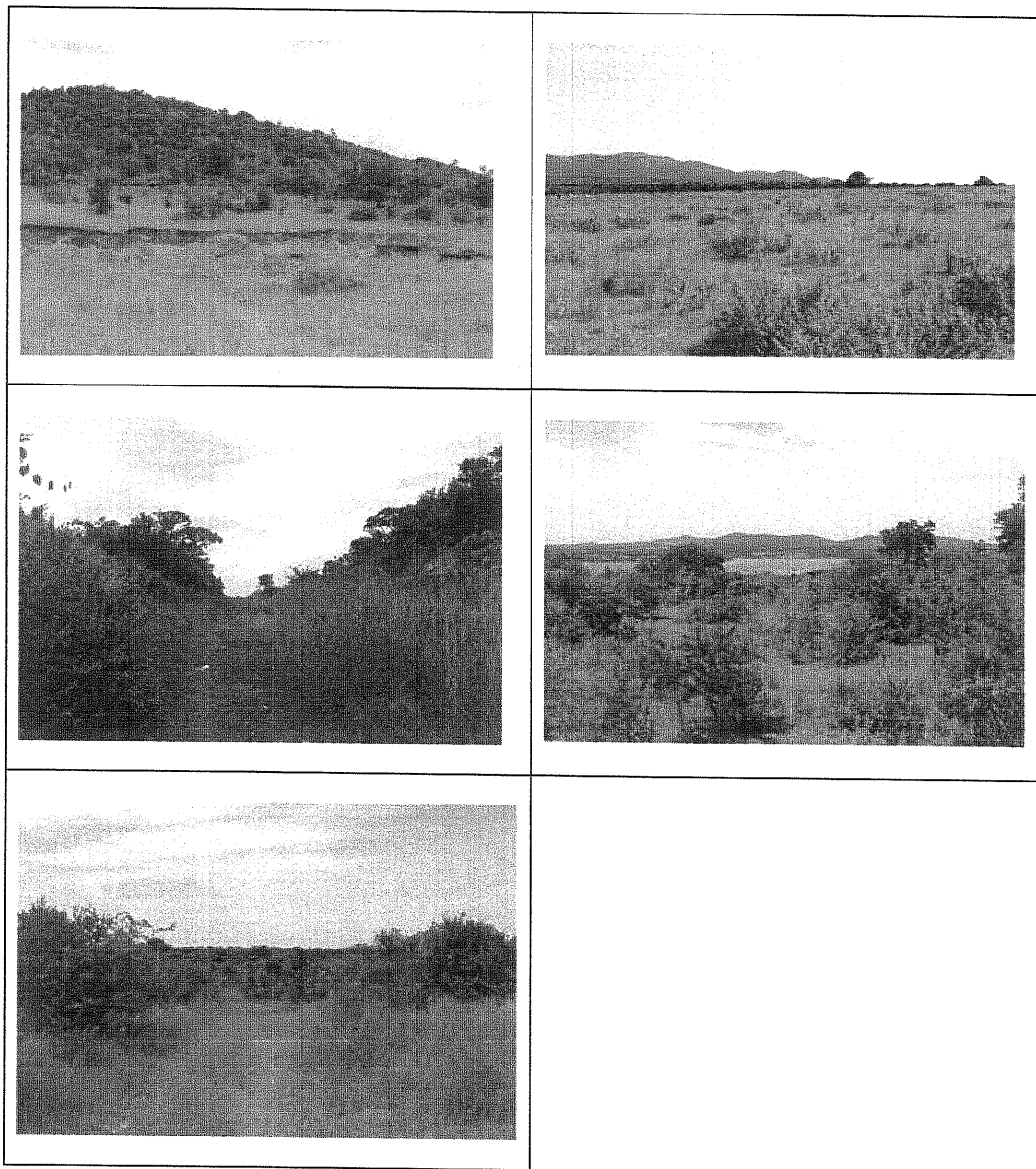


Fig. 3. Views over the various borrow pits.

5.2 Regional overview

Stone and Iron Age

Human occupation of the region started at least during the Middle Stone Age and continued through to the Later Stone Age. Because of the high impact of agricultural development, as well as the dense vegetation cover in the undeveloped area, very few indications of Stone Age occupation are usually identified during surveys. What are found, are stone tools, flakes and cores, dating to the Middle and Later Stone Age, as surface finds. As these objects are surface finds, they are out of context and are viewed to have a very low significance.

A number of rock shelters containing San rock art are known to exist in the region. These usually occur in shelters located on the granite outcrops. However, none of the known sites occur close to the road alignment.

Iron Age people moved into southern Africa by c. AD 200, entering the area either by moving down the coastal plains, or by using a more central route. It seems more likely that the first option was what brought people into the study area. From the coast they followed the various rivers inland. One of the earliest dated sites is located near Tzaneen (Silver Leaves). Some sites dating to this and a slightly later period, were identified at Plaston (Evers 1977) and still closer at Vergenoeg and The Curlews (Van Schalkwyk 2007)

Being cultivators, they preferred the rich alluvial soils close to river to settle on. Consequently, as the study area is in close proximity to the Crocodile River, one would expect settlement sites dating to the Early Iron Age to occur here. Unfortunately, large sections of this area has been subjected to agricultural activities, being ploughed over annually, or are used for orchards. These activities would have had a negative impact on any heritage sites that might have occurred here. Furthermore, the areas not in use for agricultural activities, are densely vegetated, which also makes the detection of sites very difficult.

Because of the high impact of agricultural development, as well as the dense vegetation cover in the undeveloped area, what are found, are pieces of pottery and grinding stones. Unfortunately, all of it was non-diagnostic (i.e. it did not have any decorations on), with the result that it could not be identified or dated.

- Archaeological sites

Very little information regarding the archaeology of the study area exists few intensive surveys have been done in the region.

NHRA Category	Archaeological and palaeontological sites
Protection status	
	General Protection - Section 35: Archaeology, palaeontology and meteorites

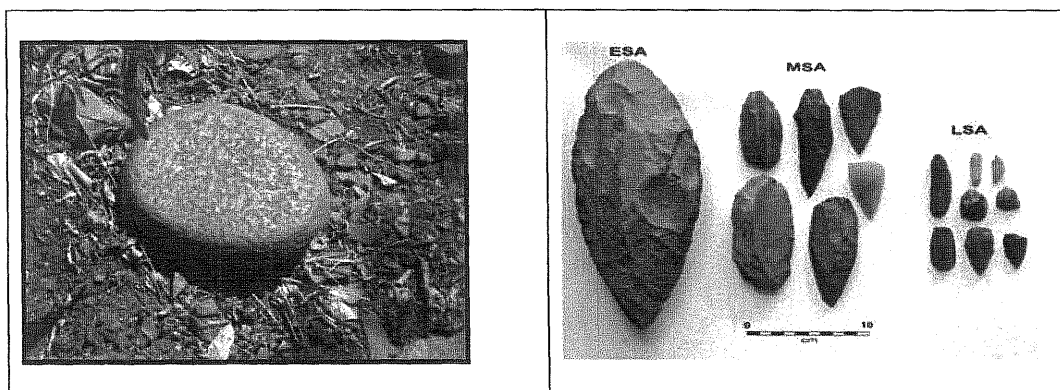


Fig. 4. Upper grinding stone dating to the Iron Age.

The stone tools in the right hand picture are not from the region and are only used to illustrate the difference between Early (left), Middle (middle) and Later Stone Age (right) technology.

Historic period

The historic period started in the 1840s. Due to the presence of malaria, few people settled here and most, being traders, hunter and miners, only passed through the area. Nelspruit as

town was proclaimed only in 1905. As time went by, the area was divided into farms and more and more people settled on a permanent basis.

The Pretoria – Lorenzo-Marques (Maputo) railway line, also known as the NZASM line, was built through the region during the 1880s. A number of features, e.g. bridges, culverts, stations, houses, good sheds, etc. still exist and forms part of this feature.

During the 1920s the old national road (now the N4) was built. Later, it was realigned in some places and upgraded. As a result some of the bridges and culverts that formed part of this road still exist, although it is not used any more.

A section of route goes through what used to be a part of the old KaNgwane homeland for Swazi-speaking people.

- Farmsteads

In the case of colonial period occupation we are fortunate to have land owners who are descendants of some of the earliest farmers who settled in the area and all of whom have a remarkable knowledge of the region and it's past.

NHRA Category	Buildings, structures, places and equipment of cultural significance
Protection status	
General Protection - Section 34: Structures older than 60 years	

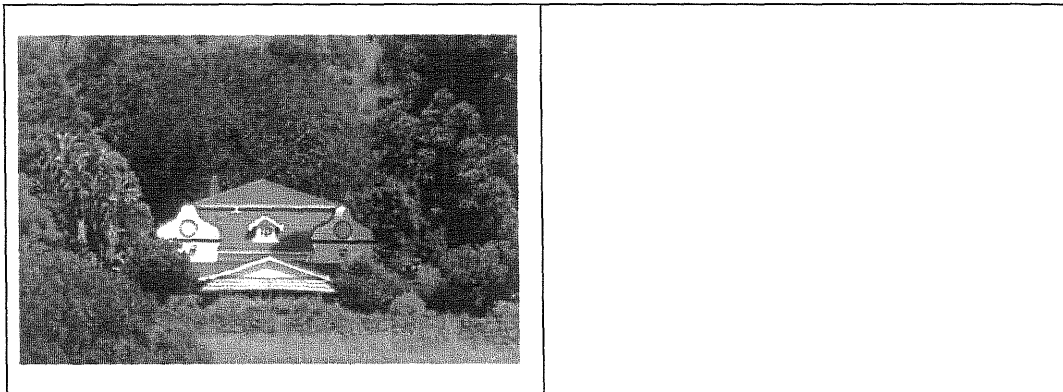


Fig. 5. Examples of farmsteads identified in the region.

- Cemeteries

Apart from the formal cemeteries that occur in municipal areas (towns or villages), a number of these, some quite informal, i.e. without fencing, is expected to occur sporadically all over, but probably in the vicinity of the various farmsteads. Many might also have been forgotten, making it very difficult to trace the descendants in a case where the graves are to be relocated.

NHRA Category	Graves, cemeteries and burial grounds
Protection status	
General Protection - Section 36: Graves or burial grounds	



Fig. 6. An isolated old grave.

Most of these cemeteries, irrespective of the fact that they are for land owner or farm labourers (with a few exceptions where they were integrated), are family orientated. They are therefore serve as important 'documents' linking people directly by name to the land.

- Infrastructure and industrial heritage

In many cases this aspect of heritage is left out of surveys, largely due to the fact that it is taken for granted. However, the land and its resources could not be accessed and exploited without the development of features such as roads, bridges, railway lines, electricity lines and telephone lines, as well as industries that exploit locally available resources.

NHRA Category	Buildings, structures, places and equipment of cultural significance
Protection status	General Protection - Section 34: Structures older than 60 years

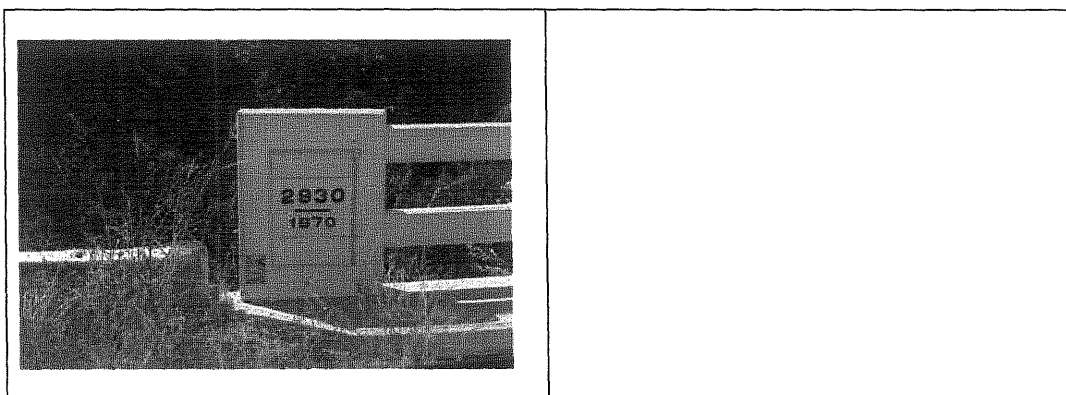


Fig. 7. Bridgehead on the R570 dating the bridge to 1970.

5.3 Identified sites

The cultural landscape qualities of the study area can be classified as a rural landscape with farming and underdeveloped townships as the dominant features.

Based on the above sources and the field visit, the following heritage sites, features and objects were identified in the proposed development area:

- No sites, features or objects of significance dating to the Stone Age were identified in the study area.
- No sites, features or objects of significance dating to the Iron Age were identified in the study area.
- No sites, features or objects of significance dating to historic times were identified in the study area.

6. SITE SIGNIFICANCE AND ASSESSMENT

6.1 Heritage assessment criteria and grading

The NHRA stipulates the assessment criteria and grading of archaeological sites. The following categories are distinguished in Section 7 of the Act:

- **Grade I:** Heritage resources with qualities so exceptional that they are of special national significance;
- **Grade II:** Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region; and
- **Grade III:** Other heritage resources worthy of conservation on a local authority level.

The occurrence of sites with a Grade I significance will demand that the development activities be drastically altered in order to retain these sites in their original state. For Grade II and Grade III sites, the applicable of mitigation measures would allow the development activities to continue.

6.2 Statement of significance

A matrix was developed whereby the above criteria, as set out in Sections 3(3) and 7 of the NHRA, No. 25 of 1999, were applied for each identified site (see Appendix 1). This allowed some form of control over the application of similar values for similar sites. Three categories of significance are recognized: low, medium and high. In terms of Section 7 of the NHRA, all the sites currently known or which are expected to occur in the study area are evaluated to have a grading as identified in the table below.

Identified heritage resources	
Category, according to NHRA	Identification/Description
Formal protections (NHRA)	
National heritage site (Section 27)	None

Provincial heritage site (Section 27)	None
Provisional protection (Section 29)	None
Place listed in heritage register (Section 30)	None
General protections (NHRA)	
structures older than 60 years (Section 34)	None
archaeological site or material (Section 35)	None
palaeontological site or material (Section 35)	None
graves or burial grounds (Section 36)	None
public monuments or memorials (Section 37)	None
Other	
Any other heritage resources (describe)	None

Table 2. Summary of identified heritage resources in the study area.

6.3 Impact assessment

Impact analysis of cultural heritage resources under threat of the proposed development, are based on the present understanding of the development.

Heritage sites assessment		
<i>Site type</i>	<i>Site significance</i>	<i>Site grading (Section 7 of NHRA)</i>
None	-	-
Impact assessment		
<i>Impact</i>	<i>Mitigation</i>	<i>Permits required</i>
None	-	-

Table 3. Summary of impact assessments.

- As no sites, features or objects of cultural heritage significance were identified in the study area, there would be no impact from the proposed development.

7. CONCLUSIONS

The aim of this survey was to locate, identify, evaluate and document sites, objects and structures of cultural significance found within the area of the proposed development, to assess the significance thereof and to consider alternatives and plans for the mitigation of any adverse impacts.

- As no sites, features or objects of cultural heritage significance were identified in the study area, there would be no impact from the proposed development.

Therefore, from a heritage point of view it is recommended that the proposed development be allowed to continue. However, it is requested that should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

8. REFERENCES

8.1 Data bases

Chief Surveyor General
Environmental Potential Atlas, Department of Environmental Affairs and Tourism.
Heritage Atlas Database, Pretoria.
National Archives of South Africa
SAHRA Archaeology and Palaeontology Report Mapping Project (2009)

8.2 Literature

Acocks, J.P.H. 1975. *Veld Types of South Africa*. Memoirs of the Botanical Survey of South Africa, No. 40. Pretoria: Botanical Research Institute.

Barnard, C. (red.) 1975. *Die Transvaalse Laeveld: kamee van 'n kontrei*. Kaapstad: Tafelberg Uitgewers.

De Jong, R.C, Van der Waal, G-M. & Heydenrych, D.H. 1988. *NZASM 100: The buildings, steam engines and structures of the Netherlands South African Railway Company*. Pretoria: Chris van Rensburg Publications.

Van Schalkwyk, J.A. 2002. *Archaeological survey of a section of the Secunda-Mozambique gas pipeline, Barberton district, Mpumalanga*. No. 3. Unpublished report 2002KH31. Pretoria: National Cultural History Museum.

Van Schalkwyk, J.A. 2007a. Heritage survey report for the proposed development on portions of various farms in the Malelane area of Mpumalanga province. Unpublished report 2007/JvS/006.

Van Schalkwyk, J.A. 2007b. Heritage survey report for the proposed development on portions of various farms in the Malelane area of Mpumalanga province. Unpublished report 2007/JvS/067.

Van Schalkwyk, J.A. 2007c. Heritage impact assessment for the proposed development on the farm Stentor Reservaat 656JU, Mpumalanga. Unpublished report 2007KH108. Pretoria: National Cultural History Museum.

8.3 Maps and aerial photographs

1: 50 000 Topocadastral maps: 2531BC, 2531DA, 2531CB
Google Earth

APPENDIX 1: CONVENTIONS USED TO ASSESS THE IMPACT OF PROJECTS ON HERITAGE RESOURCES

Significance

According to the NHRA, Section 2(vi) the **significance** of heritage sites and artefacts is determined by its aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

Matrix used for assessing the significance of each identified site/feature

1. Historic value			
Is it important in the community, or pattern of history			
Does it have strong or special association with the life or work of a person, group or organisation of importance in history			
Does it have significance relating to the history of slavery			
2. Aesthetic value			
It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group			
3. Scientific value			
Does it have potential to yield information that will contribute to an understanding of natural or cultural heritage			
Is it important in demonstrating a high degree of creative or technical achievement at a particular period			
4. Social value			
Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons			
5. Rarity			
Does it possess uncommon, rare or endangered aspects of natural or cultural heritage			
6. Representivity			
Is it important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects			
Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class			
Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality.			
7. Sphere of Significance			
	High	Medium	Low
International			
National			
Provincial			
Regional			
Local			
Specific community			
8. Significance rating of feature			
1.	Low		
2.	Medium		
3.	High		

Significance of impact:

- low where the impact will not have an influence on or require to be significantly accommodated in the project design
- medium where the impact could have an influence which will require modification of the project design or alternative mitigation
- high where it would have a "no-go" implication on the project regardless of any mitigation

Certainty of prediction:

- Definite: More than 90% sure of a particular fact. Substantial supportive data to verify assessment
- Probable: More than 70% sure of a particular fact, or of the likelihood of that impact occurring
- Possible: Only more than 40% sure of a particular fact, or of the likelihood of an impact occurring
- Unsure: Less than 40% sure of a particular fact, or the likelihood of an impact occurring

Recommended management action:

For each impact, the recommended practically attainable mitigation actions which would result in a measurable reduction of the impact, must be identified. This is expressed according to the following:

- 1 = no further investigation/action necessary
- 2 = controlled sampling and/or mapping of the site necessary
- 3 = preserve site if possible, otherwise extensive salvage excavation and/or mapping necessary
- 4 = preserve site at all costs
- 5 = retain graves

Legal requirements:

Identify and list the specific legislation and permit requirements which potentially could be infringed upon by the proposed project, if mitigation is necessary.

APPENDIX 2. RELEVANT LEGISLATION

All archaeological and palaeontological sites, and meteorites are protected by the National Heritage Resources Act (Act no 25 of 1999) as stated in Section 35:

(1) Subject to the provisions of section 8, the protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority: Provided that the protection of any wreck in the territorial waters and the maritime cultural zone shall be the responsibility of SAHRA.

(2) Subject to the provisions of subsection (8)(a), all archaeological objects, palaeontological material and meteorites are the property of the State. The responsible heritage authority must, on behalf of the State, at its discretion ensure that such objects are lodged with a museum or other public institution that has a collection policy acceptable to the heritage resources authority and may in so doing establish such terms and conditions as it sees fit for the conservation of such objects.

(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.

(4) No person may, without a permit issued by the responsible heritage resources authority-

- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
- (c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
- (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

In terms of cemeteries and graves the following (Section 36):

(1) Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.

(2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.

(3) No person may, without a permit issued by SAHRA or a provincial heritage resources authority-

- (a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
- (b) 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; or
- (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

(4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.

APPENDIX 3: SURVEY RESULTS

See Appendix 1 for an explanation of the conventions used in assessing the significance of the cultural remains.

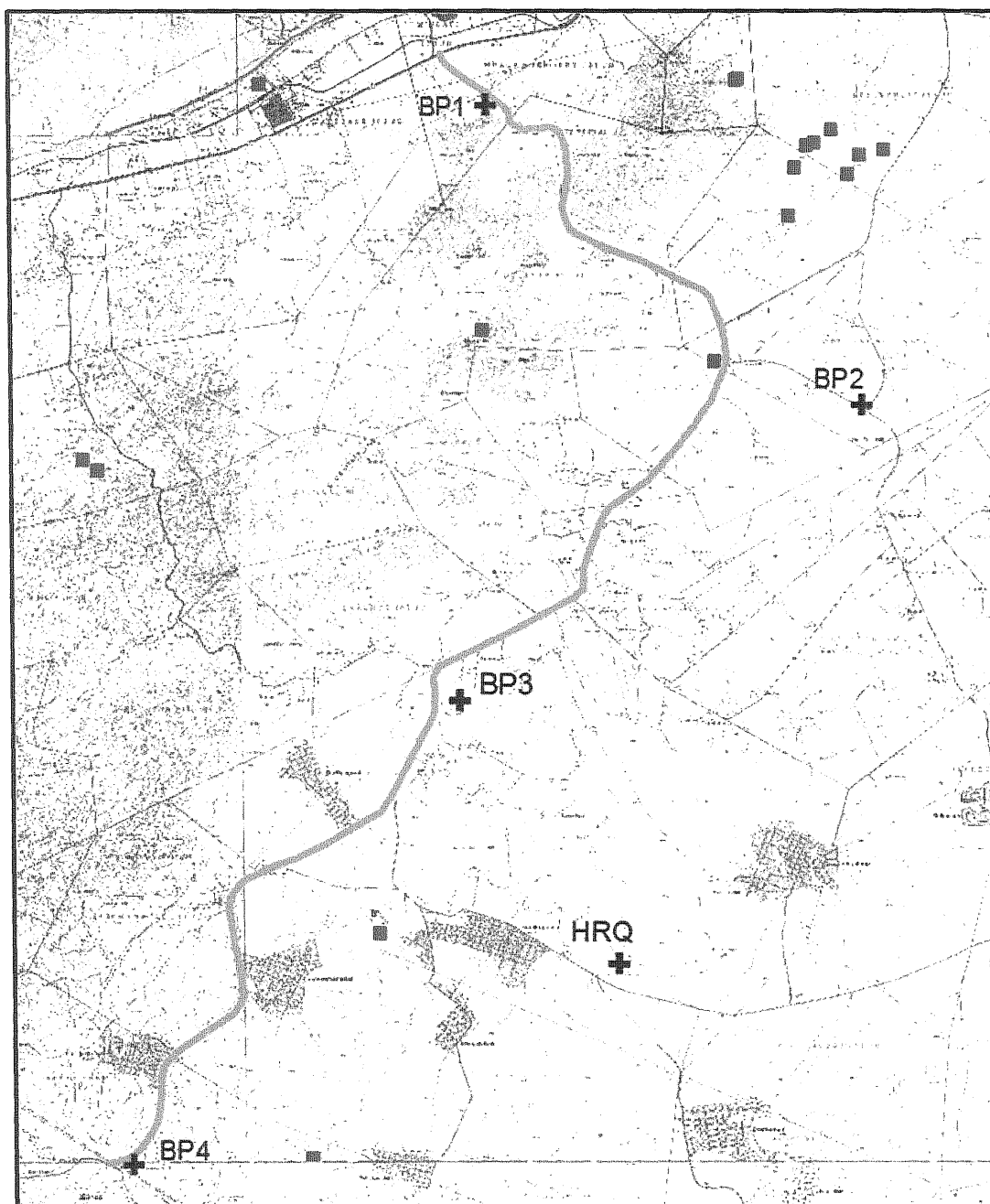


Fig. 8. The study area, outlined in green, with the borrow pits (black crosses) and known heritage sites (red squares).
(Maps 2531BC, 2531DA, 2531CB: Chief Surveyor-General).

Sites identified in the study area:

Nil

APPENDIX 4: ILLUSTRATIONS

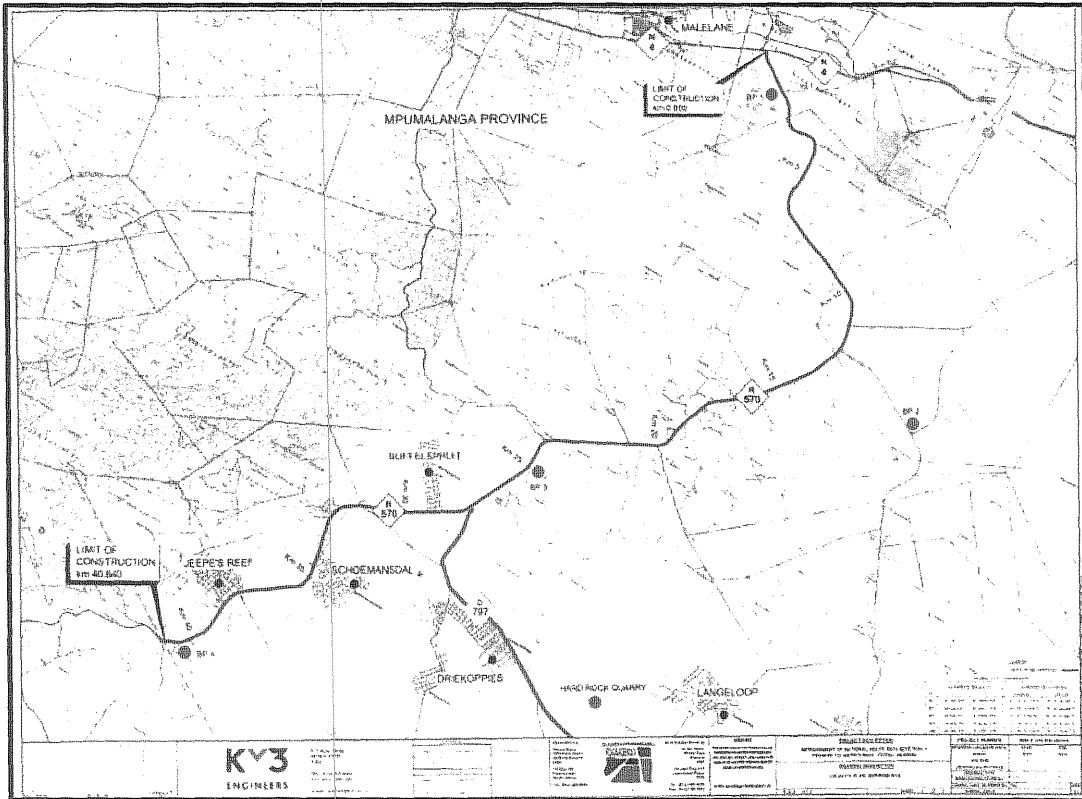


Fig. 9. The location of the route and the borrow pits.
(Map supplied by Chameleon Environmental)