

**Cultural heritage impact assessment for the
PROPOSED EXPANSION OF THE EXISTING WASTE DISPOSAL SITE IN
MUSINA, LIMPOPO PROVINCE**

CULTURAL HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED EXPANSION OF THE EXISTING WASTE DISPOSAL SITE IN MUSINA, LIMPOPO PROVINCE

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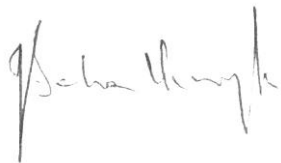
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Declaration:

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
September 2015

EXECUTIVE SUMMARY

CULTURAL HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED EXPANSION OF THE EXISTING WASTE DISPOSAL SITE IN MUSINA, LIMPOPO PROVINCE

The N1 serves as a development spine and the link between Zimbabwe and the economic hub of Gauteng. The current N1 is not continuous and motorists have to drive through Musina town centre. It is therefore proposed to construct a ring road that would by-pass the town centre. However, the proposed route would traverse the existing waste disposal site, which will have to be closed down in order to accommodate the road. It is therefore proposed to extend the waste disposal site towards the south east of the existing site.

In accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by Chameleon Environmental Services 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 the waste disposal site is to be developed.

The cultural landscape qualities of the region essentially consist of a rural setup. In this the human occupation is made up of a pre-colonial element consisting of Stone Age and Iron Age occupation, as well as a much later colonial (farmer) component. This was soon followed by the development of an urban centre, which not only served the surrounding farming communities, but also the copper mining activities that developed in the region.

- 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
September 2015

TECHNICAL SUMMARY

Property details						
Province	Limpopo					
Magisterial district	Messina					
Local municipality	Musina					
Topo-cadastral map	2330AA					
Farm name	Vogelzang 3MT					
Closest town	Musina					
Coordinates	Centre point					
	No	Latitude	Longitude	No	Latitude	Longitude
	1	S 22.35498	E 30.01448			

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	No
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	Expansion of existing waste disposal facility
Project name	Musina Waste Disposal Facility

Land use	
Previous land use	Farming
Current land use	Vacant

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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 and 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. As 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
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

CULTURAL HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED EXPANSION OF THE EXISTING WASTE DISPOSAL SITE IN MUSINA, LIMPOPO PROVINCE

1. INTRODUCTION

The N1 serves as a development spine and the link between Zimbabwe and the economic hub of Gauteng. The current N1 is not continuous and motorists have to drive through Musina town centre. It is therefore proposed to construct a ring road that would by-pass the town centre. However, the proposed route would traverse the existing waste disposal site, which will have to be closed down in order to accommodate the road. It is therefore proposed to extend the waste disposal site towards the south east of the exiting site.

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 appointed by Chameleon Environmental Services 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 the waste disposal site is to be developed.

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

This report does not deal with development projects outside of or even adjacent to the study area as is presented in Section 5 of this report. The same holds true for heritage sites, except in a generalised sense where it is used to create an overview of the heritage potential in the larger region.

2.1 Scope of work

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 the waste disposal site is to be developed.

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

2.2 Limitations and assumptions

The investigation has been influenced by the following factors:

- It is assumed that the description of the proposed project, provided by the client, is accurate.
- No subsurface investigation (i.e. excavations or sampling) were undertaken, since a permit from SAHRA is required for such activities.
- It is assumed that the public consultation process undertaken as part of the Environmental Impact Assessment (EIA) is sufficient and that it does not have to be repeated as part of the heritage impact assessment.
- Large sections of the regions in which the study area is located have not yet been subjected to systematic archaeological surveys, creating huge gaps in available knowledge. Furthermore, most information that was generated in specific regions is based on impact assessments done for the purpose of development projects of some sort, with the result that it covers these regions only selectively.
- The unpredictability of buried archaeological remains.
- This report does not consider the palaeontological potential of the site.

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 identified sites.

4. STUDY APPROACH AND METHODOLOGY

4.1 Extent of the Study

This survey and impact assessment covers the area presented in Section 5 and as illustrated in Figure 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.

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

4.2.1.2 Data bases

The *Heritage Atlas Database*, the *Environmental Potential Atlas*, the *Chief Surveyor General* and the *National Archives of South Africa* were consulted.

- Database surveys produced a number of sites located in adjacent areas.

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 maps supplied by Chameleon Environmental were converted into *kml* files and were then loaded onto a Nexus 7 tablet. This was used, in Google Earth, during the field survey to access the study areas.

The field survey was done on 8 August 2015. The site was surveyed by walking transects over it (see Fig. 1). As this was during winter time, the vegetation cover was down, increasing archaeological visibility.

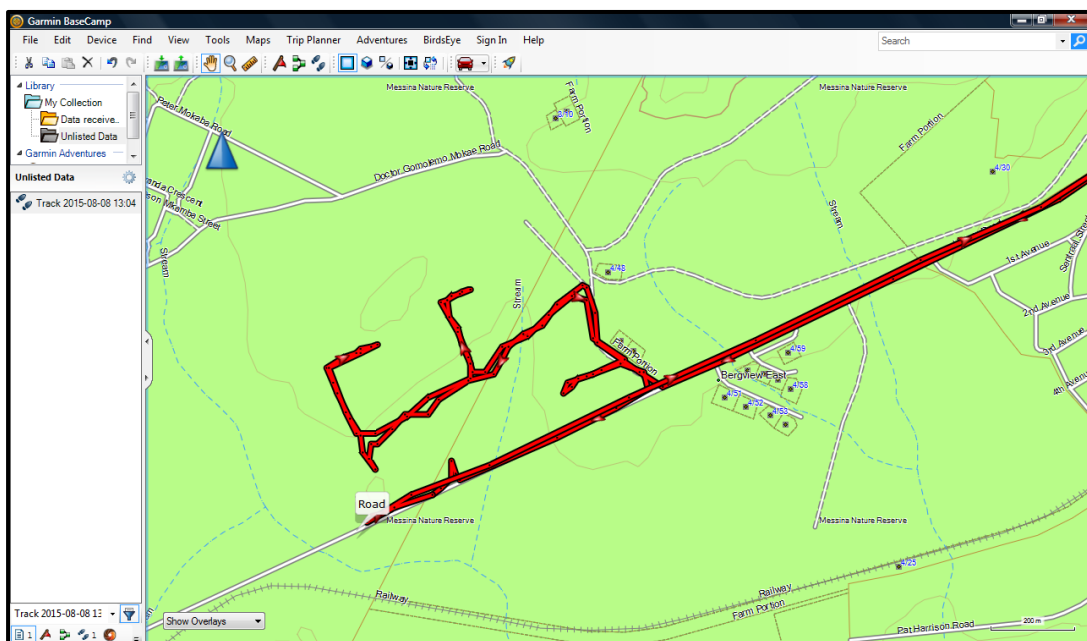


Fig. 1. Track log of the field survey.

4.2.3 Documentation

All sites, objects and structures that are identified are documented according to the general minimum standards accepted by the archaeological profession. Coordinates of individual localities are determined by means of the *Global Positioning System* (GPS) and plotted on a map. This information is added to the description in order to facilitate the identification of each locality. Map datum used: Hartebeeshoek 94 (WGS84).

The track log and identified sites were recorded by means of a Garmin Oregon 550 handheld GPS device. Photographic recording was done by means of a Canon EOS 550D digital camera.

5. PROJECT DESCRIPTION

5.1 Site location

The study area is located to the west of the town of Musina, north of the road going to the airport (Fig. 2). For more information, please see the Technical Summary presented above (p. iii).

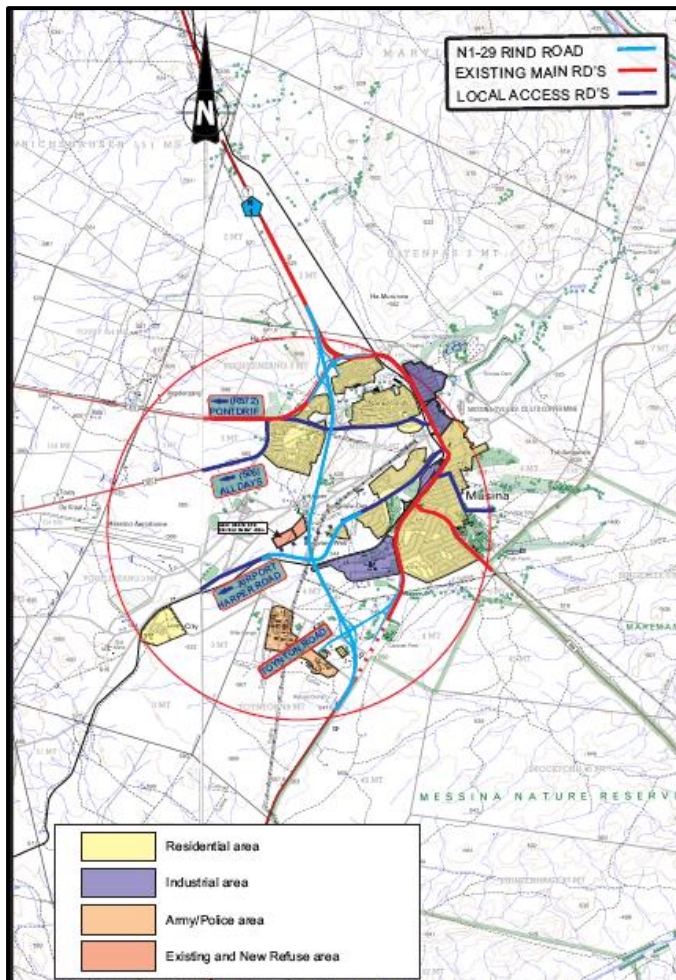


Fig. 2. Map showing the location of the study area in regional context.

5.2 Project description

It is proposed to construct a ring road that would by-pass the Musina town centre. However, the proposed route would traverse the existing waste disposal site on the western outskirts of the town (Fig. 3). This site would have to be closed down in order to accommodate the road. It is therefore proposed to extend the waste disposal site towards the south east of the exiting site. The proposed extension area is approximately 5ha in size.

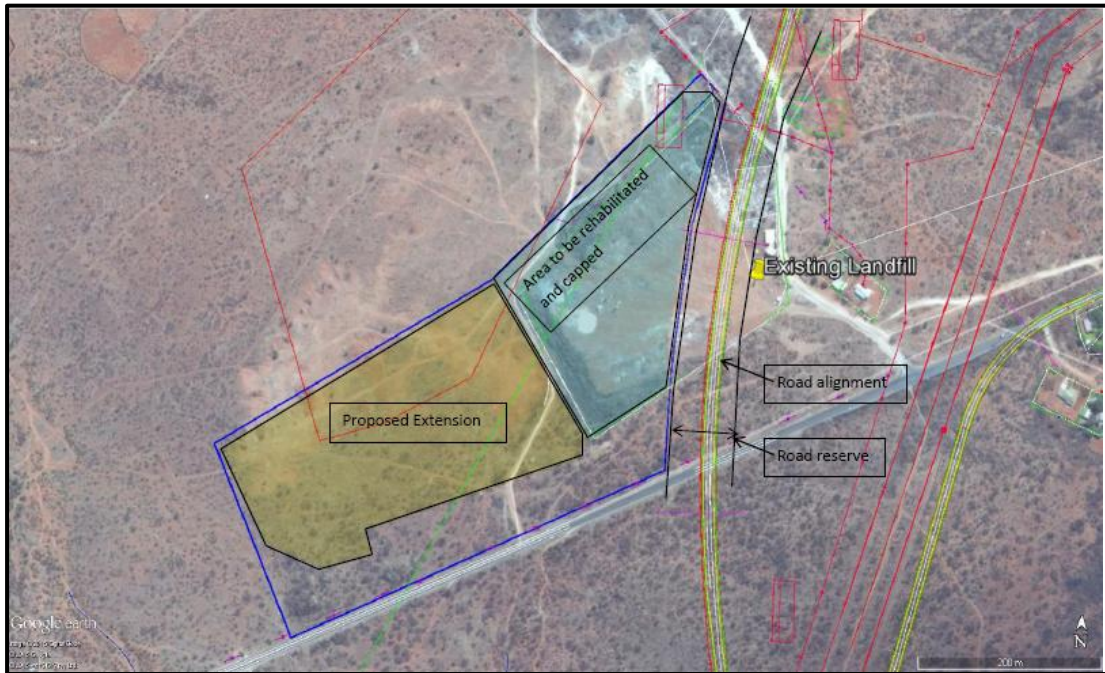


Fig. 3. Layout of the proposed development.

6. DESCRIPTION OF THE AFFECTED ENVIRONMENT

6.1 Site description

The geology is made up of gneiss, changing to quartzite on the eastern edge of the study area. The original vegetation is classified as Mopane Bushveld, but has been altered due to large scale earth removal activities in the region (see Fig. 5 below). These latter activities would also have had a negative impact on any sites, features and objects of cultural significance that might have occurred here in the past.

The topography of the region is described as irregular plains and no perennial stream or river occurs in the vicinity of the study area.

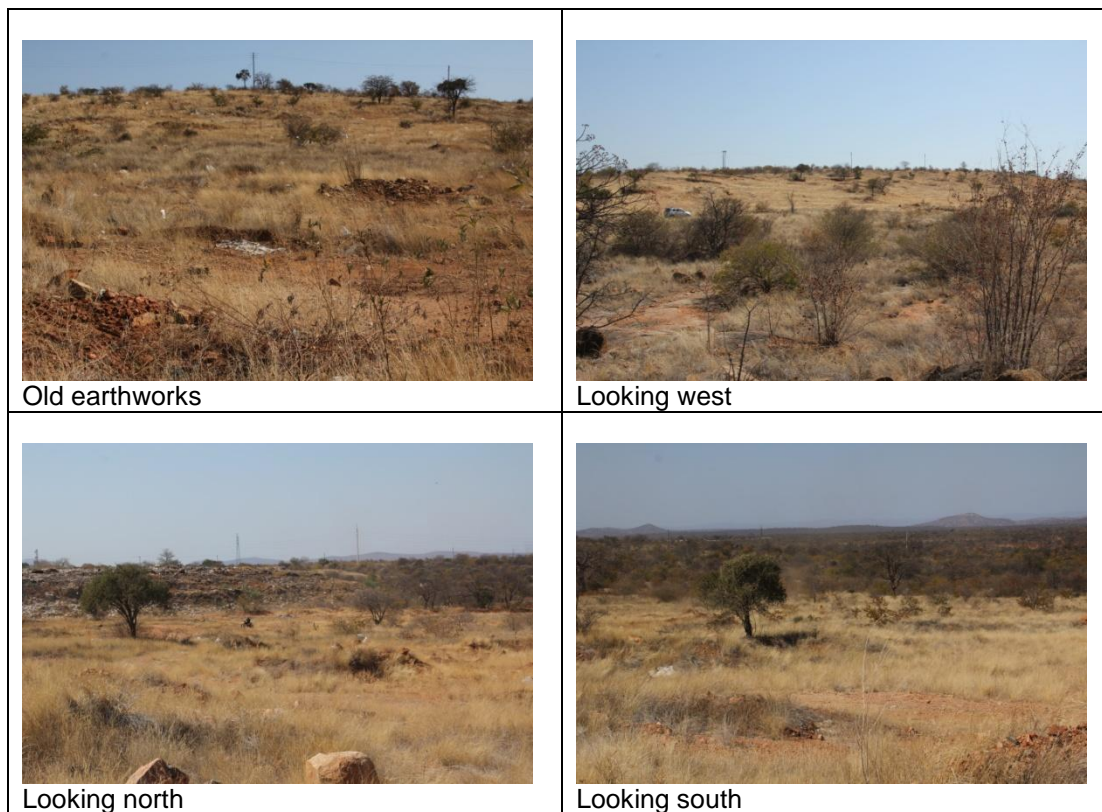


Fig. 4. Views over the study area.

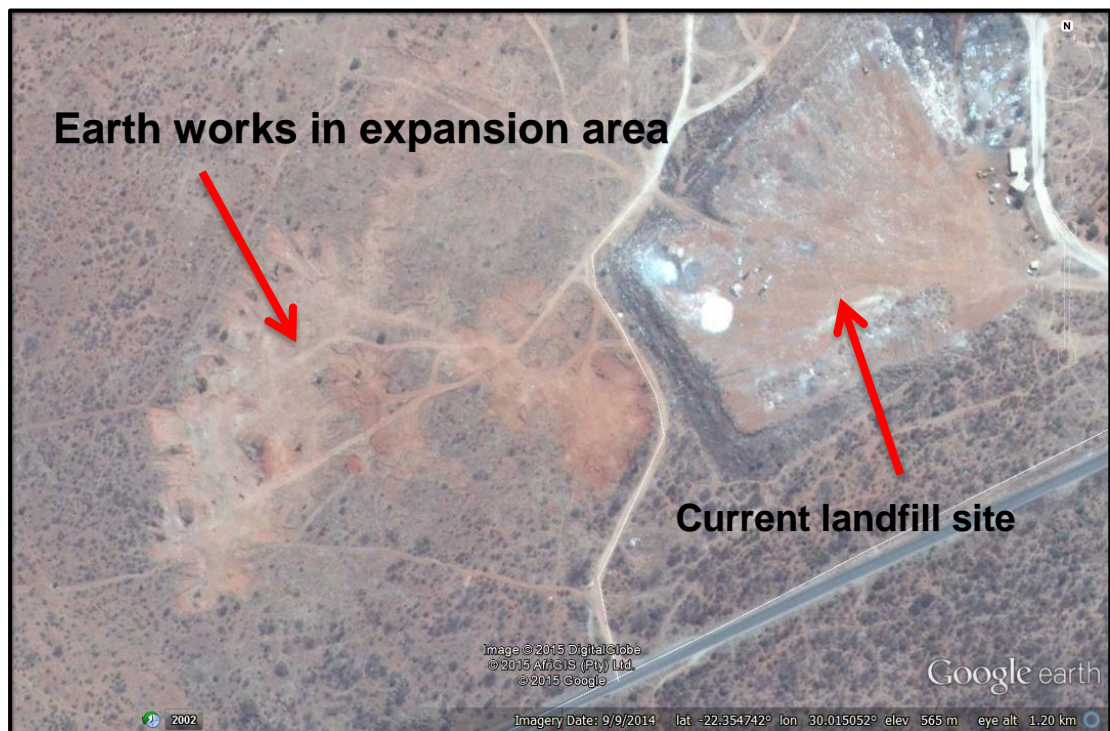


Fig. 5. Aerial view of the study area.
(Photo: Google Earth)

6.2 Regional overview

The aim of this section is to present an overview of the history of the larger region in order to eventually determine the significance of heritage sites identified in the study area, within the context of their historic, aesthetic, scientific and social value, rarity and representivity – see Section 3.2 and Appendix 1 for more information.

The cultural landscape qualities of the region essentially consist of a rural setup. In this the human occupation is made up of a pre-colonial element consisting of Stone Age and Iron Age occupation, as well as a much later colonial (farmer) component. This was soon followed by the development of an urban centre, which not only served the surrounding farming communities, but also the copper mining activities that developed in the region.

6.2.1 Stone Age

Human occupation of the larger geographical region took place since Early Stone Age times. Tools dating to this period are mostly, although not exclusively, found in the vicinity of watercourses. The oldest of these tools are known as choppers, crudely produced from large pebbles found in the river. Later, *Homo erectus* and early *Homo sapiens* people made tools shaped on both sides, called bifaces. Biface technology is known as the Acheulean tradition, from St Acheul in France, where bifaces were first identified in the mid-19th century. Biface technology is found over a large area of Africa, some parts of India, Arabia and the Near East, as well as parts of western Europe. This is one of the longest-lasting technologies the world has known, spanning a period of more than 1,5 million years. Sites in the region dating to this early period have recently been the subject of intensive research (Kuman et al 2005).

During Middle Stone Age (MSA) times (c. 150 000 – 30 000 BP), people became more mobile, occupying areas formerly avoided. According to Thackeray (1992) the MSA is a period that still remains somewhat murky, as much of the MSA lies beyond the limits of conventional radiocarbon dating. However, the concept of the MSA remains useful as a means of identifying a technological stage characterized by flakes and flake-blades with faceted platforms, produced from prepared cores, as distinct from the core tool-based ESA technology.

Open sites were still preferred near watercourses. These people were adept at exploiting the huge herds of animals that passed through the area, on their seasonal migration. As a result, tools belonging to this period also mostly occur in the open or in erosion dongas. Similar to the ESA material, artefacts from these surface collections are viewed not to be in a primary context and have little or no significance.

However, it was only during the Late Stone Age, that people started to occupy sites on a recurring basis. These are rock shelters and caves, occurring in suitable geological environments, e.g. in the Soutpansberg self and the broken environment of the Limpopo river. For the first time we now get evidence of people's activities derived from material other than stone tools. Ostrich eggshell beads, ground bone arrowheads, small bored stones and wood fragments with incised markings are traditionally linked with the LSA. They were also well known for giving expression to their complex religious beliefs in rock art, which can be found in any number of sites in the area.

Recently, Eastwood and Cnoops (1999) did an intensive survey of rock art sites in the confluence area, on both sides of the border. They identified close to 150 sites containing rock art.

6.2.2 Iron Age

Iron Age people started to settle in southern Africa c. AD 300, with one of the oldest known sites at just to the west of the tunnels at Wylies Poort, dating to c. AD 400. By AD 800 people were occupying a number of villages in the Limpopo River valley and, with the East Coast trade, populations rapidly expanded. This resulted in the development of kingdoms that ruled over large tracts of land. However, drought and changes in the trade patterns, forced these people by AD 1250 to abandon these areas, some moving north, other south (Huffman 2005, Huffman & Hanisch 1987; Calabrese 2005).

During this period trade flourished in the area, with gold and ivory being exchanged for glass beads, porcelain and cloth.

The occupation of the larger geographical area did not start much before the 1500s. By the 16th century things changed, with the climate becoming warmer and wetter, creating condition that allowed Late Iron Age (LIA) farmers to occupy areas previously unsuitable. Population movements, competition for resources, etc. created tensions amongst different groups and people were forced to congregate into large towns for defensive purposes. These stone-walled villages were almost always located near cultivatable soil and a source of water (Loubser 1991).

6.2.3 Historic period

Whites moved into the area, first as hunters, traders and missionaries, with settlers following closely on their heels. One of the first white settlements was located to the west of Louis Trichardt. Over time, farms were surveyed and new towns were laid out.

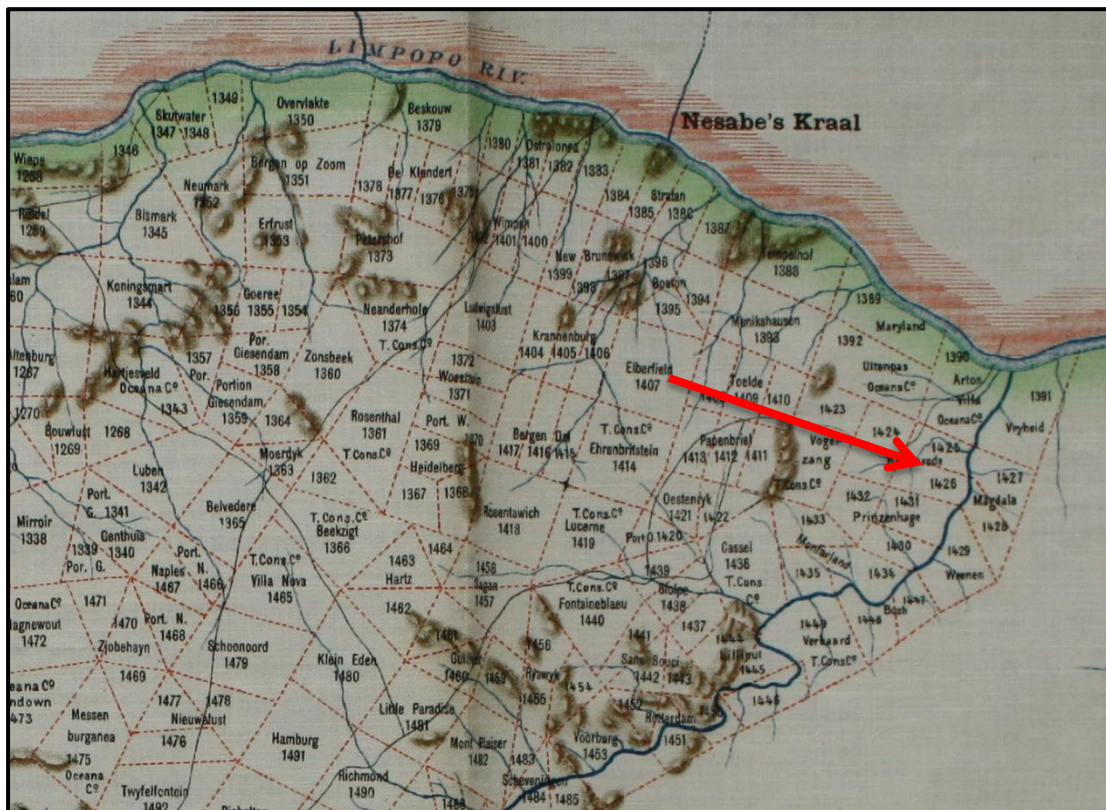


Fig. 6. Jeppe's map of 1899, showing the farm Berkenrode.

The copper deposits in the Musina area were investigated in 1903 by Colonel John P Grenfell, who then set about to establish the Messina (Transvaal) Development Company Limited to exploit the copper deposits. Most of the deposits were revealed by investigating the ancient workings, although many new sources were also identified. The town of Messina (renamed Musina in 2002) was founded in 1904 on the farm Berkenrode, as a result of the exploitation of the copper deposits. It was proclaimed as town in 1957 (Hammerbeck & Schoeman 1976:143; Raper 2004:238).

Originally traffic participating in this northwards expansion used a more westerly route, thereby by-passing the need to trek across the Soutpansberg. The border crossing, at that time was at Rhodes Drift. The current road bridge on the farm Tempelhof (Beit Bridge) was opened only in 1928, indicating that the border crossing facility dates to that period (SESA 1970:269).

The railway line from Louis Trichardt to Musina, via Waterpoort was completed in 1914 and extended to Beit Bridge by 1929, corresponding with the construction of the road bridge. It was only as late as 1974 that it was extended northwards to Harare in Zimbabwe and the more westerly route through Botswana, originally constructed in the 1890s, was used until then.

6.3 Identified sites

The following sites, features and objects of cultural significance were identified in the study area:

6.3.1 Stone Age

- No sites, features or objects dating to the Stone Age were identified in the study area.

6.3.2 Iron Age

- No sites, features or objects dating to the Iron Age were identified in the study area.

6.3.3 Historic period

- No sites, features or objects dating to the historic period were identified in the study area.

7. SITE SIGNIFICANCE AND ASSESSMENT

7.1 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.

7.2 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.

Table 1. Summary of identified heritage resources in the study area.

Identified heritage resources	
<i>Category, according to NHRA</i>	<i>Identification/Description</i>
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

7.3 Impact assessment

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

- 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.

8. 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.

The cultural landscape qualities of the region essentially consist of a rural setup. In this the human occupation is made up of a pre-colonial element consisting of Stone Age and Iron Age occupation, as well as a much later colonial (farmer) component. This was soon followed by the development of an urban centre, which not only served the surrounding farming communities, but also the copper mining activities that developed in the region.

- 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.

9. REFERENCES

9.1 Data bases

Chief Surveyor General
Environmental Potential Atlas, Department of Environmental Affairs and Tourism.
Heritage Atlas Database, Pretoria.
National Archives of South Africa

9.2 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.

Calabrese, J.A. 2005. *Ethnicity, class and polity: the emergence of social and political complexity in the Shashi-Limpopo valley of Southern Africa, AD 900 to 1300*. Unpublished PhD thesis. Johannesburg: University of the Witwatersrand.

Eastwood, E.B. & Cnoops, C. 1999. Results of the Limpopo-Shashi Confluence area rock art study. 2 Vols. Louis Trichardt: Palaeo-Art Field Services.

Hammerbeck, E.C.I. & Schoeman, J.J. 1976. Copper. In Coetzee, C.B. (ed.). *Mineral resources of the Republic of South Africa*. Handbook 7, Geological Survey. Pretoria: Government Printer. Pp. 125-146.

Hanisch, E.O.M. 1980. *An archaeological interpretation of certain Iron Age sites in the Limpopo/Shashi Valley*. Unpublished MA dissertation. Pretoria: University of Pretoria.

Holm, S.E. 1966. *Bibliography of South African Pre- and Protohistoric archaeology*. Pretoria: J.L. van Schaik.

Huffman, T.N. 2005. *Mapungubwe: ancient African Civilization on the Limpopo*. Johannesburg: Wits University Press.

Huffman, T.N. 2007. *Handbook to the Iron Age*. Scottsville: University of KwaZulu-Natal Press

Huffman, T. & Hanisch, E.O.M. 1987. Settlement hierarchies in the Northern Transvaal: Zimbabwe ruins and Venda history. *African Studies* 46(1):79-116.

Jeppe, F. 1899. *Jeppe's map of the Transvaal or South African Republic*. Pretoria: Surveyor General.

Kuman, K, Gibbon, R, Kempson, H, Langejans, G, Le Baron, J, Pollarolo, L & Suttin, M. 2005. Stone Age signatures in northernmost South Africa: early archaeology in the Mapungubwe National Park and vicinity. In d'Errico, F. & Backwell, L. (eds.) 2005. *From tools to symbols: from Early Hominids to Modern Humans*. Johannesburg: Witwatersrand University Press.

Loubser, J.H.N. 1991. The Ethnoarchaeology of Venda-speakers in South Africa. *Navorsinge van die Nasionale Museum, Bloemfontein* 7(8):145-464.

Raper, P.E. 2004. South African place names. Johannesburg: Jonathan Ball Publishers.
Thackeray, A.I. 1992. The Middle Stone Age south of the Limpopo River. *Journal of World Prehistory* 6(4):385-440.

Thackeray, A.I. 1992. The Middle Stone Age south of the Limpopo River. *Journal of World Prehistory* 6(4):385-440.

Van Ewyk, J.F. 1987. *The Prehistory of an Iron Age site on Skutwater*. Unpublished MA thesis. Pretoria: University of Pretoria

Van Warmelo, N.J. 1935. *A Preliminary survey of the Bantu Tribes of South Africa*. Ethnological Publications No. 5. Pretoria: Government Printer.

Van Warmelo, N.J. 1940. *The Copper Miners of Musina and the early history of the Zoutpansberg*. Ethnological Publications III. Pretoria: Government Printer.

9.3 Maps and aerial photographs

1: 50 000 Topocadastral maps: 2330AA

Google Earth

APPENDIX 1: CONVENTIONS USED TO ASSESS THE SIGNIFICANCE OF 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			

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: SPECIALIST COMPETENCYJohan (Johnny) van Schalkwyk

J A van Schalkwyk, D Litt et Phil, heritage consultant, has been working in the field of heritage management for more than 30 years. Based at the National Museum of Cultural History, Pretoria, he has actively done research in the fields of anthropology, archaeology, museology, tourism and impact assessment. This work was done in Limpopo Province, Gauteng, Mpumalanga, North West Province, Eastern Cape, Northern Cape, Botswana, Zimbabwe, Malawi, Lesotho and Swaziland. Based on this work, he has curated various exhibitions at different museums and has published more than 60 papers, many in scientifically accredited journals. During this period he has done more than 2000 impact assessments (archaeological, anthropological, historical and social) for various government departments and developers. Projects include environmental management frameworks, road-, pipeline-, and power line developments, dams, mining, water purification works, historical landscapes, refuse dumps and urban developments.