

# PHASE ONE HERITAGE IMPACT ASSESSMENT OF THE PROPOSED NTUKWINI ACCESS ROAD AND STRUCTURE ON LOCAL ROAD L2722 NEAR DUNDEE, KWAZULU-NATAL



## **ACTIVE HERITAGE cc.**

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## LIST OF ABBREVIATIONS AND ACRONYMS

EIA	Early Iron Age
ESA	Early Stone Age
HISTORIC PERIOD	Since the arrival of the white settlers - c. AD 1820 in this part of the country
IRON AGE	Early Iron Age AD 200 - AD 1000 Late Iron Age AD 1000 - AD 1830
LIA	Late Iron Age
LSA	Late Stone Age
MSA	Middle Stone Age
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998 and associated regulations (2006).
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999) and associated regulations (2000)
SAHRA	South African Heritage Resources Agency
STONE AGE	Early Stone Age 2 000 000 - 250 000 BP Middle Stone Age 250 000 - 25 000 BP Late Stone Age 30 000 - until c. AD 200

## EXECUTIVE SUMMARY

A first phase heritage survey of the proposed Ntukwini Access Road and Structure on Local Road L2722 near Dundee, KwaZulu-Natal identified no heritage sites or features on the footprint. There are no known paleontological reason why the development may not proceed. The area is also not part of any known cultural landscape. There is therefore no reason, from a heritage perspective, why the proposed development may not proceed as planned. However, attention is drawn to the South African Heritage Resources Act, 1999 (Act No. 25 of 1999) and the KwaZulu-Natal Heritage Act (Act no 4 of 2008) which, requires that operations that expose additional archaeological, historical or paleontological remains should cease immediately, pending evaluation by the provincial heritage agency.

## 1 BACKGROUND INFORMATION ON THE PROJECT

**Table 1. Background information**

Consultant:	Frans Prins (Active Heritage cc) for Hanslab (Pty) Ltd
Type of development:	The KZN Department of Transport (DOT) proposes to upgrade the existing access road to a type 7A gravel road approximately 1.111 km in length and 6 m in width that conforms to DOT standards. The existing road will be upgraded in one of Dundee villages off D1268 on local road L2722 (Fig 1). The road transverses a watercourse, therefore, DOT proposes to place two 600 mm pipe culvert structures
Rezoning or subdivision:	Rezoning
Terms of reference	To carry out a Heritage Impact Assessment
Legislative requirements:	The Heritage Impact Assessment was carried out in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and following the requirements of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) and the KwaZulu-Natal Heritage Act, 1997 (Act No. 4 of 2008)

### 1.1. Details of the area surveyed:

The project area is located approximately 30km to the north of Greytown and 76 km to the south of Dundee in the Tugela River Valley (Fig). It is situated within the Amajuba District Municipality. The proposed construction of an access road from a mud track to a gravel road 6 m in width, and a length of 1.111 km. The existing road will be upgraded in one of the rural villages off the D1268 on local road L2722 (Figs 2 & 3). The road will be upgraded on an existing track, which has become prone to erosion and inundated during periods of high rainfall (Fig 4). Based on DOT standard details two 600 mm pipe culverts will be placed in the watercourse. The coordinates of the proposed road upgrade are as follows:

**Starting point of the activity:** 28°49'18.49" S 30°34'30.50" E

**Middle/Additional point of the activity:** 28°49'30.88" S 30°34'42.30" E

**End point of the activity:** 28°49'43.83" S 30°34'48.41" E

### BACKGROUND TO ARCHAEOLOGICAL HISTORY OF AREA

The archaeological history of the Province of KwaZulu-Natal (KZN) dates back to about 2 million years and possibly older, which marks the beginning of the Stone Age. The Stone Age in KZN was extensively researched by Professor Oliver Davies formerly of the Natal Museum. The Stone Age period has been divided into three periods namely: Early Stone Age (ESA) dating between 2 million years ago to about 200 000 years ago, Middle Stone Age (MSA) dating between 200 000 years ago to about 30 000 years ago, and the Later Stone Age (LSA) which dates from 30 000 to about 2 000 year ago. The Stone Age period ends around approximately 2 000 years ago when Bantu speaking Age farmers from the north arrived in southern Africa. The Iron Age is also divided into three periods, namely: Early Iron Age (EIA) dating between AD 200 and AD 900, Middle Iron Age (MIA) dating between AD 900 and AD 1300, Late Iron Age (LIA) dating between AD 1 300 and 1 820.

## **2.1 Stone Age**

### **2.1.1 Early Stone Age (ESA)**

The ESA is considered as the beginning of the stone tool technology. It dates back to over 2 million years ago until 200 000 years ago. This period is characterised by Oldowan and Acheulean industries. The Oldowan Industry, dating to approximately between over 2 million years and 1.7 million years predates the later Acheulean. The Oldowan Industry consists of very simple, crudely made core tools from which flakes are struck a couple of times. To date, there is no consensus amongst archaeologists as to which hominid species manufactured these artefacts. The Acheulean Industry lasted from about 1.7 million years until 200 thousand years ago. Acheulean tools were more specialized tools than those of the earlier industry. They were shaped intentionally to carry out specific tasks such as hacking and bashing to remove limbs from animals and marrow from bone. These duties were performed using the large sharp pointed artefacts known as hand axes. Cleavers, with their sharp, flat cutting edges were used to carry out more heavy duty butchering activities (Esterhuysen, 2007). The ESA technology lasted for a very long time, from early to middle Pleistocene and thus seems to have been sufficient to meet the needs of early hominids and their ancestors. Although not identified on the footprint, ESA tools occurrence have been reported in other sites in KZN. Apart from stone artefacts, the ESA sites in this Province have produced very little as regards other archaeological remains. This has made it difficult to make inferences pointing to economical dynamics of the ESA people in this part of the world. The diet of ESA peoples has therefore had to be reconstructed on the basis of evidence from elsewhere that it comprised primarily of animal and plant foods (Mazel 1989).

### **2.1.2 Middle Stone Age (MSA)**

The MSA dates to between 200 000 and 30 000 years ago, coinciding with the emergence of modern humans. The MSA technology is therefore believed to have been manufactured by fully modern humans known as *Homo sapiens* who emerged around 250 000 years ago. While some of the sites belonging to this time period occur in similar contexts as those of ESA, most of the MSA sites are located in rock shelters.

Palaeoenvironmental data suggest that the distribution of MSA sites in the high lying Drakensberg and surrounding areas was influenced by the climate conditions, specifically the amount and duration of snow (Carter, 1976). In general, the MSA stone tools are smaller than those of the ESA. Although some MSA tools are made from

prepared cores, the majority of MSA flakes are rather irregular and are probably waste material from knapping exercises. A variety of MSA tools include blades, flakes, scrapers and pointed tools that may have been hafted onto shafts or handles and used as spearheads. Between 70 000 and 60 000 years ago new tool types appear known as segments and trapezoids. These tool types are referred to as backed tools from the method of preparation. Residue analyses on the backed tools from South African MSA sites including those in KZN indicate that these tools were certainly used as spear heads and perhaps even arrow points (Wadley, 2007). A few sites with impressive MSA deposits have been excavated in KZN. Perhaps the best known ones are Sibudu Cave and Umhlatuzana Cave to the south of the study area, and Border Cave to the north of the study area. All these sites provided impressive evidence for fine resolution data and detailed stratigraphy (Wadley & Jacobs, 2006).

### **2.1.3 Late Stone Age (LSA)**

Compared to the earlier MSA and ESA, more is known about the LSA which dates from around 30 000 to 2 000 (possibly later) years ago. This is because LSA sites are more recent than ESA and MSA sites and therefore achieve better preservation of a greater variety of organic archaeological material. The Later Stone Age is usually associated with the San (Bushmen) or their direct ancestors. The tools during this period were even smaller and more diverse than those of the preceding Middle Stone Age period. LSA tool technology is observed to display rapid stylistic change compared to the slower pace in the MSA. The rapidity is more evident during the last 10 000 years. The LSA tool sequence includes informal small blade tradition from about 22 000 – 12 000 years ago, a scraper and adze-rich industry between 12 000 – 8 000 years ago, a backed tool and small scraper industry between 8 000 – 4 000 years and ending with a variable set of other industries thereafter (Wadley, 2007). Adzes are thought to be wood working tools and may have also been used to make digging sticks and handles for tools. Scrapers are tools that are thought to have been used to prepare hides for clothing and manufacture of other leather items. Backed tools may have been used for cutting as well as tips for arrows. It was also during Later Stone Age times that the bow and arrow was introduced into southern Africa – perhaps around 20 000 years ago. Because of the bow and arrow and the use of traps and snares, Later Stone Age people were far more efficient in exploiting their natural environment than Middle Stone Age people. Up until 2 000 years ago Later Stone Age people dominated the southern African landscape. However, shortly after 2 000 years ago the first Khoi herders and Bantu-speaking agro pastoralists immigrated into

southern Africa from the north. This led to major demographic changes in the population distribution of the subcontinent. San hunter-gatherers were either assimilated or moved off to more marginal environments such as the Kalahari Desert or some mountain ranges unsuitable for small-scale subsistence farming and herding. The San in the coastal areas of KZN were the first to have been displaced by incoming African agro pastoralists. However, some independent groups continue to practice their hunter gatherer lifestyle in the foothills of the Drakensberg until the period of white colonisation around the 1840's (Wright & Mazel, 2007). According to the KwaZulu-Natal Museum archaeological database Later Stone Age sites have been located in the Tugela River in the past but these are mostly restricted to surface scatters. Also dating to the LSA period is the impressive Rock Art found on cave walls and rock faces. Rock Art can be in the form of rock paintings or rock engravings. The province of KZN is renowned for the prolific San rock painting sites concentrated in the Drakensberg. Rock art sites do occur outside the Drakensberg including Zululand, however, these sites have not been afforded similar research attention as those sites occurring in the Drakensberg. However, there are no rock art sites found within the immediate vicinity of study area, which may be due to the lack of the suitable geology.

## **2.2 Iron Age**

### **2.2.1 Early Iron Age (EIA)**

Unlike the Stone Age people whose life styles were arguably egalitarian, Iron Age people led quite complex life styles. Their way of life of greater dependence on agriculture necessitated more sedentary settlements. They cultivated crops and kept domestic animals such as cattle, sheep, goats and dogs. Pottery production is also an important feature of Iron Age communities. Iron smelting was practised quite significantly by Iron Age society as they had to produce iron implements for agricultural use. However no smelting sites were discovered in the study area as it is the northern KZN that is rich in abandoned iron smelting sites (Maggs, 1989). Although Iron Age people occasionally hunted and gathered wild plants and shellfish, the bulk of their diet consisted of the crops they cultivated as well as the meat of the animals they kept. EIA villages were relatively large settlements strategically located in valleys beside rivers to take advantage of the fertile alluvial soils for growing crops (Maggs, 1989). The EIA sites in KZN date to around AD 500 to AD 900. Extensive research in the province of this period led to it being divided in the following time lines according to ceramic styles (Maggs, 1989; Huffman 2007):

\_ Msuluzi (AD 500);



- \_ Ndondondwane (AD 700 – 800);
- \_ Ntshekane (AD 800 – 900).

The archaeological data base of the KwaZulu-Natal Museum indicates that ten Early Iron Age sites occur in the immediate vicinity of the study area. The well-known and researched site of Ndondondwane (Van Schalkwyk et al 1997) occurs approximately 20km upstream from the project area. Other well-known Early Iron Age sites such as Mamba (Van Schalkwyk 1994a), and Woshi (Van Schalkwyk 1994b) occurs within 24km's from the project area on the banks of the Tugela River.

### **2.2.2 Late Iron Age (LIA)**

The LIA is not only distinguished from the EIA by greater regional diversity of pottery styles but is also marked by extensive stone wall settlements. However, in this part of the world, stone walls were not common as the Nguni people used thatch and wood to build their houses. This explains the failure to obtain sites from the aerial photograph investigation of the study area. Trade played a major role in the economy of LIA societies. Goods were traded locally and over long distances. The main trade goods included metal, salt, grain, cattle and thatch. This led to the establishment of economically driven centres and the growth of trade wealth. Keeping of domestic animals, metal work and the cultivation of crops continued with a change in the organisation of economic activities. Evidence for this stems from the fact that iron smelting evidence was not found in almost every settlement (Maggs, 1989; Huffman 2007).

### **2.3 Historic Period**

Oral tradition is the basis of the evidence of historical events that took place before history could be recorded. This kind of evidence becomes even more reliable in cases where archaeology could be utilised to back up the oral records. Sources of evidence for socio political organization during the mid-eighteenth to early nineteenth century in the study area and the larger former Natal Province suggest that the people here existed in numerous small-scale political units of different sizes, population numbers and political structures (Wright & Hamilton, 1989). This period was largely characterised by rage and instability as political skirmishes broke due to the thirst for power and resources between chiefdoms. During the 2nd half of the eighteenth century, stronger chiefdoms and paramuncies emerged. However, these were not fully grown states as there was no proper formal central political body established. This changed in the 1780's when a shift towards a more centralized political state occurred.

This shift was mainly characterized by population growth and geographical expansion of states. The most important and largest and strongest states at the time were the Mabhudu, Ndwandwe and Mthethwa. However, other smaller states, also established themselves in the greater Tugela Region. These included in the south the Qwabe, Bhaca, Mbo, Hlubi, Bhele, Ngwane and many others (Wright & Hamilton, 1989). The Zulu kingdom, established by King Shaka however remained the most powerful in the region in the early years of the 19th century. Shaka fought ruthlessly and often defeated his rivals and conquered their cattle, wives and even burnt their villages.

These wars are often referred to as Difaqane and this period was characterised by rage and blood shedding. Shaka was assassinated in 1828 at which time he had transformed the nature of the society in the Natal and Zululand regions. He was succeeded by Dingane (Wright & Hamilton, 1989). Dutch farmers unhappy with the British rule in Cape Town decided to explore into the interior of the country, away from British rule. Some groups remained in the Eastern Cape, others kept going and a few settled in the Orange Free State and the Transvaal. A great number, led by Piet Retief and Gerrit Maritz, crossed the Drakensberg into Natal.

Here they encountered the Zulus who lured them into a trap and brutally massacred many of them. This was only one of the many failures of the white settler expeditions in the frontier areas and when the shocking news reached the Cape, more groups were sent to the interior to revenge. A series of battles were fought but the most notable was the Battle of Blood River in 1838 where the Boers defeated the Zulus. This ended the Zulu threat to the white settlers and a permanent and formal settlement in Natal was established. However the Zulu kingdom remained independent for a couple of decades. The Republic of Natalia was annexed by the British in 1845 and in 1879 the Zulu kingdom was also invaded (Wright & Hamilton, 1989). The Anglo-Zulu War has been well recorded and an important occurrence took place at Keates Drift and Jamesons Drift, near the project area, when a few British soldiers attempted to cross the Tugela River after their defeat at the battle of Isandlwana. Although no relicts or artefacts survive from this encounter the surrounding landscape is still imbued with the meaning of this important period in the colonial history of KwaZulu-Natal. The Bambata Rebellion of 1906 saw various incidents in the close vicinity of the project area. The most significant is perhaps the Bambata Rock Ambush that occurred approximately 20 km from the project area.

## **2 BACKGROUND INFORMATION OF THE SURVEY**

### **2.1 Methodology**

A desktop study was conducted of the archaeological databases housed in the KwaZulu-Natal Museum. The SAHRIS website was consulted for previous heritage surveys and heritage site data covering the project area. In addition, the available archaeological and heritage literature covering the greater Tugela Valley area was also consulted.

A ground survey, following standard and accepted archaeological procedures, was conducted on the 18th July 2015.

### **2.2 Restrictions encountered during the survey**

#### **2.2.1 Visibility**

Visibility was good.

#### **2.2.2 Disturbance**

No disturbance of any potential heritage features was noted.

### **2.3 Details of equipment used in the survey**

GPS: Garmin Etrek

Digital cameras: Canon Powershot A460

All readings were taken using the GPS. Accuracy was to a level of 5 m.

## **3 DESCRIPTION OF SITES AND MATERIAL OBSERVED**

### **3.1 Locational data**

Province: KwaZulu-Natal

Municipality: Amajuba District Municipality

Towns: Greytown & Dundee

### 3.2 Description of the general area surveyed

No formal archaeological or other heritage sites were located on the footprint. Most of the known archaeological sites in the area occur adjacent to the Tugela River more than 6km to the north of the footprint. Although rural homesteads (Fig 5) are situated adjacent to portions of the proposed road upgrade none have associated graves that could be compromised by the development. Those graves noticed were all situated more than 50m from the proposed road upgrade. The area is not part of any known cultural landscape. The paleontological desktop assessment of the area also suggests that development may proceed as planned (Appendix 1).

## 4 STATEMENT OF SIGNIFICANCE (HERITAGE VALUE)

### 4.1 Field Rating

Not applicable as no heritage sites occur on the footprint.

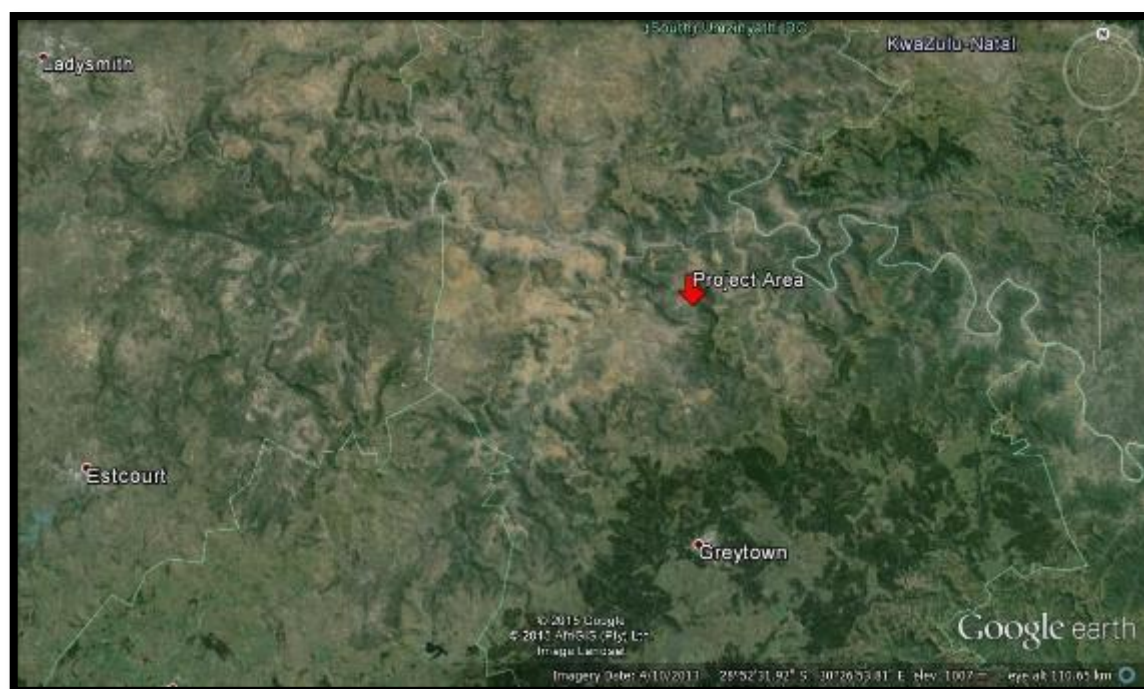
**Table 2. Field rating and recommended grading of sites (SAHRA 2005)**

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

## 5 RECOMMENDATIONS

The proposed development of the proposed Ntukwini Access Road and Structure on Local Road L2722 near Dundee, KwaZulu-Natal identified no heritage sites or features on the footprint. Although graves occur in the general area none of them occur closer than 50m to the proposed road upgrade. In addition, there are no known paleontological reasons why the development may not proceed. The area is also not part of any known cultural landscape. There is therefore no reason, from a heritage perspective, why the proposed development may not proceed as planned. However, attention is drawn to the South African Heritage Resources Act, 1999 (Act No. 25 of 1999) and the KwaZulu-Natal Heritage Act (Act no 4 of 2008) which, requires that operations that expose additional archaeological, historical or paleontological remains should cease immediately, pending evaluation by the provincial heritage agency.

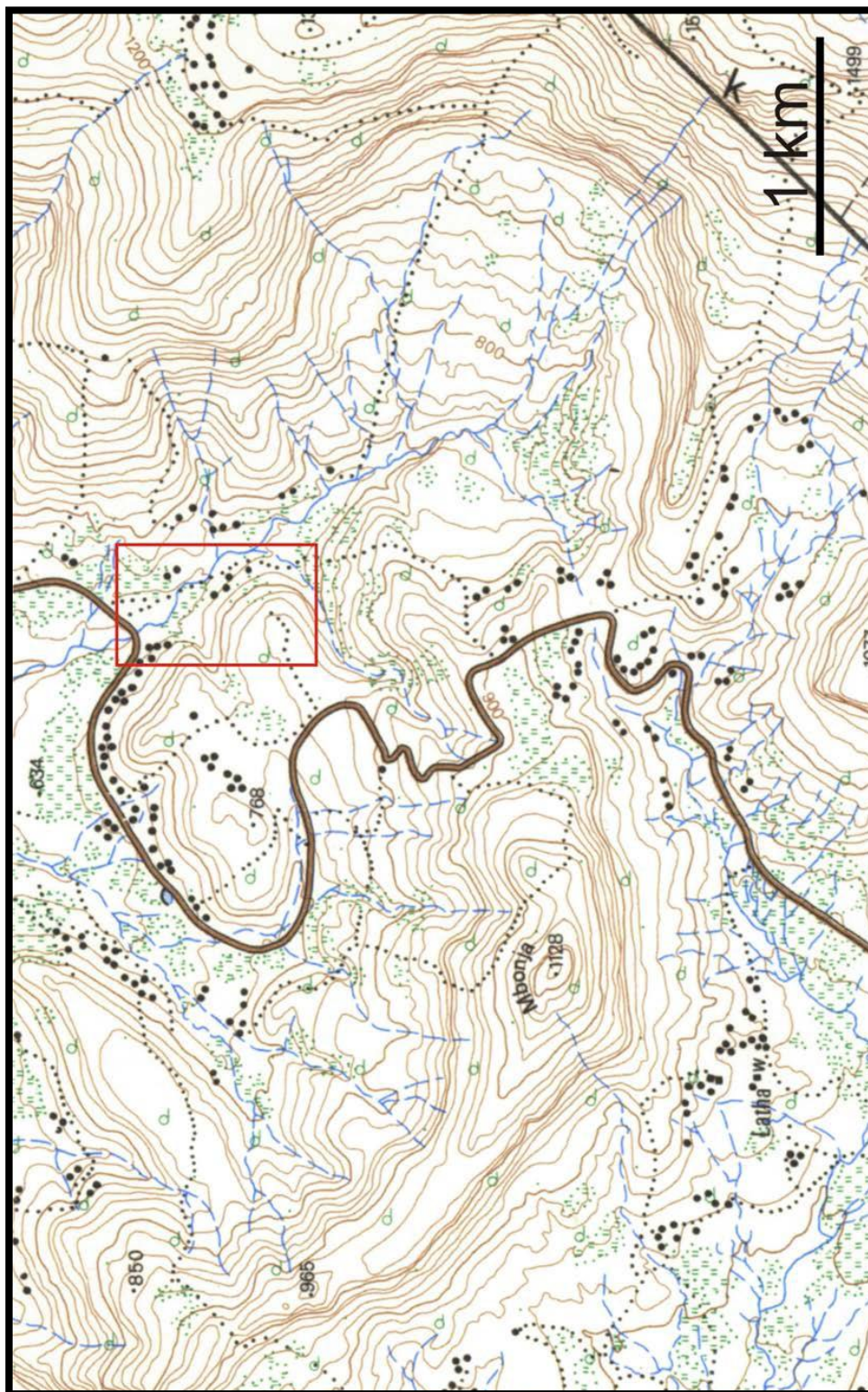
## 6 MAPS AND FIGURES



**Figure 1. Google aerial photograph showing the location of the Project Area in KwaZulu-Natal.**



**Figure 2. Google aerial photograph showing the location of the proposed Ntukwini Access Road Upgrade.**



**Figure 3. 1:50 000 Topographical Map of the Project Area.**



***Figure 4. The existing road that is geared for an upgrade***





***Figure 5. Although rural homesteads are situated adjacent to the proposed Access Road none of them have any associated graves.***

## 7 REFERENCES

Bryant, A. T. 1965. *Olden times in Zululand and Natal*. Cape Town: C. Struik.

Derwent, S. 2006. *KwaZulu-Natal Heritage Sites: A Guide to Some Great Places*. David Phillips: Cape Town

Huffman, T. N. 2007. *Handbook to the Iron Age: The Archaeology of Pre-colonial Farming Societies in Southern Africa*. University of KwaZulu-Natal Press. Pietermaritzburg.

Maggs, T. The Iron Age farming communities. In Duminy, A. and Guest, B. 1989. *Natal and Zululand: from Earliest Times to 1910. A New History*. Pg. 28-46. University of Natal Press. Pietermaritzburg.

Mitchell, P. 2002. *The Archaeology of Southern Africa*. Cambridge University Press: Cambridge

SAHRA, 2005. *Minimum Standards For The Archaeological And The Palaeontological Components Of Impact Assessment Reports, Draft version 1.4*.

## **Appendix 1**

### **Palaeontological Desktop Assessment of the Ntukwini access road and structure on local road L2722 near Dundee, KZN Province.**

Report prepared by  
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## **Executive Summary**

A desktop palaeontological impact assessment was conducted for the upgrading of an existing 1.111 km – long access road and structure off D1268 on local road L2722. The affected area is underlain by Ecca Group sediments represented by the lowermost (early Permian) Pietermaritzburg Formation. It is expected that the proposed development will impact on Ecca Group sedimentary bedrock (Pietrmaritzburg Formation ) and geologically recent superficial sediments (alluvium, residual soils). Potential palaeontological impact resulting from this particular development is considered low. The study area is assigned a site rating of General Protection C (GP C).<sup>3</sup>

## Introduction

A desktop heritage impact assessment was conducted for an upgrading by the KZN Department of Transport (DOT), of an existing access road to a type 7A gravel road approximately 1.111 km in length and 6 m in width that conforms to DOT standards. The existing road will be upgraded in one of Dundee villages off D1268 on local road L2722 (**Fig. 1**).

## Methodology

The affected area was evaluated on the basis of existing field data, geological maps and published literature. The study area is rated according to field rating categories as prescribed by SAHRA (**Table 1**).

## Locality data

1 : 50 000 scale topographic map: 2830DC Nadi

1 : 250 000 scale geological map 2830 Dundee

Approximate site coordinates (**Fig. 2**): 28°49'18.78"S 30°34'30.42"E to 28°49'40.05"S 30°34'45.25"E.

## Geology and Paleontological Background

The study area is underlain by Ecca Group sediments represented by dark, silty mudrocks of the lowermost (early Permian) Pietermaritzburg Formation (Lindstrom 1987; Johnson 2006) (**Fig. 2**). The succession comprises thinly laminated, carbonaceous siltstone or shale (Lindstrom 1987). Sedimentary rocks in the region are intruded by Jurassic dolerites (Karoo Dolerite Suite) and are capped by younger, unconsolidated Quaternary formations of the Maputland Group.

The Pietermaritzburg Formation is generally considered to be moderately sensitive in terms of paleontological heritage (**Fig. 3**). It is by and large barren, although trace fossils have been recorded from the upper layers of the formation by Lindstrom (1987). Dolerites in the form of dykes and sills are common in the region and are not palaeontologically significant. Younger and localized fossil-rich alluvial exposures, assigned to the Quaternary Cornelia Formation, are found about 200 km to north of Dundee. There is currently no record of Quaternary fossil remains or exposures from the area.

## Impact Statement and Recommendations

It is expected that the proposed development will impact on Ecca Group sedimentary bedrock (Pietmaritzburg Formation ) and geologically recent superficial sediments (alluvium, residual soils). Potential palaeontological impact resulting from this particular development is considered low. The study area is assigned a site rating of General Protection C (GP C).

## References

- Johnson, M.R. *et. al.* 2006. Sedimentary Rocks of the Karoo Supergroup. **In:** M.R. Johnson, *et. al.* (eds). *The Geology of South Africa*. Geological Society of South Africa.
- Linstrom W. 1987. The Geology of the Dundee Area. Explanation Sheet 2830 (1:250 000). Geological Survey of. South. Africa.5

## Tables and Figures

Table 1. Field rating as proposed by SAHRA

<b>Field Rating</b>	<b>Grade</b>	<b>Significance</b>	<b>Mitigation</b>
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



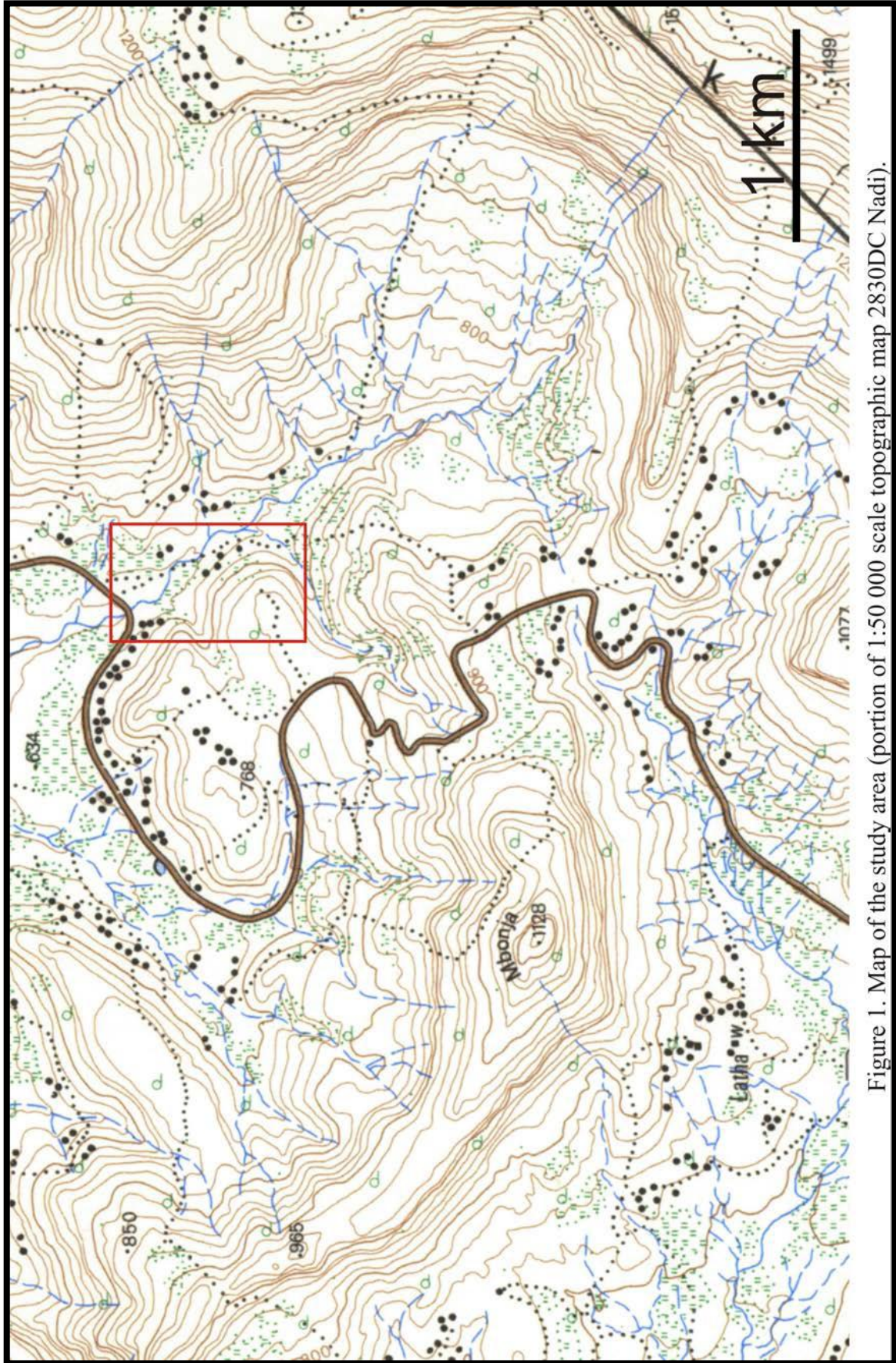


Figure 1. Map of the study area (portion of 1:50 000 scale topographic map 2830DC Nadi).



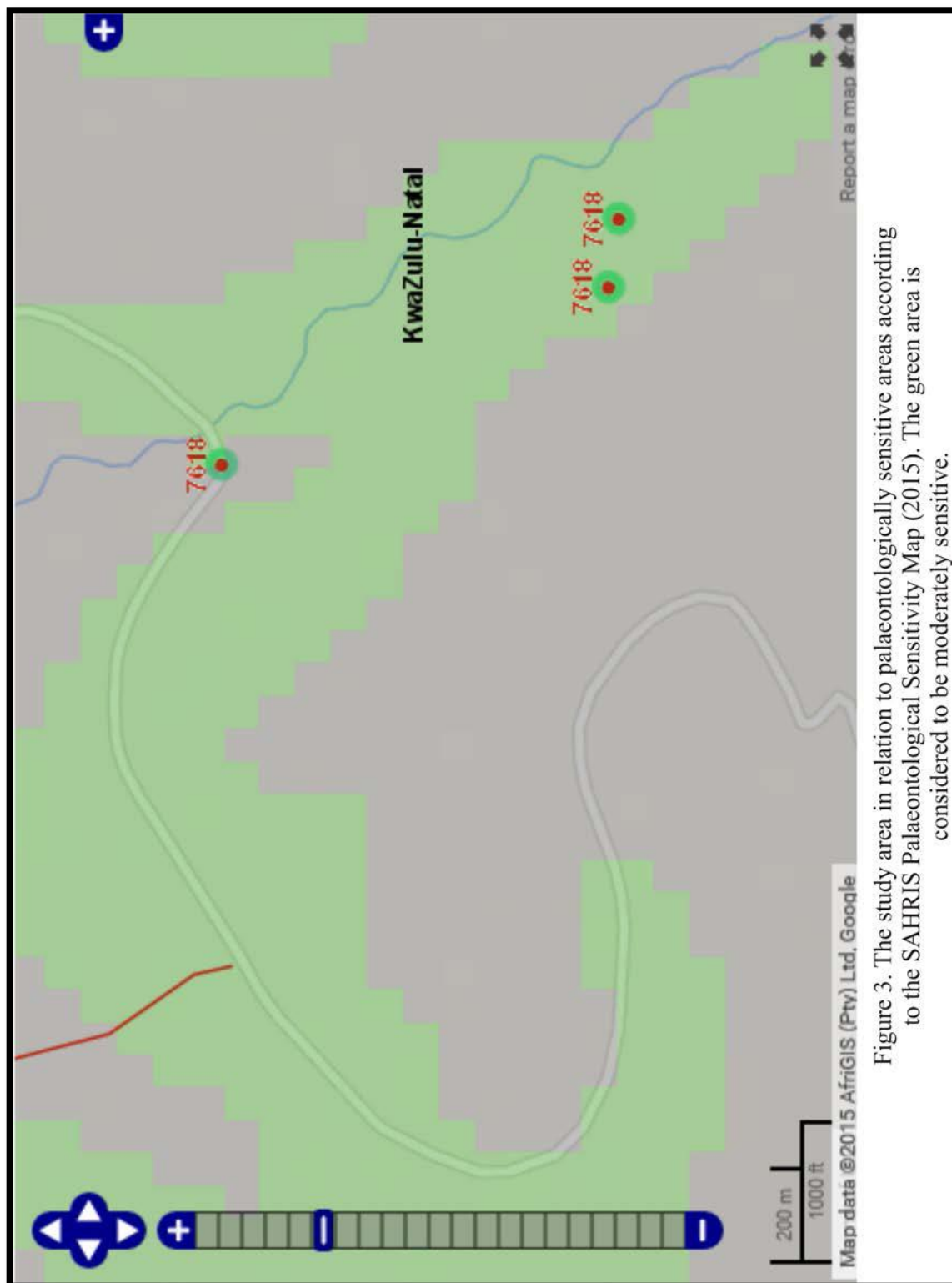


Figure 3. The study area in relation to palaeontologically sensitive areas according to the SAHRIS Palaeontological Sensitivity Map (2015). The green area is considered to be moderately sensitive.

