

**CULTURAL HERITAGE IMPACT ASSESSMENT
OF A SECTION OF THE NATIONAL ROUTE R61
BETWEEN UMTATHA AND QUEENSTOWN AND
ASSOCIATED QUARRY AND BORROW PITS,
EASTERN CAPE**



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April 2011

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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 (2010).
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 cultural heritage survey of the proposed R61 road upgrade and associated quarry and borrow pits in the Eastern Cape Province identified only one heritage site in direct association with the footprint. This heritage site consists of two graves that are probably not more than 100 years old. It is suggested that a phase 2 heritage impact assessment, including a possible grave relocation exercise, be conducted on this particular site before it is considered for any development. Alternatively, the site should be avoided and an alternative quarry site identified. Attention is drawn to the South African Heritage Resources Act, 1999 (Act No. 25 of 1999) which, requires that operations that expose archaeological or historical 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) for SRK
Type of development:	<ul style="list-style-type: none"> • New geometric alignment for a section of R61 road between Umtata and Queenstown • Construction of climbing lanes • Widening of the road reserve from 32m to 50m • Widening of the road from about 7.4m to about 12.4m • Upgrading of legal intersections to cater for turning lanes • Provision of pedestrian and informal trading facilities • Widening and upgrade of four bridges • Assessment of potential borrow pits associated with the R61 • Assessment of hard rock sources (quarry pits) for crushing of suitable building aggregates
Rezoning or subdivision:	na
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)

1.1. Details of the area surveyed:

The area surveyed consists of a section of the national road R61 between Umtata of Queenstown and its immediate environs where potential quarry and borrow pits have been identified (Fig 1). The rural town of Engcobo is centrally situated within the study area which covers a large portion of the Mzuka River valley (Figure 3) and the foothills of the Eastern Cape Drakensberg. With the exception of the town Engcobo the largest portion of the study area consists of communal land with rural homesteads and some exotic plantations along the mountain slopes. The R61 is the main route between Umtata and Queenstown. Most of the quarry and borrow pits are situated adjacent on in the near vicinity of the R61. The exception being Quarry pits 1 and 5 and 7 that are located more than 10km from the R61 (Fig 2).

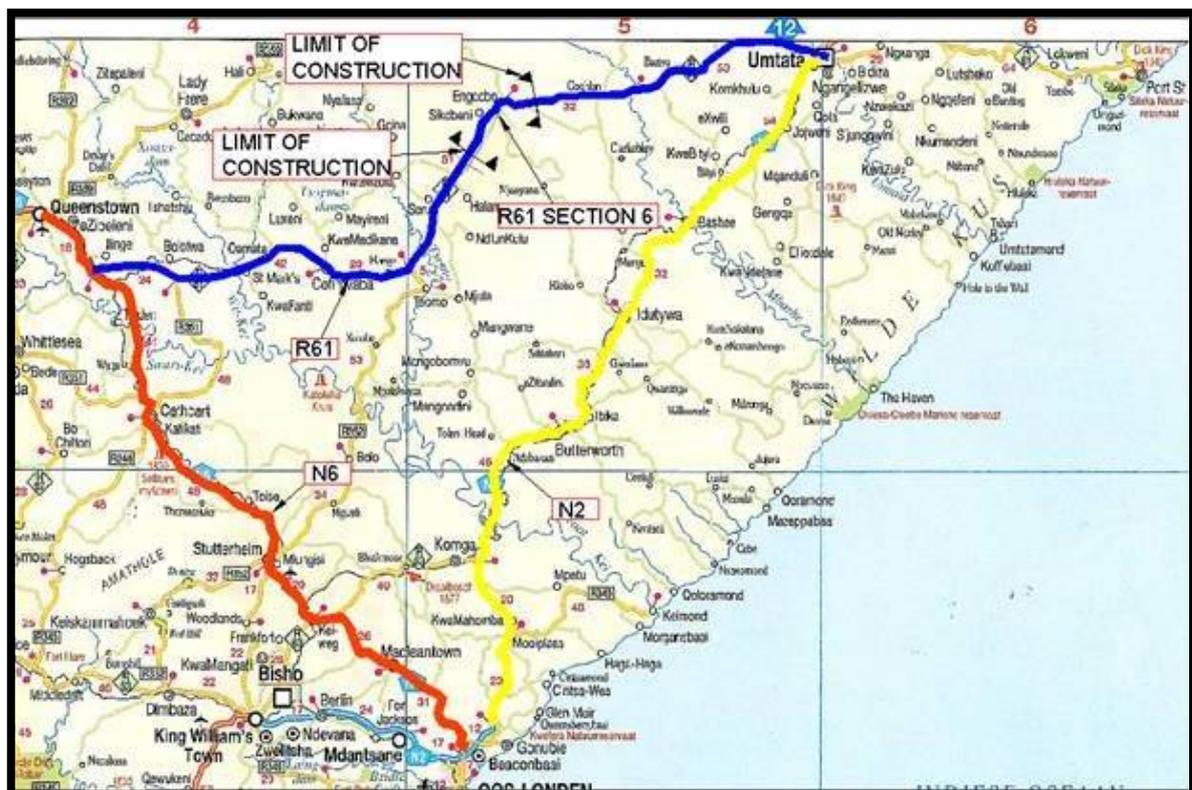


Figure 1. Map of study-area showing the section of the R61 that was surveyed.

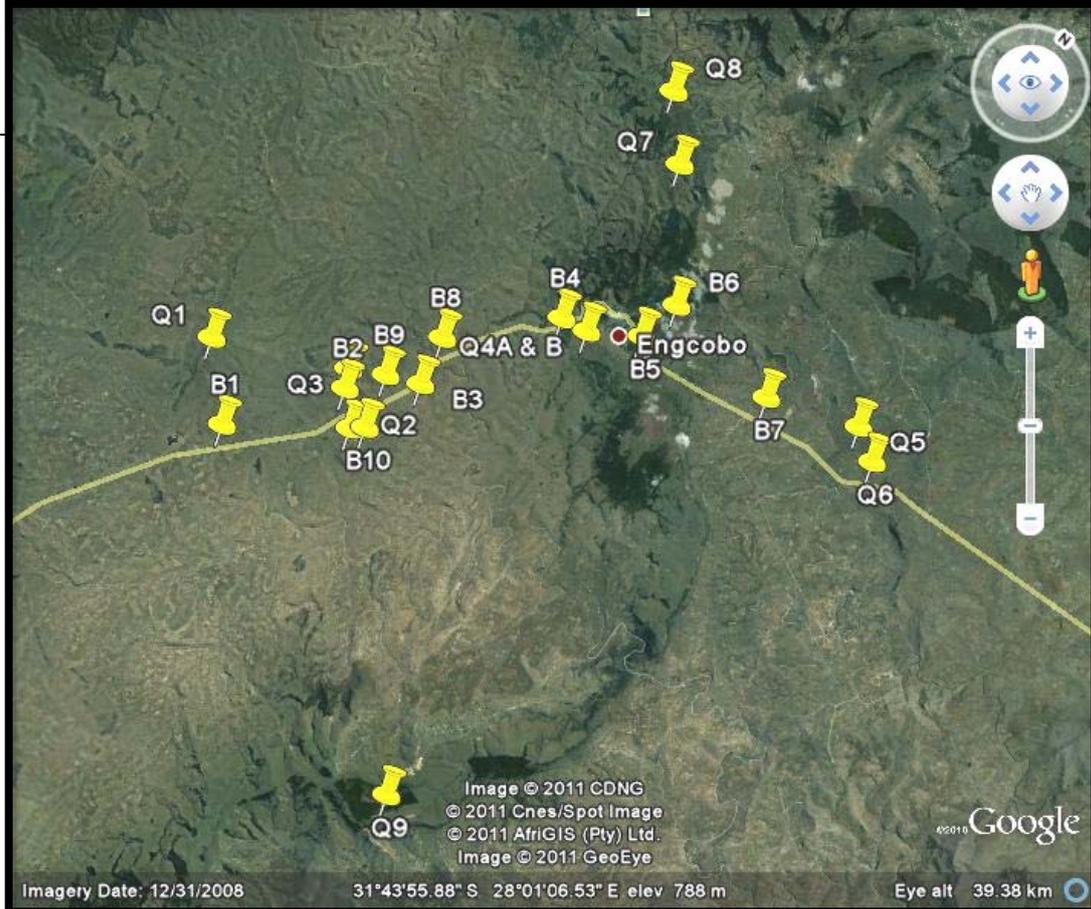


Figure 2. Google aerial photograph showing the distribution of the quarry and borrow pits in the study-area

1.2. Cultural Heritage legislation

According to Section 3 (2) of the NHRA, the heritage resources of South Africa include:

- a. places, buildings, structures and equipment of cultural significance;
- b. places to which oral traditions are attached or which are associated with living heritage;
- c. historical settlements and townscapes;
- d. landscapes and natural features of cultural significance;
- e. geological sites of scientific or cultural importance;
- f. archaeological and palaeontological sites;
- g. graves and burial grounds, including.
 - ancestral graves;
 - ii. royal graves and graves of traditional leaders;
 - iii. graves of victims of conflict;
 - iv. graves of individuals designated by the Minister by notice in the Gazette;
 - v. historical graves and cemeteries; and
 - vi. other human remains which are not covered in terms of the Human Tissue Act,

1983 (Act No. 65 of 1983);

- h. sites of significance relating to the history of slavery in South Africa;
- i. 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;
 - ii. objects to which oral traditions are attached or which are associated with living heritage;
 - iii. ethnographic art and objects;
 - iv. military objects;
 - v. objects of decorative or fine art;
 - vi. objects of scientific or technological interest; and
 - vii. 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).”

In terms of 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:

- “a. its importance in the community, or pattern of South Africa's history;
- b. its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- c. its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- d. its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- e. its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- f. its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- g. its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- h. 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
- i. sites of significance relating to the history of slavery in South Africa.”

2 BACKGROUND TO ARCHAEOLOGICAL HISTORY OF AREA

The archaeological history of the Province of the Eastern Cape Province dates back to about 2 million years and possibly older, which marks the beginning of the Stone Age. The Stone Age in the Eastern Cape Province was extensively researched by archaeologists attached to the Albany Museum in Grahamstown, the University of Stellenbosch, the then University of Transkei (UNITRA), Fort Hare University and more recently by rock art researchers attached to the Rock Art Research Institute at the University of the Witwatersrand. 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 Iron 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 the 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 study area, ESA tools

occurrence have been reported in other sites in the Transkei (Derricourt 1977: Feely 1987). Apart from stone artefacts, the ESA sites in the Transkei 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 (Mazel 1989).

2.1.2 Middle Stone Age (MSA)

The MSA dates to between 200 000 and 30 000 years ago, and is generally associated with the emergence of anatomically 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). Derricourt (1977) reported a few MSA sites in the Transkei and some sites investigated by Opperman (1987) in the 1970's and 1980's occur near Maclear directly to the north east of the project area.

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 extensive use 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 the study area were the first to have been displaced by incoming African agro-pastoralists. However, some independent and sometimes hybrid groups continue to practice their hunter-gatherer lifestyle in the foothills of the Drakensberg until the period of white colonialisation around the 1840's (Opperman 1987; Wright & Mazel, 2007; Mallen 2008; Henry 2010).

The renowned San rock paintings of the Drakensberg region also belongs to the Later Stone Age period although the majority were made between 4000 years ago and about 120 years ago. Rock Art can be in the form of rock paintings or rock engravings. The Eastern Province is renowned for the prolific San rock painting sites concentrated in the southern Drakensberg and adjacent areas (Blundell 2004; Mallen 2008; Henry 2010). These sites are the subject of ongoing research by post-graduate students of the Rock Art Research Institute, University of the Witwatersand. Recently researchers identified 3 new traditions/styles of rock art in the Eastern Cape Drakensberg (*ibid*). Derricourt (1977) reported 3 rock art sites in the greater Ngcobo district (Fig 3). These include paintings of wild ungulates such as eland and elephant as well contact period

imagery with depictions of early African agriculturists in contact with San hunter-gatherers.

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. 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; Huffman 2007). The EIA sites in the Eastern Cape Province dates back between AD 600 to AD 900. Based on extensive research on EIA sites in the eastern seaboard they can be divided along the following typological criteria and time lines according to ceramic styles (Maggs, 1989; Huffman 2007):

- _ Msuluzi (AD 500-700);
- _ Ndondondwane (AD 700 – 800);
- _ Ntshekane (AD 800 – 900).

However, no known Early Iron Age sites occur within the study area probably as the greater portion of this area is situated above the 1000m contour. The vast majority of Early Iron Age sites occur below the 1000m contour along areas in the large river valleys with a rainfall of less than 700mm a year.

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 (Derricourt 1977). This explains the failure to obtain sites from the aerial photograph investigation of the study area. LIA sites in the Eastern Cape Province occur adjacent to the major rivers in low lying river valleys but also along ridge crests above the 800m contour. The LIA in the greater project area can be ascribed to the Thembu tribal cluster or their immediate predecessors (Feely 1987). It

is also possible that some stone walled sites, especially those incorporating shelters or caves, were constructed by hybrid San/Nguni groups. 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 (Maggs, 1989; Huffman 2007). The existing data base does not indicate the location of any Later Iron Age sites in the greater project area. However, this is most probably an artefact of archaeological survey preferences in the past. It is known from oral history, for instance, that some early Thembu groupings occupied the area from the 17th century onwards (Peires 1981) and it is possible that systematic archaeological ground surveys will locate sites of this period in due course

2.3 Historic Period

Oral tradition is the basis of the evidence of historical events that took place before written 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 Transkei suggest that the people here existed in numerous small-scale political units of different sizes, population numbers and political structures (Feely 1987; 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 paramouncies 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 in parts of northern KwaZulu-Natal. The Zulu kingdom, established by King Shaka however became the most powerful in KwaZulu-Natal in the early years of the 19th century and had a marked influence on the local Nguni chiefdoms of the project area (Feely 1987). Refugees from north of the Umtavuna River such as the Bhaca and Qwabe tribes moved into the Transkei and asked the Mpondo chief for permission to settle in adjacent parts. These refugees were collectively called amaMfengu and many of these people were settled in parts of the project area and the adjacent areas near Qumbu and Mount Fletcher. One group of refugees from the north, the amaNgwane, crossed the Umthatha River near the project area, and fought a decisive battle against

British colonial troops and their Thembu and Xhosa allies in 1828 at Mbholompo Point. During this episode the amaNgwane was defeated and the tribe broken-up (Peires 1981). The project area specifically saw tremendous interaction between Thembu agriculturalists and Khoisan pastoralists in the recent past (ibid). Many place names in the study-area such as Ngcocora, and Qumanco had a Khoisan origin.

3 BACKGROUND INFORMATION OF THE SURVEY

3.1 Methodology

A desktop study was conducted of the archaeological databases housed in the Natal Museum and the SAHRA inventory of heritage sites in the Eastern Cape Province. In addition, the available archaeological and historical literature covering the Eastern Cape was also consulted.

Two visits were made to the project area on the 27th February and 22 March 2011 respectively. A ground survey, following standard and accepted archaeological procedures, was conducted during these visits.

3.2 Restrictions encountered during the survey

3.2.1 Visibility

Visibility was relatively good in most of the project area. No sites or features were masked by vegetation or other factors. Overgrazing and sheet erosion contributed to site visibility in many areas.

3.2.2 Disturbance

No disturbance of the majority of potential heritage features was noted. However, extensive soil erosion does occur in various localities of the study area but none of these areas had any heritage sites.

3.3 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.

4 DESCRIPTION OF SITES AND MATERIAL OBSERVED

4.1 Locational data

Province: Eastern Cape Province

Towns: Engcobo and adjacent areas (situated between Umtata and Queenstown)

4.2 Description of the general area surveyed

The area surveyed consists of a section of the national road R61 between Umtata of Queenstown and its immediate environs where potential quarry and borrow pits have been identified (Fig 1). The rural town of Engcobo is centrally situated within the study area which covers a large portion of the Mzuka River valley (Fig 3) and the foothills of the Eastern Cape Drakensberg. With the exception of the town Engcobo the largest portion of the study area consists of communal land with rural homesteads and some indigenous forests and exotic plantations along the mountain slopes.



Figure 3. View over the study area with the Mzuka River Valley in the foreground. Picture taken from Quarry Pit 5

The R61 is the main route between Umtata and Queenstown. Most of the quarry and borrow pits are situated adjacent on in the near vicinity of the R61. The exception

being Quarry pits 1 and 5 and 7 that are located more than 10km from the R61 (Fig 2). Given the potential impact the construction of a quarry and borrow pit may have on heritage resources in its environs a description of each and every potential pit feature is given below.

5 DESCRIPTIONS OF QUARRY AND BORROW PITS

BORROW PIT: 1

POSITION: Km 44.2 - LHS

DESCRIPTION:

Borrow Pit 1 is an existing shallow, highly to moderately weathered, disused mudstone borrow pit located alongside the road, on the north side, at Km 44.2, approximately 900m east of the Qumanco River Bridge. A small shallow reed filled pond occupies the borrow pit floor in the south west corner and a 2m wide, steeply dipping dolerite dyke, extends along the east side of the borrow pit. The borrow pit has a base 80m long by 30m wide. Material comprises maroon, highly to moderately weathered, medium hard rock mudstone which is overlain by 0.3m of light brown silt. The site is bounded by a fence and a road to the south. It can be expanded to the east, however, the depth of overburden increases to >2.5m within 30m of the eastern edge of the existing borrow pit. Trial Hole TH4 excavated 60m east of the borrow pit intersected sandstone at 2.70m.

RESERVE QUANTITY

> 1200m³

PAVEMENT POSITION

Selected subgrade

CO-ORDINATES

S31° 48' 21.1"

E27° 53' 55.7"



Heritage observations

No heritage sites and features occur on or near this borrow pit.

BORROW PIT 2**POSITION: Km 49.8km: 500m North****DESCRIPTION:**

Borrow Pit 2 is an existing, small, shallow borrow pit located 500m north of the road at Km 49.8. Access is via a narrow gravel track. Material comprises olive brown, highly to completely weathered dolerite which is overlain by red brown, completely weathered dolerite, in turn overlain by colluvial dark brown silty clay. The borrow pit dimensions are 50m x 50m x 2.5m. The completely weathered dolerite has not been sampled as it is likely to have a high Plasticity Index and would therefore be unsuitable as road subgrade material. This material must be removed to spoil prior to excavation of better quality material. The highly weathered dolerite in the borrow pit floor has, in comparison, potential as selected subgrade G6/G7 material. Deeper excavations may require blasting.

RESERVE QUANTITY> 6 000m³**PAVEMENT POSITION**

Selected Subgrade?

CO-ORDINATESS31° 46' 02,3"
E27° 55' 53,1"**Heritage observations**

No heritage sites or features occur on or near this borrow pit.

BORROW PIT 3**POSITION : Km 52.6: 1000m South****DESCRIPTION:**

Borrow Pit 3 is a weathered maroon mudstone material source located 1 Km south of the R61 road. It consists of a clearly visible large excavation near the summit of a long hill. The face length is approximately 600m with a height of approximately 12m. The mudstone is capped by sandstone which varies between 2m and 3m in thickness. Several dolerite dykes varying in thickness from 0.5m to 1.0m have intruded the mudstone at dips which vary from near-vertical to horizontal. Occasional sandstone lenses up to 10m long and 0.4m wide are present within the mudstone. Samples were removed from the face at ground level for laboratory testing. No trial holes were excavated south of the face because of the impenetrable nature of the sandstone capping.

RESERVE QUANTITY> 432 000m³**CO-ORDINATES**S31° 44' 56.8"
E27° 57' 21.6"**PAVEMENT POSITION**

Selected Subgrade

**Heritage observations**

No heritage sites or features are associated with this borrow pit.

BORROW PIT 4**POSITION: Km 59.6: 300m South****DESCRIPTION**

Borrow Pit 4 is an existing mudstone borrow pit located alongside 300m south of the R61. Material comprises maroon, highly to moderately weathered mudstone, with hardness of mudstone that increases with depth. A sandstone capping overlies the sites western and south western extent. This is a large borrow pit that has been extensively mined as confirmed by the size and extent of the cut as well as the large area of spoiled rock to the north. Ponding occurs at the base of the borrow pit and will need to be managed if further excavation occurs.

RESERVE QUANTITY>9 000m³**PAVEMENT POSITION**

Selected Subgrade

CO-ORDINATESS 31° 41' 52.0"
E 27° 59' 13.0"**Heritage observations**

No heritage sites or features are associated with this borrow pit

BORROW PIT 5**POSITION: Km 65,0: 800m South****DESCRIPTION**

Borrow Pit 5 is an existing weathered dolerite borrow pit located 800m south of the R61 and slightly beyond the south-east boundary corner of Ngcobo Town. Material comprises highly weathered to moderately/ slightly weathered dolerite. A central less-weathered zone is flanked by highly weathered zones that extend to the north west and south east. A bench within the borrow pit consists of moderately weathered dolerite and most probably remained due to an inability to rip this medium hard rock. The borrow pit is located on the side of a relatively steep slope through which the weathered dolerite is assumed to extend. A large amount of dolerite core stones are found to the north of the site where they occur within the upper residual and completely weathered dolerite horizons in this north section.

RESERVE QUANTITY>64 000m³**PAVEMENT POSITION**

G5 Subbase?

CO-ORDINATES

S 31° 41' 06.7"

E 28° 01' 09.2"

**Heritage observations**

No heritage sites or features are associated with this borrow pit.

BORROW PIT 6**POSITION: Km 65,1: 600m North****DESCRIPTION**

Borrow Pit 6 is an existing weathered dolerite borrowpit located 600m up a side road north of the R61. Its southern end comprises of a weathered mudstone previously used to construct nearby gravel roads. Material comprises of a light olive, completely weathered dolerite overlying olive, highly weathered soft to medium hard rock dolerite. On the western side of the borrow pit the dolerite is overlain by a mudstone horizon and in the north west capped by sandstone as intersected in Trial Holes 5 and 6. Sedimentary rock will require removal to spoil where encountered during borrowing. Deep weathering means there is a relatively deep ($\pm 3.0\text{m}$) volume of overburden consisting of residual and completely weathered dolerite. This material is expected to have relatively high plasticity and may require spoiling. The site is bounded by a gravel road to the south. Any new development should be extended vertically into the footwall to the north east.

RESERVE QUANTITY>10 000m³**PAVEMENT POSITION**

Selected subgrade

CO-ORDINATES

S 31° 40' 05.8"
E 28° 01' 22.2"

**Heritage observations**

No heritage sites or features occur in association with this borrow pit.

BORROW PIT 7**POSITION: Km 71,0: 200m North****DESCRIPTION**

Borrow Pit 7 is an existing highly to slightly weathered sedimentary mudstone borrow pit located 200m north of the road. Material consists of maroon, highly weathered mudstone overlying a band ($\pm 400\text{mm}$) of grey blue, slightly weathered, siltstone/sandstone which in turn overlies additional maroon, highly weathered mudstone. Mudstone hardness increases rapidly with depth. The site has most likely been used as a source of gravel wearing course for surrounding gravel roads and possibly as Selected Subgrade for the R61.

RESERVE QUANTITY>87 500 m³**PAVEMENT POSITION**

Selected subgrade

CO-ORDINATES

S 31° 40' 28.9"

E 28° 04' 42.2"

**Heritage observations**

No heritage sites or features occur in association with this borrow pit.

BORROW PIT 8

POSITION: Km 54,4: N & S

DESCRIPTION:

Borrow Pit 8 is an existing, highly to completely weathered dolerite borrow pit that is currently in use for minor road maintenance. It has two 5m to 8m high cutfaces north and south of the R61 respectively, which road bisects the borrow pit. The weathered dolerite is capped by 0.5m to 1.0m of red brown clayey silt. It can be extended north and south in a direction perpendicular to the road.

RESERVE QUANTITY

> 96 000m³

CO-ORDINATES

S31° 43' 49.7"
E27° 57' 03.9"

PAVEMENT POSITION

Selected Subgrade?



Heritage observations

No heritage sites or features were observed in association with this borrow pit.

BORROW PIT 9

POSITION: Km 51,5: 400m North

DESCRIPTION:

Borrow Pit 9 is an existing borrow pit with a relatively small 80m long X 30m wide base and hill cut extension on the western side within which is a cutface 6m high. This borrow pit has a 3m capping of moderately weathered sandstone. The borrow pit could possibly be expanded towards the east by excavating the footwall. This would eliminate the costly removal and spoiling of the thick sandstone capping.

RESERVE QUANTITY

> 7 200m³

CO-ORDINATES

S31° 45' 15.3"
E27° 56' 30.2"

PAVEMENT POSITION

Selected Subgrade?



Heritage observations

No heritage sites or features occur on or near this borrow pit.

QUARRY OPTION Q1**POSITION: 45+400; 3,5 Km N****DESCRIPTION:**

Proposed Quarry Option 1 is located near the start of the project and a direct distance of 3,5 kilometres north of the R61 (4,9 kilometres via a gravel access road). It is situated at the top end of a small natural valley along an elevated ridge. The proposed site has extensive outcrops of very hard, massive, unweathered, 'domed' dolerite. A minor flow line drains the area southwards which will be the conduit to drain stormwater from the quarry during construction. Shallow soils and short grasses cover interstitial areas between outcrops. Investigation will require rotary core drilling.

RESERVE QUANTITY

$(200\text{m} \times 150\text{m} \times 15\text{m}) \times 0,6$ (slope)
= 270 000 m³

PAVEMENT POSITION

Surfacing: Base;
Natural crushed
G4 Subbase?

CO-ORDINATES

S31° 46' 57,3"
E27° 52' 19,3"

**Heritage observations**

No heritage sites or features occur in association with this potential quarry.

QUARRY OPTION Q2**POSITION: 49+200; 1,7 Km S****DESCRIPTION:**

Quarry site Q2 is located 1,1 kilometres directly south of Km 49,1 of the R61 and 1,7 kilometres away by road. Here the topography forms a long south trending ridge comprising a dolerite sill of variable extent and weathering. The proposed quarry site is located on the gentle east facing side of the ridge. It has reasonably good access via a minor rural gravel road. The site has occasional flat to slightly domed outcrops of very hard, massive, slightly weathered to unweathered dolerite with grass covered soils and in places masses of hard angular dolerite corestones. The latter remnants of earlier weathering and erosion along the ridge. There are several homesteads downslope of the access road as located along the eastern end of the proposed site.

RESERVE QUANTITY

(100m*100m*15m)
= 150 000 m³

PAVEMENT POSITION

Surfacing; Base;
Natural crushed
G4 Subbase?

CO-ORDINATES

S31° 46' 41,3"
E27° 56' 37,5"

**Heritage observations**

No heritage sites or features occur in association with this potential quarry.

QUARRY OPTION Q3**POSITION: 50+000; 1,1Km N****DESCRIPTION:**

Quarry site Q3 is located 1,1 kilometres north of Km 50,1. It is accessible within 0,5 Km on its eastern side by a local gravel road. Thereafter access is difficult with the site separated by a marsh wetland. A new access would have to be constructed from the R61 via a low ridge leading up to the site. The site is located on an east/ west trending elevated ridge. The ridge top consists of large angular dolerite corestones piled on top of occasional domed outcrops of slightly weathered to unweathered hard rock dolerite. The eastern extremity of the ridge has large exposures of massive domed rock. There are no houses on the site and nearest habitation is about 0,5 Kms to the north and east.

RESERVE QUANTITY

(100m*70m*15m)
= 105 000 m³

PAVEMENT POSITION

Surfacing; Base;
Natural crushed
G4 Subbase?

CO-ORDINATES

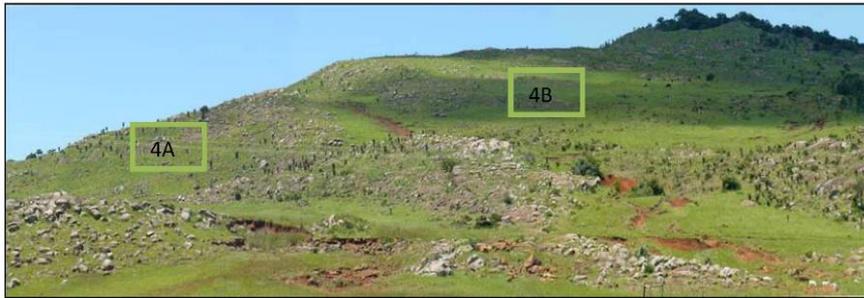
S31° 45' 39,1"
E27° 55' 38,4"

**Heritage observations**

No heritage sites or features occur in association with this potential quarry.

QUARRY OPTION Q4 A & B**POSITION: 60+500; 1,5 Km S****DESCRIPTION:**

Quarry Option 4 is located immediately south of Ngcobo Town – 1,5 kilometres south of the R61 - alongside the Ngcobo Dutywa Road on a west facing hillslope 500m east of the road. Two sites – 4A and 4B - about 200m apart are possible. Both contain excellent exposures of massive dolerite, the main difference being that A has a higher and steeper slope than B. A pathway intersects the 2 sites in what appears to be a zone of deeper weathering along a fault or feeder dyke. Springs emanating from the ridge are common with plastic reservoir tanks over-flowing below 4A.

**RESERVE QUANTITY**

$(200\text{m} \times 150\text{m} \times 15\text{m}) \times 0,6 \text{ (slope)} = 270\,000 \text{ m}^3$

PAVEMENT POSITION

Surfacing; Base; Natural crushed; G4 Subbase?

CO-ORDINATES

S31° 41' 46,0" E27° 59' 56,3"

Heritage observations

Although the terrain appeared promising for Later Iron Age site occurrence no heritage features were observed.

QUARRY OPTION Q5**POSITION: 74+200; 1,2 Km N****DESCRIPTION:**

The proposed quarry is located 6 kilometres beyond the eastern end of the project. It is 1,2 kilometres due north of the R61 and 1,4 kilometres via a local gravel access road. It is located in a small horseshoe shaped plateau area between two ridge highpoints. The proposed quarry overlooks the Xuka River valley to the west. The site is grass-covered but there are extensive nearby outcrops of massive dolerite which presumably extend to beneath the plateau proposed as the quarry site. Drilling will be required for confirmation. There are several houses immediately north of the quarry area.

RESERVE QUANTITY

$(100\text{m} \times 80\text{m} \times 20\text{m}) \times 0,8 \text{ (slope)}$
 $= 128\ 000 \text{ m}^3$

PAVEMENT POSITION

Surfacing; Base;
 Natural crushed
 G4 Subbase?

CO-ORDINATES

S31° 39' 44,1"
 E28° 07' 04,4"

**Heritage observations**

No heritage sites or features occur on the quarry site.

QUARRY OPTION Q6**POSITION: 76+200; 0,1 Km S****DESCRIPTION:**

Quarry Option Q6 is an existing disused quarry located nearly 10 kilometres beyond the eastern end of the project. It is situated not more than 100m south of the R61 where it occupies a domed rock outcrop highpoint. The existing excavation is relatively small at 30m X 30m X 4m with the quarry presumably used for construction of the original R61. There are masses of angular dolerite overbreak boulders lying about suggesting poor earlier blasting techniques. A stagnant pond masks the quarry floor. There is an abundance of domed hard rock dolerite in the area as attested to by exposures alongside the quarry excavation. Especially the large hard rock plateau on its western side.

RESERVE QUANTITY

(80m*80m*20m)
= 128 000 m³

PAVEMENT POSITION

Surfacing; Base;
Natural crushed
G4 Subbase?

CO-ORDINATES

S31° 40' 10,6"
E28° 07' 54,8"

**Heritage observations**

No heritage sites occur in association with this quarry.

QUARRY OPTION Q7**POSITION: 63+000; 5,5 Km N****DESCRIPTION:**

Quarry 7 would entail widening of an approximately 250m long cutting at a point 6 kilometres north of Ngcobo town (Km 63,0) alongside the road linking Ngcobo to Cala and Elliot. Here the road has been widened into hard unweathered dolerite. There is scope for extensive widening of the cut towards the east cutting across a natural curve in the road and in so doing providing a safer road plus extensive volumes of hard rock aggregate. There are though a number of problems that need to be overcome should this source prove popular. These include a hillslope which is steep and high with problems in development; very little flat ground on which to establish a crusher and aggregate stockpiles; closure of the road during blasting; and hauling of material through the northern part of Ngcobo. Problems are envisaged in persuading the road authorities to allow regular road closure.

RESERVE QUANTITY

$(200\text{m} \times 40\text{m} \times 15\text{m}) \times 0,8$ (slope)
= 96 000 m³

PAVEMENT POSITION

Surfacing; Base;
Natural crushed
G4 Subbase?

CO-ORDINATES

S31° 37' 37,9"
E27° 59' 11,8"

**Heritage observations**

No heritage sites occur on or near this quarry.

QUARRY OPTION Q8**POSITION: 45+400; 3,5 Km N****DESCRIPTION:**

Quarry Option 8 is an existing quarry located alongside and west of the Ngcobo to Cala and Elliot Road: 10,5 kilometres by road from Ngcobo and a direct distance of 8,3 kilometres north of the R61. It consists of an old disused quarry 120m long; 40m wide, and 10m high. Thick black wattle trees copses surround the site and though close to the road it is completely hidden by the trees. Access is via an overgrown track. The quarry floor has a shallow pond of water and there are a few boulder stockpiles scattered about the quarry floor. Good quality, hard rock, unweathered dolerite is exposed in the floor and sidewalls of the quarry and there appears to be opportunity for further development to the west and down into the existing quarry floor. Rotary drilling will be required to determine this as a visual estimate is not possible due to the dense tree cover.

RESERVE QUANTITY

(120m*40m*20m)
= 96 000 m³

PAVEMENT POSITION

Surfacing; Base;
Natural crushed
G4 Subbase?

CO-ORDINATES

S31° 36' 26,4"
E27° 57' 54,9"

**Heritage observations**

No heritage sites or features are associated with this quarry.

QUARRY OPTION Q9**POSITION: 45+400; 3,5 Km N****DESCRIPTION:**

Quarry Option 9 is an existing quarry located 23 kilometres south of Ngcobo where it is located immediately west of the new Ngcobo/ Idutywa Road. This quarry provided the Base and Surfacing aggregate for this relatively new road. The quarry excavation is now full of water making it difficult to assess both quality of rock and zones of new development. There does appear to be some scope for an east/ west direction of mining along the axis of the outcrop, and field mapping suggests that the quarry could possibly be continued on the east side of the road. Rotary core drilling will be required for additional investigations.

RESERVE QUANTITY

(100m*40m*15m)
= 60 000 m³

PAVEMENT POSITION

Surfacing; Base;
Natural crushed
G4 Subbase?

CO-ORDINATES

S31° 52' 36,2"
E28° 03' 16,0"

**Heritage observations**

No heritage sites are associated with this quarry.

6 HERITAGE SITES AND THEIR SIGNIFICANCE (HERITAGE VALUE)

The village of Engcobo, is centrally situated within the broader study area, and do contain some heritage sites. These include old church buildings older than 60 years (Figure 4) as well as the birth places of struggle-era heroes Mr. Walter Sizulu and Dr. Xuma. None of these, however, occur on the footprint.



Figure 4. Old Anglican church building situated on the outskirts of Engcobo

Previous archaeological surveys also indicate that rock painting sites occur near Engcobo. These, however, are located to the immediate north of the study area in the foothills of the Drakensberg. (Blundell 2004; Derricourt 1977; Feely 1987; Mallen 2008; White 2010). None of the known rock art sites occur in the immediate vicinity of the footprint including the proposed quarry and borrow pits. Later Iron Age sites have been recorded closer to Umtata and further north near Mount Fletcher (Feely 1987) and none are known from the study area. No heritage sites are associated with the proposed quarry sites and in fact only one heritage occurrence have been recorded in association with the proposed borrow pits. A more detailed description of this site follows below:

6.1 Graves at Borrow Pit 10

Borrow pit 10 is situated in field adjacent to a small village. It is not an existing borrow pit but consists of a borrow pit opportunity with highly weathered dolerite exposed in the road side drain on the west side of the road. The access road to this point is 4.5 km from the R61. The potential borrow pit is, however, surrounded by abandoned and occupied homesteads. These consists of huts and square cattle byres constructed of stone. Two contemporary graves occur approximately 25m to the west of the proposed borrow pit (Fig 5). These are indicated by small heaps of stone measuring

approximately 1x2m (Fig 6) and 2x3m (Fig 7) in extent. It appears that some stone robbing of the smaller grave did occur in the recent past. Preliminary interviews with inhabitants of the local village suggests that these graves are approximately 80 years old and that the descendant family of the deceased still live in the area. The main attributes of this grave site is summarised in Table 2.



Figure 5. Google aerial photograph showing the location of the graves relative to Borrow Pit 10.



Figure 6. Grave site one, some stone robbing occurred here in the past.



Figure 7. Grave site two.

Table 2. Graves associated with Borrow Pit 10

No	Heritage Site	Estimated Age	Significance	Requires Mitigation?	Type of Mitigation	GPS Latitude and Longitude
1	Two informal graves situated adjacent each other, indicated by heaps of stone	Approximately 80 years old according to local informants	High significance locally (see Table 3)	Yes	It is suggested that this area remains intact and that another borrow pit locality is identified. Alternatively, a phase 2 heritage impact assessment could be conducted following the guidelines regarding grave relocation principles (Appendix 1)	31 46 28.06 S 27 56 52.53 E

6.1 Field Rating

A rating method developed by SAHRA was applied to evaluate the significance of the graves (Table 3). The results are also presented in Table 2. The graves have been rated as Local Grade 111b indicating that they are regarded as of high significance locally. Given the close proximity of these graves to the proposed borrow pit and the fact that all graves are protected by national heritage legislation mitigation should take place before the site can be developed as a borrow pit. Given the legal status as well as local sensitivities associated with graves it is suggested that an alternative borrow pit site being identified. Alternatively a phase 2 heritage impact assessment following grave relocation principles (Appendix 1) could be implemented. However, this is a time consuming exercise and the results of such a study may suggest that the graves being left alone. There is no guarantee that a second phase heritage assessment would pave the way for the proposed borrow pit to be developed.

Table 3. 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

7 RECOMMENDATIONS

With the exception of the two grave sites identified on Borrow Pit 10 it is suggested that the proposed development at the footprint may proceed in terms of heritage values as no heritage sites are in any immediate danger of being destroyed or altered. No potential cultural landscapes or palaeontological sites have been located on the footprint. However, the following rules must be adhered to during the proposed development of the footprint:

- Avoid Borrow Pit 10 or initiate a second phase heritage impact assessment of this site following the principles as developed for grave relocation (Appendix 1).
- Conduct a second heritage impact assessment on the identified locality should an alternative to Borrow Pit 10 being identified for development.
- Only use existing roads during the development phase of the project. All informal access roads, once identified, must first be surveyed for heritage sites before construction may commence.
- Maintain a buffer zone of at least 20m around all heritage sites identified in this study.

- No stone robbing or removal of any material from these sites for construction purposes is allowed. Any disturbance or alteration of these sites would be illegal and punishable by law.
- It should also be pointed out that the South African National Heritage Act requires that operations exposing archaeological and historical residues should cease immediately pending an evaluation by the heritage authorities.

8 RISK PREVENTATIVE MEASURES ASSOCIATED WITH CONSTRUCTION

Maintain a 20m buffer zone around the identified heritage sites. No dumping of construction material is allowed within this buffer zone and no alteration or damage of these sites may occur.

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