

## Archaeological Impact Assessment

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**For the proposed widening of the N4 National Road, Section 6E, Near Waterval-Onder, Mpumalanga Province**

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Prepared For

**Prism EMS**

By



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**VERSION 1.0**  
**22 July 2015**

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SIGNATURE: \_\_\_\_\_

## EXECUTIVE SUMMARY

**Site name and location:** The TRAC N4 Section 6E located on Sections N4-6X and N4-7X between Waterval-Onder and Montrose through Elandsport on MDC Section 6E of the Maputo Development Corridor and is generally referred to as MDC Section 6E or MDC-6E. The start point is at km 23,0 of N4-6X on the Farm Kindergoed 332-JT approximately 7,5km east of Waterval-Onder and the project ends at km 22,7 of N4-7X on the farm Montrose 290-JT. Total length of the project is approximately 43km.

**Purpose of the study:** Phase 1 Archaeological Impact Assessment to determine the presence of cultural heritage sites and the impact of the proposed project.

**1:50 000 Topographic Map:** 2530 CB, 2530 DA.

**Environmental Consultant:** Prism EMS

**Developer:** SANRAL

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

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**Date of Report:** 22 July 2015

### Findings of the Assessment:

The proposed road upgrades are located within the existing N4 servitude and as such the chances of recovering surface archaeological materials *in situ*, are limited. However 5 sites were recorded consisting of Late Iron Age Stone walled settlements, sites of possible ritual significance, a possible historical culvert/bridge and rectangular stone walled foundations probably dating from the historical period.

Most of these sites are located outside of the road reserve and area of impact but some sites are located within the area of impact and mitigation measures must be implemented at the following sites and passing lanes:

- A stone cairn and Marula tree of possible ritual significance were recorded at WB3 and a bridge/culvert of unknown age at WB4.
- Two stone walled sites were recorded in the vicinity of WB 7 where the existing N4 national road impacted on the archaeological site and it is possible that subsurface archaeological material might be exposed during construction within the road reserve. It is recommended that this section is monitored during the construction phase to mitigate any accidental finds and a chance find procedure must be implemented for the project.

If during construction, any archaeological finds are made (e.g. stone tools, skeletal material), the operations must be stopped, and the archaeologist must be contacted for an assessment of the finds.

Based on the results of the phase 1 AIA there is from an archaeological point of view no reason why the development cannot proceed provided that the recommendations made in the AIA are adhered by and based on approval from SAHRA.

## General

Due to the subsurface nature of archaeological material and unmarked graves the possibility of the occurrence of unmarked or informal graves and subsurface finds cannot be excluded. If during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find.

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

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

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**ABBREVIATIONS**

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

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

**GLOSSARY**

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

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

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

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

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

## 1 BACKGROUND INFORMATION

<b><i>Kind of study</i></b>	Archaeological Impact Assessment
<b><i>Type of development</i></b>	Road Upgrades
<b><i>Developer:</i></b>	SANRAL
<b><i>Consultant:</i></b>	Prism EMS

The aim of the study is to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, a desktop study that includes collection from various sources and consultations; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey 5 sites of possible heritage significance was identified. General site conditions and features on sites were recorded by means of photographs, GPS locations, and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report.

This report must also be submitted to the SAHRA for review.



## 1.1 Terms of Reference

### Desktop study

Conducting a brief desktop study where information on the area is collected to provide a background setting of the archaeology that can be expected in the area.

### Field study

Conduct a field study to: a) systematically survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points identified as significant areas; c) determine the levels of significance of the various types of heritage resources recorded in the project area.

### Reporting

Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with Heritage legislation and the code of ethics and guidelines of ASAPA.

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

## 1.2. Archaeological Legislation and Best Practice

Phase 1, an AIA or a HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of a heritage specialist input is to:

- » Identify any heritage resources, which may be affected;
- » Assess the nature and degree of significance of such resources;
- » Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- » Assess the negative and positive impact of the development on these resources;
- » Make recommendations for the appropriate heritage management of these impacts.

The AIA or HIA, as a specialist sub-section of the EIA, is required under the National Heritage Resources Act NHRA of 1999 (Act 25 of 1999), Section 23(2)(b) of the NEMA and section s.39(3)(b)(iii) of the MPRDA.

The AIA should be submitted, as part of the EIA, BIA or EMP, to the PHRA if established in the province or to SAHRA. SAHRA will be ultimately responsible for the professional evaluation of Phase 1 AIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 AIA reports and additional development information, as per the EIA, BIA/EMP, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level).

Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is a legal body, based in South Africa, representing professional archaeology in the SADC region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 AIAs are primarily concerned with the location and identification of sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for from SAHRA by the client before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999 is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare.

Authorisation for exhumation and reinterment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

### **1.3 Description of Study Area**

#### **1.3.1 Location Data**

The project is located on Sections N4-6X and N4-7X between Waterval-Onder and Montrose through Elandspoot on MDC Section 6E of the Maputo Development Corridor and is generally referred to as MDC Section 6E or MDC-6E. The start point is at km 23,0 of N4-6X on the Farm Kindergoed 332-JT (25° 36' 27.4417" S, 30° 26' 04.3248" E) approximately 7,5km east of Waterval-Onder and the project ends at km 22,7 of N4-7X on the farm Montrose 290-JT (25° 30' 47.0163" S, 30° 42' 01.8860" E).

1.3.2. Location Map

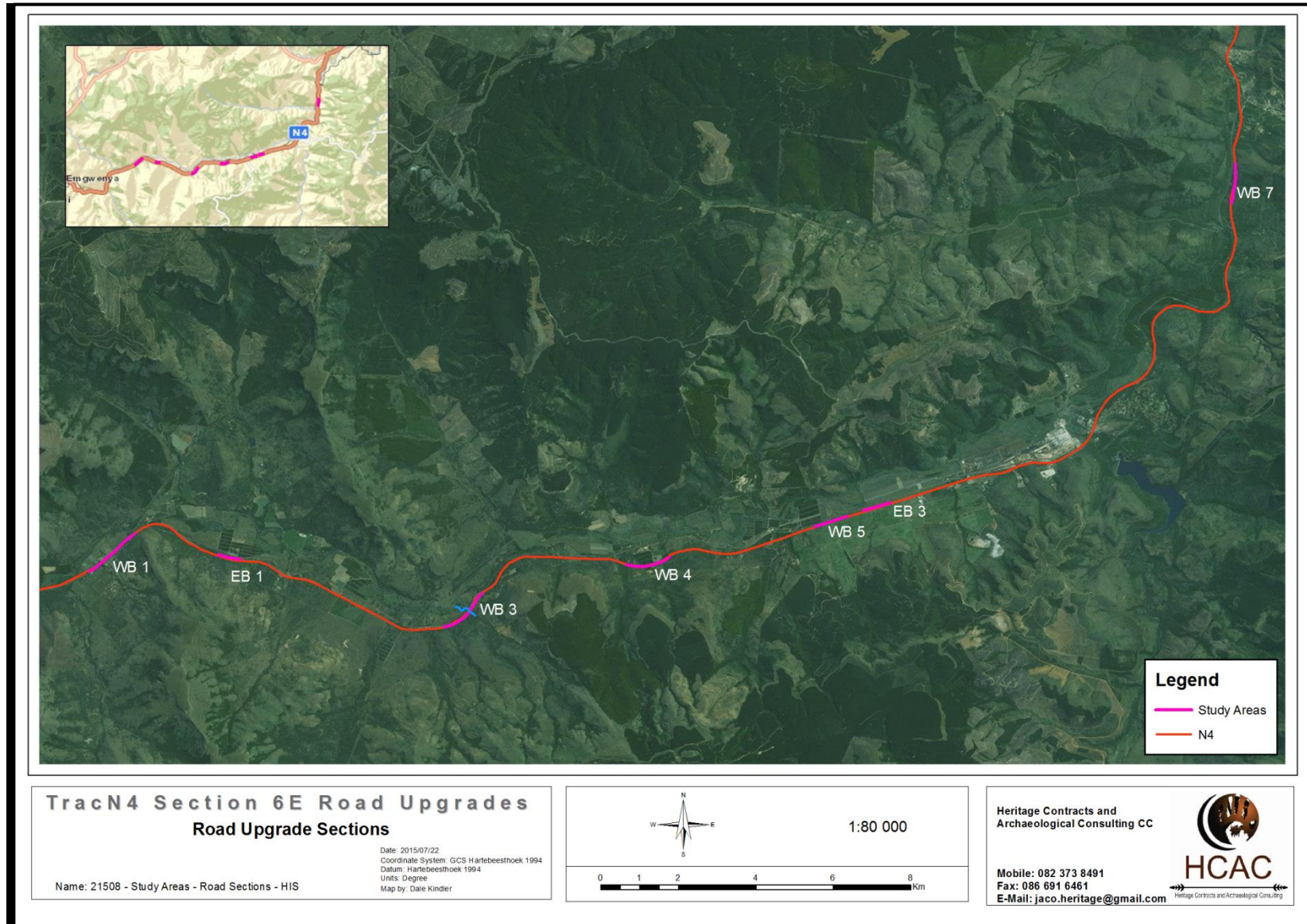


Figure 1: Location map

## 2. APPROACH AND METHODOLOGY

The aim of the study is to cover archaeological databases to compile a background of the archaeology that can be expected in the study area followed by field verification; this was accomplished by means of the following phases.

### 2.1 Phase 1 - Desktop Study

The first phase comprised a desktop study scanning existing records for archaeological sites, historical sites, graves, architecture (structures older than 60 years) of the area.

#### 2.1.1 Literature Search

Utilising data for information gathering stored in the archaeological database at Wits and previous CRM reports done in the area. The aim of this is to extract data and information on the area in question.

#### 2.1.2 Information Collection

SAHRIS was consulted to collect data from previously conducted CRM projects in the region to provide a comprehensive account of the history of the study area.

#### 2.1.3 Consultation

A public participation process is conducted by Prism EMS. No heritage concerns were raised.

#### 2.1.4 Google Earth and Mapping Survey

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

#### 2.1.5 Genealogical Society of South Africa

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

### 2.2 Phase 2 - Physical Surveying

Due to the nature of cultural remains, the majority of which occurs below surface, a field survey of the study area was conducted. The study area was surveyed by means of vehicle and extensive surveys on foot by a professional archaeologist on the 28<sup>th</sup> and 29<sup>th</sup> of April 2015.

### 2.3. Limitations and Assumptions

Due to the fact that most cultural remains may occur below surface, the possibility exists that some features or artefacts may not have been discovered/ recorded during the survey. Low ground visibility of parts of the study area is due to high vegetation and impact from previous road work activities, and the possible occurrence of unmarked graves and other cultural material cannot be excluded. This study did not assess living or intangible heritage.

Only the new proposed passing lanes was surveyed as indicated in the location map, and not the entire road section. Although HCAC surveyed the area as thoroughly as possible, it is incumbent upon the developer to stop operations and inform the relevant heritage agency should further cultural remains, such as stone tool scatters, artefacts, bones or fossils, be exposed during the process of development. It is assumed that information obtained for the wider region is applicable. Future changes in layout will require a heritage walk through and assessment of the impact on known sites.

## 3. NATURE OF THE DEVELOPMENT

Approximately 14,5 km passing lanes were constructed and the existing road surface including widenings were provided with an asphalt overlay during the initial construction phase of Section 6E during 1998 - 2000. Subsequent to this, the road was repaired and surfaced with a 13 mm single seal between 2006 and 2008. Drivers' passing opportunity is to be

increased by a further addition of 0,5 km and 4,87 km passing lanes on the eastbound and westbound directions respectively.

Despite proposed widening's for passing lanes being designed to be a total surfaced width of 4,7m, the upgrades will remain within the existing road servitude owned by SANRAL.

## **4. HISTORICAL AND ARCHAEOLOGICAL BACKGROUND OF THE STUDY AREA**

### **4.1 Databases Consulted**

#### ***SAHRIS***

Few CRM studies are on record for the study area on SAHRIS, most notably is the studies by van Schalkwyk (2007), Coetzee (2005), Van Schalkwyk recorded several sites that range from settlements to initiation sites, industrial and farming related sites as well as cemeteries. Coetzee (2005) recorded Iron Age Stone Walled Settlements, farming structures and 2 cemeteries.

#### ***Genealogical Society and Google Earth Monuments***

Neither the Genealogical Society nor the monuments database at Google Earth (Google Earth also include some archaeological sites and historical battlefields) have any recorded sites in the study area.

## 4.2 Archaeological and Historical Information Available on the Study Area

### 4.2.2 Stone Age

In Mpumalanga Province the Drakensberg separates the interior plateau also known as the Highveld from the low-lying subtropical Lowveld which stretches to the Indian Ocean. A number of rivers amalgamate into two main river systems, the Olifants River and the Komati River. This fertile landscape has provided resources for humans and their predecessors for more than 1,7 million years (Esterhuizen & Smith in Delius, 2007). The Stone Age sequence can be divided into 3 distinct phases. Early, Middle and Later Stone Age.

#### The Early Stone Age (ESA)

In South Africa the ESA dates from about 2 million to 30/40 thousand years ago in other words from the early to middle Pleistocene. The archaeological record shows that as the early ancestors progressed physically, mentally and socially, bone and stone tools were developed. One of the most influential advances was their control of fire and diversifying their diet by exploitation of the natural environment (Esterhuizen & Smith in Delius, 2007).

The earliest tools date to around 2,5 million years ago from the site of Gona in Ethiopia. Stone tools from this site shows that early hominids had to cognitive ability to select raw material and shape it for a specific application. Many bones found in association with stone tools like these have cut marks which lead scientists to believe that early hominids purposefully chipped cobblestones to produce flakes with a sharp edge capable of cutting and butchering animal's carcasses. This supplementary diet of higher protein quantities ensured that brain development of hominids took place more rapidly. Mary Leaky discovered tools like these in the Olduvai Gorge in Tanzania during the 1960s. These tools are named after this gorge and are known as the Oldowan industry. These tools, only found in Africa, are mainly simple flakes which were struck from cobbles. This method of manufacture remained for about 1,5 million years. Although there is continuing debate about who made these tools, two hominids may have been responsible. The first of these was an early form of *Homo* and the second was *Parathropus robustus*, which became extinct about 1 million years ago (Esterhuizen & Smith in Delius, 2007).

Sometime later, around 1,7 million years ago more specialised tools known as Acheulean tools, appeared. These are named after tools from a site in France by the name of Saint Acheul, where they were first discovered in the 1800s. It is argued that these tools had their origin in Africa and then spread towards Europe and Asia with the movement of hominids out of Africa. These tools had longer and sharper edges and shapes which suggest that they could be used for a larger range of activities which included the butchering of animals, chopping of wood, digging roots and cracking bone. *Homo ergaster* was probably responsible for the manufacture of Acheulean tools in South Africa. This physical type was arguably physically similar to modern humans, a larger brain and modern face, body height and proportion are all characteristics which are very similar to us. *Homo ergaster* was able to flourish in a variety of habitats in part because they were dependent on tools. They adapted to drier, more open grassland settings. Because these early people were often associated with water sources such as rivers and lakes, sites where they left evidence of their occupation are very rare. Most tools of these people have been washed into caves, eroded out of riverbanks and washed downriver. An example in Mpumalanga is Maleoskop on the farm Rietkloof where ESA tools have been found. This is one of only a handful of such sites in Mpumalanga.

#### Middle Stone Age (MSA)

A greater variety of tools with diverse sizes and shapes appeared by 250 000 BP. These replaced the large hand axes and cleavers of the ESA. This technological advancement introduces the Middle Stone Age (MSA). This period is characterised by tools which are smaller in size but different in manufacturing technique (Esterhuizen & Smith in Delius, 2007).

In contrast to the ESA technology of removing flakes from a core, MSA tools were flakes to start with. They were of a predetermined size and shape and were made by preparing a core of suitable material and striking off the flake so that it was flaked according to a shape which the toolmaker desired. Elongated, parallel-sided blades, as well as triangular flakes are common finds in these assemblages. Mounting of stone tools onto wood or bone to produce spears, knives and axes became popular during the MSA. These early humans not only settled close to water sources but also occupied

caves and shelters. The MSA represents the transition of more archaic physical type (*Homo*) to anatomically modern humans, *Homo sapiens*.

The MSA has not been extensively studied in Mpumalanga but evidence of this period has been excavated at Bushman Rock Shelter, a well-known site on the farm Klipfonteinhoek in the Ohrigstad district. This cave was excavated twice in the 1960s by Louw and later by Eloff. The MSA layers show that the cave was repeatedly visited over a long period. Lower layers have been dated to over 40 000 BP while the top layers date to approximately 27 000 BP (Esterhuizen & Smith in Delius, 2007; Bergh, 1998).

#### Later Stone Age (LSA)

Early hunter gatherer societies were responsible for a number of technological innovations and social transformations during this period starting at around 20 000 years BP. Hunting of animals proved more successful with the innovation of the bow and link-shaft arrow. These arrows were made up of a bone tip which was poisoned and loosely linked to the main shaft of the arrow. Upon impact, the tip and shaft separated leaving the poisoned arrow-tip imbedded in the prey animal. Additional innovations include bored stones used as digging stick weights to uproot tubers and roots; small stone tools, mostly less than 25 mm long, used for cutting of meat and scraping of hides; polished bone tools such as needles; twine made from plant fibres and leather; tortoiseshell bowls; ostrich eggshell beads; as well as other ornaments and artwork (Esterhuizen & Smith in Delius, 2007).

At Bushman Rock Shelter the MSA is also represented and starts at around 12 000 BP but only lasted for some 3 000 years. The LSA is of importance in geological terms as it marks the transition from the Pleistocene to the Holocene which was accompanied by a gradual shift from cooler to warmer temperatures. This change had its greatest influence on the higher lying areas of South Africa. Both Bushman Rock Shelter and a nearby site, Heuningneskrans, have revealed a greater use in plant foods and fruit during this period (Esterhuizen & Smith in Delius, 2007; Bergh, 1998).

Faunal evidence suggests that LSA hunter-gatherers trapped and hunted zebra, warthog and bovids of various sizes. They also diversified their protein diet by gathering tortoises and land snails (*Achatina*) in large quantities.

Ostrich eggshell beads were found in most of the levels at these two sites. It appears that there is a gap of approximately 4 000 years in the Mpumalanga LSA record between 9 000 BP and 5 000 BP. This may be a result of generally little Stone Age research being conducted in the province. It is, however, also a period known for rapid warming and major climate fluctuation which may have led people to seek out protected environments in this area. The Mpumalanga Stone Age sequence is visible again during the mid-Holocene at the farm Honingklip near Badplaas in the Carolina district (Esterhuizen & Smith in Delius, 2007; Bergh, 1998).

At this location, two LSA sites were located on opposite sides of the Nhlazatshe River, about one kilometre west of its confluence with the Teespruit. These two sites are located on the foothills of the Drakensberg where the climate is warmer than the Highveld but also cooler than the lowveld (Esterhuizen & Smith in Delius, 2007; Bergh, 1998).

Nearby the LSA sites, dated to between 4870 BP and 200 BP are four panels which contain rock art. Colouring material is present in all the excavated layers of the site which makes it difficult to determine whether the rock art was painted during the mid- or later Holocene. Stone walls at both sites date from the last 250 years of hunter gatherer occupation and they may have served as protection from predators and intruders (Esterhuizen & Smith in Delius, 2007; Bergh, 1998).

The brief background study indicates that a range of Stone Age manifestations can be expected in the areas demarcated for potential development. Engraved boulders or stones may also occur throughout the area. Concentrations of stone tools point to activities that took place at various stages over the past 1.5 million years, representing the different groups of people who inhabited or moved across the landscape over time.

#### 4.2.2. Iron Age

Stone walled settlements are well known around the Watervalboven and Machadodorp area, in fact these settlements are found all along the Mpumalanga escarpment, from Ohrigstad in the north, all the way to Carolina in the south (Maggs 2007). These settlements consist of roughly circular homesteads linked by walled roads or cattle tracks associated with agricultural terraces. These complexes sometimes extend over several square kilometres and some researchers claim that these settlements are the most prominent footprint on the landscape of any pre-colonial society in South Africa and compare this complex agricultural system to the internationally renowned terraced settlements of Nyanga in eastern Zimbabwe (Delius et al 2012).

The famous rock engraving site of Boomplaats located to the west of Lydenburg first attracted academic interest on the archaeology of the area. These engravings were first described by C Pijper (1918). Somewhat later P.W Laider visited the stone-walled sites in the area in the late 1920's, and based on his ceramic analysis concluded that the sites had similarities with Zulu material culture (1932). The first comprehensive investigation into the architecture and layout of the stone-walled sites was published by Van Hoepen (1939). Due to various factors research in the area was abandoned until a new research programme was initiated by Revil Mason in the early 1960s that focused on the stone-walled sites in the Transvaal (Mason 1962). He utilised aerial photographs of the area and plotted the distribution of the extensive stone walled sites and identified 1792 stone walled sites in the region (Mason 1968). Mike Evers further built on this foundation with an intensive aerial photograph survey of the area between Lydenburg and Machadadorp (Evers 1975) followed by Dave Collett (1979) who focused on site specific features within these settlements. During the 1980s research interest on the area diminished however Tim Maggs (1995) returned to the rock engravings of the area and linked them explicitly with the stone-walled settlement patterns, while Maria Schoeman (1997) focused on the neighbouring Ndzundza (Delius et al 2012). The previous research omitted to a large degree historical sources and oral traditions of groups who expressed clear connections to this region (Delius et al 2012). The recently established 500 Year Initiative is trying to rectify this limitations and refocused academic interest on the area promoting collaboration between archaeologists, historians and also focussing on oral traditions and are exploring new research avenues, we will discuss the current research topics later on the report.

On the Mpumalanga escarpment these settlements are classified in the literature by various names. The first is Marateng (from a local mountain) was first proposed by Collett (1982) for the style of pottery associated with these settlements. Maggs (2007) extended the use of this name to cover the whole cultural package including the stone walling and therefore Marateng is used in the literature (eg Maggs 1995b, Widgren 2004). Due to the close association that the name Marateng has with "Pedi Pottery" this can create some confusion about who constructed these stone walled settlement's and will therefore not be used for this project. Huffman (2007) uses the term Badfontein walling for this settlement type and more recently Bokoni seems to be the preferred term used in the literature (Delius & Schoeman 2010, Delius 2012).

In addition to Koni, various Ndebele groups lived in the district that also made stonewalling. Generally, people called 'Ndebele' have retained the Nguni language. As a further generality, Southern Ndebele claim Musi as a legendary figure, while Northern Ndebele claim Langa (Huffman 2004; Van Warmelo 1930, 1944). All came from KwaZulu-Natal (Fourie 1921).

Southern Ndebele settled in the Pretoria area in the 17th century. According to oral tradition, in about 1630 AD, Ndzundza, one of Musi sons, fled to the east and settled near the tributaries of the Steelpoort River. They finally settled at KwaMaza under Bongwe (Schoeman 1997).

We turn now to the stonewalled settlements close to the project area.

Archaeological evidence recorded in *Prehistory of the Transvaal: a record of human activity* does however refer to the presence of "terraced settlements" and an "unusual group of walls" that most likely indicates that a small Iron Age agricultural village used to be located in the broader area in which Waterval Boven is located. (Mason 1962:414) Information cited in the *Geskiedenisatlas van Suid-Afrika. Die vier noordelike provinsies* confirms the presence of Late Iron Age settlements in this area between 1000 and 1800 AD. (Bergh et al 1999:7). Myburgh states that contemporary and archaeological evidence show that the ruins can be attributed to the Sotho people who used to live in the area until the hostilities of the Swazi forced them out of the area during the nineteenth century. (Myburgh 1956: 126)

Various stone ruins in the Machadodorp/Waterval Boven area show that Iron Age humans settled in this region. It would seem that these people were livestock farmers and also practiced subsistence farming. From archaeological and anthropological studies it seems that the first black people who lived in the area were called the Koni. They were ousted by the Pedi who built a rather large settlement in the area. The area was also occupied by the Swazi people at the time. (Myburgh 1956: 126).





Figure 2: Example of Stone Walled Settlements in the western portion of the study area.

#### 4.2.4. Historical Information

The following section will give an overview of the general history of human settlement in the area under investigation for the nineteenth and twentieth centuries. It will also give a broader historical account of some important issues that affected the lives of black people during this period in the area being investigated. Various archaeologists, anthropologists and historians have taken an interest in the history of Mpumalanga. The main focus of their studies falls on the binary theme of white and black interaction, as well as on the consequences that this reaction elicited in the past two hundred years. One of the prominent groups of people who inhabit this area today is the Swazi. The Swazi people have a very rich political and cultural history and numerous academics have devoted their time on researching this group. The abundance of secondary work available is thus of great assistance in obtaining a concise overview of the history of this area.

During the nineteenth century the Lowveld area of Mpumalanga was extensively occupied by both black and white groups that migrated into this territory. Black migration mainly resulted from a political upheaval known as the *Difaqane* (Sotho), or *Mfekane* ("the crushing" in Nguni-languages). This was a period of bloody tribal and faction struggles in present-day KwaZulu-Natal and on the Highveld area, which occurred around the early 1820s until the late 1830s. (Bergh *et al* 1999:109-115) The *Mfekane* came about in response to heightened competition for land and trade, which caused population groups like gun-carrying Griquas and the Zulu under leadership of King Shaka to attack other tribes. (Giliomee 2003:133) During this period, a movement of Swazi people took place to the areas located north and northwest of Swaziland. As a result, reports indicate that the Swazi were living in the Lowveld area of Mpumalanga by the 1840's. (Bergh *et al* 1999:1) Swazi troops moved through the area during the *Mfekane*. These migrants were moving in a north westerly direction from Swaziland towards the area of the Stoffberg. Groups of attacking Ndebeles also moved past this area, some distance to the west of Waterval Boven, during the *Mfekane*. It seems that the Koni Tribe, under the chief Makopole, may have been the people who lived closest to the area of Waterval Boven before the *Mfekane* took place. (Bergh *et al* 1999:10-11)

During the time of the *Mfekane*, a northward migration of white settlers from the Cape was also taking place. Some travellers, missionaries and adventurers had however gone on expeditions to the northern areas in South Africa long before this, some already as early as the 1720's. Robert Scoon was one of the early travellers that ventured into the northern provinces of South Africa. Much of his journey was recorded in an article in The Graham's Town Journal on 28 July 1836. At one point of this expedition, which took place in 1836, Scoon passed not too far to the west of the area in which Waterval Boven is located today. During this journey Scoon apparently met up with Louis Trichardts' group; in other words the Great Trek from the Cape to the northern areas had commenced. (Bergh *et al* 1999:13, 121-122)

The first Europeans arrived in the Cape in 1652, and expansion to the north only started in the late 1820s. The Great Trek of 1837, as this northern movement of white people from the Cape Colony was called, resulted in a mass migration of white people into the northern areas of South Africa. (Ross 2002:39) Permanent white settlement of the eastern areas of Mpumalanga can first be traced back to a commission under the leadership of A.H. (Hendrik) Potgieter who negotiated for land with the Portuguese Governor at Delagoa Bay in 1844. It was agreed that these settlers could settle in an area that was four days journey from the east coast of Africa between the 10° and 26° south latitudes. Boers started migrating into this area in 1845. In July 1845, Andries-Ohrigstad was the first town established in the area after the Boers successfully negotiated for land with the Pedi Chief Sekwati. Farms were given out as far west as the Olifants River. The western boundary was not officially defined, but at a *Volksraad* [Governing Council] meeting in 1849 it was decided that the Elands River would be the boundary between the districts of Potchefstroom and Lydenburg, as this eastern portion of the Transvaal was then known. (Bergh *et al* 1999:7)

#### 4.2.5. Waterval Boven and the construction of the eastern railway line

The building of the railway line between Pretoria and Delagoa Bay (present-day Maputo) can be considered the most important event that led to the founding and development of the town Waterval Boven. The construction of the railway line and the building of the station at Waterval Boven can be viewed as a remarkable achievement in the history of the former eastern Transvaal (now Mpumalanga). Construction of the line began in 1889 on the eastern border of the Zuid-Afrikaansche Republic or South African Republic (ZAR) and finally reached Waterval Boven on 20 June 1894.

With the settling of white people in the eastern Transvaal during the latter half of the nineteenth century the need arose to find a way to the sea. This was necessary in order to establish contact with the outside world free from British interference. With the formal establishment of the borders of the ZAR during the 1850's it was evident that the country was to be land locked with the only viable ports at that time being firmly under British control in the colonies of the Cape and Natal. When the Voortrekkers left the Cape Colony in 1837 one of their main objectives was to escape the brunt of British rule.

By not having direct access to the sea and their own harbour, the white settlers still had to suffer the economic dominance of the British. Custom and export duties levied by the Cape and Natal ports were very high. This caused growing resentment among the settlers of the ZAR. (Jooste 2008:99) The construction of the Eastern Railway line therefore needs to be understood in the context of the various political, economic and social forces that impacted on southern Africa during the course of the nineteenth century.

It was clear to the ZAR government that full economic independence from Britain would only be achieved if there was a reliable transport route established between Pretoria and the Portuguese harbour of Delagoa Bay. This harbour was geographically located closer to Pretoria than any of the British harbours on the southern African coast line. The opening of the Suez Canal in Egypt in 1869 further increased the prominence of the Delagoa Bay harbour as it would be cheaper for importers to transport goods via a railway line linking the southern African interior with the Indian Ocean. At this time the harbour at Durban was also not accessible to deep-drawing ships and the ports at Port Elizabeth and East London only had open anchorage available for vessels. (Jooste 2008:100)

At first the *Volksraad* of the ZAR suggested that a wagon transport road between Lourenco Marques and the town of Lydenburg could be built to address this issue. However, the prevalence of malaria and the tsetse fly in this area made the building of such a road difficult. Under the leadership of President T.F. Burghers the *Volksraad* was persuaded that it would make political and economic sense to build a railway line through the eastern Transvaal to Delagoa Bay. In 1874 a contract was entered into between the ZAR and the governor of Mozambique for the building of a railway line through the Portuguese territory. However, the ZAR government was financially very weak and Burghers became an increasingly unpopular president. Due to various political problems compounded by escalating warfare with the Bapedi under leadership of Sekhukhune in the northern areas of the ZAR the British decided to annex the country in 1877. With the annexation of the ZAR the construction of a railway line to Delagoa Bay was placed on hold. (Jooste 2008:99; Ross 1999:60)

In 1881 the Boers managed to defeat the British in the First Anglo-Boer War (1880-81) and the ZAR regained its independence. Prominent Boer leader, S.J.P. Kruger knew that the question of establishing a link with the rest of the world which was to be free from British interference could no longer be put on hold. It was clear that the economic and political independence of the ZAR could only be guaranteed if the country could lessen its economic dependence on the British colonies of the Cape and Natal. (Bergh *et al* 1999:238-244) On 8 November 1881 the *Volksraad* approved a resolution for the ZAR government to grant a concession for the building of a railway line to the Portuguese territory. A commission was appointed to investigate the most suitable route for constructing the railway line. It was, however, only with the help of Joaquim José Machado that this process was finally concluded. Machado was the head of the Public Works Department in the Portuguese Mozambique Colony and measured out the trajectory for the railway line in the Portuguese territory. In July 1883 the ZAR government negotiated with the Portuguese government to obtain the services of Machado to also measure out the railway line in the eastern Transvaal. Machado completed his work within eight months and finally the ZAR government had a workable plan for a potential route on which the railway line could be constructed. (Jooste 2008:103; Bergh *et al* 1999:327-328)

Machado's route followed a trajectory across Pretoriuskop along the Crocodile River (close to the present day city of Nelspruit). From here the line would snake along the Elands River until it reached the present day village of Waterval Onder. The suggested route would then go up the escarpment to Belfast from where it would be constructed to Middelburg to ultimately reach Pretoria. Of interest is the fact that if Machado's route was not later adjusted the railway line would not have followed the route on which the towns of Waterval-Boven and Machadodorp were later established. (Jooste 2008:108; Jooste *et al* 1988:105-109).

Due to the political tension with Britain the decision was made by the ZAR that the concession for construction of the railway line should be given to a private company from the Netherlands. In 1883 the then newly elected President Kruger led a Boer deputation to London to renegotiate the terms of the peace settlement signed at the end of the First Anglo-Boer War in Pretoria in 1881. The subsequent signing of the London Convention restored sovereignty to the ZAR. (*Bergh et al* 1999:243-244) While in Europe the deputation also visited Amsterdam and negotiated a provisional concession with a Netherlands' Committee that would be responsible for obtaining the necessary capital investment for the building of the railway line. This agreement was concluded on 16 April 1884. (De Jong *et al*, 1988: 29) The granting of the concession was subsequently approved by the *Volksraad* in August of that year. However, the sourcing of funding for the project proved difficult. One of the main factors that complicated matters was the fact that the Portuguese government granted a concession to Edward McMurdo, an American financier, to build the railway line in the Portuguese territory. McMurdo established the Delagoa Bay and East African Railway Company and commenced with the building of this portion of the track in 1887. (Bornman 1994:22; De Jong *et al* 1988:29) The McMurdo concession was viewed sceptically by many potential investors as it was believed that McMurdo could not be trusted. Without the completion of the railway line in the Portuguese territory the building of the railway line in the ZAR could not begin as the building material had to be supplied via rail from Delagoa Bay to the border of the Transvaal. (Jooste 2008:111)

It was however the discovery of gold in 1886 on the Witwatersrand that was forever to alter the course of history in the ZAR. Almost overnight the country was placed on the road of rapid industrial development and investors started flocking to the country. On 9 June 1887 the Netherlands Committee could finally obtain the funds for the building of the railway line from a Netherlands-German Bank Consortium. On 21 June 1887 the *Nederlandsche Zuid-Afrikaansche Spoorweg Maatschappij* or Dutch South African Railway Company (NZASM) was officially established. (De Jong *et al* 1988: 36) The company received a loan of two million Gulden, which was divided into 2000 shares, to raise the necessary capital. The company was now in the financial position to commence the building of the railway line. President Kruger was now assured that the railway line which the people of the country had for so long waited for would be built free of any British involvement. (Jooste 2008:111; Berg *et al* 1899:328)

The construction of the railway line was initially delayed. McMurdo first had to complete the building of the railway line from Delagoa Bay to the border of the ZAR. Kruger also placed a moratorium on the building of the line which would only be lifted once the NZASM had negotiated a cordial agreement with McMurdo regarding the fees levied on the transport of building material via rail from Delagoa Bay to the Transvaal border. It was only after the Portuguese government withdrew its concession from McMurdo that an amicable solution could be reached between the different parties. Building of the railway line finally commenced on 01 November 1889 in the vicinity of the Nkhomati River. (Berg *et al*, 1899: 328) The first five kilometres of the track was completed on 01 July 1891 from the border of Mozambique to Komatipoort Station. By the end of 1891 the railway line reached Malelane. In 1892 the building of the railway line from Pretoria to the east commenced. The intention being that the construction of the two tracks would link up at some point in the eastern Transvaal. In June 1892 the line reached Nelspruit and finally on 20 January 1894 the line was open for rail traffic up to Waterval Onder. (Jooste 2008:112)

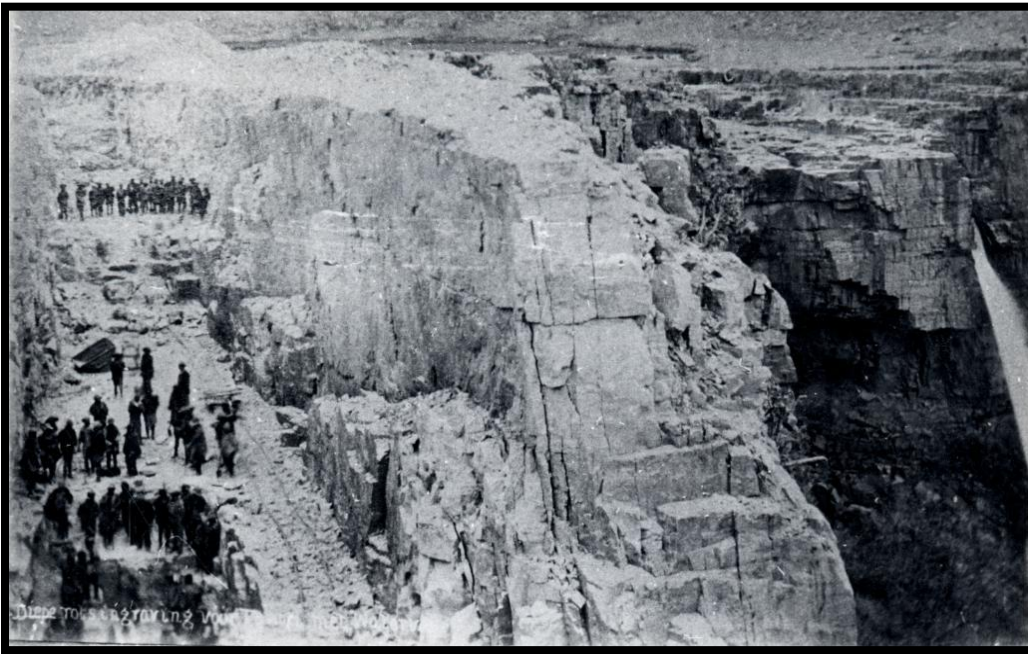


Figure 3 : Construction workers pushing through the rock at Waterval Boven during the construction of the Eastern Railway Line. (NASA)

The most difficult part of the construction was going to be the building of the railway line in the area where the Lowveld and Highveld intersected. The reason for this was that the escarpment climbed with 208 metres within a few kilometres. A survey concluded a gradient for the line of one in twenty. To further complicate the situation the line would have to form a curve with a radius of 225 metres. In October 1892 the building of a tunnel to link Waterval Onder with the Highveld commenced. (De Jong *et al* 1988:115) This was truly to be a feat of striking design and magnificent engineering. It was also to be the only tunnel build by the NZASM and would be the first tunnel of its kind in the ZAR. The project was surveyed by the company's engineers C. Sissingh and P.H. Bouten. (De Jong *et al* 1988:107)





**Figure 4 : P.H. Bouten (1857-1952) one of the NZASM engineers who surveyed the railway tunnel between Waterval Onder and Waterval Boven. (NASA)**

The NZASM decided to issue a concession to the firm of Warren & Royce to construct the tunnel. On 18 October 1892 the rocky outreaches of the Drakensberg escarpment echoed with thunder as the company started drilling and blasting through the mountain. What made this venture even more unique was the fact that it was decided to start tunnelling through the ridge from both sides at the same time. A power plant was built on top of the ridge to generate compressed air for the drilling. The cutting away of the mountain and blasting was done by experienced miners. On 9 September 1893 the two teams toiling away at the hard rock met to triumphant and jubilant jeers when the last bid of rock was blasted away. Of such impressive workmanship was the tunnelling that when the centre and levels were measured in the middle of the tunnel it was correct to within 5 centimetres. This was a remarkable achievement for this time with the tools that were used. (De Jong *et al* 1988:152; Bulpin 1989:241)

The tunnel profile was then hacked out of the rock and due to the instability of the rock it was necessary to line the tunnel with masonry. In order to keep the tunnel as short as possible it was also decided to blast away a section of the ridge on the eastern side. On the western side it was decided to make a huge cut through the rock. The main reason for this was that the tunnel could not be too long as the smoke from the coal driven steam engines could collect in the tunnel before the train reached the opening of the tunnel on the opposite side thus smothering the passengers and train conductors. The completed tunnel had a length of 211 metres. (De Jong *et al* 1988:152)

Of particular interest regarding the tunnel's design is an arched niche that was constructed on at the halfway mark on the one side of the tunnel. This was seemingly done to act as a safety precaution and acted as recess constructed in the wall of the tunnel. The theory held that if a train was to arrive at the tunnel the workmen and gangers working in the tunnel would have to seek refuge in this recess. If this recess could not be reached however the men had to lie down in the crevices between the railway line and tunnel wall. This had to be a very tight squeeze and most certainly a dance with death as there was approximately only 50 centimetres between the sides of the train and the tunnel walls. This also necessitated the tunnel being equipped with a gauge at each entrance. These gauges were to be used by goods trains to ensure that they met the required measurements of the tunnel and thus prevented trains from getting stuck in the tunnel by being overloaded. (De Jong *et al* 1988:152)

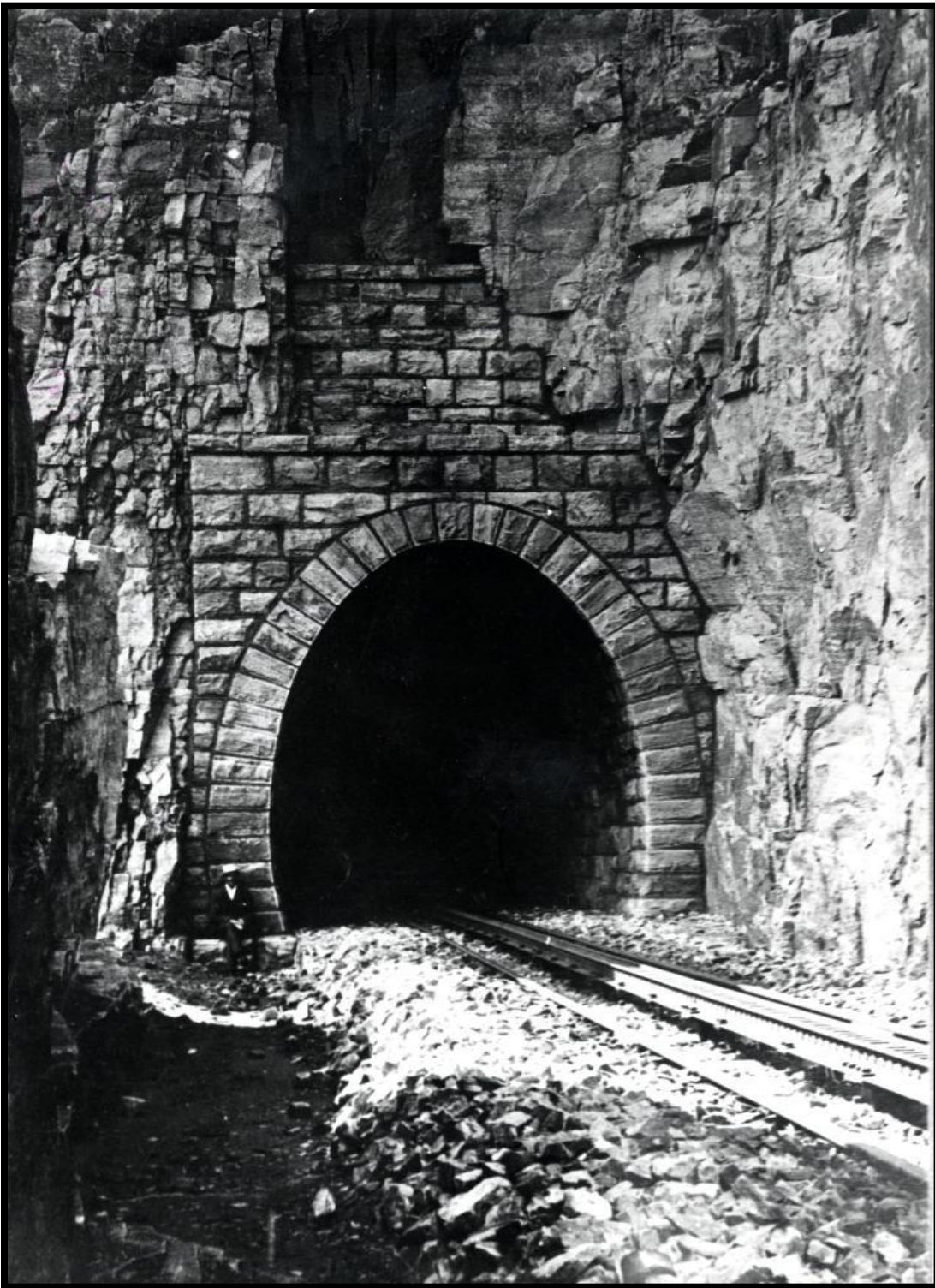


Figure 5: The eastern entrance of the Nzsam tunnel after the project was completed. Note the stone masonry. (NASA)





**FIGURE 6: A group of NZASM employees in front of the eastern entrance to the tunnel. (NASA)**



Figure 7: The western entrance of the tunnel. Note the rack-rail in between the normal railway tracks. (NASA)

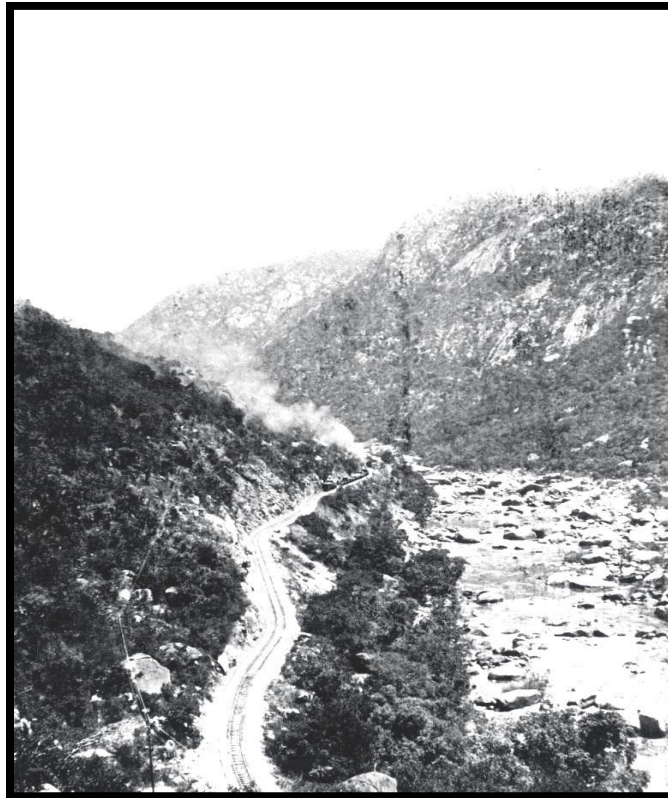
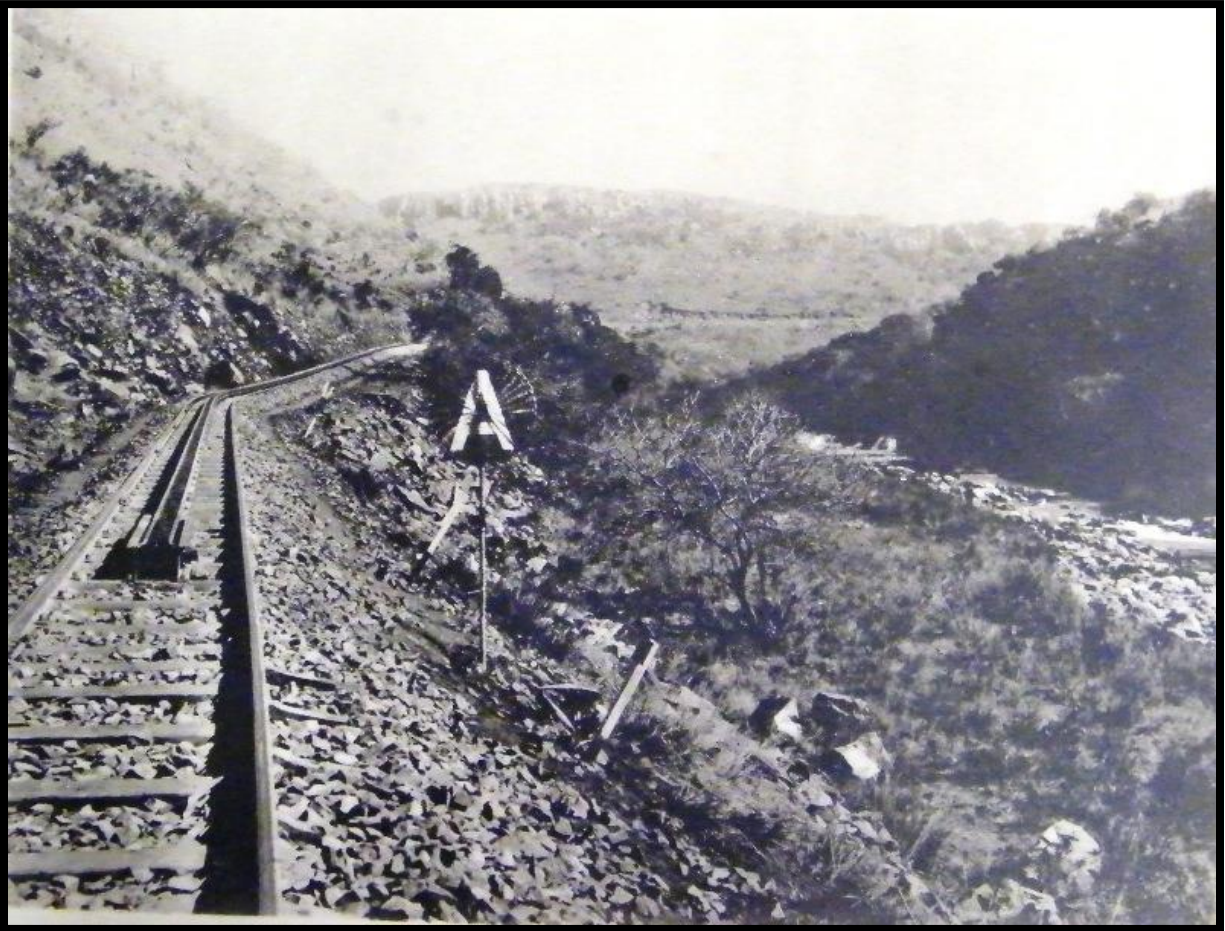


Figure 8: A steam train making the journey between Waterval Boven and Waterval Onder. (NASA)

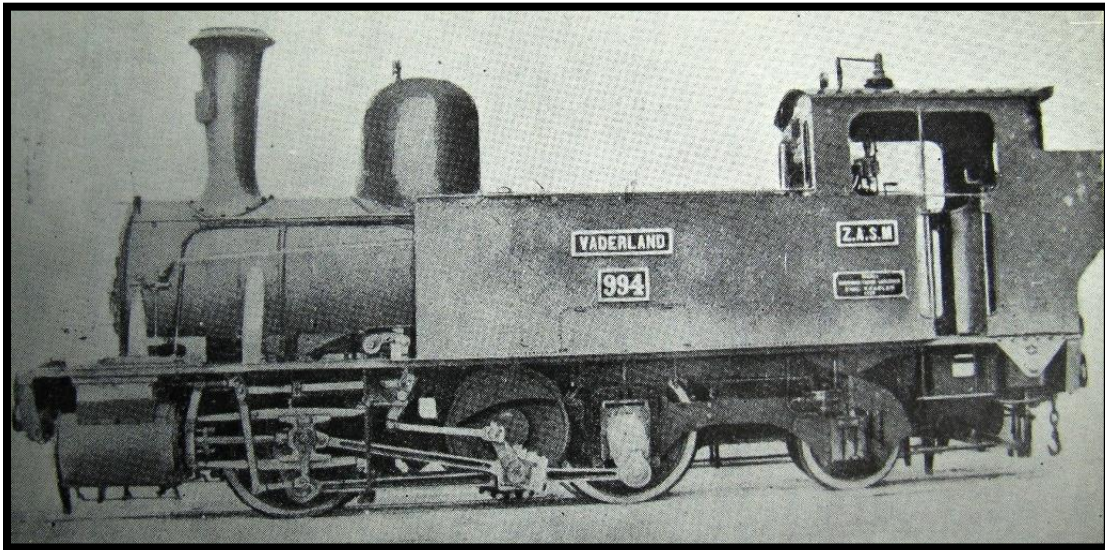


The tunnel made use of a rack-railway system. This system was necessary in that, although the distance between Waterval Onder and Boven was about eight kilometres, trains had to travel at very slow speeds due to the steepness of the slope. The use of the rack-railway system was first employed by Niklaus Riggenschach in the Swiss Alps in 1871 to regulate the pace of trains in these mountains. In essence between the rails of the normal track another rack was laid consisting of U-shaped beams and numerous transverse cogs. These cogs were then engaged by a crank-driven cog-wheel fixed to a specially manufactured rack locomotive. The rack rails were laid by May 1894 in order to reach Waterval Boven as soon as possible. (De Jong *et al* 1988:153)



**Figure 9: The beginning of the rack-rail line. (GEDENKBOEK: 1895)**

The NZASM made use of four of these specially designed rack locomotives on the section of rail between Waterval Onder and Boven. Trains approaching Waterval Boven from the east would be coupled with a rack locomotive at the back once it arrived at the Waterval Onder stations. Therefore the train was literally assisted in being pushed up the slope from the rear by the rack locomotive. Trains leaving from Waterval-Boven station towards Waterval Onder had to be coupled in the front of the normal locomotive so that the rack locomotive could perform a braking function on the slope down into the Lowveld. (De Jong *et al* 1988:153; Bulpin 1989:242).



**Figure 10: Rack Locomotive No. 994, named "Vaderland". It was the last remaining locomotive of the four rack locomotives that were used on the railway line between Waterval Boven and Waterval Onder. (Lombard: 1952)**

This gateway between the Lowveld and the Highveld was used until 1908 when a new line joining Waterval Boven and Waterval Onder was opened on the opposite side of the gorge. During the 1920's the tunnel became a road tunnel for motor vehicles. It fell in disuse after the Elands Pass was opened for motorists. During the construction of the road tunnel in the 1970's it was again briefly used as an alternative route by motorists. It was proclaimed a national monument in 1962. (De Jong *et al* 1988:155)

Another important feature that was constructed in the area is located between Waterval Boven and Waterval Onder and was a stone viaduct with five arches across the Dwaalheuwel Spruit in 1894. It was named "Five-Arch Bridge" and was also built by the firm Warren & Royce. With the opening of the new railway line between Waterval Onder and Waterval Boven in 1908 it was abandoned, but then served as a road bridge until the completion of the new national road in the 1970's. (Derwent 1999:38; De Jong *et al* 1988:151)



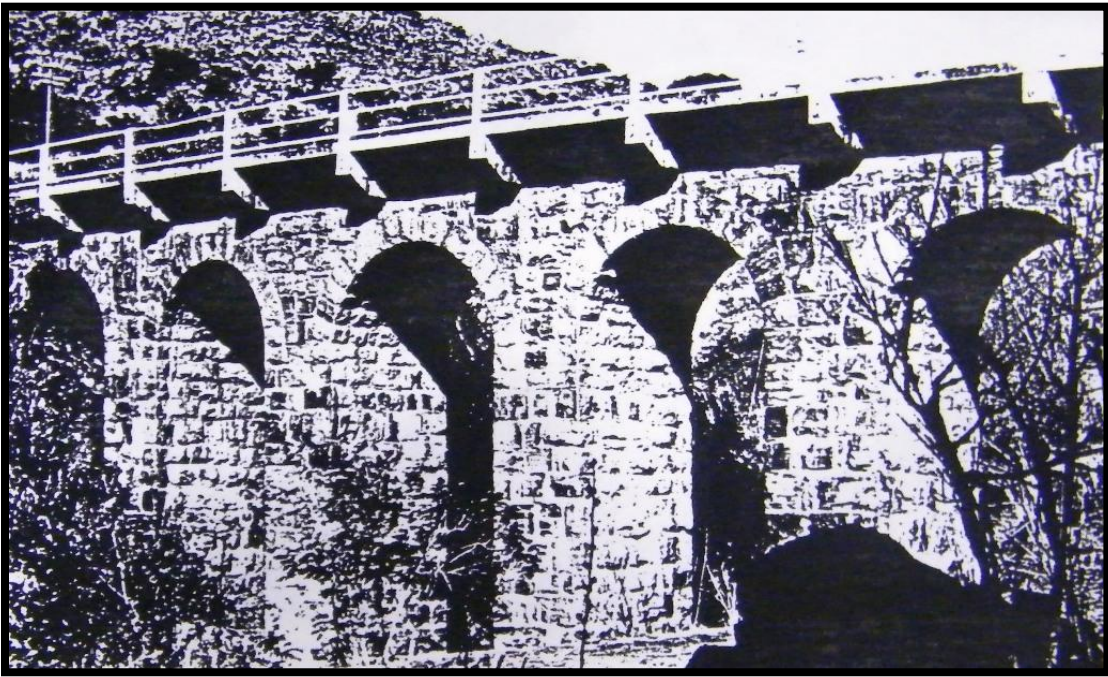


Figure 11: The "Five-Arch Bridge" spanning the Dwaalheuwel Spruit close to Waterval Boven. (De Jong: 1988)

## 5. HERITAGE SITE SIGNIFICANCE AND MITIGATION MEASURES

The presence and distribution of heritage resources define a 'heritage landscape'. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed quarry extension the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface.

This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance:

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

Furthermore, The National Heritage Resources Act (Act No 25 of 1999, Sec 3) distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

- » Its importance in/to 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;
- » Sites of significance relating to the history of slavery in South Africa.

### 5.1. Field Rating of Sites

Site significance classification standards prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 7 of this report.

<b><i>FIELD RATING</i></b>	<b><i>GRADE</i></b>	<b><i>SIGNIFICANCE</i></b>	<b><i>RECOMMENDED MITIGATION</i></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



## 6. BASELINE STUDY-DESCRIPTION OF SITES

It is important to note that the entire 43km of road in which the 7 passing lanes is located was not surveyed but only the approximate 5.37 km earmarked for the proposed passing lanes on the eastbound and westbound directions respectively as indicated in Figure 1. The upgrades will remain within the existing road servitude owned by SANRAL and therefore the areas under investigation are extensively disturbed by the construction of the existing N4 national road that would have destroyed any surface indicators of archaeological sites and cemeteries. The only remains that can be expected within the road reserve are bridges and remains of roads of a historical nature. For the purposes of this report 2 heritage features are significant, the first is the railway line that follows the existing N4 national road mostly to the north of the N4 and the old road the T4/3 that was upgraded to the existing national road. The following sections describe each of the passing lanes and the required mitigation measures.



Figure 12. General site conditions in the study area.



Figure 13. General site conditions in the study area.

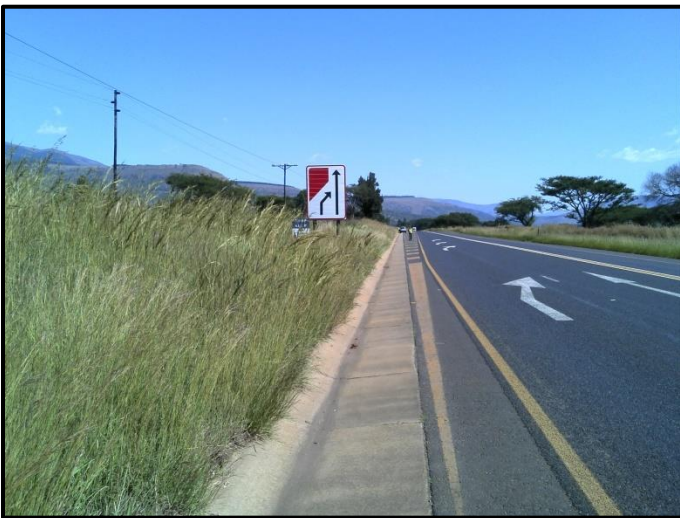


Figure 14. General site conditions in the study area.

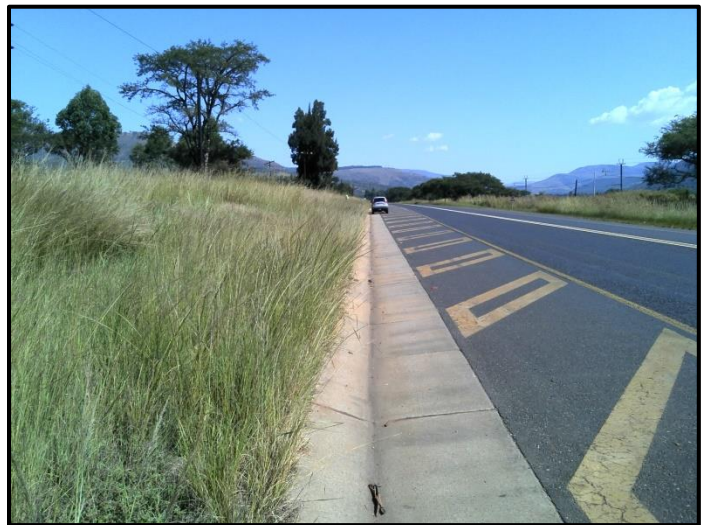


Figure 15. General site conditions in the study area.



**6.1 WB 1**

This passing lane measures 1.427 km and is located to the south of the N4. No heritage sites were recorded within or on the periphery of the road reserve.

**Impact of the proposed development/ activity:**

It is envisaged that the proposed development will not impact on the heritage resources of the area.

**Mitigation:**

It is recommended that chance finds procedures are put in place during the construction phase to mitigate any accidental finds.

**6.2 EB 1**

This passing lane measures 527.83 m and is located to the north of the N4. No heritage sites were recorded within or on the periphery of the road reserve.

**Impact of the proposed development/ activity:**

It is envisaged that the proposed development will not impact on the heritage resources of the area.

**Mitigation:**

It is recommended that chance finds procedures are put in place during the construction phase to mitigate any accidental finds.

### 6.3 WB3

This passing lane is located to the south of the N4 measuring 1.298 km. Everything within the road reserve has been bulldozed and no archaeological surface indicators remains. A stone cairn was recorded here of unknown purpose next to a Marula tree (Figure 16) of which the bark was harvested (Site 4) inside the proposed road reserve. The site has possible ritual significance and will then have a field rating of generally protected B. Rectangular stone foundations of presumably a farm labourer dwelling (Site 5) was recorded approximately 20 meter to the south **outside** of the proposed road reserve. Cultural material consisted of undecorated ceramics. The site is of low to medium significance, if it is older than 60 years, it is protected by legislation and will then have a field rating of generally protected B.

#### **Impact of the proposed development/ activity:**

It is envisaged that the proposed development will impact directly on the stone cairn. No impact will occur on the rectangular stone foundations. (Figure 17).

#### **Mitigation:**

It is recommended that this section is monitored during the construction phase to mitigate any accidental finds.



Figure 16: Scarring on Marula tree next to a stone cairn.





Figure 17: Site 4 and 5 in relation to the proposed passing lane WB3.



## 6.4 WB4

This passing lane measures 1.068 km and is located to the south of the N4. No archaeological sites were recorded within or on the periphery of the road reserve. However a culvert/bridge (Site 3) (Figure 18) is located at the southern section of the proposed passing lane. The significance of the culvert is unknown. It has no technological or architectural significance. If the culvert is older than 60 years it is protected by legislation and will then be of low to medium significance and a field rating of generally protected B.

### **Impact of the proposed development/ activity:**

The impact of the project on the culvert can only be determined once the developer can give a more detailed indication of the nature of project activities in this area (Figure 19).

### **Mitigation:**

It is recommended that it is determined if the proposed site will be impacted on. If so a conservation architect must assess the structure and recommend possible mitigation measures.



Figure 18. Site 3 viewed from the south.



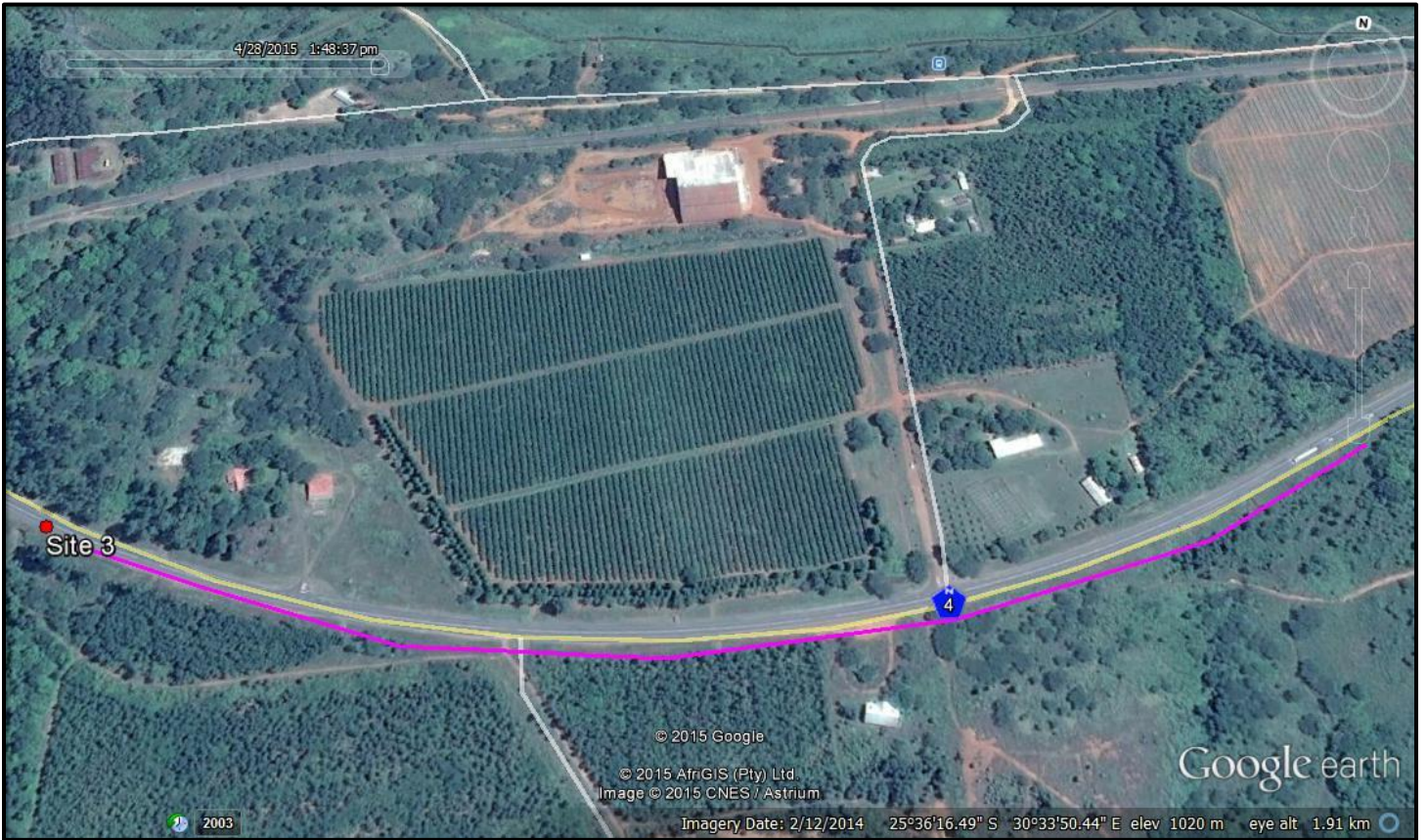


Figure 19: Site 3 in relation to the proposed passing lane

**6.5 WB5**

This passing lane measures 809.87 m and is located to the south of the N4. No heritage sites were recorded within or on the periphery of the road reserve.

**Impact of the proposed development/ activity:**

It is envisaged that the proposed development will not impact on the heritage resources of the area.

**Mitigation:**

It is recommended that chance finds procedures are put in place during the construction phase to mitigate any accidental finds.

**6.6 EB 3**

This passing lane measures 659.72m and is located to the north of the N4 between the national road and the railway line. No heritage sites were recorded within or on the periphery of the road reserve.

**Impact of the proposed development/ activity:**

It is envisaged that the proposed development will not impact on the heritage resources of the area.

**Mitigation:**

It is recommended that chance finds procedures are put in place during the construction phase to mitigate any accidental finds.



## 6.7 WB7

This passing lane is located to the east of the N4 measuring 1.02 km. A small hill is located here and the remains of highly overgrown LIA stone walling (Figure 20) was recorded at two locations Site 1 and Site 2 at the foot of the hill. Both sites is located **outside** (Figure 21) of the existing road servitude although it seems as if the N4 negatively impacted on Site 1 and partially transected through the site. What remains of site 1 is so overgrown that it is not possible to determine site extent and layout. The sites are of low to medium significance and has a field rating of generally protected B.

### **Impact of the proposed development/ activity:**

It is envisaged that the proposed development will not further impact on the site as everything within the road servitude has been bulldozed. Earthworks during the construction phase might however expose subsurface material.

### **Mitigation:**

It is recommended that this section is monitored during the construction phase to mitigate any accidental finds.



Figure 20: Overgrown stone walling at site 1.



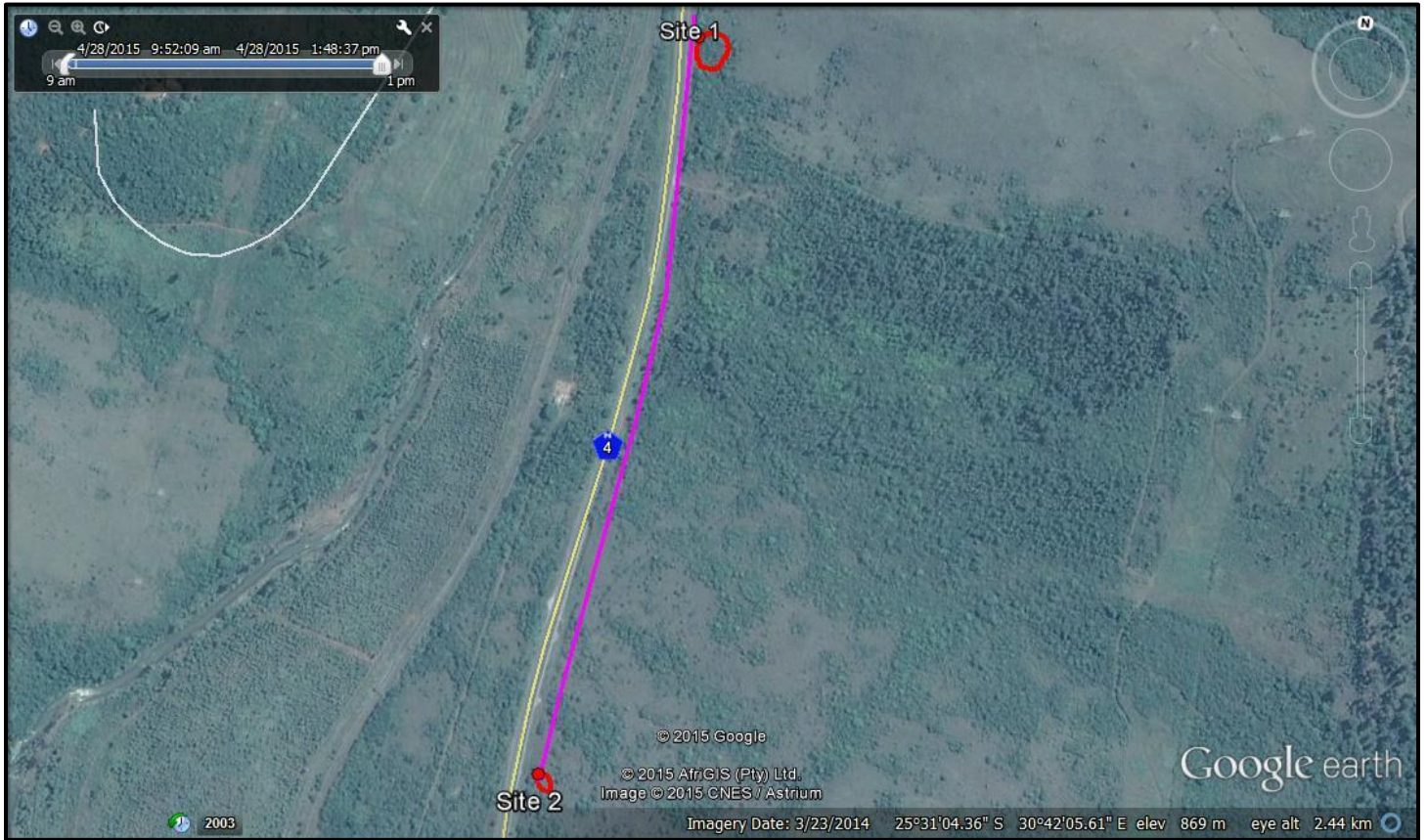


Figure 21: Site 1 and 2 in relation to the proposed passing lane.

Site	Description	Co ordinate	Field Rating
1	LIA Stone Walling	30.6998774657, - 25.5221266978	Generally Protected B – Low Medium Significance
2	LIA Stone Walling	30.6998774657, - 25.5221266978	Generally Protected B – Low Medium Significance
3	Culvert / Bridge	30.5590230413 - 25.6059699599	Generally Protected B – Low Medium Significance (if older than 60 years)
4	Maroela Tree	30.5232670158 - 25.6158750225	Possibly Generally Protected B – Low archaeological Significance but possibly of high social significance
5	Rectangular Stone Foundations	30.5167994833, - 25.6205179835	Generally Protected B –Low -Medium Significance( if older than 60 years)



## 7. RECOMMENDATIONS AND CONCLUSIONS

The proposed road upgrades are located within the existing N4 servitude and as such the chances of recovering surface archaeological materials *in situ*, are limited.

However 5 sites were recorded consisting of Late Iron Age Stone walled settlements, sites of possible ritual significance, a possible historical culvert/bridge and rectangular stone walled foundations probably dating from the historical period.

Most of these sites are located outside of the road reserve and area of impact but some sites are located within the area of impact and mitigation measures must be implemented at the following sites and passing lanes:

A stone cairn and Marula tree of possible ritual significance were recorded at WB3 and a bridge/culvert of unknown age at WB4.

- It is recommended that the area where the cairn is located should be monitored during construction.
- It is recommended that it is determined if the culvert will be impacted on. If so a conservation architect must assess the structure and recommend possible mitigation measures.
- It is recommended that the public participation team should confirm whether the stone cairn is a grave and whether the Maroela tree indicated in site 3 is of ritual significance

Two stone walled sites were recorded in the vicinity of WB 7 where the existing N4 national road impacted on the archaeological site and it is possible that subsurface archaeological material might be exposed during construction within the road reserve.

- It is recommended that this section is monitored during the construction phase to mitigate any accidental finds and a chance find procedure must be implemented for the project.

If during construction, any archaeological finds are made (e.g. stone tools, skeletal material), the operations must be stopped, and the archaeologist must be contacted for an assessment of the finds.

Based on the results of the phase 1 AIA there is from an archaeological point of view no reason why the development cannot commence work provided that the recommendations made in the AIA are adhered by and based on approval from SAHRA.

### Chance finds procedure

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

**7.1 Reasoned Opinion**

If the above recommendations are adhered to and based on approval from SAHRA, HCAC is of the opinion that the development can continue. If during construction, any archaeological finds are made (e.g. graves, stone tools, and skeletal material), the operations must be stopped, and the archaeologist must be contacted for an assessment of the finds.

## **8. PROJECT TEAM**

Jaco van der Walt, Project Manager

## **9. STATEMENT OF COMPETENCY**

I (Jaco van der Walt) am a member of ASAPA (no 159), and accredited in the following fields of the CRM Section of the association: Iron Age Archaeology, Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation. This accreditation is also valid for/acknowledged by SAHRA and AMAFA.

Currently, I serve as Council Member for the CRM Section of ASAPA, and have been involved in research and contract work in South Africa, Botswana, Zimbabwe, Mozambique, Tanzania and the DRC; having conducted more than 300 AIAs since 2000.

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