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TITLE:

HERITAGE IMPACT ASSESSMENT STUDY FOR THE PROPOSED CONSTRUCTION OF A 500KV POWER LINE FROM NZHELELE TO ZIMBABWE, IN THE LIMPOPO PROVINCE, SOUTH AFRICA

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DECLARATION OF INDEPENDENCE

This HIA report has been compiled and authored by Nkosinathi Tomose, principal archaeologist and heritage consultant for NGT Projects and Heritage Consultants (Division: NGT Heritage Solutions). The scoping aspect of the report was compiled by Dr Morris Sutton, Mr Neil Swart and Miss Carli Terreblanche from NGT. The views expressed in this report are entirely those of the authors and no other interest was displayed during the decision making process for the project.

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EXECUTIVE SUMMARY

NGT Projects and Heritage Consultants (Division: NGT Heritage Solutions) was appointed by Baagi Environmental Consultancy cc to conduct an Heritage Impact Assessment (HIA) (exclusive of Palaeontological desktop study) for the proposed construction of a 500kv power line from Nzhelele in Limpopo to Zimbabwe, as part of specialists inputs impact assessment studies required to fulfill the EIA process. The EIA is done in terms of the National Environmental Management Act Section 24 of the NEMA, No 107 of 1998 and the 2010 EIA Regulations (Government Notice 544 published in terms of the NEMA, No 107 of 1998). The HIA is conducted in terms of Section 38 (1) of the National Heritage Resources Act, No. 25 of 1999. The standard NGT Projects & Heritage Consultants HIA entailed conducting a detailed background information search of the affected environment. A physical survey of the project foot print to identify, record/document and map out any archaeological and heritage resources along and within the development footprint. The assessment and evaluation of impacts on the identified heritage resources follows this process.

The following conclusions and recommendations are made about the Eskom power line in terms of heritage resources management.

Conclusions:

- It is concluded that the heritage scoping of the affected environment yielded the archaeological, history and heritage of the affected environment and we know from this that the development footprint is located within a rich cultural landscape.
- The proposed development has a potential to contribute to the discovery of new archaeological and heritage sites in the region, but also the potential to contribute to the destruction of archaeological resources.
- Based on the various analyses of the project area and the proposed powerline corridors it is concluded that Alternative 1A and Alternative 2B be omitted from the list of preferred alternatives. Alternative 1A has a potential to impact on more archaeological resources because it is closer to the Mapungubwe cultural landscape. Based on exiting database of known archaeological resources in the region this alternative is also closer to known Khami sites and two Khami Capitals as shown in Figure 13 (position of two Capitals)
- Alternative 2B is located in area currently being researched by the University of Pretoria and with known archaeological resources.

- Alternatives 1 and 1B are the preferred alternatives for the project and should be the two alternatives from heritage perspectives that should be given a Positive Review Comment. However, should these two alternatives not be considered by the developer; Alternatives 2 and 2A should be the second preferred alternatives from a heritage perspective.

Recommendations:

- It is recommended that SAHRA approves Alterative 1 and Alternative 1B as the preferred alternatives for the proposed development.
- Should Alternative 1 and Alternative 1B not be supported by the developer SAHRA should approve Alternative 2 and Alternative 2B.
- It is recommended to the client that once the EIA process has been completed, a specialist walkdown programme should be developed for the approved Alternative as part of the Construction Environmental Management Programme.
- A heritage consultant or archaeologist should be employed in the specialist walkdown to conduct a Phase 2 HIA for the preferred alternative and assess the location of tower positions in relation to any other heritage resources that would be identified in the walkdown as part of Construction Environmental Management Programme.
- The heritage specialist would then advise both SAHRA and the developer on the mitigation measures for sites that would be impacted and applied for heritage permits for their mitigation in line with the NHRA, No. 25 of 1999.

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ABBREVIATIONS:

Acronyms	Description
AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
ARCH	Archaeological
BAR	Basic Assessment Report
BID	Background Information Document
BEL	Built Environment and Landscape
BGG	Burial Grounds and Graves
BGG	Proven not to be Burial Ground and Grave
CRM	Cultural Resource Management
DEA	Department of Environmental Affairs
EAP	Environmental Assessment Practitioner
EIR	Environmental Impact Report
EIA	Environmental Impact Assessment
ESA	Early Stone Age
GIS	Geographic Information System
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Party
K.y.a	Thousand years ago
LSA	Late Stone Age
LIA	Late Iron Age
MSA	Middle Stone Age
MIA	Middle Iron Age
NHRA	National Heritage Resources Act
NEMA	National Environmental Management Act
NWA	National Water Act
PHRA	Provincial Heritage Resources Authority
LPHRA	Limpopo Provincial Heritage Resources Authority
PSSA	Palaeontological Society of South Africa
ROD	Record of Decision

PDAFP	Proposed Development Area Footprint
SAHRA	South African Heritage Resources Agency

TERMS AND DEFINITIONS

Archaeological resources

This includes:

- Material remains resulting from human activities which are in a state of disuse and are in or on land and which are older than 100 years including artefacts, human and hominid remains and artificial features and structures;
- rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation;
- wrecks, being any vessel or aircraft, or any part thereof which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation;
- Features, structures and artefacts associated with military history which are older than 75 years and the site on which they are found.

Cultural significance

This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

Development

This means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of the heritage authority in any way result in the change to the nature, appearance or physical nature of a place or influence its stability and future well-being, including:

- Construction, alteration, demolition, removal or change in use of a place or a structure at a place;
- Carrying out any works on or over or under a place;

- Subdivision or consolidation of land comprising a place, including the structures or airspace of a place;
- Constructing or putting up for display signs or boards;

- Any change to the natural or existing condition or topography of land; and

- Any removal or destruction of trees, or removal of vegetation or topsoil

Heritage resources

This means any place or object of cultural significance

1. INTRODUCTION

1.1. Project background

1.1.1. Summary of the Proposed Project

Eskom is proposing a construction of a 2 x 250 MVA 400/132 kV substation at the Nzhelele site and a 400 kV Transmission Line to supply loads between the Soutpansberg Mountains and the Zimbabwe border currently fed from Tabor and Spencer. The energy will be transported via powerline from Nzhelele substation to the border of Zimbabwe.

The proposed power line will run from the Nzhelele substation to Beitbridge at the border of Zimbabwe in the Limpopo Province, within the Vhembe District Municipality. The line will traverse from the N1 road before the R525 road to Beitbridge at the border of Zimbabwe and South Africa (Alternative 1 & 2). In between the line branches to the East and West according to the alternatives proposed. The west route (Alt 1A) is approximately 15km to Musina from the N1 main road, and approximately 20km after Baobab Toll Plaza to the border. The western middle route (Alt 1B) will traverse on the N1 main road until the town of Musina (Figure 1). The eastern middle route begin in the middle of the R508 traversing north-east to the border. Alt 2A begins in the same area as the 2B traversing north-west to Musina town. Alt 1B and 2A meet just before the east of the town of Musina traversing north to the border (*Figure 1*).

1.1.2. Proposed Project Aims

Eskom's mandate is to provide electricity in an efficient and sustainable manner. Eskom is a critical and strategic contributor to the government's performance in providing the country's citizens with a secure supply of electricity. In pursuing its mandate, Eskom's purpose is to provide sustainable electricity solutions to grow the economy and improve the quality of life of the people in South Africa and the region.

The Nzhelele 400 kV Integration project proposes the establishment of a 2 x 250 MVA 400/132 kV substation at the Nzhelele site to supply loads between the Soutpansberg

Mountains and the Zimbabwe border currently fed from Tabor and Spencer. It will be fed via two 400 kV lines from Tabor and Borutho, respectively.

1.1.3. Terms of Reference for the Appointment of Archaeologist and Heritage Specialist

The nature and size of the construction requires an environmental authorisation. As a result, the environmental application process developed in terms of the Section 24 of the National Environmental Act (NEMA), No. 107 of 1998 as amended (2014) with the 2010 EIA (EIA) Regulations requires a HIA study to be undertaken as part of the environmental management process. There are also other various triggers to this project because of the nature of proposed activities. The following legislation also becomes relevant – National Water Act (NWA), 1998 (Act No. 36 of 1998) and National Heritage Resources Act (NHRA), No.25 of 1999.

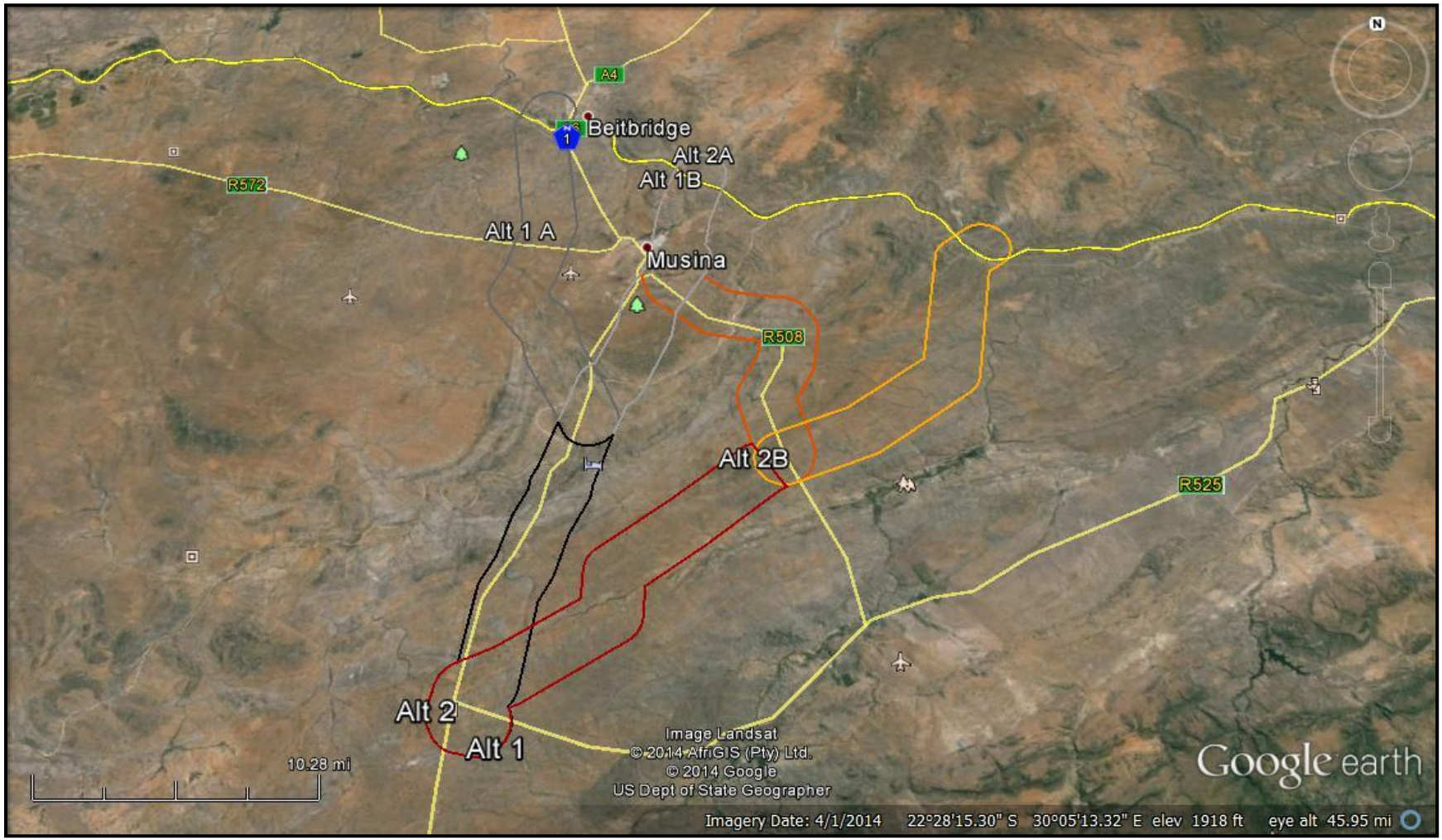

Figure 1: Aerial view of the proposed power line and the surrounding area

2. BACKGROUND OF THE STUDY AREA

2.1. Archaeological Background

The study area is situated within the Limpopo Province from Nzhelele to the border of South Africa and Zimbabwe within and around the Musina area. Limpopo is one of the provinces with an abundance of known and documented archaeological sites. Heritage resources found date from the Earlier Stone Age until late Iron Age as well as contact and historical archaeology.

2.2. Stone Age Archaeology

2.2.1. Earlier Stone Age 2.5mya – 300kya

The Earlier Stone Age (ESA) dates to ~2.5 mya with stone artefacts found at Gona in Ethiopia. This early stone tool technology is called Oldowan after the first tools recovered were described by Mary Leakey at Olduvai Gorge, Tanzania. The Oldowan is characterized by a simple core and flake industry and is also referred to as Mode 1 technology. The tool makers, believed to be *Homo habilis*, used river cobbles and pebbles to produce flakes for various cutting and scraping activities. The knapping process resulted in sharp edges on the cores, which were also used as tools by the tool makers. Oldowan sites are most often associated with perennial river settings suggesting early hominins were closely tied to these sources of raw material. However, due to the limited number of Oldowan sites it is likely this is archaeological bias and is a reflection of preservation and eventual recovery by researchers.

In South Africa the earliest Oldowan stone tools date to ~2.0 mya and are found at four sites; Swartkrans (Sutton 2012), Sterkfontein (Kuman and Field 2009) and Kromdraai (Kuman and Field 1997) in the Cradle of Humankind in Gauteng Province and at Wonderwerk Cave (Chazen 2008) in the Northern Cape.

After almost a million years of a somewhat stasis use of technology, innovations appear in the archaeological record around 1.7 mya. This new, more adaptive technology is called the Acheulean. The Acheulean is characterized by large cutting tools (LCT) such as handaxes, picks and cleavers. These heavy-duty tools are often made on large flake blanks reflecting a greater use of raw material sources than what was seen in the Oldowan. The makers of LCTs show adaptability in technology and behaviour as sites are greater in size and have a higher density

of tools present (Kuman 2014). In addition, Acheulean sites are found in a variety of environmental habitats suggesting greater use of the landscape.

West of the study area in the Limpopo River valley along the borders of South Africa, Zimbabwe and Botswana Earlier Stone Age material has been recovered from three sites: Hackthorne, Kudu Koppie and Keratic Koppie. All three sites yielded ESA Acheulean material. These sites exist along a paleo-escarpment south of the current position of the Limpopo River. Additionally, surveys in the area identified occasional LCTs scattered on the landscape suggesting ESA tool makers were widely occupying the area.

2.2.2. Middle Stone Age ~300kya – 35kya

The Middle Stone Age follows the Earlier Stone Age, appearing around 300k years ago and continuing until ~40/30k years ago (McBrearty and Brooks 2000). The MSA is characterised by a change in stone tool types. Handaxes and cleavers, which had been part of the Earlier Stone Age tool kit for well over a million years, are replaced with lighter, more standardised flake and blade industries, largely driven by the development of hafting technology (Lombard 2006, Wadley 2005). An important part of the flake industry is the production of points. Additionally, prepared core reduction techniques become common in the MSA.

In addition to technological changes occurring in the MSA, the period is also important for two other significant archaeological attributes. The MSA represents the first appearance of anatomically modern Homo sapiens and, arguably, the first appearance of modern human behaviour.

In the last two and a half decades, the Middle Stone Age has become a critical time period in the debates surrounding modern *Homo sapiens*. Much of this renewed interest in the MSA has, more recently, been focused on the South African archaeological record. Several South African sites, primarily those on the southern cape coast, have yielded remarkably preserved archaeological material from 50k-100k years ago. While sites in the interior of the country have not exhibited the same preservation from this time period, there exists a limited record of stone artefacts.

West of the study area MSA artefacts were recovered from the Limpopo River valley area at the Kudu Koppie and Keratic Koppie sites. Additionally, MSA artefacts were identified during surveys on the Parma Farms south of the Palaeo Limpopo River escarpment. The surveys also resulted in the identification of several large scatters of artefacts at raw material outcrops reflecting MSA stone tool factory sites (Sutton 2007).

2.2.3. Later Stone Age 35kya-2kya

The LSA is characterized by the presence of microlithic (small stone tool) technologies, including bladelet (small blade) production. In addition to the downsizing to small flakes and blades, the LSA reflects more widespread use of symbols and art, the presence of bored stones and digging sticks, tortoise shell bowls, ostrich egg shell beads and greater use of bone points. The earliest firmly dated South African LSA site is Border Cave along the border of South Africa and Swaziland. The LSA at Border Cave dates to 38kya and reflects the transition from MSA technology to LSA technology with the presence of some MSA tool types alongside microlithic stone tools.

In South Africa the LSA can be loosely divided into three periods, represented by technological change that is most likely hunter-gatherer adaptations to shifting climate conditions.

- Late Pleistocene 40-12kya. The Robberg is a microlithic industry that reflects a high reliance on small blades (bladelets), especially after 20kya.
- Terminal Pleistocene / Early Holocene 12-8kya. The Oakhurst reflects a move back to broader and larger flakes and scraping tools. The raw material includes more coarse-grained rocks.
- Holocene 8kya-contact period. The Wilton represents a move back towards microlithic assemblages with many thumbnail size scrapers. This period also reflects the use of a large variety of bone and shell tools.

The later part of the LSA shows a marked increase in burials, in some cases including ocher (for ornamentation) and grave goods and, more common, painted gravestones. There is also an increase in rock paintings and engravings (Wadley 1993).

LSA sites have been recorded west of the study area in the greater Mapungubwe landscape. Five sites have been excavated—Balerno Main Shelter, Tshisiku Shelter, Balerno Shelter 2 and 3

(van Doornum 2000, 2005, 2007, 2008), and Little Muck Shelter (Hall and Smith 2000). These excavations show Later Stone Age people occupying the area from about 13kya. LSA material has also been recovered south of the study area on the Makgabeng Plateau in Limpopo Province. From the site of Leholamogo (28°49'32"E: 23°16'04"S) Stone Age artefacts recovered suggests hunter-gatherers continued their way of life in the area into the 19th century (Bradfield et al. 2009).

2.3. Iron Age Archaeology

According to Huffman (2007) the Iron Age marks the early evidence of farming communities in southern Africa. Animal husbandry, crop farming, pottery and metal working were introduced which in due time liberated hunter gatherers to change their predominately mobile way of life (Carruthers 1990). Due to vast technological discrepancies and settlement patterns within this period, researchers divided the Iron Age into three periods. The Early Iron Age (EIA) dates to AD 200 – 900, Middle Iron Age (MIA) dates to AD 900 – 1300, and the Late Iron Age (LIA) dates to AD 1300 – 1840 (Huffman 2007).

During an interview with Prof Huffman on 30 July 2014, for this study he stated that the following can be expected from the area: Iron Age sites from the Kalundu tradition. This type of tradition originates from north-west Africa and is known as the Western Stream (Huffman 2007) (see figure 1). Three types of potteries can be expected; Malapati, Eiland and Mutamba. Malapati is an Early Iron Age site dating to AD 700 – AD 1000. It is characterized by decoration and punctuates on the lip, multiple neck bands and large bands on shoulders (see figure 2). Mutamba is a Middle Iron Age site dating to AD 1000 – AD 1250. It is characterized by cross-hatched triangles with graphite and pendent triangle below lip (see figure 3). Lastly, Eiland is also a Middle Iron Age site dating to AD 1020 – AD 1300. It is characterized by herringbone type of design (see figure 4).

The Shashe-Limpopo landscape, west of the study area, has undergone decades of research which has resulted in hundreds of Iron Age sites being identified.

One of the early important sites in the area was K2. In the K2 period (AD 1000 to AD 1220) there is evidence of wide international trade; imported glass beads, along with ceramics, are

the earliest and most abundant artefacts in the archaeological record that attest to international trade. The K2 series is characterised by large quantities of transparent to translucent, turquoise to blue-green cylinders that generally have heat treated ends. (Wood, 2000) There are also beads found from Indo-Pacific origin which are generally red, yellow and green in colour.

Mapungubwe is a place of importance within the late Iron Age. Mapungubwe became a capital in about AD 1220, (Huffman, 2001) and represents the emergence of a new form of cultural division. A few elite people lived on top of the hill and the commoners would live at the bottom. This spatial pattern is associated with class distinction, and represents the origin of the Zimbabwe culture. This also correlates well with historical examples of capitals at the top of the five-level hierarchy of leadership 1) family heads 2) headmen 3) petty chiefs 4) senior chiefs and 5) the king with most people settling below the hill and in front of it, on the west side.

By 1250, when Mapungubwe was at its peak of power, some 5 000 people lived in the area. This makes Mapungubwe Southern Africa's largest known settlement in its day. The people at Mapunguwe pioneered the famous walling later used at Great Zimbabwe. Three walling functions helped to facilitate sacred leadership and class distinction. 1) Prestige walling provided ritual seclusion for the sacred leader. 2) Similar prestige walling characterises the office of the principle court official and 3) roughly piled terraces supported noble households.

Excavations in the 1930's uncovered a major cemetery containing 23 graves. In these graves along with the bodies, golden bangles; golden beads; glass beads, necklaces and cowrie shell jewellery were found. Best known object found are probably the famous golden rhinoceros. These grave goods became world famous and SAHRA had declared them a National Treasure (Huffman, 2001). Mapungubwe is the earliest place in Southern Africa where grave goods were associated with status (Huffman, 2007).

Mapungubwe is also known for internal and external trade in which copper, gold, salt, ivory; glass beads, clay artefacts and textile were being traded internally between Mapungubwe and surrounding areas, and externally between Mapungubwe and places as far as China across the Indian Ocean (Huffman, 2001).

East of the study area is the stone-wall site of Thulamela, located in the north-eastern part of South Africa near Pafuri in the Kruger National Park (Vogel, 1999), near "Crooks Corner" where

South Africa, Zimbabwe and Mozambique meet. The site, overlooking the Levhuvhu River covers about nine hectares.

Thulamela is a Venda word meaning "the place of giving birth". Carbon dating confirms that the kingdom existed between about 1240 AD to 1700 AD (Steyn & Miller, 1998). The excavations at Thulamela revealed two distinct phases of occupation: an earlier phase, which pre-dates the main construction of the extensive dry walling, and a distinct second phase during which the walled settlement was inhabited. Huffman connects the pre walling phase with the Mutamba group and the later phase to the Khami group.

The stone walled enclosures cluster according to size and position, these enclosures are grouped around a central focal point, and are situated at the highest and most isolated part of the site. Non-walled areas of habitation surround the walled area. This, like in Zimbabwe, suggests that the royal leaders are not protected by walls, but by their subjects (Steyn & Miller, 1998). It has been debated that either the death of a ruler, an environmental disaster or a war over the control of land and resources was to blame for the fall of Thulamela.

2.4. Rock Art

Rock art can be found in at least 20 000 to 30 000 places in Southern Africa. This is a remarkable record of religious life and culture. Most of it was created by the San hunter-gatherers but the Khoekhoe, Iron Age-farmers and European settlers also contributed to this tradition. Hunter-gatherer art was mostly painted with small brushes or pens made of reed and shows fine lines and delicate detail. Many ingredients were used in the manufacture of the paint: charcoal was for black; red and yellow ochre for red and yellow; and ostrich eggshell and raptor faces for white. Other elements were also added to increase the potency or spiritual power of the art that was painted, such as the blood or venom of animals that the San regarded as possessing potency or spiritual powers (Bassett, 2001). The hunter-gatherers did not only make paint to last millenniums, but they were also very gifted artists and contributed to the rock engravings in the Karoo as well (Giliomee & Mbenga, 2007).

Most paintings are evidence of metaphors, conventions and practice of San belief. Research

shows us that large antelopes, such as the eland, play a central role San cosmology; they believe that the eland can give them access to supernatural powers to heal, make rain and control game. San rock art sites provided a means to communicate and enter the spirit world. These sites were the scene of many rituals in order to communicate the spirit world. The practice of rubbing rock art was also used as a means to gain the potency of the eland and the spirit word that lay beyond the rock surface (Ouzman, 2001). The San painted elements of other groups that they came in contact with, such as the contact with herder, farmer and settler cultures as well as scenes of conflict between these cultures. Paintings of sheep and cattle, as well as Europeans with horses and guns with their hands on their hips were being seen later in San Rock art.

Painted art was not the only form of rock art that exists. Rock engravings can also be found. In the Central Limpopo Basin painted rock art and engravings often occur together. Engravings tend to contain cuples, grooves, animals, animal tracks, as well as a small range of geometric images (Smith & Ouzman, 2004). The engravings tend to occur on boulder tumbles, glaciated pavements, hills, ridges and rocks. Sites tend to be located in semi-arid conditions within predominantly flat and rocky landscapes that may contain isolated and impressive hills and mountain ranges, vast plains and few watercourses (Ouzman, 2001). The rocks that are often chosen for engraving tend to be Ventersdorp diabase, which is a dolerite rock with a very dark outer cortex, which covers a much lighter inner rock. Newly engraved rock engravings strongly contrast in colour from un-engraved rock. The engravings darken over time due to outside exposure to the elements and sun. The practice of San rock engraving can be dated to about 14 000 years ago. These engravings don't often display the fine detail than those of the painted rock art (Ouzman, 2001).

The Khoekhoe herders of Southern Africa are descendants of hunter-gatherers groups that have acquired livestock, through trade, work, or raiding from the farmer Bantu-speakers in the northern parts of Southern Africa. Like the Bantu speaking farmers they were also a migratory people and are believed to have already been settled in the Central Limpopo Basin by the last century BCE (Eastwood & Smith, 2005).They are also contributors to the rock art tradition with their own style and variation of the practice. These locations were often near watering holes that are found right next to rock. Depictions of magical snakes are common as well as military depictions in the art of the later multi-ethnic Korana (descendants of the Khoekhoe). Very often one can find Khoekhoe rock art painted over San rock art. Fingerprints, handprints and

geometric patterns of circles, dots, sunburst and aprons are often found in Khoekhoe rock art in the Central Limpopo Basin. Increasing contact with the Bantu-speaking farmers migrating southwards, they were eventually pushed to the peripheries of the area.

Forager-herder-farmer interaction occurred in the Limpopo valley can be seen in certain rock art sites in the area, where we see images such as sheep and cattle in San rock art, and many other such examples of elements of the 'other' being depicted in the rock art of the San, Khoe and Bantu.

Iron Age-farmers contributed to these paintings since about a thousand years ago in most parts of Southern Africa. Their paintings were made by both finger and brush and strongly relate to the initiation of young men and women.

2.5. Historical Background of Nzhelele

Nzhelele Valley, found around the Soutpansberg, is the cultural heartland of the Venda people. The landscape north of the Soutpansberg has played a pivotal cultural and ecological role in the history of South Africa. The Limpopo River, the Sand River, the Nzhelele and the Nwanetsetsi Rivers have provided water and ample food through the fertile soils surrounding them. The hills of Soutpansberg have provided shelter to a vast number of people over the generations. The Nzhelele originates high in the Soutpansberg and cuts through the landscape and passes through the heartland of present – day Venda at the foothills of Soutpansberg mountain range. The river further meanders through a series of sandstone hills, which are named Ha – Tshirundu Mountains and ends in the Limpopo River at the Ha–Dowe Mountain. It is a section of the Limpopo Valley that had been used and cultivated for thousands of years. It is argued that significant moments in the history of South Africa have taken place around the Nzhelele area. As the Nzhelele Valley is closely linked with the Venda people, it will, then, be useful to understand their history as well.

2.6. History of the Venda People

The Venda people display similar linguistic and cultural characteristics with the western Shona (Kalanga) of Zimbabwe. According to studies, the Venda nation is Shona in origin (Indigenous

and Institutional Profile: Limpopo River Basin, Working Paper 112, University of Pretoria). Some aspects of the Venda language can also be compared to that of the Sotho. However, the Venda language has enough unique elements that allows it to have a status to be considered a distinct language. The language of the Venda people has three regional dialects: 1). a dialect found in the north – western Soutpansberg known as Twamamba; 2). Another one spoken in the western and central mountains called Ilafuri; 3). then Tshimbedzi which is used by Venda people in southern Zimbabwe (IWMI 2006).

There are two schools of thought that have dominated interpretations of the origins of the Venda People. One is that the Venda people migrated from somewhere in the north of the Zambezi River in the vicinity of present day Malawi. The basis of this hypothesis is from the Singo oral traditions. Singo is the totemic name of the politically dominant group among the Venda. It is alleged that during their migration southward through Shonaland, several Shona elements were incorporated into this pre – Venda culture. As they moved through present – day Zimbabwe and Shona territory they came into contact with some important Zimbabwean groups, like the Rozvi at Danangombe, the capital of Changamire Rozwi from 1693 to the early 1820's. The Rozvi are taken as the principal Zimbabwean dynasty of the past (IWMI 2006). It is argued that the first three generations of the Singo lineage ruled north of the Limpopo River and the last five ruled in the Soutpansberg before the rule of the Venda Chief Makhado in 1864. This group of Shona immigrants (the royal Singo) moved into South Africa and settled on the banks of the Nzhelele River near the Soutpansberg. They established their capital known as Dzata and extended their power base which allowed them to dominate the whole Venda Kingdom. The Singo empire collapsed due to the dispute over the succession of chief Thoho- ya – Ndou. The Singo empire in the Nzhelele Valley is likely to have dispersed between 1750 and 1800 (IWMI 2006).

The second account of Venda origins surrounds the Bavenda people, who are a conglomeration of the original Venda group and several other groups. The Venda family formed the royal group and their leaders were acknowledged as chiefs of the whole population. The chieftainship of Thoho–ya-Ndou presided over an extended period of relative peace in the area. After his death, leadership was contested and three main sections developed out of this contestation. The three distinct groups are the Western, Eastern and the Southern Venda, which define the basis of the Venda classification. The Western section comprises the Ramabulana Singo, the Eastern section consists of the Tshivase and the Mpahaphuli dynasty, whilst the Southern section includes

former slaves of the Singo who gradually became incorporated into the Sotho chiefdoms. These areas were the rule of independent chiefs who ruled the various Venda tribes. While the eastern tribes remained relatively isolated, the western tribes had greater contact with other tribal groups and white settlers. Information about the origins and development of the western tribes is more readily available than other sections. Their chiefs are said to descend from the more senior bloodline of Thoho–ya–Ndou. Chief Mphephu is recognized as the most senior of all the Venda chiefs of the western Venda group (IWMI 2006).

Today Nzhelele River is home to large rural settlements that are found in the upper Nzhelele Valley. The tropical climate of the Soutpansberg area and the daily rain and mist showers high up on the mountain feed into the run off streams that become the Nzhelele River. The river feeds the fertile valleys at the foothills of the Soutpansberg. Communities dotting these fertile valleys are predominantly Venda speaking and use the valley for agricultural activity. Water is taken from the Nzhelele to adjacent farms for irrigation purposes. Some of the rural households found here depend on the river for food as it is a rich source of fish. The river played a similar role in the lives of the Venda people over many generations.

2.7. Description of the affected environment

Table 1: Description of the affected environment of the proposed Eskom Power line.

Location	The project area is located in the Limpopo Province, South Africa. The proposed development site covers an area of more than 5000m². The site center GPS Coordinates are:
	• Alt 1: North: 22°29'00.93"S 30°00'08.68"E South: 22°40'06.90"S 29°55'23.53"E • Alt 1A: North: 22°13'07.70"S 29°57'48.69"E South: 22°29'00.93"S 30°00'08.68"E • Alt 1B: North: 22°16'51.18"S 30°05'03.12"E South: 22°29'00.93"S 30°00'08.68"E • Alt 2: North: 22°30'16.78"S 30°06'59.28"E South: 22°40'06.90"S 29°55'23.53"E • Alt 2A: North: 22°16'51.18"S 30°05'03.12"E South: 22°30'53.33"S 30°08'05.09"E • Alt 2B: North 22°21'04.45"S 30°16'36.75"E South: 22°30'31.84"S 30°06'34.58"E

Surrounding Townships/Industrial Zones/ Villages	The study area is in and around Musina/Messina, Artonvilla, Bosrand, Messina/Nancefield and Beitbridge (*Figure 1 & 4*).
Land Uses in and around the study area	The area is defined by dense vegetation, mountains and rivers and is characterised by (*Figures 2-6*): • Mining • Nature Reserves • Commercial area • Farming • Residential area
Land Owner(s)	• Government – • Private property-residential and commercial sites • Government Parastatal - Eskom and some nature reserves
Current Conditions (on site)	In terms of the natural environment some portion of the site is located within nature reserves which mean the area is less/not disturbed, while some are highly disturbed due to mining activities in some areas and developed areas.
EAP	Baagi Environmental Consultancy
Applicant	Eskom
Proposed Development	• Construction of 400kv power line
Access	The development footprint is accessible through the following roads: • N1 • R508 • R525 • R572 • Local dirt/farm roads
Defining natural features	• A Ridge is found in Alt 1B and 2A, East of Musina (*e.g. Figure 2*) • Rivers and streams are found in all the proposed routes. Three major rivers are the Limpopo River (north), the Sand River (mid and north of the development footprint) and Nzhelele River (south of the development) (*e.g. Figure 7 & 1*)
Zoning	• Mining • Farming/Agricultural (existing) • Residential (existing) • Power generation activities

Figure 2- The natural environment in and around the proposed development area

Figure 3- Mining areas near Musina

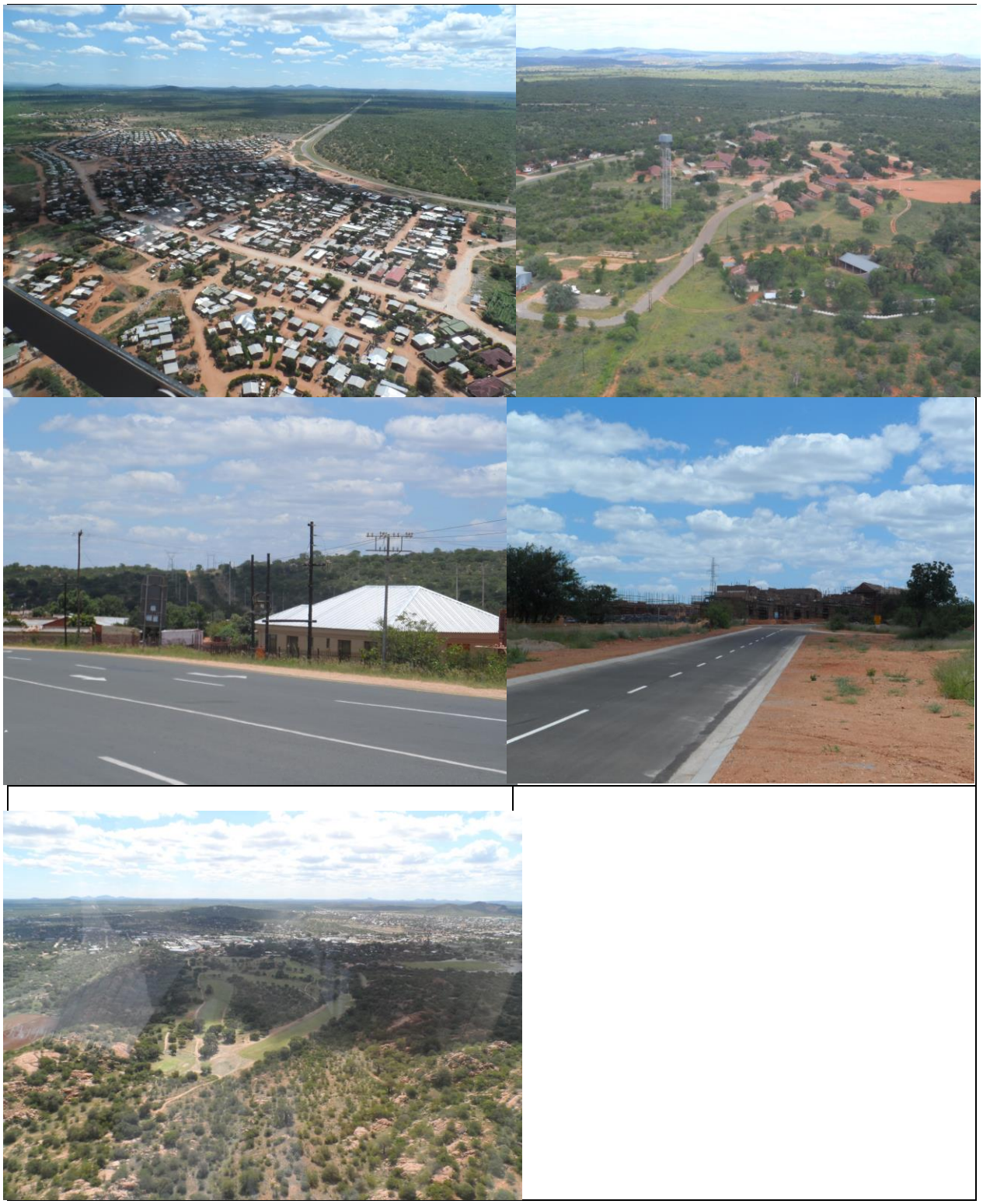

Figure 4- Town lands in and around Musina

Figure 5- Farms nears Musina

Figure 6- Roads in and around the development area

Figure 7- Sand River pictures

2.8. Description of proposed activities: Proposed Infrastructure

Table 2: List of Proposed Activities

Activity 1	• Environmental Authorization Application and Water Use License Application
Activity 2	• Construction of the 500kv power line

2.9. Needs and Desirability

Table 3: List of activities in-line with the project scope

Activity 1	• Scoping the amount of heritage resources, their value and integrity within and around the development footprint with a particular focus on resources within the proposed line servitudes. • Survey and documentation and recording of cultural resources within the proposed power line area.
Activity 2	• The mapping, assessment and evaluation of the heritage value and integrity of the identified heritage resources and development of Go Area vs. No Go Area.
Activity 3	• Developing of plan of study for the Construction Environmental Management Plan report (CEMPr) • Making recommendations to SAHRA and provincial heritage resources authority (LPHRA)

3. METHODOLOGY

3.1. Legislative Requirements

Section 24 of the NEMA, No. 107 of 1998 stipulated that for any development in South African to be granted permission to go ahead an assessment of the potential impacts of the proposed development on both the natural and cultural environment needs to be conducted. As such, this HIA fulfils the requirements of NEMA and is conducted in-line with Section 38 (1) of the NHRA, No. 25 of 1999 as well as applicable 2010 EIA Regulations.

3.2. Methodology

This chapter outlines the methodologies used in conducting this scoping heritage study for the proposed Eskom power line. This is done in accordance to the Terms of Reference provided by the client for the completion of this study. Additionally, some areas of the report follow minimum standards for completion of professional HIAs (adopted for the scoping phase) as stipulated in SAHRA minimum standard (2012) such as detailed account to the archaeological and historical background of the study area or region affected.

3.2.1 Step I: Literature Review (Desktop Phase)

- Background information search for the proposed development took place following the receipt of appointment letter. Sources used included, but not limited to published academic papers and HIA studies conducted in and around the region where the current development will take place;
- Map Archives were studied and assessed to aid with information about the KwaZulu-Natal region;
- This also included a review and assessment of relevant environmental and heritage legislations, and Bills such as the KwaZulu-Natal Heritage Bill, 21 February 2008.

3.2.2. Step II: Physical Survey

- The physical survey of the proposed Nzhelele-to Zimbabwe border transmission was undertaken on two occasions first for site orientation and second for the survey ().
- The site orientation was conducted by Nkosinathi Tomose (Managing Director and principal consultant)
- The survey was conducted by Miss Khosi Mngomezulu and Miss Gugu Dube heritage consultants for NGT Projects & Heritage Consultants;
- The objective of the survey is to locate and identify archaeological and heritage resources and/or sites within the proposed Nzhelele to the border of Zimbabwe power line route;
- To record and document identified resources using necessary and applicable tools and technology;

- The physical survey is deemed necessary since the desktop phase yielded some information about the history and heritage of the Limpopo Province and the region under consideration;
- The survey paid special attention to disturbed and exposed layers of soils as such as eroded surfaces because these areas are more likely to exposed or yield archaeological and other heritage resources that may be buried underneath the soil and brought to the earth surface by natural, animal and human activities;
- The following technological tools will be utilitsed for documenting and recording located and/or identified sites:
    - Garmin GPS (i.e. Garmin 62s): to take Lat/Long coordinates of the identified sites and to track the site.
    - DELL Notebook aided with Garmin Basecamp Software, Google Earth: to plot the propose project footprint.
    - Samsung: to take photos of the affected environment and the identified sites.
    - For the identified sites: open sources GIS system (Quantum) was used to map them in the landscape.
- Shapefiles provided by the client will be used to map the project area and sites located in and around the proposed line corridor.

3.2.3. Step III: Data Consolidation and Report Writing

All the archaeological and heritage data as well as the data captured on the development area by means of Google Earth spotting is used as a baseline for this desktop heritage study. This data is also use to develop assessment for current and future impacts within the development footprint:

- Assessment of the significance of the cultural resources in terms of their archaeological, built environment and landscape, historical, scientific, social, religious, aesthetic and tourism value;
- Description of possible impact of the proposed development on these cultural environment and remains, according to a set of standard and conventions for the

management of the cultural environment;

- Proposal of suitable mitigation measures to minimize possible negative impacts on the cultural environment and resources that may result from the proposed power line;
- Review of applicable legislative requirements: *as discussed in section 1.1 above under Terms of Reference for the Appointment of Heritage Specialist.*
- Highlighting of assumptions, exclusions and key uncertainties. *Chapter 4 below.*
- The final step involves the consolidation of the data collected using the various sources as described above.
- Discussing the findings and making recommendation on the management and mitigation measures of the identified cultural environmental features and the potential heritage resources that might be encountered within and around these cultural environment areas such as local farmsteads.

3.2.4. Assessment of Site Significance in Terms of Heritage Resources Management Methodologies

The significance of heritage the identified heritage resources sites was based on four main criteria:

- Site integrity (i.e. primary vs. secondary context)
- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures)
    - Density of scatter (dispersed scatter)
    - Low - <10/50m^2
    - Medium - 10-50/50m^2
    - High - >50/50m^2
- Uniqueness and;
- Based on the site integrity, amount of deposits and uniqueness the identified resources were assessed in terms of the potential to answer research questions.

Management actions and recommended mitigation, which will result in a reduction in the impact on the sites, will be expressed as follows:

- A - No further action necessary;
- B - Mapping of the site and controlled sampling required;

- C - No-go or relocate pylon position;
- D - Preserve site, or extensive data collection and mapping of the site; and
- E - Preserve site

Impacts on these sites by the development will be evaluated as follows:

Site Significance

The following site significance classification minimum standards as prescribed by the SAHRA (2006) and approved by the ASAPA for the SADC region were used for the purpose of this report.

Table 4: Site significance classification standards as prescribed by SAHRA

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
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.A)	-	Low Significance	Destruction

3.2.5. Methodology for Impact Assessment in terms of Environmental Impact Assessment Methodologies including Measures for Environmental Management Plan Consideration:

The Basic Assessment Methodology (adopted for purposes of this EIA and HIA) assists in evaluating the overall effect of a proposed activity on the environment. The determination of the effects of environmental impact on an environmental parameter is determined through a systematic analysis of the various components of the impact. This is undertaken using information that is available to the environmental practitioner through the process of the Basic Assessment & Environmental Impact Assessment. The impact evaluation of predicted impacts was undertaken through an assessment of the significance of the impacts:

The Basic Assessment included:

- an indication of the methodology used in determining the significance of potential environmental impacts
- a description of all environmental issues that were identified during the environmental impact assessment process
- an assessment of the significance of direct, indirect and cumulative impacts in terms of the following criteria:
    - the *nature* of the impact, which shall include a description of what causes the effect, what will be affected and how it will be affected
    - the *extent* of the impact, indicating whether the impact will be local (limited to the immediate area or site of development), regional, national or international
    - the *duration* of the impact, indicating whether the lifetime of the impact will be of a short-term duration (0–5 years), medium-term (5–15 years), long-term (> 15 years, where the impact will cease after the operational life of the activity) or permanent
    - the *probability* of the impact, describing the likelihood of the impact actually occurring, indicated as improbable (low likelihood), probable (distinct possibility), highly probable (most likely), or definite (impact will occur regardless of any preventative measures)
    - the *severity/beneficial scale*, indicating whether the impact will be very severe/beneficial (a permanent change which cannot be mitigated/permanent and

significant benefit, with no real alternative to achieving this benefit), severe/beneficial (long-term impact that could be mitigated/long-term benefit), moderately severe/beneficial (medium- to long-term impact that could be mitigated/ medium- to long-term benefit), slight or have no effect

- the *significance*, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high
- the *status*, which will be described as either positive, negative or neutral
- the *degree* to which the impact can be reversed
- the *degree* to which the impact may cause irreplaceable loss of resources
- the *degree* to which the impact can be *mitigated*

- A description and comparative assessment of all alternatives identified during the environmental impact assessment process
- Recommendations regarding practical mitigation measures for potentially significant impacts, for inclusion in the Environmental Management Plan (EMP)
- An indication of the extent to which the issue could be addressed by the adoption of mitigation measures
- A description of any assumptions, uncertainties and gaps in knowledge
- An environmental impact statement which contains:
  - a summary of the key findings of the environmental impact assessment;
  - an assessment of the positive and negative implications of the proposed activity (one alternative only in EIA phase);
  - a comparative assessment of the positive and negative implications of identified alternatives

Assessment of Impacts

Direct, indirect and cumulative impacts of the issues identified through the scoping study, as well as all other issues identified in the EIA phase must be assessed in terms of the following criteria and the table below gives descriptions and weights/scores of predicted impacts (*Table 5*):

- The nature, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The extent, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- The duration, wherein it will be indicated whether:
    - the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
    - the lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
    - medium-term (5–15 years) – assigned a score of 3;
    - long term (> 15 years) - assigned a score of 4; or
    - permanent - assigned a score of 5;
- The magnitude, quantified on a scale from 0-10, where 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The probability *of occurrence*, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1–5, where 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).

- the significance, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- The status, which will be described as positive, negative or neutral.
- The degree to which the impact can be reversed.
- The degree to which the impact may cause irreplaceable loss of resources.
- The *degree* to which the impact can be *mitigated.*

The significance is calculated by combining the criteria in the following formula:

S= (E+D+M) P

S = Significance weighting; E = Extent; D = Duration; M = Magnitude; P = Probability

The significance weightings for each potential impact are as follows:

- < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

Table 5- Descriptions and Weights of Impacts

Aspec	Description	Weight
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short term	1
	Medium term	3
	Long term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severit	Low	2
	Medium	6
	High	8
Significance	Sum (Duration, Scale, Magnitude) x Probability	
	Negligible	≤20
	Low	>20 ≤40
	Moderate	>40 ≤60
	High	>60

Assessment of impacts must be summarised in the following table format (*Table 6 & 7*). The rating values as per the above criteria must also be included.

Table 6: Example of Impact table summarising the significance of impacts (with and without mitigation)		
Nature:		
	Without Mitigation	With Mitigation
Extent	High (3)	Low (1)
Duration	Medium-term (3)	Medium-term(3)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	36 (Medium)	24 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation: Mitigation Measures		
Cumulative impacts: Cumulative Impacts		
Residual Impacts: Residual Impacts		

Table 7: Measures for the inclusion in the draft Environmental Management Plan:		
OBJECTIVE: Description of the objective, which is necessary in order to meet the overall goals; these take into account the findings of the environmental impact assessment specialist studies.		
Project component/s	List of project components affecting the objective	
Potential Impact	Brief description of potential environmental impact if objective is not met	
Activity/risk source	Description of activities which could impact on achieving objective	
Mitigation: Target/Objective	Description of the target; include quantitative measures and/or dates of completion	
Mitigation: Action/control	Responsibility	Timeframe
List specific action(s) required to meet the mitigation target/objective described above	Who is responsible for the measures	Time periods for implementation of measures
Performance Indicator	Description of key indicator(s) that track progress/indicate the effectiveness of the management plan.	
Monitoring	Mechanisms for monitoring compliance; the key monitoring actions required to check whether the objectives are being achieved, taking into consideration responsibility, frequency, methods and reporting	

4. ASSUMPTIONS: LIMITATIONS, EXCLUSIONS AND UNCERTAINITIES

The following exclusions or limitations have direct consequence to the study and its results:

4.1. Limitations:

- The project footprint covers several farms and properties; as such no deeds search was conducted as part of this HIA.
- The survey was conducted in February 2014; as such there was high level of vegetation cover for the archaeologist/heritage surveyors to pick up all the different archaeological and heritage features in the landscape such as unmarked graves and Stone Age artefacts like stone tools. This forms one major limitation in terms of observing and recording all forms of archaeological and heritage sites in the surveyed landscape.
- In some case where there is evidence of ruins there was high level of vegetation cover which limited clear observation of the environment around these ruins.
- In other cases there was evidence of graves in the landscape, but these could not be clearly verified as they lacked markers to ascertain with certainty that they are indeed burial grounds and graves.

4.2. Exclusions:

- No formal heritage social consultation took place within the scope of this study to enquire with the local chiefs and residents about the known heritage resources in and around the development footprint. As such some of the area's intangible heritage and stories maybe be missing.

4.3. Uncertainties

Heritage studies like most other specialist studies often experience many challenges during and after the physical survey of the proposed development area. From an archaeological and general heritage perspective - the assumption is often made that the amount of identified archaeological and heritage resources during a physical survey of the proposed development area represents the sum of the total amount of resources that exist in and around the development area. This is often not true because the nature of some the archaeological and heritage resources being

subterranean in nature and as such, one cannot totally rule out their presence or existence within the project area. These resources may be exposed or brought to the surface during the construction phase of the project which will involve excavation for foundations of the homes. This presents one of the major uncertainties regarding the 'holistic' management of archaeological and heritage resources within the project footprint. Archaeologists and heritage specialists refer to the discovery of such resources as chance finds and to mitigate such uncertainty - it is always advised that should such chance finds be made of archaeological and heritage resources the ECO should report them to the nearest SAHRA office or museum or call an archaeologist and/or heritage specialist to investigate the finds and make necessary recommendations.

5. FINDINGS

5.1. Deeds Search

No deeds search was conducted as part of this study as per the reasons given in the exclusion section of this report.

5.2. HIA's Conducted in and around the proposed development area

An HIA conducted for the proposed development of Musina Western Ring Road by Dr J van Schalkwyk yielded the following information about the study area (November 2010):

- No heritage resources found within the study area

An HIA conducted for the proposed township establishment on Portion 5 of the Farm Uitenpas 2-MT, near Musina by Vhufa Hashu Heritage Consultants cc, yielded the following information about the study area (September 2008):

- No heritage resources found within the study area

A Scoping HIA conducted for the proposed Borutho-Nzhelele 400kv power lines by N G Tomose & Dr M Murimbika yielded the following information about the study area (April 2012):

- The study yielded a number of heritage resources varying from archaeological, rock art and formal and informal burial grounds and graves site.

5.3. Field Findings

The survey of the proposed line servitudes yielded approximately 3 heritage sites. The sites consist of an archaeological site, a burial grounds and grave site in form of an active cemetery, and built environment and landscape features in form of old Artonvilla Mining Village.

Site Name:	**ZZ-01**
Type:	Archaeological
Density:	Medium
Location/GPS Coordinates:	22°25'3.76"S 30°14'11.69"E
Approximate Age:	Older than 80 years
Applicable NHRA Section:	Section 35
Field Rating	GPA
Grade	Grade 3c
Heritage Significance	High
Description:	
The site is one of the Late Iron Age archaeological sites located with Meremani Nature Reserve. The site form part of the University of Pretoria archaeological research in Meremani Nature Reserve (*Figure 11*).	

Figure 8- Meremani Nature Reserve archaeological dig

Figure 9- Arial view of the sites within Meremani Nature Reserve

Site Name:	ZZ-02
Type:	Burial Grounds and Graves
Density:	High Density
Location/GPS Coordinates:	22°19'28.53"S 30° 2'47.21"E
Approximate Age:	Less than 60 years
Applicable NHRA Section:	Section 36
Field Rating	GPA
Grade	Grade 3c
Heritage Significance	High
Description:	
This is a recent cemetery with approximately with over 2000 graves. Some of the graves have granite headstones and dressing. Other graves have stone mound and soil mound dressing and headstones. The cemetery is active – meaning that it is in use (*Figure 11*).	

Figure 10-Musina Cemetery

Site Name:	ZZ-03
Type:	Built Environment & Landscape
Density:	Medium
Location/GPS Coordinates:	22°18' 23.67"S 30° 5' 0.27"E
Approximate Age:	Older than 80 years
Applicable NHRA Section:	Section 35
Field Rating	GPA
Grade	Grade 3c
Heritage Significance	High
Description:	
This is a recent cemetery with approximately 36 graves. Some of the graves have granite headstones and dressing. Other graves have stone mound dressing and headstones. The cemetery is active – meaning that it is in use (*Figure 11*).	

Figure 11-Artonville Mining Village

Figure 12: Artonvilla mining community. Note the amphitheatre in red circle and old compound design in yellow circle.

6. DISCUSSION OF THE RESULTS

From the background information search of the broader Limpopo region, the Limpopo Province is a known to contain some of South Africa's most researched archaeological, rock art, historical and other cultural heritage sites. West of the project area, along the Limpopo River, sites of Mapungubwe and Great Zimbabwe cultures are found (*Figure 14*). Some of these sites extend to the project foot print on the western end such as Khami sites (*Figure 13*). On the eastern end of the project footprint Late Iron Age sites have been found in Meremani Nature Reserve (*e.g. Figure 8*). Therefore it can be argued that the project area is located with a rich cultural landscape with a potential of yielding more archaeological, rock art and other heritage resources sites. Because of the size of the proposed alignments or corridors which cover approximately 4km each in width, not all areas were covered by the survey. For the areas that were not covered by the survey, we conducted Google Earth spotting of the affected areas/environment and used this together with existing database to analyse which of the corridors should be

approved in terms of heritage resources management. Interviews with one of the renowned archaeologists working in the area were held by NGT staff with Professor Tom Huffman of the University of the Witwatersrand. According to Prof Huffman during the interview and assessment of the proposed route and its alternatives, all routes have the potential to yield Iron Age sites. Alternative 1A was identified as having a high possibility of yielding Iron Age sites, as compared to 2B with the least Iron Age possible sites as compared to the other proposed routes such as Alternative 1B and Alternative 2B. This assertion is further supported by the Google Earth spotting (*Figure 16*) of the affected environment and existing maps database (*Figures: 13, 14 & 15*) below. From Figure 16 we can see that Alternative 1A has more potential archaeological yield areas as compared to Alternative 2B (small red ink). Two sites were discovered in Alternative 1B and Alternative 2A; however, these two alternatives are less likely to result to the discovery of more archaeological resources as compared to Alternative 1A and Alternative 2B which also yielded an archaeological site. Alternatives 1 and 2 have not yielded any archaeological resources and no potential yield areas; however, they may still be some archeological resources that can be discovered once the corridors have been reduced for alignment for the Construction Environmental Management Programme. Based on the above and the associated databases; it is advisable that the developer should omit Alternative 1A from the list of corridors. Alternative 2B has a potential to yield archaeological resources, but less as compared to Alternative 1A. This Alternative is, however, not supported in that it falls within an area in which the University of Pretoria is currently conducting research and is known to contain archaeological sites. The developer should therefore consider Alternative 1 and Alternative 1B as the preferred alternatives for the proposed development. Alternative 2 and Alternative 2A are the second preferred Alternatives to the project in that they have less likelihood of impacting on archaeological resources. In both Alternative 1B and Alternative 2A two heritage resources were identified, however, these heritage resources can easily be mitigated by means of avoidance during the construction phase of the project. Furthermore, Artonvilla site is a dilapidated mining compound (*Figure 11*) and the Musina cemetery can easily be avoided (*Figure 10*). Based on the above, the following conclusions and recommendations are made about the project.

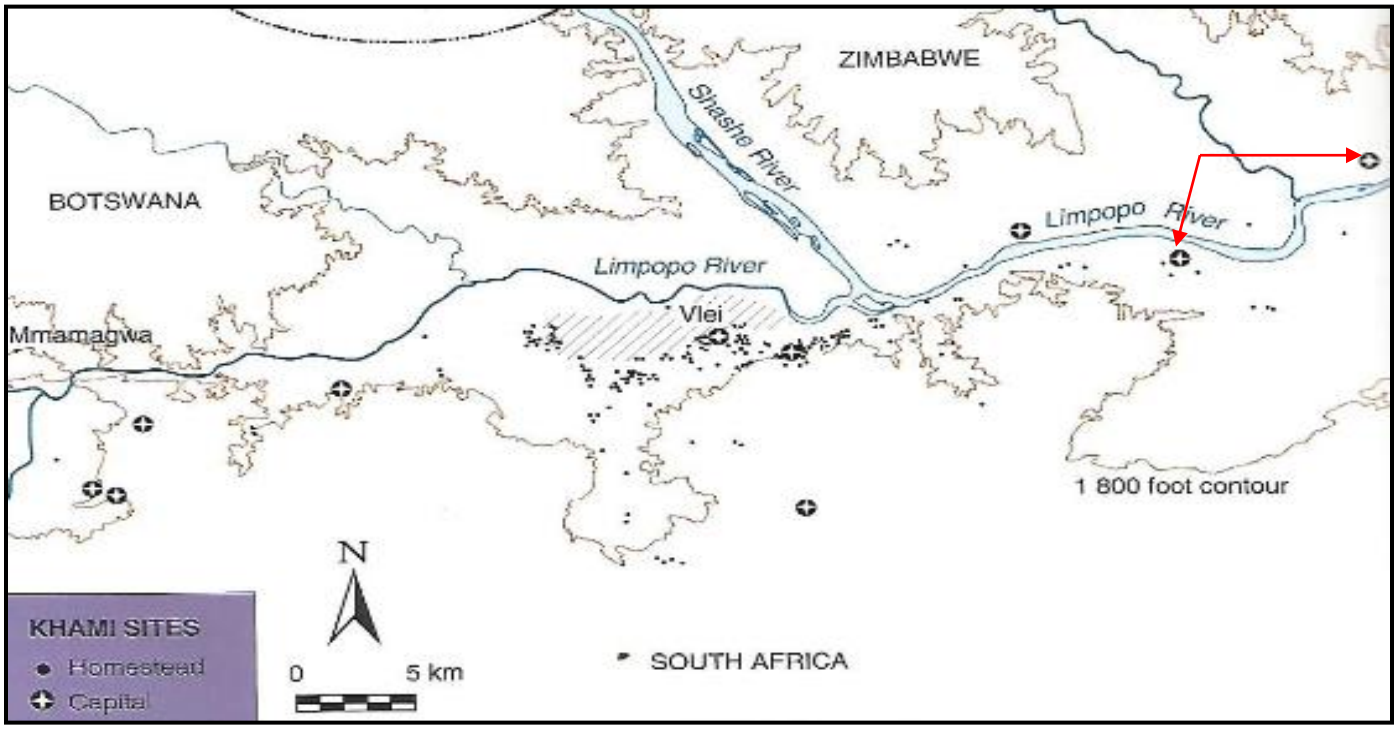

Figure 13- Distribution of Khami (Late Iron Age) sites along the Limpopo River. Note to Khami Capital near our project area (red arrow). @ Huffman, 2007.

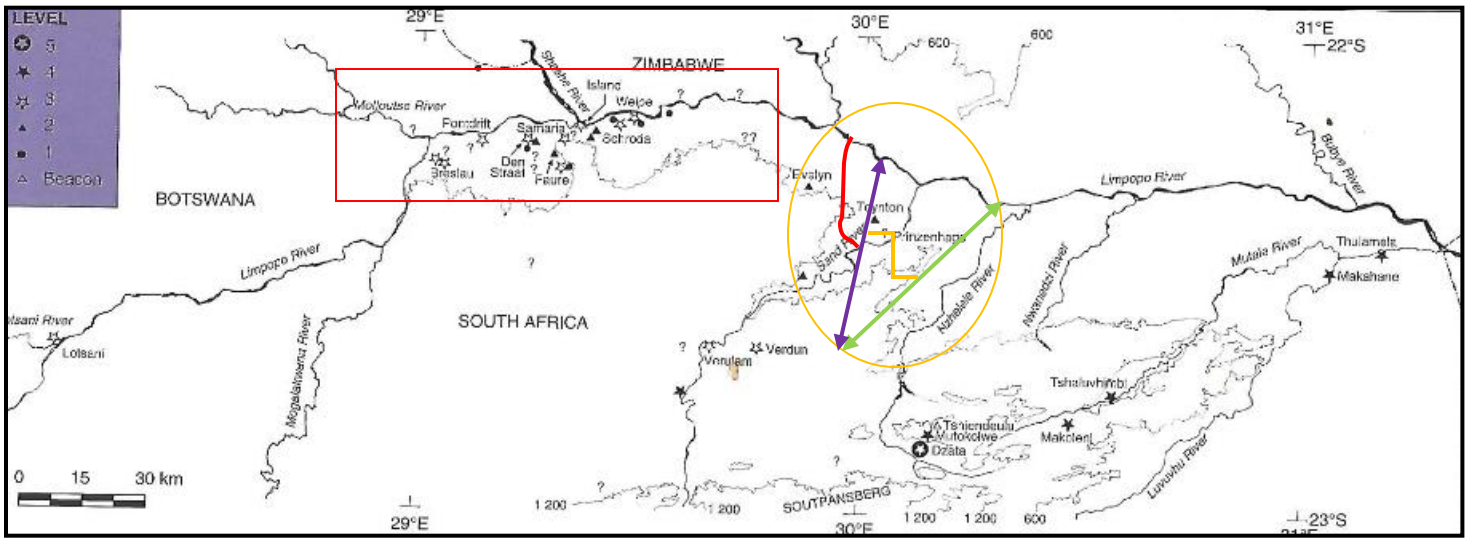

Figure 14- Distribution of known archaeological sites west of the project footprint. @ Huffman, 2007.

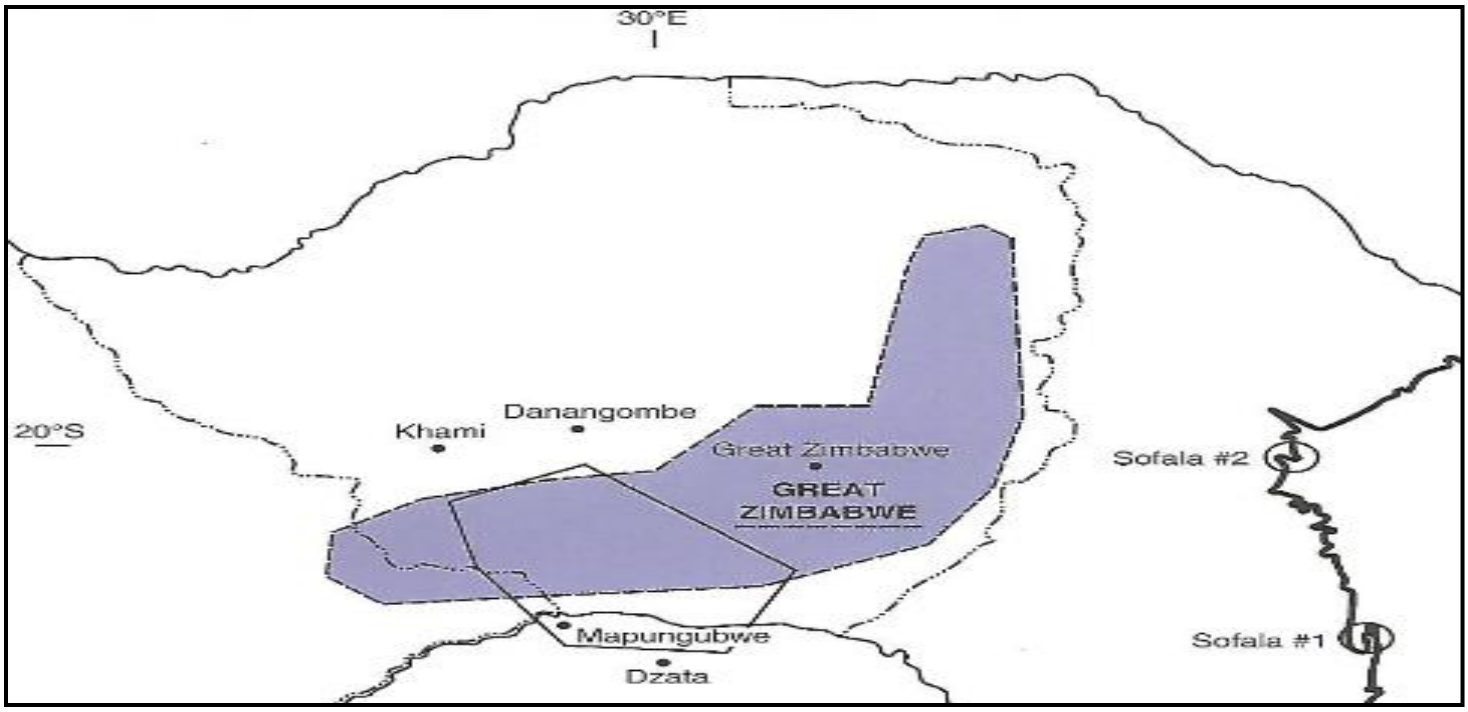

Figure 15- The extent of Mapungubwe culture in the diagonal box. @ Huffman, 2007.

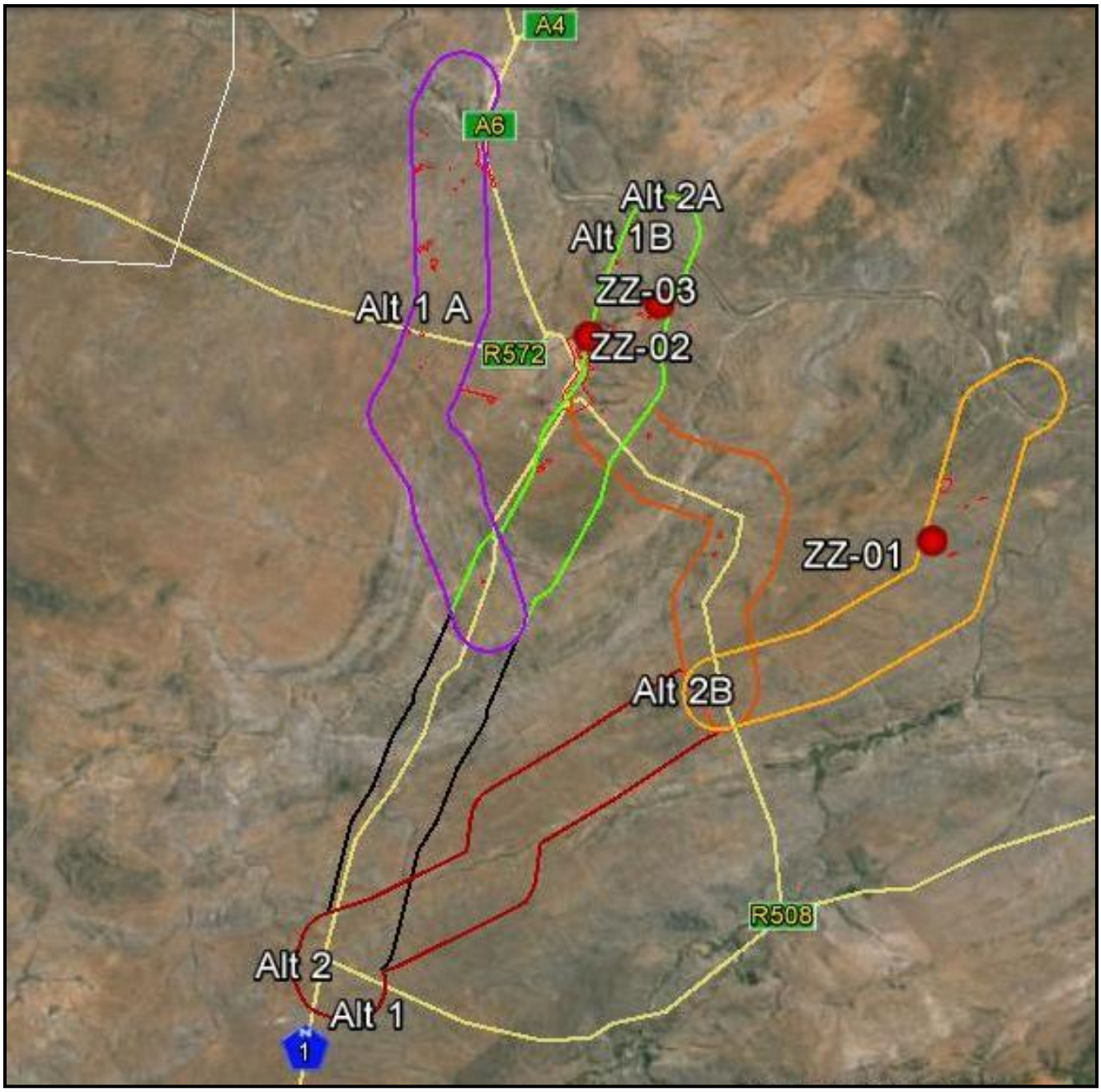

Figure 16- Distribution of the three identified heritage resources and archaeological potential yield areas as shown small red ink

7. CONCLUSIONS

The following conclusions are made about the proposed development area:

- It is concluded that the heritage scoping of the affected environment yielded the archaeological, history and heritage of the affected environment and we know from this that the development footprint is located within a rich cultural landscape.
- The proposed development has a potential to contribute to the discovery of new archaeological and heritage sites in the region, but also the potential to contribute to the destruction of archaeological resources.
- Based on the various analyses of the project area and the proposed powerline corridors it is concluded that Alternative 1A and Alternative 2B be omitted from the list of preferred alternatives. Alternative 1A has a potential to impact on more archaeological resources because it is closer to the Mapungubwe cultural landscape. Based on exiting database of known archaeological resources in the region this alternative is also closer to known Khami sites and two Khami Capitals as shown in Figure 13 (position of two Capitals)
- Alternative 2B is located in area currently being researched by the University of Pretoria and with known archaeological resources.
- Alternatives 1 and 1B are the preferred alternatives for the project and should be the two alternatives from heritage perspectives that should be given a Positive Review Comment. However, should these two alternatives not be considered by the developer; Alternatives 2 and 2A should be the second preferred alternatives from a heritage perspective.

8. RECOMMENDATIONS

The following recommendations are made about the proposed development:

- It is recommended that SAHRA approves Alterative 1 and Alternative 1B as the preferred alternatives for the proposed development.
- Should Alternative 1 and Alternative 1B not be supported by the developer SAHRA should approve Alternative 2 and Alternative 2B.
- It is recommended to the client that once the EIA process has been completed, a specialist walkdown programme should be developed for the approved Alternative as part of the Construction Environmental Management Programme.

- A heritage consultant or archaeologist should be employed in the specialist walkdown to conduct a Phase 2 HIA for the preferred alternative and assess the location of tower positions in relation to any other heritage resources that would be identified in the walkdown as part of Construction Environmental Management Programme.
- The heritage specialist would then advise both SAHRA and the developer on the mitigation measures for sites that would be impacted and applied for heritage permits for their mitigation in line with the NHRA, No. 25 of 1999.

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