



**TITLE: HERITAGE IMPACT ASSESSMENT STUDY FOR THE PROPOSED CONSTRUCTION OF KEATES DRIFT BULKWATER SUPPLY SCHEME FOR PHASE 3 AND 4 SPANNING OVER ETEMBENI MISSION ERF 8312, AANGELEGEN ERF 1201, DUIKER HOEK ERF 3283, IMPANZA RIVER 1843, OLIVEFONTEIN 4427 AND TUGELA LOCATION 4674 WITHIN UMVOTI LOCAL MUNICIPALITY AND MSINGA LOCAL MUNICIPALITY IN KWAZULU NATAL PROVINCE, SOUTH AFRICA**

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This report has been compiled by Nkosinathi Tomose for NGT Consulting. The views expressed in this report are entirely those of the author and no other interest was displayed during the decision making process for the project.

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## **EXECUTIVE SUMMARY**

NGT Consulting (Pty) Ltd was appointed by Magalela & Associates (Pty) Ltd in terms of the National Environmental Management Act No. 107 of 1998 (and applicable 2014 EIA Regulations) as an independent Cultural Resources Management firm to conduct a Heritage Impact Assessment (HIA) (inclusive of Palaeontological Desktop Study) in terms of Section 38 (1) of the National Heritage Resources Act No. 25 of 1999. The HIA is for the proposed Construction of Keates Drift Bulkwater Supply Scheme for Phase 3 and Phase 4 spanning over Etembeni Mission Erf 8312, Aangelegen Erf 1201, Duiker Hoek Erf 3283, Impanza River 1843, Olivefontein 4427 and Tugela Location 4674 within uMvoti Local Municipality and Msinga Local Municipality in KwaZulu Natal Province, South Africa.

The project survey resulted in the identification of 19 heritage sites along the proposed pipeline and associated infrastructure. The resources included 14 grave sites, 1 terrace, 3 kraals and the ruins of a farmstead. The kraals, terrace and farmstead ruins were assessed and found to be of low heritage significance. Conversely, grave sites are of high heritage significance. In terms of potential impacts of the project, the terrace, kraals and farmstead ruins are determined to have Low Impact Probability. However the graves' high heritage significance means the project will have a High Impact Probability on the graves. The following conclusions and recommendations are made about the project:

### **Conclusions:**

This is a Phase 1 HIA conducted in terms of the NHRA, No 25 of 1999 (for the protection, conservation and management of the Nation Estate), the KwaZulu-Natal Act, No. 10 of 1997 (at a provincial level), and the KwaZulu-Natal Heritage Bill of 21 February 2008. It does not include the implementation of the recommendations made for mitigation of heritage resources.

- It is concluded that the project will not have negative impacts on the identified heritage resources if the proposed project mitigation measures are implemented by the developer, such as complete avoidance of burial grounds and grave sites and treating them as No-Go-Areas.
- The project will also have a minimal impact in terms of the broader cultural fabric of the study area because the proposed infrastructure traverses areas that have previously been disturbed. Most of the pipeline is planned along the existing road servitudes.
- It is our view that Amafa KwaZulu-Natali should issue the project a Positive Review Comment as it traverses areas that have already been disturbed.

- The type and size of proposed pipelines does not warrant grave relocation to make way for the development. Instead the pipeline should be deviated away from the graves and they should be monitored during project construction phase.

**Recommendations:**

- We recommend the developer avoid all the identified graves and regard them as No-Go-Areas.
- It is recommended that the Environmental Assessment Practitioner (EAP) appoints an Environmental Control Officer (ECO) to monitor all graves that are located close to the proposed pipeline servitudes during the project construction phase.
- A buffer of approximately 5m should be kept between the graves and the pipeline trenches.
- That the graves should be taped off from construction activities and that the ECO should ensure that they are monitored at all times during the project construction phase to limit any potential impact on them.
- A cemetery management plan should be developed to guide the management of these graves during and post project construction phases. For post construction phase, the plan will inform the maintenance of the water pipelines.

It should be noted that some archaeological resource are subterranean in nature. These resources (including unmarked graves) can be disturbed and brought to the surface by project excavation activities. Heritage consultants refer to such resources as chance finds. It is recommended that the developer and the appointed ECO should pay special attention to these resources during the construction phase of the project. In the case that such resources are unearthed and brought to the surface by the project construction activities, the project construction activities in and around the area in which such resources are found should stop and the ECO should consult an archaeologist and heritage consultant to immediately come to the site and investigate the finds and make necessary recommendations. Amafa aKwaZulu-Natali and the South African Police Services (in case of forensic bones) should also be informed of such finds.

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**TABLE 1- ABBREVIATIONS**

Acronyms	Description
AIA	Archaeological Impact Assessment
AMAFA	Amafa aKwaZulu-Natali
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
DEA	Department of Environmental Affairs
DoE	Department of Energy
EIA practitioner	Environmental Impact Assessment Practitioner
EIA	Environmental Impact Assessment
ESA	Early Stone Age
GIS	Geographic Information System
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&AP	Interested & Affected Party
KZNHA	KwaZulu-Natal Heritage Act
KZNHB	KwaZulu-Natal Heritage Bill
K.y.a	Thousand years ago
LSA	Late Stone Age
LIA	Late Iron Age
MSA	Middle Stone Age



MIA	Middle Iron Age
NERSA	National Energy Regulator of South Africa
NHRA	National Heritage Resources Act
NEMA	National Environmental Management Act
PHRA	Provincial Heritage Resources Agency
PSSA	Palaeontological Society of South Africa
ROD	Record of Decision
RDP	Reconstruction and Development Programme
PDAFP	Proposed Development Area Footprint
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Agency
SPV	Special Purpose Vehicle

## TERMS & DEFINITION

### *Archaeological resources*

This includes:

material remains resulting from human activity 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**

Magalela & Associates has been appointed for the proposed construction of Keates Drift Bulkwater Supply Scheme for Phase 3 and 4 spanning over the following farms Etembeni Mission Erf 8312, Aangelegen Erf 1201, Duiker Hoek Erf 3283, Impanza River 1843, Olivefontein 4427 and Tugela Location 4674 situated in uMvoti Local Municipality and Msinga Local Municipality, KwaZulu Natal Province, South Africa (*Figure 1*). The project was submitted to Amafa KwaZulu-Natali for the attention of the heritage authority which requested that an HIA should be conducted on the affected environment and make recommendations of the identified heritage resources (*Annexure 1*).

#### **1.1.2. Proposed Project Aims**

Projects of such nature are aimed at providing basic human rights services such as access to clean water in line with the statutes of the Constitutional Act of South Africa, No. 108 of 1996. The project basic aim is therefore supply of clean water to communities that area situated with the following farms and municipalities: Etembeni Mission Erf 8312, Aangelegen Erf 1201, Duiker Hoek Erf 3283, Impanza River 1843, Olivefontein 4427 and Tugela

Location 4674 situated in uMvoti Local Municipality and Msinga Local Municipality, KwaZulu Natal Province, South Africa (*Figure 1*).

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

The nature and the size of the proposed development, which is linear development exceeding 300m in length requires that a HIA study be conducted in terms of Section 38 (1a). In terms of the National Environmental Management Act (NEMA), No. 107 of 1998 the following regulations are pertinent. In terms of the EIA Regulations of November 2014 (Government Notice 983 and 984 published in terms of the NEMA, No 107 of 1998) the construction of the proposed facilities is listed as an activity that requires environmental authorisation. The current process comprises of an EIA and it involves the identification and assessment of environmental impacts through specialist studies, as well as public participation.

Magalela & Associates (Pty) Ltd was appointed as a lead Environmental Impact Practitioner to manage the EIA process and associated impact studies for the proposed development project. It appointed NGT Consulting (Pty) Ltd as an independent and lead Cultural Resources Management (CRM) firm to conduct an HIA (inclusive of Palaeontological desktop study) for the proposed development. Nkosinathi Tomose, the principal archaeologist & heritage consultant for NGT Consulting (Pty) conducted the HIA study for the proposed. The palaeontological desktop study for the project was conducted by Professor Marion Bamford NGT Consulting resident Palaeontologist.

The appointment of NGT Consulting (Pty) Ltd (as an independent CRM firm) is in terms of the KZNHA, No. 10 of 1997 (at a provincial level), NHRA, No. 25 of 1999, the NEMA, No.107 of 1998 (as amended & the applicable 2010 Regulations), as well as other applicable legislations and bills such as the KZNHB of 21 February 2008.

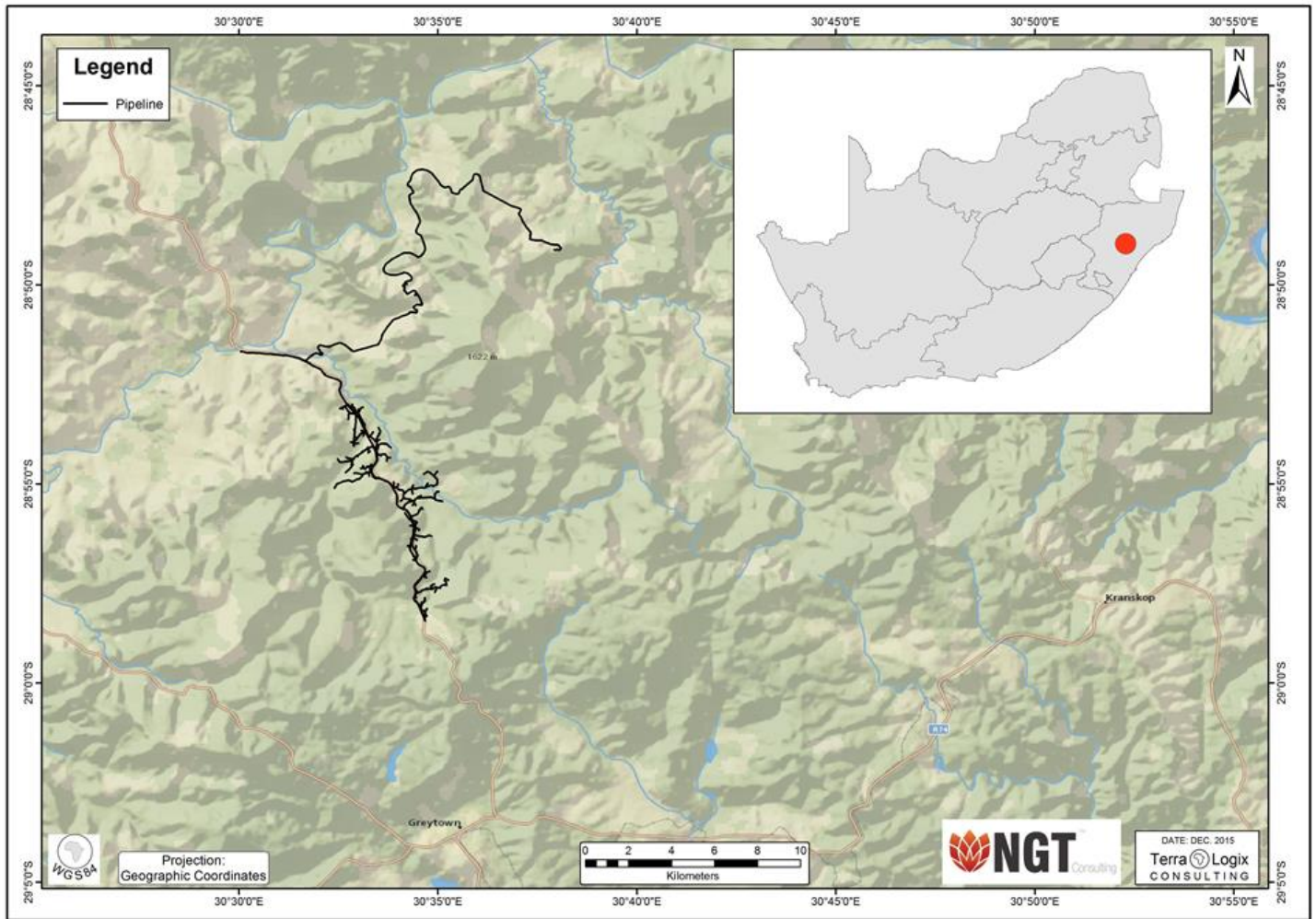


Figure 1- Location of the project footprint in KwaZulu-Natal Province, South Africa

## 2. BACKGROUND OF THE STUDY AREA

### 2.1. Description of the affected environment

The study area is located north of the historic town of Greytown in KwaZulu Natal, South African. It covers the following farms Etembeni Mission Erf 8312, Aangelegen Erf 1201, Duiker Hoek Erf 3283, Impanza River 1843, Olivefontein 4427 and Tugela Location 4674. It also spans over two local municipalities which are uMvoti Local Municipality and Msinga Local Municipality (Figure 1). The area that the bulk water supply infrastructure covers is characterised by villages, hills and valleys (Figure 2). Most of the planned infrastructure will run parallel to existing roads, pipelines and water storage facilities (e.g. Figures 3-11).





Figure 2- Landscape view of the affected environment



Figure 3- Existing water pipeline markers (yellow and white cement marker)





Figure 4- Shembe open air church (note the water pipes- red arrows)



Figure 5- Above are existing water distribution pipelines within villages. Below (left) is current water collection point to affected communities. Below and right is the project communication board.





Figure 6- Above is the existing (newly constructed) reservoir in eMabomvini where the project ends. Below are the existing reservoirs along the D1268 Road from the R33 to eMabomvini.







Figure 7-Existing Keates Drift Water Works reservoirs



Figure 8- The existing JoJo water storage tanks





*Figure 9-Water trenches along the D1268 Road*



*Figure 10- Diesel engines that assist with pumping of water from reservoirs and boreholes to communities*





Figure 11-Left is the road sign of the D1268 road which joins the R33 Road in the south. The road continues south until it reached the R33 in the south. Right is the R33 road linking Greytown and Keates Drift.

## 2.2. Desktop Study: Archaeological and Heritage

KwaZulu-Natal province provides palaeoscientists and cultural scientists alike with a rich canvas of heritage resources varying from natural to manmade or human influenced or altered resources. The man made environment of KwaZulu-Natal dates from prehistoric to historic times (time of written documents). Among archaeological (and heritage) time periods it includes: the ESA (Earlier Stone Age)– 2.6 m.ya to 250 k.y.a.; MSA (Middle Stone Age)–250 k.y.a to about 35 k.y.a.; LSA (Later Stone Age)– 25 k.y.a to about 2000 k.y.a; 2 Iron Age periods (i.e. Early Iron Age & Late Iron Age)– 2000 k.y.a ; Colonial period and historic period- 1800s.

This HIA assesses the range of all the manmade or human influenced/altered resources within the proposed development area. It makes recommendations on how to best manage them within a legal framework as stipulated in the NHRA, No. 25 of 1999, KZNHA, No. 10 of 1997 and KZNHB, 2008.

### 2.2.1. Stone Age

Earlier Stone Age artefacts have been identified in the wider area, especially in the foothills of the Drakensberg. These artefacts are handaxes and cleavers or Large Cutting Tools (LCTs) that are of Acheulean technology and associated with *Homo ergaster*. This technology first appears around 1.7 mya and is present in the archaeological record for almost 1.5 million years. While it is clear these earlier hominins were active in the area, the finds are all in secondary context and are not occupation or repeatedly used sites. However, the lack

of primary context ESA sites is most probably a reflection of preservation and landscape geomorphology rather than land use behavioural patterns.

There are many more MSA occurrences found throughout the area, including primary context sites that reflect long-term repeated use of rock shelters by MSA hunter-gatherers.

One of the most important MSA sites is located in KwaZulu Natal east of the study area toward the coast. Sibudu Cave is located about 15 km inland from Ballito. Sibudu is important because of the long-term sequence of occupations there coupled with outstanding preservation of the archaeological material. The oldest levels at Sibudu are dated to ~75 kya. The site has yielded a wealth of information regarding the behaviours of early hunter-gatherers during the MSA. In some of the lower levels of the sequence, Sibudu has some of the earliest examples of sea-shell beads (d'Errico et al. 2008), a wide variety of bone tools and bone arrowheads for hunting. Sibudu also has yielded the earliest evidence of the use of bow and arrow technology (Lombard and Phillipson 2010). There are also examples of the use of herbal medicine and preserved plant material that was used as bedding (Wadley et al. 2011) as well as an abundance of stone tools used for a variety of purposes (Soriano et al. 2015). The site also has yielded LSA material as well as an overlying Iron Age component. This indicates the importance of the site/shelter over not only long temporal spans but among different technological evolutionary periods of our past. Sibudu Cave has been nominated both as a National Heritage Site and as an UNESCO World Heritage Site. The

Another known site, Umhlatuzana Rock Shelter, lies just south of the study area. This rock shelter is a Stone Age site that spans the MSA and LSA (Kaplan 1990, Lombard and Wadley 2010). The lowest levels of the shelter have been dated to ~70 kya and have yielded Still Bay like serrated edged points. This is followed by Howieson's Poort artefacts in the middle phase levels of the MSA. After that are post-Howieson's Poort artefact bearing late MSA levels. Thus the site has a long sequence of mid to late MSA occupations dating from 70,000 years ago. There is evidence of an MSA/LSA transition in the middle layers of the sequence. Here LSA bladelets and bladelet cores are present along with MSA blade points and MSA hollow-based points (Kaplan 1990). The LSA layers also reflect long term use/occupation of the shelter. The lowest part of the LSA sequence are dominated by the presence Robberg bladelets, which are an early LSA tool type. These layers are overlain by late Robberg artefacts. Dating of the LSA levels reflects almost 10,000 years of repeated use of the rock shelter by LSA people.

The LSA is associated with hunter-gatherer people that are most likely ancestral to present day San and Khoi-Khoi groups. LSA material is prolific across the landscape in the wider area as well as near the study area.

Also related to this period and these groups are Rock Art sites. There have been many recordings of Rock Art sites in the wider area. Hundreds have been noted in the Drakensberg. There is a high concentration of Rock

Art sites west of the study area near the Lesotho border. These include later paintings (white paintings and engravings) by agro-pastoralists who moved into the area during the Iron Age. Several sites include both types of rock and provide insight into hunter-gatherer and agro-pastoralists interactions. One such site is eMkhobeni Shelter, west of the study area.

### **2.2.2. Iron Age**

The Early Iron Age begins early in KZN with Nguni speaking groups who migrated down the eastern corridor into southern Africa. By ~450 AD these agro-pastoralists were encountering hunter-gatherer groups in the area. The Thukela Basin of KwaZulu Natal has yielded some of the most comprehensive evidence of regional EIA cultural sequences. Sites such as Mamba, Wosi, and Ndongondwane have proven to be important in interpreting early EIA behaviours. Ndongondwane appears to reflect three occupation phases including patterns that are indicative of the Central Cattle Pattern associated with Eastern Bantu speakers. One of the earliest Iron Age (EIA) settlements in the Thukela Basin is the Msuluzi Confluence site, dated to AD 450–700 (Maggs 1980). The evidence at Msuluzi Confluence suggests the stone tools and bone points were produced by hunter-gatherer groups and the smelting of comparatively large amounts of iron are reflective of EIA activity. Other EIA sites such as Mbabane Shelter near the study area and eSinhlonhlweni Shelter further west provide further evidence of the interaction between some of the first agro-pastoralists (EIA) in the area and the existing hunter-gatherer groups (LSA). These early agro-pastoralists followed a landscape use pattern by occupying areas conducive to their lifeways. The sites are found in areas with mixed bushveld grassland with medium to low rainfall, in valley areas with thick colluvial soils and close to rivers or river tributaries.

There is no clear evidence of MIA occupations in the area. This may be due to preservation or a reflection of settlement patterns wherein Iron Age people did not occupy the area from the late EIA until the LIA. If the latter is true then this could indicate prohibitive environmental conditions in the area during this period.

There exists a number of LIA sites in the wider area. These are usually identified by stonewalling and have different material culture than the EIA sites. Whether this is due to changes and adaptations among existing groups or the influence of new groups arriving in the area is debatable. Huffman (2004) has argued the KwaZulu Natal LIA sites represent new arrivals and, based on the ceramics, divides the material into three phases. The earliest is Blackburn (1050 AD – 1300 AD). This phase is represented by sites mostly along the coastal region and is not present at most of the inland sites, especially near the study area. The second phase is Moor Park (1300 AD – 1700 AD). The phase is well represented in the wider study area with the type site is less than 50km away. Huffman (2007) sees the appearance of this phase as possibly reflecting the separation of the Northern

Nguni and Southern Nguni. The iGujwana and Sewula Gorge sites are other examples of this period in the Thukela Basin. This period is also characterized by extensive stonewalling which may reflect defensive walling due to an increase in hostilities among the different groups. The final phase is Ngabeni (1700 AD – 1850 AD). Examples of this period include the sites Enkwazini and Mgoduyanuka and represent the time of the mfecane when there were large movements of people out of what is present day KwaZulu Natal (Huffman 2004). It is not clear if this phase represents movement of other groups into the area or adoptions by local groups of traditions from new arrivals. These new settlements made more use of stone and had a wider variety of pottery. Most settlements follow the Central Cattle Pattern suggesting a greater reliance on the use of cattle in the economies of these late LIA people. There is a probability of the existence of Iron Age material in the current study area.

### **2.2.3. Historical Period**

In Zululand our current region of study within the KwaZulu-Natal Province - one of the bigger local chiefdoms that were conquered was the Ndwandwe chiefdom of Zwide kaLanga which were situated north of Shaka's territory around the modern day kwaNongoma (Knight, 1998). Shaka managed to achieve his ideal kingdom by strategically expanding/extending the traditional amabutho system. The amabutho were the brigade of young men of similar age gathered together for a period of national service (Laband & Thompson, 2000; Torlage & Watt, 1999; Knight, 1998; Ommer-Cooper, 1993; Wright, 1991). The amabutho were quartered at large royal homestead, amakhanda which were sited strategically above the surrounding country to guard against both outside attack and internal dissension like the site of Moor Park discussed above. During the times of need, amabutho would be organised into impi to fight and protect the Zulu kingdom. The amabutho, organised into impi, would also be sent out to attack and take over rival chiefdoms that were opposed to King Shaka's rule and in the process incorporating them under his monarchy. As powerful as it may have been, King Shaka's reign as the Zulu King did not last long as he was assassinated by his younger brothers in September 1828. One of them, Dingane KaSenzangakhona later became King. It is argued that by the time of his assassination he had not yet fully managed to assume and reconcile into his kingdom all the local Zulu chiefdoms: "much chiefdom within the kingdom were still unreconciled to Zulu rule, while Zulu influence south of Thukela [was still] patchy" (Knight, 1998: 14). The area south of the Thukela River (Natal) was to some degree not in King Shaka's hold. He did not manage to assimilate all the chiefdoms south of uThukela under his rule and this had negative ramification to the Zulu kingdom for the years to come. King Shaka moved the royal homestead to KwaDukuza, Stanger, south of upper Thukela River before his assassination by Dingane (and Mpande) who later re-located and rebuilt it at eMgungundlovu, 'The Place Surrounding the Elephant' in the emaKhosini valley where King Shaka and King Dingane's forefathers are buried. The moving of the royal homestead by both Shaka and

Dingane presents an interesting 'thesis' into the internal dynamics and politics of the Royal House and possibly one of the reasons for the assassination of King Shaka by his brothers. One important reason for the relocation of the royal homestead back to uMgungundlovu- north of the upper Thukela River was the growing influence of the white community at Port Natal (settlers) and the encroaching Trek Boers who crossed uKhahlamba Mountains into Natal in the 1837 (Knight, 1998). The period of encroachment of first Natal, then Zululand represents a fourth phase of settlement or occupation of KwaZulu-Natal. Before it became open to most the border between the former Natal colony and Zululand developed as a result of political influences between the settlers, the Afrikaners and the Zulu people. The area located north of Upper Thukela (uThukela) River was under the former Zululand and the area south was under the Afrikaner and settler communities. The territorial border between Zululand and Natal develop in the late 1830s. Following the demarcation of the two territorial boundaries - Zululand became the area between the Upper Thukela River, Swaziland and Mozambique. Natal was the area south of the Upper-Thukela River. Natal came into exist when, "the south-eastern seaboard had remained unknown to the European world until Christmas Day 1497, when the Portuguese explorer, Vasco da Gama, had noted its existence in his log as he sailed around the Cape and up the east coast of Africa, searching for a route to the Indies. He christened it Terra Natalis, in honour of the birth of Christ, and for the centuries Natal was used to describe the country south of uThukela" (idem: 15).

The Portuguese were the first Europeans to enter what is present day KwaZulu Natal, but they were primarily focused further north, establishing a port in Delagoa Bay in the 1540s. Much later the British established a trading post at Port Natal (now Durban) in 1824, and that same year they signed a treaty with Shaka ceding them Port Natal and about 80 km of coastline and about 160 km of land inland from the coast. However, the British made little attempt to develop the interior, which continued to be controlled by the Zulus. In 1835 Captain A.F. Gardiner secured from Dingane a treaty ceding the southern half of Natal to the British (Natal 2015).

Piet Retief led an Afrikaner voortrekker group into the Natal in 1837. Retief obtained from Dingane the promise of nearly all of Natal if he recovered some stolen cattle for the Zulu leader. After this task was accomplished Dingane had Retief and his group killed in February 1838. Dingane then sent his impis to kill the remaining voortrekkers who were camped along the Mtshezi River. This resulted in the deaths of over 500 men, women and children. In December 1838 the Afrikaners, under the overall command of Andries Pretorius, defeated the Zulus at the Battle of Blood River, killing more than 3,000 of Dingane's army (ibid.)

The town of Weenen (weeping) was established on the banks of the Mtshezi River at the site of the Zulu massacre of the voortrekkers. Weenen is the second oldest European settlement in the province.

Dingane was replaced by his brother Mpande, who made concessions to the Afrikaners and established his land north of the Tugela River.

The Afrikaners established the Republic of Natal with its capital at Pietermaritzburg and its northern border at the Tugela River. However, this new republic would face additional pressure from two other sources. The defeat of Dingane's Zulus resulted in other groups previously driven out of the area during the mfecane returning to reclaim their land. Secondly, the British, opposed the establishment of any independent state on the coast of southern Africa. They annexed Natal in 1843 and many of the Afrikaners left the area for the Transvaal and the Orange Free State. This was followed by an influx of new British immigrants into the area. Natal was given a local administration but remained basically an adjunct of the Cape Colony until 1856, when it was made a crown colony and given its own legislative council. Beginning in the 1860s Indians also entered the colony to work as indentured labourers in the sugar plantations on the coast. In 1879, the British laid claims on the whole of Zululand. Current Zulu King Cetshwayo would not agree to concessions, leading to the Anglo-Zulu War. Early victories by the Zulus resulted in additional British troops being sent in and escalation in the fighting. Eventually the large, heavily equipped British army proved victorious in 1887 and KwaZulu was annexed by Natal. The northern border is the Tugela River. There are many battle sites throughout present day KwaZulu Natal though none near the study area.

Natal was granted internal self-government by the British in 1893. In 1899 a war began between the two Afrikaner republics and the British Colonies began. During the Anglo-Boer War, Natal was invaded by the Afrikaner forces, and met the British defense at Ladysmith just east of the study area. The British achieved victory in this war also and in May 1902, a peace contract was signed. Both Afrikaner Republics became British Crown Colonies.

In 1906, Zulu resentment against the imposition of a 'Poll Tax' unleashed a brutal and bloody armed campaign to suppress the challenge to British colonial rule. The Bambatha Rebellion was led by Chief Bambatha kaMancinza, head of the Zondi. This Zulu group lived in the Mpanza valley. Today this is the Greytown District which is just south of the study area. The events took place around Greytown and Keats Drift. Bambatha, together with a small group of supporters, launched a series of attacks against the colonial forces, using the Nkandla Forest as a base. The campaign, culminated in a battle against the colonial forces at Mome Gorge, where Bambatha and his followers were finally defeated. Several thousand Zulus were either killed or imprisoned as a result of the rebellion. A memorial has been created to commemorate this event (*Figure 12*).

- The landscape around the study area has a long pre-history and history of occupations, emigrations and immigrations. This has resulted in important archaeological heritage in the form of artefacts, rock art, built structures, burials and graves and culturally significant landscapes/areas all being present in the



wider area. There is a high probability that heritage material may be identified within the current study area.



Figure 12- Bhambatha memorial site

### 3. METHODOLOGY

#### 3.1. Legislative Requirements

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 need 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 and the KwaZulu-Natal Heritage Act, No. 10 of 1997 (various sections as applicable) as well as applicable 2010 EIA Regulations.



## **3.2. Methodology**

This chapter outlines the methodologies used in conducting the study. This HIA report was compiled by Nkosinathi Tomose, principal archaeologist and heritage consultant for NGT Consulting, for the proposed construction of Keates Drift Bulkwater Supply Scheme for Phase 3 and 4 spanning over the following farms Etembeni Mission Erf 8312, Aangelegen Erf 1201, Duiker Hoek Erf 3283, Impanza River 1843, Olivefontein 4427 and Tugela Location 4674 situated both in uMvoti Local Municipality and Msinga Local Municipality, KwaZulu Natal Province.

### **3.2.1. Step I – Literature Review (Desktop Phase)**

The background information of the proposed area of development following the receipt of appointment letter and sites maps from the client. 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.

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 development area footprint (PDAFP) was conducted by Nkosinathi Tomose, a qualified archaeologist and general heritage specialist between the 11 November and 15 November 2015. He was assisted by Miss Zetu Damane (NGT Consulting Socio-Economic Specialist) and Mr Sibusiso Tomose (NGT Consulting field technician). The survey covered entire project footprint and track logs were recorded. The objective of the survey was to locate and identify archaeological and heritage resources and/or sites within and along the proposed pipeline routes and areas proposed for the reservoirs and tanks.

The physical survey was deemed necessary since the desktop phase of the project yielded known heritage resources and sites within the proposed development footprint.

The survey also paid special attention to disturbed and exposed layers of soils as such as eroded surfaces because these areas are more likely to be exposed or yield archaeological and other heritage resources that may be buried underneath the soil and brought to the earth surface by animal and human activities. Such as animal

barrow pits and human excavated grounds. The dirty roads edges/sides were also inspected for possible Stone Age scatters as well as exposed Iron Age implements and other resources.

The following technological tools were deemed important 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.
- Lenovo ThinkPad aided Garmin Basecamp Software, Google Earth – to plot the propose project footprint.
- ArcGIS Software was used to develop project maps
- Maps provided by the client before the survey proved to be invaluable
- Shapefiles provided by the client were used were used to map the project area and sites located within the project footprint.
- Samsung camera was used to take photos of the affected environment and the identified heritage resources.

### **3.2.3. Step III – Data Consolidation and Report Writing**

The final step involved the consolidation of the data collected using the various sources as described above.

- This involved the manipulation Shapefiles/KMZ files through ArcGIS
- Assessing the significance and potential impact of the identified sites, discussing the finds, report writing and making recommendation on the management and mitigation measures of the identified sites and resources as well as the impact and influence of these sites and resources on the proposed development project and project area.

### **3.3. Assessment of Site Significance in Terms of Heritage Resources Management Methodologies**

- The significance of heritage 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<sup>2</sup>
  - Medium - 10-50/50m<sup>2</sup>

- High - >50/50m<sup>2</sup>
- Uniqueness and
- Potential to answer present 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 2: 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

### **3.4. Methodology for Impact Assessment in terms of Environmental Impact Assessment Methodologies including Measures for Environmental Management Plan Consideration**

The Basic Assessment Methodology 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.

#### **3.3.1. 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

### 3.3.2. 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:

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).

Assessment of impacts must be summarised in the following table format. The rating values as per the above criteria must also be included.

*Table 3-Example of Impact table summarising the significance of impacts (with and without mitigation).*

<i>Nature:</i>		
	Without mitigation	With mitigation
<i>Extent</i>	High (3)	Low (1)
<i>Duration</i>	Medium-term (3)	Medium-term (3)
<i>Magnitude</i>	Moderate (6)	Low (4)
<i>Probability</i>	Probable (3)	Probable (3)
<i>Significance</i>	36 (Medium)	24 (Low)
<i>Status (positive or negative)</i>	Negative	Negative
<i>Reversibility</i>	Low	Low
<i>Irreplaceable loss of resources?</i>	Yes	Yes
<i>Can impacts be mitigated?</i>	Yes	
<i>Mitigation: Mitigation Measures</i>		
<i>Cumulative impacts: Cumulative Impacts</i>		
<i>Residual Impacts: Residual Impacts</i>		

*Table 4 -Measures for 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 AND LIMITATIONS

The following assumptions and limitations exist in terms of the present study:

The current study is a Phase 1 Heritage Impact Assessment. As such literature review was undertaken before the HIA survey to inform the consultant of site conditions. The survey was undertaken to identify tangible heritage resources located in and around the proposed development area footprint. No formal heritage social consultation took place with. Informal questions about known graves and historic sites were asked from some residents.



It is therefore deemed that the identified heritage resources present the total number of heritage resources as visible to the archaeologist and the support team.

No deed search was conducted with the Registry of Deeds or the National Archives as this process was deemed unnecessary.

## **5. FINDINGS**

The survey identified a total of 19 sites which included 14 grave sites, 3 kraals, a terrace and farmstead ruins. Below is the description and field assessment of each of the 19 sites identified sites (*Figure 31*):

<b>Site Name:</b>	KDP 1
<b>Type:</b>	Grave
<b>Density:</b>	1 grave (Low Density)
<b>Location/GPS Coordinates:</b>	28° 48'9.21"S 30° 37'4.69"E
<b>Approximate Age:</b>	Recent
<b>Applicable Section of the NHRA, No 25 of 1999:</b>	Section 36
<b>Applicable Sections of the KZNHA, No.10 of 1997</b>	Section 26 (3 & 4)
<b>Applicable Sections of the KZNHB, 2008</b>	Chapter 8 Sections 40 and 41
<b>Applicable Sections of the KZNHB, 2008</b>	Chapter 8 Sections 40 and 41 (graves) and Chapter 7 and section 29 (1)
<b>Description:</b> This is a single grave with stone mound dressing and headstone. It has a north-south grave orientation. It is located some 20m from the road. ((Figure 13)	

Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	Low	Low	High significance	Probable	Improbable	N/A	Avoid and treat it as a No-Go-Area

*Nature: Construction activities have a potential to impact negatively on the grave if not mitigated.*

	Without mitigation	With mitigation
<i>Extent</i>	Local (1)	Local (1)
<i>Duration</i>	Very Short (1)	Very short (1)
<i>Magnitude</i>	Minor (2)	Small (0)
<i>Probability</i>	Improbable (2)	Very Improbable (1)
<i>Significance</i>	(8) Low	(2) Low
<i>Status (positive or negative)</i>	Positive	Positive
<i>Reversibility</i>	No impacts	No impacts
<i>Irreplaceable loss of resources?</i>	No	No
<i>Can impacts be mitigated?</i>	Yes	
<b>Mitigation:</b>		
Treat the grave as a No-Go-Area		
<b>Cumulative impacts:</b> N/A		
<b>Residual Impacts:</b> N/A		

Measures for inclusion in the draft Environmental Management Plan:

**OBJECTIVE:**

The overall goal is to identify, manage and conserve heritage resources within and immediately outside the proposed development footprint. In order to achieve this goal it is recommended that the grave be avoided and treated as a No-Go-Area for both the construction material and personnel.

Project component/s	Construction and operational phases of the project		
Potential Impact	In case where the identified grave (es) is ( or are) not avoided and treated as a No-Go-Area from construction and operational activities, the following impacts are predicted: disturbance of the gravesite (e.g. exposure of the remains as a result of machinery excavation activities; destruction of grave markers). This will make it difficult for the deceased families to recognise their grave resulting to <u>legal disputes between the contractor and affected families</u> .		
Activity/risk source	Exclusion of the above objectives from the overall Environmental Management Plan		
Mitigation: Target/Objective	The grave site should be avoided and treated as a No-Go-Area during the construction phase. The project ECO should ensure that no machinery or any other construction materials in placed in the area with the grave (s).		
Mitigation: Action/control	Responsibility	Timeframe	
With the approval of the project, the Environmental Consultant and/or ECO should ensure implantation of proposed mitigation.	ECO	Construction phase	
Performance Indicator	The type of indicator used here will be Actionable Indicators – this will measure action/progress in terms of completion of the above objectives with the approval of the project against their actual implementation.		
Monitoring	N/A		



Figure 13-Single grave on the junction leading to the newly constructed eMabomvini reservoir. The graves I located some 10 to 15 m from the road.

<b>Site Name:</b>	KDP 2
<b>Type:</b>	Graves
<b>Density:</b>	2 graves (Low Density)
<b>Location/GPS Coordinates:</b>	28 47'37.58"S 30 36'8.82"E
<b>Approximate Age:</b>	Less than 60 years
<b>Applicable Section of the NHRA, No 25 of 1999:</b>	Section 36
<b>Applicable Sections of the KZNHA, No.10 of 1997</b>	Section 26 (3 & 4)
<b>Applicable Sections of the KZNHB, 2008</b>	Chapter 8 Sections 40 and 41
<b>Description:</b>	

The site consists of 2 graves located approximately 2 meters from the road. The graves have stone mound dressing and headstones. Their orientation is east-west (Figure 14)

*Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic*

*Assessment Guidelines):*

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	High	Low	High significance	Highly probable	Probable	Permanent: Construction	Avoid the grave by bending the pipeline away from the resource. Tape the grave off from construction activities and monitor.

*Nature: Construction activities have a potential to impact negatively on the grave if not mitigated.*

	Without mitigation	With mitigation
<i>Extent</i>	High (5)	Local (1)
<i>Duration</i>	Permanent (5)	Short Duration (2)
<i>Magnitude</i>	Very High (10)	Low (4)
<i>Probability</i>	Definite (5)	Probable (4)
<i>Significance</i>	(100) High	(28) Low
<i>Status (positive or negative)</i>	Negative	Positive (if mitigated)

<i>Reversibility</i>	Low	Medium
<i>Irreplaceable loss of resources?</i>	Yes	No
<i>Can impacts be mitigated?</i>	Yes	
<b>Mitigation:</b>		
<p>The grave site should be avoided and treated as a No-Go-Area during the construction phase. The pipeline should be diverted away from the grave site. A buffer of 6 to 10 meters should be kept between the grave and the construction activities. The grave site should be tapped off from construction activities and the project ECO should ensure that he/she monitors the grave during the project construction phase.</p>		
<b>Cumulative impacts:</b> There will be minimum cumulative impacts if proposed mitigation measures are adhered to.		
<b>Residual Impacts:</b> They will be negative if mitigation measures are not applied.		

*Measures for inclusion in the draft Environmental Management Plan:*

**OBJECTIVE:**

The overall goal is to identify, manage and conserve heritage resources within and immediately outside the proposed development footprint. In order to achieve this goal it is recommended that the grave be avoided and treated as a No-Go-Area for both the construction material and personnel.

Project component/s	Construction and operational phases of the project
Potential Impact	In case where the identified grave (es) is ( or are) not avoided and treated as a No-Go-Area from construction and operational activities, the following impacts are predicted: disturbance of the gravesite (e.g. exposure of the remains as a result of machinery excavation activities; destruction of grave markers). This will make it difficult for the deceased families to recognise their grave resulting <u>to legal disputes between the contractor and affected families.</u>
Activity/risk source	Exclusion of the above objectives from the overall Environmental Management Plan

Mitigation: Target/Objective	The grave site should be avoided and treated as a No-Go-Area during the construction phase. The project ECO should ensure that no machinery or any other construction materials in placed in the area with the grave (s).		
Mitigation: Action/control	Responsibility	Timeframe	
With the approval of the project, the Environmental Consultant and/or ECO should ensure implantation of proposed mitigation.	ECO	Construction phase	
Performance Indicator	The type of indicator used here will be Actionable Indicators – this will measure action/progress in terms of completion of the above objectives with the approval of the project against their actual implementation.		
Monitoring	The ECO should ensure that the all grave (es) is (are) monitored during the construction and that no construction activities, machinery and personnel disturb or sit on the grave.		



Figure 14-Two grave sites near D1268 from eMabomvini



Site Name:	KDP 3
Type:	Graves
Density:	9 graves (Low Density)
Location/GPS Coordinates:	28 47'16.7"S 30 34'41.62"E
Approximate Age:	Less than 60 years
Applicable Section of the NHRA, No 25 of 1999:	Section 36
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (3 & 4)
Applicable Sections of the KZNHB, 2008	Chapter 8 Sections 40 and 41
<b>Description:</b> <p>The site is a cemetery with 9 graves along the road. They are located approximately 10 meters from the road. The graves have stone mound dressing and follow east-west grave orientation. (Figure 15)</p>	

Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	Medium	Low	High significance	Improbable	Improbable	N/A	Avoid and treat it as a No-Go-Area

*Nature: Construction activities have a potential to impact negatively on the grave if not mitigated.*

	Without mitigation	With mitigation
<i>Extent</i>	Local (1)	Local (1)
<i>Duration</i>	Very Short (1)	Very short (1)
<i>Magnitude</i>	Minor (2)	Small (0)
<i>Probability</i>	Improbable (2)	Very Improbable (1)
<i>Significance</i>	(8) Low	(2) Low
<i>Status (positive or negative)</i>	Positive	Positive
<i>Reversibility</i>	No impacts	No impacts
<i>Irreplaceable loss of resources?</i>	No	No
<i>Can impacts be mitigated?</i>	Yes	
<b>Mitigation:</b>		
Treat the grave as a No-Go-Area		
<b>Cumulative impacts:</b> N/A		
<b>Residual Impacts:</b> N/A		

Measures for inclusion in the draft Environmental Management Plan:

**OBJECTIVE:**

The overall goal is to identify, manage and conserve heritage resources within and immediately outside the proposed development footprint. In order to achieve this goal it is recommended that the grave be avoided and treated as a No-Go-Area for both the construction material and personnel.

Project component/s	Construction and operational phases of the project		
Potential Impact	In case where the identified grave (es) is ( or are) not avoided and treated as a No-Go-Area from construction and operational activities, the following impacts are predicted: disturbance of the gravesite (e.g. exposure of the remains as a result of machinery excavation activities; destruction of grave markers). This will make it difficult for the deceased families to recognise their grave resulting to <u>legal disputes between the contractor and affected families</u> .		
Activity/risk source	Exclusion of the above objectives from the overall Environmental Management Plan		
Mitigation: Target/Objective	The grave site should be avoided and treated as a No-Go-Area during the construction phase. The project ECO should ensure that no machinery or any other construction materials in placed in the area with the grave (s).		
Mitigation: Action/control	Responsibility	Timeframe	
With the approval of the project, the Environmental Consultant and/or ECO should ensure implantation of proposed mitigation.	ECO	Construction phase	
Performance Indicator	The type of indicator used here will be Actionable Indicators – this will measure action/progress in terms of completion of the above objectives with the approval of the project against their actual implementation.		
Monitoring	N/A		



Figure 15- Cemetery with 9 graves south of the D1268

<b>Site Name:</b>	<b>KDP 4</b>
Type:	Historic Terrace
Density:	High density
Location/GPS Coordinates:	28 47'6.43"S 30 34'41.62"E
Approximate Age:	Old than 60 years
Applicable Section of the NHRA, No 25 of 1999:	Section 36
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (3 & 4)
Applicable Sections of the KZNHB, 2008	Chapter 8 Sections 40 and 41
<b>Description:</b> Historic terrace along the road to R33, the residents are allocated north of the road. The community located north of the road and terrace is probable the old residents of this terrace koppie. (Figure 16)	

Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	Low	Low	High significance	Probable	Improbable	N/A	Avoid and treat it as a No-Go-Area

No further action required



*Figure 16-Terrace on the hill west of the D1268 towards road to R33*



<b>Site Name:</b>	<b>KDP 5</b>
Type:	Graves
Density:	3 graves (Low Density)
Location/GPS Coordinates:	28 47'56.54"S 30 34'10.12"E
Approximate Age:	Historic
Applicable Section of the NHRA, No 25 of 1999:	Section 36
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (3 & 4)
Applicable Sections of the KZNHB, 2008	Chapter 8 Sections 40 and 41
<b>Description:</b> The site consists of 3 graves. 2 graves are located outside the yard and one inside. All the graves have stone mound dressing and have east-west orientation. (Figure 17)	

*Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic*

*Assessment Guidelines):*

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	High	Low	High significance	Highly probable	Probable	Permanent: Construction	Avoid the grave by bending the pipeline away from the resource. Tape the grave off from construction activities and monitor.

*Nature: Construction activities have a potential to impact negatively on the grave if not mitigated.*

	Without mitigation	With mitigation
<i>Extent</i>	High (5)	Local (1)
<i>Duration</i>	Permanent (5)	Short Duration (2)
<i>Magnitude</i>	Very High (10)	Low (4)
<i>Probability</i>	Definite (5)	Probable (4)
<i>Significance</i>	(100) High	(28) Low
<i>Status (positive or negative)</i>	Negative	Positive (if mitigated)
<i>Reversibility</i>	Low	Medium
<i>Irreplaceable loss of resources?</i>	Yes	No
<i>Can impacts be mitigated?</i>	Yes	
<p><b>Mitigation:</b></p> <p>The grave site should be avoided and treated as a No-Go-Area during the construction phase. The pipeline should be diverted away from the grave site. A buffer of 6 to 10 meters should be kept between the grave and the construction activities. The grave site should be tapped off from construction activities and the project ECO should ensure that he/she monitors the grave during the project construction phase.</p>		
<p><b>Cumulative impacts:</b> There will be minimum cumulative impacts if proposed mitigation measures are adhered to.</p>		
<p><b>Residual Impacts:</b> They will be negative if mitigation measures are not applied.</p>		



*Measures for inclusion in the draft Environmental Management Plan:*

**OBJECTIVE:**

The overall goal is to identify, manage and conserve heritage resources within and immediately outside the proposed development footprint. In order to achieve this goal it is recommended that the grave be avoided and treated as a No-Go-Area for both the construction material and personnel.

Project component/s	Construction and operational phases of the project	
Potential Impact	In case where the identified grave (es) is ( or are) not avoided and treated as a No-Go-Area from construction and operational activities, the following impacts are predicted: disturbance of the gravesite (e.g. exposure of the remains as a result of machinery excavation activities; destruction of grave markers). This will make it difficult for the deceased families to recognise their grave resulting <u>to legal disputes between the contractor and affected families</u> .	
Activity/risk source	Exclusion of the above objectives from the overall Environmental Management Plan	
Mitigation: Target/Objective	The grave site should be avoided and treated as a No-Go-Area during the construction phase. The project ECO should ensure that no machinery or any other construction materials in placed in the area with the grave (s).	
Mitigation: Action/control	Responsibility	Timeframe
With the approval of the project, the Environmental Consultant and/or ECO should ensure implantation of proposed mitigation.	ECO	Construction phase
Performance Indicator	The type of indicator used here will be Actionable Indicators – this will measure action/progress in terms of completion of the above objectives with the approval of the project against their actual implementation.	
Monitoring	The ECO should ensure that the all grave (es) is (are) monitored during the construction and that no construction activities, machinery and personnel disturb or sit on the grave.	



Figure 17: Gravesite next to a homestead with two graves outside the yard and one inside, all are with stone mound dressing.

Site Name:	KDP 6
Type:	Graves
Density:	5 graves (Low Density)
Location/GPS Coordinates:	28 48'6.15"S 30 34'24.87"E
Approximate Age:	
Applicable NHRA Section:	
Description:	The site consists of 5 graves located 10 meters away from the road (R33). 1 grave has a granite dressing and headstone. The 4 other graves have stone mound dressing. (Figure 18)

Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	Medium	Low	High significance	Improbable	Improbable	N/A	Avoid and treat it as a No-Go-Area

*Nature: Construction activities have a potential to impact negatively on the grave if not mitigated.*

	Without mitigation	With mitigation
<i>Extent</i>	Local (1)	Local (1)
<i>Duration</i>	Very Short (1)	Very short (1)
<i>Magnitude</i>	Minor (2)	Small (0)
<i>Probability</i>	Improbable (2)	Very Improbable (1)
<i>Significance</i>	(8) Low	(2) Low
<i>Status (positive or negative)</i>	Positive	Positive
<i>Reversibility</i>	No impacts	No impacts
<i>Irreplaceable loss of resources?</i>	No	No
<i>Can impacts be mitigated?</i>	Yes	
<b>Mitigation:</b>		
Treat the grave as a No-Go-Area		
<b>Cumulative impacts:</b> N/A		
<b>Residual Impacts:</b> N/A		

*Measures for inclusion in the draft Environmental Management Plan:*

<b>OBJECTIVE:</b>		
<p>The overall goal is to identify, manage and conserve heritage resources within and immediately outside the proposed development footprint. In order to achieve this goal it is recommended that the grave be avoided and treated as a No-Go-Area for both the construction material and personnel.</p>		
Project component/s	Construction and operational phases of the project	
Potential Impact	In case where the identified grave (es) is ( or are) not avoided and treated as a No-Go-Area from construction and operational activities, the following impacts are predicted: disturbance of the gravesite (e.g. exposure of the remains as a result of machinery excavation activities; destruction of grave markers). This will make it difficult for the deceased families to recognise their grave resulting <u>to legal disputes between the contractor and affected families.</u>	
Activity/risk source	Exclusion of the above objectives from the overall Environmental Management Plan	
Mitigation: Target/Objective	The grave site should be avoided and treated as a No-Go-Area during the construction phase. The project ECO should ensure that no machinery or any other construction materials in placed in the area with the grave (s).	
Mitigation: Action/control	Responsibility	Timeframe
With the approval of the project, the Environmental Consultant and/or ECO should ensure implantation of proposed mitigation.	ECO	Construction phase
Performance Indicator	The type of indicator used here will be Actionable Indicators – this will measure action/progress in terms of completion of the above objectives with the approval of the project against their actual implementation.	
Monitoring	N/A	



Figure 18-A Gravesite east of homestead some graves are with stone mound dressing and one is with granite dressing and a head stone.

<b>Site Name:</b>	<b>KDP 7</b>
Type:	Graves
Density:	1 grave (Low Density)
Location/GPS Coordinates:	28 48'11.13"S 30 34'27.98"E
Approximate Age:	Historic
Applicable Section of the NHRA, No 25 of 1999:	Section 36
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (3 & 4)
Applicable Sections of the KZNHB, 2008	Chapter 8 Sections 40 and 41
Description:	The site is a single grave along the road to R33 with stone mound dressing. In terms of orientation it follows that standard east-west grave orientation (Figure 19).

Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	Medium	Low	High significance	Improbable	Improbable	N/A	Avoid and treat it as a No-Go-Area

<i>Nature: Construction activities have a potential to impact negatively on the grave if not mitigated.</i>		
	Without mitigation	With mitigation
<i>Extent</i>	Local (1)	Local (1)
<i>Duration</i>	Very Short (1)	Very short (1)
<i>Magnitude</i>	Minor (2)	Small (0)
<i>Probability</i>	Improbable (2)	Very Improbable (1)
<i>Significance</i>	(8) Low	(2) Low
<i>Status (positive or negative)</i>	Positive	Positive
<i>Reversibility</i>	No impacts	No impacts
<i>Irreplaceable loss of resources?</i>	No	No
<i>Can impacts be mitigated?</i>	Yes	
<b>Mitigation:</b>		
Treat the grave as a No-Go-Area		

<b>Cumulative impacts:</b> N/A
<b>Residual Impacts:</b> N/A

*Measures for inclusion in the draft Environmental Management Plan:*

**OBJECTIVE:**

The overall goal is to identify, manage and conserve heritage resources within and immediately outside the proposed development footprint. In order to achieve this goal it is recommended that the grave be avoided and treated as a No-Go-Area for both the construction material and personnel.

Project component/s	Construction and operational phases of the project	
Potential Impact	In case where the identified grave (es) is ( or are) not avoided and treated as a No-Go-Area from construction and operational activities, the following impacts are predicted: disturbance of the gravesite (e.g. exposure of the remains as a result of machinery excavation activities; destruction of grave markers). This will make it difficult for the deceased families to recognise their grave resulting <u>to legal disputes between the contractor and affected families.</u>	
Activity/risk source	Exclusion of the above objectives from the overall Environmental Management Plan	
Mitigation: Target/Objective	The grave site should be avoided and treated as a No-Go-Area during the construction phase. The project ECO should ensure that no machinery or any other construction materials in placed in the area with the grave (s).	
Mitigation: Action/control	Responsibility	Timeframe
With the approval of the project, the Environmental Consultant and/or ECO should ensure implantation of proposed mitigation.	ECO	Construction phase



Performance Indicator	The type of indicator used here will be Actionable Indicators – this will measure action/progress in terms of completion of the above objectives with the approval of the project against their actual implementation.
Monitoring	N/A



*Figure 19-A single grave east of homestead with stone mound dressing*



<b>Site Name:</b>	<b>KDP 8</b>
<b>Type:</b>	Graves
<b>Density:</b>	3 graves (Low Density)
<b>Location/GPS Coordinates:</b>	28 48'51.33"S 30 34'37.4"E
<b>Approximate Age:</b>	Historic
<b>Applicable Section of the NHRA, No 25 of 1999:</b>	Section 36
<b>Applicable Sections of the KZNHA, No.10 of 1997</b>	Section 26 (3 & 4)
<b>Applicable Sections of the KZNHB, 2008</b>	Chapter 8 Sections 40 and 41
<b>Description:</b>	The site consist of 3graves east of the road (R33), The graves have stone mound dressing and east-west orientation

*Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic*

*Assessment Guidelines):*

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	High	Low	High significance	Highly probable	Probable	Permanent: Construction	Avoid the grave by bending the pipeline away from the resource. Tape the grave off from construction activities and monitor.

*Nature: Construction activities have a potential to impact negatively on the grave if not mitigated.*

	Without mitigation	With mitigation
<i>Extent</i>	High (5)	Local (1)
<i>Duration</i>	Permanent (5)	Short Duration (2)
<i>Magnitude</i>	Very High (10)	Low (4)
<i>Probability</i>	Definite (5)	Probable (4)
<i>Significance</i>	(100) High	(28) Low
<i>Status (positive or negative)</i>	Negative	Positive (if mitigated)
<i>Reversibility</i>	Low	Medium
<i>Irreplaceable loss of resources?</i>	Yes	No
<i>Can impacts be mitigated?</i>	Yes	
<p><b>Mitigation:</b></p> <p>The grave site should be avoided and treated as a No-Go-Area during the construction phase. The pipeline should be diverted away from the grave site. A buffer of 6 to 10 meters should be kept between the grave and the construction activities. The grave site should be tapped off from construction activities and the project ECO should ensure that he/she monitors the grave during the project construction phase.</p>		
<p><b>Cumulative impacts:</b> There will be minimum cumulative impacts if proposed mitigation measures are adhered to.</p>		
<p><b>Residual Impacts:</b> They will be negative if mitigation measures are not applied.</p>		

Measures for inclusion in the draft Environmental Management Plan:

<b>OBJECTIVE:</b>		
The overall goal is to identify, manage and conserve heritage resources within and immediately outside the proposed development footprint. In order to achieve this goal it is recommended that the grave be avoided and treated as a No-Go-Area for both the construction material and personnel.		
Project component/s	Construction and operational phases of the project	
Potential Impact	In case where the identified grave (es) is ( or are) not avoided and treated as a No-Go-Area from construction and operational activities, the following impacts are predicted: disturbance of the gravesite (e.g. exposure of the remains as a result of machinery excavation activities; destruction of grave markers). This will make it difficult for the deceased families to recognise their grave resulting to <u>legal disputes between the contractor and affected families</u> .	
Activity/risk source	Exclusion of the above objectives from the overall Environmental Management Plan	
Mitigation: Target/Objective	The grave site should be avoided and treated as a No-Go-Area during the construction phase. The project ECO should ensure that no machinery or any other construction materials in placed in the area with the grave (s).	
Mitigation: Action/control	Responsibility	Timeframe
With the approval of the project, the Environmental Consultant and/or ECO should ensure implantation of proposed mitigation.	ECO	Construction phase
Performance Indicator	The type of indicator used here will be Actionable Indicators – this will measure action/progress in terms of completion of the above objectives with the approval of the project against their actual implementation.	
Monitoring	The ECO should ensure that the all grave (es) is (are) monitored during the construction and that no construction activities, machinery and personnel disturb or sit on the grave.	

<b>Site Name:</b>	<b>KDP 9</b>
Type:	Graves
Density:	4 graves (Low Density)
Location/GPS Coordinates:	28 49'4.56"S 30 34'41.22"E
Approximate Age:	Historic
Applicable Section of the NHRA, No 25 of 1999:	Section 36
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (3 & 4)
Applicable Sections of the KZNHB, 2008	Chapter 8 Sections 40 and 41
Description:	The site consists of 4 graves with stone mound dressing. Their orientation is east-west. (Figure 20)

*Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):*

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	Medium	Low	High significance	Improbable	Improbable	N/A	Avoid and treat it as a No-Go-Area

*Nature: Construction activities have a potential to impact negatively on the grave if not mitigated.*

	Without mitigation	With mitigation
<i>Extent</i>	Local (1)	Local (1)
<i>Duration</i>	Very Short (1)	Very short (1)
<i>Magnitude</i>	Minor (2)	Small (0)
<i>Probability</i>	Improbable (2)	Very Improbable (1)
<i>Significance</i>	(8) Low	(2) Low
<i>Status (positive or negative)</i>	Positive	Positive
<i>Reversibility</i>	No impacts	No impacts
<i>Irreplaceable loss of resources?</i>	No	No
<i>Can impacts be mitigated?</i>	Yes	
<b>Mitigation:</b>		
Treat the grave as a No-Go-Area		
<b>Cumulative impacts:</b> N/A		
<b>Residual Impacts:</b> N/A		

Measures for inclusion in the draft Environmental Management Plan:

**OBJECTIVE:**

The overall goal is to identify, manage and conserve heritage resources within and immediately outside the proposed development footprint. In order to achieve this goal it is recommended that the grave be avoided and treated as a No-Go-Area for both the construction material and personnel.

Project component/s	Construction and operational phases of the project		
Potential Impact	In case where the identified grave (es) is ( or are) not avoided and treated as a No-Go-Area from construction and operational activities, the following impacts are predicted: disturbance of the gravesite (e.g. exposure of the remains as a result of machinery excavation activities; destruction of grave markers). This will make it difficult for the deceased families to recognise their grave resulting to <u>legal disputes between the contractor and affected families</u> .		
Activity/risk source	Exclusion of the above objectives from the overall Environmental Management Plan		
Mitigation: Target/Objective	The grave site should be avoided and treated as a No-Go-Area during the construction phase. The project ECO should ensure that no machinery or any other construction materials in placed in the area with the grave (s).		
Mitigation: Action/control	Responsibility	Timeframe	
With the approval of the project, the Environmental Consultant and/or ECO should ensure implantation of proposed mitigation.	ECO	Construction phase	
Performance Indicator	The type of indicator used here will be Actionable Indicators – this will measure action/progress in terms of completion of the above objectives with the approval of the project against their actual implementation.		
Monitoring	N/A		





Figure 20- Graves with stone mound dressing

<b>Site Name:</b>	<b>KDP 10</b>
Type:	Graves
Density:	4 graves (Low Density)
Location/GPS Coordinates:	28 49'15.29"S 30 34'24.55"E
Approximate Age:	
Applicable Section of the NHRA, No 25 of 1999:	Section 36
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (3 & 4)
Applicable NHRA Section:	
Description: .The site consists of 4 graves with stone mound dressing and is located approximately 15 meters from the road (R33). (Figure 21)	

*Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):*

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	Low	Low	High significance	Probable	Improbable	N/A	Avoid and treat it as a No-Go-Area

<i>Nature: Construction activities have a potential to impact negatively on the grave if not mitigated.</i>		
	Without mitigation	With mitigation
<i>Extent</i>	Local (1)	Local (1)
<i>Duration</i>	Very Short (1)	Very short (1)
<i>Magnitude</i>	Minor (2)	Small (0)
<i>Probability</i>	Improbable (2)	Very Improbable (1)
<i>Significance</i>	(8) Low	(2) Low
<i>Status (positive or negative)</i>	Positive	Positive
<i>Reversibility</i>	No impacts	No impacts
<i>Irreplaceable loss of resources?</i>	No	No
<i>Can impacts be mitigated?</i>	Yes	
<b>Mitigation:</b>		
Treat the grave as a No-Go-Area		
<b>Cumulative impacts:</b> N/A		
<b>Residual Impacts:</b> N/A		

*Measures for inclusion in the draft Environmental Management Plan:*

<b>OBJECTIVE:</b>		
<p>The overall goal is to identify, manage and conserve heritage resources within and immediately outside the proposed development footprint. In order to achieve this goal it is recommended that the grave be avoided and treated as a No-Go-Area for both the construction material and personnel.</p>		
Project component/s	Construction and operational phases of the project	
Potential Impact	In case where the identified grave (es) is ( or are) not avoided and treated as a No-Go-Area from construction and operational activities, the following impacts are predicted: disturbance of the gravesite (e.g. exposure of the remains as a result of machinery excavation activities; destruction of grave markers). This will make it difficult for the deceased families to recognise their grave resulting <u>to legal disputes between the contractor and affected families.</u>	
Activity/risk source	Exclusion of the above objectives from the overall Environmental Management Plan	
Mitigation: Target/Objective	The grave site should be avoided and treated as a No-Go-Area during the construction phase. The project ECO should ensure that no machinery or any other construction materials in placed in the area with the grave (s).	
Mitigation: Action/control	Responsibility	Timeframe
With the approval of the project, the Environmental Consultant and/or ECO should ensure implantation of proposed mitigation.	ECO	Construction phase
Performance Indicator	The type of indicator used here will be Actionable Indicators – this will measure action/progress in terms of completion of the above objectives with the approval of the project against their actual implementation.	
Monitoring	N/A	



Figure 21-4 graves with stone mound dressing north of a homestead

<b>e Name:</b>	<b>KDP 11</b>
Type	Graves
Density:	4 graves (Low density)
Location/GPS Coordinates:	20 49'12.30"S 30 34'17.83"E
Approximate Age:	Historic
Applicable Section of the NHRA, No 25 of 1999:	Section 36
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (3 & 4)
Applicable Sections of the KZNHB, 2008	Chapter 8 Sections 40 and 41
Description:	The site consists of 4 graves with stone mound dressing. The graves are located approximately 5 meters from the road i.e. R33. (Figure 22).

*Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic*

*Assessment Guidelines):*

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	High	Low	High significance	Highly probable	Probable	Permanent: Construction	Avoid the grave by bending the pipeline away from the resource. Tape the grave off from construction activities and monitor.

<i>Nature: Construction activities have a potential to impact negatively on the grave if not mitigated.</i>		
	Without mitigation	With mitigation
<i>Extent</i>	High (5)	Local (1)
<i>Duration</i>	Permanent (5)	Short Duration (2)
<i>Magnitude</i>	Very High (10)	Low (4)
<i>Probability</i>	Definite (5)	Probable (4)
<i>Significance</i>	(100) High	(28) Low
<i>Status (positive or negative)</i>	Negative	Positive (if mitigated)
<i>Reversibility</i>	Low	Medium
<i>Irreplaceable loss of resources?</i>	Yes	No



<i>Can impacts be mitigated?</i>	Yes
<p><b>Mitigation:</b></p> <p>The grave site should be avoided and treated as a No-Go-Area during the construction phase. The pipeline should be diverted away from the grave site. A buffer of 6 to 10 meters should be kept between the grave and the construction activities. The grave site should be tapped off from construction activities and the project ECO should ensure that he/she monitors the grave during the project construction phase.</p>	
<p><b>Cumulative impacts:</b> There will be minimum cumulative impacts if proposed mitigation measures are adhered to.</p>	
<p><b>Residual Impacts:</b> They will be negative if mitigation measures are not applied.</p>	

*Measures for inclusion in the draft Environmental Management Plan:*

**OBJECTIVE:**

The overall goal is to identify, manage and conserve heritage resources within and immediately outside the proposed development footprint. In order to achieve this goal it is recommended that the grave be avoided and treated as a No-Go-Area for both the construction material and personnel.

Project component/s	Construction and operational phases of the project
Potential Impact	In case where the identified grave (es) is ( or are) not avoided and treated as a No-Go-Area from construction and operational activities, the following impacts are predicted: disturbance of the gravesite (e.g. exposure of the remains as a result of machinery excavation activities; destruction of grave markers). This will make it difficult for the deceased families to recognise their grave resulting <u>to legal disputes between the contractor and affected families.</u>

Activity/risk source	Exclusion of the above objectives from the overall Environmental Management Plan	
Mitigation: Target/Objective	The grave site should be avoided and treated as a No-Go-Area during the construction phase. The project ECO should ensure that no machinery or any other construction materials in placed in the area with the grave (s).	
Mitigation: Action/control	Responsibility	Timeframe
With the approval of the project, the Environmental Consultant and/or ECO should ensure implantation of proposed mitigation.	ECO	Construction phase
Performance Indicator	The type of indicator used here will be Actionable Indicators – this will measure action/progress in terms of completion of the above objectives with the approval of the project against their actual implementation.	
Monitoring	The ECO should ensure that the all grave (es) is (are) monitored during the construction and that no construction activities, machinery and personnel disturb or sit on the grave.	



Figure 22-Graves with stone mound dressing

<b>Site Name:</b>	KDP 12
<b>Type:</b>	Graves
<b>Density:</b>	4 graves (Low Density)
<b>Location/GPS Coordinates:</b>	28 49'11.85"S 30 34'9.17"E
<b>Applicable Section of the NHRA, No 25 of 1999:</b>	Section 36
<b>Applicable Sections of the KZNHA, No.10 of 1997</b>	Section 26 (3 & 4)
<b>Applicable Sections of the KZNHB, 2008</b>	Chapter 8 Sections 40 and 41
<b>Description:</b>	The site consists of 4 graves next to drainage system. 1 of the 4 graves is separated from the rest by the drainage erosion. (Figure 23)

*Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic*

*Assessment Guidelines):*

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	High	Low	High significance	Highly probable	Probable	Permanent: Construction	Avoid the grave by bending the pipeline away from the resource. Tape the grave off from construction activities and monitor.

*Nature: Construction activities have a potential to impact negatively on the grave if not mitigated.*

	Without mitigation	With mitigation
<i>Extent</i>	High (5)	Local (1)
<i>Duration</i>	Permanent (5)	Short Duration (2)
<i>Magnitude</i>	Very High (10)	Low (4)
<i>Probability</i>	Definite (5)	Probable (4)
<i>Significance</i>	(100) High	(28) Low
<i>Status (positive or negative)</i>	Negative	Positive (if mitigated)
<i>Reversibility</i>	Low	Medium
<i>Irreplaceable loss of resources?</i>	Yes	No
<i>Can impacts be mitigated?</i>	Yes	
<p><b>Mitigation:</b></p> <p>The grave site should be avoided and treated as a No-Go-Area during the construction phase. The pipeline should be diverted away from the grave site. A buffer of 6 to 10 meters should be kept between the grave and the construction activities. The grave site should be tapped off from construction activities and the project ECO should ensure that he/she monitors the grave during the project construction phase.</p>		
<p><b>Cumulative impacts:</b> There will be minimum cumulative impacts if proposed mitigation measures are adhered to.</p>		
<p><b>Residual Impacts:</b> They will be negative if mitigation measures are not applied.</p>		

Measures for inclusion in the draft Environmental Management Plan:

**OBJECTIVE:**

The overall goal is to identify, manage and conserve heritage resources within and immediately outside the proposed development footprint. In order to achieve this goal it is recommended that the grave be avoided and treated as a No-Go-Area for both the construction material and personnel.

Project component/s	Construction and operational phases of the project	
Potential Impact	In case where the identified grave (es) is ( or are) not avoided and treated as a No-Go-Area from construction and operational activities, the following impacts are predicted: disturbance of the gravesite (e.g. exposure of the remains as a result of machinery excavation activities; destruction of grave markers). This will make it difficult for the deceased families to recognise their grave resulting to <u>legal disputes between the contractor and affected families</u> .	
Activity/risk source	Exclusion of the above objectives from the overall Environmental Management Plan	
Mitigation: Target/Objective	The grave site should be avoided and treated as a No-Go-Area during the construction phase. The project ECO should ensure that no machinery or any other construction materials in placed in the area with the grave (s).	
Mitigation: Action/control	Responsibility	Timeframe
With the approval of the project, the Environmental Consultant and/or ECO should ensure implantation of proposed mitigation.	ECO	Construction phase
Performance Indicator	The type of indicator used here will be Actionable Indicators – this will measure action/progress in terms of completion of the above objectives with the approval of the project against their actual implementation.	
Monitoring	The ECO should ensure that the all grave (es) is (are) monitored during the construction and that no construction activities, machinery and personnel disturb or sit on the grave.	



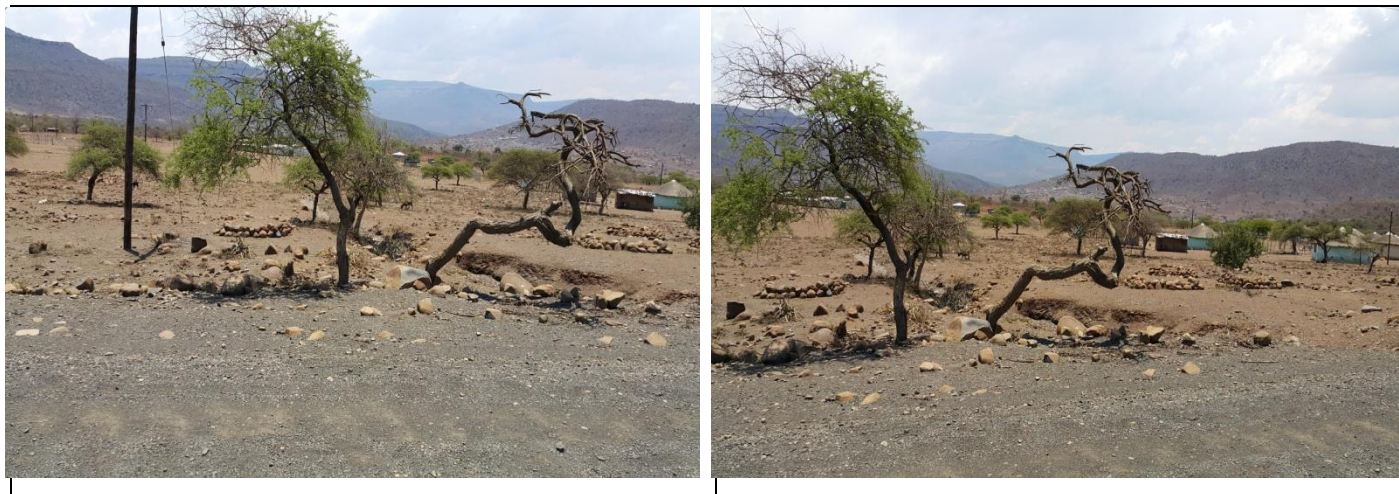


Figure 23-Four graves east of the road with stone mound dressing with 1 separated by drainage system

<b>Site Name:</b>	<b>KDP 13</b>
Type:	Old kraal
Density:	1 (Low Density)
Location/GPS Coordinates:	28 49'47.45"S 30 34'19.11"E
Approximate Age:	Older than 60 years
Applicable Section of the NHRA, No 25 of 1999:	Section 34 and 35 (kraal)
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (1) and Section 26 (6)
Applicable Sections of the KZNHB, 2008	Chapter 7 and section 29 (1) and Chapter 8 section 42
<b>Description:</b>	
The site is a stone Kraal. It is located along the dirt road. Only foundation stone still remain. Most stone have removed or salvaged for construction activities elsewhere. (Figure 24)	

Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	Low	Low	High significance	Probable	Improbable	N/A	Avoid and treat it as a No-Go-Area

No further action required



Figure 24-Kraal ruins foundations next to the road

<b>Site Name:</b>	KDP 14
Type:	
Density:	Low
Location/GPS Coordinates:	28 50'12.46"S 30 34'15.72"E
Approximate Age:	Older than 60 years
Applicable Section of the NHRA, No 25 of 1999:	Section 34 and 35 (kraal)
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (1) and Section 26 (6)
Applicable Sections of the KZNHB, 2008	Chapter 7 and section 29 (1) and Chapter 8 section 42
<b>Description:</b> Historic kraal west of the R33 road to Msinga. The structure is in bad state. (Figure 25)	

*Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):*

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	Low	Low	High significance	Probable	Improbable	N/A	Avoid and treat it as a No-Go-Area

No further action required





Figure 25-Foundations of kraal ruins

Site Name:	KDP 15
Type:	Historic kraal
Density:	Low
Location/GPS Coordinates:	28 50'31.10S 30 34'26.12"E
Approximate Age:	Older than 60 years
Applicable Section of the NHRA, No 25 of 1999:	Section 34 and 35 (kraal)
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (1) and Section 26 (6)
Applicable Sections of the KZNHB, 2008	Chapter 7 and section 29 (1) and Chapter 8 section 42

**Description:**  
 This is a stone kraal located along the road from Msinga to uMvoti. It is located east of the road. (Figure 26)

*Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic Assessment Guidelines):*

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	Low	Low	High significance	Probable	Improbable	N/A	Avoid and treat it as a No-Go-Area

No further action required





Figure 26-Historic stone kraal next to the road with east facing entrance

Site Name:	KDP 16
Type:	Graves
Density:	3 graves (Low Density)
Location/GPS Coordinates:	28 50'38.59"S 30 34'26.11"E
Approximate Age:	Older than 60 years
Applicable NHRA Section:	Section 36
Applicable Section of the NHRA, No 25 of 1999:	Section 36
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (3 & 4)
Applicable Sections of the KZNHB, 2008	Chapter 8 Sections 40 and 41
Description:	The site consists of 3 graves. Surveyors have marked 2 graves with white paint showing intent of laying the water pipeline in the area in which the graves are located. The graves have stone mound dressing and east-west orientation. (Figure 27)

*Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic*

*Assessment Guidelines):*

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	High	Low	High significance	Highly probable	Probable	Permanent: Construction	Avoid the grave by bending the pipeline away from the resource. Tape the grave off from construction activities and monitor.

<i>Nature: Construction activities have a potential to impact negatively on the grave if not mitigated.</i>		
	Without mitigation	With mitigation
<i>Extent</i>	High (5)	Local (1)
<i>Duration</i>	Permanent (5)	Short Duration (2)
<i>Magnitude</i>	Very High (10)	Low (4)
<i>Probability</i>	Definite (5)	Probable (4)
<i>Significance</i>	(100) High	(28) Low
<i>Status (positive or negative)</i>	Negative	Positive (if mitigated)
<i>Reversibility</i>	Low	Medium
<i>Irreplaceable loss of resources?</i>	Yes	No
<i>Can impacts be mitigated?</i>	Yes	
<b>Mitigation:</b>		
The grave site should be avoided and treated as a No-Go-Area during the construction phase. The pipeline should be diverted away from the grave site. A buffer of 6 to 10 meters should be kept between the grave and the construction activities. The grave site should be tapped off from construction activities and the project ECO should ensure that he/she monitors the grave during the project construction phase.		
<b>Cumulative impacts:</b> There will be minimum cumulative impacts if proposed mitigation measures are adhered to.		
<b>Residual Impacts:</b> They will be negative if mitigation measures are not applied.		

*Measures for inclusion in the draft Environmental Management Plan:*

**OBJECTIVE:**

The overall goal is to identify, manage and conserve heritage resources within and immediately outside the proposed development footprint. In order to achieve this goal it is recommended that the grave be avoided and treated as a No-Go-Area for both the construction material and personnel.

Project component/s	Construction and operational phases of the project	
Potential Impact	In case where the identified grave (es) is ( or are) not avoided and treated as a No-Go-Area from construction and operational activities, the following impacts are predicted: disturbance of the gravesite (e.g. exposure of the remains as a result of machinery excavation activities; destruction of grave markers). This will make it difficult for the deceased families to recognise their grave resulting <u>to legal disputes between the contractor and affected families.</u>	
Activity/risk source	Exclusion of the above objectives from the overall Environmental Management Plan	
Mitigation: Target/Objective	The grave site should be avoided and treated as a No-Go-Area during the construction phase. The project ECO should ensure that no machinery or any other construction materials in placed in the area with the grave (s).	
Mitigation: Action/control	Responsibility	Timeframe
With the approval of the project, the Environmental Consultant and/or ECO should ensure implantation of proposed mitigation.	ECO	Construction phase
Performance Indicator	The type of indicator used here will be Actionable Indicators – this will measure action/progress in terms of completion of the above objectives with the approval of the project against their actual implementation.	
Monitoring	The ECO should ensure that the all grave (es) is (are) monitored during the construction and that no construction activities, machinery and personnel disturb or sit on the grave.	

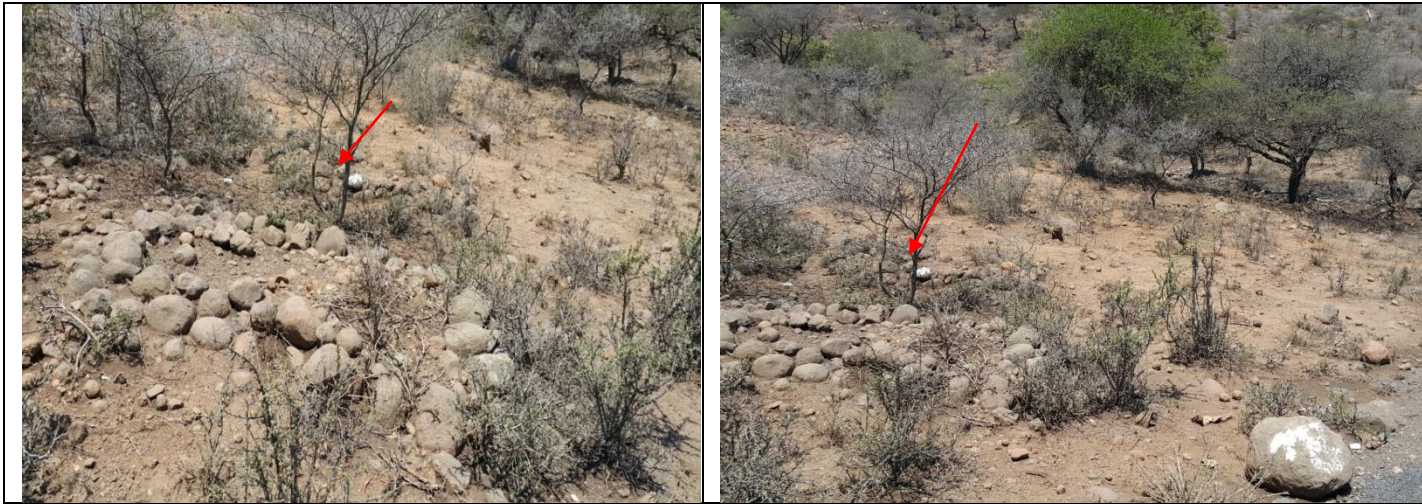


Figure 27-Three graves next to the road. Note the red arrow points at the surveyor mark on the grave

<b>Site Name:</b>	<b>KDP 17</b>
Type:	Graves
Density:	3 graves (Low Density)
Location/GPS Coordinates:	28 50'49.39"S 30 34'08.85"E
Approximate Age:	
Applicable Section of the NHRA, No 25 of 1999:	Section 36
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (3 & 4)
Applicable Sections of the KZNHB, 2008	Chapter 8 Sections 40 and 41
Description:	The site consists of 3 graves near a bridge. Construction activities are approximately 5 meters from the grave site (Figure 28)

*Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic*

*Assessment Guidelines):*

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	High	Low	High significance	Highly probable	Probable	Permanent: Construction	Avoid the grave by bending the pipeline away from the resource. Tape the grave off from construction activities and monitor.

<i>Nature: Construction activities have a potential to impact negatively on the grave if not mitigated.</i>		
	Without mitigation	With mitigation
<i>Extent</i>	High (5)	Local (1)
<i>Duration</i>	Permanent (5)	Short Duration (2)
<i>Magnitude</i>	Very High (10)	Low (4)
<i>Probability</i>	Definite (5)	Probable (4)
<i>Significance</i>	(100) High	(28) Low
<i>Status (positive or negative)</i>	Negative	Positive (if mitigated)
<i>Reversibility</i>	Low	Medium
<i>Irreplaceable loss of resources?</i>	Yes	No



Can impacts be mitigated?	Yes
<b>Mitigation:</b>	
The grave site should be avoided and treated as a No-Go-Area during the construction phase. The pipeline should be diverted away from the grave site. A buffer of 6 to 10 meters should be kept between the grave and the construction activities. The grave site should be tapped off from construction activities and the project ECO should ensure that he/she monitors the grave during the project construction phase.	
<b>Cumulative impacts:</b> There will be minimum cumulative impacts if proposed mitigation measures are adhered to.	
<b>Residual Impacts:</b> They will be negative if mitigation measures are not applied.	

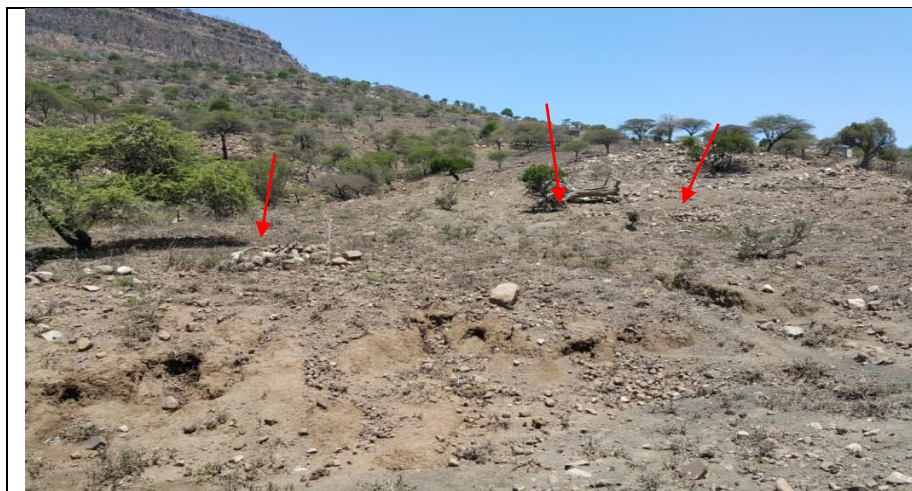
*Measures for inclusion in the draft Environmental Management Plan:*

**OBJECTIVE:**

The overall goal is to identify, manage and conserve heritage resources within and immediately outside the proposed development footprint. In order to achieve this goal it is recommended that the grave be avoided and treated as a No-Go-Area for both the construction material and personnel.

Project component/s	Construction and operational phases of the project
Potential Impact	In case where the identified grave (es) is ( or are) not avoided and treated as a No-Go-Area from construction and operational activities, the following impacts are predicted: disturbance of the gravesite (e.g. exposure of the remains as a result of machinery excavation activities; destruction of grave markers). This will make it difficult for the deceased families to recognise their grave resulting <u>to legal disputes between the contractor and affected families</u> .
Activity/risk source	Exclusion of the above objectives from the overall Environmental Management Plan
Mitigation: Target/Objective	The grave site should be avoided and treated as a No-Go-Area during the construction phase. The project ECO should ensure that no machinery or any other construction materials in placed in the area with the grave (s).

Mitigation: Action/control	Responsibility	Timeframe
With the approval of the project, the Environmental Consultant and/or ECO should ensure implantation of proposed mitigation.	ECO	Construction phase
Performance Indicator	The type of indicator used here will be Actionable Indicators – this will measure action/progress in terms of completion of the above objectives with the approval of the project against their actual implementation.	
Monitoring	The ECO should ensure that the all grave (es) is (are) monitored during the construction and that no construction activities, machinery and personnel disturb or sit on the grave.	



*Figure 28-Three graves with stone mound dressing next to the bridge with erosion east of the graves*

<b>Site Name:</b>	<b>KDP 18</b>
Type:	Graves
Density:	6 graves (Low Density)
Location/GPS Coordinates:	28 50'58.52"S 30 33'47.29"E
Approximate Age:	More than 60 years
Applicable Section of the NHRA, No 25 of 1999:	Section 36
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (3 & 4)
Applicable Sections of the KZNHB, 2008	Chapter 8 Sections 40 and 41
Description: The site consists of 6 graves with stone mound dressing next to the bridge and a surveyor mark is about a meter away from the graves (Figure 29).	

*Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic*

*Assessment Guidelines):*

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	High	Low	High significance	Highly probable	Probable	Permanent: Construction	Avoid the grave by bending the pipeline away from the resource. Tape the grave off from construction activities and monitor.

<i>Nature: Construction activities have a potential to impact negatively on the grave if not mitigated.</i>	
	Without mitigation
	With mitigation

<i>Extent</i>	High (5)	Local (1)
<i>Duration</i>	Permanent (5)	Short Duration (2)
<i>Magnitude</i>	Very High (10)	Low (4)
<i>Probability</i>	Definite (5)	Probable (4)
<i>Significance</i>	(100) High	(28) Low
<i>Status (positive or negative)</i>	Negative	Positive (if mitigated)
<i>Reversibility</i>	Low	Medium
<i>Irreplaceable loss of resources?</i>	Yes	No
<i>Can impacts be mitigated?</i>	Yes	
<p><b>Mitigation:</b></p> <p>The grave site should be avoided and treated as a No-Go-Area during the construction phase. The pipeline should be diverted away from the grave site. A buffer of 6 to 10 meters should be kept between the grave and the construction activities. The grave site should be tapped off from construction activities and the project ECO should ensure that he/she monitors the grave during the project construction phase.</p>		
<p><b>Cumulative impacts:</b> There will be minimum cumulative impacts if proposed mitigation measures are adhered to.</p>		
<p><b>Residual Impacts:</b> They will be negative if mitigation measures are not applied.</p>		

Measures for inclusion in the draft Environmental Management Plan:

**OBJECTIVE:**

The overall goal is to identify, manage and conserve heritage resources within and immediately outside the proposed development footprint. In order to achieve this goal it is recommended that the grave be avoided and treated as a No-Go-Area for both the construction material and personnel.

Project component/s	Construction and operational phases of the project	
Potential Impact	In case where the identified grave (es) is ( or are) not avoided and treated as a No-Go-Area from construction and operational activities, the following impacts are predicted: disturbance of the gravesite (e.g. exposure of the remains as a result of machinery excavation activities; destruction of grave markers). This will make it difficult for the deceased families to recognise their grave resulting to <u>legal disputes between the contractor and affected families</u> .	
Activity/risk source	Exclusion of the above objectives from the overall Environmental Management Plan	
Mitigation: Target/Objective	The grave site should be avoided and treated as a No-Go-Area during the construction phase. The project ECO should ensure that no machinery or any other construction materials in placed in the area with the grave (s).	
Mitigation: Action/control	Responsibility	Timeframe
With the approval of the project, the Environmental Consultant and/or ECO should ensure implantation of proposed mitigation.	ECO	Construction phase
Performance Indicator	The type of indicator used here will be Actionable Indicators – this will measure action/progress in terms of completion of the above objectives with the approval of the project against their actual implementation.	
Monitoring	The ECO should ensure that the all grave (es) is (are) monitored during the construction and that no construction activities, machinery and personnel disturb or sit on the grave.	





Figure 29-Cemetery it 6 graves. Note the red arrows pointing to surveyor markers near the graves

<b>Site Name:</b>	<b>KDP 19</b>
Type:	Farm stead ruins
Density:	Over 4 structures (Low/Medium Density)
Location/GPS Coordinates:	28 54'35.31"S 30 32'49.07"E
Approximate Age:	
Applicable Section of the NHRA, No 25 of 1999:	Section 34
Applicable Sections of the KZNHA, No.10 of 1997	Section 26 (1) and Section 26 (6)
Applicable Sections of the KZNHB, 2008	Chapter 7 and section 29 (1) and Chapter 8 section 42
Description:	The site is an old farmstead. It has been abandoned and the buildings on site have all dilapidated. All the structures do not have windows, roof, doors etc. Associated with the farmstead is a kraal made of stones and some matured trees (Figure 30)

Nature of Impacts, Assessments & Predictions in terms of Standard Heritage & Basic Assessment (i.e. adopted from Standard Environmentally Basic

*Assessment Guidelines*):

Field Rating	Grade	Impact	Impact Significance (WOM)	Impact Significance (WM)	Heritage Significance	Certainty of Impacts WOM	Certainty of Impacts WM	Duration	Mitigation
LS	3A	Localised	Low	Low	High significance	Probable	Improbable	N/A	Avoid and treat it as a No-Go-Area

No further action required





*Figure 30-Farmstead ruins*

## 6. DISCUSSION

The physical survey of the bulk water supply focused on the entire project development footprint. This included the main transmission pipelines from Keates Drift to eMabomvini which covered the main routes along the D1268 from the R33 Road linking Keates Drift and Greytown (e.g. *Figures 6, 7, 9 & 11*). It also focused on smaller pipelines that distribute water into villages from the reservoirs and small JoJo Storage tanks (e.g. *Figures 3, 5, 8*). The second focus was along the R33 from Keates Drift to Greytown and the small distribution water pipelines into villages from the reservoirs and JoJo Storage tanks (*Figure 11*). The survey resulted in the identification of 19 sites within and along the pipeline and existing road servitudes (*Figure 13-30 – refer to figure 31 for sites distribution*). Out of the 19 sites identified, 14 sites were burial grounds and graves (*Figures 13, 14, 16 – 22, 26 - 28*). 3 sites were kraals (*Figures 23, 24, 26*), 1 old reservoir north of the R33 road and 1 historic farmstead ruins (*Figure 29*). There was also a Bhambatha memorial site along the R33 Road. All 19 sites were assessed in terms of the potential impact of the proposed development on them. The assessment excluded the Bhambatha memorial site which is outside of the project footprint and far from the proposed infrastructure (*Figure 12*). The Bhambatha memorial site is located along the R33 Road between Greytown and Keates Drift (*Figure 12*).

The assessment of potential impacts to the identified heritage resources resulted in various impact potentials. Not all sites have the potential to be impacted equally by the proposed development. This means not all sites will be negatively impacted by the proposed development. The impacts will vary from primary (directly impacted) and secondary impacts (indirectly impacted).

Out of the 19 sites, 7 sites will be highly negatively impacted by the project if not mitigated (*Table 5*).

*Table 5- Impact potential to the identified heritage sites*

Potential High Impact if not Mitigate	Mediums Impacts	Low Impacts
KDP 2	DDP 3	KDP 1
KDP 8	KDP 6	KDP 10
KDP 11	KDP 7	KDP 13
KDP 12	KDP 9	KDP 14
KDP 16		KDP 15
KDP 17		KDP 19
KDP 18		



We stress that the potential of impacts to sites will only be high if the proposed mitigation measures are not adopted and implemented. In the current development area some of the identified sites have already been affected by previous development activities. Therefore, such the impacts will be cumulative rather than primary.

This project has the potential to positively contribute to addressing the previous developer's mistakes by adopting and implementing the proposed project recommendations. To better manage the identified heritage resources; the first step will be to understand the context in which they exist. Secondly we considered specific statutes of the legislations that talk directly to the types of resources identified on site. The following statutes of the heritage laws are important and apply to the management of the identified heritage resources.

In terms of the NHRA, No. 25 of 1999 the followings sections of the Act are applicable in this project:

- Section 34 for structures/buildings
- Section 35 for the stone kraal
- Section 36 for the cemeteries and burial sites

In terms of the KZNHB, 21 February 2008 – the management of grave sites is under Chapter 8 of the KZNHB. Section 40 and 41 of this Bill is applicable for the management of the identified graves and cemeteries. In terms of the KZNHA, No. 10 of 1997 graves are managed under Section 26 (3 & 4).

The management of the stone kraal which is typically associated with archaeological resources will in this case be managed in accordance to Chapter 8 and Section 42 of the KZNHB. They are also managed in terms of Section 26 (6) of the KZNHA, No. 10 of 1997. Chapter 9 of the KZNHB will also assist to give guidance on the processes necessary in managing the heritage resources in terms of General Protection.

Out of the 19 sites that have been identified it has been found that most sites fall outside the proposed pipeline servitudes and associated water storage infrastructure. The water pipelines run parallel to the existing road servitudes, with minimum impact to the cultural environment features such as graves and kraals. The pipeline is a mostly 20mm pipeline between houses. Trenches of this size pipeline are very small and there is less probability of them impacting on graves or kraals. The old graves that stand a high probability of being impacted are those that are located along the bigger pipeline along the road to eMabovini from the R33. Along this road we noted surveyor marks in close proximity to graves; which showed intent to work near these graves. If that is the case, the project will result in high impacts and these may lead to disputes with the community and delays to the project. Community members informally consulted regarding graves in the area have expressed discomfort due to previous developments exhibiting little respect toward their cultural resources. This project



should therefore minimise such risks and strive to work together with communities on the preservation of the cultural resources

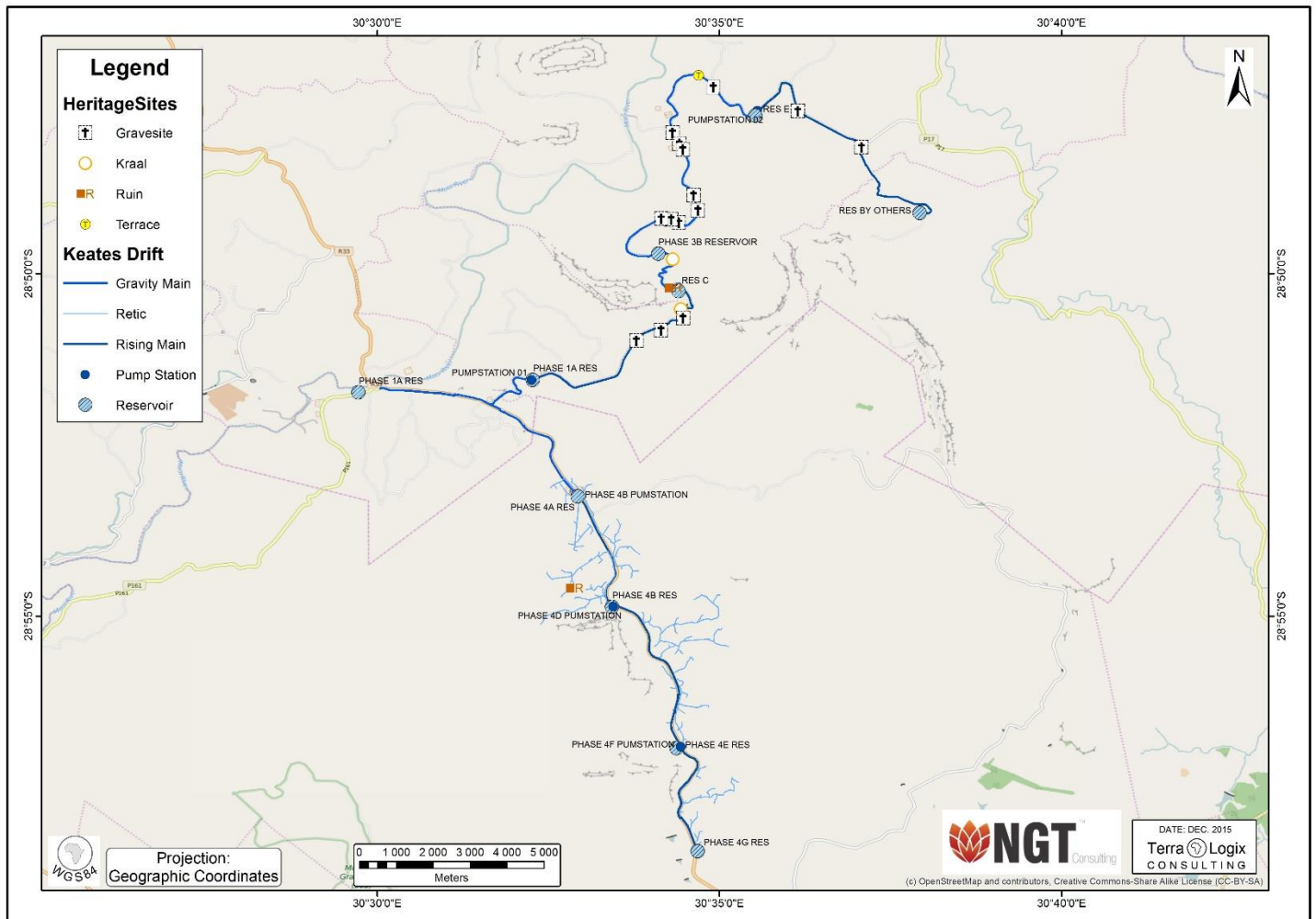


Figure 31- Heritage resources sites distribution map (Please note that the resources are not overlaying the pipeline, they are located near the pipelines and are mentioned here so that the developer should be away of them).

## 7. CONCLUSIONS

This is a Phase 1 HIA conducted in terms of the NHRA, No 25 of 1999 (for the protection, conservation and management of the National Estate), the KwaZulu-Natal Act, No. 10 of 1997 (at a provincial level), and the KwaZulu-Natal Heritage Bill of 21 February 2008. It does not include the implementation of the recommendations made for mitigation of heritage resources.

- It is concluded that the project will not have negative impacts on the identified heritage resources if the proposed project mitigation measures are implemented by the developer, such as complete avoidance of burial grounds and grave sites and treating them as No-Go-Areas.
- The project will also have a minimal impact in terms of the broader cultural fabric of the study area, because the proposed infrastructure traverses areas that have previously been disturbed. Most of the pipeline is planned along the existing road servitudes.
- It is our view that Amafa KwaZulu-Natali should issue the project a Positive Review Comment as it traverses areas that have already been disturbed.
- The type and size of proposed pipelines does not warrant grave relocation to make way for the development. Instead the pipeline should be deviated away from the graves and they should be monitored during the project construction phase.

## 8. RECOMMENDATIONS

Based on the above conclusions the following recommendation are made about actions that should be followed in order to mitigate potential impacts to identified heritage resources.

- We recommend that the developer should avoid all the identified graves and treat them as No-Go-Areas.
- It is recommended that the Environmental Assessment Practitioner (EAP) appoints an Environmental Control Officer (ECO) to monitor all graves that are located close to the proposed pipeline servitudes during the project construction phase.
- A buffer of approximately 5m should be kept between the graves and the pipeline trenches.
- That the graves should be taped off from construction activities and that the ECO should ensure that they are monitored at all times during the project construction phase to limit any potential impact on them.
- A cemetery management plan should be developed to guide the management of these graves during and post project construction phases. For post construction phase, the plan will inform the maintenance of the water pipelines.

It should be noted that some archaeological resources are subterranean in nature. These resources (including unmarked graves) can be disturbed and brought to the surface by project excavation activities. Heritage consultants refer to such resources as chance finds. It is recommended that the developer and the appointed

ECO should pay special attention to these resources during the construction phase of the project. In the case that such resources are unearthed and brought to the surface by the project construction activities, the project construction activities in and around the area in which such resources are found should stop and the ECO should consult an archaeologist and heritage consultant to immediately come to the site and investigate the finds and make necessary recommendations. Amafa aKwaZulu-Natali and the South African Police Services (in case of forensic bones) should also be informed of such finds.

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