

**LOMBARD'S KOP BULK WATER PIPELINE,
KWAZULU-NATAL**

FOR JEFFARES & GREEN

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INTRODUCTION

Umlando was contracted by Jeffares and Green to undertake a heritage survey for a bulk water pipeline from Umbulwane to Lombard's Kop, Ladysmith. The line is ~15km in length; however some of it is existing pipeline that might be replaced. The northern section of the line will be mostly a new line that goes to an existing reservoir at the base of Lombards Kop.

Figures 1 – 3 indicate the location of the proposed line.

Umlando cannot locate an HIA survey for the existing line, although the line was probably built some time ago.

The pipeline passes through hills with dolerite outcrops and through small and large flood plains. These outcrops tend to be favoured areas for Late Iron Age, Historical Period settlements, and this has continued to the present. These hills tend to have many stone walled settlements dating to the last 100 years. Moreover, the Siege of Ladysmith resulted in most of the hills around Ladysmith being occupied by Boer and British Forces, and thus their fortifications and adaptations to existing structures also occur. The pipeline crosses the Klip River and its flood plain. While this was an almost no-man's land during the Siege of Ladysmith, it was the location of Intombi Camp, and the pipeline route passes through this historical site.

The survey did not locate any red flags, and would require some minor readjustments to the final routing in certain areas.

FIG. 1 GENERAL LOCATION OF THE STUDY AREA

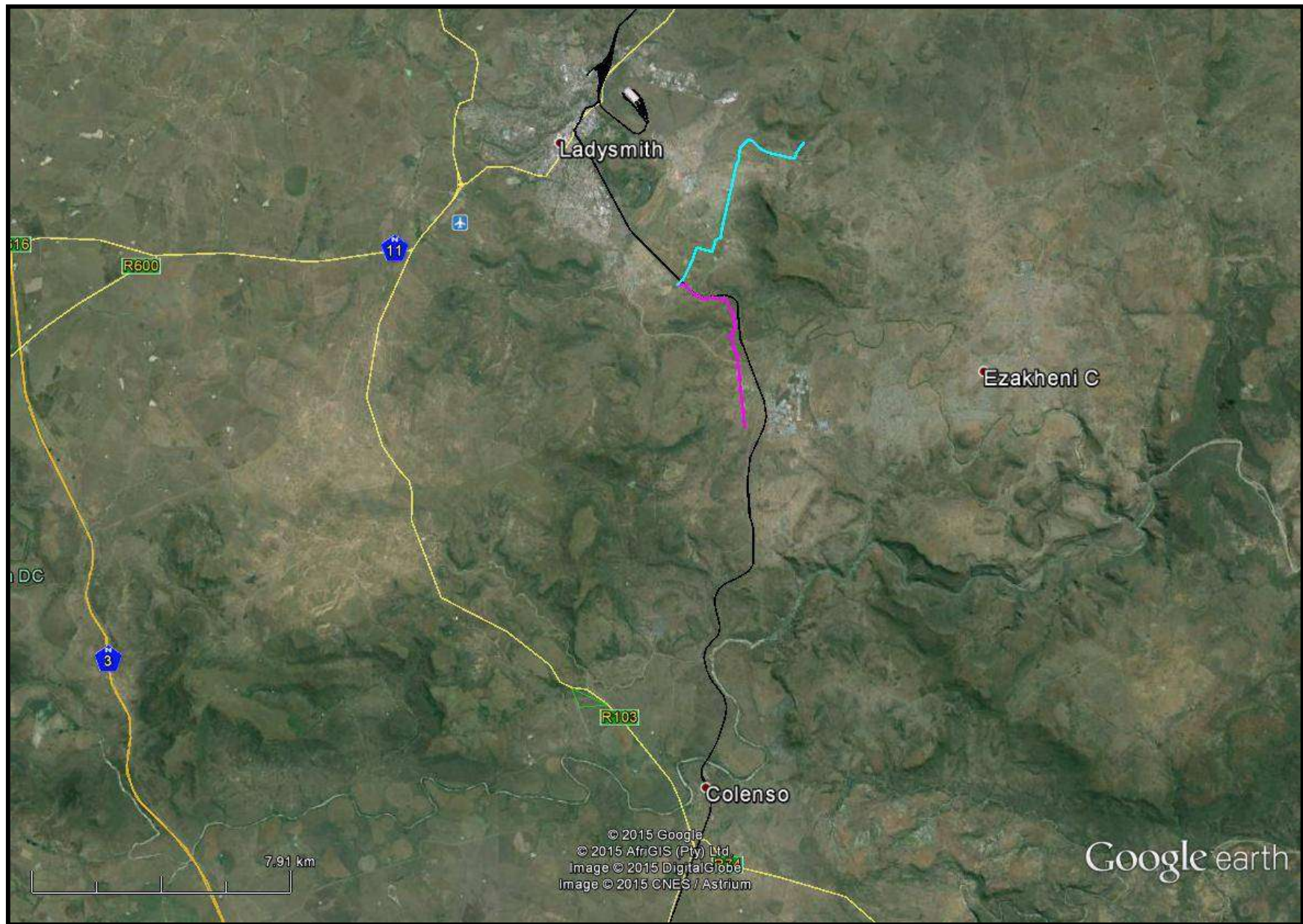
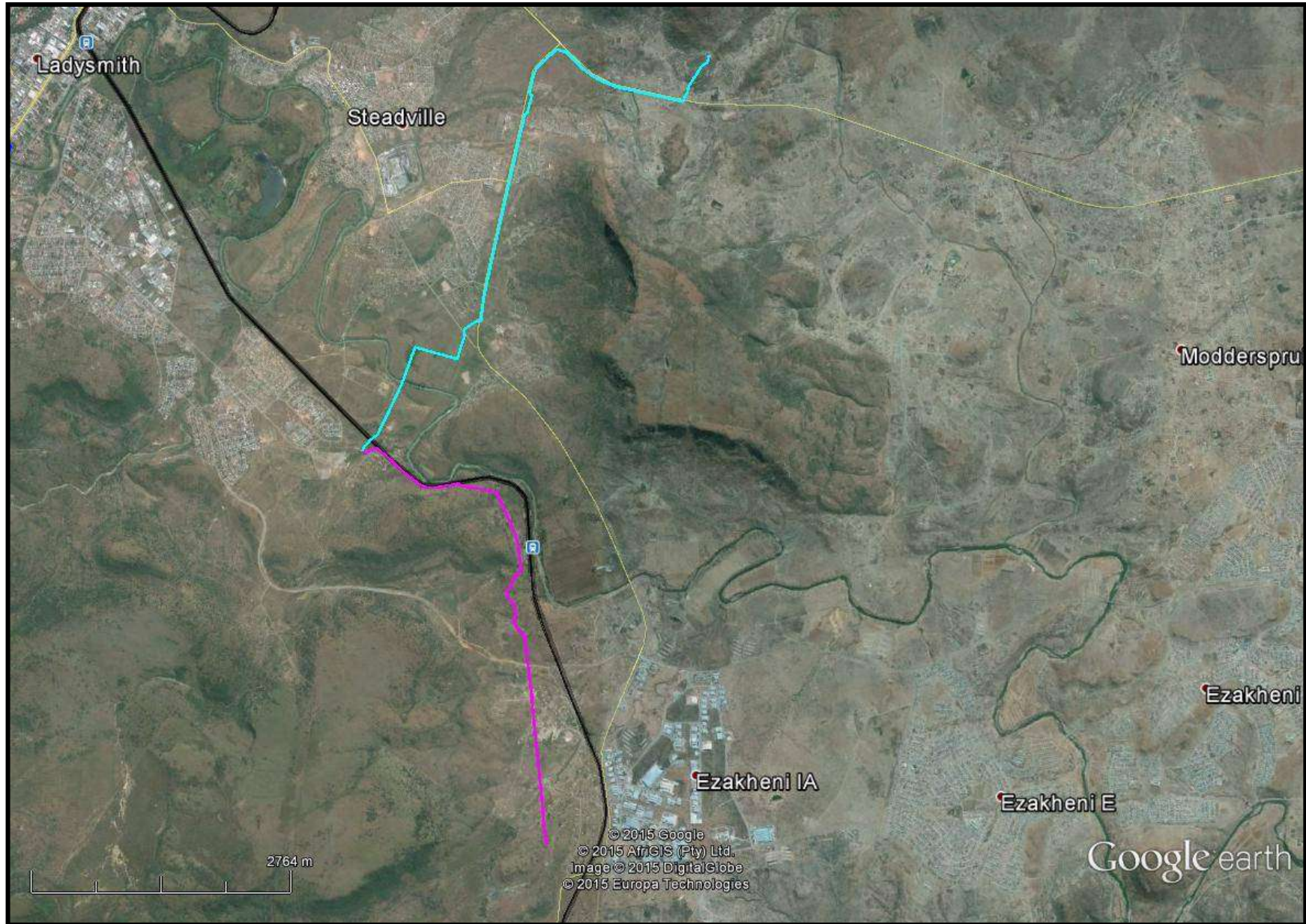
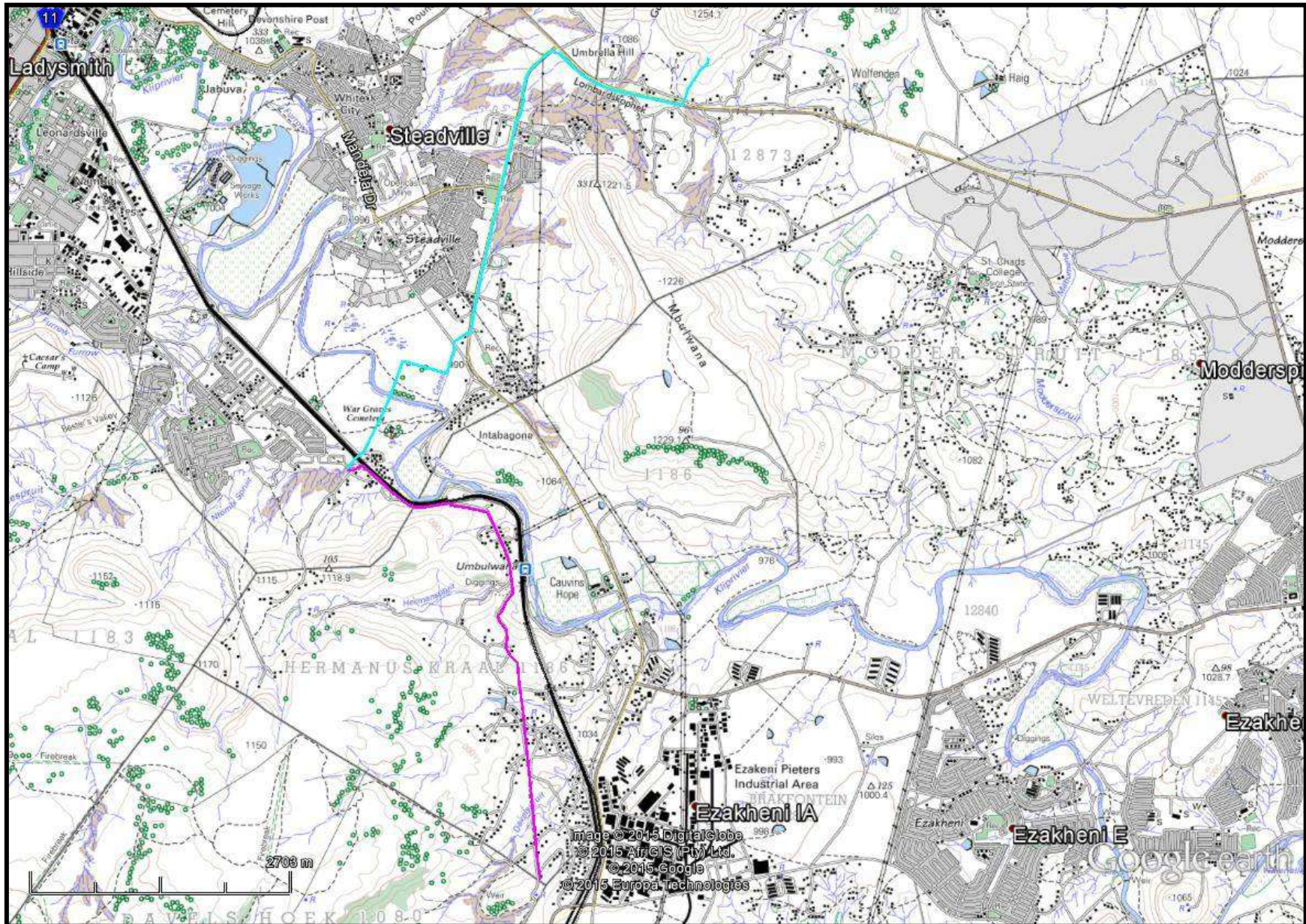


FIG. 2: AERIAL OVERVIEW OF THE STUDY AREA¹



¹ Purple = existing line; turquoise = new line

FIG. 3: TOPOGRAPHICAL OVERVIEW OF THE STUDY AREA



KWAZULU-NATAL HERITAGE ACT NO. 4 OF 2008

“General protection: Structures.—

- No structure which is, or which may reasonably be expected to be older than 60 years, may be demolished, altered or added to without the prior written approval of the Council having been obtained on written application to the Council.
- Where the Council does not grant approval, the Council must consider special protection in terms of sections 38, 39, 40, 41 and 43 of Chapter 9.
- The Council may, by notice in the *Gazette*, exempt—
- A defined geographical area; or
- defined categories of sites within a defined geographical area, from the provisions of subsection where the Council is satisfied that heritage resources falling in the defined geographical area or category have been identified and are adequately protected in terms of sections 38, 39, 40, 41 and 43 of Chapter 9.
- A notice referred to in subsection (2) may, by notice in the *Gazette*, be amended or withdrawn by the Council.

General protection: Graves of victims of conflict.—No person may damage, alter, exhume, or remove from its original position—

- the grave of a victim of conflict;
- a cemetery made up of such graves; or
- any part of a cemetery containing such graves, without the prior written approval of the Council having been obtained on written application to the Council.
- General protection: Traditional burial places.—
- No grave—
- not otherwise protected by this Act; and
- not located in a formal cemetery managed or administered by a local authority, may be damaged, altered, exhumed, removed from its original position, or otherwise disturbed without the prior written approval of the Council having been obtained on written application to the Council.

The Council may only issue written approval once the Council is satisfied that—

- the applicant has made a concerted effort to consult with communities and individuals who by tradition may have an interest in the grave; and
- the applicant and the relevant communities or individuals have reached agreement regarding the grave.

General protection: Battlefield sites, archaeological sites, rock art sites, palaeontological sites, historic fortifications, meteorite or meteorite impact sites.—

- No person may destroy, damage, excavate, alter, write or draw upon, or otherwise disturb any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Council having been obtained on written application to the Council.
- Upon discovery of archaeological or palaeontological material or a meteorite by any person, all activity or operations in the general vicinity of such material or meteorite must cease forthwith and a person who made the discovery must submit a written report to the Council without delay.
- The Council may, after consultation with an owner or controlling authority, by way of written notice served on the owner or controlling authority, prohibit any activity considered by the Council to be inappropriate within 50 metres of a rock art site.
- No person may exhume, remove from its original position or otherwise disturb, damage, destroy, own or collect any object or material associated with any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Council having been obtained on written application to the Council.
- No person may bring any equipment which assists in the detection of metals and archaeological and palaeontological objects and material, or excavation equipment onto any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, or meteorite impact site, or use similar detection or excavation equipment for the recovery of

- meteorites, without the prior written approval of the Council having been obtained on written application to the Council.
- The ownership of any object or material associated with any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site, on discovery, vest in the Provincial Government and the Council is regarded as the custodian on behalf of the Provincial Government.” (KZN Heritage Act of 2008)

METHOD

The method for Heritage assessment consists of several steps.

The first step forms part of the desktop assessment. Here we would consult the database that has been collated by Umlando. These databases contains archaeological site locations and basic information from several provinces (information from Umlando surveys and some colleagues), most of the national and provincial monuments and battlefields in Southern Africa (<http://www.vuvuzela.com/googleearth/monuments.html>) and cemeteries in southern Africa (information supplied by the Genealogical Society of Southern Africa). We use 1st and 2nd edition 1:50 000 topographical and 1937 aerial photographs where available, to assist in general location and dating of buildings and/or graves. The database is in Google Earth format and thus used as a quick reference when undertaking desktop studies. Where required we would consult with a local data recording centre, however these tend to be fragmented between different institutions and areas and thus difficult to access at times. We also consult with an historical architect, palaeontologist, and an historian where necessary.

The survey results will define the significance of each recorded site, as well as a management plan.

All sites are grouped according to low, medium, and high significance for the purpose of this report. Sites of low significance have no diagnostic artefacts or features. Sites of medium significance have diagnostic artefacts or features and these sites tend to be sampled. Sampling includes the collection of artefacts for future analysis. All diagnostic pottery, such as rims, lips, and decorated sherds are sampled, while bone, stone, and shell are mostly noted. Sampling usually occurs on most sites. Sites of high significance are excavated and/or extensively sampled. Those sites that are extensively sampled have high research potential, yet poor preservation of features.

Defining significance

Heritage sites vary according to significance and several different criteria relate to each type of site. However, there are several criteria that allow for a general significance rating of archaeological sites.

These criteria are:

1. State of preservation of:

- 1.1. Organic remains:
 - 1.1.1. Faunal
 - 1.1.2. Botanical
- 1.2. Rock art
- 1.3. Walling
- 1.4. Presence of a cultural deposit
- 1.5. Features:
 - 1.5.1. Ash Features
 - 1.5.2. Graves
 - 1.5.3. Middens
 - 1.5.4. Cattle byres
 - 1.5.5. Bedding and ash complexes

2. Spatial arrangements:

- 2.1. Internal housing arrangements
- 2.2. Intra-site settlement patterns

2.3. Inter-site settlement patterns

3. Features of the site:

3.1. Are there any unusual, unique or rare artefacts or images at the site?

3.2. Is it a type site?

3.3. Does the site have a very good example of a specific time period, feature, or artefact?

4. Research:

4.1. Providing information on current research projects

4.2. Salvaging information for potential future research projects

5. Inter- and intra-site variability

5.1. Can this particular site yield information regarding intra-site variability, i.e. spatial relationships between various features and artefacts?

5.2. Can this particular site yield information about a community's social relationships within itself, or between other communities?

6. Archaeological Experience:

6.1. The personal experience and expertise of the CRM practitioner should not be ignored. Experience can indicate sites that have potentially significant aspects, but need to be tested prior to any conclusions.

7. Educational:

7.1. Does the site have the potential to be used as an educational instrument?

7.2. Does the site have the potential to become a tourist attraction?

7.3. The educational value of a site can only be fully determined after initial test-pit excavations and/or full excavations.

8. Other Heritage Significance:

8.1. Palaeontological sites

8.2. Historical buildings

8.3. Battlefields and general Anglo-Zulu and Anglo-Boer sites

8.4. Graves and/or community cemeteries

8.5. Living Heritage Sites

8.6. Cultural Landscapes, that includes old trees, hills, mountains, rivers, etc related to cultural or historical experiences.

The more a site can fulfill the above criteria, the more significant it becomes. Test-pit excavations are used to test the full potential of an archaeological deposit. This occurs in Phase 2. These test-pit excavations may require further excavations if the site is of significance (Phase 3). Sites may also be mapped and/or have artefacts sampled as a form of mitigation. Sampling normally occurs when the artefacts may be good examples of their type, but are not in a primary archaeological context. Mapping records the spatial relationship between features and artefacts.

Each site is given a SAHRA rating according to its significance. This is summarised in Table 1.

TABLE 1: SAHRA GRADINGS FOR HERITAGE SITES

SITE SIGNIFICANCE	FIELD RATING	GRADE	RECOMMENDED MITIGATION
High Significance	National Significance	Grade 1	Site conservation / Site development
High Significance	Provincial Significance	Grade 2	Site conservation / Site development
High Significance	Local Significance	Grade 3A - C	
High / Medium Significance	Generally Protected A	3A	Site conservation or mitigation prior to development / destruction
Medium Significance	Generally Protected B	3B	Site conservation or mitigation / test excavation / systematic sampling / monitoring prior to or during development / destruction
Low Significance	Generally Protected C	3C	On-site sampling monitoring or no archaeological mitigation required prior to or during development / destruction

RESULTS

DESKTOP STUDY

The desktop study consisted of analysing various maps for evidence of prior habitation in the study area, as well as for previous archaeological surveys. The archaeological database indicates that there are archaeological sites in the

general area (fig. 4). These sites include all types of Stone Age and Iron Age sites. A few sites occur near the study area. These sites tend to be historical sites and/or related to the 2nd Anglo-Boer War (2ABW). In one area, the pipeline goes through, or very near Intombi Camp, specifically 100m from the existing memorial. The existing water reservoir at Lombard's Kop was placed on Boer positions during the Siege of Ladysmith, albeit temporary positions.

The area around Hermanspruit is the location of the German Troops and Utrecht Commandos during the Siege of Ladysmith. The late Mr Gilbert Torlage undertook an historical survey for Umlando in 2011 for Hermanspruit, and I quote extensively from his report: "From information gathered about the site near Ladysmith the most significant historical events relate to the South African War (Second Anglo-Boer War 1899 – 1902) and in particular to the Siege of Ladysmith from 2 November 1899 to 28 February 1900".

After the Boers had rebuffed the British on 30 October 1899 they then set about to fully encircle the town of Ladysmith which was occupied by a British force numbering approximately 13 745 men and several civilians. Boer forces during 2 and 3 November 1899 took up positions around the town to besiege it and all those who were within it.

As a result, the Utrecht Commando of the Zuid Afrikaansche Republiek (Transvaal) forces occupied the ridge lying immediately to the north of the Hermanspruit just west of where it flows into the Klip River. They formed an almost continuous siege line around Ladysmith. Immediately south of them and south of the Hermanspruit on the next ridge were stationed the Pretoria German Corps under command of Acting Commandant Paul Krantz.



Germans with the Boers around Ladysmith in November 1899.

From there they were in a position to carry out a supporting role to the Utrecht Commando. They were also able to control the Hermanspruit valley to both west and east and they had a view into the Klip River valley and could cover the plains to the south of the town from whence a relieving force moving in from Colenso and the Tugela (Thukela) River may advance.

From historic maps published in 1910 (see Amery & Maurice) it is evident that it is highly possible that the Utrecht Commando encampment was placed on or near the terrain that is envisaged for development. Also located in the vicinity were the German Corps positions and camp as well as an artillery gun. In the valley just to the east of the quarry site was the Vryheid Commando camp

Early in November 1899 because of negotiations between the British and Boer, commanding officers in and around Ladysmith the British established a neutral camp, the Intombi Camp in which British civilians and recuperating British soldiers were accommodated. This camp was situated a mere one kilometre from the Utrecht Commando lines. The presence of this camp in this area would have meant that the Utrecht Commando would have had to be especially vigilant, and with it also the German Corps who were in support of them.



Intombi Camp. Note how close it is to the encircling hills around the town occupied by besieging Boers.

In early February 1900 the Boers set in motion a plan to flood the town of Ladysmith by damming the Klip River at a position approximately 1.5 kilometres north-east of the German Corps' position. There is some evidence that it may have been the German Commandant Paul Krantz who designed the dam. Although there is also conflicting evidence which challenges this conclusion. The dam was never completed as Ladysmith was relieved before the Boer plan could be completed" (Torlage 2011:46 - 50, in Anderson 2011).

Much of the pipeline thus passes through 2ABW areas; however, it appears that the at least half of the line has already been built, and will now be replaced, and thus the initial damage has already been undertaken.

The 1940 aerial photographs indicate that there are ten human settlements near the line and one area of walling. This is shown in fig. 5 and Table 2. The 1953 topographical map indicates that there are fewer settlements along the line route, and these are in new places. The walling from 1937 appears to have disappeared and new walling is noted near Hermanspruit. This is shown in fig. 6 and Table 2.

TABLE 2: LOCATION OF SITES NOTED IN THE DESKTOP STUDY

NAME	LATITUDE	LONGITUDE	DESCRIPTION
Ah1	-28.561852510	29.855527420	Settlement 1937
ah10	-28.621796405	29.835661560	Settlement 1937
ah11	-28.623917872	29.837158905	Settlement 1937
ah12	-28.626679685	29.837352304	Settlement 1937
Ah2	-28.562269418	29.855280109	Settlement 1937
AH3	-28.591133836	29.822427168	Settlement 1937
ah4	-28.590002685	29.822267385	Settlement 1937
ah5	-28.591284829	29.822609902	Settlement 1937
ah6	-28.598025878	29.818223619	Settlement 1937
ah7	-28.618648448	29.835413643	Settlement 1937
ah8	-28.616084825	29.834566482	Settlement 1937
ah9	-28.620586611	29.836078577	Settlement 1937
AW1	-28.560136898	29.858011618	Walling 1937
bh6	-28.599322396	29.817570011	Settlement 1953
Bh1	-28.620303569	29.835453112	Settlement 1953
bH2	-28.616217423	29.834803014	Settlement 1953
bH3	-28.599910011	29.821566539	Settlement 1953
bH4	-28.599245689	29.820633739	Settlement 1953
bH5	-28.599752013	29.819968294	Settlement 1953
bH7	-28.598113788	29.819122658	Settlement 1953
bW1	-28.614425375	29.834552126	Walling 1953
HER03	-28.611513	29.835451	Graves
HER03	-28.611556	29.835143	Graves
HER03	-28.611811	29.834916	Graves
HER06	-28.61204	29.833977	2ABW walling?
HER08	-28.613721	29.832636	Western edge of stone walling
740	-28.610739	29.835175	2ABW walling

A 50m radius should be placed around these points and they should be marked as sensitive. Human settlements may yield graves. No walling may be damaged without permission from the archaeologist and/or Amafa KZN.

FIG. 5: LOCATION OF SITES IN 1940

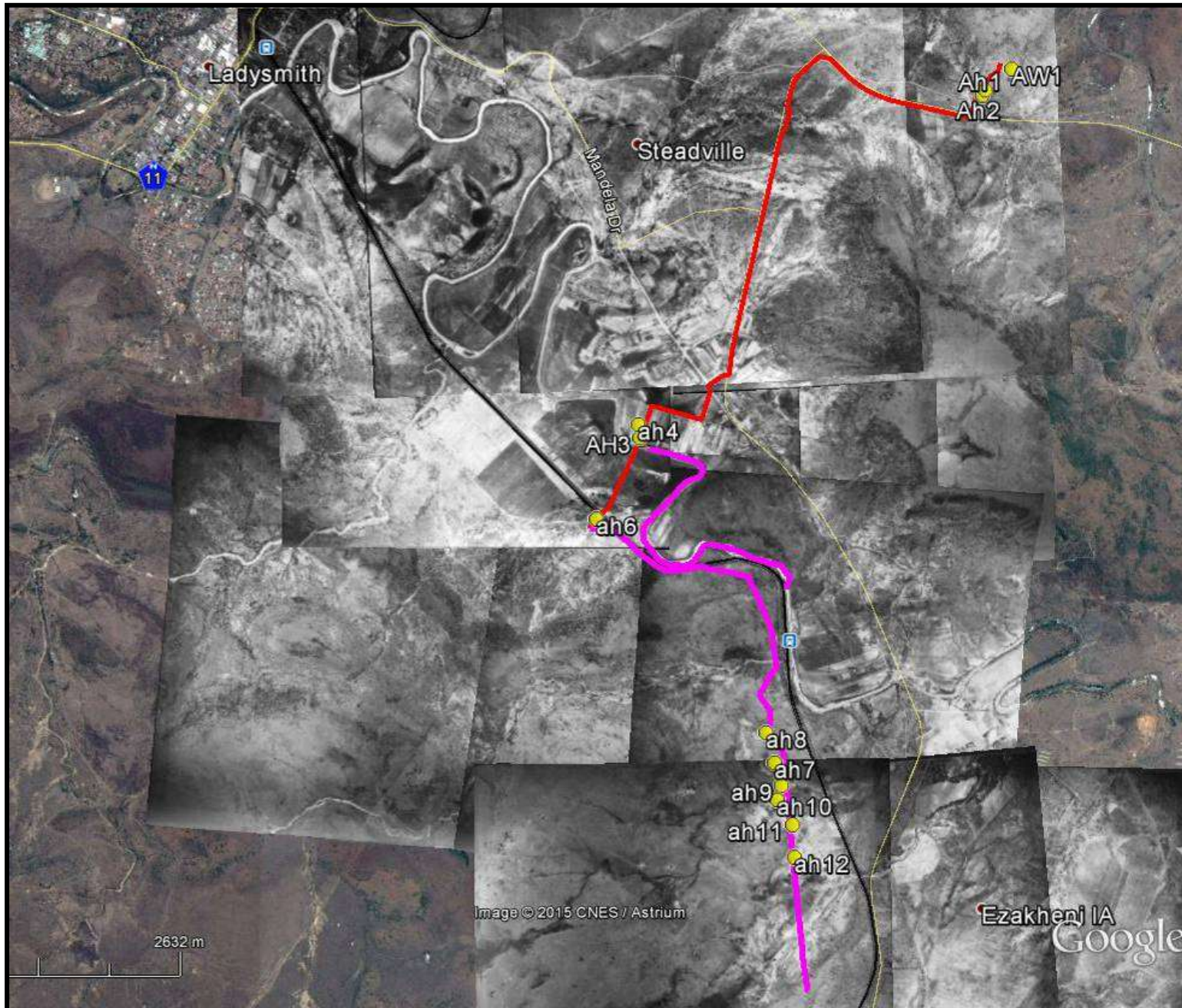
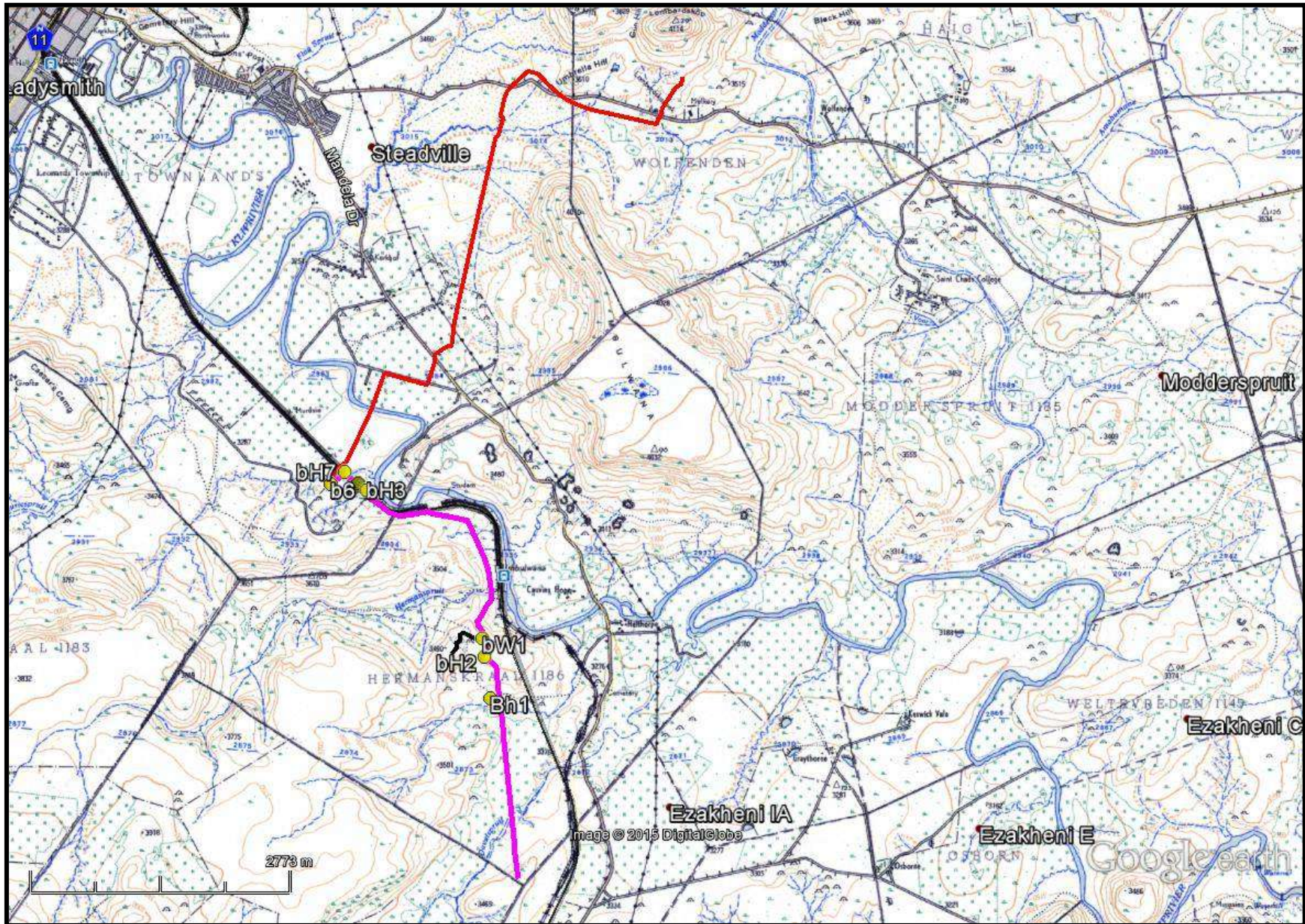


FIG. 6: LOCATION OF SITES IN 1953



FIELD SURVEY

The field survey was undertaken in April 2015. Both the existing and proposed new line was surveyed. The new line follows the road reserve for about 5km, and this area had been severely disturbed by previous developments. The flood plains of the Klip River were grassed resulting in poor visibility. This area has been under cultivation for nearly 100 years, if not more, and it is unlikely to yield and built structures. Those features noted on the 1940 aerial map are no longer visible. Fig. 7 shows some of these areas. Fig. 8 shows the recorded sites.

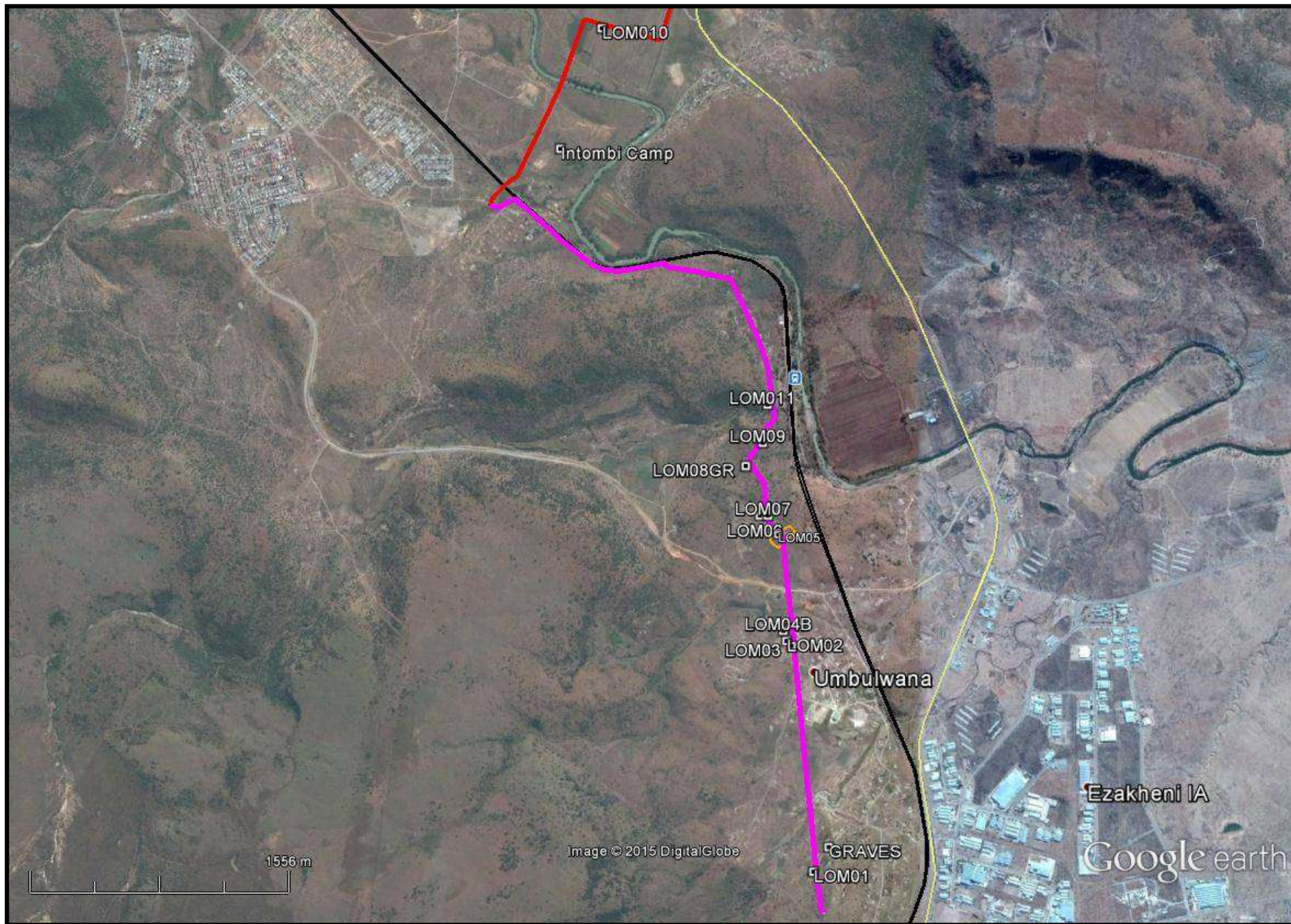
FIG. 7: SCENIC VIEWS OF SOME OF THE LINE



TABLE 3: LOCATION AND SUMMARY OF RECORDED SITES

NAME	LATITUDE	LONGITUDE	DESCRIPTION	SIGNIFICANCE
GRAVES	-28.634289000	29.839068000	Modern graves	High
Intombi Camp	-28.595570545	29.822105364	2ABW Camp and graves	High
LOM01	-28.635599000	29.838084000	Stone walling	Low
LOM010	-28.588986248	29.825395499	Trees and small holding	Low-medium
LOM011	-28.609779000	29.835232000	Stone walling	Low
LOM02	-28.622875000	29.836410000	Graves	High
LOM03	-28.623154000	29.836732000	Grave	High
LOM04	-28.622186000	29.836232000	Grave	High
LOM04B	-28.622309000	29.836206000	Grave	High
LOM05a	-28.617106000	29.835960000	Cemetery point	High
LOM05b	-28.617122000	29.835960000	Cemetery point	High
LOM05c	-28.616929000	29.835729000	Cemetery point	High
LOM05d	-28.616847000	29.835698000	Cemetery point	High
LOM05e	-28.616929000	29.835900000	Cemetery point	High
LOM05f	-28.616970000	29.835914000	Cemetery point	High
LOM06	-28.615914000	29.834696000	Graves	High
LOM07	-28.615918000	29.835209000	Walling	High
LOM07	-28.615118000	29.835071000	Walling	High
END				
LOM07GR1	-28.615777000	29.834974000	Graves	High
LOM07GR2	-28.615673000	29.834995000	Grave	High
LOM08GR	-28.613189000	29.833819000	Grave	High
LOM08GR2	-28.613010000	29.833712000	Grave	High
LOM08GR4	-28.612983000	29.833629000	Grave	High
LOM08GR6	-28.612876000	29.833553000	Grave	High
LOM09 edge	-28.611900911	29.834908198	Graves	High

FIG. 8: LOCATION OF RECORDED SITES²



² No sites occur to the north

LOM01

LOM01 is located at the base of a hill where the southern reservoir is located, south of Umbulwana. The site consists of two circular stone walled enclosures (fig. 9). The smallest enclosure is ~5m in diameter and is attached to a primary enclosure that has been bisected by the pipeline. The damage occurs on the eastern side of the wall. An old maize lower grinding stone occurs near the walling and graves that are more recent occur in and amongst the existing settlements.

Significance: The site is of low significance.

Mitigation: No further mitigation is required; however, graves are known to occur in some cattle byres.

SAHRA Rating: 3C

FIG. 9: PRIMARY & SECONDARY WALLING AT LOM01



LOM02

LOM02 occurs south of a small stream. The site consists of an abandoned house and a much older grave (fig 10). The grave occurs ~35m east of the existing line centre point. The grave is in an east-west orientation.

Significance: The grave is of high significance

Mitigation: A 20m buffer is required between the edge of the grave and the edge of the pipeline footprint. The grave needs to be clearly demarcated before construction begins.

SAHRA Rating: 3A

FIG. 10: GRAVE AT LOM02



LOM03

LOM03 are two graves located near the road. They appear to be recent (i.e. last 20 years) in age, but are not associated with a specific house. The graves are two raised stone cairns and in an east-west orientation (fig. 11). The graves are located ~10m from the existing pipeline.

Significance: The graves are of high significance

Mitigation: A 20m buffer is required between the edge of the grave and the edge of the pipeline footprint. The grave needs to be clearly demarcated before construction begins.

SAHRA Rating: 3A

FIG. 11: GRAVES AT LOM03



LOM04

LOM04 is located to the north LOM01 – 03. The site consists of a recently abandoned homestead and three graves. Two graves are fenced together and in a northwest-southeast orientation while the individual grave is in an east-west orientation (fig. 12). The graves are ~45m from the line.

Significance: The graves are of high significance

Mitigation: A 20m buffer is required between the edge of the grave and the edge of the pipeline footprint. The grave needs to be clearly demarcated before construction begins.

SAHRA Rating: 3A

FIG. 12: GRAVES AT LOM04



LOM05

LOM05 occurs at the top of a hill and along its edge. The site is a large cemetery that extends for ~150m x 100m in size. The existing pipeline occurs in the southwestern quarter of the cemetery (fig. 13). There is no record that I know of, if any graves were disturbed during the construction of the pipeline. It is of concern in that there are existing graves within the pipeline footprint (fig. 14). The cemetery appears to have been used for several decades. The graves are mostly in an east-west orientation.

Significance: The graves are of high significance

Mitigation: The pipeline poses a conundrum. It has already been excavated, and if it requires upgrading it will need to adhere to new or refined legislation. The legislation requires a 20m buffer between a development and a grave. For this site, the pipeline will not be able to be repaired or upgraded, and thus some form of exemption is required

The previous pipeline has already affected the cemetery. I suggest that if this area must be upgraded then a corridor/footprint is made that only occurs on the existing excavation trench with a meter on each side. The excavations would either need to be undertaken manually, or with smaller excavation equipment. The chances of damaging other graves in the cemetery are high as can be seen in fig. 14. The construction team must also note that graves may slump after burial, and thus are the remains are not always directly below the cairn.

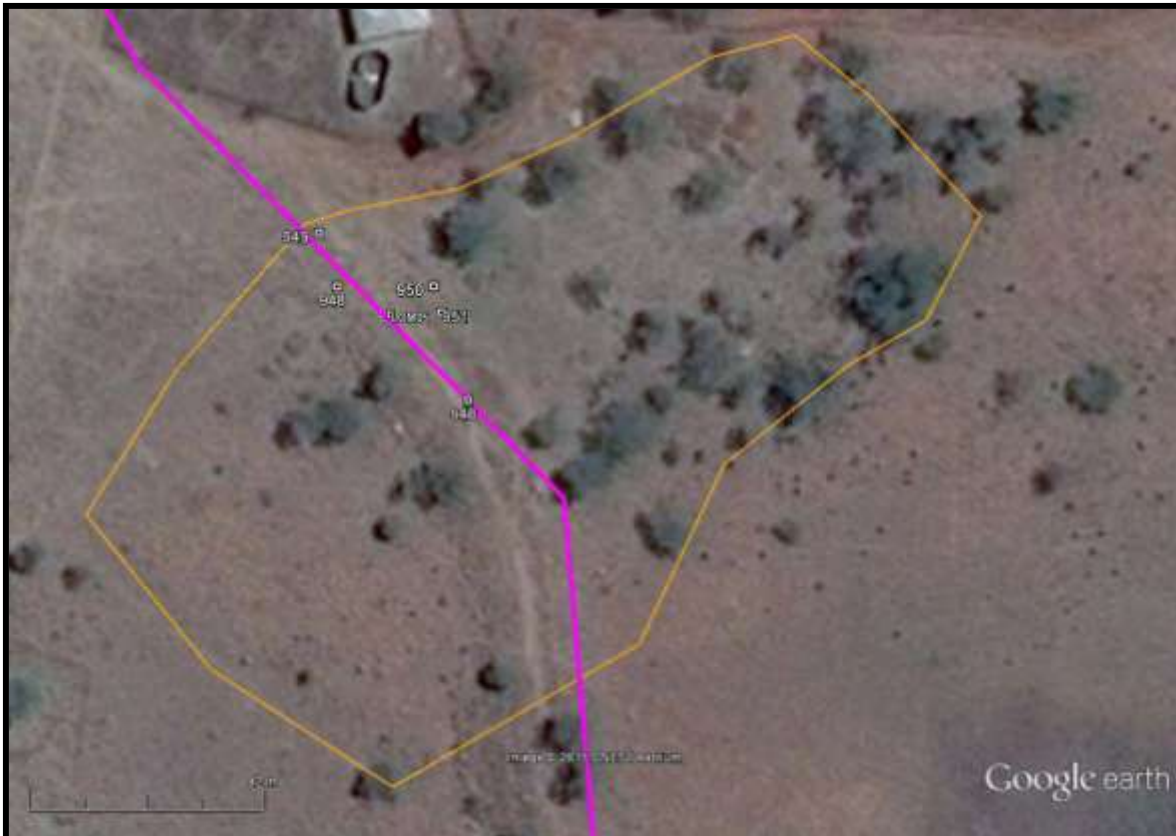
I also suggest that the community living in this area are consulted regarding these graves.

SAHRA Rating: 3A

FIG. 13: EXISTING PIPELINE THROUGH A CEMETERY AT LOM05



FIG. 14: LOCATION OF GRAVES NEAR THE PIPELINE



LOM06

LOM06 occurs at the top of the hill near the existing pipeline. The site consists of at least five human graves at the corner of two tracks and a property (fig. 15). The graves are in an east-west orientation and vary in age. The graves occur ~30m from the existing pipeline.

Significance The graves are of high significance

Mitigation: A 20m buffer is required between the edge of the grave and the edge of the pipeline footprint. The grave needs to be clearly demarcated before construction begins.

SAHRA Rating: 3A

FIG. 15: GRAVES AT LOM06



LOM07

LOM07 is a large settlement that probably consists of several settlements over time. The site consists of several stonewalls of which the main wall forms a kraal. There are five to six graves on the eastern side of the site, and possible two graves in the main kraal (fig. 16). The map has the existing pipe just touching these walls, however, in the field the pipeline is on the opposite side of the dirt road.

Significance: The graves are of high significance

Mitigation: A 20m buffer is required between the edge of the grave and the edge of the pipeline footprint. The grave needs to be clearly demarcated before construction begins. The walling should not be affected.

SAHRA Rating: 3A

FIG. 16: GRAVES AT LOM07



LOM08

LOM08 is an extensive LIA stone walled settlement, and some of it might link up with HER08 (see desktop study). The site consists of many primary and secondary stonewalls along the eastern ridge of the hill (fig. 17). The site is more visible, as a road has been recently cleared where previously there was just a small road/servitude (from our original survey). Amongst the stone walled enclosures are 4 – 5 graves probably relating to the stone walled settlements. At the top of the hill is HER06, HER07 and HER08, and these are sites linked to the Utrecht Commando and German Forces mentioned above. There are more 2ABW features to the west but they occur outside of the footprint.

HER06 is an area that appears to have walling and/or a cleared floor. The vegetation was too thick to photograph and properly assess the site. HER07 is an area that appears to have walling and/or a cleared floor. The vegetation was too thick to photograph and properly assess the site. HER08 is a unique site in that it appears to originally date to the Late Iron Age, and has then been subsequently rebuilt, modified and extended for the last 500 years. It extends for ~100m x 100m. The site consists of a multiple series of stone walled circles. Some of these circles have aged, or patinated, rocks, while the more recent ones have little patination. There are at least four graves associated with the various walls.

Significance: 3B

Mitigation: The walling and graves should not be disturbed, as there is already an existing line. If the line is upgraded, the excavation plans and methods will need to be cleared by an archaeologist and/or Amafa KZN. The excavation will need to place the excavated soil on the eastern side of the road and leave the western side clear. No further intrusion into the hillside may occur as the walling is, in some places, within 3m of the existing pipeline.

SAHRA Rating: 3A for graves, 2B for 2ABW walling

FIG. 17: STONE WALLING AT LOM08 AND HER07 (BOTTOM LEFT)



LOM09

LOM09 occurs just below the existing dirt road. It was recorded as HER03 in the previous survey. HER03 is located on the northern side of the one road to the site. The site dates between 1954 and 2000, according to the maps and graves (fig. 18). Parts of HER03 may also post-date 1937; however, the aerial photograph is not very clear. The site consist of 40+ human graves, stonewalls for cattle kraals and house foundations. It is unlikely that the current community living above this site are related to this site, as the former have graves in the area, with more recent dates. The pipeline is unlikely to affect the cemetery.

Significance: The site is of high significance

Mitigation: No mitigation is currently required.

SAHRA Rating: 3A

FIG. 18: CEMETERY AT LOM09



LOM010

LOM010 is located on the flood plains of the Klip River on the opposite side of Intombi Camp. The site consists of blue gum trees and apparent smallholdings that predate the 1940s (fig. 19). Buildings are shown on the 1953 topographical map, but nothing is visible today. The trees are already established in the 1940 map, but do not occur in the 1899 photos (see Watt 1982). They thus have historical and environmental value and should not be damaged. The smallholdings could have late 19th century and early 20th century middens that would be of historical value.

Significance: The area is of medium significance in that it may yield useable information.

Mitigation: The excavations from the banks of the Klip River to the trees should be monitored for potential historical middens by a qualified archaeologist. On site, sampling and/or excavations may need to occur.

SAHRA Rating: 3B

INTOMBI CAMP

“By an agreement between Sir George White and General Joubert, the British in Ladysmith decided to establish a neutral camp about 5 km from the town, towards the south-east, and bounded by the Klip River and the Intombi Spruit. Work was begun on Sunday, 5 November 1899, tents were brought for a 300-bed hospital, and by 18h00 the first wounded were accommodated. The hospital consisted of 100 beds of the No 12 hospital, 50 beds from the No 26 Indian Field Hospital and 80 beds of No 1 Natal Volunteer Field Hospital. In all, there were 215 medical personnel. In addition about 1 200 civilians were accommodated in a camp separated by the railway from the military. After about a week's hard work, the hospital personnel settled down into comparative comfort; all the nursing sisters had arrived, the trenches had been dug around the tents, the water brought from the Klip River in the town was purified for drinking purposes,

sanitation was carefully organised, a gang of washermen was collected, and a bakery was established” (Watt 1982)

Intombi Camp would have covered an extensive area, but now only the cemetery remains while the rest is being encroached upon by informal settlements to the southwest and municipal infrastructure to the west. There is an existing pipeline running through the camp as well. While not part of the scope of this report, Amafa KZN should inspect these developments in relation to Intombi Camp.

Significance: The camp should be of high significance and not only the memorials. The convalescence camp was an important aspect to the Siege of Ladysmith and the artefacts left behind would be of historical value.

Mitigation: A qualified archaeologist should monitor any trenching and if there is a new line then it should be surveyed with a metal detector and/or excavated by test pit excavations.

SAHRA Rating: 2A

LOM011

LOM011 is located at the base of a hill near Umbulwana Station. The site consists of three small circular stone structures (fig. 20). They are ~3m in diameter. The pipeline occurs ~50m to the east of the walls.

Significance: The site is of low significance:

Mitigation: No mitigation is required, as they are not affected:

SAHRA Rating: 3C

FIG. 19: TREES AND HISTORICAL MAP OF LOM010



FIG. 20: INTOMBI CAMP CEMETERY



FIG 21: STONE WALLING AT LOM011



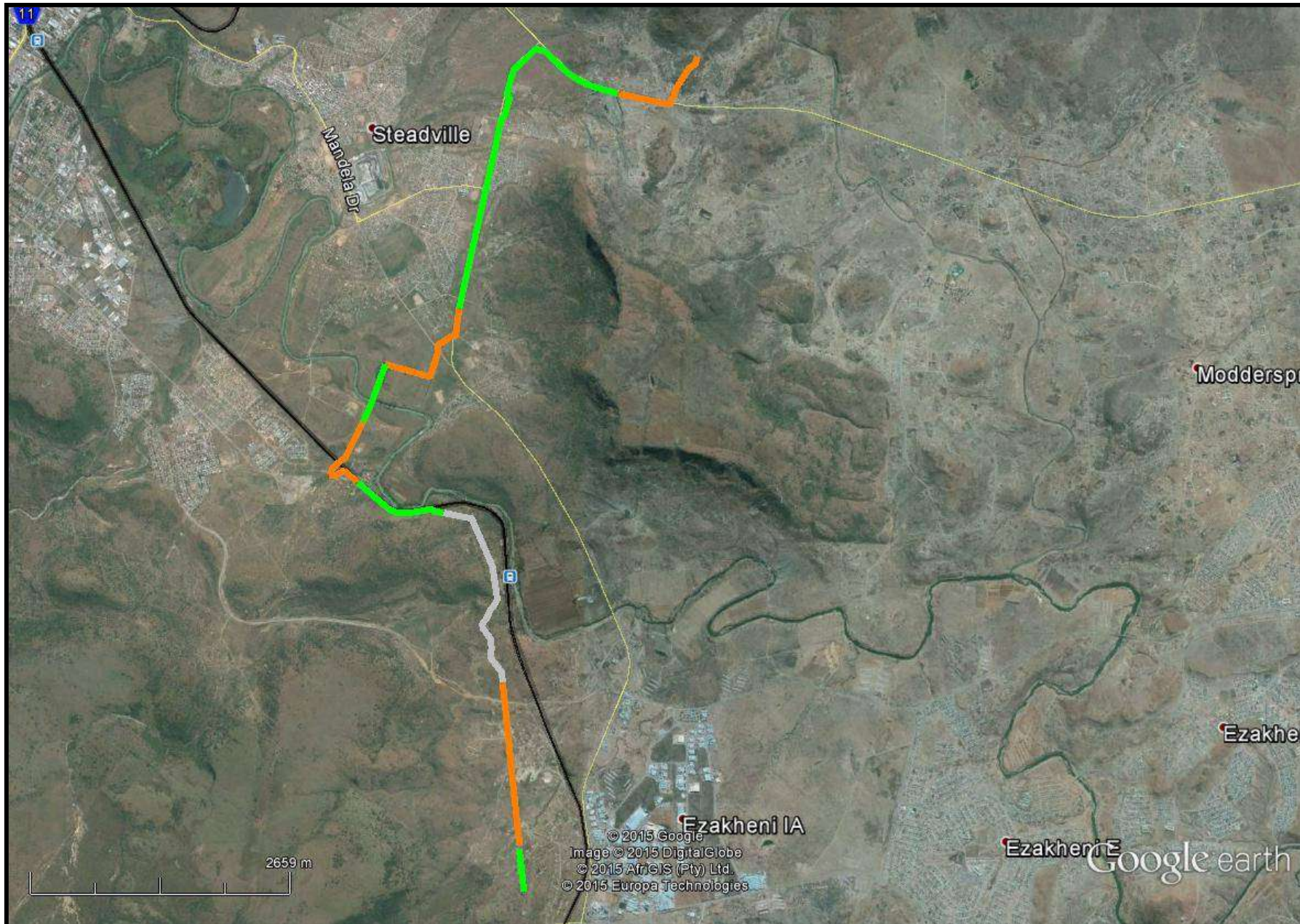
PALAEONTOLOGICAL IMPACT ASSESSMENT

A desktop survey was undertaken by Dr. G. Groenewald (Appendix C). The palaeontological sensitivity for the line is mostly of high to moderate palaeontological sensitivity. There are area of very high and low sensitivity as well (fig. 22). These palaeontological deposits will be exposed in areas where trenching is deeper than 2m. "Trenching of up to 2m depth will in fact expose bedrock of the Volksrust and Normandien Formations during the construction phase. The recording of fossils from the development site will have a significant impact on our understanding of the palaeo-environments in this part of Gondwanaland and a Very High Palaeontological Sensitivity is allocated to the sections underlain by the Normandien Formation. A High Palaeontological Sensitivity is allocated to sections underlain by the Volksrust Formation, and, although not many fossils have been recorded from the Masotcheni Formation, a Moderate Palaeontological Sensitivity is allocated to these areas to ensure that new finds are properly recorded. Areas underlain by dolerite will have no significant Palaeontological Sensitivity" (Groenewald Appendix C).

MANAGEMENT PLAN

All graves need to have a 20m buffer between them and the edge of the pipeline footprint. The graves need to be clearly demarcated before construction begins and contractors need to be made aware of their occurrences as part of the site safety training. Only one site LOM05 will be problematic for the 50m buffer. If the pipeline is to be replaced in this section then the pipeline may need to be manually excavated or excavated with smaller machinery as there are several graves within a few meters of the centre point of the line. The final routing and planning must be confirmed with an archaeologist and Amafa KZN.

FIG. 22: PALAEOONTOLOGICAL SENSITIVITY MAP



Stone walled settlements, such as those at LOM08 must not be disturbed. The left or western side of the road must be barricaded and all dumping is to occur on the eastern side of the road. This is to avoid damaging the walling and graves that occur near the existing road. The final routing and planning must be confirmed with an archaeologist and Amafa KZN.

Two areas require monitoring during excavations: LOM011 and Intombi Camp, if a new pipeline is to be placed. These monitoring needs to be undertaken by a qualified archaeologist who will need to apply for a permit before hand to sample any material. The archaeologist may sample and/or excavate and middens in these areas if deemed necessary, and thus may stop pipeline excavation in this specific area as well.

If any human remains are exposed during the course of pipeline excavations, then construction needs to stop in that area immediately. The SAPS and Amafa KZN need to be informed, as well as the contracted archaeologist who would be able to make a more immediate and informed opinion.

Stone Tools occur throughout the area as isolated occurrences. These were not noted nor recorded and do not form a site. No mitigation is required for isolated artefacts.

The palaeontological sensitivity map needs to be compared with the pipeline construction map. In those areas where the old pipeline will be replaced, then no mitigation will be required provided that there is no further trenching and/or the excavations do not go below 1.5m in depth.

All sections of the development where bedrock is exposed due to erosion or where geotechnical surveys indicate that trenching will exceed 1,5m in areas underlain by Very High, High and Moderate Palaeontologically Sensitive rocks must be inspected by a qualified palaeontologist as part of a Phase 1 Palaeontological Impact Assessment. The professional Palaeontologist must be appointed to record and collect the fossils according to SAHRA and AMAFA

specifications as part of a Phase 1 Palaeontological Impact Assessment, preferably before construction in areas where the rocks area exposed due to erosion and also during construction when trenching exceeds 1,5m in depth

CONCLUSION

A heritage survey was undertaken for the Umbulwane – Lombard’s Kop bulk water pipeline. Several heritage sites were noted occurring along the pipeline and these were described with various forms of mitigation. The heritage vary include Late Iron Age stone walled settlements, 2nd Anglo-Boer War fortifications, hospitals and graves, and more recent human graves. The pipeline route initially affects some of these sites; however, with the suggested mitigation and minor route realignment these sites are no longer affected.

A Phase 1 palaeontological survey will be required for some areas of the pipeline route where the new pipes will be placed.

REFERENCES

Anderson, G. 2011. Heritage Survey of a Proposed Quarry at Hermanspruit, Ladysmith. For Afzelia Environmental.

Watt S.A. 1982. Intombi Military Hospital and Cemetery. *Military History Journal* **5 (6)**.

APPENDIX A
SITE RECORD FORMS

UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA	X	IIA			
Historical	Historical Period:		Recent Past (last 60 yrs):					

Recorder's Site No.: **LOM 01**

Official Name: Hermanus Kraal 1186

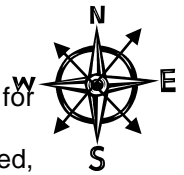
Local Name:

Map Sheet: 2829 DB Ladysmith

GPS reading: S28.635599000 E29.838084000

DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

At the P325 and P333 intersection outside Ezakheni, get onto the P325 and drive northeast for 612m before turning left onto an unpaved road. Follow this road for 1.3km, then turn left again. LOM01 is located 2.0km from here at the base of a hill where the southern reservoir is located, south of Umbulwana.



SITE DESCRIPTION:

Type of Site: Stone Walled enclosures

Merits conservation: The site is of low significance. No further mitigation is required; however, graves are known to occur in some cattle byres.

Threats: Yes

What threats: **Lombard's Kop Bulk Water Pipeline**

RECORDING:

Digital pictures Yes Tracings:

Drawings:

Recorder/Informant: Name: Gavin Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 05/05/2015

Owner:

References:

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

The site consists of two circular stone walled enclosures. The smallest enclosure is ~5m in diameter and is attached to a primary enclosure that has been damaged by the existing pipeline, on the eastern side of the wall. An old maize lower grinding stone occurs near the walling and graves that are more recent occur in and amongst the existing settlements.

UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA		IIA			
Historical	Historical Period:		Recent Past (last 60 yrs):	X				

Recorder's Site No.: **LOM 02**

Official Name: Hermanus Kraal 1186

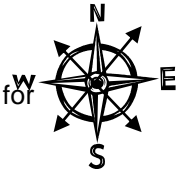
Local Name:

Map Sheet: 2829 DB Ladysmith

GPS reading: S28.622875000 E29.836410000

DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

At the P325 and P333 intersection outside Ezakheni, get onto the P325 and drive northeast for 612m before turning left onto an unpaved road. Follow this road for 1.3km, then turn left again. LOM02 is located 847m from here, south of a small stream.



SITE DESCRIPTION:

Type of Site: Grave and abandoned house

Merits conservation: The grave is of high significance. A 20m buffer is required between the edge of the grave and the edge of the pipeline footprint. The grave needs to be clearly demarcated before construction begins.

Threats: Yes

What threats: **Lombard's Kop Bulk Water Pipeline**

RECORDING:

Digital pictures Yes Tracings:

Drawings:

Recorder/Informant: Name: Gavin Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 05/05/2015

Owner:

References:

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

The site consists of an abandoned house and a much older grave. The grave occurs ~35m east of the existing line centre point. The grave is in an east-west orientation.

UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA		IIA			
Historical	Historical Period:		Recent Past (last 60 yrs):	X				

Recorder's Site No.: **LOM 03**

Official Name: Hermanus Kraal 1186

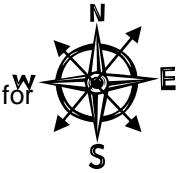
Local Name:

Map Sheet: 2829 DB Ladysmith

GPS reading: S28.623154000 E29.836732000

DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

At the P325 and P333 intersection outside Ezakheni, get onto the P325 and drive northeast for 612m before turning left onto an unpaved road. Follow this road for 1.3km, then turn left again. LOM03 is located 822m from here, near the road.



SITE DESCRIPTION:

Type of Site: Graves

Merits conservation: The graves are of high significance. A 20m buffer is required between the edge of the grave and the edge of the pipeline footprint. The grave needs to be clearly demarcated before construction begins.

Threats: Yes

What threats: **Lombard's Kop Bulk Water Pipeline**

RECORDING:

Digital pictures Yes Tracings:

Drawings:

Recorder/Informant: Name: Gavin Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 05/05/2015

Owner:

References:

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

LOM03 are two graves located near the road. They appear to be recent (i.e. last 20 years) in age, but are not associated with a specific house. The graves are two raised stone cairns and in an east-west orientation. The graves are located ~10m from the existing pipeline.

UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA		IIA			
Historical	Historical Period:		Recent Past (last 60 yrs):					

Recorder's Site No.: **LOM 04**

Official Name: Hermanus Kraal 1186

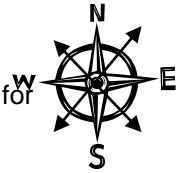
Local Name:

Map Sheet: 2829 DB Ladysmith

GPS reading: S28.622186000 E29.836232000

DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

At the P325 and P333 intersection outside Ezakheni, get onto the P325 and drive northeast for 612m before turning left onto an unpaved road. Follow this road for 1.3km, then turn left again. LOM04 is located 937m from here, to the north of LOM01 – 03



SITE DESCRIPTION:

Type of Site: Graves and an abandoned homestead.

Merits conservation: The graves are of high significance. A 20m buffer is required between the edge of the grave and the edge of the pipeline footprint. The grave needs to be clearly demarcated before construction begins.

Threats: Yes

What threats: **Lombard's Kop Bulk Water Pipeline**

RECORDING:

Digital pictures Yes Tracings:

Drawings:

Recorder/Informant: Name: Gavin Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 05/05/2015

Owner:

References:

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

The site consists of a recently abandoned homestead and three graves. Two graves are fenced together and in a northwest-southeast orientation while the individual grave is in an east-west orientation. The graves are ~45m from the line.

UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA		IIA			
Historical	Historical Period:	X	Recent Past (last 60 yrs):	X				

Recorder's Site No.: **LOM 05**

Official Name: Hermanus Kraal 1186

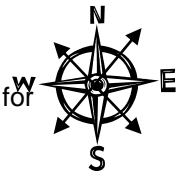
Local Name:

Map Sheet: 2829 DB Ladysmith

GPS reading: S28.617106000 E29.835960000

DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

At the P325 and P333 intersection outside Ezakheni, get onto the P325 and drive northeast for 612m before turning left onto an unpaved road.
LOM05 is located 2.2km from here, at the top of a hill and along its edge.



SITE DESCRIPTION:

Type of Site: Cemetary

Merits conservation: The graves are of high significance. The pipeline poses a conundrum. It has already been excavated, and if it requires upgrading it will need to adhere to new or refined legislation. The legislation requires a 20m buffer between a development and a grave. For this site, the pipeline will not be able to be repaired or upgraded, and thus some form of exemption is required

The previous pipeline has already affected the cemetery. I suggest that if this area must be upgraded then a corridor/footprint is made that only occurs on the existing excavation trench with a meter on each side. The excavations would either need to be undertaken manually, or with smaller excavation equipment. The chances of damaging other graves in the cemetery are high. The construction team must also note that graves may slump after burial, and thus are the remains are not always directly below the cairn.

I also suggest that the community living in this area are consulted regarding these graves.

Threats: Yes

What threats: **Lombard's Kop Bulk Water Pipeline**

RECORDING:

Digital pictures Yes Tracings:

Drawings:

Recorder/Informant: Name: Gavin Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 05/05/2015

Owner:

References:

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

The site is a large cemetery that extends for ~150m x 100m in size. The existing pipeline occurs in the southwestern quarter of the cemetery. There is no record that I know of, if any graves were disturbed during the construction of the pipeline. It is of concern in that there are existing graves within the pipeline footprint. The cemetery appears to have been used for several decades. The graves are mostly in an east-west orientation.

UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA		IIA			
Historical	Historical Period:	X	Recent Past (last 60 yrs):	X				

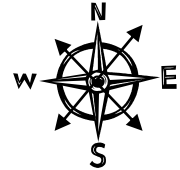
Recorder's Site No.: **LOM 06**

Official Name: Hermanus Kraal 1186

Local Name:

Map Sheet: 2829 DB Ladysmith

GPS reading: S28.615914000 E29.834696000



DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

At the P325 and P333 intersection outside Ezakheni, get onto the P325 and drive northeast for 612m before turning left onto an unpaved road. LOM06 is located 2.4km from here, at the top of the hill near the existing pipeline.

SITE DESCRIPTION:

Type of Site: Graves

Merits conservation: The graves are of high significance. A 20m buffer is required between the edge of the grave and the edge of the pipeline footprint. The grave needs to be clearly demarcated before construction begins.

Threats: Yes

What threats: **Lombard's Kop Bulk Water Pipeline**

RECORDING:

Digital pictures Yes Tracings:

Drawings:

Recorder/Informant: Name: Gavin Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 05/05/2015

Owner:

References:

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

The site consists of at least five human graves at the corner of two tracks and a property. The graves are in an east-west orientation and vary in age. The graves occur ~30m from the existing pipeline.

UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA	X	IIA			
Historical	Historical Period:	X	Recent Past (last 60 yrs):	X				

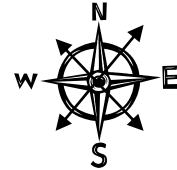
Recorder's Site No.: **LOM 07**

Official Name: Hermanus Kraal 1186

Local Name:

Map Sheet: 2829 DB Ladysmith

GPS reading: S28.615918000 E29.835209000



DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

At the P325 and P333 intersection outside Ezakheni, get onto the P325 and drive northeast for 612m before turning left onto an unpaved road.

LOM07 is located 2.4km from here,

SITE DESCRIPTION:

Type of Site: Stonewalled settlement and graves

Merits conservation: The graves are of high significance. A 20m buffer is required between the edge of the grave and the edge of the pipeline footprint. The grave needs to be clearly demarcated before construction begins. The walling should not be affected.

Threats: Yes

What threats: **Lombard's Kop Bulk Water Pipeline**

RECORDING:

Digital pictures Yes Tracings:

Drawings:

Recorder/Informant: Name: Gavin Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 05/05/2015

Owner:

References:

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

LOM07 is a large settlement that probably consists of several settlements over time. The site consists of several stonewalls of which the main wall forms a kraal. There are five to six graves on the eastern side of the site, and possible two graves in the main kraal. The map has the existing pipeline just touching these walls, however, in the field the pipeline is on the opposite side of the dirt road.

UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA		IIA			
Historical	Historical Period:		Recent Past (last 60 yrs):					

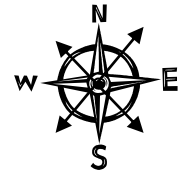
Recorder's Site No.: **LOM 08**

Official Name: Hermanus Kraal 1186

Local Name:

Map Sheet: 2829 DB Ladysmith

GPS reading: S28.613189000 E29.833819000



DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

At the P325 and P333 intersection outside Ezakheni, get onto the P325 and drive northeast for 612m before turning left onto an unpaved road.

LOM08 is located 2.5km from here,

SITE DESCRIPTION:

Type of Site: Stone walled settlement and graves

Merits conservation: The walling and graves should not be disturbed, as there is already an existing line. If the line is upgraded, the excavation plans and methods will need to be cleared by an archaeologist and/or Amafa KZN. The excavation will need to place the excavated soil on the eastern side of the road and leave the western side clear. No further intrusion into the hillside may occur as the walling is, in some places, within 3m of the existing pipeline.

Threats: Yes

What threats: **Lombard's Kop Bulk Water Pipeline**

RECORDING:

Digital pictures Yes Tracings:

Drawings:

Recorder/Informant: Name: Gavin Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 05/05/2015

Owner:

References:

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

LOM08 is an extensive LIA stone walled settlement, and some of it might link up with HER08 (see desktop study). The site consists of many primary and secondary stonewalls along the eastern ridge of the hill. The site is more visible, as a road has been recently cleared where previously there was just a small road/servitude (from our original survey). Amongst the stone walled enclosures are 4 – 5 graves probably relating to the stone walled settlements. At the top of the hill is HER06, HER07 and HER08, and these are sites linked to the Utrecht Commando and German Forces mentioned above. There are more 2ABW features to the west but they occur outside of the footprint. HER06 is an area that appears to have walling and/or a cleared floor. The vegetation was too thick to photograph and properly assess the site. HER07 is an area that appears to have walling and/or a cleared floor. The vegetation was too thick to photograph and properly assess the site. HER08 is a unique site in that it appears to originally date to the Late Iron Age, and has then been subsequently rebuilt, modified and extended for the last 500 years. It extends for ~100m x 100m. The site consists of a multiple series of stone walled circles. Some of these circles have aged, or patinated, rocks, while the more recent ones have little patination. There are at least four graves associated with the various walls.

UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA		IIA			
Historical	Historical Period:		Recent Past (last 60 yrs):	X				

Recorder's Site No.: **LOM 09**

Official Name: Hermanus Kraal 1186

Local Name:

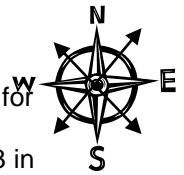
Map Sheet: 2829 DB Ladysmith

GPS reading: S28.611900911 E29.834908198

DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

At the P325 and P333 intersection outside Ezakheni, get onto the P325 and drive northeast for 612m before turning left onto an unpaved road.

LOM09 is located 2.7km from here, just below the existing dirt road. It was recorded as HER03 in the previous survey. HER03 is located on the northern side of the one road to the site.



SITE DESCRIPTION:

Type of Site: Stonewalls for cattle kraals and house foundations and 40+ graves

Merits conservation: The pipeline is unlikely to affect the cemetery. The site is of high significance. No mitigation is currently required.

Threats: No

What threats: **None at the moment**

RECORDING:

Digital pictures Yes Tracings:

Drawings:

Recorder/Informant: Name: Gavin Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 06/05/2015

Owner:

References:

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

The site dates between 1954 and 2000, according to the maps and graves. Parts of HER03 may also post-date 1937; however, the aerial photograph is not very clear. The site consist of 40+ human graves, stonewalls for cattle kraals and house foundations. It is unlikely that the current community living above this site are related to this site, as the former have graves in the area, with more recent dates.

UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA		IIA			
Historical	Historical Period:		Recent Past (last 60 yrs):					

Recorder's Site No.: **LOM 10**

Official Name: Town Lands

Local Name:

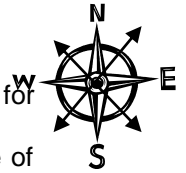
Map Sheet: 2829 DB Ladysmith

GPS reading: S28.588986248 E29.825395499

DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

At the P325 and P333 intersection outside Ezakheni, get onto the P325 and drive northeast for 4.0km before turning left onto an unpaved road.

LOM010 is located 704m from here on the flood plains of the Klip River on the opposite side of Intombi Camp



SITE DESCRIPTION:

Type of Site: Historical buildings and trees

Merits conservation: The area is of medium significance in that it may yield useable information. The excavations from the banks of the Klip River to the trees should be monitored for potential historical middens by a qualified archaeologist. On site, sampling and/or excavations may need to occur.

Threats: Yes

What threats: **Lombard's Kop Bulk Water Pipeline**

RECORDING:

Digital pictures Yes Tracings:

Drawings:

Recorder/Informant: Name: Gavin Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 05/05/2015

Owner:

References:

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

The site consists of blue gum trees and apparent smallholdings that predate the 1940s. Buildings are shown on the 1953 topographical map, but nothing is visible today. The trees are already established in the 1940 map, but do not occur in the 1899 photos (see Watt 1982). They thus have historical and environmental value and should not be damaged. The smallholdings could have late 19th century and early 20th century middens that would be of historical value.

UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA		IIA			
Historical	Historical Period:	X	Recent Past (last 60 yrs):					

Recorder's Site No.: **iNtombi Camp**

Official Name: Town Lands

Local Name:

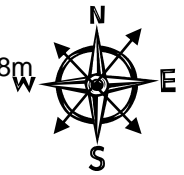
Map Sheet: 2829 DB Ladysmith

GPS reading: S28.595570545 E29.822105364

DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

Drive south along Marula Rd in Ladysmith and turn right onto Kiaat Rd. Follow Kiaat for 318m then turn right onto the L1298.

Intombi Camp is located 631m from here on the flood plains of the Klip River



SITE DESCRIPTION:

Type of Site: Second Anglo Boer War encampment and cemetery

Merits conservation: The camp should be of high significance and not only the memorials. The convalescence camp was an important aspect to the Siege of Ladysmith and the artefacts left behind would be of historical value. A qualified archaeologist should monitor any trenching and if there is a new line then it should be surveyed with a metal detector and/or excavated by test pit excavations.

Threats: Yes

What threats: **Lombard's Kop Bulk Water Pipeline**

RECORDING:

Digital pictures Yes Tracings:

Drawings:

Recorder/Informant: Name: Gavin Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 06/05/2015

Owner:

References:

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

"By an agreement between Sir George White and General Joubert, the British in Ladysmith decided to establish a neutral camp about 5 km from the town, towards the south-east, and bounded by the Klip River and the Intombi Spruit. Work was begun on Sunday, 5 November 1899, tents were brought for a 300-bed hospital, and by 18h00 the first wounded were accommodated. The hospital consisted of 100 beds of the No 12 hospital, 50 beds from the No 26 Indian Field Hospital and 80 beds of No 1 Natal Volunteer Field Hospital. In all, there were 215 medical personnel. In addition about 1 200 civilians were accommodated in a camp separated by the railway from the military. After about a week's hard work, the hospital personnel settled down into comparative comfort; all the nursing sisters had arrived, the trenches had been dug around the tents, the water brought from the Klip River in the town was purified for drinking purposes, sanitation was carefully organised, a gang of washermen was collected, and a bakery was established" (Watt 1982) Intombi Camp would have covered an extensive area, but now only the cemetery remains while the rest is being encroached upon by informal settlements to the southwest and municipal infrastructure to the west. There is an existing pipeline running through the camp as well. While not part of the scope of this report, Amafa KZN should inspect these developments in relation to Intombi Camp.

UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA		IIA			
Historical	Historical Period:		Recent Past (last 60 yrs):					

Recorder's Site No.: **LOM 11**

Official Name: Town Lands

Local Name:

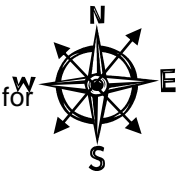
Map Sheet: 2829 DB Ladysmith

GPS reading: S28.609779000 E29.835232000

DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

At the P325 and P333 intersection outside Ezakheni, get onto the P325 and drive northeast for 612m before turning left onto an unpaved road.

LOM011 is located 2.9km from here at the base of a hill near Umbulwana Station.



SITE DESCRIPTION:

Type of Site: Circular stone structures

Merits conservation: The site is of low significance. No mitigation is required, as they are not affected:

Threats: No

What threats: **None at the moment**

RECORDING:

Digital pictures Yes Tracings:

Drawings:

Recorder/Informant: Name: Gavin Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 06/05/2015

Owner:

References:

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

The site consists of three small circular stone structures. They are ~3m in diameter. The pipeline occurs ~50m to the east of the walls.

APPENDIX B
PIA DESKTOP REPORT

**DESKTOP PALAEOLOGICAL
ASSESSMENT FOR THE PROPOSED
LADYSMITH AND LOMBARDSKOP
PIPELINES, OKHAHLAMBA AND
EMNAMBITHI/LADYSMITH LOCAL
MUNICIPALITY, UTHUKELA DISTRICT
MUNICIPALITY, KWAZULU-NATAL
PROVINCE.**

**FOR
Umlando**

DATE: 1 June 2015

By

**Gideon Groenewald
Cell: 0787136377**

EXECUTIVE SUMMARY

Gideon Groenewald was appointed to undertake a desktop survey, assessing the potential Palaeontological Impact of the proposed construction of the Ladysmith and Lombardskop Pipelines, Okhahlamba and Emnambithi/ Ladysmith Local Municipalities, Uthukela District Municipality, KwaZulu-Natal Province

The footprint of the proposed construction of the Ladysmith and Lombardskop Pipelines in the Local Municipality in the KwaZulu-Natal Province is underlain by Permian aged shale of the Volksrust Formation, Ecca Group, Permian aged sandstone and mudstone of the Normandien Formation (Adelaide Subgroup) of the Beaufort Group, Jurassic aged Dolerite of the Karoo Supergroup and Quaternary aged sand and silt of the Masotcheni Formation.

Although rare, significant fossils have been described from the Volksrust Formation, with specific reference to trace fossils. Highly significant fossils have been recorded from the Adelaide Subgroup and Normandien Formation. The Dolerite will not contain fossils and recording of new fossils from the Masotcheni Formation will be very significant. Recording of fossils from the construction site will contribute significantly to our understanding of the palaeo-environments that existed in this part of the Karoo basin during the Permian and Quaternary.

It is expected that trenching for the pipeline will be deeper than 1,5m.

Recommendations:

1. The EAP and ECO of the project must be informed of the fact that all the geological formations, except for dolerite, will contain fossils if exposed at a depth of more than 1,5m.
2. All sections of the development where bedrock is exposed due to erosion or where geotechnical surveys indicate that trenching will exceed 1,5m in areas underlain by Very High, High and Moderate Palaeontologically Sensitive rocks must be inspected by a qualified palaeontologist as part of a Phase 1 Palaeontological Impact Assessment. The professional Palaeontologist must be appointed to record and collect the fossils according to SAHRA and AMAFA specifications as part of a Phase 1 Palaeontological Impact Assessment, preferably before construction in areas where the rocks area exposed due to erosion and also during construction when trenching exceeds 1,5m in depth.
3. These actions must form part of the EMP of the projects.

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INTRODUCTION

Gideon Groenewald was appointed to undertake a desktop survey, assessing the potential Palaeontological Impact of the proposed construction of the Ladysmith and Lombardskop Pipelines, Okhahlamba and Emnambithi/ladysmith Local Municipalities, Uthukela District Municipality, Kwazulu-Natal Province (Figure 1).



Figure 1. Locality of the Ladysmith and Lombardskop Pipelines shown in grey

SOUTH AFRICAN NATIONAL HERITAGE RESOURCE ACT NO 25/1999 AND KWAZULU-NATAL HERITAGE ACT NO 4/2008

This Palaeontological Assessment forms part of the Heritage Impact Assessment (HIA) and complies with the requirements of the South African National Heritage Resource Act No 25 of 1999 as well as the KwaZulu-Natal Heritage Act No 4 of 2008. In accordance with Section 38 of the National Resources Act No 25 of 1999 (Heritage Resources Management), a HIA is required to assess any potential impacts to palaeontological heritage within the development footprint.

Categories of heritage resources recognised as part of the National Estate in Section 3 of the Heritage Resources Act, and which therefore fall under its protection, include:

- geological sites of scientific or cultural importance;

- objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
- objects with the potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage.

METHODOLOGY

Following the "SAHRA APM Guidelines: Minimum Standards for the Archaeological & Palaeontological Components of Impact Assessment Reports" the aims of the palaeontological impact assessment are:

- to identify exposed and subsurface rock formations that are considered to be palaeontologically significant;
- to assess the level of palaeontological significance of these formations;
- to comment on the impact of the development on these exposed and/or potential fossil resources and
- to make recommendations as to how the developer should conserve or mitigate damage to these resources.

In preparing a palaeontological desktop study the potential fossiliferous rock units (groups, formations etc) represented within the study area are determined from geological maps and Google Earth imagery. The known fossil heritage within each rock unit is inventoried from the published scientific literature, previous palaeontological impact studies in the same region and the author's field experience.

The likely impact of the proposed development on local fossil heritage is determined on the basis of the palaeontological sensitivity of the rock units concerned and the nature and scale of the development itself, most notably the extent of fresh bedrock excavation envisaged. The different sensitivity classes used are explained in Table 1 below.

Table 1 Palaeontological sensitivity analysis outcome classification

PALAEONTOLOGICAL SIGNIFICANCE/VULNERABILITY OF ROCK UNITS	
The following colour scheme is proposed for the indication of palaeontological sensitivity classes. This classification of sensitivity is adapted from that of Almond et al 2008.	
RED	Very High Palaeontological sensitivity/vulnerability. Development will most likely have a very significant impact on the Palaeontological Heritage of the region. Very high possibility that significant fossil assemblages will be present in all outcrops of the unit. Appointment of professional palaeontologist, desktop survey, phase I Palaeontological Impact Assessment (PIA) (field survey and recording of fossils) and phase II PIA (rescue of fossils during construction) as well as application for collection and destruction permit compulsory.
ORANGE	High Palaeontological sensitivity/vulnerability. High possibility that significant fossil assemblages will be present in most of the outcrop areas of the unit. Fossils most likely to occur in associated sediments or underlying units, for example in the areas underlain by Transvaal Supergroup dolomite where Cenozoic cave deposits are likely to occur. Appointment of professional palaeontologist, desktop survey and phase I Palaeontological Impact Assessment (field survey and collection of fossils) compulsory. Early application for collection permit recommended. Highly likely that a Phase II PIA will be applicable during the construction phase of projects.
GREEN	Moderate Palaeontological sensitivity/vulnerability. High possibility that fossils will be present in the outcrop areas of the unit or in associated sediments that underlie the unit. For example areas underlain by the Gordonia Formation or undifferentiated soils and alluvium. Fossils described in the literature are visible with the naked eye and development can have a significant impact on the Palaeontological Heritage of the area. Recording of fossils will contribute significantly to the present knowledge of the development of life in the geological record of the region. Appointment of a professional palaeontologist, desktop survey and phase I PIA (ground proofing of desktop survey) recommended.
BLUE	Low Palaeontological sensitivity/vulnerability. Low possibility that fossils that are described in the literature will be visible to the naked eye or be recognized as fossils by untrained persons. Fossils of for example small domal Stromatolites as well as micro-bacteria are associated with these rock units. Fossils of micro-bacteria are extremely important for our understanding of the development of Life, but are only visible under large magnification. Recording of the fossils will contribute significantly to the present knowledge and understanding of the development of Life in the region. Where geological units are allocated a blue colour of significance, and the geological unit is surrounded by highly significant geological units (red or orange coloured units), a palaeontologist must be appointed to do a desktop survey and to make professional recommendations on the impact of development on

	<p>significant palaeontological finds that might occur in the unit that is allocated a blue colour. An example of this scenario will be where the scale of mapping on the 1:250 000 scale maps excludes small outcrops of highly significant sedimentary rock units occurring in larger alluvium deposits. Collection of a representative sample of potential fossiliferous material is recommended.</p>
<p>GREY</p>	<p>Very Low Palaeontological sensitivity/vulnerability. Very low possibility that significant fossils will be present in the bedrock of these geological units. The rock units are associated with intrusive igneous activities and no life would have been possible during emplacement of the rocks. It is however essential to note that the geological units mapped out on the geological maps are invariably overlain by Cenozoic aged sediments that might contain significant fossil assemblages and archaeological material. Examples of significant finds occur in areas underlain by granite, just to the west of Hoedspruit in the Limpopo Province, where significant assemblages of fossils and clay-pot fragments are associated with large termite mounds. Where geological units are allocated a grey colour of significance, and the geological unit is surrounded by very high and highly significant geological units (red or orange coloured units), a palaeontologist must be appointed to do a desktop survey and to make professional recommendations on the impact of development on significant palaeontological finds that might occur in the unit that is allocated a grey colour. An example of this scenario will be where the scale of mapping on the 1:250 000 scale maps excludes small outcrops of highly significant sedimentary rock units occurring in dolerite sill outcrops. It is important that the report should also refer to archaeological reports and possible descriptions of palaeontological finds in Cenozoic aged surface deposits.</p>

When rock units of moderate to high palaeontological sensitivity are present within the development footprint, a field-based assessment by a professional palaeontologist is usually warranted.

The key assumption for this desktop study is that the existing geological maps and datasets used to assess site sensitivity are correct and reliable. However, the geological maps used were not intended for fine scale planning work and are largely based on aerial photographs alone, without ground-truthing.

These factors may have a major influence on the assessment of the fossil heritage significance of a given development and, without supporting field assessments, may lead to either:

- an underestimation of the palaeontological significance of a given study area due to ignorance of significant recorded or unrecorded fossils preserved there, or
- an overestimation of the palaeontological sensitivity of a study area, for example when originally rich fossil assemblages inferred from geological maps have in fact been destroyed by weathering, or are buried beneath a thick mantle of unfossiliferous “drift” (soil, alluvium etc).

GEOLOGY

The study area is underlain by Permian aged sedimentary rocks of the Ecca and Beaufort Groups as well as Jurassic aged dolerite of the Karoo Supergroup, (Figure 2).

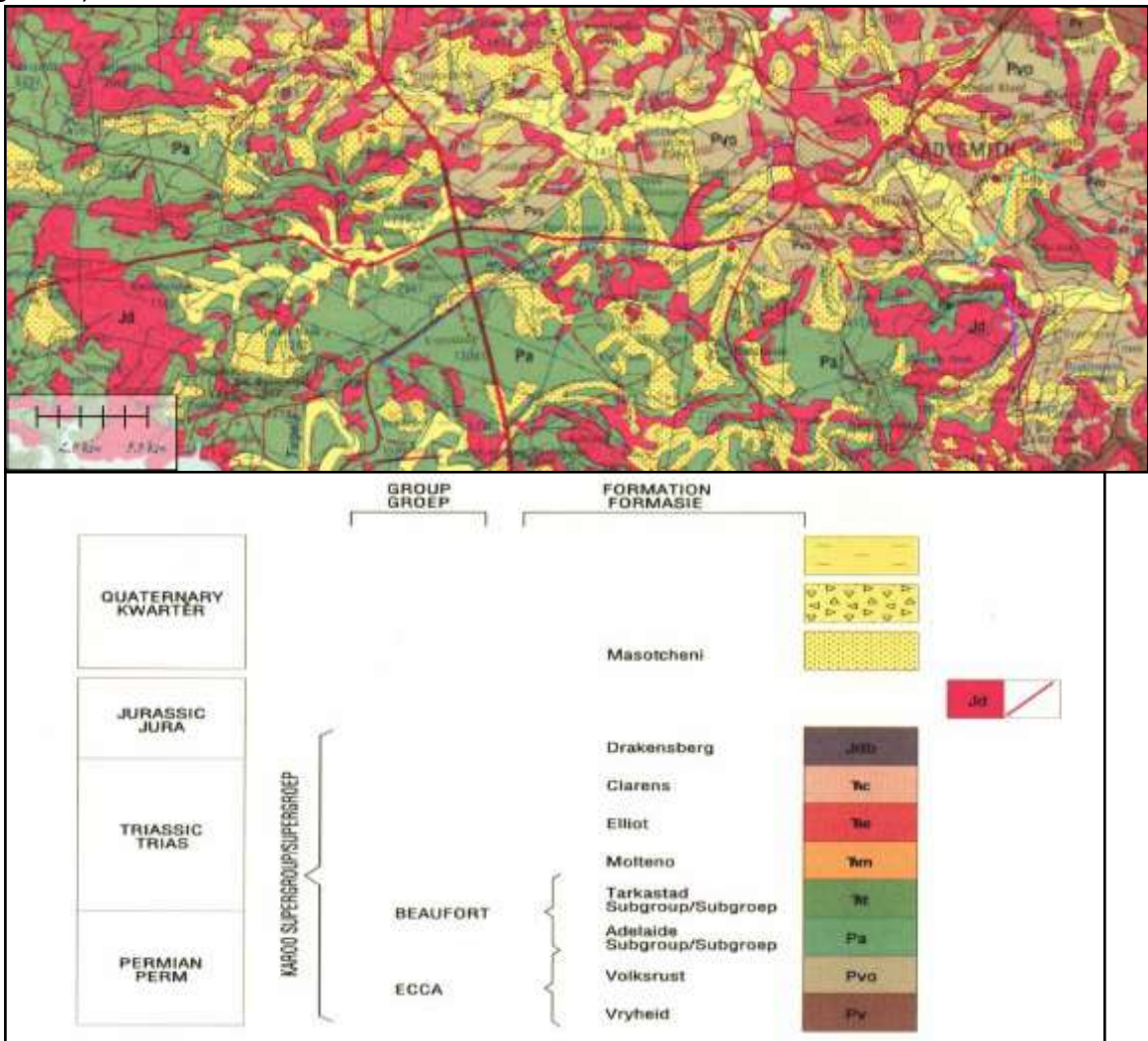


Figure 2 Geology of the area underlying the Ladysmith and Lombardskop pipeline routes

Ecca Group

Volksrust Formation (Pvo)

The Permian aged Volksrust Formation is an assemblage of fine-grained sediments, consisting mainly of dark grey mudstone and shale. The deposits represent Permian aged marine deposits in this part of Gondwanaland (Johnson et al, 2009).

Offshore shelf, but possibly also nearshore / lacustrine / lagoonal deposits.

Beaufort Group

Normandien Formation [Adelaide Subgroup (Pa)]

The Permian aged Adelaide Subgroup comprises the lower part of the Beaufort Group along the Drakensberg Escarpment and on some 1:250 000 sheets is referred to as the Adelaide Formation. In most of the outcrop areas in KwaZulu-Natal the Adelaide Subgroup consists primarily of a lower deltaic facies, mostly referred to as the Estcourt Formation and an upper fluvial facies referred to as the Normandien Formation (Groenewald, 1984; Johnson et al 2009).

Recently there is consensus to refer to the entire Adelaide Subgroup as the Normandien Formation.

The Normandien Formation represents the northward migration of deltaic environments, followed by fluvial environments into the Karoo Basin. The Formation consists of a sequence of interbedded deltaic to fluvial and lacustrine sandstones and mudstone (Groenewald, 1990; Johnson et al. 2009).

Dolerite

Jurassic aged dolerite dykes and sills represent a volcanic episode that occurred during the breakup of Gondwanaland.

Masotcheni Formation

The Masotcheni Formation comprises palaeosols that represent local colluvial deposits of Cenozoic age in the interior of KwaZulu-Natal (Johnson et al, 2009).

PALAEONTOLOGY

Ecca Group

Volksrust Formation

Trace fossils have been described from the upper layers of the Formation (Johnson et al. 2009).

The bivalve *Megadesmus* is described from the Late Permian Volksrust Shale Formation in the north-eastern Karoo Basin, South Africa; this is the first reported discovery of this genus in Africa. The fossil is large, 9 cm dorsally and 8.4 cm laterally, and both valves are articulated indicating minimum transport after death. The bivalve was encased in interbedded siltstone-shale that constitutes the distal sediments of a prograding delta at the Beaufort –Ecca Group boundary. *Megadesmus* is known from other continents (Australia, India, Siberia, South America and Tasmania) where its presence indicates exclusively marine conditions. The implication for the northeastern Karoo Basin during the Late Permian is that a marine enclave still existed in this geographic area and that terrestrial conditions did not yet prevail as in the southern basin region (Cairncross *et al.*, 2005).

Beaufort Group

Adelaide Subgroup [Normandien Formation] (Pa)

The Adelaide Subgroup overlies the Volksrust Formation of the Ecca Group and the transition from deep water deposits of the Volksrust Formation to pro-deltaic and deltaic deposits of the Beaufort Group present fieldworkers with problems in mapping these units (Groenewald, 1984; Munitingh, 1989; Johnson and Verster, 1994; Johnson et al, 2009). The Adelaide Subgroup and Normandien Formation comprise the *Cistecephalus* Assemblage Zone, *Dicynodon* Assemblage Zone as well as the overlying *Lystrosaurus* Assemblage Zone of the Karoo Supergroup. It also contains abundant plant fossils of the *Glossopteris* Assemblage.

Dolerite

Due to its igneous character dolerite will not contain fossils.

Masotheni Formation

The Quaternary aged Masotheni Formation represents important colluvial deposits and although very few fossils have to date, been described from KwaZulu-Natal, very significant fossils of mammals, including Homonin remains have been recorded in similar deposits in the Free State.

DISCUSSION

The predicted palaeontological impact of the development is based on the initial mapping assessment and literature reviews. Although fossils are rarely recorded from the Volksrust Formation, the recording of trace fossils and other fossils from this part of the Ecca Basin will contribute significantly to our understanding of the palaeo-environments that existed during the Permian.

The Adelaide Subgroup and Normandien Formation is known to be very productive and both plant, vertebrate and invertebrate fossils, as well as abundant trace fossils, including casts of vertebrate burrows have been recorded from this unit. The Masotheni Formation needs more research, but important fossils are expected in this group of sediments.

The Palaeontological Significance is summarised in Table 2.

A variety of fossils have been described from the Permian to Triassic aged Adelaide Subgroup and includes plant fossils of the *Glossopteris* Assemblage and vertebrate fossils of the *Cistecephalus*, *Dicynodon* and *Lystrosaurus* Assemblage Zones. Invertebrate fossils include several small trace fossils as well as casts of vertebrate burrows.

The palaeontological significance is summarised in Table 2.

Table 2 Palaeontological significance of geological units on site

Geological Unit	Rock Type and Age	Fossil Heritage	Vertebrate Biozone	Palaeontological Sensitivity
Volksrust Formation	Dark Shale PERMIAN	Trace fossils Bivalve <i>Megadesmus</i>	None	High
Adelaide Subgroup	Siltstone and fine-grained sandstone PERMIAN/TRIASSIC	Plant fossils of the <i>Glossopteris</i> Assemblage. Vertebrate fossils of the <i>Cistecephalus</i> , <i>Dicynodon</i> and <i>Lystrosaurus</i> Assemblage Zones Trace fossils including casts of vertebrate burrows	<i>Cistecephalus</i> <i>Dicynodon</i> and <i>Lystrosaurus</i>	Very High
Masotheni Formation	Silt and sand Colluvial sand and silt QUATERNARY	Vertebrate fossils	None	Moderate

MANAGEMENT PLAN

The likely impact of the proposed development on local fossil heritage is determined on the basis of the palaeontological sensitivity of the rock units concerned and the nature and scale of the development itself, most notably the extent of bedrock excavation envisaged. The different sensitivity classes used are explained in Table 1.

The palaeontological sensitivity of the development is related to the specific geology that underlies the development footprints. For the sake of this desktop survey it is assumed that where there are no significant outcrops on site, that trenching of up to 2m depth will in fact expose bedrock of the Volksrust and Normandien Formations during the construction phase. The recording of fossils from the development site will have a significant impact on our understanding of the palaeo-environments in this part of Gondwanaland and a Very High Palaeontological Sensitivity is allocated to the sections underlain by the Normandien Formation. A High Palaeontological Sensitivity is allocated to sections underlain by the Volksrust Formation, and, although not many fossils have been recorded from the Masotcheni Formation, a Moderate Palaeontological Sensitivity is allocated to these areas to ensure that new finds are properly recorded. Areas underlain by dolerite will have no significant Palaeontological Sensitivity.

The palaeontological sensitivity of the pipeline route is shown in Figure 3.



Figure 3 Palaeontological sensitivity for pipelines, colour coding explained in Table 1

CONCLUSION AND RECOMMENDATIONS

The footprint of the proposed construction of the Ladysmith and Lombardskop Pipelines in the Local Municipality in the KwaZulu-Natal Province is underlain by Permian aged shale of the Volksrust Formation, Ecca Group, Permian aged sandstone and mudstone of the Normandien Formation (Adelaide Subgroup) of the Beaufort Group, Jurassic aged Dolerite of the Karoo Supergroup and Quaternary aged sand and silt of the Masotcheni Formation.

Although rare, significant fossils have been described from the Volksrust Formation, with specific reference to trace fossils. Highly significant fossils have been recorded from the Adelaide Subgroup and Normandien Formation. The Dolerite will not contain fossils and recording of new fossils from the Masotcheni Formation will be very significant. Recording of fossils from the construction site will contribute significantly to our understanding of the palaeo-environments that existed in this part of the Karoo basin during the Permian and Quaternary.

It is expected that trenching for the pipeline will be deeper than 1,5m.

Recommendations:

1. The EAP and ECO of the project must be informed of the fact that all the geological formations, except for dolerite, will contain fossils if exposed at a depth of more than 1,5m.

2. All sections of the development where bedrock is exposed due to erosion or where geotechnical surveys indicate that trenching will exceed 1,5m in areas underlain by Very High, High and Moderate Palaeontologically Sensitive rocks must be inspected by a qualified palaeontologist as part of a Phase 1 Palaeontological Impact Assessment. The professional Palaeontologist must be appointed to record and collect the fossils according to SAHRA and AMAFA specifications as part of a Phase 1 Palaeontological Impact Assessment, preferably before construction in areas where the rocks are exposed due to erosion and also during construction when trenching exceeds 1,5m in depth.

3. These actions must form part of the EMP of the projects.

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QUALIFICATIONS AND EXPERIENCE OF THE AUTHOR

Dr Gideon Groenewald has a PhD in Geology from the University of Port Elizabeth (Nelson Mandela Metropolitan University) (1996) and the National Diploma in Nature Conservation from Technicon RSA (the University of South Africa) (1989). He specialises in research on South African Permian and Triassic sedimentology and macrofossils with an interest in biostratigraphy, and palaeo-ecological aspects. He has extensive experience in the locating of fossil material in the Karoo Supergroup and has more than 20 years of experience in locating, collecting and curating fossils, including exploration field trips in search of new localities in the southern, western, eastern and north-eastern parts of the country. His publication record includes multiple articles in internationally recognized journals. Dr Groenewald is accredited by the Palaeontological Society of Southern Africa (society member for 25 years).

DECLARATION OF INDEPENDENCE

I, Gideon Groenewald, declare that I am an independent specialist consultant and have no financial, personal or other interest in the proposed development, nor the developers or any of their subsidiaries, apart from fair remuneration for work performed in the delivery of palaeontological heritage assessment services. There are no circumstances that compromise the objectivity of my performing such work.



Dr Gideon Groenewald
Geologist