

**HERITAGE SURVEY OF THE PROPOSED ULUNDI  
BULK WATER MAIN REPLACEMENT, KWAZULU-  
NATAL**

**FOR GREEN SCENE AND ZAI CONSULTANTS**

**DATE: 8 APRIL 2019**

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## Abbreviations

HP	Historical Period
IIA	Indeterminate Iron Age
LIA	Late Iron Age
EIA	Early Iron Age
ISA	Indeterminate Stone Age
ESA	Early Stone Age
MSA	Middle Stone Age
LSA	Late Stone Age
HIA	Heritage Impact Assessment
PIA	Palaeontological Impact Assessment

## INTRODUCTION

Umlando was appointed by Green Scene and ZIA Consultants to undertake a desktop study and then a Phase 1 survey of the proposed Ulundi bulk water pipeline upgrade. A desktop was undertaken first to determine the need for further HIA investigation. An existing pipeline occurs and this will be upgraded, by building a new line ~5m from it.

Water will be pumped from the White Umfolozi to the first reservoir for 2km. From there the pipeline goes eastwards for ~6km, to a reservoir on the top of the hill at Ulundi B.

The desktop noted that the area was sensitive for human graves and palaeontological remains, as well as archaeology in general.

Fig.'s 1 – 4 show the location of the development.

FIG. 1 GENERAL LOCATION OF THE STUDY AREA



FIG. 2: AERIAL OVERVIEW OF THE STUDY AREA

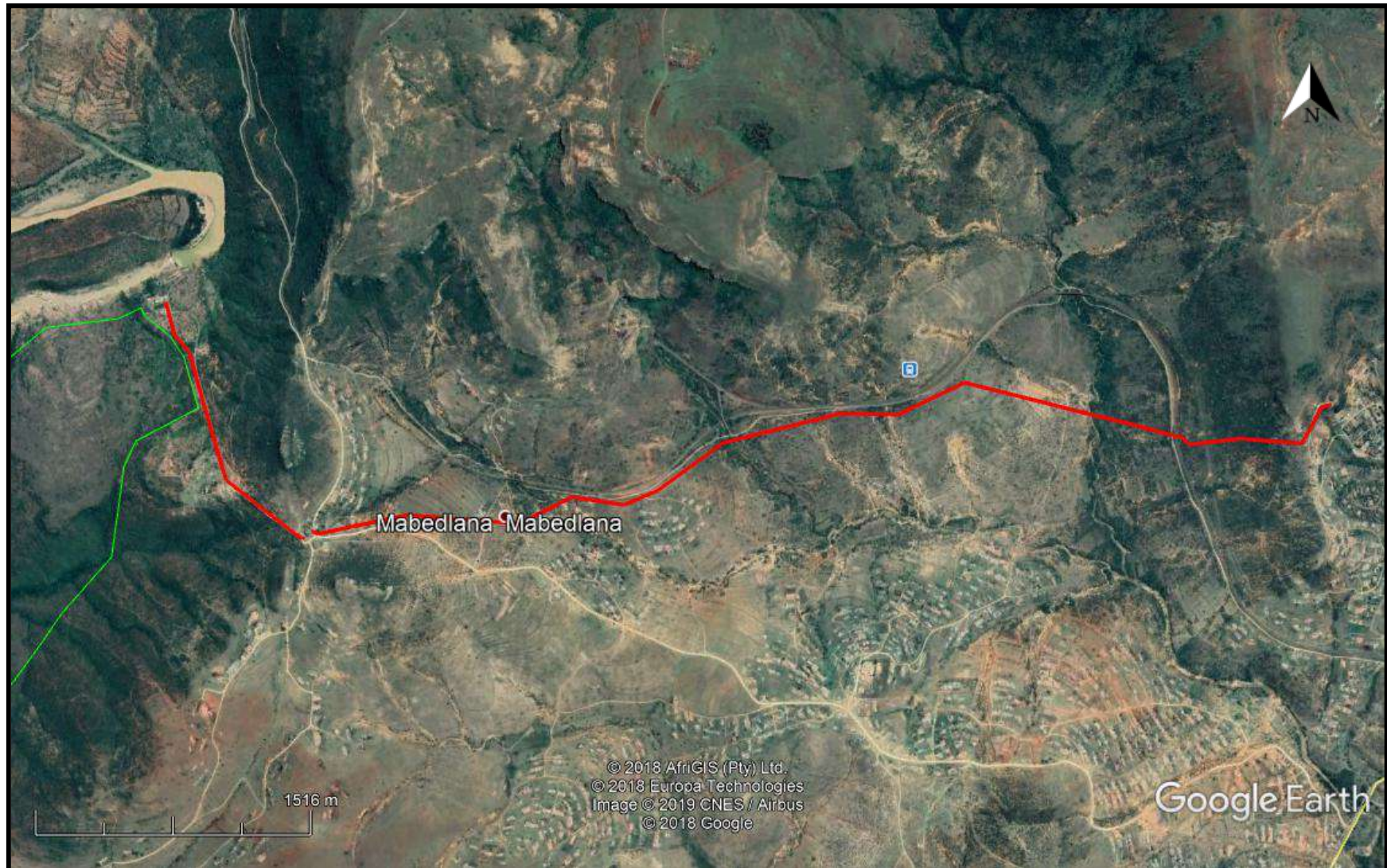


FIG. 3: TOPOGRAPHICAL OVERVIEW OF THE STUDY AREA

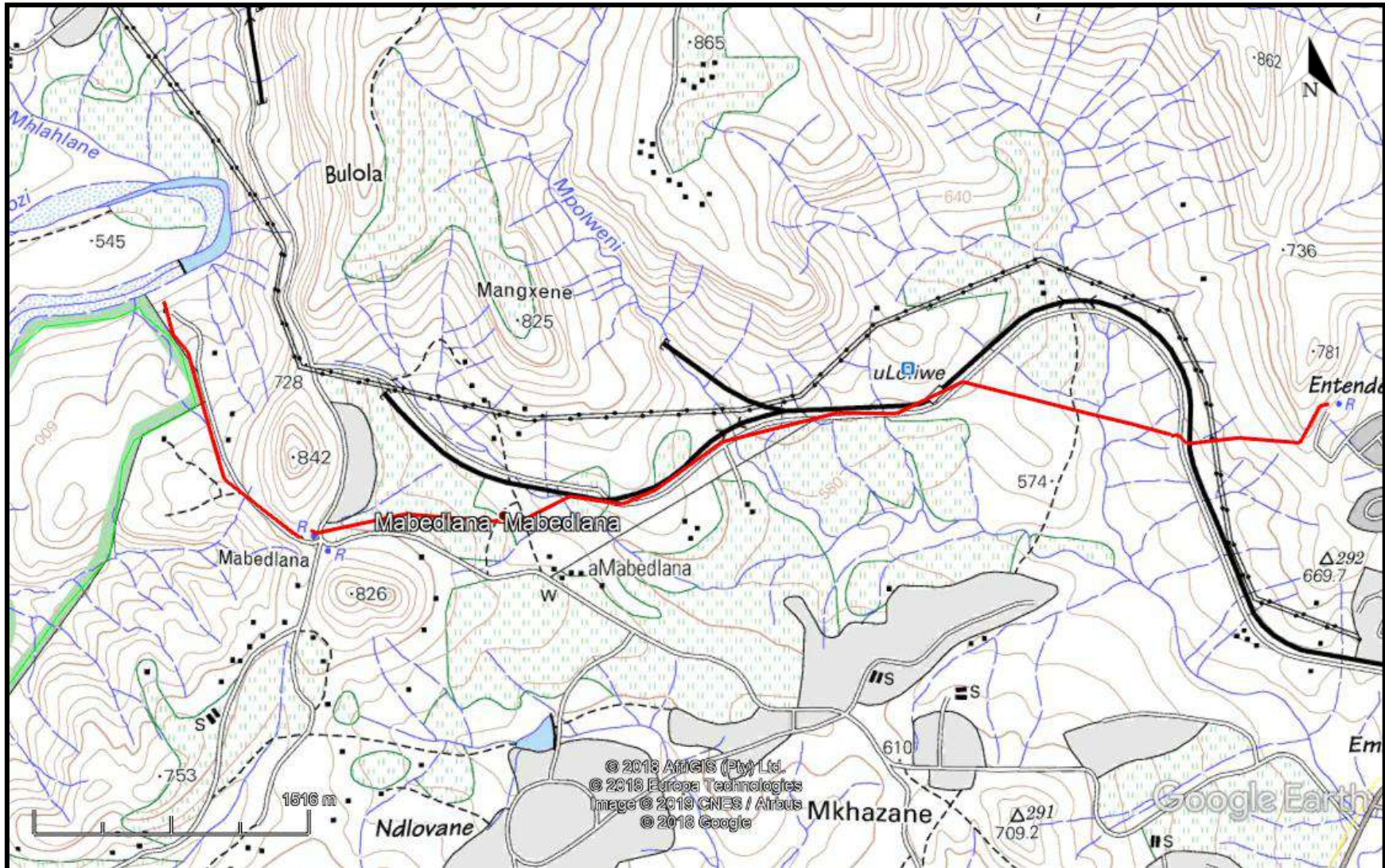


FIG. 4: SCENIC VIEWS OF THE STUDY AREA





**KWAZULU NATAL AMAFA AND RESEARCH INSTITUTE, ACT 05, 2018**

“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 1<sup>st</sup> and 2<sup>nd</sup> 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. The above significance ratings allow one to grade the site according to SAHRA's grading scale. This is summarised in Table 1.

**TABLE 1: SAHRA GRADINGS FOR HERITAGE SITES**

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

## RESULTS

### DESKTOP STUDY

The desktop study consists 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. 5). These sites include all types of Stone Age and Iron Age sites, as well as Colonial period sites. No known sites occur in the study area. This suggests that there will probably be archaeological sites or scatters of stone tools and pottery shards in the study proposed pipeline is in an archaeologically sensitive area.

No national monuments, battlefields, or historical cemeteries are known to occur in the study area.

The 1937 aerial photographs indicate that there are seven settlements within 50m of the proposed route (fig. 6). These are settlements that will have human graves. The graves are probably not clearly visible on the surface and would have sunken a bit below the surface. They would appear as piles of rocks. A 50m buffer must be placed around these areas as areas of high sensitivity with possible graves until a survey has been undertaken.

The 1968 1:50 000 topographical map indicates that there are eight settlements within 100m of the pipeline (fig. 7). These sites will also have human graves. A few graves in the servitude were reported by the engineer. Graves are dealt with below. Amafa KZN might require evidence of community consultation regarding these sites and/or possible graves along the route. The locations of these sites are given in Table 2.

The area is of medium palaeontological significance however the desktop (Appendix A) noted that no fossiliferous material will be found. No further PIA mitigation is required.

FIG. 5: LOCATION OF KNOWN HERITAGE SITES NEAR THE STUDY AREA

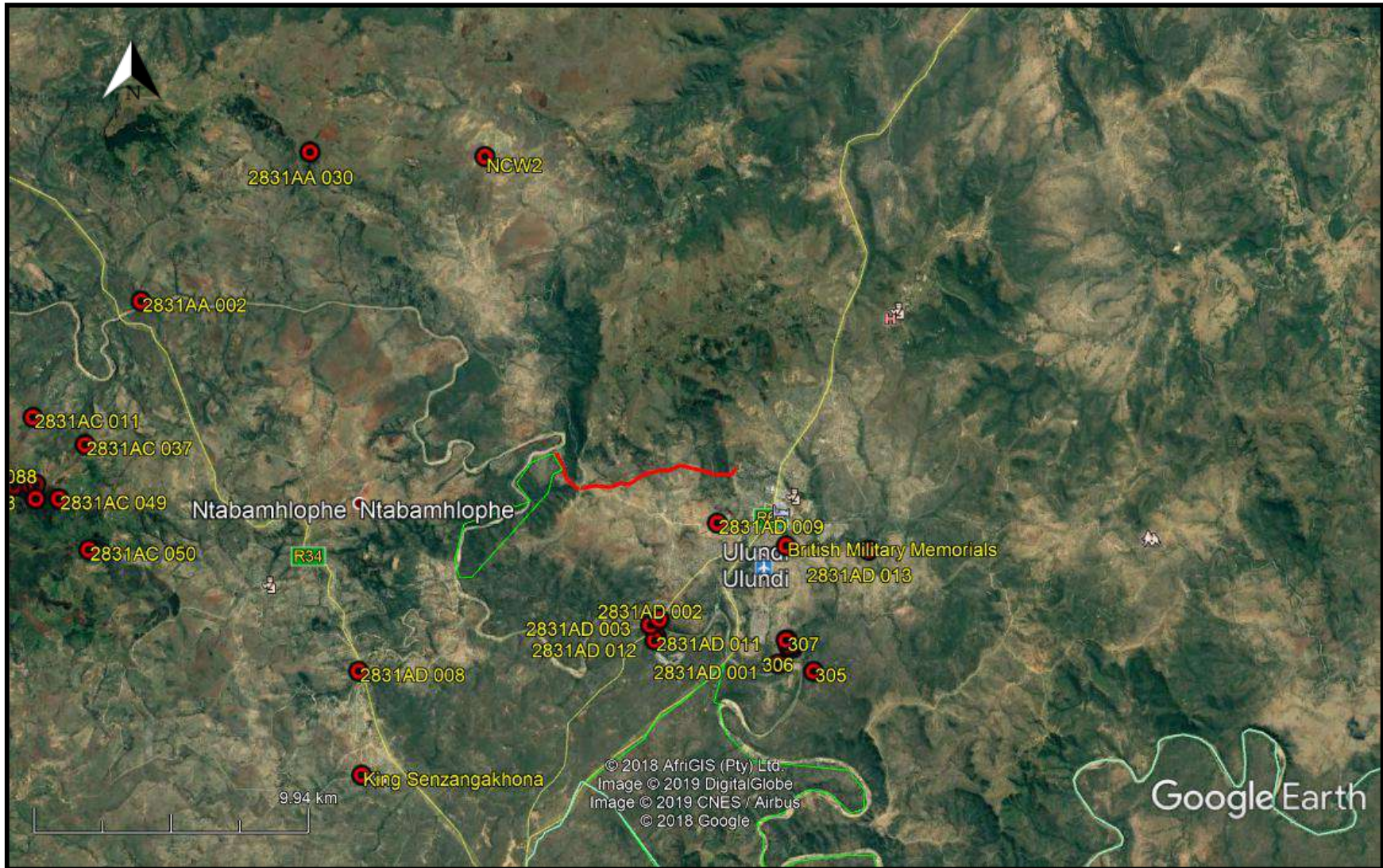




FIG. 6: STUDY AREA IN 1937



FIG. 7: STUDY AREA IN 1968

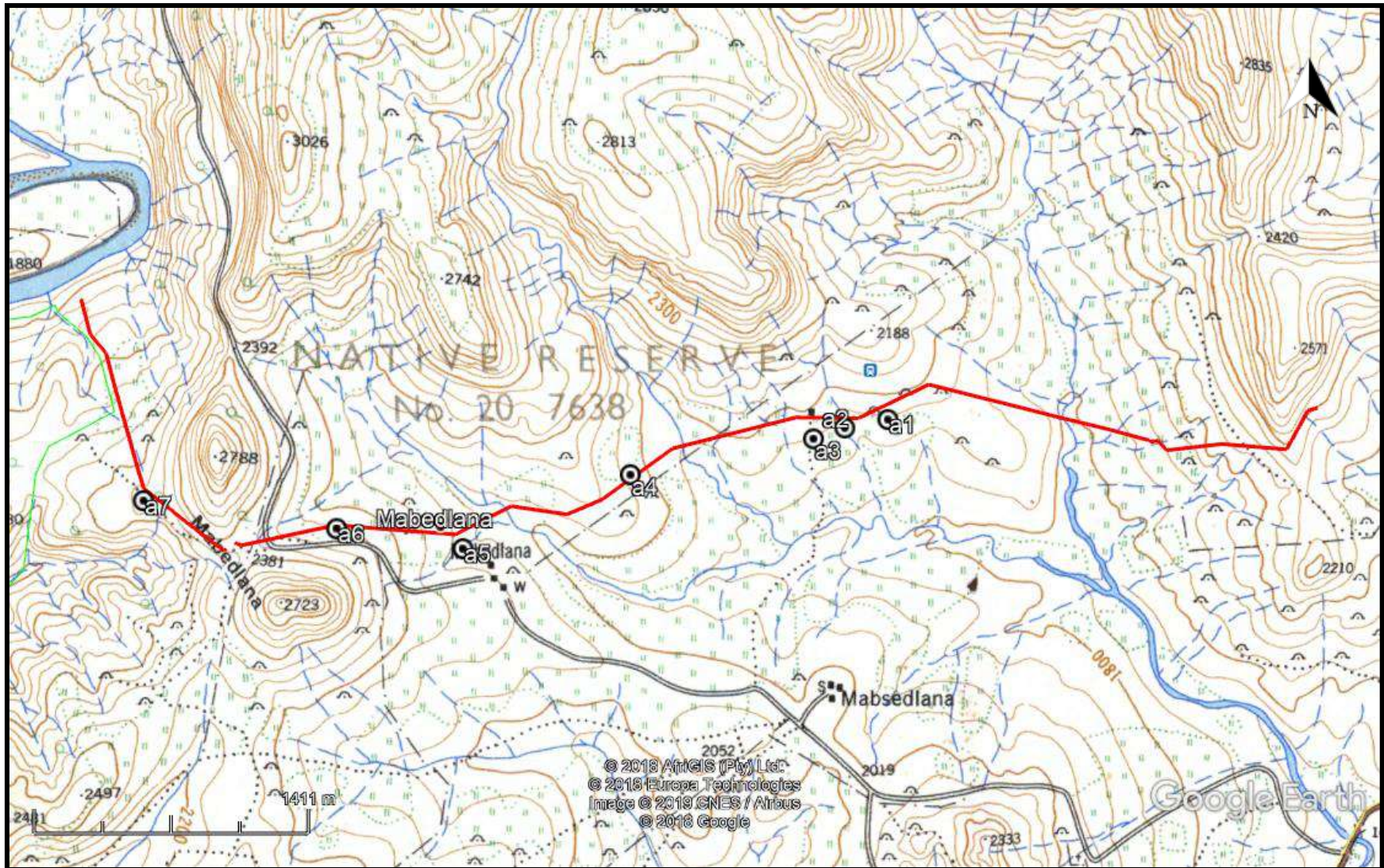
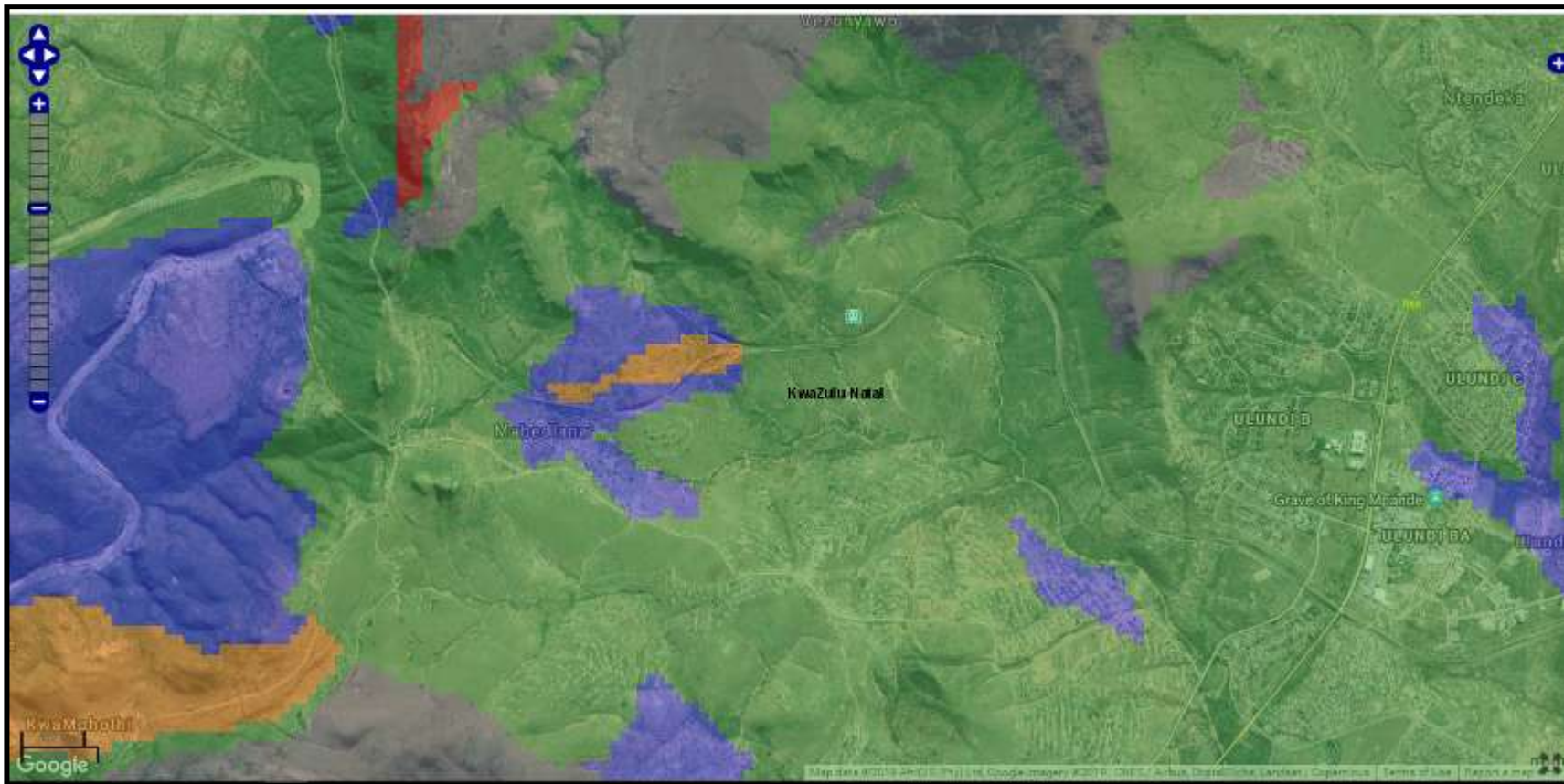


FIG. 8: PALAEOLOGICAL IMPACT ASSESSMENT



COLOUR	SENSITIVITY	REQUIRED ACTION
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

**TABLE 2: LOCATION OF SETTLEMENTS FROM THE DESKTOP STUDY**

<b>name</b>	<b>latitude</b>	<b>longitude</b>	<b>Map date reference</b>
<b>a1</b>	-28.287270635	31.384143519	1937
<b>a2</b>	-28.287669912	31.381796796	1937
<b>a3</b>	-28.288190923	31.380098475	1937
<b>a4</b>	-28.289901276	31.370167613	1937
<b>a5</b>	-28.293410239	31.361144468	1937
<b>a6</b>	-28.292427458	31.354475298	1937
<b>a7</b>	-28.291108421	31.344158446	1937
<b>b1</b>	-28.287011625	31.379936495	1969
<b>g1?</b>	-28.288362692	31.373663105	2018
<b>g2</b>	-28.292558231	31.357681326	2018
<b>g3</b>	-28.293218612	31.349559291	2018
<b>h1</b>	-28.292611717	31.358362027	1969
<b>h2</b>	-28.291851445	31.369772802	1969
<b>h3</b>	-28.290931620	31.371207343	1969
<b>h4</b>	-28.286899972	31.383259491	1969
<b>h5</b>	-28.286110979	31.385021760	1969
<b>h6</b>	-28.286113819	31.387087557	1969
<b>h7</b>	-28.289429886	31.400449448	1969
<b>h8</b>	-28.288195205	31.400278749	1969

### FIELD SURVEY

A field survey was undertaken on 22 March 2018. Much of the line occurs in dense vegetation along the eastern side resulting in poor visibility. The central part of the line tends to occur in very eroded areas. The new line occurs ~5m from the existing line.

All areas identified in the desktop study that occurred within 50 of the pipeline were visited. Only one of these sites had evidence of settlements: this is A6. The rest are either in erosion gullies, agricultural fields are affected by the previous pipeline or current railroad (and servitudes).

Two cemeteries were identified by the company previously and I will retain their naming: Graves 1 and 2. The location of recorded sites is shown in Fig. 9 and listed in Table 3.

FIG. 9: LOCATION OF RECORDED SITES



Middle and Late Stone Age tools occur throughout the area on the surface. All of these are in a secondary context and are of no significance.

**TABLE 3: LOCATION OF RECORDED SITES**

NAME	LATITUDE	LONGITUDE
<b>Graves 1</b>	-28.287270635	31.384143519
<b>Graves 2</b>	-28.287669912	31.381796796
<b>E. ingens 1</b>	-28.288190923	31.380098475
<b>E. ingens 2</b>	-28.284145	31.341891
<b>Walling</b>	-28.289901276	31.370167613

### **Graves 1**

Graves 1 is located ~300m east of the two main reservoirs. The cemetery consists of four graves of which appear to be relatively recent (fig. 10). The graves are raised rectangular cairns and rest in a roughly north-south orientation. Slightly uphill from the graves is a large erosion gully that was temporarily fixed with boulders and fencing. We were not sure if this was to preserve the existing pipe.

The graves are currently ~13m from the centre point of the line.

**Significance:** The graves are of high significance.

**Mitigation:** The graves should not be affected by the pipeline. There needs to be a 20m buffer between the edge of the grave and the edge of the pipeline footprint. If the pipeline occurs within 50m of the graves then the graves need to be clearly demarcated. The demarcation should be at least 5m from the edge of the grave(s). This means the pipeline will need to be aligned as close as possible to the road or be moved further north.

FIG. 10: BURIALS AT GRAVE 1



## Grave 2

Grave 2 occurs ~200m east of Grave 1. This area is also that of the site A6 from the desktop study. The cemetery consists of 20+ graves of various ages and degrees of preservation. Some of the older graves have sunken into the ground leaving a small flat cairn. The site has been used for some time and we suspect that it extends further to the west with possible older graves (Fig. 11). The cemetery is encircled by a fence that covers more than just the graves.

Inside the cemetery, at the southeast corner is a large boulder and syringa tree. This area has been used for some time either in a domestic situation (i.e. for settlement A6) and for activities related to the cemetery. A range of artefacts are found around the boulder, these include recent beer bottles, as well as bottles with oxidised silica and a fragment of a white glass container used for general medicinal creams. The boulder, but not the tree, is visible in the 1937 aerial photograph. These containers tend to date to the first half of the 20<sup>th</sup> century. There are enamel bowls between the tree and the boulder. The syringa tree is itself more than 50 years in age. Fig. 12 shows some of these items.

**Significance:** The graves are of high significance.

**Mitigation:** The graves should not be affected by the pipeline. There needs to be a 20m buffer between the edge of the grave and the edge of the pipeline footprint. If the pipeline occurs within 50m of the graves then the graves need to be clearly demarcated. The demarcation should be at least 5m from the edge of the grave(s). This means the pipeline will need to be aligned as close as possible to the road or be moved further north.

I would suggest the pipeline is moved closer to the road as it will then be between the road and the outer fence of the cemetery, or as near to the road as possible.



FIG. 11: GRAVES AT GRAVE 2



FIG. 12: ARTEFACTS AROUND BOULDER AT ENTRANCE



## E. ingens

The *Euphorbia ingens*, *umhlonhlo*, or *naaldeboom* has been associated with human graves for at least the Historical Period to mid 20<sup>th</sup> century. Solitary large *E. ingens* on the landscape are probably old human graves. One was located between Grave 1 and Grave 2 (fig. 13). Several *E. ingens* are located on the eastern hills leading to the White Umfolozi and these appear to be naturally occurring. However, all old/large *E. ingens* should be treated as potential graves with the same mitigation and buffering.

**FIG. 13: E. INGENS ALONG THE PIPELINE ROUTE**



## Walling

Only one small stone walled feature was noted along the pipeline route. This occurred near the western end of the line. The wall appears to be recent in origin and is associated with a concrete floor ~5m away (fig. 14). Part of the wall is made with tar from a road.

**Significance:** The walling is of no significance.

**Mitigation:** No mitigation is required.

**FIG. 14: STONE WALLING AND FLOOR**



## MANAGEMENT PLAN

The two cemeteries need similar management plans. All cemeteries need at least a 20m buffer between the edge of the footprint and the edge of the outer grave. If development occurs within 50m of the grave/cemetery, then it needs to be visibly demarcated during construction time. The 20 m buffer is used as there are often unmarked graves in these areas. The 5m buffer around the grave is due to the fact that the remains often slump several years after burial.

The initial field survey findings were submitted to the client for discussion. An additional Option for the pipeline route was discussed. Option 1 (orange) is the proposed route, while Option 2 (white) is a revised route (fig. 15). Option 2 has moved further from the cemeteries and will have less impact. Option 1 might be preferable due to technical and design issues. I would support Option 2, however, if Option 1 is chosen then the following needs to occur.

Having said the above, the 20m can be made smaller in special circumstances, and requires a bit of give and take from all parties. Option 1 is to the south of existing line and it will be very close to Graves 2, whereas Graves 1 will be buffered by the existing pipe. The following is required for Option 1:

- Community approval, in writing, that the pipeline can come closer to the cemeteries.
- the footprint in the vicinity of the cemetery is decreased to the absolute minimum. That means ground leveling, etc does not go the 15m width of the footprint and the depth of the leveling is also as little as possible. 300mm should be sufficient.
- All HME is kept to the opposite side of the cemetery
- The cemetery buffer is clearly demarcated and someone is placed as a point's person during construction.
- A qualified archaeologist is on site to monitor all earthmoving activity in the two areas. This person will have the right to stop excavations if human remains are uncovered, or to stop and assess and verify any bone material

Option 2 will probably require community permission to pass through the entrance of the cemetery. The syringa tree, while an alien invasive, has cultural significance and may not be removed unless discussed with the community and/or Amafa.

**FIG. 15: OPTIONS 1 AND 2 FOR THE PIPELINE ROUTE<sup>1</sup>**



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<sup>1</sup> Option 1 = orange; Option 2 = white

## CONCLUSION

A desktop and field heritage survey was undertaken for the proposed Ulundi Bulk Water pipeline upgrade. The desktop noted that the area had palaeontological and archaeological sensitivity. Moreover, known graves occur near the pipeline. The field survey confirmed the presence of the graves and that the pipeline occurred very near both cemeteries.

After discussions with the client an Option 2 route was suggested. Option 2 will require permission from the community to pass through the entrance to the cemetery. Option 1 will require permission from Amafa and the community to build near the cemetery. In addition to that there would be footprint width restrictions near the cemeteries. Both cemeteries will require on site monitoring during contraction activity.

THE PIA desktop noted that the area is of medium palaeontological sensitivity. However, fossiliferous material is not expected to occur along the pipeline route. No further PIA mitigation is required.

## REFERENCES

117C of 1 Flight path 11, photos 06341 – 06343

117C of 1 Flight path 13, photos 06566 - 06568

2831AD Ulundi 1968, 1999

KwaZulu-Natal Museum Site Record Database

SAHRIS Database

Umlando Database

### **EXPERIENCE OF THE HERITAGE CONSULTANT**

Gavin Anderson has a M. Phil (in archaeology and social psychology) degree from the University of Cape Town. Gavin has been working as a professional archaeologist and heritage impact assessor since 1995. He joined the Association of Professional Archaeologists of Southern Africa in 1998 when it was formed. Gavin is rated as a Principle Investigator with expertise status in Rock Art, Stone Age and Iron Age studies. In addition to this, he was worked on both West and East Coast shell middens, Anglo-Boer War sites, and Historical Period sites.

### **DECLARATION OF INDEPENDENCE**

I, Gavin Anderson, 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 heritage assessment services. There are no circumstances that compromise the objectivity of my performing such work.

A handwritten signature in black ink, appearing to read 'G. Anderson', with a horizontal line underneath.

Gavin Anderson  
Archaeologist/Heritage Impact Assessor



**APPENDIX A  
PIA DESKTOP**

**Proposed ByPass Pipeline for Ulundi bulk water  
pipeline upgrade**

**DESKTOP PALAEOLOGY REPORT**

**FOR**

**UMLANDO: Archaeological Surveys & Heritage Management**

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**March 2019**

**EXECUTIVE SUMMARY: The proposed site is not fossiliferous.**

## PROPOSED PROJECT

### Project information

The proponent (Green Scene and ZAI consultants) wishes to lay a pipeline as part of a White Umfolosi River water transfer scheme.

Dr Alan Smith Pr. Sc. Nat was asked to conduct a desk-top Palaeontological Impact Assessment by UMLANDO: Archaeological Surveys & Heritage Management.

## LOCATION

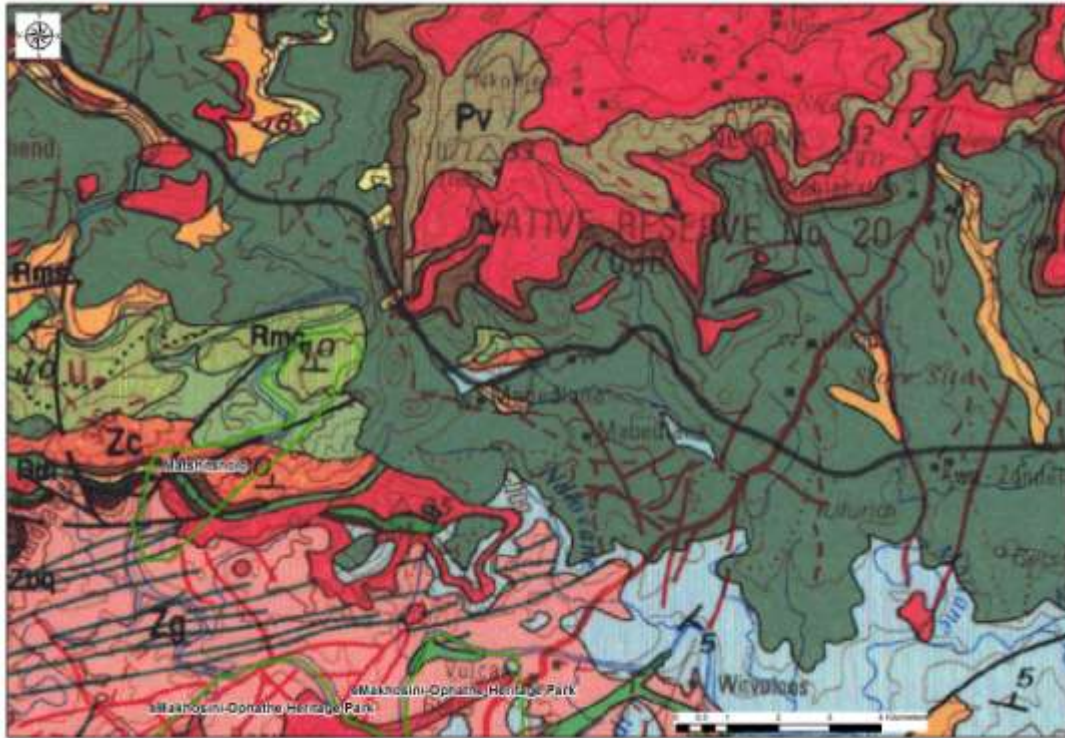
The project is situated between the White Umfolosi River and Ulundi (Figure 1).



*Figure 1: Location of the proposed White Umfolosi ByPass scheme. Image source: UMLANDO: Archaeological Surveys & Heritage Management; GoogeEarth..*

## GEOLOGY

The proposed pipeline traverses an area which is shown as green on the AMAFA sensitivity map. Inspection of the 2632 Kosi Bay 1: 250 000 geological map indicates the presence of the Dwyka Group. There is also a possibility that it could intersect patches of Natal Group Sandstone. The latter is not fossiliferous. The Dwyka Group may contain trace fossils, but no body fossils have been recorded.



*Figure 2: Extract from the 2632 Kosi Bay 1: 250 000 geological map. The Dwyka Group is grey and the Natal Group light blue.*

## CONCLUSIONS

This site is not fossiliferous so it is unnecessary to proceed further.

## REFERENCES

Kosi Bay 2632 1: 25 000 Geological Map Council for Geosciences, Pretoria.