

**HIA OF THE PHASE 2 OF THE MHLABATSHANE
BWSS, KWAZULU-NATAL**

FOR TRIPLO4

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By Gavin Anderson

**Umlando: Archaeological Surveys and Heritage
Management**

PO Box 102532, Meerensee, 3901

Phone/fax: 035-7531785 Fax: 0865445631

Cell: 0836585362



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INTRODUCTION

Umgeni Water (UW) is currently implementing Phase 1 of the Mhlabatshane BWSS as part of a larger Regional Scheme development by Ugu District Municipality (OM). This scheme is aimed at reducing water service backlogs in certain rural areas in the Umzumbhe and Hibiscus Coast Local Municipalities. The first phase included the construction of the Mhlabatshane dam, raw and potable water pipelines, a water treatment works and reservoirs. To date, the construction of the dam bulk pipelines has been completed while that of the water treatment works and reservoirs are in progress.

Phase 2 of the Mhlabatshane BWSS is currently being investigated by the Planning Services Department for implementation to meet the future demand requirements of the area. The second phase of the project comprises a proposed weir and pipeline from the Umzimkhulu River to the water treatment plant. Water will be abstracted directly from the Umzimkulu River, pumped to the existing Water Treatment Works (which will need to be upgraded) and then fed into the reticulation system via an existing command reservoir. The construction of the Mhlabatshane Dam has been designed to supply a maximum of 4MI/day and a further 8MI/day can be augmented from the Umzimkulu River. Raw water from the Umzimkulu River along with the 4MI/d from the Mhlabatshane Dam will be treated at the existing water treatment works currently 4MI/d, to be upgraded to 8MI/d. The following infrastructure is envisaged for the Mhlabatshane Phase 2 Project:

- oA River abstraction works and weir on the Umzimkhulu River
- oA pipeline to a sand trap
- oA desilting mechanism
- oA pressurised pipeline to the WTW
- oA high lift pump station
- oStorage at the WTW
- oUpgrading of the WTW from 4MI/d to 8MI/d

The original HIA survey was undertaken by Umlando in August 2014 (Anderson 2104). Subsequent to this survey, the pipeline has been changed, and finalised. The new route was resurveyed in October 2015. Thereafter the line was re-aligned as a result of the heritage survey.

Figures 1 – 3 show the location of the planned pipeline. The proposed BWSS is mostly located adjacent to existing roads. In some instances the pipeline will go through existing maize fields. These roads and fields occur at the top of the hills above the Umzimkulu River. When the pipeline descends into the Umzimkulu River Valley, it is often through dense vegetation and at times steep slopes.

Figure 4 shows some of the BWSS routes.

FIG. 1 GENERAL LOCATION OF THE STUDY AREA

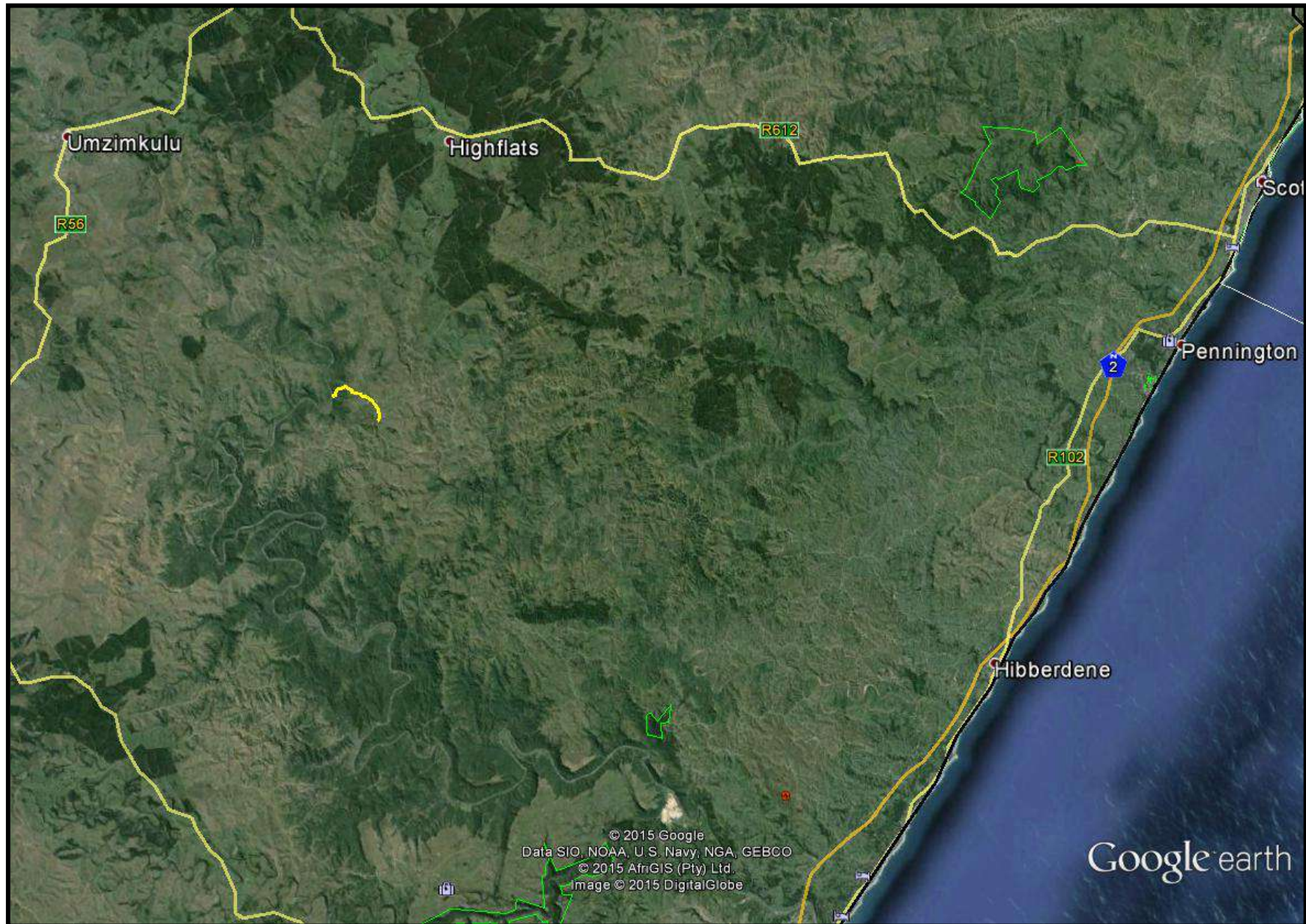


FIG. 2: AERIAL OVERVIEW OF THE STUDY AREA

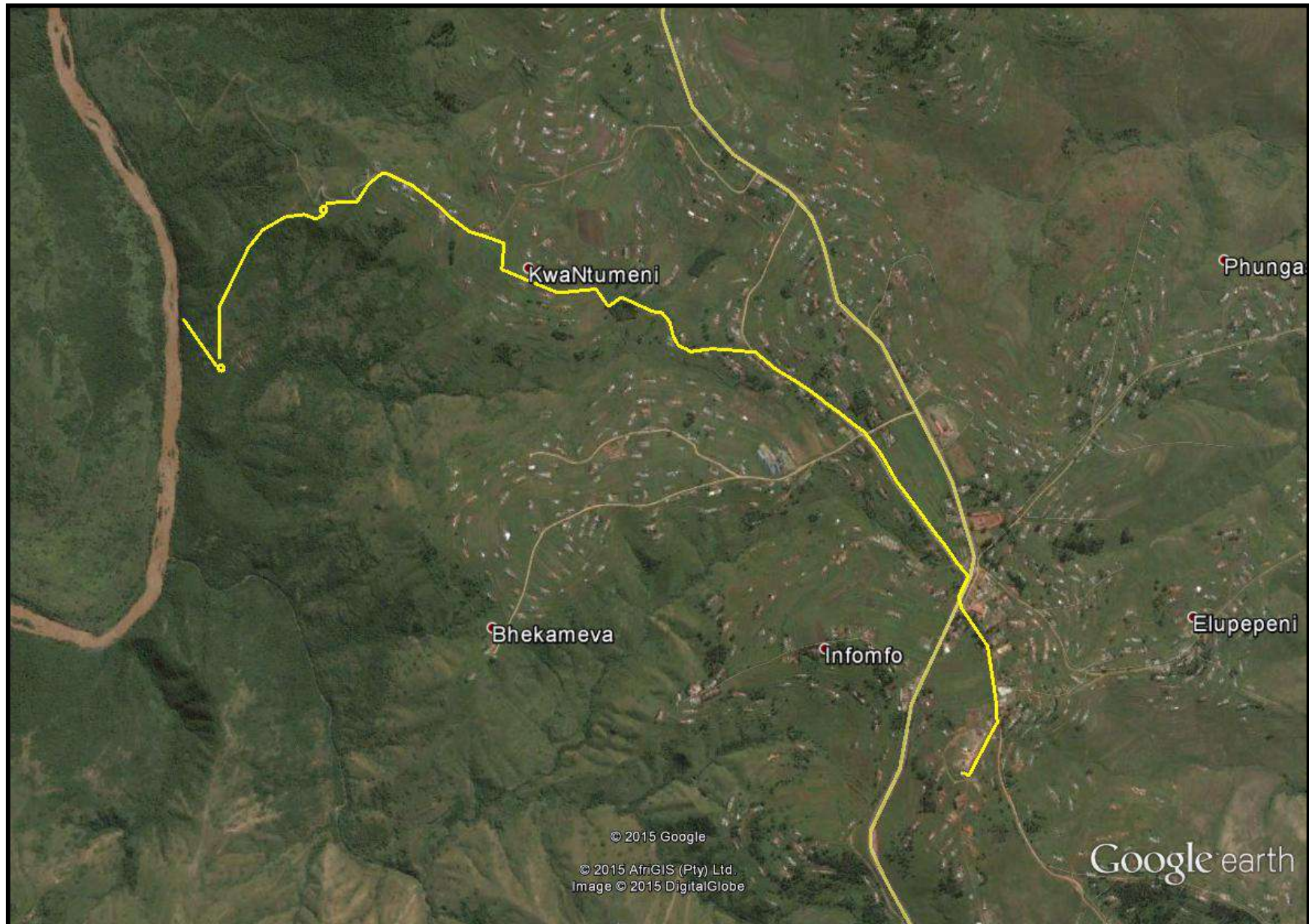


FIG. 3: TOPOGRAPHICAL OVERVIEW OF THE STUDY AREA

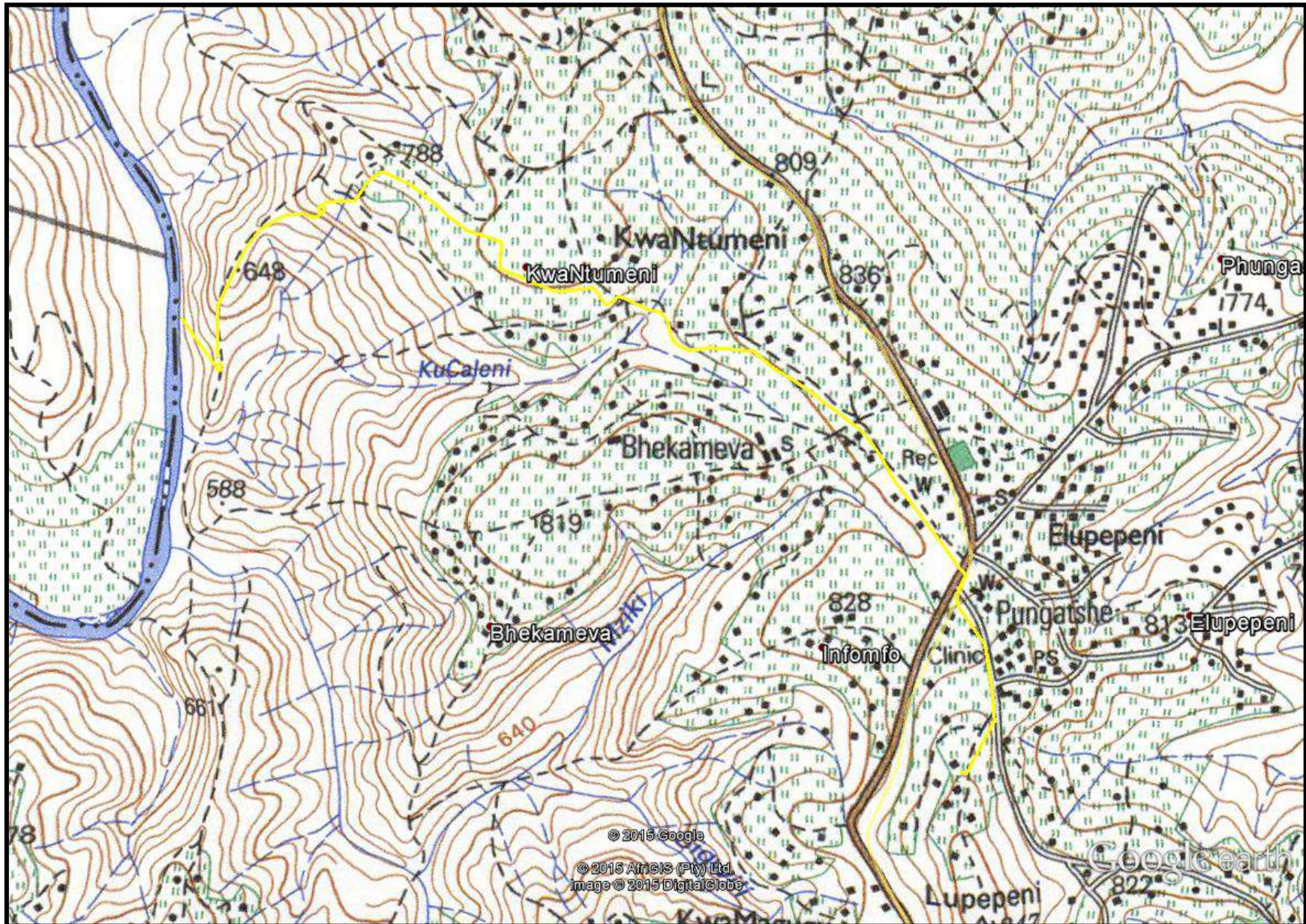


FIG. 4: SCENIC VIEWS OF THE PIPELINE ROUTE



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.

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. No sites occur in the study area.

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

The 1937 aerial photographs indicate that there is an extensive settlement of rural farms near the route (Fig. 6). By 1968, there are more houses along the route and the track has been made into a dirt road (Fig. 7).

FIG. 4: LOCATION OF KNOWN HERITAGE SITES NEAR THE STUDY AREA



FIG. 6: STUDY AREA IN 1937

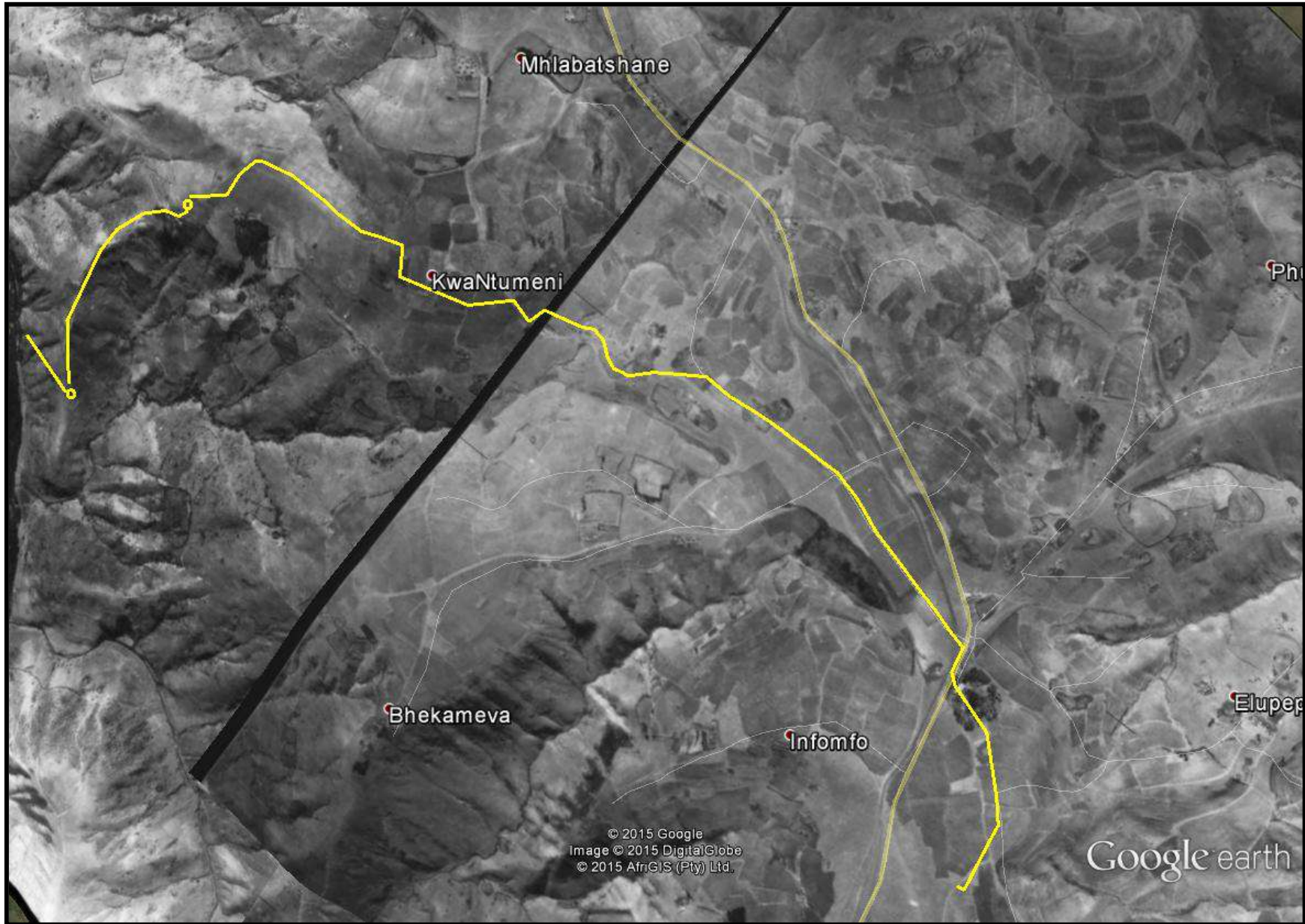
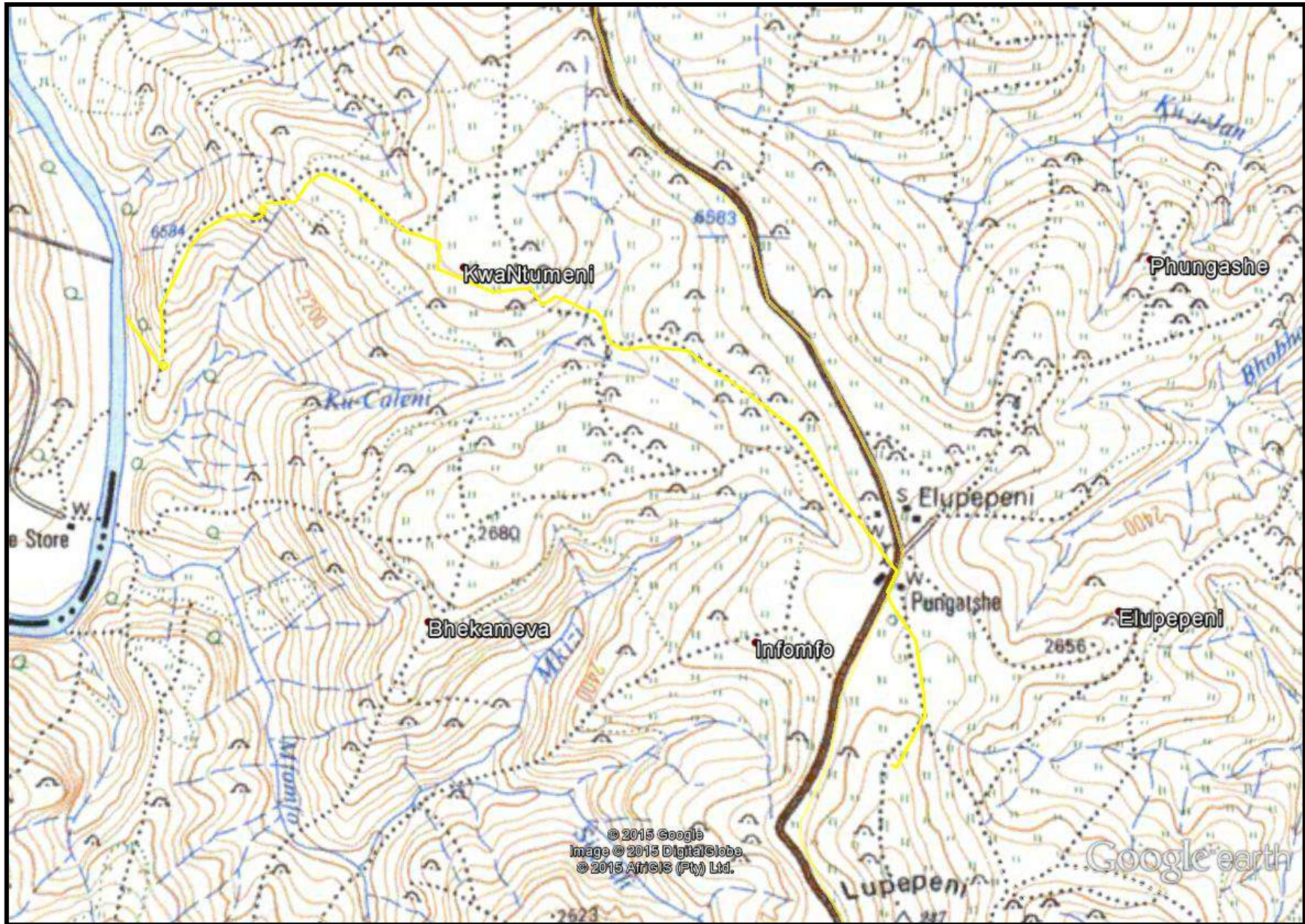


FIG. 7: STUDY AREA IN 1968



FIELD SURVEY

The field survey was undertaken in September 2015. Parts of the line surveyed occurred had been subsequently changed after the survey was completed (Fig. 8). The survey was undertaken with the surveyor so that sensitive areas could be mapped directly and feedback given to the engineers for line re-alignment.

Table 1 lists the locations of the sites.

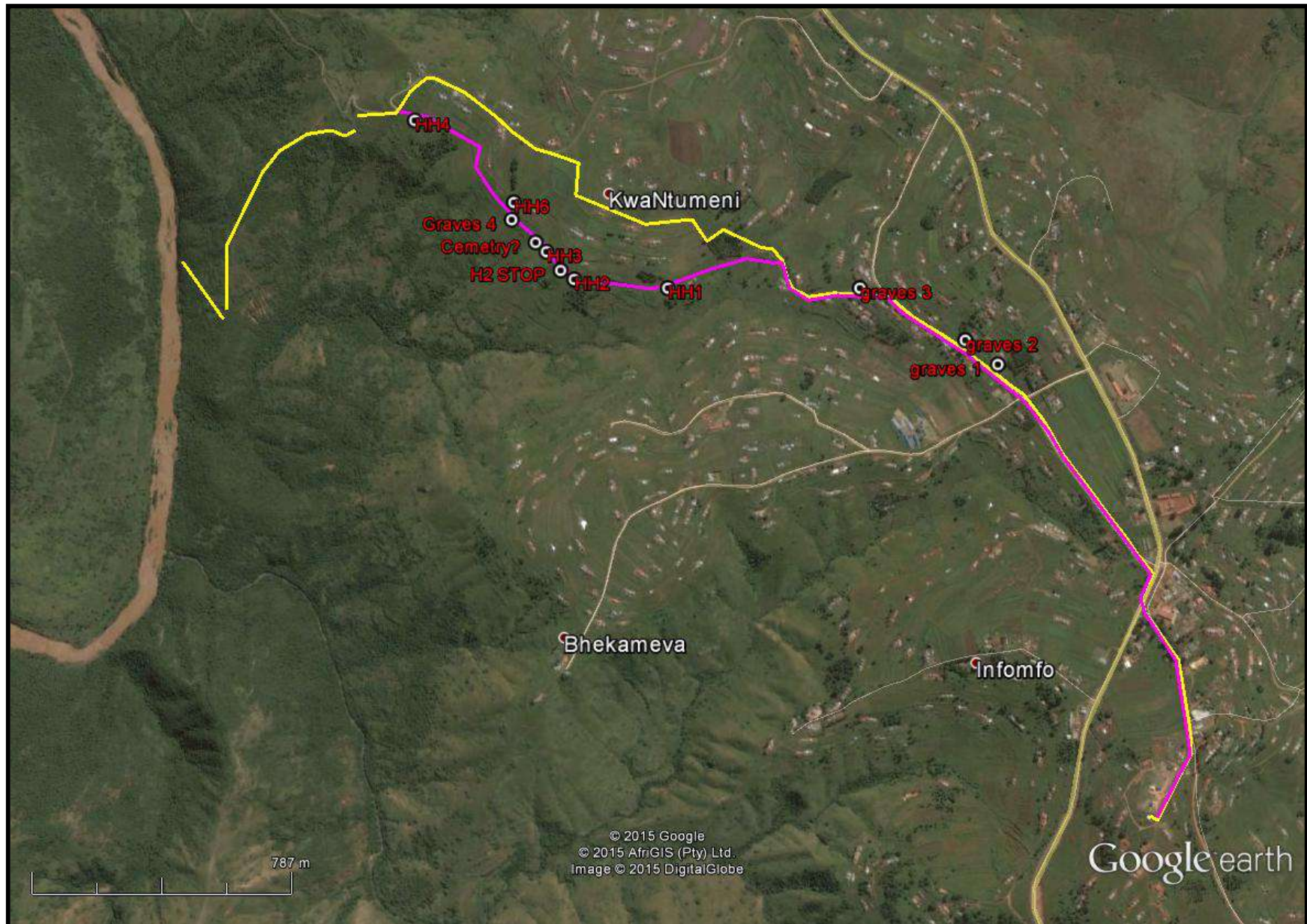
TABLE 1: LOCATIONS OF RECORDED SITES

Name	Latitude	Longitude	Distance From Centre Point
Grave 1	-30.417362062	30.146664730	28m
Grave 2	-30.416702779	30.145641331	28m
Grave 3	-30.415268671	30.142348372	21m
Graves 4	-30.413354000	30.131311000	>50m, not affected
HH1	-30.415239000	30.136280000	>50m, not affected
HH2	-30.414997000	30.133302000	>50m, not affected
HH2 end	-30.414751000	30.132873000	>50m, not affected
HH3	-30.414241000	30.132423000	>50m, not affected
HH4	-30.410617000	30.128215000	>50m, not affected
HH6	-30.412898000	30.131393000	>50m, not affected
Cemetery?	-30.413981000	30.132074000	>50m, not affected

Visibility along the route was very good. Much of the new line route occurs in areas disturbed by road and agricultural activity.

A development footprint of 20m in width is envisaged.

FIG. 8: LINE ROUTES AND RECORDED SITES¹



¹ Yellow = new line; pink = surveyed line

GRAVE 1

Grave 1 is located within a settlement that is fenced off from the road. There is a solitary recent grave in a northeast-southwest alignment (Fig. 9). This grave occurs ~28m from the line centre point.

Significance: The grave is of high significance.

Mitigation: Normally a 20m buffer is required between a grave and a development. Either the line must move to the southern side of the road, the footprint be decreased to 8m, or permission would be required to impact on this buffer zone. I would suggest decreasing the footprint width.

SAHRA Rating: 3A

FIG. 9: SITE AT GRAVE 1



GRAVE 2

Grave 2 is located within a settlement that is fenced off from the road. There is a solitary recent grave in a northeast-southwest alignment located between the house and the maize field (Fig. 10). This grave occurs ~28m from the line centre point.

Significance: The grave is of high significance.

Mitigation: Normally a 20m buffer is required between a grave and a development. Either the line must move to the southern side of the road, the footprint be decreased to 8m, or permission would be required to impact on this buffer zone. I would suggest decreasing the footprint width.

SAHRA Rating: 3A

FIG. 10: SITE AT GRAVE 2



GRAVE 3

Grave 3 is located within a settlement that is fenced off from the road. There is a solitary recent grave in a northeast-southwest alignment (Fig. 11). This grave occurs ~21m from the line centre point; however, it is on the opposite side of the road.

Significance: The grave is of high significance.

Mitigation: Normally a 20m buffer is required between a grave and a development. The road itself will act as a buffer, and thus the buffer zone should be partially omitted for this site.

SAHRA Rating: 3A

FIG. 11: SITE AT GRAVE 3



GRAVE 4

Grave 4 is located on the western side of the line and may be associated with HH6. The site consists of at least two graves underneath a bush on the slopes of the hill (Fig. 12). An informant from the nearby house stated that the graves might date to the 1980s and the descendants have moved nearby. There is another set of graves ~40m northeast of these graves. These latter graves are associated with the existing settlement.

The line route has been moved >50m from the graves.

Significance: The graves are of high significance.

Mitigation: No mitigation is currently required.

SAHRA Rating: 3A

FIG. 12: SITE AT GRAVE 4



HH1

HH1 occurs on the slopes of the hill. The site consists of an old settlement that is ~100m long and 20m wide (Fig. 13). Several raised house floors still occur, but nor graves were directly visible. The site occurs on the 1968 topographical map.

The line has been moved >50m uphill from the site

Significance: Site is of low significance unless graves occur.

Mitigation: No mitigation is currently required.

SAHRA Rating: 3C

FIG. 13: SETTLEMENT AT HH1



HH2

HH2 occurs on the slopes of the hill. The site consists of an old settlement that is ~50m long and 20m wide (Fig. 14). Several raised house floors still occur, but nor graves were directly visible. The site occurs on the 1968 topographical map.

The line has been moved >50m uphill from the site

Significance: Site is of low significance unless graves occur.

Mitigation: No mitigation is currently required.

SAHRA Rating: 3C

FIG. 14: SETTLEMENT AT HH2



HH3

HH3 occurs on the slopes of the hill. The site consists of an old building that could have been a General Dealer (Fig. 15). The site occurs on the 1968 topographical map. No graves are directly associated with the building.

The line has been moved >50m uphill from the site

Significance: Site is of low significance unless graves occur.

Mitigation: No mitigation is currently required.

SAHRA Rating: 3C

FIG. 15: BUILDING AT HH3



HH4

HH4 occurs on the slopes of the hill on the western side of the line. The site consists of an old settlement that is ~50m long and 20m wide (Fig. 16). Two raised house floors still occur. No graves are directly associated with the building. The site occurs on the 1968 topographical map.

The line has been moved 150m uphill from the site

Significance: Site is of low significance unless graves occur.

Mitigation: No mitigation is currently required.

SAHRA Rating: 3C

FIG. 16: SETTLEMENT AT HH2



HH6

HH6 occurs on the slopes of the hill on the western side of the line. The site consists of an old settlement that is ~50m long and 20m wide. Two raised house floors still occur. Grave 4 might be related to this settlement. The site occurs on the 1968 topographical map. No photograph was taken for this settlement due to the high grass.

The line has been moved 150m uphill from the site

Significance: Site is of low significance unless graves occur.

Mitigation: No mitigation is currently required.

SAHRA Rating: 3C

CEMETERY

Below, and 40m northwest of, HH6 is a formally demarcated area. The area has been bricked up with a low wall, and it appears to be a cemetery (Fig. 17). There are at least three mounds in the area, but no headstones.

The line has been moved 200m uphill from the site

Significance: Site is of low significance unless graves occur.

Mitigation: No mitigation is currently required.

SAHRA Rating: 3C

FIG. 17: POSSIBLE CEMNETERY NEAR HH3



PALAEONTOLOGICAL IMPACT ASSESSMENT

Most of the line is in a non-palaeontological sensitive area. The last 800m occurs in the green area of the sensitivity map (Fig. 18). Along this latter section it follows the crest of the hill, and then down a steep hill into the flood plains. I would suggest that this part of the line be exempt from a PIA due to its short distance and that the pipeline will occur a maximum of 1.5m below the surface and thus only affect already disturbed and weathered deposits.

Amafa has approved of this approach for the first report.

FIG. 18: PALAEOSENSITIVITY MAP OF THE LINE



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.

CONCLUSION

A heritage survey was undertaken for the updated proposed Mhlabatshane pipeline. There were originally three options for the first survey. However, these options were removed and a final option was given in September 2015.

Three graves were noted to occur within 30m of the proposed pipeline footprint. I suggested that two of these areas have a restricted footprint, while the last grave has a natural barrier in the form of the road.

The survey was undertaken with the land surveyor, and subsequent to this, the line was moved away from any heritage sites, or sites with potential graves.

No further HIA mitigation is required.

REFERENCES

Anderson, G. 2014. Heritage Survey Of The Mhlabatshane BWSS Phase 2. HIA Report for Triplo4.