HERITAGE IMPACT ASSESSMENT:
PROPOSED WATER PIPELINE, NQUTU MAGISTERIAL DISTRICT, KWAZULU-NATAL

Required under Section 38(8) of the National Heritage Resources Act (No. 25 of 1999)
as part of a Heritage Impact Assessment.

Report for:

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On behalf of:

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EXECUTIVE SUMMARY

ASHA Consulting (Pty) Ltd was appointed by Ecopsphere Environmental Management Services to assess the potential impacts to heritage resources that might occur through the proposed construction of a 600 mm diameter underground water pipeline from the Vant's Drift Pump Station on the Buffels River at Hlati-Dlamini to a reservoir at Nquthu. The west and east points of the project are located at S28° 14' 38" E30° 30' 51" and S28° 12' 48" E30° 39' 36" respectively and the pipeline will cross the remainder of Portion 17 of Farm Reserve No. 18 15838 and Portion 19 of Farm Reserve No. 18 15838 (Figure 2). It runs approximately parallel to an existing 400 mm water pipeline and is intended to supplement the water supply infrastructure to meet the current and medium term water needs of the community.

Much of the route has been disturbed in the past by construction of the existing adjacent pipeline and by the old road which is followed for part of the route. Nevertheless, heritage resources do occur in the area. Scattered MSA stone artefacts were seen associated with eroding areas near streams but these are of very low density and have no cultural significance. Two open, informal cemeteries and a number of graves in private areas were seen. Although lying quite close to the proposed pipeline route at times, none of these features will be directly impacted. Two historical bridges, one of sandstone and metal, the other of concrete, were also noted along the route. These will not be impacted.

It is recommended that the proposed project be allowed to continue but subject to the following recommendations:

- The graves and memorial stones at features 1, 11 and 12 must be cordoned off during construction with a minimum 5 m buffer and monitored by the ECO;
- No work, including stockpiling of excavated materials, may occur within the fenced and cordoned off areas;
- Should it become necessary to fasten the pipeline to bridges then a permit application to AMAFA will be required for this activity; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

Glossary

Background scatter: Artefacts whose spatial position is conditioned more by natural forces than by human agency.

Early Iron Age: Early farming communities dating between AD 200 and AD 900.

Early Stone Age: Period of the Stone Age extending approximately between 2 million and 200 000 years ago.

Holocene: The geological period spanning the last approximately 10-12 000 years.

Hominid: a group consisting of all modern and extinct great apes (i.e. gorillas, chimpanzees, orangutans and humans) and their ancestors.

Later Stone Age: Period of the Stone Age extending over the last approximately 20 000 years.

Late Iron Age: Early farming communities dating between AD 1300 –and AD 1840.

Middle Iron Age: Early farming communities dating between AD 900 and 1300.

Middle Stone Age: Period of the Stone Age extending approximately between 200 000 and 20 000 years ago.

Pleistocene: The geological period beginning approximately 2.5 million years ago and preceding the Holocene.

Abbreviations

APHP: Association of Professional Heritage Practitioners

ASAPA: Association of Southern African Professional Archaeologists

BA: Basic Assessment

CRM: Cultural Resources Management

ECO: Environmental Control Officer

ESA: Early Stone Age

GP: General Protection

GPS: global positioning system

HIA: Heritage Impact Assessment

KZN: KwaZulu-Natal

LSA: Later Stone Age

MSA: Middle Stone Age

NEMA: National Environmental Management Act (No. 107 of 1998)

NHRA: National Heritage Resources Act (No. 25) of 1999

SAHRA: South African Heritage Resources Agency

SAHRIS: South African Heritage Resources Information System

Contents

1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by Ecopsphere Environmental Management Services to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed construction of a 600 mm diameter underground water pipeline from the Vant's Drift Pump Station on the Buffels River at Hlati-Dlamini to a reservoir at Nquthu (Figure 1). The west and east points of the project are located at S28° 14' 38" E30° 30' 51" and S28° 12' 48" E30° 39' 36" respectively and the pipeline will cross the remainder of Portion 17 of Farm Reserve No. 18 15838 and Portion 19 of Farm Reserve No. 18 15838 (Figure 2). It runs approximately parallel to an existing 400 mm water pipeline (Figures 3 to 5) and is intended to supplement the water supply infrastructure to meet the current and medium term water needs of the community.

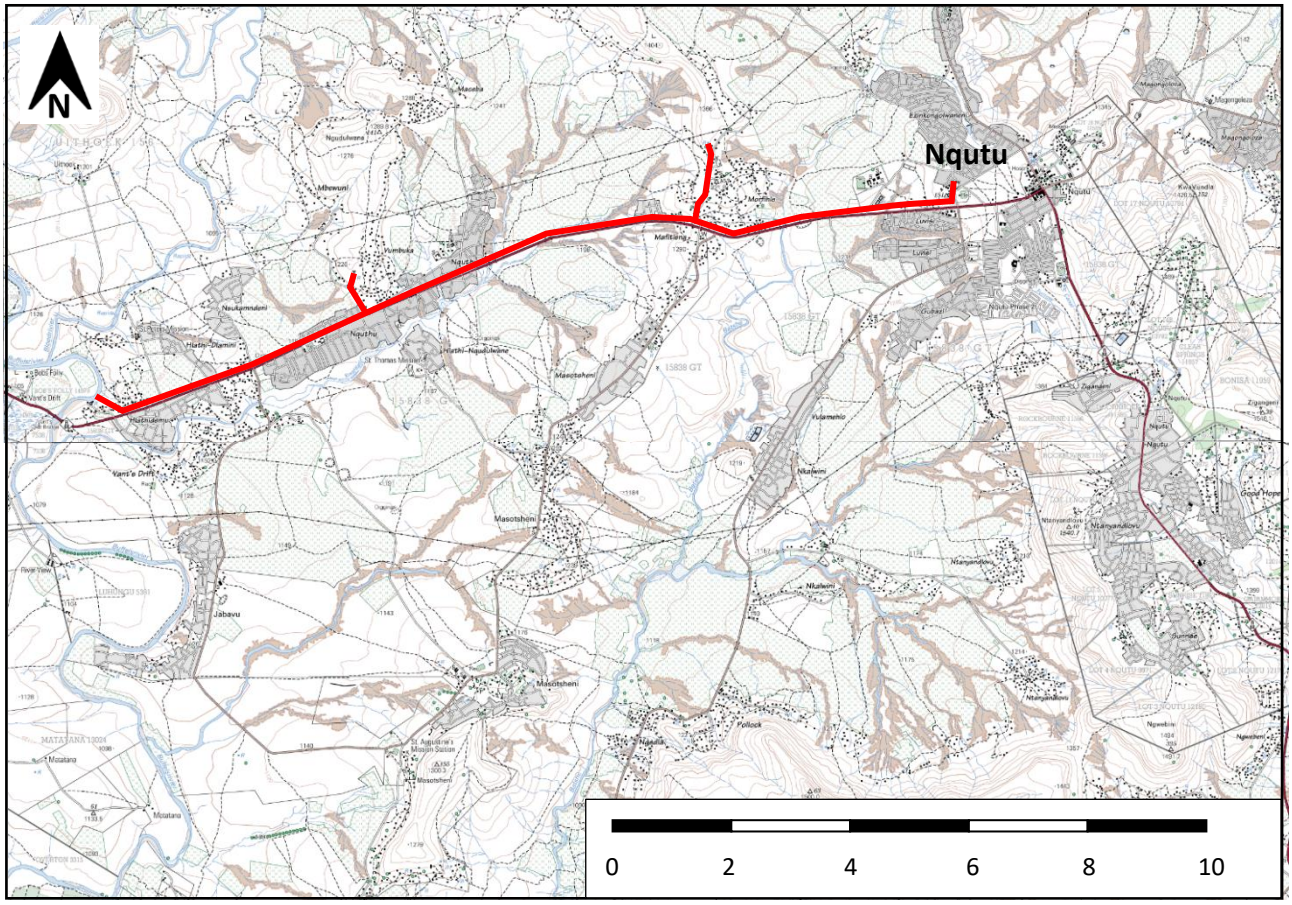

Figure 1: *Extract from 1:50 000 topographic map 2830BA & 2830BC showing the location of the existing pipeline that will be upgraded (red lines). The new line will be very close to this one. Source of basemap: Chief Directorate: National Geo-Spatial Information. Website: www.ngi.gov.za.*

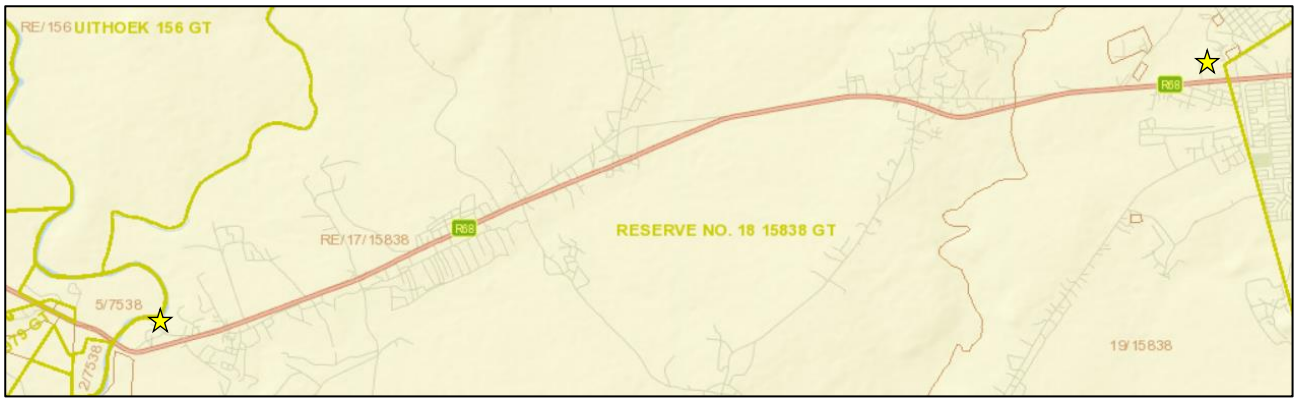

Figure 2: *Map indicating the three properties crossed by the proposed new pipeline. The two end points are shown by the yellow stars.*

Figure 3: *Western part of the study area showing the existing pipeline to be upgraded in pink and the proposed new pipeline in blue.*

Figure 4: *Central part of the study area showing the existing pipeline to be upgraded in pink and the proposed new pipeline in blue.*

Figure 5: *Eastern part of the study area showing the existing pipeline to be upgraded in pink and the proposed new pipeline in blue.*

1.1. The proposed project

1.1.1. Project description

The project is needed in order to meet the current and medium term water needs of the area. The project will comprise of three main aspects as follows:

1. The existing Vant's Drift Pump Station will be upgraded to allow for a greater capacity. This will involve the installation of three new pumps;
2. Corrosion protection measures will be applied to the existing steel rising main in order to prolong its lifetime (it is possible that certain sections may require replacement within the same trench if their condition is beyond salvation); and
3. A new 15.1 km long and 600 mm diameter ductile iron rising main pipeline will be constructed from Vant's Drift to the terminal water reservoir in Nquthu town. The pipeline will be outside of the R68 road reserve. It will need to be buried with a minimum 800 mm cover in non-trafficked areas, but all areas alongside or beneath roads will be buried with at least 1000 mm soil cover.

Several streams and rivers will be crossed. The preferred method is to trench into the stream beds and bury the pipeline below the streams. Where roads need to be crossed, a trench will be excavated across these roads. Almost all roads are gravel.

1.1.2. Identification of alternatives

No alternatives have been identified and only the preferred and No-Go options will be assessed.

1.1.3. Aspects of the project relevant to the heritage study

All aspects of the proposed development are relevant. Excavations may impact on archaeological and/or palaeontological remains, while the above-ground aspects, although temporary, create

potential visual (contextual) impacts to the cultural landscape and any significant heritage sites that might be visually sensitive.

1.2. Terms of reference

ASHA was asked to compile a heritage impact assessment (HIA) that would assess all the relevant aspects of heritage in the study area and meet the requirements of AMAFA. The study was to include a field assessment.

1.3. Scope and purpose of the report

An HIA is a means of identifying any significant heritage resources before development begins so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the fragile heritage of South Africa. This HIA report aims to fulfil the requirements of the heritage authorities such that a comment can be issued by them for consideration by the KwaZulu-Natal (KZN) Department of Economic Development, Tourism and Environmental Affairs who will review the Basic Assessment (BA) and grant or refuse authorisation. The HIA report will outline any management and/or mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of authorisation should this be granted.

1.4. The author

Dr Jayson Orton has an MA (UCT, 2004) and a D.Phil (Oxford, UK, 2013), both in archaeology, and has been conducting Heritage Impact Assessments and archaeological specialist studies in South Africa (primarily in the Western Cape and Northern Cape provinces) since 2004 (please see curriculum vitae included as Appendix 1). He has also conducted research on aspects of the Later Stone Age in these provinces and published widely on the topic. He is an accredited heritage practitioner with the Association of Professional Heritage Practitioners (APHP; Member #43) and also holds archaeological accreditation with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #233) as follows:

- Principal Investigator: Stone Age, Shell Middens & Grave Relocation; and
- Field Director: Colonial Period & Rock Art.

Jaco van der Walt has been practising as a CRM archaeologist for 20 years. He obtained an MA degree in Archaeology from the University of the Witwatersrand focussing on the Iron Age in 2012 and is a PhD candidate at the University of Johannesburg focusing on Stone Age Archaeology with specific interest in the Middle Stone Age (MSA) and Later Stone Age (LSA). Jaco is an accredited member of ASAPA (#159) and APHP (#114) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, KZN as well as the Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, DRC, Zambia, Guinea, Tanzania as well as Afghanistan. Through this, he has a sound understanding of the IFC Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage.

1.5. Declaration of independence

ASHA Consulting (Pty) Ltd and its consultants have no financial or other interest in the proposed development and will derive no benefits other than fair remuneration for consulting services provided.

2. LEGISLATIVE CONTEXT

Section 34 of the National Heritage Resources Act (NHRA) and Section 37 of the Kwazulu-Natal AMAFA and Research Institute Act deal with structures that are older than 60 years. Section 35(4) of the NHRA deals with archaeology, palaeontology and meteorites as does Section 40 of the KZN Heritage Act. Section 36 of the NHRA and Section 38 and 39 of the KZN Act, deal with human remains older than 60 years. Unidentified/unknown graves are also handled as older than 60 years until proven otherwise.

Following Section 2 of the NHRA, the definitions applicable to the above protections are as follows:

- Structures: "any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith";
- Palaeontological material: "any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace";
- Archaeological material: a) "material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures"; b) "rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation"; c) "wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation"; and d) "features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found";
- Grave: "means a place of interment and includes the contents, headstone or other marker of such a place and any other structure on or associated with such place"; and
- Public monuments and memorials: "all monuments and memorials a) "erected on land belonging to any branch of central, provincial or local government, or on land belonging to any organisation funded by or established in terms of the legislation of such a branch of government"; or b) "which were paid for by public subscription, government funds, or a public-spirited or military organisation, and are on land belonging to any private individual."

Section 3(3) of the NHRA describes the types of cultural significance that a place or object might have in order to be considered part of the national estate. These are as follows:

a) its importance in the community, or pattern of South Africa's history;

b) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
c) its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
d) its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
f) its importance in demonstrating a high degree of creative or technical achievement at a particular period;
g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
h) its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
i) sites of significance relating to the history of slavery in South Africa.

While landscapes with cultural significance do not have a dedicated Section in the NHRA, they are protected under the definition of the National Estate (Section 3). Section 3(2)(c) and (d) list "historical settlements and townscapes" and "landscapes and natural features of cultural significance" as part of the National Estate. Furthermore, some of the points in Section 3(3) speak directly to cultural landscapes.

Section 38(8) of the NHRA and Section 41(8) of the KZN Act state that if an impact assessment is required under any legislation other than those Acts then it must include a heritage component that satisfies the requirements of S.38(3). Furthermore, the comments of the relevant heritage authority must be sought and considered by the consenting authority prior to the issuing of a decision. Under the National Environmental Management Act (No. 107 of 1998; NEMA), as amended, the project is subject to an BA. The present report provides the heritage component. AMAFA is required to provide comment on the proposed project in order to facilitate final decision making by the KZN Department of Economic Development, Tourism and Environmental Affairs.

3. METHODS

3.1. Literature survey and information sources

A survey of available literature was carried out to assess the general heritage context into which the development would be set. The information sources used in this report are presented in Table 1. Data were also collected via a field survey.

Table 1: *Information sources used in this assessment.*

Data / Information	Source	Date	Type	Description
Maps	Chief Directorate: National Geo-Spatial Information	Various	Spatial	Historical and current 1:50 000 topographic maps of the study area and immediate surrounds

Aerial photographs	Chief Directorate: National Geo-Spatial Information	Various	Spatial	Historical aerial photography of the study area and immediate surrounds
Aerial photographs	Google Earth	Various	Spatial	Recent and historical aerial photography of the study area and immediate surrounds
Cadastral data	Chief Directorate: National Geo-Spatial Information	Various	Survey diagrams	Historical and current survey diagrams, property survey and registration dates
Background data	South African Heritage Resources Information System (SAHRIS)	Various	Reports	Previous impact assessments for any developments in the vicinity of the study area
Palaeontological sensitivity	South African Heritage Resources Information System (SAHRIS)	Current	Spatial	Map showing palaeontological sensitivity and required actions based on the sensitivity.
Background data	Books, journals, websites	Various	Books, journals, websites	Historical and current literature describing the study area and any relevant aspects of cultural heritage.

3.2. Field survey

The site was subjected to a detailed foot survey on 30th March 2021. This was during autumn. Recent seasonal rains had resulted in good grass growth but, given the generally disturbed surface of the study area, the vegetation cover, this was not an issue. The season thus made no meaningful difference to the assessment. Other heritage resources are not affected by seasonality. During the survey the positions of finds and survey tracks (see appendix 2) were recorded on a hand-held Global Positioning System (GPS) receiver set to the WGS84 datum. Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the proposed development.

It should be noted that amount of time between the dates of the field inspection and final report do not materially affect the outcome of the report.

3.3. Specialist studies

Given the high palaeontological sensitivity of parts of the study area, a specialist palaeontological assessment was commissioned. This was conducted by Dr Marion Bamford

3.4. Grading

S.7(1) of the NHRA provides for the grading of heritage resources into those of National (Grade I), Provincial (Grade II) and Local (Grade III) significance. Grading is intended to allow for the identification of the appropriate level of management for any given heritage resource. Grade I and II resources are intended to be managed by the national and provincial heritage resources authorities respectively, while Grade III resources would be managed by the relevant local planning authority. These bodies are responsible for grading, but anyone may make recommendations for grading.

It is intended under S.7(2) that the various provincial authorities formulate a system for the further detailed grading of heritage resources of local significance but this is generally yet to happen. SAHRA (2007) has formulated its own system[1] for use in provinces where it has commenting authority. In this system sites of high local significance are given Grade IIIA (with the implication that the site should be preserved in its entirety) and Grade IIIB (with the implication that part of the site could be mitigated and part preserved as appropriate) while sites of lesser significance are referred to as having 'General Protection' (GP) and rated as GP A (high/medium significance, requires mitigation), GP B (medium significance, requires recording) or GP C (low significance, requires no further action). Because KZN has not formulated its own system the SAHRA system will be applied in this report.

3.5. Consultation

The NHRA requires consultation as part of an HIA but, since the present study falls within the context of an EIA which includes a public participation process (PPP), no dedicated consultation was undertaken as part of the HIA. Interested and affected parties would have the opportunity to provide comment on the heritage aspects of the project during the PPP.

3.6. Assumptions and limitations

The field study was carried out at the surface only and hence any completely buried archaeological sites would not be readily located. Similarly, it is not always possible to determine the depth of archaeological material visible at the surface. The line runs close to homesteads and fenced in areas and these private residences were not accessible during the survey. High rainfall resulted in knee-high grass cover that limited archaeological visibility.

4. PHYSICAL ENVIRONMENTAL CONTEXT

4.1. Site context

The proposed pipeline runs along the northern side of the R68 road. The general area is rural and consists of residential settlements interspersed with agricultural lands. The pump station and three reservoirs already exist along the route, although the new pipeline will not actually connect to the western and central reservoirs.

4.2. Site description

The majority of the proposed pipeline follows an existing pipeline marked by manholes and dumped rock with excavation marks but does deviate along an old road along a part of its length. The study area is characterised by fallow agricultural land that has not been ploughed in many years as well as by traditional homesteads. There are many small roads between the residential dwellings. Several tributaries of the KwaHlati and the Batshe Rivers pass through the study area, and these areas are marked by sheet erosion. Figures 3 to 8 show views of the study area.

[1] The system is intended for use on archaeological and palaeontological sites only.

Figure 3: *Pipeline route between fenced homesteads.*

Figure 4: *General site conditions outside of residential areas.*

Figure 5: *Manholes marking the existing pipeline.*

Figure 6: *Boulders excavated during construction of the existing pipeline.*

Figure 7: *General site conditions in the central portion of the pipeline route.*

Figure 8: *General site conditions at river crossing.*

5. FINDINGS OF THE HERITAGE STUDY

This section describes the heritage resources recorded in the study area during the course of the project. They are mapped in Appendix 2.

5.1. Palaeontology

The SAHRIS Palaeosensitivity map shows three sensitivity ratings (Figure 9). Some parts are of zero sensitivity – these are dolerite area which are completely non-fossiliferous. A few small areas along stream channel fills are of moderate sensitivity but about half of the study area is regarded as of very high sensitivity.

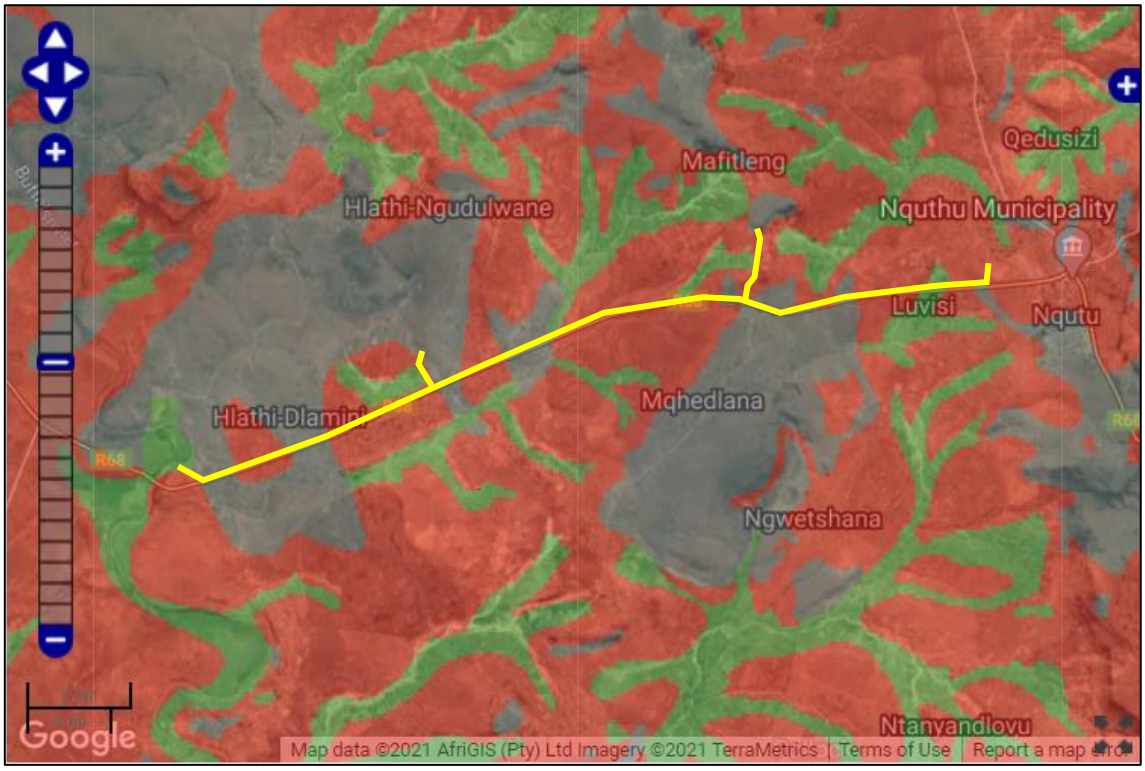

Figure 9: *Extract from the SAHRIS Palaeosensitivity map showing the study area (yellow line) be variably of very high (red), medium (green) and zero (grey) palaeontological sensitivity.*

5.2. Archaeology

5.2.1. Desktop study

The archaeology of KwaZulu-Natal can be divided in three main periods namely the Stone Age, Iron Age and Historical period.

5.2.1.1 Stone Age

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Earlier Stone Age (ESA; until c. 300 000 years ago), the Middle Stone Age

(MSA; c. 300 000 to 30 000 years ago) and the Later Stone Age (LSA; after c. 30 000 years ago). Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation. For Cultural Resources Management (CRM) purposes it is often only expected/ possible to identify the presence of the three main phases. Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable (Lombard 2011).

The LSA is well represented in KwaZulu-Natal with an abundance of rock art, like the rock paintings at Giants Castle and Kamberg in the Drakensburg Mountains (Vinnicombe 1976). Rock art sites have also been documented in the areas around Estcourt, Mooi River and Dundee. Several caves in KZN contain significant archaeological deposits like the well-known MSA site of Sibudu Cave near the coast, which shows evidence for early forms of cognitive human behavioural patterns (Wadley 2005). Another well-known cave site called Border Cave is situated some 190 kilometres to the north east of the study area at the Ingodini Border Cave Museum Complex. The site was first investigated by Raymond Dart in 1934; here excavations exposed a thick deposit of archaeological material dating from the Iron Age overlaying MSA artefacts. Later excavations, by Beaumont in the early 1970s, revealed a complete MSA sequence succeeded by Early and Later Iron Age deposits (Klein 1977).

5.2.1.2 Iron Age and historical period

Bantu-speaking people moved into Eastern and Southern Africa about 2 000 years ago (Mitchell 2002). The general pattern of movement is shown in Figure 10. These people cultivated sorghum and millet, herded cattle and small stock, and manufactured iron tools and copper ornaments. Because metalworking represents a new technology, archaeologists call this period the Iron Age. Characteristic ceramic styles help archaeologists to separate the sites into different groups and time periods. The Iron Age as a whole represents the spread of Bantu speaking people and includes both the Pre-Historic and Historic periods. It can be divided into three distinct periods:

- The Early Iron Age: Most of the first millennium AD.
- The Middle Iron Age: 10th to 13th centuries AD.
- The Late Iron Age: 14th century to colonial period.

Early Iron Age people made a living by mixed farming. They had the technology to work metals like iron. The site of Mzonjani, 15 km from Durban, is the oldest known Iron Age site in KwaZulu-Natal, dating to the 3rd Millennium AD (Huffman 2007).

The area that was occupied by the Nguni speaking group of the Eastern Bantu language stream is characterised by settlement patterns defined as the Central Cattle Pattern (CCP) (Huffman 2007). The Nguni ceramic sequence consists of the *Blackburn* (AD 1050-1500), *Moor Park* (AD 1350-1700) and, *Nqabeni* (AD 1700-1850), although excavated pottery is seldom decorated and therefore complicates archaeological interpretation (Huffman 2007: 441, 443). *Blackburn* pottery is on record along the north and south coasts of KwaZulu-Natal, often in shell middens (Huffman 2007: 443). The available radiocarbon dates place *Blackburn* between about AD 1100 and c. AD 1500.

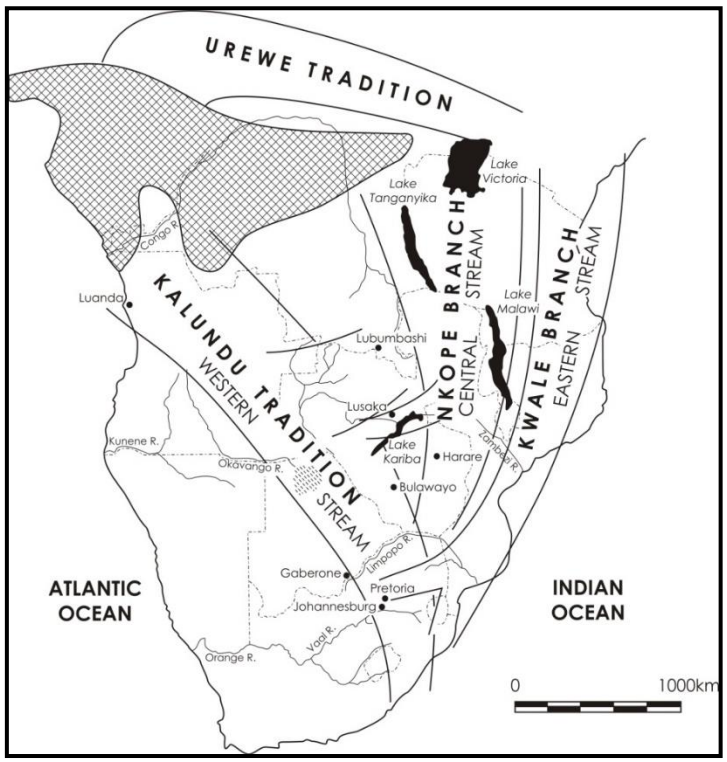

Figure 10: *Movement of Bantu speaking farmers. Source: Huffman (2007).*

The earliest known type of stonewalling that characterises this settlement pattern (CCP) in the region is the Moor Park site, which dates from the 14th to 16th Centuries AD (Huffman, 2007). This type of stonewalling can be found in defensive positions on hilltops in the Midlands of KZN (Huffman 2007). Archaeologists have concluded that the function of these structures was mainly to serve defensive purposes (Huffman 2007). Archaeologically, the KZN area was occupied by the Zulu people by AD 1050 (Huffman 2007).

The Late Iron Age economy was based on agriculture and livestock. Both components were inextricably linked to cultural practices. In the Nguni groups, economic activities were divided along gender lines; men were closely associated with cattle and women with farming. It is believed that maize was introduced to northern KwaZulu-Natal via the Delagoa Bay trade network and the crop soon became widely cultivated. According to oral tradition, the Mthethwa first produced maize in the late 18th century (Huffman 2007: 453, 457).

Along with cattle and trade beads (both used as currency for bride wealth); metal objects also became markers of wealth, status and power. Iron and copper ornaments (bangles, neck- and earrings) were worn to indicate social position and were also used in trade (Wylie 2006: 58, 59). Other metal artefacts which may appear in the archaeological record are iron spear points and hoes used for agriculture (very few have been found in context). It is interesting that the deliberate burial of numerous metal objects (mostly spearheads and hoes) seems to have been a common practice in Late Iron Age KwaZulu-Natal (Maggs 1991). This phenomenon is probably connected to the period of instability leading up to the Mfecane.

The Difaqane (Sotho), or Mfekane/Imfecane ("the crushing" in Nguni) was a time of bloody upheavals in Natal and on the Highveld, which occurred around the early 1820s until the late 1830s

(Berg 1999: 109-115). It came about in response to heightened competition for land and trade, and caused population groups like gun-carrying Griquas and Shaka's Zulus to attack other tribes (Berg 1999: 14; 116-119). In KwaZulu-Natal, this commenced in the early 1800s when the amaZulu were still under Senzangakona (Omer-Cooper, 1993).

The Mthethwa confederacy also arose in the 18th century as a consolidation of clans that formed part of the greater northern Nguni-speaking cultural group in southern Africa. Their ruling lineage (the Nyambose) originally settled between the Mfolozi and Mhlatuse rivers (Wylie 2006: 49). Indian Ocean trade contributed to changes in the socio-political structures of many groups, including that of the Mthethwa: imported beads became part of bride-wealth/lobola currency, increased demand for meat and grain from east coast ships necessitated more control of agricultural labour, cattle-raids etc., and even influenced the evolution of the amabutho (age-set regiments) system. Ivory, hides, slaves, grain, and metal hoes were exchanged for incoming commodities such as beads and cloth (Mitchell & Whitelaw 2005: 228; Huffman 2007: 77-80). It was amid the ensuing power struggles between politically complex chiefdoms that the Mthethwa, Ndwandwe in the north and the Qwabe in the south emerged as prominent role-players.

5.3. Site visit

Several isolated stone artefacts were recorded at Features 3 and 13 (Figure 11 and 12). Although all are likely from the MSA, some were highly patinated indicating long term exposure or greater age (Figure 11), while others were very fresh indicating the artefacts to be recent in age or only recently exposed. These were all exposed by erosion and found along stream and riverbeds. They were too few in number to be of significance but nonetheless serve to show that MSA people were present in the area. They can be considered to be background scatter. At the far eastern end of the study area a set of terraces and foundations of a structure were seen (Figures 13 & 14). They ae associated with modern materials and are thus possibly not even legally archaeological. All finds are listed in Table 2.

Table 2: *Recorded Stone Age finds.*

Number	Co-ordinates	Description	Significance (grade)
Feature 3	S28° 13' 21.4932" E30° 34' 56.9693"	Very low density, possibly MSA artefacts on highly patinated raw material (probably hornfels). Very weathered and exposed in the streambed.	Very low (GPC)
Feature 13	S28° 12' 55.6687" E30° 38' 58.3680"	Isolated broken blade on unpatinated material (probably hornfels).	Very low (GPC)
Feature 14	S28° 12' 53.4132" E30° 39' 27.2161"	Terrace walls and the foundations of a rectangular stone packed enclosure (recent/ historical kraal) located at the foot of the small hill where the reservoir is located. The area is impacted by the previous pipeline and road construction. Although historical in age, the features are more archaeological in nature. They may not be older than 100 years but are graded for precautionary reasons.	Very low (GPC)
Feature 15	S28° 12' 52.6062" E30° 39' 34.7129"		Very low (GPC)

Figure 11: *Highly patinated and weathered Stone Age artefacts at Feature 3.*

Figure 12: *Unpatinated broken blade (Feature 13).*

Figure 13: *Stone walled foundations. Feature 14 viewed from the hill.*

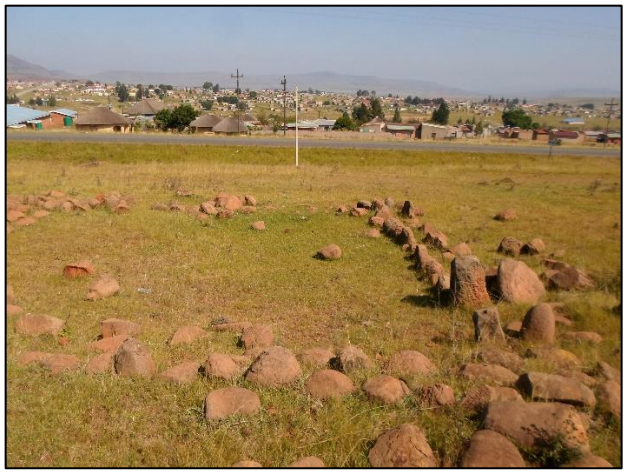

Figure 14: Feature 14 viewed from the north.

5.4. Graves, battlefields and memorials

5.4.1. Desktop study

The area is known for numerous battlefield sites relating to the Anglo Zulu War (1879). The surrounding area includes memorials and cemeteries with the closest being in Dundee. These include a First World War memorial. No graves are indicated by the Genealogical Society of South Africa for the study area.

5.4.2. Site visit

During the site visit two informal cemeteries were recorded, one of them quite large (Figures 15 & 16). In addition, several private burial sites were noted within fenced properties often close to the pipeline (Figure 17). The smaller cemetery towards the east is shown in Figure 18, while a lone ritual

marker with no sign of adjacent graves is shown in Figure 19. None of these cemeteries and graves will be impacted by the development. They are listed in Table 3. Note that although many graves may be younger than 60 years, they are all graded for precautionary reasons.

Table 3: *Recorded burial sites. Note that most burial sites within private yard areas were plotted from the boundary fences and their co-ordinates are thus not completely accurate.*

Number	Co-ordinates	Description	Significance (grade)
Feature 1	S28° 14' 44.0081" E30° 31' 07.3276"	Large Cemetery located between residential stands and the R68 provincial road. Grave dressings are predominantly stone packed, with few formal headstones. Accurate count of the graves is not possible as the site is overgrown. The cemetery is about 35 m by 105 m in size.	High (IIIA)
Feature 2	S28° 14' 01.2521" E30° 33' 10.5107"	Stone Packed Graves behind wire fence within yard.	High (IIIA)
Feature 5	S28° 13' 00.6868" E30° 37' 12.2730"	Stone Packed Graves behind wire fence within yard.	High (IIIA)
Feature 6	S28° 13' 01.9447" E30° 37' 12.2932"	Stone Packed Graves behind wire fence within yard.	High (IIIA)
Feature 7	S28° 13' 01.9138" E30° 37' 28.1150"	Stone Packed Graves behind wire fence within yard.	High (IIIA)
Feature 8	S28° 13' 01.4764" E30° 37' 40.0699"	Stone Packed Graves behind wire fence within yard.	High (IIIA)
Feature 9	S28° 13' 02.0754" E30° 37' 38.4732"	Stone Packed Graves behind wire fence within yard.	High (IIIA)
Feature 11	S28° 12' 59.5464" E30° 38' 03.7961"	This is a small cemetery consisting of 7 stone packed graves with no headstones. Adjacent to the cemetery is a stone packed cairn that is painted white as a ritual marker, artefacts like glass and snuff bottles are placed on top of the cairn.	High (IIIA)
Feature 12	S28° 12' 55.3298" E30° 38' 42.0840"	Packed and painted white stone ritual marker similar to Feature 11 without visible graves.	High (IIIA)

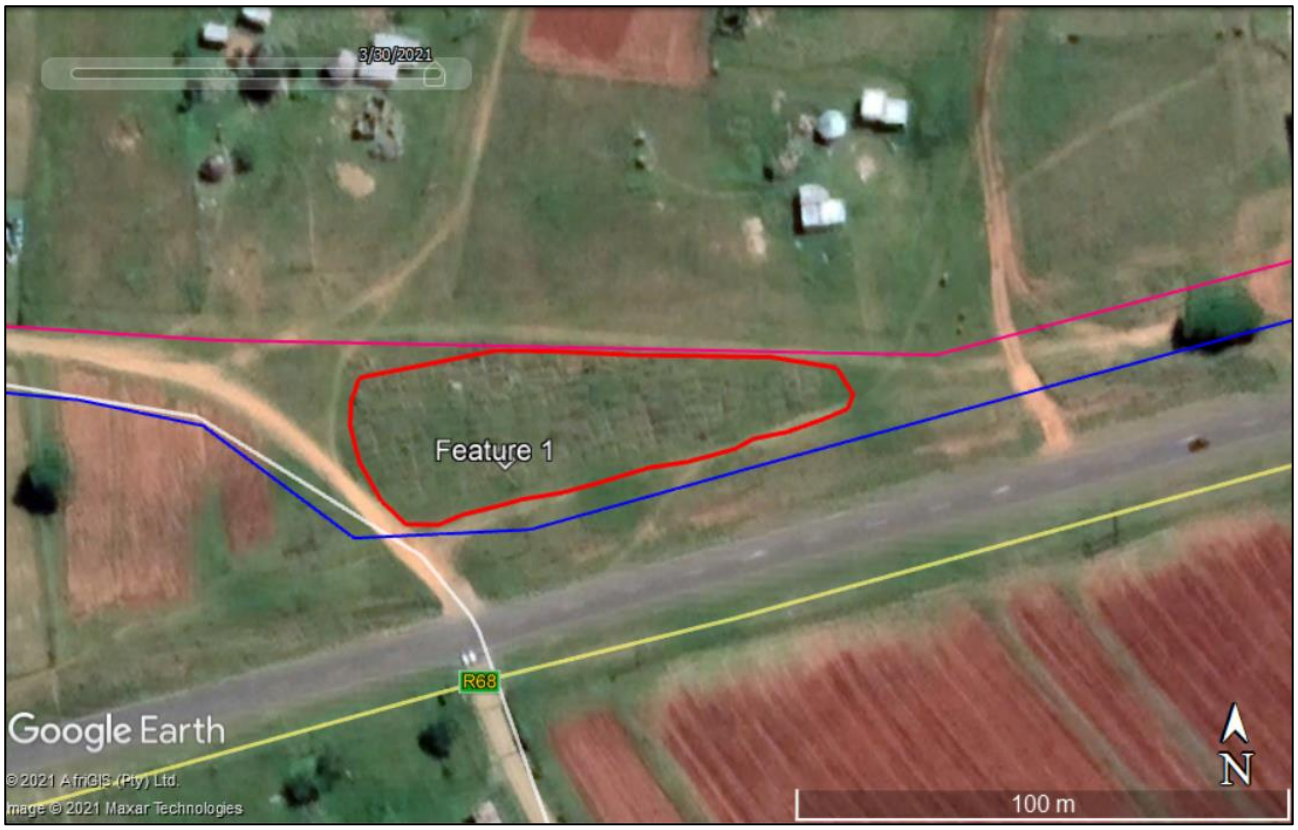

Figure 15: *Aerial view showing the large cemetery in the western part of the study area.*

Figure 16: *Large cemetery with stone packed graves at Feature 1.*

Figure 17: *Graves in a fenced yard.*

Figure 18: *Stone packed graves at Feature 11. Scale bar = 1 m.*

Figure 19: *White ritual marker at Feature 12. Scale bar = 1 m.*

5.5. Historical aspects and the Built environment

5.5.1. Desktop study

Early Voortrekkers travelled through the region and discovered rich surface deposits of coal as early as the 1830's (Von der Heyde 2013). The farm on which the town of Dundee was established in 1882 was owned by Peter Smith and the area was actively mined from 1850 onwards. Many settlers especially from Scotland staked their claims in the area. The area bore witness to battles between the Boers, British Forces and the Zulu for more than 60 years. The Battle of Blood River (1838) occurred a short distance north of Vant's Drift, while the Isandlwana, Rorke's Drift and Fugitives Drift battle sites from the Anglo Zulu War (1879) are within some 17 km downstream of Vant's Drift. Also in this region was the first major battle of the 2nd Anglo Boer War in 1899 (Talana Hill) (Von der Heyde 2013). These sites are mapped in Figure 20.

5.5.2. Site visit

Two historical bridges were recorded along the pipeline route and are described in Table 4. The age of the cement bridge at Feature 4 is unknown (Figure 21), but a stone and metal bridge (Feature 10) is definitely older than 60 years and is thus a heritage resource (Figures 22 to 25). Neither of the features will be impacted on by the development.

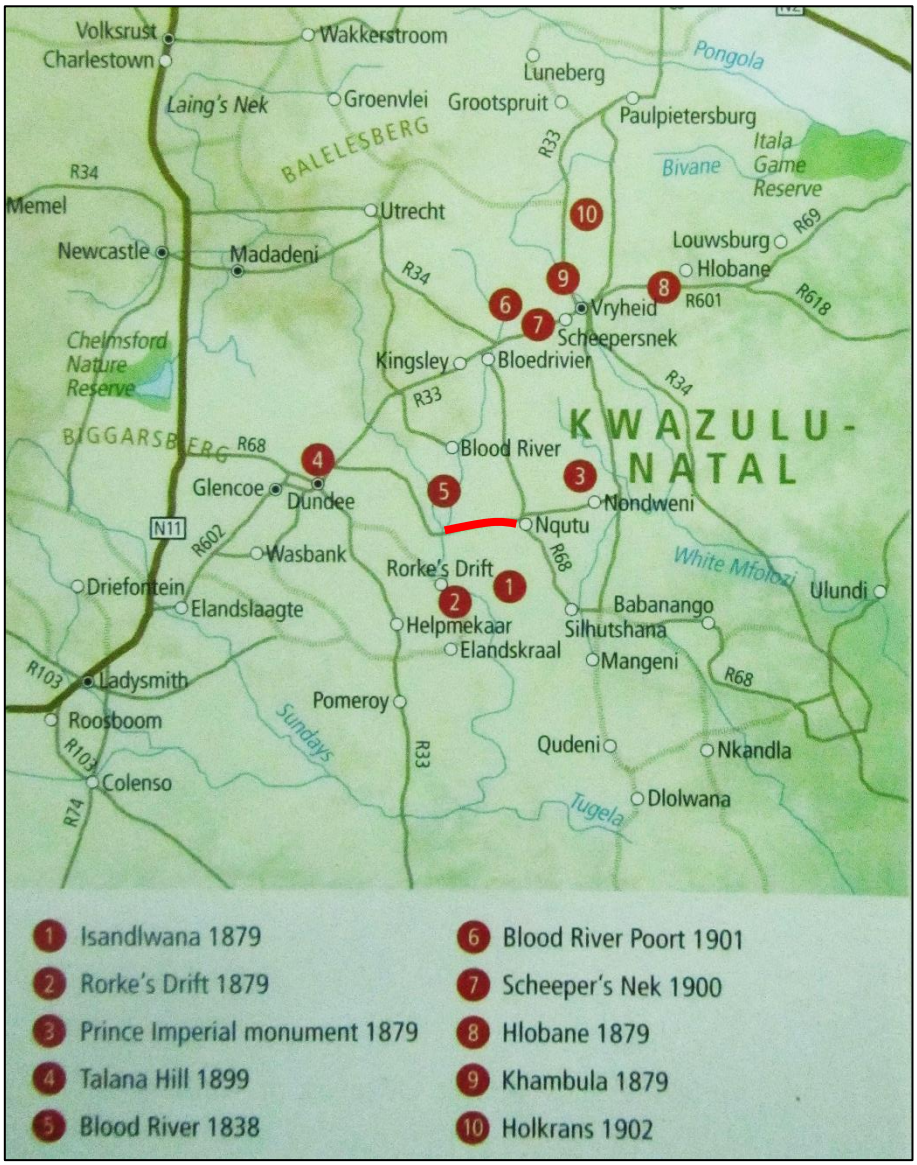

Figure 20: *Map showing the main battle sites in the Dundee region. The study area is shown by the red line. Source: Von der Heyde (2013:133).*

Table 4. *Recorded historical features. [Note that the SAHRA grading system does not apply to built heritage features.]*

Number	Co-ordiates	Description	Significance (Grade)
Feature 4	S28° 13' 09.3977" E30° 35' 31.0957"	Cement Bridge of unknown age.	---
Feature 10	S28° 13' 00.8465" E30° 37' 54.9032"	Bridge constructed with sandstone blocks and with a metal deck. An inscription on the bridge indicates the construction date as Dec 1935 with the name Gibb possibly referring to the engineer.	---

Figure 21: *Cement bridge at Feature 4.*

Figure 22: *Sandstone bridge at Feature 10.*

Figure 23: *Sandstone pillars.*

Figure 24: *Sandstone blocks were used for the construction of Feature 10.*

Figure 25: *Inscription on the Feature 10 bridge.*

5.6. Cultural landscapes and scenic routes

Historical aerial photography of the area is available from the early 1980s. The site was part of the earlier kwaZulu 'homeland' and settlement follows a very much traditional pattern. This is strongly evident in the historical aerial photographs (Figures 26 to 29) and it is clear that the only change forty years later is to the density of the residential settlement which has increased. This is illustrated by the close-up aerial photograph of a portion of the study area (Figure 30).

Figure 26: *1981 aerial photograph of the western end of the study area showing the cultural landscape to be much the same as it is today, but with a lower density of dwellings. There is a structure at the location of the existing pump station (red arrow).*

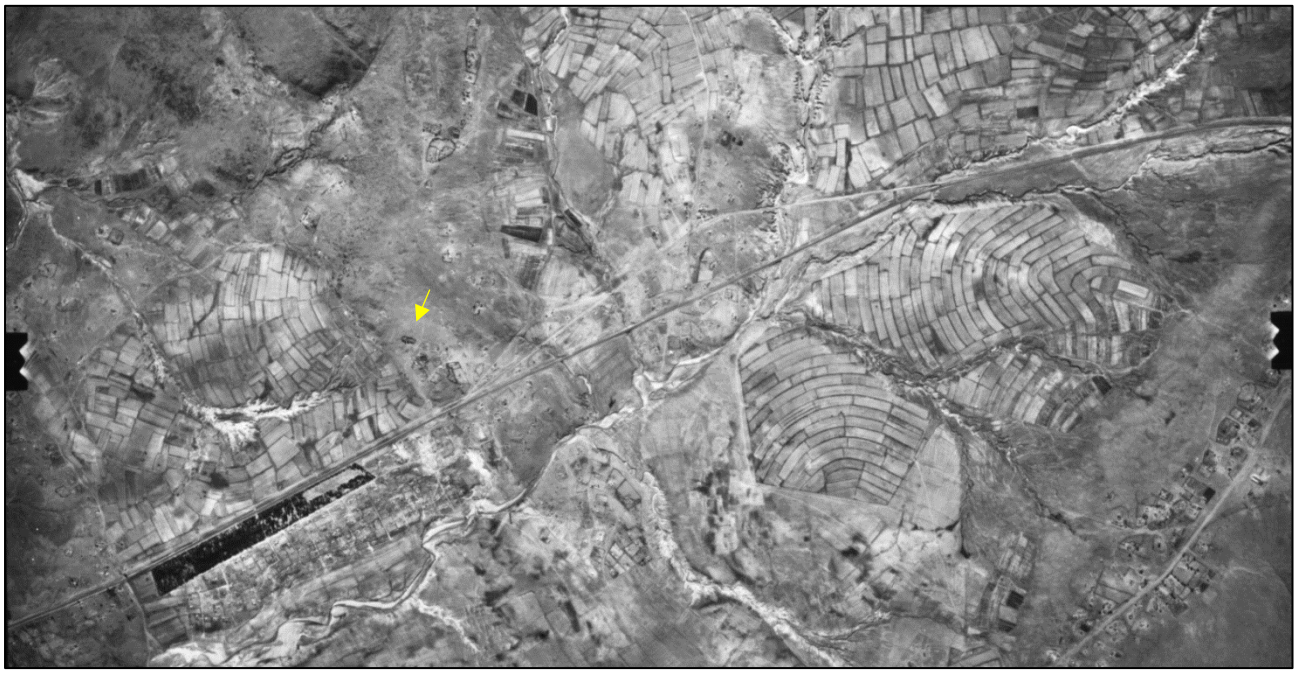

Figure 27: *1982 aerial photograph of the west-central part of the study area. The currently existing water reservoir was not present at this time (yellow arrow).*

Figure 28: *1981 aerial photograph of the east-central part of the study area. The currently existing water reservoir was not present at this time (yellow arrow).*

Figure 29: *1981 aerial photograph of the eastern end of the study area showing the water reservoir near Nqutu already in place (red arrow). Nqutu town (visible at right) was far smaller.*

Figure 30: *Close-up aerial views of a part of the study area from 1982 and 2021 showing the same settlement pattern but with a greater residential density today.*

5.7. Statement of significance and provisional grading

Section 38(3)(b) of the NHRA requires an assessment of the significance of all heritage resources. In terms of Section 2(vi), ‘‘cultural significance’’ means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. The reasons that a place may have cultural significance are outlined in Section 3(3) of the NHRA (see Section 2 above).

The archaeological resources are deemed to have low cultural significance for their scientific nd historical values. All are considered as no more than grade GPC resources.

Graves are deemed to have high cultural significance for their social value and are allocated grades of IIIA.

Although the cement bridge is of low significance, the sandstone one is a built heritage resource of high local significance.

The cultural landscape has medium cultural significance for its aesthetic, historical and social significance.

6. ASSESSMENT OF IMPACTS

6.1. Impacts to palaeontological resources

This aspect of heritage is dealt with in the separate specialist study submitted with this HIA.

6.2. Impacts to archaeological resources, graves and built heritage

The project has avoided all known heritage resources and direct impacts are not expected (low intensity) unless excavated materials are dumped over graves by mistake, in which case a high intensity impact might occur. Such impacts could occur during the construction phase but, because the graves are reasonably visible or are fenced into private yards, impacts are improbable. The impact significance before mitigation is **medium negative** (Table 6). Mitigation will entail ensuring that those grave and/or memorial features that are not fenced in get cordoned off and protected from harm throughout the development. With mitigation the impact significance will be **low negative**. Although the proposed pipeline runs quite close to a number of graves, it does not cross any and there are thus no fatal flaws.

Table 6: *Assessment of archaeological impacts.*

Potential impacts on archaeological resources	
Nature and status of impact:	Direct, negative
Extent and duration of impact:	Local, permanent
Intensity	Medium
Probability of occurrence:	Improbable
Degree to which the impact can be reversed:	Irreversible
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium
Degree to which the impact can be mitigated:	High
Proposed mitigation:	Avoidance of recorded features and the implementation of a chance find procedure.
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

<u>Mitigation and management</u>

It is required that the graves that are not within fenced, private spaces should be cordoned off and protected throughout the development duration. They should be marked on plans of the pipeline to ensure that all staff are aware of their locations. These sites should be monitored by the Environmental Control Officer (ECO) to ensure their continued integrity. Furthermore, a chance finds procedure should be included in the Environmental Management Programme (EMPr). This should list dense clusters of artefacts and possibly human remains and potential finds to be aware of. Any such finds should be immediately protected *in situ* and reported to AMAFA.

6.3. Impacts to the cultural landscape

Impacts to the cultural landscape are primarily visual or contextual impacts whereby the landscape is disrupted by inappropriate development or activity. In the present case the development will be underground and thus impacts will be temporary and would cease after rehabilitation of the site. Without mitigation, impact significance could be **medium negative** (Table 7), especially if erosion results from the surface disturbance. With effective mitigation, however, it is expected that the site will be revegetated and the impact significance would be **low negative** or even possibly neutral. Cumulative impacts are of no concern and there are no fatal flaws in terms of the cultural landscape.

Table 7: *Assessment of impacts to the cultural landscape.*

Potential impacts on the cultural landscape	
Nature and status of impact:	Direct, negative
Extent and duration of impact:	Local, medium term
Intensity	Low
Probability of occurrence:	Definite
Degree to which the impact can be reversed:	High
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium
Degree to which the impact can be mitigated:	High
Proposed mitigation:	Ensure effective rehabilitation
Cumulative impact post mitigation:	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

Mitigation

An effective rehabilitation plan needs to be in place and this must be properly effected so as to ensure that erosion of the disturbed surface does not occur.

6.4. The No-Go alternative

The No-Go alternative is not expected to result in any impacts to heritage and thus a significance rating of neutral is applicable. It is notable, however, that from the socio-economic point of view there may be negative impacts if the new water pipeline is not installed.

6.5. Existing impacts to heritage resources

There are currently no obvious threats to heritage resources on the site aside from the natural degradation, weathering and erosion that will affect archaeological and palaeontological materials and graves. It is notable that erosion is prevalent along all stream beds and that this could be accelerated by the project if rehabilitation is not effective. Trampling from grazing animals and/or farm/other vehicles can also cause impacts.

6.6. Cumulative impacts

Because the expected impacts are so minimal, cumulative impacts are not expected to be an issue for any aspect of heritage.

6.7. Levels of acceptable change

Any impact to an archaeological or palaeontological resource or a grave is deemed unacceptable until such time as the resource has been inspected and studied further if necessary. Impacts to the landscape are difficult to quantify but in general a development that visually dominates the landscape from many

vantage points is undesirable. Because the pipeline would be underground, such an impact is not envisaged.

7. EVALUATION OF IMPACTS RELATIVE TO SUSTAINABLE SOCIAL AND ECONOMIC BENEFITS

Section 38(3)(d) of the NHRA requires an evaluation of the impacts on heritage resources relative to the sustainable social and economic benefits to be derived from the development. The pipeline is required to improve water supply in the area. This is obviously a significant socio-economic benefit and far outweighs any impacts to heritage resources that may occur.

8. CONCLUSIONS

If mitigation is implemented as discussed above, then no significant heritage concerns exist for this project. It is typical to apply buffers of 30 m to heritage resources but, in this instance where graves are often closer than this to the road, it is suggested that a minimum space of 5 m be retained between the trench and existing graves.

8.1. Reasoned opinion of the specialist

Given that no significant impacts are expected to arise from the implementation of this project, it is the opinion of the heritage specialist that the proposed water pipeline may be authorised in full.

9. RECOMMENDATIONS

It is recommended that the proposed project be allowed to continue but subject to the following recommendations:

- The graves and memorial stones at features 1, 11 and 12 must be cordoned off during construction with a minimum 5 m buffer and monitored by the ECO;
- No work, including stockpiling of excavated materials, may occur within the fenced and cordoned off areas;
- Should it become necessary to fasten the pipeline to bridges then a permit application to AMAFA will be required for this activity; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

10. REFERENCES

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APPENDIX 1 – Curriculum Vitae

Curriculum Vitae

Jayson David John Orton

ARCHAEOLOGIST AND HERITAGE CONSULTANT

Contact Details and personal information:

Address: 40 Brassie Street, Lakeside, 7945
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Cell Phone: 083 272 3225
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Birth date and place: 22 June 1976, Cape Town, South Africa
Citizenship: South African
ID no: 760622 522 4085
Driver's License: Code 08
Marital Status: Married to Carol Orton
Languages spoken: English and Afrikaans

Education:

SA College High School	Matric	1994
University of Cape Town	B.A. (Archaeology, Environmental & Geographical Science)	1997
University of Cape Town	B.A. (Honours) (Archaeology)*	1998
University of Cape Town	M.A. (Archaeology)	2004
University of Oxford	D.Phil. (Archaeology)	2013

*Frank Schweitzer memorial book prize for an outstanding student and the degree in the First Class.

Employment History:

Spatial Archaeology Research Unit, UCT	Research assistant	Jan 1996 – Dec 1998
Department of Archaeology, UCT	Field archaeologist	Jan 1998 – Dec 1998
UCT Archaeology Contracts Office	Field archaeologist	Jan 1999 – May 2004
UCT Archaeology Contracts Office	Heritage & archaeological consultant	Jun 2004 – May 2012
School of Archaeology, University of Oxford	Undergraduate Tutor	Oct 2008 – Dec 2008
ACO Associates cc	Associate, Heritage & archaeological consultant	Jan 2011 – Dec 2013
ASHA Consulting (Pty) Ltd	Director, Heritage & archaeological consultant	Jan 2014 –

Professional Accreditation:

Association of Southern African Professional Archaeologists (ASAPA) membership number: 233
CRM Section member with the following accreditation:

- Principal Investigator: Coastal shell middens (awarded 2007)
  Stone Age archaeology (awarded 2007)
  Grave relocation (awarded 2014)
- Field Director: Rock art (awarded 2007)
  Colonial period archaeology (awarded 2007)

Association of Professional Heritage Practitioners (APHP) membership number: 43

- Accredited Professional Heritage Practitioner

➢ *Memberships and affiliations:*

South African Archaeological Society Council member	2004 – 2016
Assoc. Southern African Professional Archaeologists (ASAPA) member	2006 –
UCT Department of Archaeology Research Associate	2013 –
Heritage Western Cape APM Committee member	2013 –
UNISA Department of Archaeology and Anthropology Research Fellow	2014 –
Fish Hoek Valley Historical Association	2014 –
Kalk Bay Historical Association	2016 –
Association of Professional Heritage Practitioners member	2016 –

Fieldwork and project experience:

Extensive fieldwork and experience as both Field Director and Principle Investigator throughout the Western and Northern Cape, and also in the western parts of the Free State and Eastern Cape as follows:

Feasibility studies:

- Heritage feasibility studies examining all aspects of heritage from the desktop

Phase 1 surveys and impact assessments:

- Project types
  - Notification of Intent to Develop applications (for Heritage Western Cape)
  - Desktop-based Letter of Exemption (for the South African Heritage Resources Agency)
  - Heritage Impact Assessments (largely in the Environmental Impact Assessment or Basic Assessment context under NEMA and Section 38(8) of the NHRA, but also self-standing assessments under Section 38(1) of the NHRA)
  - Archaeological specialist studies
  - Phase 1 archaeological test excavations in historical and prehistoric sites
  - Archaeological research projects
- Development types
  - Mining and borrow pits
  - Roads (new and upgrades)
  - Residential, commercial and industrial development
  - Dams and pipe lines
  - Power lines and substations
  - Renewable energy facilities (wind energy, solar energy and hydro-electric facilities)

Phase 2 mitigation and research excavations:

- ESA open sites
  - Duinefontein, Gouda, Namaqualand
- MSA rock shelters
  - Fish Hoek, Yzerfontein, Cederberg, Namaqualand
- MSA open sites
  - Swartland, Bushmanland, Namaqualand
- LSA rock shelters
  - Cederberg, Namaqualand, Bushmanland
- LSA open sites (inland)
  - Swartland, Franschhoek, Namaqualand, Bushmanland
- LSA coastal shell middens
  - Melkbosstrand, Yzerfontein, Saldanha Bay, Paternoster, Dwarskersbos, Infanta, Knysna, Namaqualand
- LSA burials
  - Melkbosstrand, Saldanha Bay, Namaqualand, Knysna
- Historical sites
  - Franschhoek (farmstead and well), Waterfront (fort, dump and well), Noordhoek (cottage), variety of small excavations in central Cape Town and surrounding suburbs
- Historic burial grounds
  - Green Point (Prestwich Street), V&A Waterfront (Marina Residential), Paarl

Awards:

Western Cape Government Cultural Affairs Awards 2015/2016: Best Heritage Project.

APPENDIX 2 – Mapping

The study area is mapped from west to east with heritage resources marked as Feature 12, Feature 2, etc and survey tracks as thin black lines. The existing and proposed pipelines are in blue and pink respectively.


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Feature 2
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© 2021 AfriGIS (Pty) Ltd.
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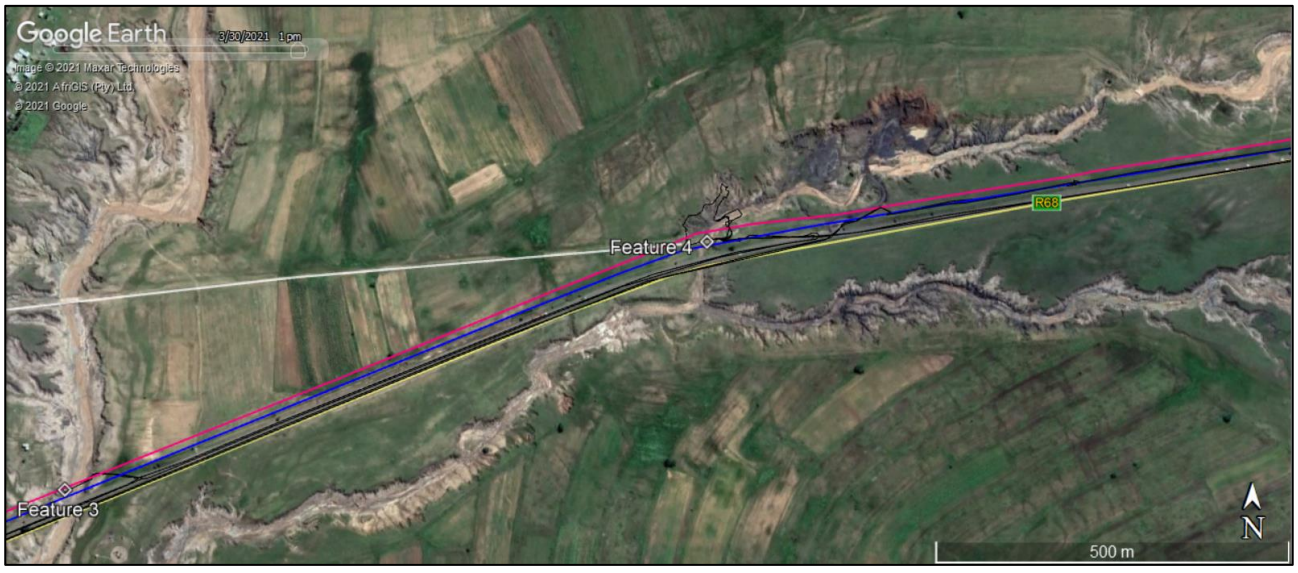
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Feature 4
Feature 3
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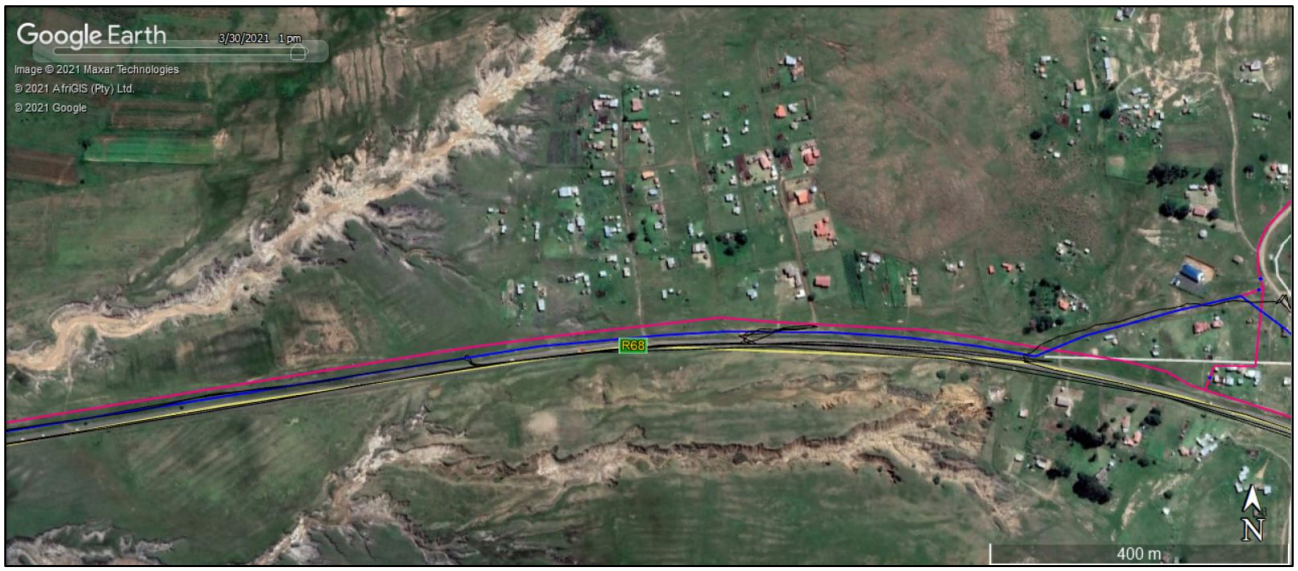
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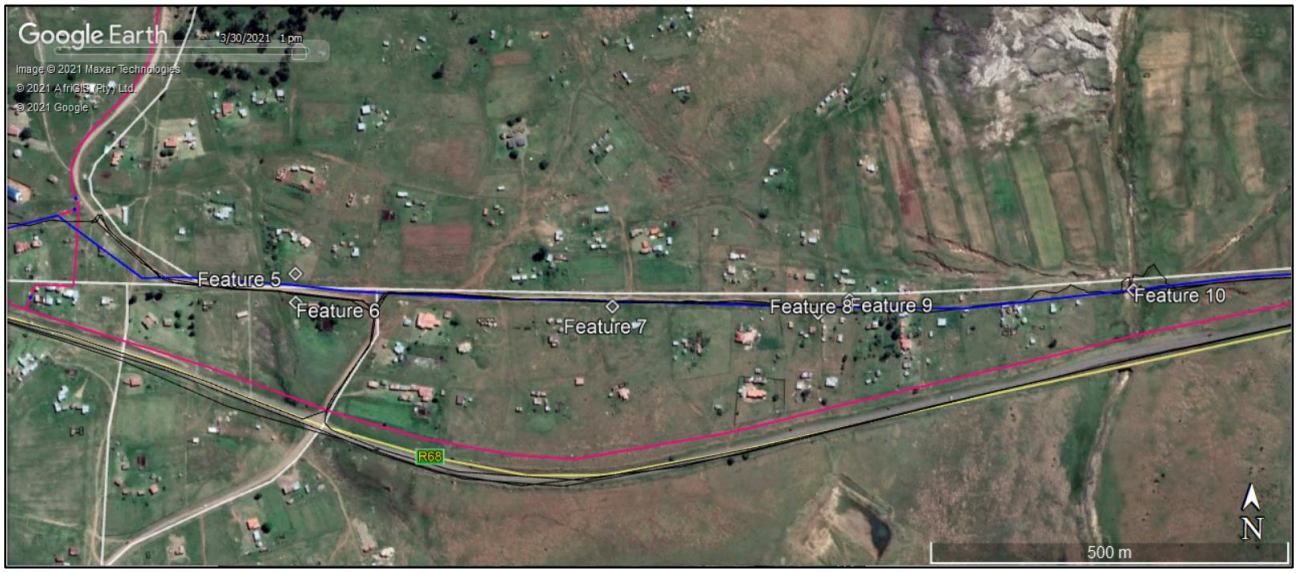
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Feature 5
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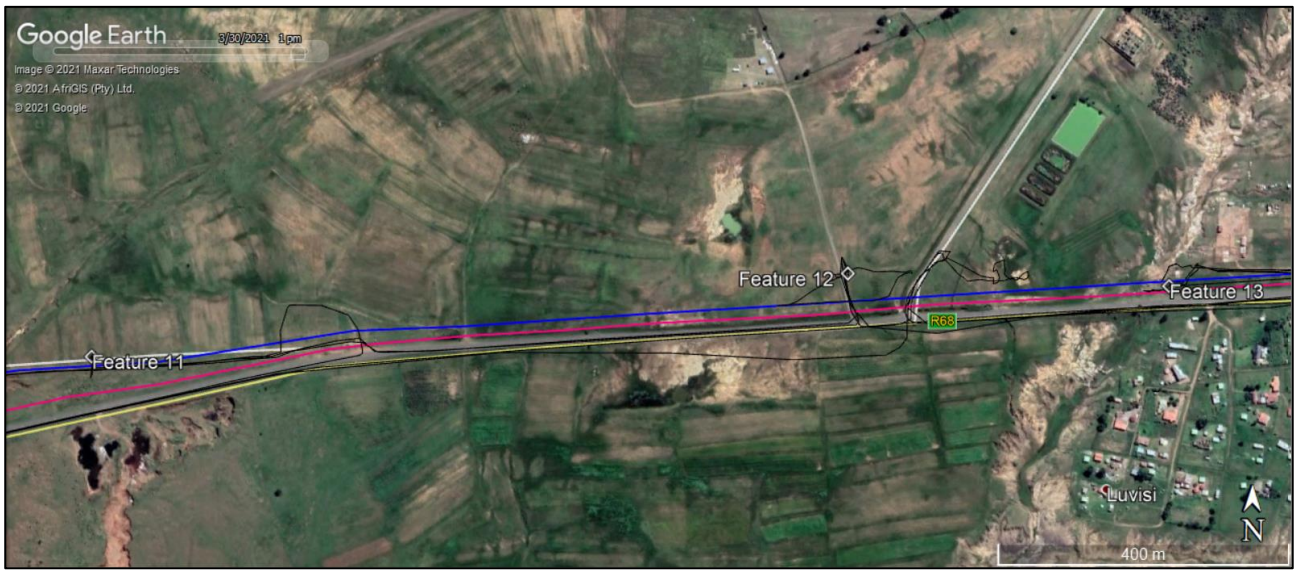
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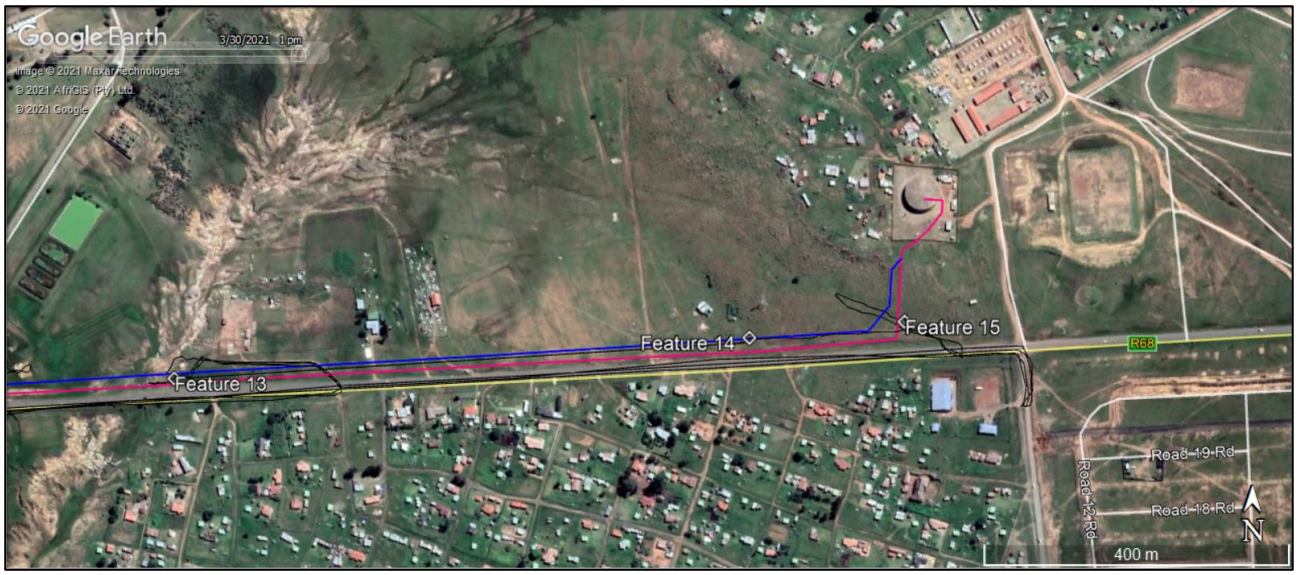
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Image © 2021 Maxar Technologies
© 2021 AfriGIS (Pty) Ltd.
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Feature 13
Feature 14
Feature 15
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Road 18 Rd
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