

**HIA FOR THE KWANYUSWA PIPELINE
REPLACEMENT PROJECT, UGU DISTRICT
MUNICIPALITY**

FOR WALLACE & GREEN (PTY) LTD

DATE: 27 MARCH 2022

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Management**

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EXECUTIVE SUMMARY

The project area is located 25km Northwest of the town of Port Shepstone in KwaZulu Natal. The project area encompasses a mix of urban areas, peri-urban areas and low income areas; all situated within the Ugu District Municipality.

The proposed project is a direct pipeline replacement of the existing 50mm diameter HDPE rising main with a 9km 63mm diameter 16 pipe that can cater for the projected demand.

The upgraded scheme will serve the following areas:

- *Kwanyuswa*
- *St. Martins*
- *Mampangeni*

The desktop heritage survey noted several settlements and buildings within 100m of the pipeline. Several of these features are older than 60 years and would be protected by the heritage legislation.

A Chance Find Protocol for palaeontological finds will be initiated when this project commences.

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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

JTN Consulting was appointed by Ugu District Municipality to investigate and design the pump upgrade and pipeline replacement from Kwanyuswa Reservoir 2 to the existing reservoir at St. Martins. A portion of the existing 50mm HDPE rising main will be converted to a gravity main and feed the local reticulation in Kwanyuswa. The objective of the project is to deliver reliable water to the Kwanyuswa community via reticulation, and supply key areas in St. Martins and Mampangeni.

The project has been triggered by constant pump operation problems. The proposed project is a direct pipeline replacement of the existing 50mm diameter HDPE rising main with a 9km 63mm diameter HDPE Class 16 pipe that can cater for the projected demand.

The upgraded scheme will serve the following areas:

- Kwanyuswa
- St. Martins
- Mampangeni

The proposed scope of work as follows;

- Proposed 63mm diameter HDPE Class 16 rising main pipeline to replace the existing 50mm diameter HDPE rising main pipeline.
- Upgrading / replacing of the existing pump.
- Approval of the project and pipeline locations by relevant stakeholders.

The project area is located 25km Northwest of the town of Port Shepstone in KwaZulu Natal. The project area encompasses a mix of urban areas, peri-urban areas and low income areas; all situated within the Ugu District Municipality. Access to the communities is mainly via gravel roads, with surfaced road access in the urban areas.

Umlando was requested to undertake an HIA of the proposed pipeline upgrades. Figures 1 – 4 show the location of the development.

FIG. 1 GENERAL LOCATION OF THE PROPOSED DEVELOPMENT

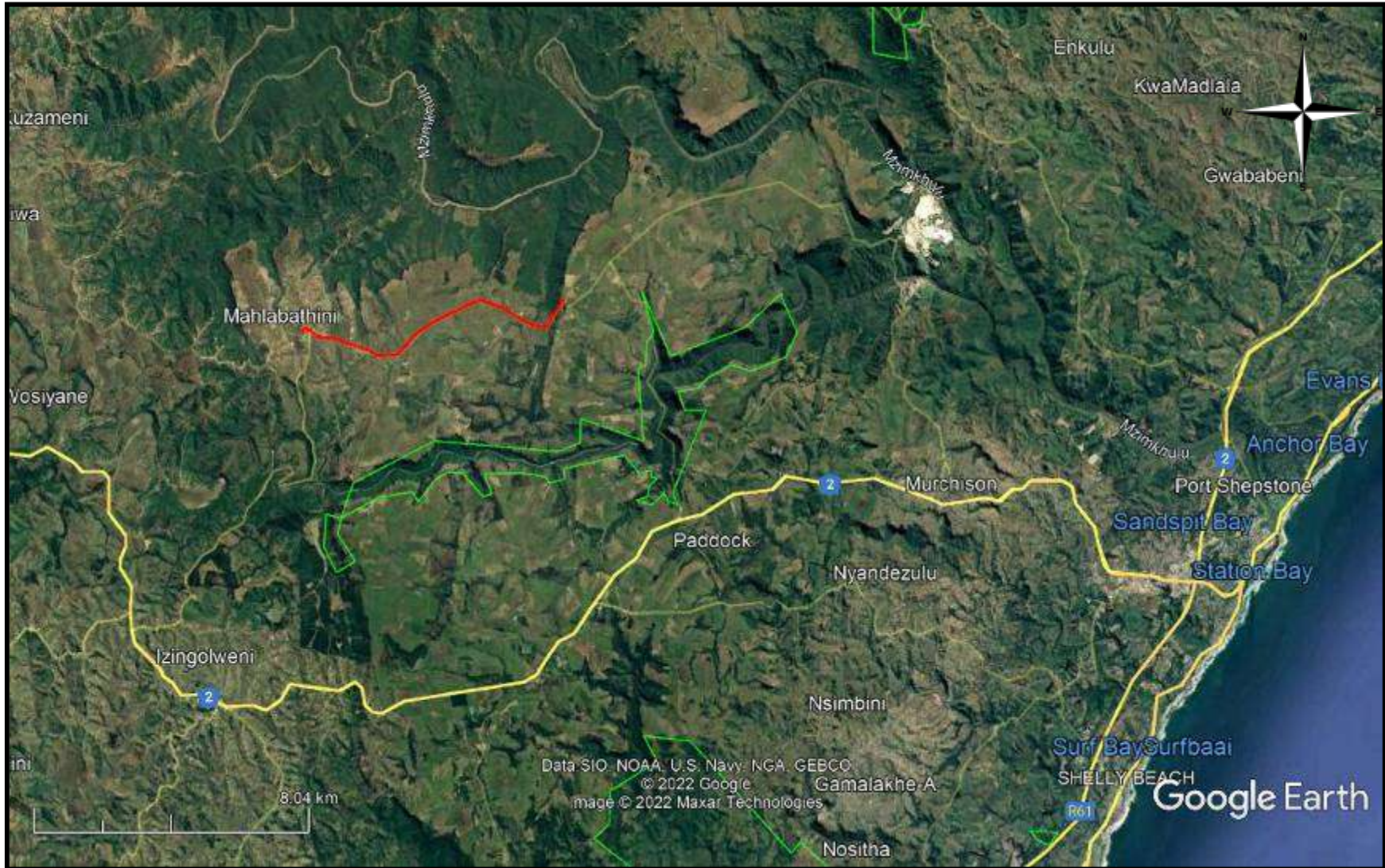


FIG. 2: AERIAL OVERVIEW OF THE PROPOSED DEVELOPMENT



FIG. 3: TOPOGRAPHICAL MAP OF THE PROPOSED DEVELOPMENT (1993)

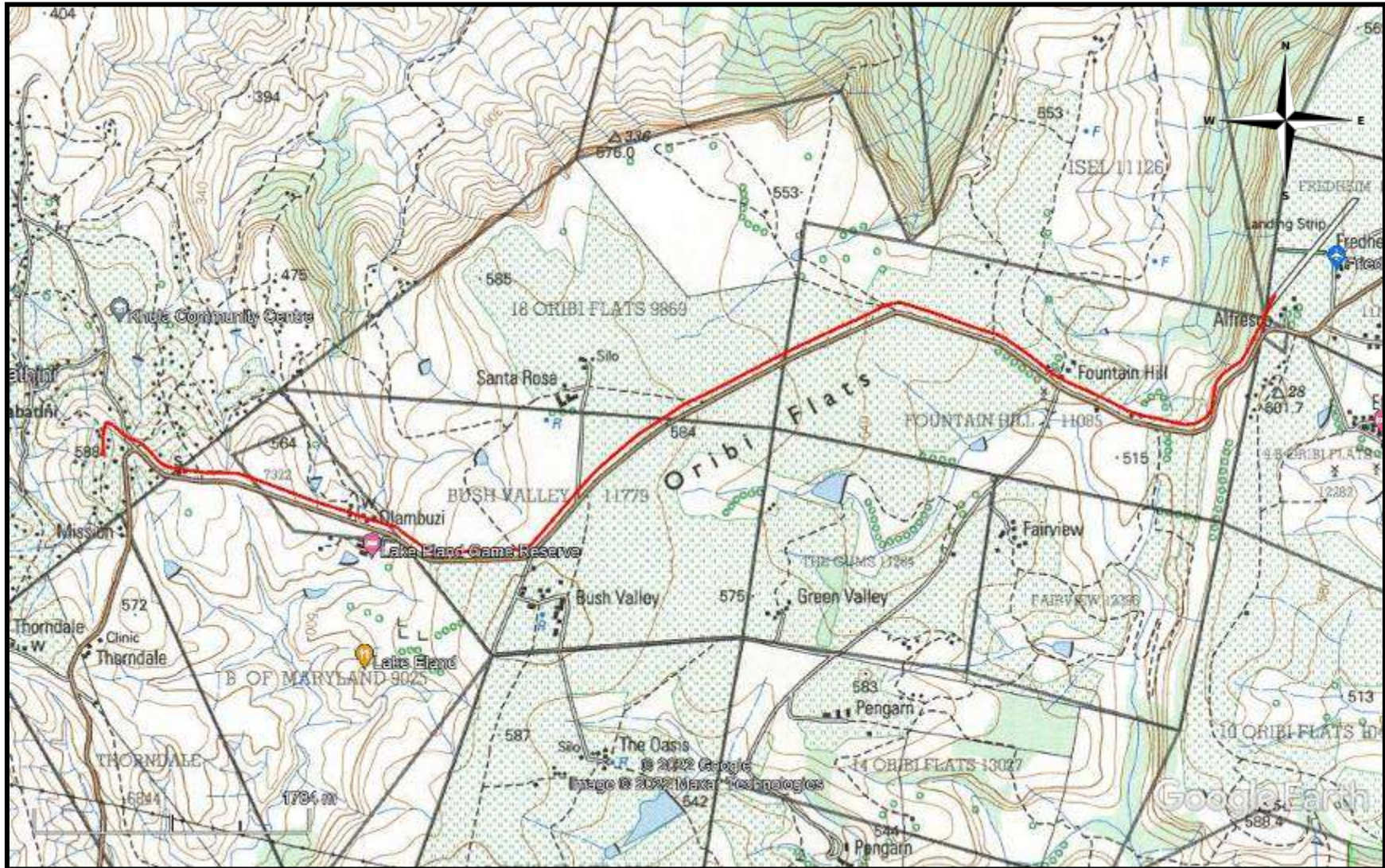


FIG. 4: SCENIC VIEWS OF THE STUDY AREA



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.”

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. This 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. Table 1 lists the grading system.

TABLE 1: SAHRA GRADINGS FOR HERITAGE SITES

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

RESULTS

DESKTOP STUDY

The desktop study consisted of analysing various maps for evidence of prior habitation in the study area, as well as for previous archaeological surveys. Many archaeological sites occur in the general area. The archaeological sites tend to be open Stone Age and Iron Age sites of varying significance. Some historical buildings do occur in the form of original farmsteads. These are sites that have been recorded through systematic surveys (fig. 5). No known sites occur within the pipeline footprint.

The 1937 aerial photograph indicates that there are four settlements and five buildings within 100m of the pipeline (fig. 6). The settlements would probably be wattle and daub constructions and have human graves associated with them.

The 1955 aerial map indicates that the settlements no longer exist, while the buildings still occur (fig. 7). A new building occurs on this map, and is identified as a school on the 1969 topographical map. This topographical map also has a place of worship recorded adjacent to the road (fig. 8). Some of the buildings no longer exist.

The locations of the sites are shown in Table 2.

TABLE 2: LOCATION OF SITES FROM THE DESKTOP STUDY

Name	Latitude	Longitude	Description	Dates On Map
b1	-30.683618025	30.237302620	Building	1937
b2	-30.680602206	30.239310322	Building	1937, 1955, 1969
b3	-30.678890548	30.240200379	Building	1937, 1955
b5?	-30.691295131	30.176711705	Building?	1937, 1955, 1969
farm1	-30.683042353	30.225096949	Farmstead	1937, 1955, 1969
K1	-30.679420723	30.216321687	Place of worship	1969
s1	-30.687679758	30.160179583	Houses	1937
s2	-30.686834534	30.160048980	Houses	1937
s3	-30.685952564	30.160570849	Houses	1937
s4?	-30.686467215	30.161559301	Houses	1937
School	-30.688718768	30.165432648	School	1955, 1969

FIG. 5: LOCATION OF KNOWN HERITAGE SITES IN THE GENERAL AREA

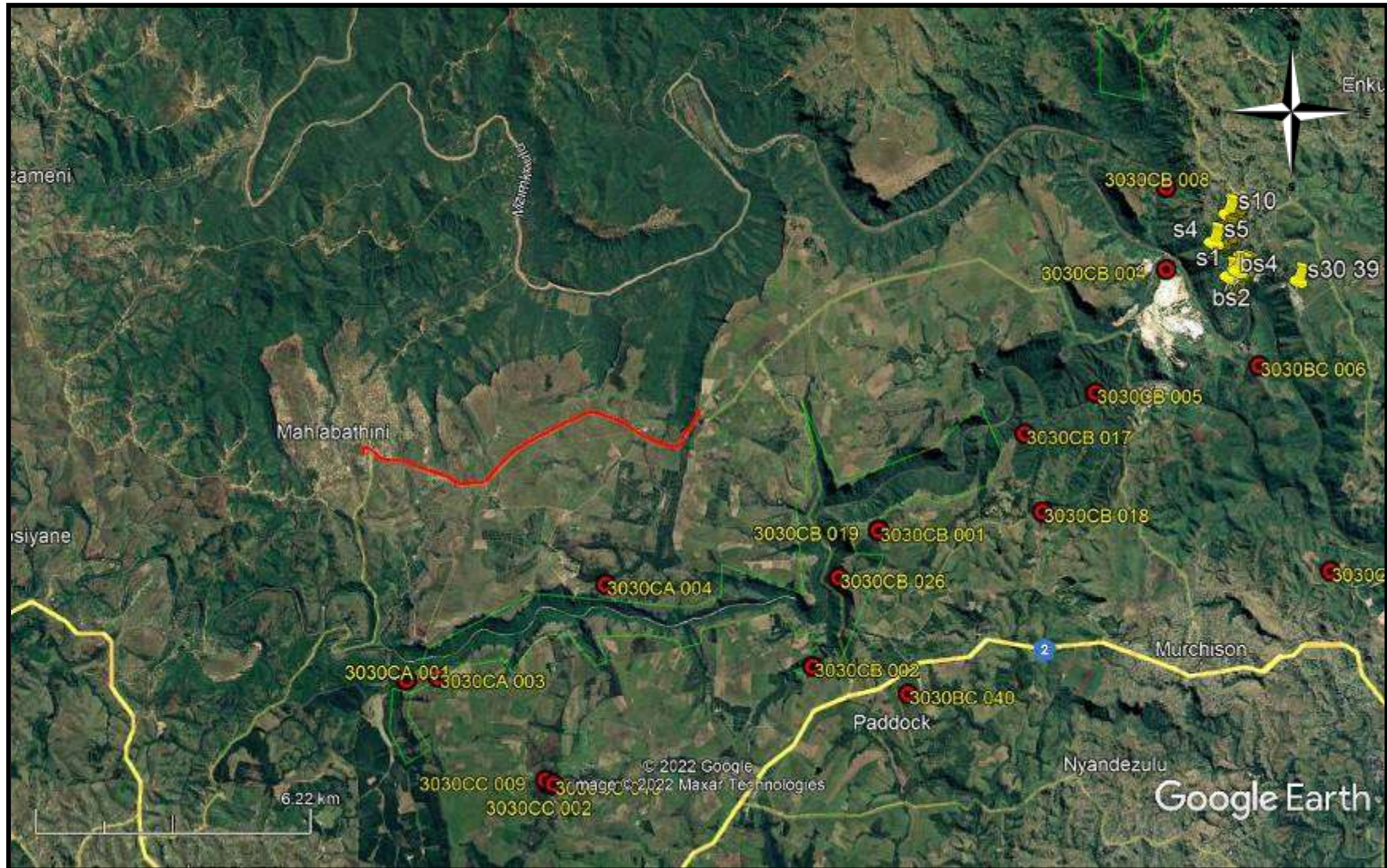


FIG. 6: LOCATION OF THE STUDY AREA IN 1937

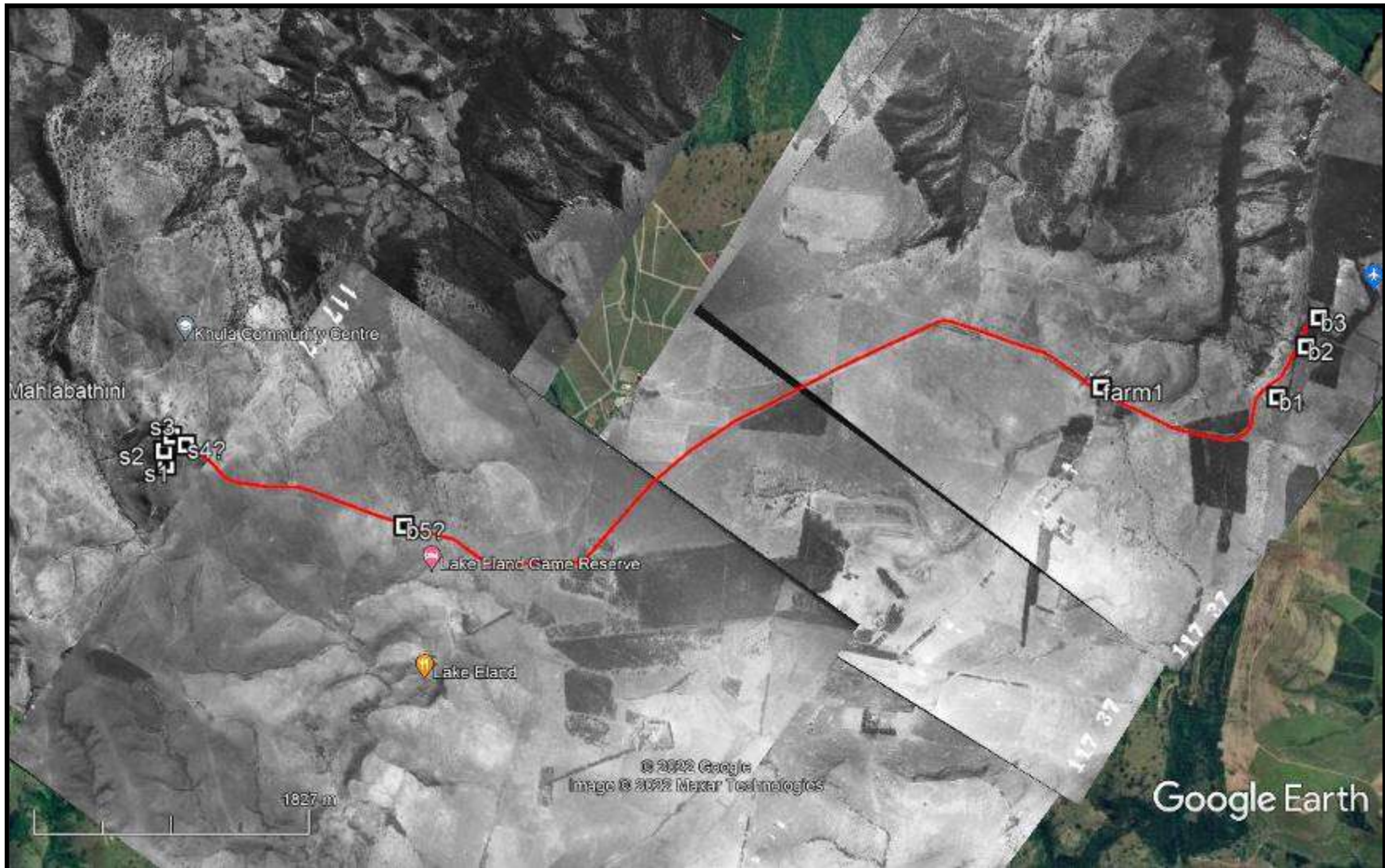


FIG. 7: LOCATION OF THE STUDY AREA IN 1955



PALAEONTOLOGICAL SENSITIVITY

The pipeline is mostly in an area of zero to low palaeontological sensitivity, while the western pipeline is of medium significance (fig. 9). Some of the pipeline is part of an upgrade that will only widen a small section. No further PIA mitigation is required as stated in the Letter of Exemption (Appendix A). Dr Smith states: “The proposed KwaNyusa project will be developed on Mzikaba Formation. This is a coarse-pebbly grained quartz arenite. It is coded blue in the Sahris Palaeosensitivity map. This lithology developed on a marine shelf or ramp. This is a very high energy environment, as proven by the coarse-grained nature, and consequently incompatible with fossil preservation. Trace fossils may be found on the bed tops, but these are not significant. “

FIG. 9: PALAEONTOLOGICAL SENSITIVITY MAP



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.

FIELD SURVEY

The field survey was undertaken in March 2022. Ground visibility was very good along the entire route. The proposed pipeline occurs on the existing pipeline; however, the footprint will be wider. The pipeline occurs mostly a few meters from the road reserve.

The four settlements noted from the desktop no longer exist. The base of S1 is visible, but only as the cleared and levelled ground (fig. 10). No graves were noted in this area.

FIG. 10: LOCATION OF S1



The school noted on the 1955 aerial photograph still exists and is currently in use (fig. 11). The school building and possible middens will not be affected.

FIG. 11: SCHOOL BUILDING



BUILDINGS

Several old farm buildings and structures occur within 50m of the pipeline (fig. 12). These buildings are older than 60 years in age, and some have been recently renovated. None of these buildings will be affected by the pipeline footprint

FIG. 12: BUILDINGS NEAR THE PIPELINE



RECOMMENDATIONS AND MITIGATION

The pipeline footprint will not affect any of the recorded heritage sites. While it is unlikely that the pipeline will affect palaeontological material, a Chance Find Protocol has been initiated.

No further heritage mitigation is required.

CONCLUSION

A heritage survey was undertaken for the proposed KwaNyuswa Pipeline Replacement Project. No heritage sites were found within the footprint, while a few historical buildings occur within 100m of it. A Chance Find Protocol has been initiated for the palaeontology.

REFERENCES

1:50 000 Topographical Maps

3030CA St Faiths 1969, 1993

Aerial Photographs

117A_037_36397

117A_037_36398

117A_037_36399

117A_033_40417

117A_032_40145

117A_032_40146

358_012_06603

358_012_06604

Database

KZN Museum

SHARIS

Umlando

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.



Gavin Anderson
Archaeologist/Heritage Impact Assessor

APPENDIX A
PIA DESKTOP STUDY



**Dr Alan Smith
Alan Smith Consulting
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4091**

**UMLANDO: Archaeological Surveys & Heritage
Management
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Email:umlando@gmail.com**

Letter of Exemption from Palaeontological Impact Assessment for:

**THE KWANYUSWA PIPELINE, NEAR MAHLABATHINI, UGU
MUNICIPALITY, KWAZULU-NATAL.**

Dear Sir

Dr Alan Smith was asked by UMLANDO: Archaeological Surveys & Heritage Management to conduct a PIA for the above named project.

The proposed KwaNyusa project will be developed on Mzikaba Formation. This is a coarse-pebbly grained quartz arenite. It is coded blue in the Sahr's Palaeosensitivity map. This lithology developed on a marine shelf or ramp. This is a very high energy environment, as proven by the coarse-grained nature, and consequently incompatible with

fossil preservation. Trace fossils may be found on the bed tops, but these are not significant.

There is no reason to conduct a PIA for this project; consequently an exemption from Palaeontological Impact Assessment (PIA) is requested for this project. However a “Chance Find Protocol” is attached to cover any chance find.

Should any of the proposed plans change then the project will need to be reassessed in terms of a PIA

Dr Alan Smith.
Alan Smith Consulting
6 April, 2022



CHANCE FIND PROTOCOL

This Chance Find Protocol must be included in the site EMPr.

If any fossils are found, a Palaeontologist must be notified immediately by the ECO and/or EAP and a site visit must be arranged at the earliest possible time with the Palaeontologist.

In the case of the ECO or the Site Manager becoming aware of suspicious looking palaeo-material:

- The construction must be halted in that specific area and the Palaeontologist must be given enough time to reach the site and remove the material before excavation continues.

- Mitigation will involve the attempt to capture all rare fossils and systematic collection of all fossils discovered. This will take place in conjunction with descriptive, diagrammatic and photographic recording of exposures, also involving sediment samples and samples of both representative and unusual sedimentary or biogenic features. The fossils and contextual samples will be processed (sorted, sub-sampled, labeled, and boxed) and documentation consolidated, to create an archive collection from the excavated sites for future researchers.

Functional responsibilities of the Developer

1. At full cost to the project, and guided by the appointed Palaeontological Specialist, ensure that a representative archive of palaeontological samples and other records is assembled to characterize the palaeontological occurrences affected by the excavation operation.

2. Provide field aid, if necessary, in the supply of materials, labour and machinery to excavate, load and transport sampled material from the excavation areas to the sorting areas, removal of overburden if necessary, and the return of discarded material to the disposal areas.

3. Facilitate systematic recording of the stratigraphic and palaeo-environmental features in exposures in the fossil-bearing excavations, by described and measured geological sections, and by providing aid in the surveying of positions where significant fossils are found.

4. Provide safe storage for fossil material found routinely during excavation operations by construction personnel. In this context, isolated fossil finds in disturbed material qualify as “normal” fossil finds.
5. Provide covered, dry storage for samples and facilities for a work area for sorting, labeling and boxing/bagging samples.
6. Costs of basic curation and storage until collected. Documentary record of palaeontological occurrences must be done.
7. The contractor will, in collaboration with the Palaeontologist, make the excavation plan available to the appointed specialist, in which appropriate information regarding plans for excavations and work schedules must be indicated on the plan of the excavation sites. This must be done in conjunction with the appointed specialist.
8. Initially, all known specific palaeontological information will be indicated on the plan. This will be updated throughout the excavation period.
9. Locations of samples and measured sections are to be pegged, and routinely and accurately surveyed. Sample locations, measured sections, etc., must be recorded three-dimensionally if any “significant fossils” are recorded during the time of excavation.

DETAILS OF SPECIALIST

Dr Alan Smith

Private Consultant: *Alan Smith Consulting, 29 Brown's Grove, Sherwood, Durban, 4091*

&

Honorary Research Fellow: *Discipline of Geology, School of Agriculture, Earth and Environmental Sciences, University of KwaZulu-Natal, Durban.*

Role: Specialist Palaeontological Report production

Expertise of the specialist:

- PhD in Geology (University of KwaZulu-Natal), Pr. Sc. Nat., I.A.H.S.
- Expert in Vryheid Formation (Ecca Group) in northern KZN, this having been the subject of PhD.
- Scientific Research experience includes: Fluvial geomorphology, palaeoflood hydrology, Cretaceous deposits.
- Experience includes understanding Earth Surface Processes in both fluvial and coastal environments (modern & ancient).
- Alan has published in both national and international, peer-reviewed journals. He has published + 50 journal articles with 497 citations (detailed CV available on request).
- Attended and presented scientific papers and posters at numerous international and local conferences (UK, Canada, South Africa) and is actively involved in research.

Selected recent palaeo-related work includes:

- Desktop PIA: Proposed middle income housing units on Portion 23 of Farm Lot H Weston 13026, Bruntville, Mpofana Local Municipality. Client: UMLANDO.
- Desktop PIA: Proposed ByPass Pipeline for Ulundi bulk water pipeline upgrade. Client: UMLANDO.
- Fieldwork PIA: Bhekuzulu Epangweni KZN water reticulation project, Cathkin Park. Client: Mike Webster, HSG Attorneys.
- Fieldwork PIA: Mpungoze water supply scheme, Empangeni. Client: Enviropro.
- Fieldwork PIA: Helpmekaar Dam. Client: Afzelia environmental consultants.
- Desktop PIA: Zuka valley, Ballito. Client: Mike Webster, HSG Attorneys.
- Mevamhlope proposed quarry palaeontology report. Client: Enviropro.

- Desktop PIA: Proposed Lovu Desalination site. Client: eThembeni Cultural Heritage.
- Desktop PIA: Tinley Manor phase 2 North & South banks: eThembeni Cultural Heritage
- Desktop PIA: Tongaat. Client: eThembeni Cultural Heritage.
- Palaeontological Assessment Reports (3) to Scatec Solar SA (Pty) Ltd on an Appraisal of Inferred Palaeontological Sensitivity for a Potential Photo Voltaic Park at (1) Farm Rooilyf near Groblershoop, N Cape; (2) Farm Riet Fountain No. Portions 1 and 6, 18km SE of De Aar, N Cape; and (3) Dreunberg, near Burgersdorp, Eastern Cape. Client: Sustainable Development Projects.