

**HERITAGE SURVEY OF THE UPGRADING OF THE  
D2286, P372, L1190, P148, L1333, L1351, D897,  
AND D30**

**FOR AFZELIA ENVIRONMENTAL CONSULTANTS**

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## EXECUTIVE SUMMARY

*The proposed project is located at Nquthu/Isandlwana area which is within the jurisdiction of the Nquthu Local Municipality and uMzinyathi District Municipality in the KwaZulu-Natal. The project is split into 2 phases, Phase 1 being P372 and Phase 2 includes P148, D897, D30, L1190, L1333, D2286 and road to Isandlwana.*

*The road upgrade includes Road P372 P148, D897, D30, P60, D1348, L1190, L1333 & D2286.*

*The major aspects of this project include the following:*

- Surfacing of the existing gravel road to low traffic volume standards ,*
- Improvement and Strengthening the existing pavement structure from Gravel to Surfaced,*
- Vertical and horizontal geometric improvements,*
- Provision of new road signs and markings.*
- Minor structures – drifts, low level crossings etc.*
- Trial section using nanotechnology*
- Slope stabilization*

*The area is known to have high archaeological, historical and palaeontological sensitivity. The desktop noted thirty-two homesteads from 1944, and fifty-one from 1950-1964, occurring within 50m of the proposed roads. These sites have either been built over, or abandoned over time. These desktop sites should be treated as being sensitive for possible human remains and a Chance Find Protocol was initiated.*

*The field survey recorded fifty-one heritage sites. Most of these sites were graves and/or cemeteries and forty-two require further mitigations. Most of the*

*mitigation is in the form of demarcating the site before construction occurs, and placing the appropriate buffers between the site and the road upgrade.*

*One site will require the road to be re-aligned as the existing culvert directly affects a human grave. Another grave needs to be reinforced, as erosion will eventually expose the human remains in the road cutting.*

*The road upgrades could affect two parts of the Battle of Isandlwana. The first is the unofficial viewing areas used by tour guides on the D2286. I suggested a formal viewing area is constructed. The second part is the southern roads bordering battlefield. These will require a metal detector survey for potential battle artefacts.*

*While the area is of medium to high palaeontological sensitivity, significant fossils are not expected to be found. A Chance Find protocol was initiated.*

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## Abbreviations

EIA	Early Iron Age
ESA	Early Stone Age
HIA	Heritage Impact Assessment
HP	Historical Period
IIA	Indeterminate Iron Age
ISA	Indeterminate Stone Age
KZNARI	KwaZulu-Natal Amafa & Research Institute
LIA	Late Iron Age
LSA	Late Stone Age
MSA	Middle Stone Age
PIA	Palaeontological Impact Assessment
SAHRA	South African Heritage Resources Agency

## INTRODUCTION

The proposed project is located at Nquthu/Isandlwana area which is within the jurisdiction of the Nquthu Local Municipality and uMzinyathi District Municipality in the KwaZulu-Natal. The project is split into 2 phases, Phase 1 being P372 and Phase 2 includes P148, D897, D30, L1190, L1333, D2286 and road to Isandlwana.

Phase 1 is the main provincial route P372 commencing from P372 & R68 intersection (at Luvisi Village) The road then goes in a south westerly direction through to Isandlwana Battlefield with latitude and longitude coordinates of 28°21'20"S & 30°39'15"E respectively. From Isandlwana Battlefield the road continues in a south easterly direction to ends at P372 & R68 intersection (at Ngwebeni Village).

Phase 2 are rest of the local and district connecting roads P148, D897, D30, L1190, L1333, D2286 and road to Isandlwana.

It is important to note that the contract is split into 2 Phases. Phase 1 includes Road P372 and Phase 2 includes Roads P148, D897, D30, P60, D1348, L1190, L1333 & D2286. Phase 2 will commence approximately 4 months after Phase 1 has commenced and will run concurrently of which the EAP will be involved in both Phase 1 and Phase 2. Phase 2 will complete 4 months after Phase 1 has completed, however the total duration for both contracts is 24 months.

The major aspects of this project include the following:

- Surfacing of the existing gravel road to low traffic volume standards ,
- Improvement and Strengthening the existing pavement structure from Gravel to Surfaced,
- Vertical and horizontal geometric improvements,



- Provision of new road signs and markings.
- Minor structures – drifts, low level crossings etc.
- Trial section using nanotechnology
- Slope stabilization

After the initial RFQ, the following have been removed

- • possible 6.5m wide temporary deviation to accommodate two-way traffic during construction. No deviation road will be undertaken.
- • Opening and re-entry into 3 potential Borrow pits. Existing quarry and provider will be used from Dundee.
- • Stockpile areas and vegetation clearance outside road reserve in excess of one hectare. Will not be used.

The roads to be upgraded are:

- D2286
- P372
- L1190
- P148
- L1333
- L1351
- D897
- D30

Umlando was requested to undertake an HIA of the proposed road upgrade developments. Figures 1 – 4 show the location of the road upgrades.

FIG. 1 GENERAL LOCATION OF THE PROPOSED DEVELOPMENT

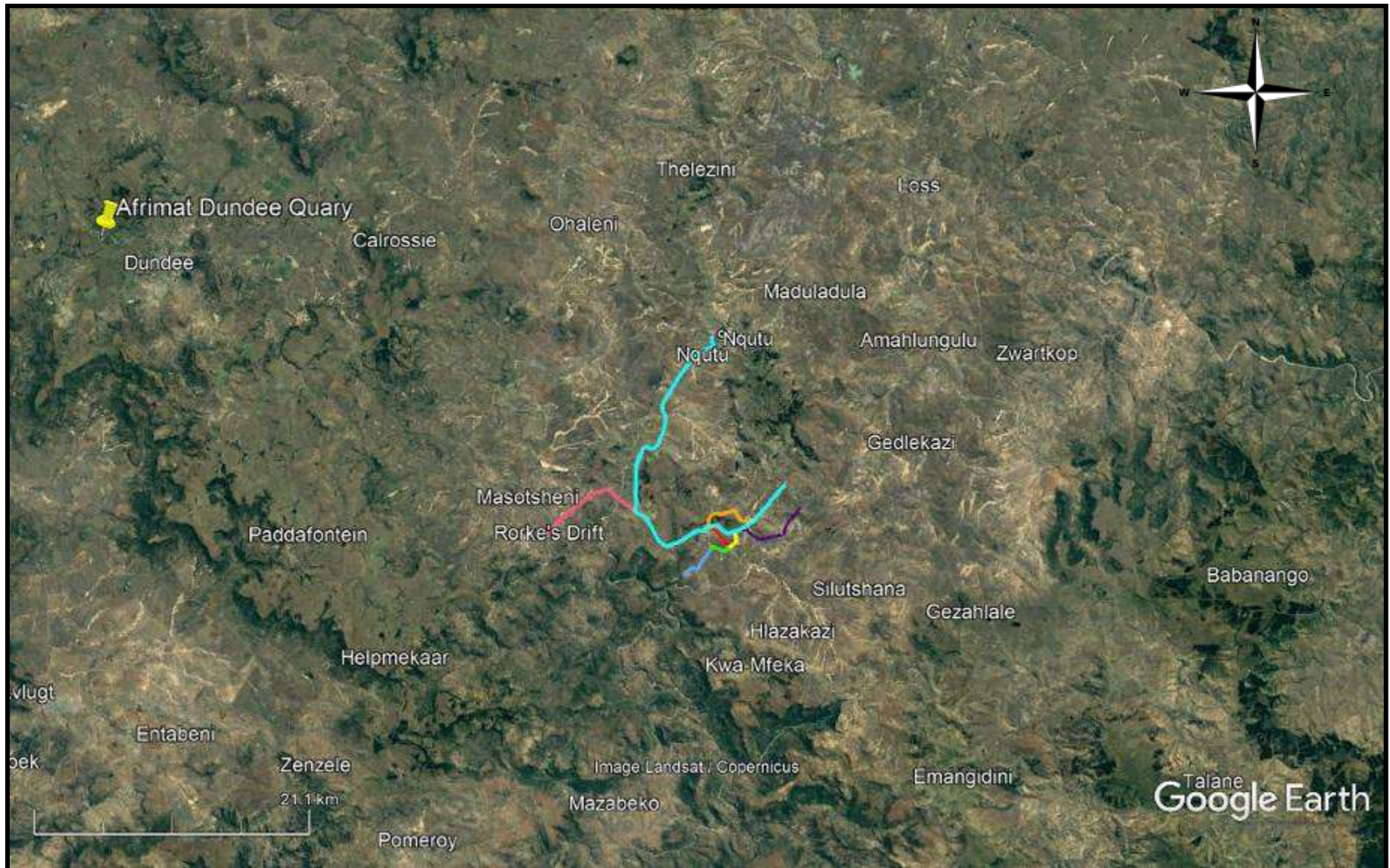


FIG. 2: AERIAL OVERVIEW OF THE ROADS TO BE UPGRADED



FIG. 3: TOPOGRAPHICAL MAP OF THE PROPOSED DEVELOPMENT (2000)

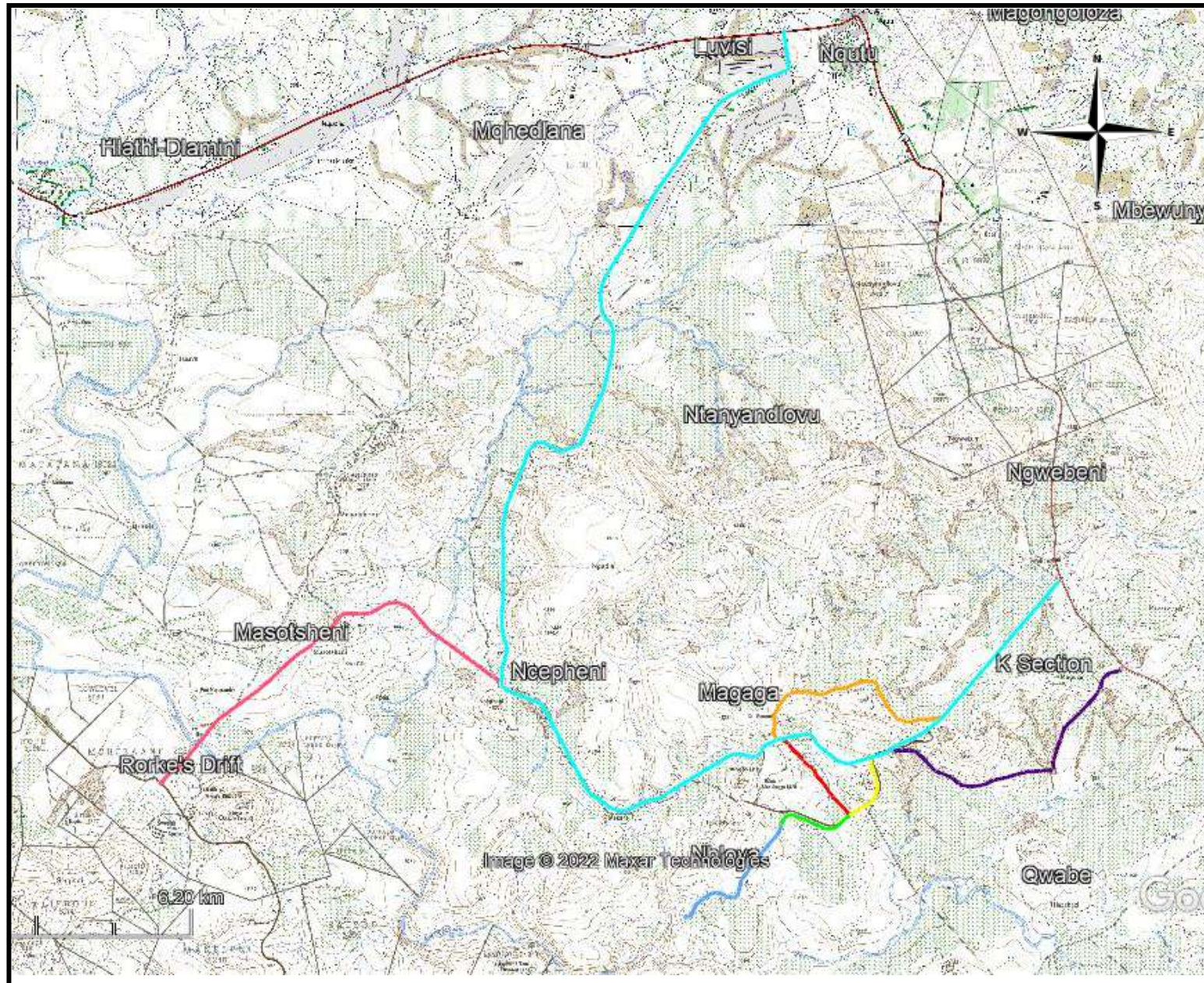
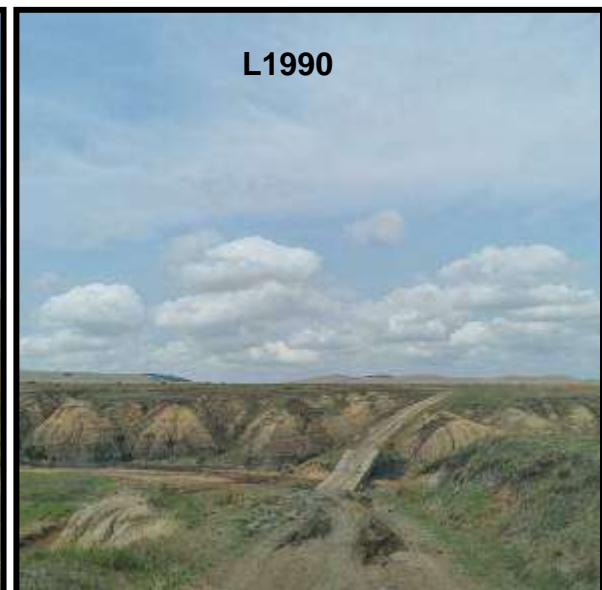
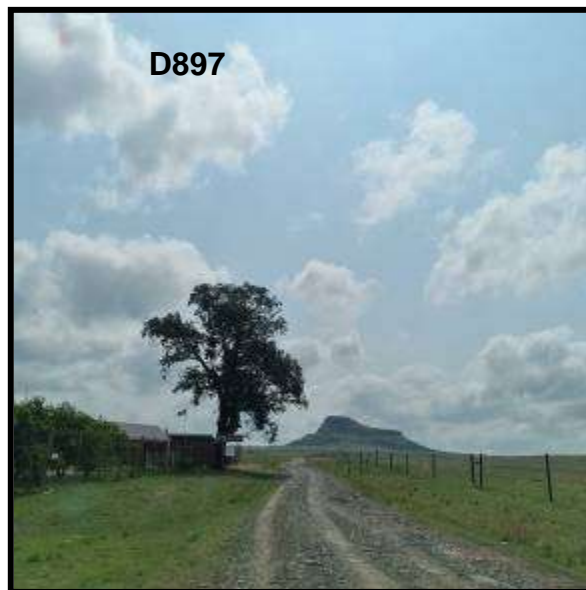
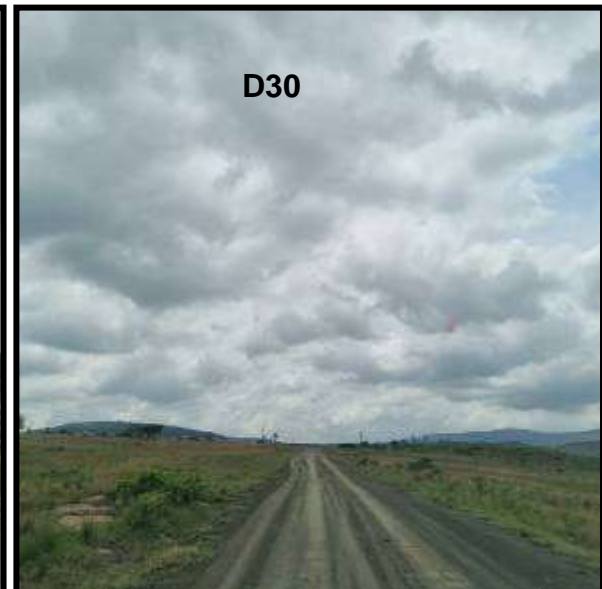


FIG. 4: SCENIC VIEWS OF THE STUDY AREA



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

The Kwazulu Natal Amafa And Research Institute, Act 05, 2018, Chapter 8 (pp 29 – 32) defines heritage resources.

**“General protection: Structures.**

37.(1)(a) 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 Institute having been obtained on written application to the Council.

(b) Where the Institute does not grant approval, the Institute must consider special protection in terms of sections 38, 39, 40, 41 and 43 of Chapter 9.

The Institute may, by notice in the *Gazette*, exempt—

(a) A defined geographical area; or

(b) defined categories of sites within a defined geographical area, from the provisions of subsection where the Institute 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.

(3) 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.**

38. No person may damage, alter, exhume, or remove from its original position

(a) the grave of a victim of conflict;

(b) a cemetery made up of such graves; or

(c) any part of a cemetery containing such graves, without the prior written approval of the Institute having been obtained on written application to the Council.

**General protection: Informal and private burial grounds**

39.(1) or burial ground older than 60 years, or deemed to be of heritage significance by a heritage authority -

- (a) not otherwise protected by this Act; and
- (b) 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 Institute having been obtained on written application to the Council.

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

- (a) the applicant has made a concerted effort to consult with communities and individuals who by tradition may have an interest in the grave; and
- (b) 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.—**

40 (1) 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 Institute having been obtained on written application to the Council.

(2) 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 Institute without delay.

(3) The Institute 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 Institute to be inappropriate within 50 metres of a rock art site.

(4) 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 Institute having been obtained on written application to the Council.

(5) 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 Institute having been obtained on written application to the Council.

(6)(a) 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, vests in the Provincial Government and the Institute is regarded as the custodian on behalf of the Provincial Government.

(b) The Institute may establish and maintain a provincial repository or repositories for the safekeeping or display of —

- (i) archaeological objects;
- (ii) palaeontological material;
- (iii) ecofacts;
- (iv) objects related to battlefield sites;
- (v) material cultural artefacts; or
- (vi) meteorites,



(7) The Institute may, subject to such conditions as the Institute may determine, loan any object or material referred to in subsection (6) to a national or provincial museum or institution.

(8) No person may, without the prior written approval of the Institute having been obtained on written application to the Institute, trade in, export or attempt to export from the Province ~

- (a) any category of archaeological object;
- (b) any palaeontological material;
- (c) any ecofact;
- (d) any object which may reasonably be regarded as having been recovered from a battlefield site;
- (e) any material cultural artefact; or
- (f) any meteorite.

(9)(a) A person or institution in possession of an object or material, referred to in paragraphs (a) ~ (f) of subsection (8), must submit full particulars of such object or material, including such information as may be prescribed, to the Institute.

(b) An object or material referred to in paragraph (a) must, subject to paragraph (c) and the directives of the Institute, remain under the control of the person or institution submitting the particulars thereof.

(c) The ownership of any object or material referred to in paragraph (a) vests in the Provincial Government and the Institute 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 1<sup>st</sup> and 2<sup>nd</sup> edition 1:50 000 topographical and 1937 aerial photographs where available, to assist in general location and dating of buildings and/or graves. The database is in Google Earth format and thus used as a quick reference when undertaking desktop studies. Where required we would consult with a local data recording centre, however these tend to be fragmented between different institutions and areas and thus difficult to access at times. We also consult with an historical architect, palaeontologist, and an historian where necessary.

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

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

## **Defining significance**

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

These criteria are:

### **1. State of preservation of:**

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

### **2. Spatial arrangements:**

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

### **3. Features of the site:**

- 3.1. Are there any unusual, unique or rare artefacts or images at the site?
- 3.2. Is it a type site?
- 3.3. Does the site have a very good example of a specific time period, feature, or artefact?

**4. Research:**

- 4.1. Providing information on current research projects
- 4.2. Salvaging information for potential future research projects

**5. Inter- and intra-site variability**

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

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

**6. Archaeological Experience:**

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

**7. Educational:**

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

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

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

**8. Other Heritage Significance:**

8.1. Palaeontological sites

8.2. Historical buildings

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

8.4. Graves and/or community cemeteries

8.5. Living Heritage Sites

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

The more a site can fulfill the above criteria, the more significant it becomes. Test-pit excavations are used to test the full potential of an archaeological deposit. This occurs in Phase 2. These test-pit excavations may require further excavations if the site is of significance (Phase 3). Sites may also be mapped

and/or have artefacts sampled as a form of mitigation. Sampling normally occurs when the artefacts may be good examples of their type, but are not in a primary archaeological context. Mapping records the spatial relationship between features and artefacts. Table 1 lists the grading system.

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

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

## RESULTS

### DESKTOP STUDY

The desktop study consisted of analysing various maps for evidence of prior habitation in the study area, as well as for previous archaeological surveys. The general area is known for its archaeological and Anglo-Boer War sites (fig. 5). The archaeological sites consist of the whole range of sites from the Stone Ages, Rock Art and Iron Ages. The main two Anglo-Zulu War sites near the road upgrade are Rorke's Drift and Isandlwana (1879 ACE). Colonial Period houses also occur in the general area.

Three heritage surveys have occurred nearby the road upgrades. Gaigher (2015) recorded four family grave sites and two stone walls. Prins (2015) surveyed the area around KwaNyoni and did not find any heritage sites. He did note that there is a possibility of unrecorded and unmarked graves from the Battle of Isandlwana. Prins (2016) proceeded to record eleven graves in his study area. There is thus a strong possibility of unknown, or unmarked graves, from the Battle of Isandlwana occurring near some of the proposed road upgrades. This would be especially true for the relevant part of the P372, D897, L1333 and L1351.

The 1944 aerial photographs indicate that the area has had intensive agriculture in the northern and eastern parts. Those areas around Rorke's Drift and Isandlwana have been left for grazing (fig. 6). Thirty-two (32) settlements occur within 50m of the roads and these could have human graves.

The 1950 and 1967 topographical map indicates that most of the area is under agricultural activity. (fig. 7). A total of 51 settlements and buildings occur within 50m of the proposed road upgrades. A few of these are in the same location as in 1944,

The location of the various settlements and buildings are listed in Table 2.

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

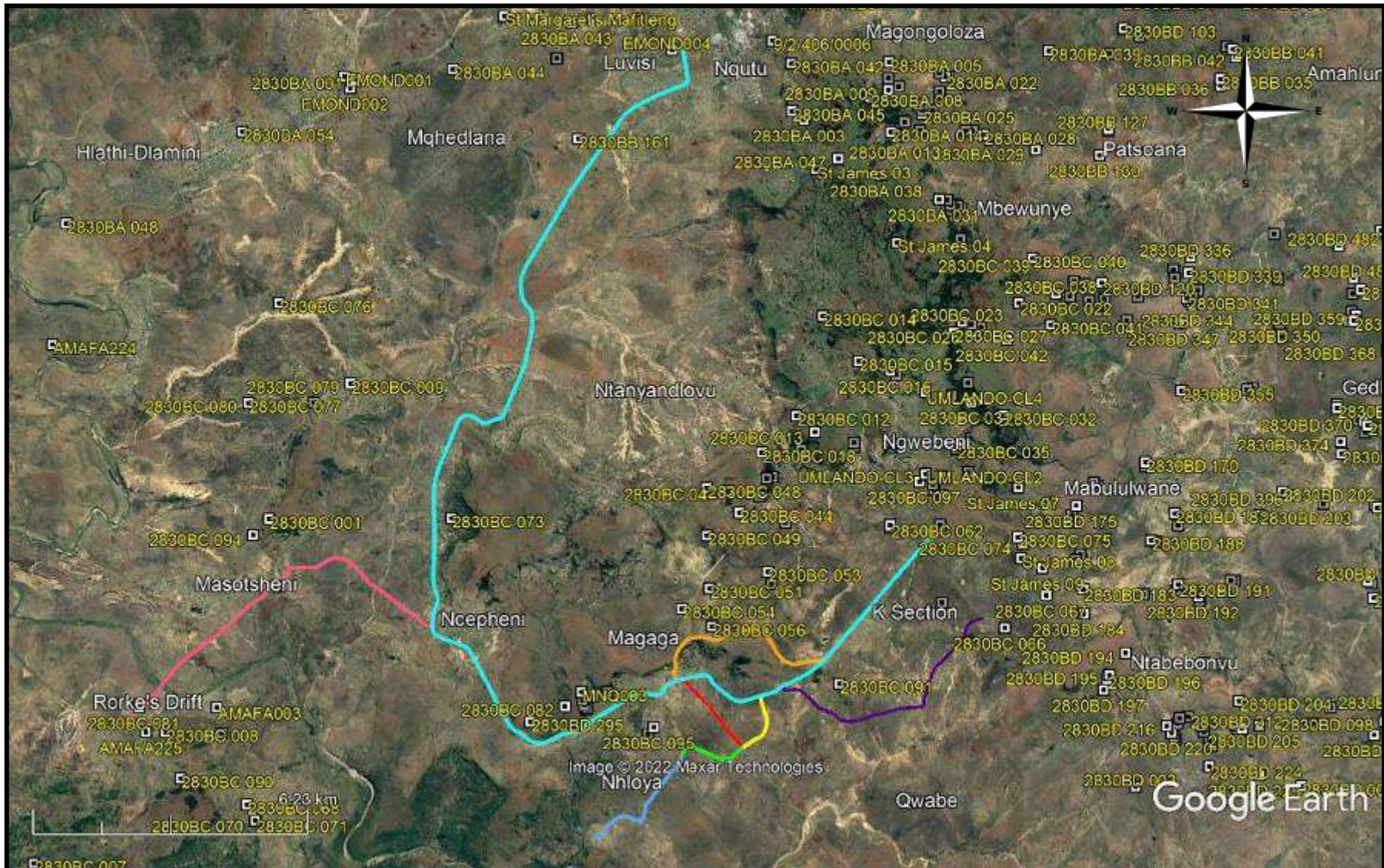


FIG. 6: LOCATION OF THE STUDY AREA IN 1944

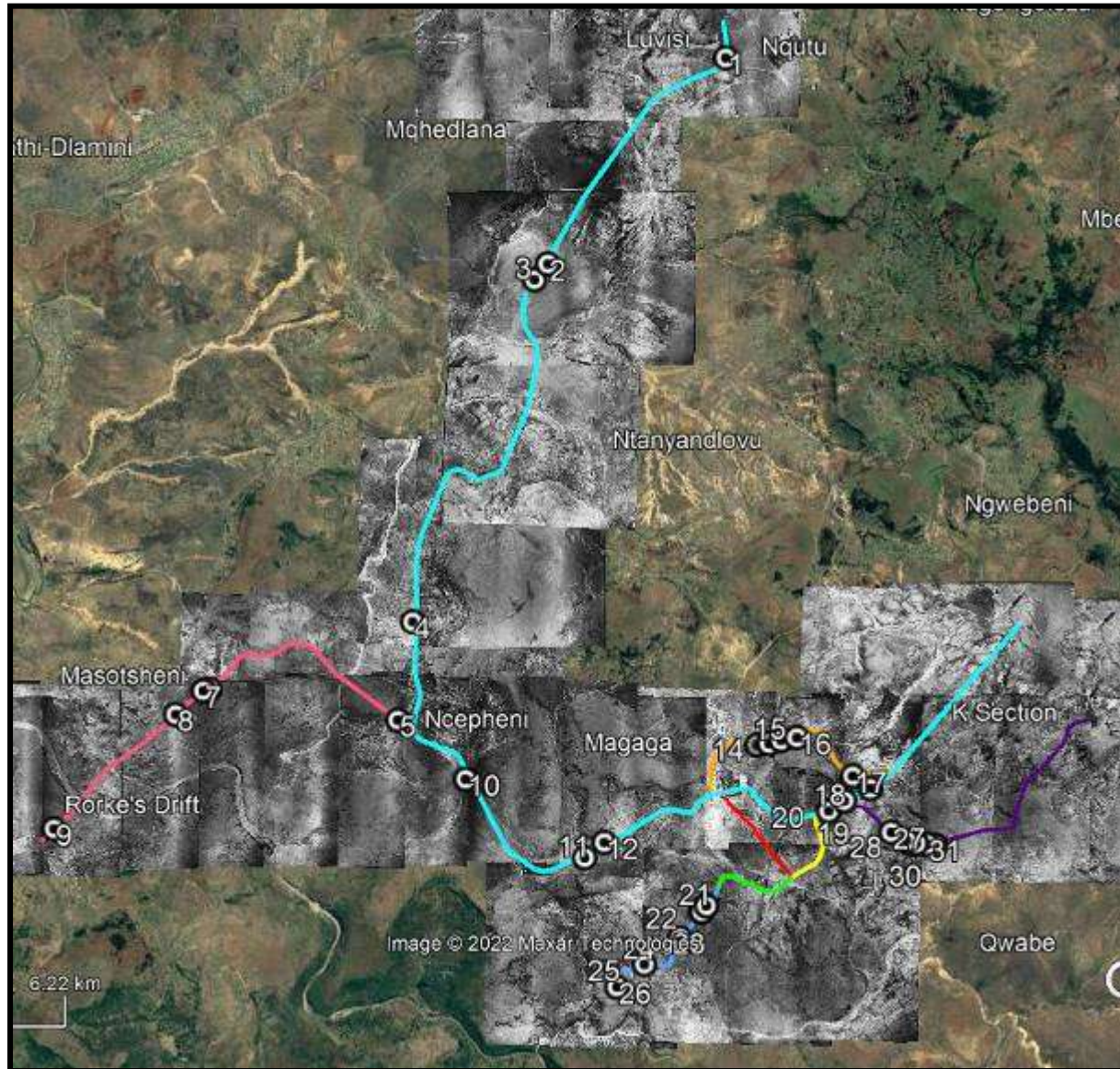
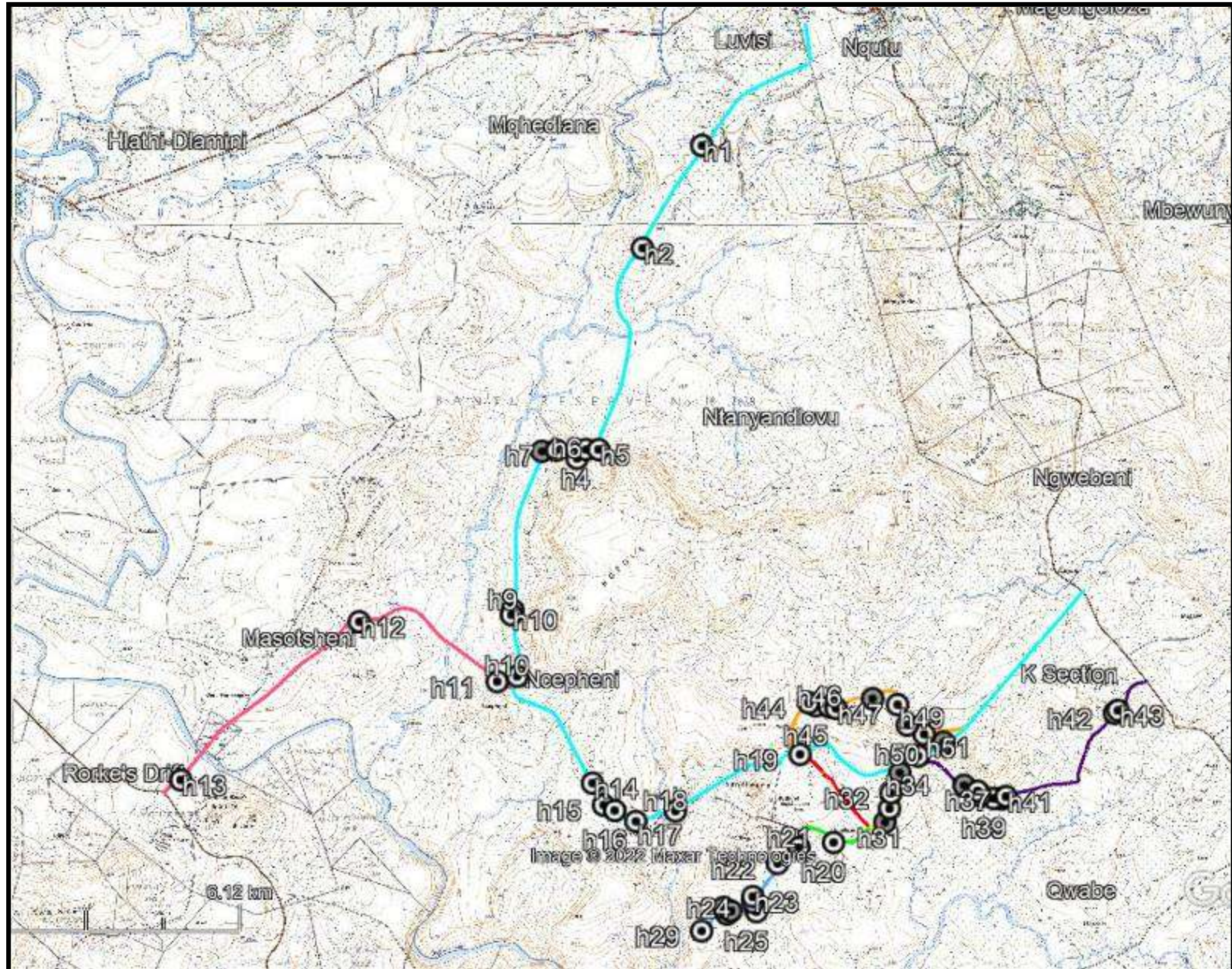




FIG. 7: LOCATION OF THE STUDY AREA IN 1950 - 1967



**TABLE 2: LOCATION OF HERTIAGE SITES NOTED IN THE DESKTOP STUDY**

Date	Name	Latitude	Longitude	Description
1944	1	-28.220925024	30.662039926	Settlement
1944	2	-28.255257550	30.628170621	Settlement
1944	3	-28.257892129	30.625635726	Settlement
1944	4	-28.315438692	30.602316492	Kraal
1944	5	-28.331981521	30.599448915	Settlement
1944	6	-28.326777738	30.563458815	Settlement
1944	7	-28.327045154	30.562223824	Settlement
1944	8	-28.331046152	30.556881210	Settlement
1944	9	-28.350385506	30.533422291	Historical houses
1944	10	-28.341937746	30.612633106	Settlement
1944	11	-28.355217252	30.635273710	Settlement
1944	12	-28.352580594	30.639015958	Settlement
1944	13	-28.336123399	30.667945375	Settlement
1944	14	-28.335677474	30.670270235	Settlement
1944	15	-28.335125831	30.672554024	Settlement
1944	16	-28.334678741	30.675574868	Settlement
1944	17	-28.341119915	30.686241229	Settlement
1944	18	-28.343265291	30.689705870	Settlement
1944	19	-28.345277008	30.685016795	Settlement
1944	20	-28.347142939	30.681852437	Settlement
1944	21	-28.363219236	30.658578475	Settlement
1944	22	-28.364240360	30.657744853	Settlement
1944	23	-28.364111785	30.657407940	Settlement
1944	24	-28.368660516	30.653533352	Settlement
1944	25	-28.373190977	30.646743426	Settlement
1944	26	-28.377111494	30.641484299	Settlement
1944	27	-28.350736102	30.693831888	Settlement
1944	28	-28.352152642	30.696815446	Settlement
1944	29	-28.352672926	30.697860396	Settlement
1944	30	-28.352639019	30.698692065	Settlement
1944	31	-28.353040431	30.700472409	Settlement
1944	32	-28.352953153	30.702275634	Settlement
1950-1964	h1	-28.236377632	30.640689927	Settlement
1950-1964	h2	-28.254652813	30.628674530	Settlement
1950-1964	h4	-28.290665995	30.617238664	Settlement
1950-1964	h5	-28.290665961	30.619811582	Settlement
1950-1964	h6	-28.292259382	30.615442818	Settlement
1950-1964	h7	-28.290772920	30.611255608	Settlement
1950-1964	h8	-28.290981016	30.608251434	Settlement
1950-1964	h9	-28.319424543	30.602417232	Settlement
1950-1964	h10	-28.320227723	30.602099656	Settlement
1950-1964	h10	-28.331215788	30.603351886	Settlement
1950-1964	h11	-28.332242019	30.599222173	Settlement
1950-1964	h12	-28.321530448	30.571162499	Settlement
1950-1964	h13	-28.350013005	30.534576334	historic buildings
1950-1964	h14	-28.350299668	30.618665559	Settlement
1950-1964	h15	-28.354279455	30.620897433	Settlement
1950-1964	h16	-28.355273386	30.623176185	Settlement
1950-1964	h17	-28.357258585	30.627479109	Settlement
1950-1964	h18	-28.355451905	30.635533962	Settlement
1950-1964	h19	-28.345067777	30.660807864	Settlement
1950-1964	h20	-28.360964374	30.667740365	Buildings
1950-1964	h21	-28.361837327	30.660677618	Settlement
1950-1964	h22	-28.364686467	30.656313551	Settlement

1950-1964	h23	-28.370670266	30.651304980	Settlement
1950-1964	h24	-28.371704498	30.651360129	Settlement
1950-1964	h25	-28.373413122	30.652072200	Settlement
1950-1964	h26	-28.373338759	30.646900369	Settlement
1950-1964	h27	-28.372713907	30.645379625	Settlement
1950-1964	h28	-28.373928158	30.646059744	Settlement
1950-1964	h29	-28.377047590	30.640912098	Settlement
1950-1964	h30	-28.357260827	30.678131174	Settlement
1950-1964	h31	-28.354708351	30.679025103	Settlement
1950-1964	h32	-28.351904136	30.679286713	Settlement
1950-1964	h33	-28.348311044	30.681071413	Settlement
1950-1964	h34	-28.345280472	30.684782739	Settlement
1950-1964	h35	-28.342741975	30.689812287	Settlement
1950-1964	h36	-28.350534149	30.694120682	Settlement
1950-1964	h37	-28.351551755	30.696887934	Settlement
1950-1964	h38	-28.352431460	30.697405173	Settlement
1950-1964	h39	-28.352944892	30.700272584	Settlement
1950-1964	h40	-28.353006335	30.701904531	Settlement
1950-1964	h41	-28.352572372	30.702729524	Settlement
1950-1964	h42	-28.337534525	30.724488408	Settlement
1950-1964	h43	-28.337012375	30.725170458	Settlement
1950-1964	h44	-28.335684362	30.662426370	Settlement
1950-1964	h45	-28.336218615	30.663887285	Settlement
1950-1964	h46	-28.336410271	30.666631951	Settlement
1950-1964	h47	-28.336680815	30.667955685	Settlement
1950-1964	h48	-28.334926769	30.675367118	Settlement
1950-1964	h49	-28.335999618	30.680418950	Settlement
1950-1964	h50	-28.339628625	30.682406981	Settlement
1950-1964	h51	-28.341265963	30.685817473	Settlement

## **PALAEONTOLOGICAL SENSITIVITY**

The area is in an area of medium palaeontological sensitivity (fig. 8). A desktop PIA was undertaken by Dr Alan Smith (Appendix A). There are four main geological groupings:

### **1. Alluvium:**

- a. This is water-borne sediment and will not be fossiliferous.

### **2. Dwyka Group (green)**

- a. Vertebrate fossils are not common in this region of the planet during the world-wide Late Palaeozoic (Dwyka) Glaciation. Trace fossils are found but these are not of great palaeontological interest.

### **3. Pietermaritzburg Formation (Green)**

- a. The Pietermaritzburg Formation may contain scattered, fragmentary plant fossils and invertebrate trace fossils, some of which are diagnostic of marine conditions. The chances of finding Palaeontological Material is very low, but not zero

### **4. Vryheid Formation (Red)**

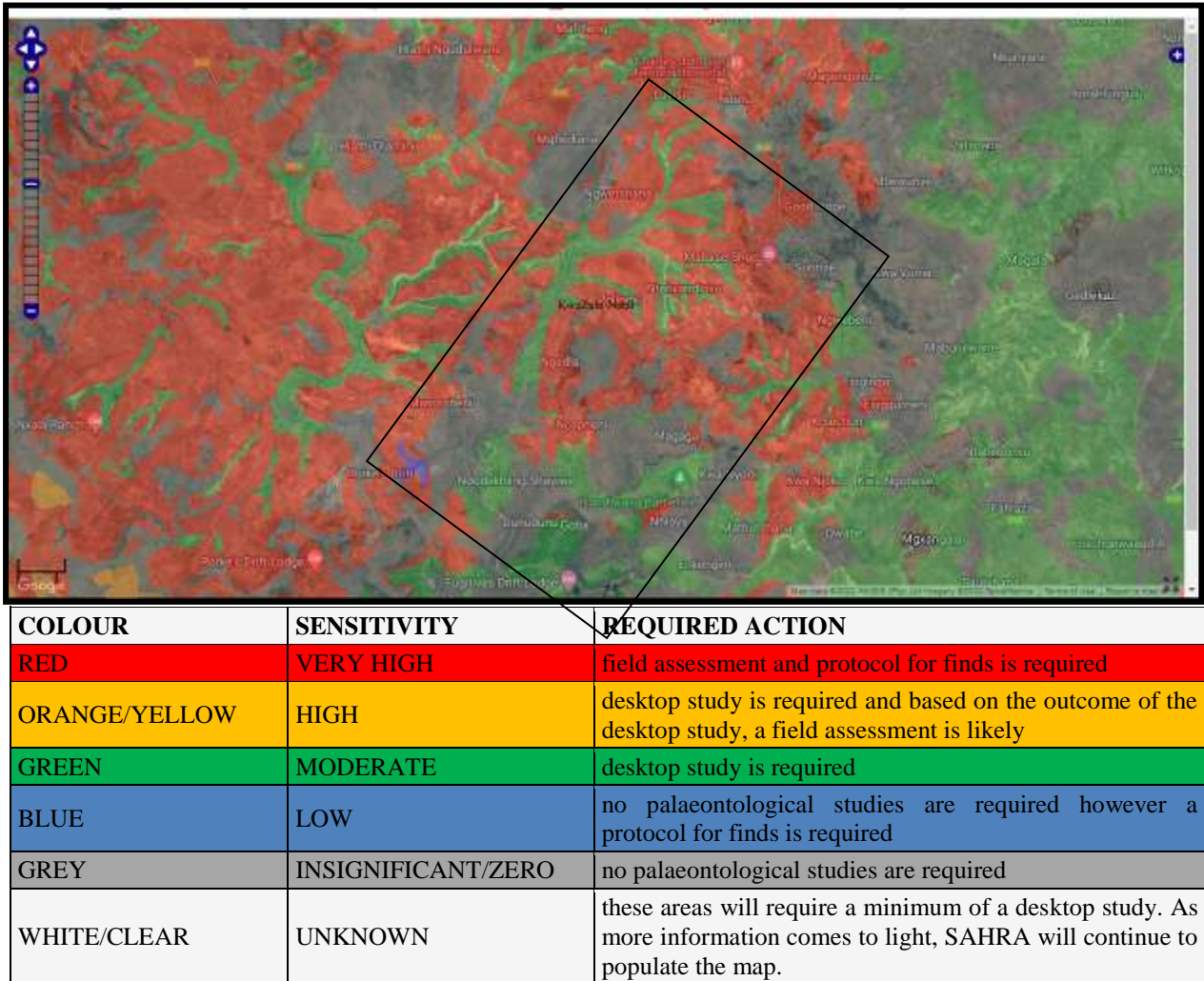
- a. The Vryheid Formation as a **Very High Palaeosensitivity Zone**. In practise, no vertebrate fossils have been recorded from the Vryheid Formation in this area, however invertebrate trace fossils are common

### **5. Karoo Dolerite**

- a. This is an intrusive igneous rock and by definition cannot be fossiliferous.

Thus while the much of the area is noted as being potentially sensitive there is a low chance of finding significant fossils. No further mitigation is required; however, a Chance Find Protocol was initiated.

FIG. 8: PALAEOLOGICAL SENSITIVITY MAP



## FIELD SURVEY

A field survey was undertaken on the 21 May 2022. Ground visibility was very good. The road margin up to the fences were considered to be the footprint for the road upgrades; however, graves within 50m of the road were noted.

All graves are of high significance and automatically rated as 3A on the SAHRIS system. For the purpose of this report, one to four to six graves within a homestead is referred to as a 'grave'. A cemetery is more than four to six graves outside of a homestead's boundaries. The cemetery is a communal burial area whereas the graves are related to a specific family.

Demarcation of a grave requires a 5m buffer between the edge of the grave(s) and the demarcation. No development within 20m of a grave is the preferred option. This is used as there may be other subsurface graves that are not visible. In some cases, the 20m buffer can be reduced. Any reduction must be reviewed at first at a desktop level and then a field visit if needed.

Heritage sites in the report occurs as recorded in the field, and not in numerological order.

### **P372**

The P372 consists of 31.9km of gravel road in various conditions.

#### **Grave 1**

Grave 1 consists of a stone cairn ~15m east from the edge of the road (fig. 9).

**Mitigation:** The grave needs to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the grave and any roadworks.

**FIG. 9: GRAVE 1**



## Grave 2

Grave 2 consists of two graves: a stone cairn and a tombstone. These are ~15m southeast from the edge of the road (fig. 10). The graves occur between a stone walled kraal and the road.

**Mitigation:** The graves need to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the grave and any roadworks.

**FIG. 10: GRAVE 2**

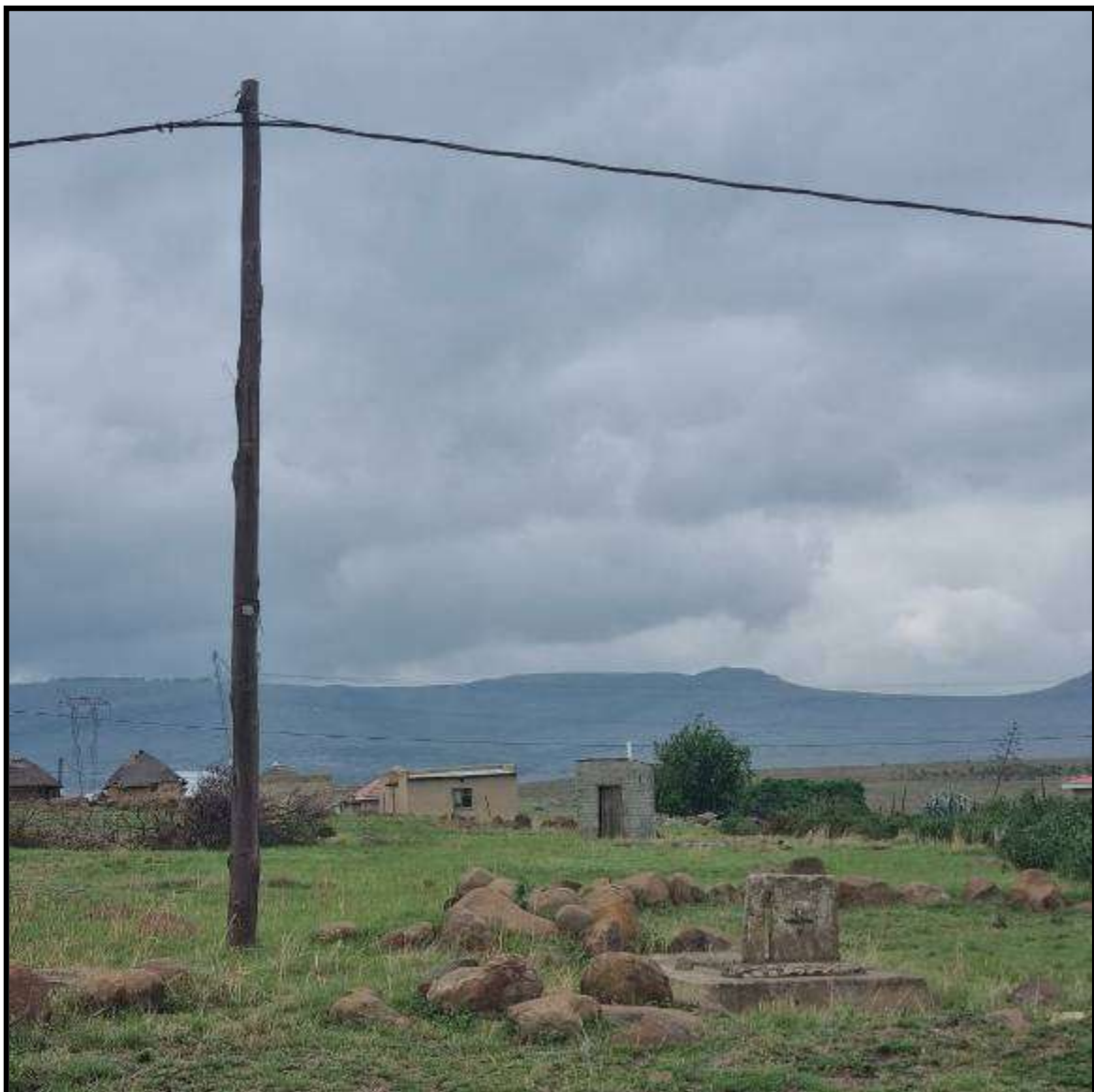


### Grave 3

Grave 3 consists of a single grave with a cement covering and headstone. Grave 3 is ~15m southeast from the edge of the road (fig. 11).

**Mitigation:** The graves need to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the grave and any roadworks.

**FIG. 11: GRAVE 3**





#### Grave 4

Grave 4 consists of three stone cairns and one tombstone. They occur behind a fence and ~30m east from the edge of the road (fig. 12).

**Mitigation:** The graves are unlikely to be affected and already have been demarcated by the existing fence.

**FIG. 12: GRAVE 4**



### **Cemetery 9**

Cemetery 9 (recorded as Grave 5 during the survey) consists of a seven stone cairns ~15m – 20m east from the edge of the road (fig. 13). Two stone cairns are slightly separated from the main group.

**Mitigation:** The graves need to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the grave and any roadworks.

**FIG. 13: CEMETERY 9**

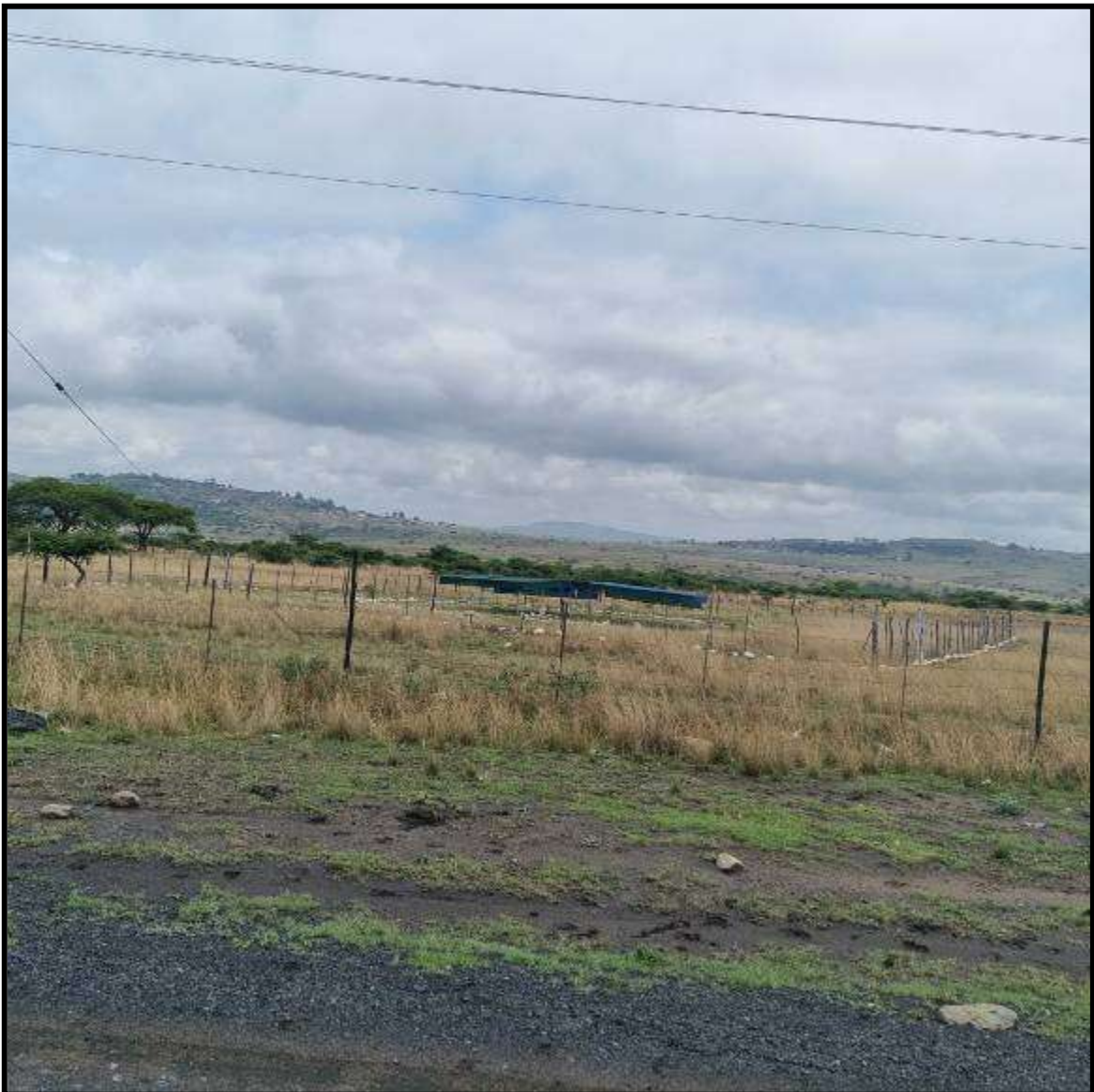


### Shembe Temple 1

The Shembe Temple occurs ~30m west from the edge of the road (fig. 141).

**Mitigation:** The site will not be affected and is already fenced off.

**FIG. 14: SHEMBE TEMPLE 1**



## Grave 6

Grave 6 consists of a three stone cairns within a stone walled feature (fig. 15). The cairns are graves and are ~3m east from the edge of the road.

**Mitigation:** The graves need to be clearly demarcated before construction begins along this section of the road. The 10m buffer cannot be applied in this case so the demarcation must occur on the edge of the road. The road cannot be expanded eastwards in this area; however the western side of the road is clear.

**FIG. 15: GRAVE 6**



### Cemetery 1

Cemetery 1 occurs ~20m north from the edge of the road (fig. 16). The cemetery is not demarcated with a fence.

**Mitigation:** The cemetery needs to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the cemetery and any roadworks.

**FIG. 16: CEMETERY 1**

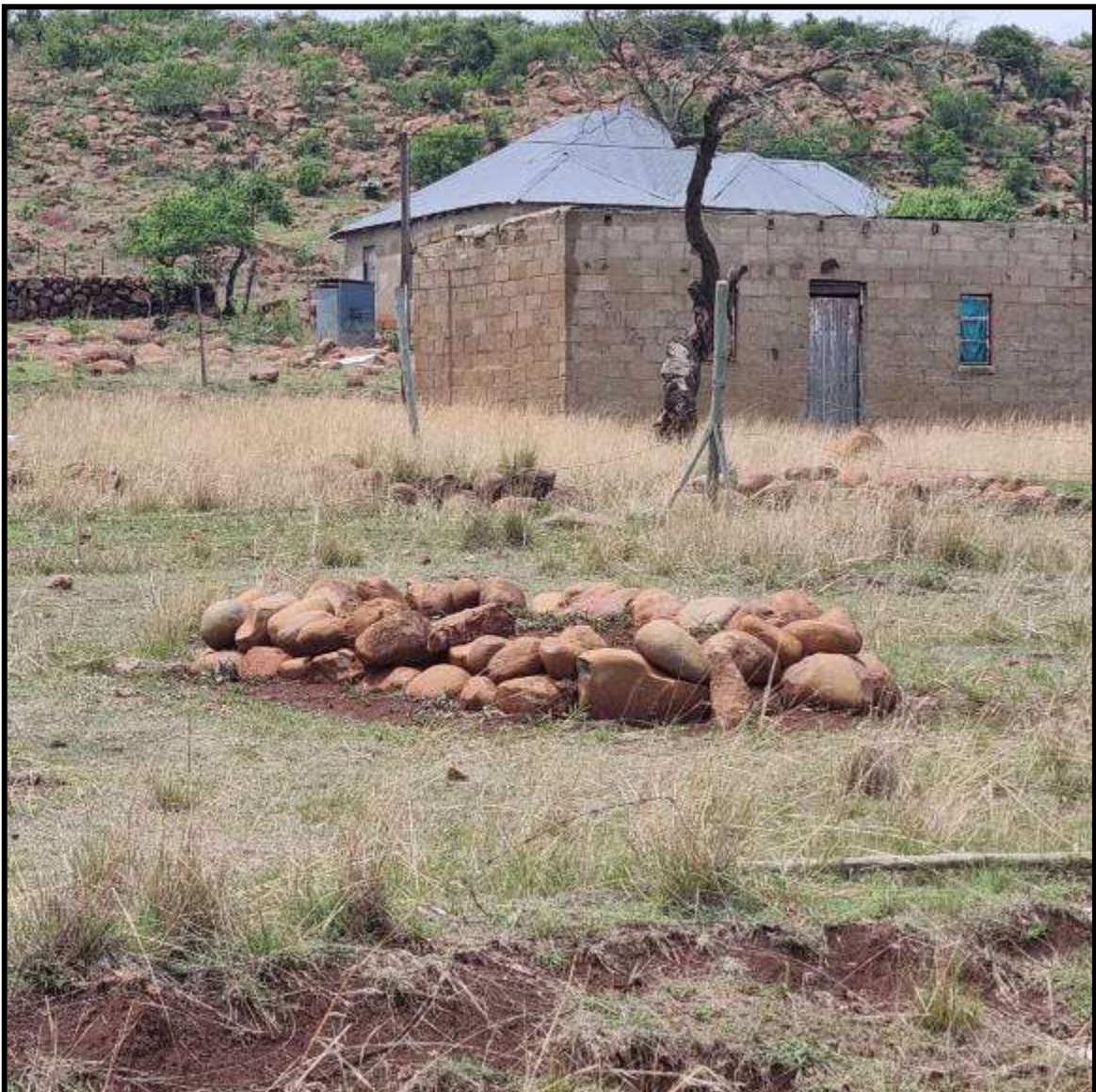


**Grave 10**

Grave 10 consists of a stone cairn ~13m east from the edge of the road (fig. 17). The grave is not demarcated.

**Mitigation:** The graves need to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the grave and any roadworks.

**FIG. 17: GRAVE**

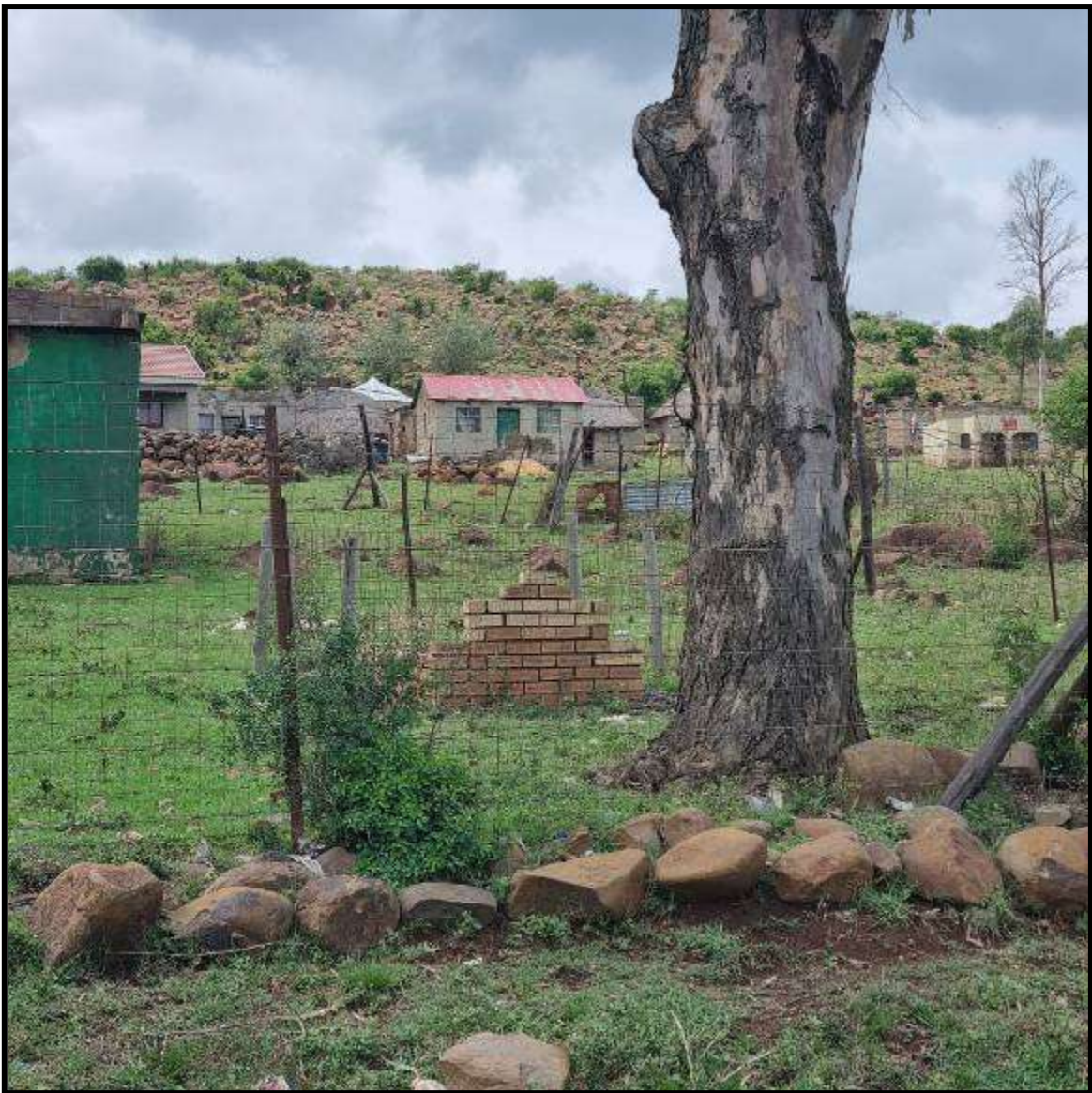


### Grave 11

Grave 11 consists of a bricked grave structure with a headstone. The grave occurs ~15m east from the edge of the road (fig. 18). The grave is in a fenced off area and thus already demarcated.

**Mitigation:** The grave requires no further mitigation.

**FIG. 18: GRAVE 11**

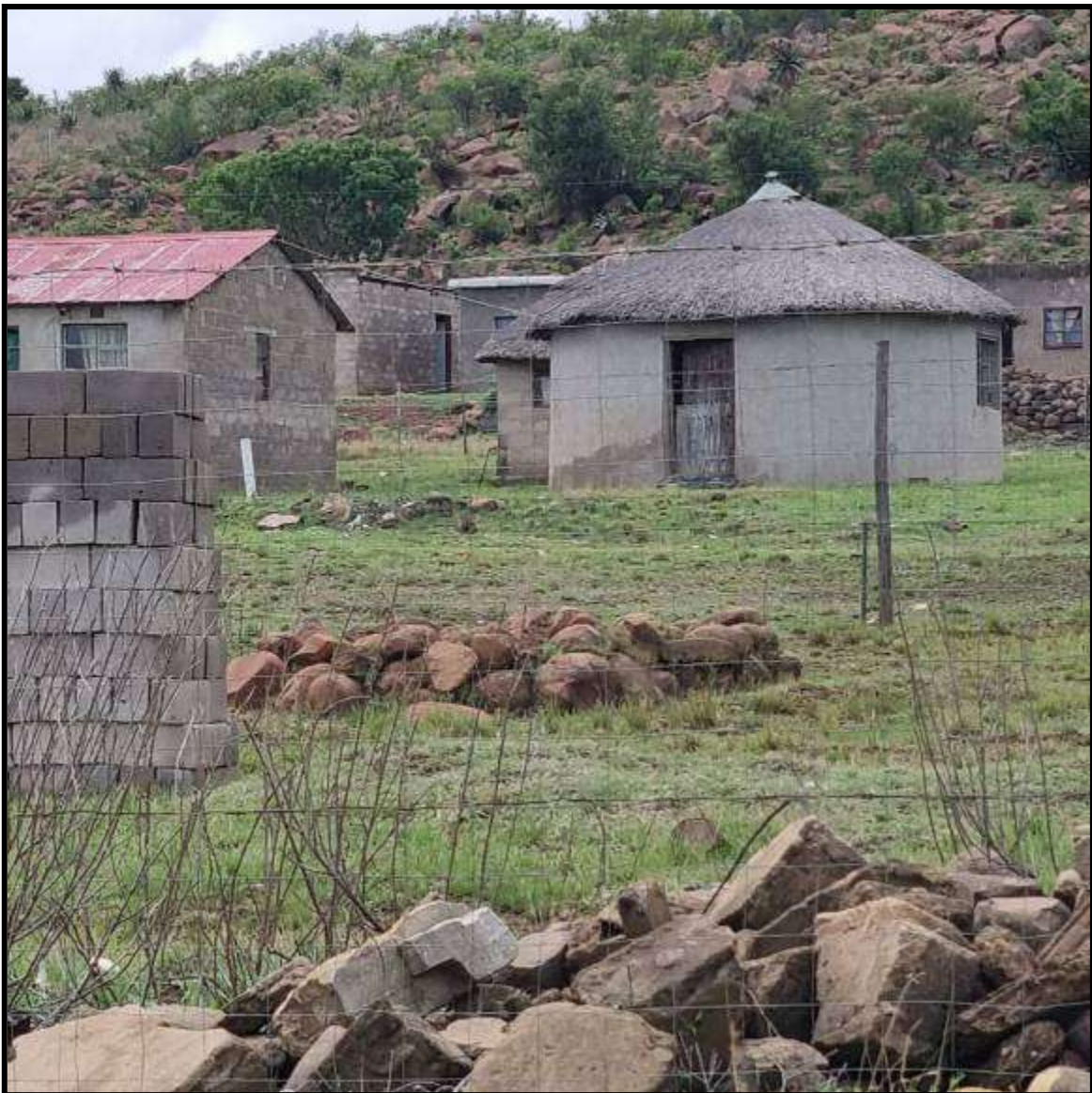


**Grave 12**

Grave 12 consists of a stone cairn ~10m east from the edge of the road (fig. 19). The grave is in a fenced off area and thus already demarcated.

**Mitigation:** The grave requires no further mitigation.

**FIG. 19: GRAVE 12**



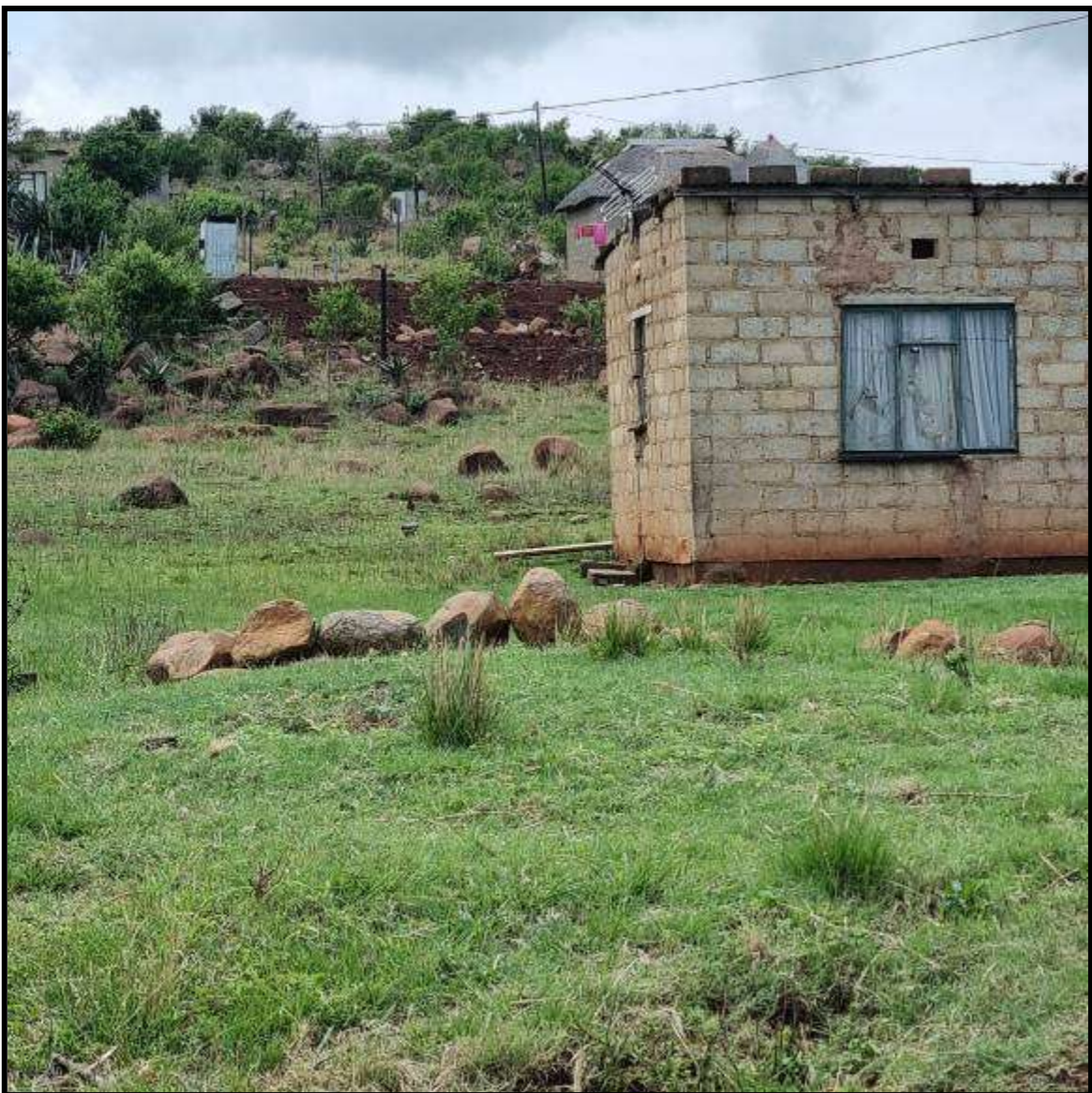


**Grave 13**

Grave 13 consists of a stone cairn ~15m from the edge of the road (fig. 20). The grave is in a fenced off area and thus already demarcated.

**Mitigation:** The grave requires no further mitigation.

**FIG. 20: GRAVE 13**



### Grave 14

Grave 14 consists of 10 graves as stone cairns (fig. 21). Some graves have headstones. It is technically a cemetery, according to my definition; however the graves are directly associated with the house. The graves are not fenced off and occur ~10m from the edge of the road.

**Mitigation:** The graves need to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the grave and any roadworks.

**FIG. 21: GRAVE 14**



### Grave 15

Grave 15 consists of a single stone cairn with a headstone. The grave is ~10m northeast from the edge of the road (fig. 22). The grave is in a fenced off area and thus already demarcated.

**Mitigation:** The grave requires no further mitigation.

**FIG. 22: GRAVE 15**

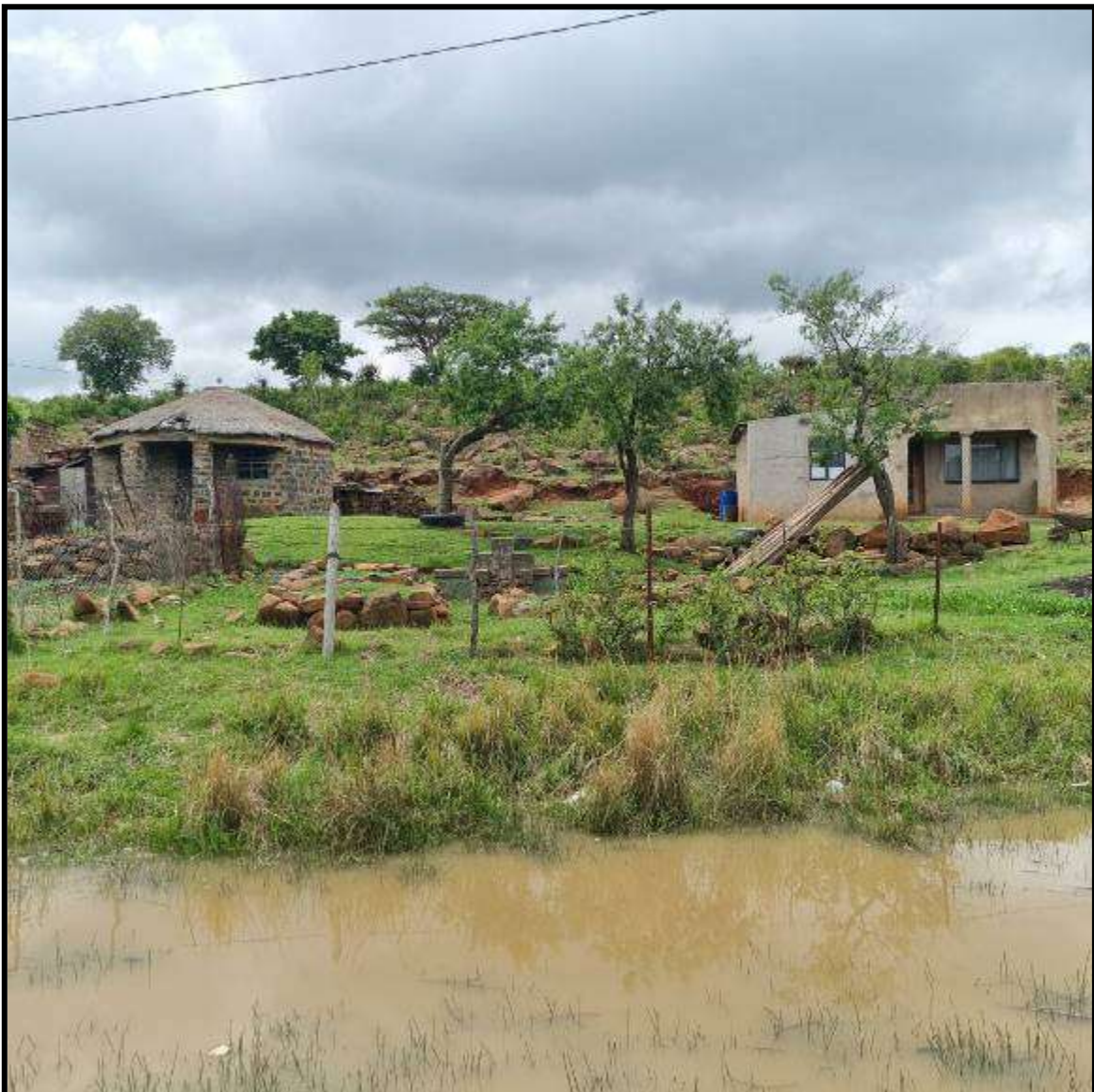


### Grave 16

Grave 16 consists of seven graves within a fenced off area. Most of the graves are stone cairns while one is made from cement. The graves are ~10m from the edge of the road (fig. 23). The grave is in a fenced off area and thus already demarcated.

**Mitigation:** The grave requires no further mitigation.

**FIG. 23: GRAVE 16**



## Shembe Temple 2

Shembe 2 consists of a Shembe Temple and church. These occur ~40m north from the edge of the road (fig. 24).

**Mitigation:** No further mitigation is required.

**FIG. 24: SHEMBE TEMPLE**



### **Kraal 1**

Kraal 1 is a stone walled cattle byre or kraal) ~17m c 10m in size. The stone walling occurs ~15m north from the edge of the road and behind a fence (fig. 25).

**Mitigation:** No further mitigation is required.

**FIG. 25: KRAAL 1**



### Grave 22

Grave 22 consists of a single stone cairn on a raised area on the edge of the road. There are broken stone walled features near the grave and behind the fence. The grave is ~2m from the edge of the road (fig. 26).

**Mitigation:** The graves need to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the grave and any roadworks. The grave should be reinforced by some backfilling along the road side to make sure that it is not exposed by natural erosion.

**FIG. 26: GRAVE 22**



**Grave 21**

Grave 23 consists two or three stone cairns ~15m northwest from the edge of the road (fig. 27). The grave is in a fenced off area and thus already demarcated. There are the foundations of houses further uphill from the graves.

**Mitigation:** The grave requires no further mitigation.

**FIG. 27: GRAVE 21**





### Cemetery 3

Cemetery 3 consists of ten+ graves at the base of the hill. The graves are all stone cairns. The cemetery occurs ~13m from the edge of the road (fig. 28).

**Mitigation:** The cemetery is already demarcated, and requires no further mitigation.

**FIG. 28: CEMETERY**



### **Shembe Temple 3**

The site consists of a Shembe Temple behind a fence. The temple occurs ~40m from the edge of the road (fig. 29).

**Mitigation:** The site will not be affected..

**FIG. 29: SHEMBE TEMPLE 3**



### **D30**

The D30 is 9km long and is one of the access roads to Rorke's Drift.

### Grave 7

Grave 7 consists of several stone walled foundations and a single grave (fig. 30). The grave is a stone cairn. The site covers an area of ~200m c 90m in size consists of several house floors. The grave is ~305m from the edge of the road. The built features do not occur on the historical maps and could predate them.

**Mitigation:** The grave needs to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the grave and any roadworks. The road upgrade is unlikely to affect any of the stone walled foundations, as they are also ~30m from the road.

**FIG. 30: GRAVE 7 AND STONE WALLED FOUNDATIONS**

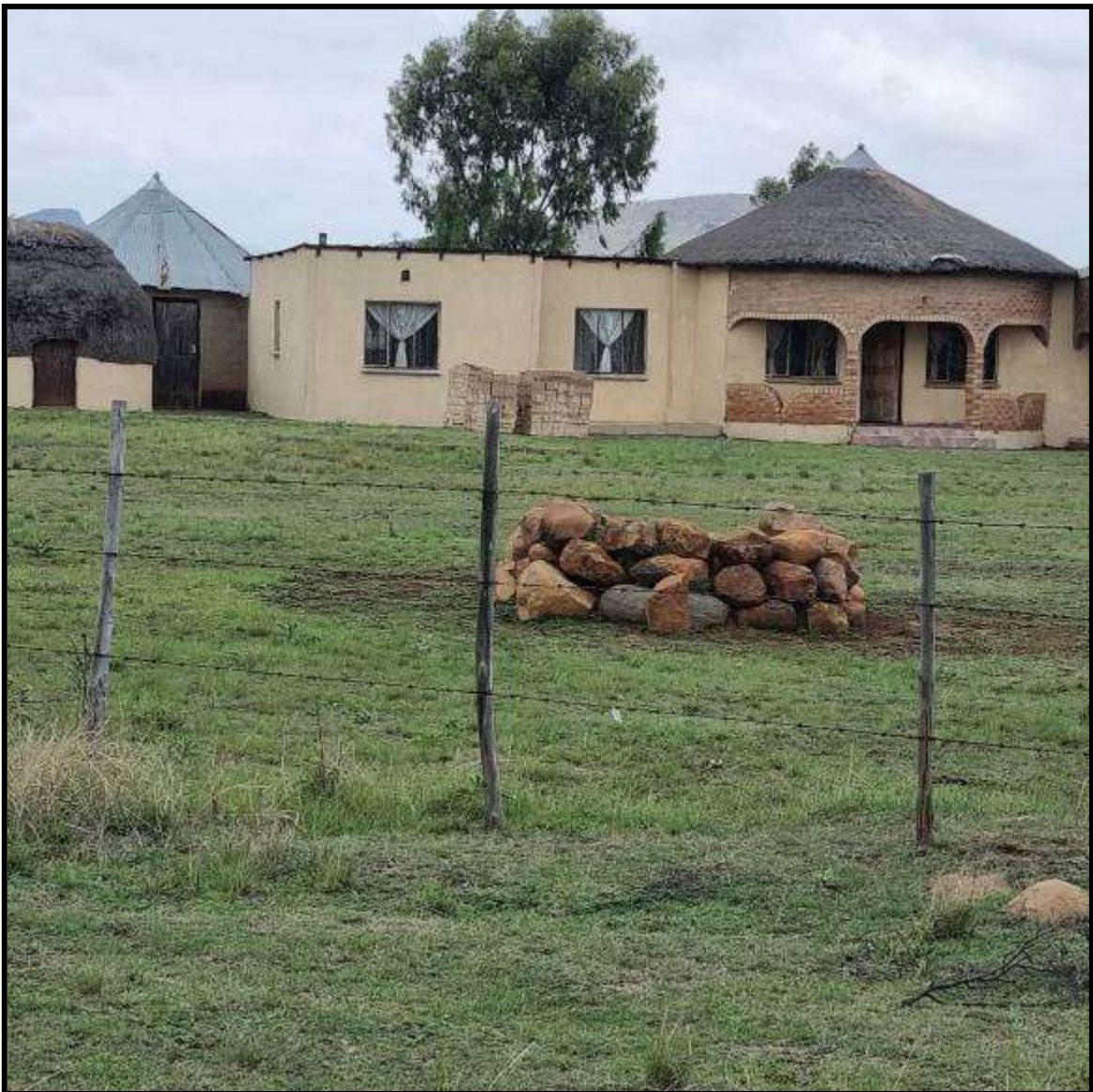


**Grave 9**

Grave 9 consists of a single stone cairn ~20m from the edge of the road (fig. 31). The grave occurs within a homestead and is behind a fence.

**Mitigation:** No further mitigation is required.

**FIG. 31: GRAVE 9**



## Shembe Temple 2

The Shembe Temple occurs ~30m northwest from the edge of the road (fig. 32). It will not be affected.

**Mitigation:** No further mitigation is required

**FIG. 32: SHEMBE TEMPLE 2**



### Grave 8

Grave 8 consists of a stone cairn ~20m southeast from the edge of the road (fig. 33). The grave is fenced off but does not occur within a yard.

**Mitigation:** The graves need to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the grave and any roadworks.

**FIG. 33: GRAVE 8**



### Historical houses

The historical houses predating 1944 occur along the southern road after the Buffalo River crossing. The houses are in ruin and will not be affected by the road upgrade (fig. 34).

**Mitigation:** No further mitigation is required..

**FIG. 34: HISTORICAL HOUSES**



### L1333

The L1333 is 2.1km long and is on the eastern border of the Battle of Isandlwana.

### Grave 23

Grave 23 consists of a stone cairn within a yard. The yard is demarcated, with poles but there is no fencing. The grave is ~9m from the edge of the road (fig. 35).

**Mitigation:** The graves need to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the grave and any roadworks.

**FIG. 35: GRAVE 23**





### Cemetery 4

Cemetery 4 occurs ~15m from the edge of the road (fig. 36). It is ~80m x 40m in size and is fenced off.

**Mitigation:** The cemetery should be clearly demarcated before construction begins along this section of the road.

**FIG. 36: CEMETERY 4**

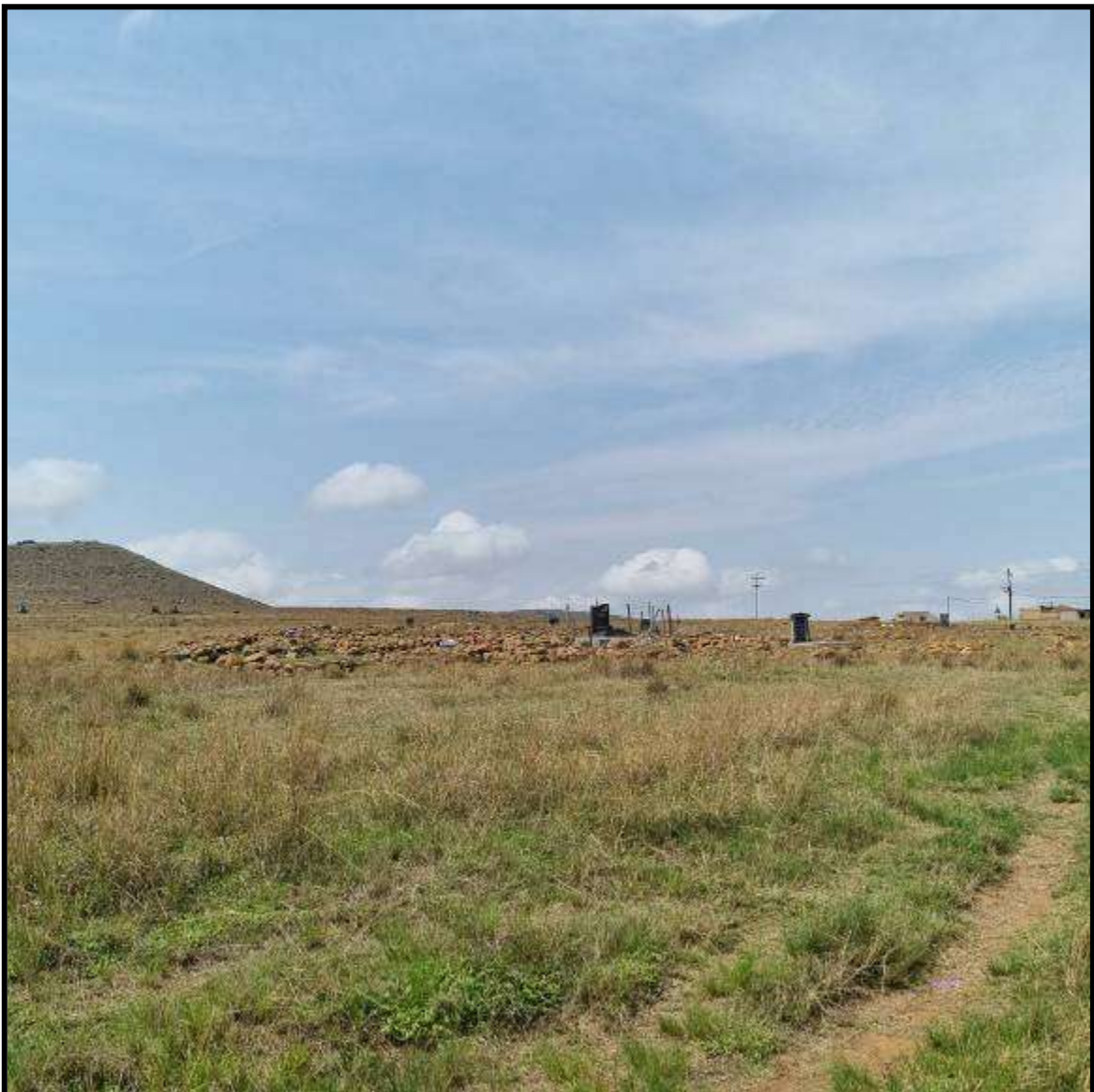


### Cemetery 5

Cemetery 5 is located at the corner of the L1333 and P148. The cemetery is about 80m x 80m in size and ~205m from the edge of the two roads (fig. 37).

**Mitigation:** The cemetery needs to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the cemetery and any roadworks.

**FIG. 37: CEMETERY 5**



### **D897**

The D897 is 1.3km long and no heritage features were noted. This road also borders The Battle of Isandlwana. Several battlefield graves occur within 30m of the road. No road works should occur on the battlefield side of the road without being approved. Any excavations or cutting may need mitigation in the form of a metal detector survey.

### **L1351**

L1351 is ~3.1km long. The first 800m also borders The Battle of Isandlwana. Several battlefield graves occur within 100m of the road. No road works should occur on the battlefield side of the road without being approved. Any excavations or cutting may need mitigation in the form of a metal detector survey.

### **Stone walling**

The stone walling is part of a kraal with house floors to the northwest (fig. 38). This is probably 'h22' from the 1964 map. No graves were noted, however they could have sunken below the surface. If graves do occur, then they will be between the kraal and the road.

**Mitigation:** Preferably, no earthmoving activity should occur on the northern side of the road. If it has to occur, the EMPr must note the possible occurrence of subsurface graves in this specific area.

### **Kraal 4**

Kraal 4 is a small kraal for goats/sheep ~8m from the edge of the road (fig. 39). The kraal might predate 1944.

**Mitigation:** The kraal needs to be clearly demarcated before construction begins along this section of the road.

**FIG. 38: STONE WALLING**



**FIG. 39: KRAAL 4**



**Grave 26**

Grave 26 consists of a single stone cairn ~10m from the edge of the road (fig. 40).

**Mitigation:** The graves need to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the grave and any roadworks.

**FIG. 40: GRAVE 26**

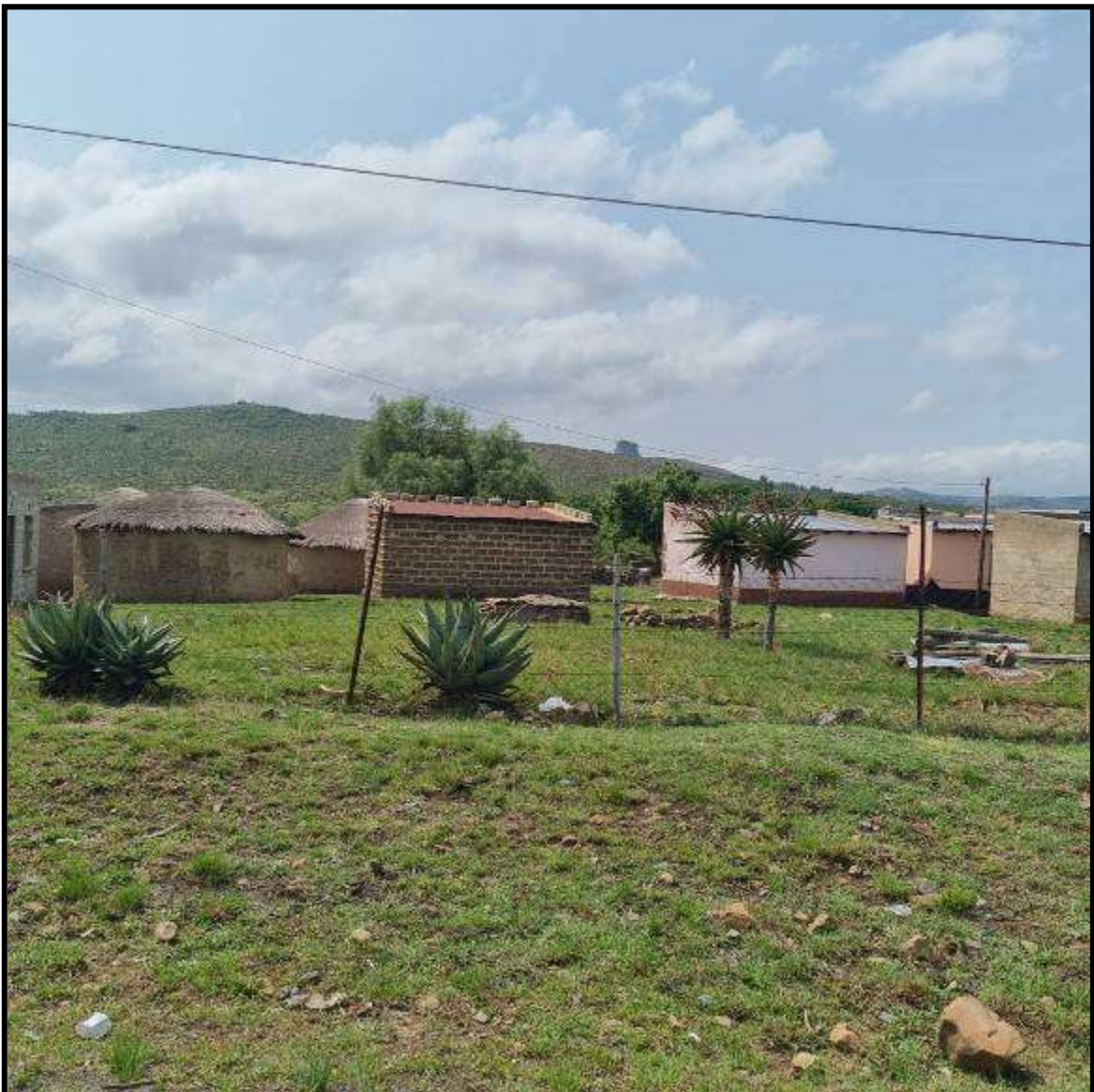


**Grave 27**

Grave 27 consists of two stone cairns within a yard. The yard is demarcated, with fencing. The graves are ~20m from the edge of the road (fig. 41).

**Mitigation:** The graves need to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the grave and any roadworks.

**FIG. 41: GRAVE 27**

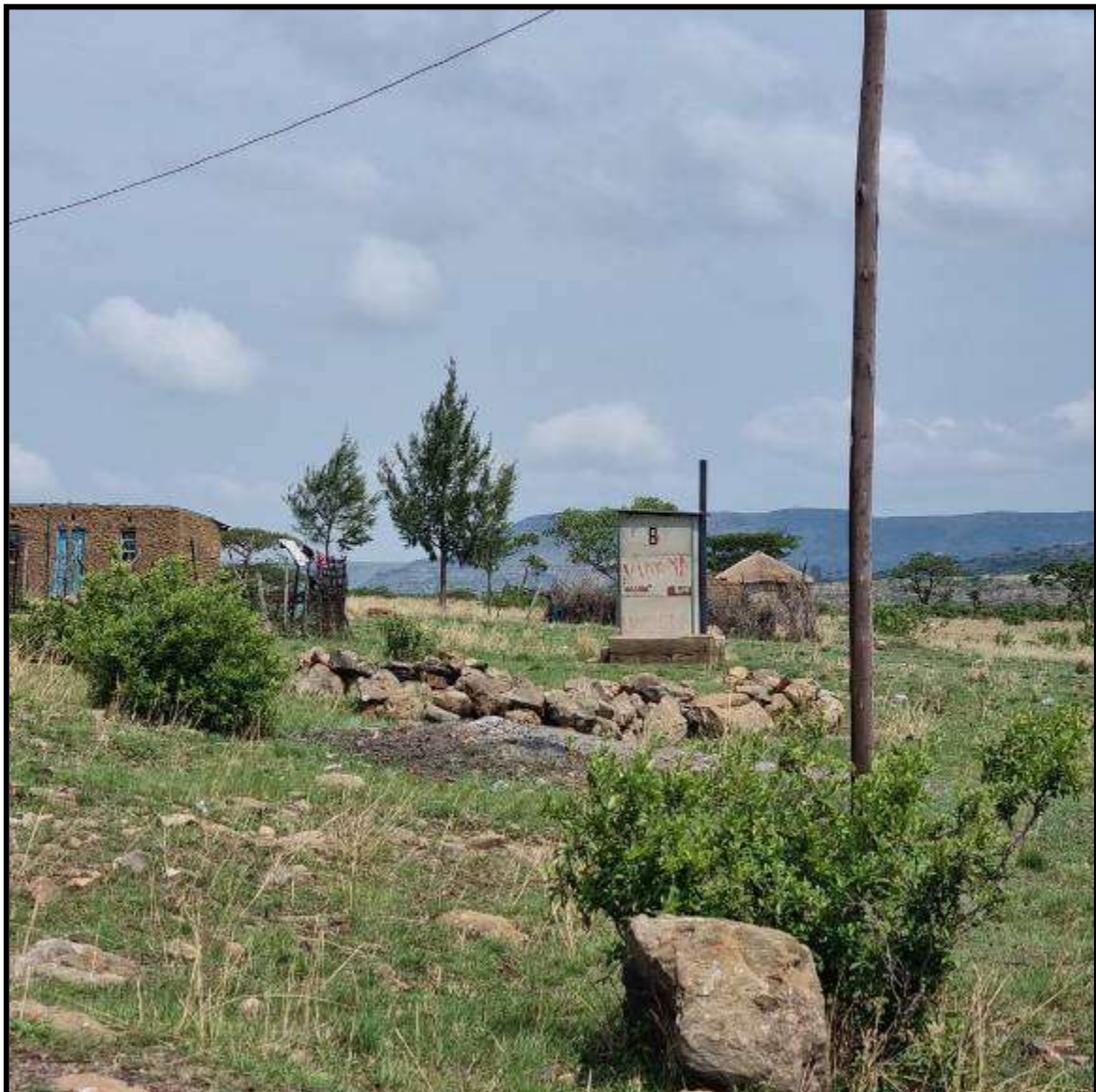


### Grave 28

Grave 29 consists of three stone cairns in the open. The site may relate to the 19944 site '26'. The graves are ~10m from the edge of the road (fig. 42).

**Mitigation:** The graves need to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the grave and any roadworks.

**FIG. 42: GRAVE 28**



**Grave 29**

Grave 29 consists of a stone cairn within a yard that is not fenced. The grave is ~5m south from the edge of the road (fig. 43).

**Mitigation:** The graves need to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the grave and any roadworks.

**FIG. 43: GRAVE 29**





### Grave 30

Grave 30 consists of a grave with a headstone surrounded by aloes and trees. The vegetation is a natural buffer; however, it still needs to be demarcated. The grave is ~10m from the edge of the road (fig. 44).

**Mitigation:** The grave need to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the grave and any roadworks.

**FIG. 44: GRAVE 30**



### P148

The P148 is 1.5km long and is an established road. The road runs northeast of Isandlwana and has no direct bearing on it. The cemetery at the P148 and L1333 was commented upon above.

### Kraal 5

Kraal 5 consists of a circular stone walled kraal ~16m in diameter. The cairn occurs within a yard. The yard is demarcated, with poles but there is no fencing. The kraal is ~9m from the edge of the road and behind a fence (fig. 45).

**Mitigation:** No mitigation is required as it is already demarcated.

**FIG. 45: KRAAL 5**



## Kraal 2

Kraal 2 consists of a square stone walled kraal ~10m wide. The kraal is ~9m from the edge of the road and behind an existing fence (fig. 46).

**Mitigation:** No mitigation is required as it is already demarcated.

**FIG. 46: GRAVE**



## L1190

The L1990 is 6.1km long

### Cemetery 6

Cemetery 6 is enclosed on the western side by a small wall; while the rest is open (fig. 47). The cemetery is ~4m from the edge of the road

**Mitigation:** The cemetery needs to be clearly demarcated before construction begins along this section of the road. At least a 4m buffer needs to occur between the cemetery and any roadworks. That is, the road cannot extend closer to the cemetery unless there are special reasons/restrictions.

**FIG. 47: CEMETERY 6**

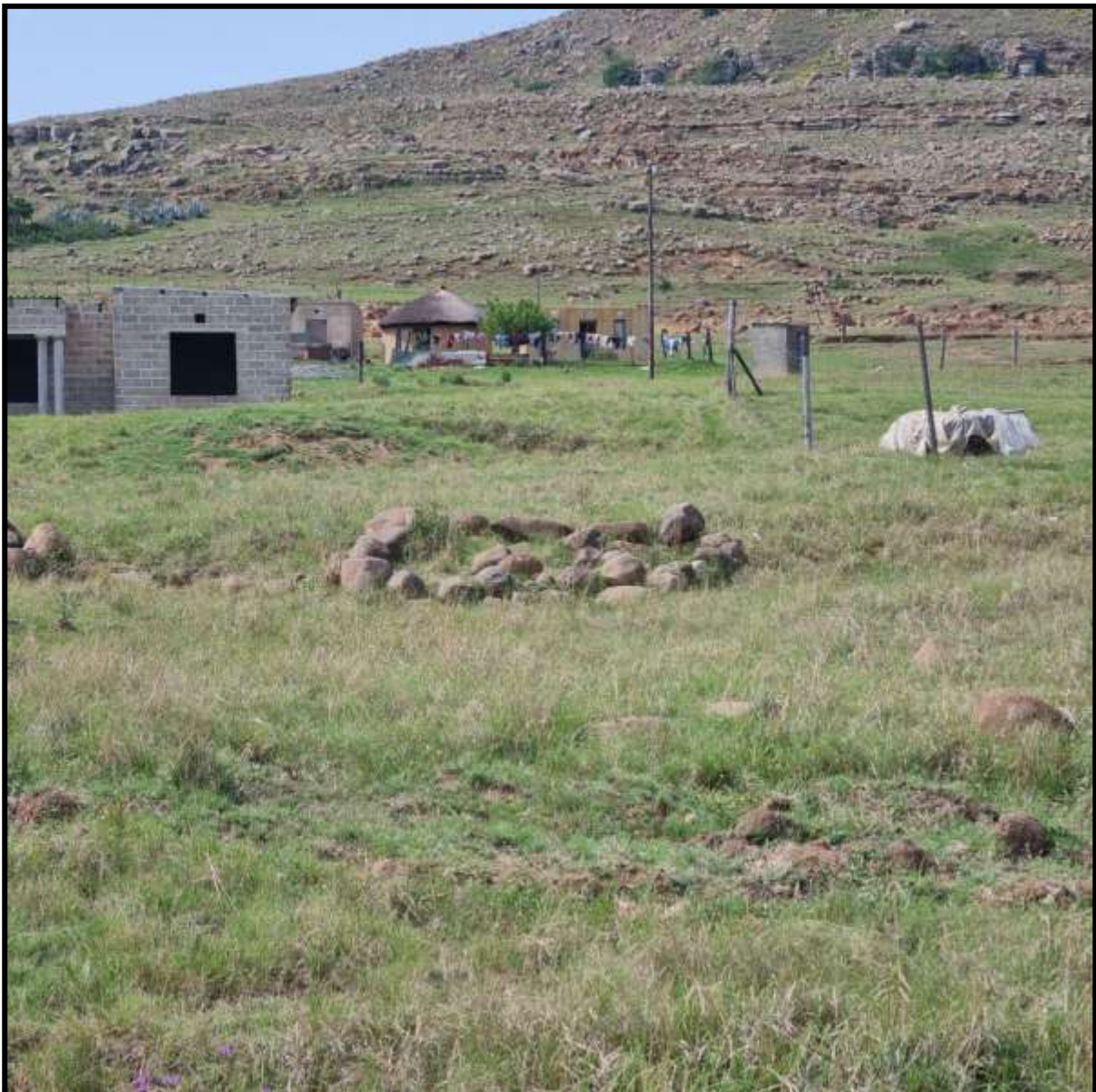


### Grave 30

Grave 30 is enclosed on the western side by a small wall; while the rest is open (fig. 48). The grave is ~15m from the edge of the road

**Mitigation:** The cemetery needs to be clearly demarcated before construction begins along this section of the road. At least a 4m buffer needs to occur between the cemetery and any roadworks. That is, the road cannot extend closer to the cemetery unless there are special reasons/restrictions.

**FIG. 48: GRAVE 30**



## Cemetery 7

Cemetery 6 is enclosed on the western side by a small wall; while the rest is open (fig. 49). The grave is ~4m from the edge of the road

**Mitigation:** The cemetery needs to be clearly demarcated before construction begins along this section of the road. At least a 4m buffer needs to occur between the cemetery and any roadworks. That is, the road cannot extend closer to the cemetery unless there are special reasons/restrictions.

**FIG. 49: CEMETERY 7**



### Grave 31

Grave 31 consists of a single stone cairn within a partially built stone walled kraal (fig. 50). The kraal is referred to as Kraal 3. These features are behind a fence. The grave is ~20m from the edge of the road, while the walling is ~9m from the road. The sites could relate to sites 29 or 30 from the 1944 map.

**Mitigation:** The site is already demarcated and no further mitigation is required

**FIG. 50: GRAVE 31 & KRAAL 3**



## Houses

Houses consists of several stone walled features and foundations that relate to '31' and 'h39' from 1944 and 1964, respectively. The features are 15m to 40m from the edge of the road (fig. 51) and are already demarcated by a fence.

**Mitigation:** The site is already demarcated and no further mitigation is required

**FIG. 51: HOUSES**





### **Cemetery 8**

Cemetery 8 consists of several stone cairns under young thorn bush trees. The cairns themselves appear to be old. The cemetery is ~9m from the edge of the road and is not demarcated (fig. 52).

**Mitigation:** The cemetery needs to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the grave and any roadworks. This means the southern edge of the road should not be affected; however given the limited space the 10m buffer could be reduced.

**FIG. 52: CEMETERY 8**



## D2286

D2286 is 4.7km long and passes the Isandlwana Museum and the view point used by the Isandlwana tour guides (fig. 53). The road does not affect the museum or related buildings.

### Isandlwana View point

The Isandlwana view point is used by local guides to describe one of the aspects of the battle. It even featured on an episode of Voetspoore. The view point is not a heritage site; however perhaps a safer viewing platform, or levelled area, should be made to view the main Heritage site. Consultation with the tour guides would result in a best view option along this section of the road.

**FIG. 53: ISANDLWANA VIEWPOINT FOR TOURISTS**



### Grave 5

Grave 16 consists of three stone cairns just north of a stone walled kraal within a yard. The yard is demarcated, with poles but there is no fencing. The graves are ~25m from the edge of the road (fig. 54).

**Mitigation:** The graves need to be clearly demarcated before construction begins along this section of the road. At least 10m buffer needs to occur between the grave and any roadworks.

**FIG. 54: GRAVE 5**



## Cemetery 2

Cemetery 2 consists of a stone cairn and graves with headstones uphill from the road. There is a fence around the cemetery. The yard is demarcated, with poles but there is no fencing. The cemetery is ~20m from the edge of the road (fig. 55).

**Mitigation:** The cemetery will not be affected and no further mitigation is required.

**FIG. 55: CEMETERY 2**



### Grave 17

Grave 17 consists of a two recent graves with headstones (fig. 56). There is a small fence around the graves, and a fence between the graves and the road. The graves are ~15m from the edge of the road and will not be affected.

**Mitigation:** The graves will not be affected and no further mitigation will be required.

**FIG. 56: GRAVE 17**



**Grave 18**

Grave 18 consists of six stone cairns of which some are on the verge of the road (fig. 57). One of the graves appears to have a water culvert excavated onto the cairn itself (fig. 58).

**Mitigation:** The road needs to be realigned and moved away from the graves.

**FIG. 57: GRAVE**



**FIG 58: AFFECTED GRAVE WITH WATER CULVERT**



## MANAGEMENT PLAN

Table 3 lists the management plan required for each site

<b>Name</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Altitude (M)</b>	<b>Significance</b>	<b>Mitigation Required</b>
<b>Cemetery 1</b>	-28.290045213	30.609823856	1137.9	High	Demarcate & 10m Buffer
<b>Cemetery 2</b>	-28.335549947	30.680700458	1307.2	High	Demarcate & 10m Buffer
<b>Cemetery 3</b>	-28.344712279	30.686640283	1228.2	High	None
<b>Cemetery 4 start</b>	-28.351490800	30.668046400	1164.3	High	Demarcate
<b>Cemetery 8</b>	-28.352234806	30.705762611	1178.1	High	Demarcate & 10m Buffer
<b>Cemetery 4 end</b>	-28.351603471	30.668620747	1161.6	High	Demarcate
<b>cemetery5</b>	-28.358009837	30.674872734	1159.0	High	Demarcate & 10m Buffer
<b>Cemetery 6</b>	-28.347702284	30.689837586	1198.7	High	Demarcate & 10m Buffer
<b>Cemetery 7</b>	-28.352044063	30.696667469	1193.3	High	Demarcate & 10m Buffer
<b>Cemetery 9</b>	-28.260255000	30.624232700	1156.8	High	Demarcate & 10m Buffer
<b>Grave 01</b>	-28.238976568	30.639270859	1226.8	High	Demarcate & 10m Buffer
<b>Grave 02</b>	-28.247204120	30.633101255	1195.0	High	Demarcate & 10m Buffer
<b>Grave 03</b>	-28.257903489	30.625710184	1175.7	High	Demarcate & 10m Buffer
<b>Grave 04</b>	-28.259927956	30.624593817	1160.0	High	none
<b>Grave 05</b>	-28.336438	30.668018	1338	High	Demarcate & 10m Buffer
<b>Grave 06</b>	-28.290011000	30.619239700	1168.2	High	Demarcate & 10m Buffer
<b>Grave 07</b>	-28.321052100	30.584361200	1114.9	High	Demarcate & 10m Buffer
<b>Grave 08</b>	-28.327101863	30.563008979	1141.0	High	Demarcate & 10m Buffer
<b>Grave 09</b>	-28.322259055	30.568656945	1160.2	High	none
<b>Grave 10</b>	-28.346643629	30.615985855	1164.2	High	Demarcate & 10m Buffer



<b>Grave 11</b>	-28.347596400	30.616388000	1166.4	High	Demarcate & 10m Buffer
<b>Grave 12</b>	-28.347925807	30.616685928	1166.5	High	None
<b>Grave 13</b>	-28.349517105	30.617640584		High	None
<b>Grave 14</b>	-28.349818747	30.617904259	1164.7	High	Demarcate & 10m Buffer
<b>Grave 15</b>	-28.354224289	30.620600195	1148.1	High	None
<b>Grave 16 end</b>	-28.336443050	30.668018225	1332.8	High	None
<b>Grave 16 start</b>	-28.354720099	30.621124085	1147.8	High	None
<b>Grave 17</b>	-28.341127034	30.686178386	1290.1	High	None
<b>Grave 18</b>	-28.341442900	30.686616300	1293.2	High	Realign road
<b>Grave 21</b>	-28.345046835	30.685950566	1226.6	High	None
<b>Grave 22</b>	-28.345347800	30.685484600	1224.2	High	Demarcate & 10m Buffer, reinforce
<b>Grave 23</b>	-28.345092200	30.661238488	1201.3	High	Demarcate & 10m Buffer
<b>Grave 26</b>	-28.373479557	30.651063758	1135.9	High	Demarcate & 10m Buffer
<b>Grave 27</b>	-28.373572518	30.649788510	1136.2	High	Demarcate & 10m Buffer
<b>Grave 28</b>	-28.377241660	30.641363613	1090.4	High	Demarcate & 10m Buffer
<b>Grave 29</b>	-28.373316230	30.648563108	1131.5	High	Demarcate & 10m Buffer
<b>Grave 30</b>	-28.373114168	30.648659794	1131.5	High	Demarcate & 10m Buffer
<b>Grave 30</b>	-28.350894815	30.694439941	1195.8	High	Demarcate & 10m Buffer
<b>Grave 31 house</b>	-28.352932372	30.698443150	1179.8	High	None
<b>Grave 31 floors</b>	-28.320294153	30.583486691	1116.7	High	Demarcate & 10m Buffer
<b>Houses</b>	-28.353144925	30.700432031	1183.0	Low	None
<b>Isandlwana Museum</b>	-28.341563151	30.659790842		High	None
<b>Kraal 1</b>	-28.346939350	30.681842263	1202.1	Low	None
<b>Kraal 2</b>	-28.354418252	30.680078535	1191.4	Low	None
<b>Kraal 3</b>	-28.353014035	30.698251342	1182.1	Low	None
<b>Kraal 4</b>	-28.365295900	30.656694800	1157.1	Low	Demarcate
<b>Kraal 5</b>	-28.356314622	30.678725010	1184.0	Low	None
<b>Shembe 1</b>	-28.286918617	30.620009486	1159.6	High	None
<b>Shembe 2</b>	-28.322680115	30.567395211	1159.8	High	None
<b>Shembe 3</b>	-28.346969856	30.653500599	1206.3	High	None
<b>Shembe 4</b>	-28.328725332	30.706164807	1268.1	High	None
<b>Stone walling</b>	-28.364924500	30.656862000	1158.7	High	None

<b>View point</b>	-28.335833953	30.663925538		Medium	Consult with tour guides
<b>walling</b>	-28.345066400	30.685553900	1274.7	Low	None

All graves and stone walled features within 20m of any upgrade need to be clearly demarcated before construction begins. Demarcation would be in the form of high visibility netting or tape. The community should be made aware that this demarcation will occur at each household or cemetery. The demarcation needs to be 5m from the edge of the last grave. If the grave is within 10m of the proposed upgrade then the type of upgrade needs to be noted and the site re-assessed in terms of buffering and distance.

Grave 18 requires the road to be re-aligned so that it no longer affects the graves.

Grave 22 has the possibility of being eroded from the side of the road cutting. I suggest that this section of the road is reinforced with backfill to prevent the grave collapsing.

Access to Shembe Temples should not be restricted.

There is no formal viewing platform along the D2286 for the Battle of Isandlwana. Current guides use a few select areas to explain the on wave of attack. The new road design should not restrict these areas. Alternatively, the road design should make on area a viewing platform after consultation with local tour guides. This could be a more formal viewing platform.

The D897 and L1351 follow the border of the Battle of Isandlwana. In a few areas war graves occur within 30m of the road. This means that artefacts relating to the Battle of Isandlwana could still occur in the ground. A metal detector survey should be undertaken along those sections. The person undertaking the metal detector survey should be accompanied by a member of KZNARI based at the

Isandlwana Museum. This would be to confirm finds and interact with community members.

Prins 2016 showed that there were still unmarked graves from the battle. Graves near the battlefield that are obviously not recent, should be treated as potential war graves.

A Chance Find Protocol was initiated for the palaeontology. This should be extended to archaeological finds and more recent human graves. If any artefacts, human remains, or fossils are uncovered during the upgrade, then it needs to be reported to KZNARI immediately for comment. It can also be reported to the ECO and/or contracted archaeologist who can make on site decisions via photographs.

## CONCLUSION

A heritage survey was undertaken for the proposed road upgrades of the D2286, P372, L1190, P148, L1333, L1351, D897, and D30. The upgrades will include resurfacing, stabilisation, pavements and river crossings.

The area is known to have high archaeological, historical and palaeontological sensitivity. The desktop noted thirty-two homesteads from 1944, and fifty-one from 1950-1964 occurring within 50m of the proposed roads. These sites have either been built over, or abandoned over time. These desktop sites should be treated as being sensitive for possible human remains and a Chance Find Protocol was initiated.

The field survey recorded fifty-one heritage sites. Most of these sites were graves and/or cemeteries and forty-two require further mitigations. Most of the mitigation is in the form of demarcating the site before construction occurs, and placing the appropriate buffers between the site and the road upgrade.

One site will require the road to be re-aligned as the existing culvert directly affects a human grave. Another grave needs to be reinforced, as erosion will eventually expose the remains in the road cutting.

The road upgrades could affect two parts of the Battle of Isandlwana. The first is the unofficial viewing areas used by tour guides on the D2286. I suggested a formal viewing area is constructed. The second part is the southern roads bordering battlefield. These will require a metal detector survey for potential battle artefacts.

## REFERENCES

Gaigher, S. 2015. Proposed construction of the Mnqunyeneni access road.

Prins, F. 2015. Phase One Heritage Impact Assessment Of The Proposed Isandlwana Heritage Development, Umzinyathi District Municipality, Kwazulu-Natal

Prins, F. 2016. Phase Two Heritage Impact Assessment Of The Proposed Isandlwana Heritage Development, Umzinyathi District Municipality, Kwazulu-Natal

### **1:50 000 Topographical Maps**

2830BA Nqutu 1950, 1996

2830BC 1964, 1981 Rorke's Drift

### **Aerial Photographs**

75\_011\_04994 - 75\_011\_04997

75\_012\_05051

75\_013\_05077 - 75\_013\_05078

75\_014\_05135 - 75\_014\_05136

75\_015\_05157 - 75\_015\_05158

75\_015\_05157 - 75\_016\_05220

75\_017\_05232 - 75\_017\_05247

75\_018\_05297 - 75\_018\_05300

**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**

**DESKTOP PALEONTOLOGICAL  
ASSESSMENT FOR THE ISANDWALA ROADS  
UPGRADE, KWA-ZULU NATAL**

**FOR**

**UMLANDO: Archaeological Surveys & Heritage Management  
PO Box 102532, Meerensee, KwaZulu-Natal 3901  
phone (035)7531785 fax: 0865445631  
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by

**Dr Alan Smith  
Alan Smith Consulting**  
29 Browns Grove, Sherwood, Durban, 4091, South Africa  
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**27 October 2022**



## Declaration of Independence

This report has been compiled by Dr Alan Smith (Pr. Sc. Nat.) of Alan Smith Consulting, Durban. The views expressed in this report are entirely those of the author, if not then the source has been duly acknowledged. No other interest was displayed during the decision making process for the Project.

Specialist: Dr Alan Smith

Signature:



## EXECUTIVE SUMMARY

Alan Smith Consulting was appointed by **UMLANDO: Archaeological Surveys & Heritage Management** to conduct a Desk-Top field assessment of the potential impacts to **Palaeontology Resources** that might occur through the activities of the proposed Isandwala Roads upgrade, KwaZulu-Natal

Section 38 of the National Resources Act No 25 of 1999 (Heritage Resources Management), requires a Palaeontological Impact Assessment (PIA) to assess any potential impacts to palaeontological heritage.

The Vryheid Formation is flagged red in the SAHRIS paleo-sensitivity map, but this is precautionary. To date no significant fossils have been found in it. The other lithologies are not fossiliferous.

The chances of encountering fossils are **Low, but Not Zero**; consequently a ***“Chance Find Protocol”*** has been included.

## ACRONYMS

BA:	Basic Assessment
EDTEA:	(Department of) Economic Development, Tourism and Environmental Affairs
HIA:	Heritage Impact Assessment
PIA;	Palaeontological Impact Assessment
SAHRA:	South African Heritage Resource Agency
SAHRIS:	South African Heritage Resources Information System

## 1. TERMS OF REFERENCE

Alan Smith Consulting was requested by **UMLANDO: Archaeological Surveys & Heritage Management** to provide a Desk-Top Palaeo Impact Assessment for the Isandwala Roads upgrade project (Figure 1). This report is to meet the requirements of the National Environmental Management Act (Act 107 of 1998) [as amended] Environmental Impact Assessment (EIA) regulations, Appendix 6.



*Figure 1: Location of the proposed Isandwala Roads upgrade.*

## 2. SCOPE AND PURPOSE OF REPORT

A Palaeontological Impact Assessment (PIA) is a means of identifying any significant palaeontological material 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 Desk-Top investigation fulfills the requirements of the heritage authorities (SAHRA), such that a comment can be issued by them for consideration

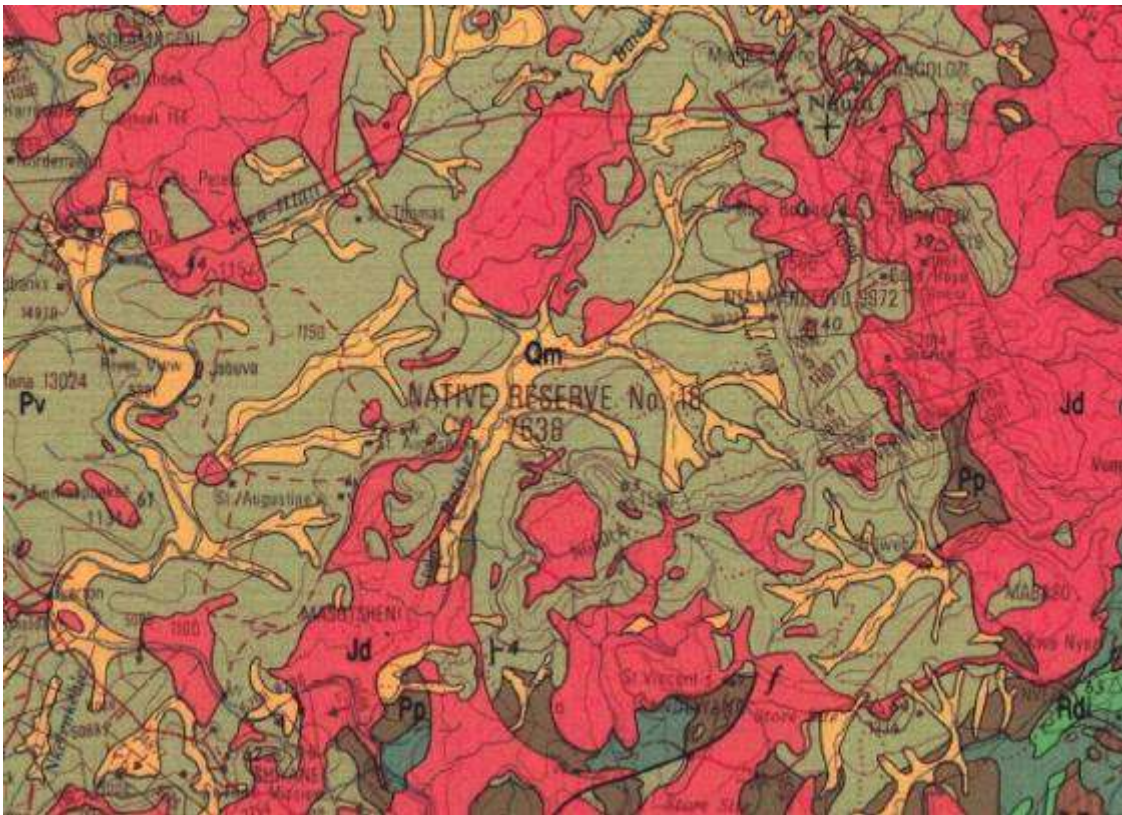
by the competent authority (EDTEA), who will review the Basic Assessment (BA) and grant or refuse authorisation. The PIA report will outline any management and/or mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of authorisation, should this be granted.

### **3. METHODOLOGY**

Geological maps, a literature review and personal experience (see Section 9) were used in this research.

#### 4. GEOLOGY

The Vryheid Formation, Pietermaritzburg Formation, Karoo dolerite, Dwyka Group and alluvium may be present in this area (Figure 2).



*Figure 2: Approximate area of the Isandwala Roads Upgrade project. Extract from the 125 000 Geological Map: Durban 2930. According to this map, the road upgrades will lie on alluvium (Qm: orange), Vryheid Formation (Pv: grey, Pietermartizburg Formation (Pp: brown) and Karoo Dolerite (Jd: red).*

##### **Alluvium (Qm: yellow)**

This is sediment that has been eroded from the country rocks and deposited in river floodplains.

##### **Dwyka Group (grey)**

The Dwyka Group is the lithified product of sediments laid down during the Late Palaeozoic (or Dwyka) Glaciation (or Ice Age) (Visser, 1990). This glacial deposit accumulated during the Permian, a time when southern Africa (at the time part of the Gondwana Supercontinent)

was located near the South Pole. This glaciation was a global event which began at 327 Ma (million years ago) and ended about 260 Ma (Fielding et al., 2008).

The Dwyka Group is characterized by massive debrites, which ranges in composition from boulders to silt. This unsorted material was deposited in a deep marine setting due to sediment melting from an ice sheet which was retreating across the Karoo Sea.

### **Pietermaritzburg Formation (Pp: brown)**

The Pietermaritzburg Formation is very dark blue (when fresh) and crops out as a massive siltstone. This formation belongs to the Karoo Sequence. The Pietermaritzburg Formation is Lower Permian in age and was deposited within the Karoo Sea, located in the centre of the Gondwana Supercontinent. This unit was deposited under post Dwyka Glacial (Late Paleozoic Glaciation) low energy conditions (Bordy et al., 2017) at circa 260 Ma, contemporaneously with the lower part of the Vryheid Formation.

### **Vryheid Formation**

The Permian aged Vryheid Formation (Kungurian Stage  $\approx$  260Ma: Green and Smith, 2012) comprises predominantly coarse-grained sandstone and siltstones, interbedded with dark shales and coal beds. The Formation is interpreted as “near-shore sandbars” and deltaic deposits that prograded into the ancient Karoo Sea. The latter was located within central part of the Gondwana supercontinent (Johnson et al, 2009).

### **Karoo Dolerite**

At this location, the Karoo Dolerite is represented by dykes this (vertical sheets) and sills, (sub-horizontal sheets). It is part of the Karoo Large Igneous Province (LIP). The Karoo LIP is a sequence of lavas up to 4.5 km thick which was deposited about 184 Ma (million years ago). These igneous rocks are part of the “plumbing” of the LIP, which was extruded as a “Continental Flood Basalt”, a process that has never been witnessed by mankind. This process is believed to have taken place by fissure eruption. This event may have triggered the break-up of the Gondwana supercontinent (Hastie et al., 2014).

## 5. PALAEOLOGY

The colour coding used in the SAHRIS Palaeosensitivity Map are shown in Table 1 below.

**Table 1: Summary of SAHRIS categories**

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

### Alluvium (Green)

This is water-borne sediment and will not be fossiliferous.

### Dwyka Group (green)

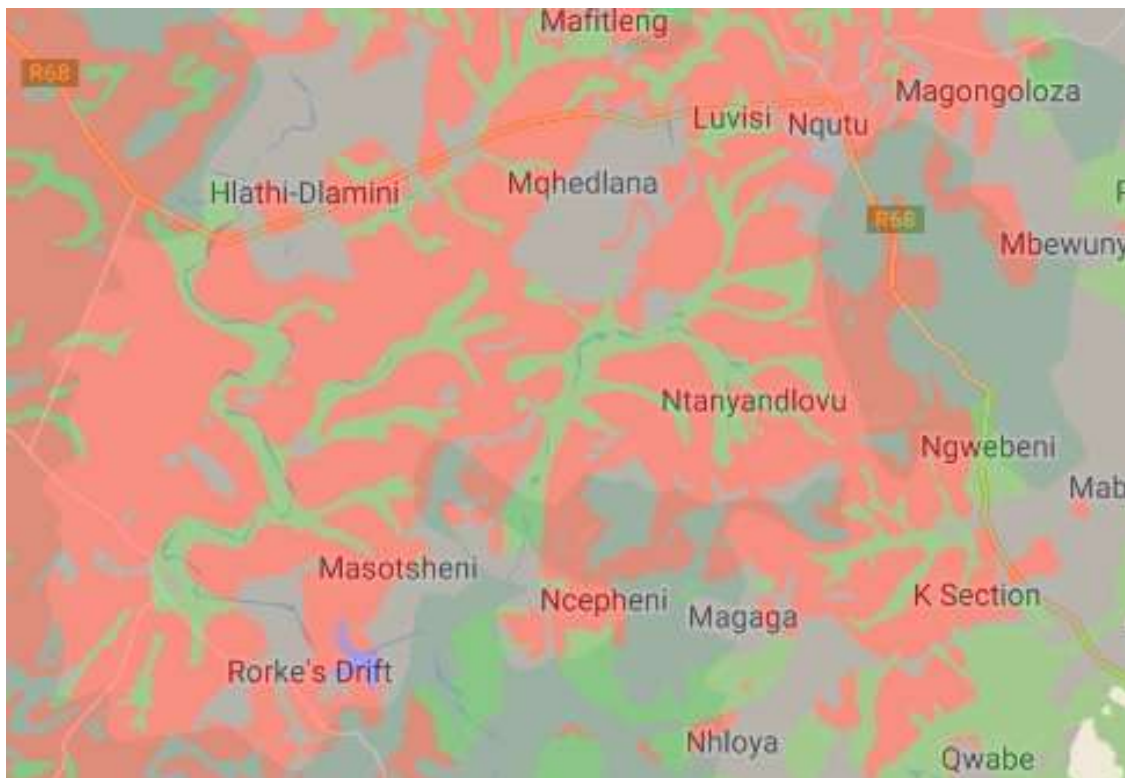
The Dwyka Group is classified green in the SAHRIS Paleosensitivity Map (Figure 3). Life is common in modern glacial environments, but vertebrate fossils are not common in this region of the planet during the world-wide Late Palaeozoic (Dwyka) Glaciation. This may have been due to the continuous “rain” of silt depositing from the melting ice sheet restricting the growth of organisms, but the actual reason is unknown. Trace fossils are found but these are not of great palaeontological interest. Although the chances are very low, they are not zero, and a “Chance find Protocol” has been inserted (see Section 7).

### Pietermaritzburg Formation (Green)

The Pietermaritzburg Formation may contain scattered, fragmentary plant fossils and invertebrate trace fossils, some of which are diagnostic of marine conditions (such as *Helminthopsis*) (Bordy et al., 2017). Potentially it could contain vertebrate fossils, but to the writer’s knowledge none have been found. The chances of finding Palaeontological Material is very low, but not zero, consequently a chance find protocol has been included in this report (see section 7).

### Vryheid Formation (Red)

The SAHRIS Palaeosensitivity Map (Figure 3 – red shaded area) considers the Vryheid Formation as a **Very High Palaeosensitivity Zone**. In practise, no vertebrate fossils have been recorded from the Vryheid Formation in this area, however invertebrate trace fossils are common (Tavener Smith, 1983; Mason and Christie, 1985; Hastie et al., 2019). Groenewald (2018) pointed out that the aquatic reptile, *Mesosaurus* (earliest known reptile from the Karoo Basin), as well as the fish, *Palaeoniscus capensis*, have been recorded in the Whitehill Formation in the southern part of the Karoo Basin (MacRae, 1999). The Whitehill Formation (500 km to the southwest), within the Main Karoo Basin, *may* be a correlative of the Vryheid Formation, however they are not physically connected. Further, recent research has shown that some the lower Vryheid Formation in this area has a different source (Maurice Ewing Bank) to the rest of the Vryheid Formation (Hastie et al., 2019).



*Figure 3: Palaeosensitivity of the approximate area where the Isandwala Road Upgrades will take place. Extract from SAHRIS Palaeosensitivity Map).*

Economic coal seams are known from the Vryheid Formation, but only thin, uneconomic coals are expected in this region (Tavener Smith, 1982; Hastie et al., 2019). Coal comprises



compressed plant material and thus constitutes a fossil. Plants such as *glossopteris*, *gangamopteris*, *lepidodendron* and *sigillaria* can be recognized, but these are common.

### **Karoo Dolerite**

This is an intrusive igneous rock and by definition cannot be fossiliferous.

## 6. CONCLUSIONS

The chance of fossils being found on this site is **Low**, but not **Zero**. A “**Chance Find Protocol**” has been included to cover this eventuality (section 7). No further palaeontological work is required, unless triggered by the “**Chance Find Protocol**” in which a suitably qualified palaeontologist must be consulted. The “**Chance Find Protocol**” must form part of the Environmental Management Programme (EMPr) for the site.

## 7. 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.

## 8. REFERENCES

Green, A.N., Smith, A.M. (2012). Can ancient shelf sand ridges be mistaken for Gilbert-type deltas? Examples from the Vryheid Formation, Ecca group, KwaZulu-Natal, South Africa. *J. Afr. Earth Sci.* 76, 27–33.

Hastie, W; Watkeys, MK; Smith, AM, (2019). Tectonic significance of the sedimentary and palaeocurrent record at the eastern edge of the Karoo Basin. *Journal of African Earth Sciences* 158 (2019) 103543.

Johnson MR, Anhaeusser CR and Thomas RJ (Eds). (2009). *The Geology of South Africa*. GSSA, Council for Geoscience, Pretoria.

MacRae C. (1999). *Life Etched in Stone*. Geological Society of South Africa, Linden, South Africa.

Mason, TR and Christie AC, (1986). Palaeoenvironmental significance of Ichnogenus *Diplocraterion torell* from the Permian Vryheid Formation of the Karoo Supergroup, South Africa. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 52.

SAHRIS Palaeosensitivity Map: <https://sahris.sahra.org.za/map/palaeo>

Tavener Smith, (1982). Prograding coastal facies associations in the Vryheid formation (Permian) at Effingham quarries near Durban, South Africa. *Sedimentary Geology* Volume 32, Issues 1–2, May 1982, Pages 111-14

9. **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 590 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.