

**HERITAGE SURVEY OF THE PROPOSED MFUNDA
YOPHONGOLO IRRIGATION CLUSTER ONE
PROJECT, KZN**

FOR AFZELIA ENVIRONMENTAL CONSULTANTS

DATE: 30 NOVEMBER 2019

By Gavin Anderson

**Umlando: Archaeological Surveys and Heritage
Management**

PO Box 102532, Meerensee, 3901

Phone: 035-7531785 Cell: 0836585362

umlando@gmail.com



EXECUTIVE SUMMARY

GFK Consulting Engineers cc (GFK hereafter) were appointed by the Department of Rural Development and Land Reform for the complete design and construction monitoring for Imfunda Yophongolo irrigation cluster one project in Umhlabuyalingana Local Municipality within Umkhanyakude district municipality in Kwazulu-Natal.

The Imfunda Yophongolo irrigation cluster one project is located in Umlalazi Umhlabuyalingana Local Municipality within Umkhanyakude District Municipality in Kwazulu-Natal. The nearest town is Jozini, approximately 21 km South West of proposed irrigation scheme.

It is estimated that there is approximately 870 ha of soils which are suitable for irrigation that can be practically irrigated in the area. At present only 400 ha is planned for phase 1 of the project in the Madonela area.

A heritage survey was undertaken for the proposed Imfunda Yophongolo irrigation cluster. Several nearby surveys have indicated that the archaeological material occurs as a lag deposit and is mostly of low significance. The main heritage feature that occurs are human graves from the various settlements. Given the nature of the sandy soils, unmarked graves disappear quickly if they are not maintained. This is unfortunately the case for most of the graves in the general area.

The survey recorded 91 settlements, and noted several others that could not be accessed. Some of these have graves, while most do not. I suggested that each settlement has a 50m sensitivity radius placed around it. This should be used to avoid placing irrigation piping on the site. It is unlikely that ploughing activity will affect unmarked graves, as they are too deep for the blades.

Those graves that were recorded require a physical buffer around them at the 5m mark. In addition to this, there must be a 20m buffer of no disturbance around the grave.

The PIA study noted that the area is too disturbed to have significant alluvial palaeontological deposits.

No further HIA mitigation is required.

TABLE OF CONTENT

INTRODUCTION	9
KWAZULU NATAL AMAFA AND RESEARCH INSTITUTE, ACT 05, 2018	14
METHOD	16
Defining significance.....	17
RESULTS	19
DESKTOP STUDY	19
PALAEONTOLOGICAL SENSITIVITY	22
FIELD SURVEY RESULTS	22
MADO01	25
MADO02 & MADO03.....	26
MADO04.....	27
MADO05 & MADO06.....	28
MADO07	29
MADO08	30
MADO09	31
MADO10.....	32
MADO11	33
MADO12.....	34
MADO13.....	35
MADO14	35
MADO15.....	36
MADO16.....	37
MADO17	38
MADO18.....	39
MADO19.....	40
MADO20.....	41
MADO21	42
MADO22.....	43
MADO23.....	44
MADO24	45
MADO25	45
MADO26	47
MADO27	48
MADO28.....	49
MADO29.....	50
MADO30 & MADO31	51
MADO32.....	52
MADO33 & MADO34	53
MADO35.....	54
MADO36.....	55
MADO37	56
MADO38.....	57
MADO39	59
MADO40.....	60
MADO41	60
MADO42 & MADO43	61
MADO44.....	62
MADO45.....	63
MADO46.....	64
MADO47	65
MADO48.....	66
MADO49.....	67
MADO50.....	68
MADO51 & MAD052	69

MADO053.....	70
MADO054.....	71
MADO055.....	72
MADO056.....	73
MADO057.....	74
MADO058.....	75
MADO059.....	76
MADO060.....	77
MADO061.....	78
MADO062.....	79
MADO063.....	80
MADO064.....	81
MADO065.....	82
MADO066.....	83
MADO067.....	84
MADO068.....	85
MADO069 & MAD070	86
MADO071.....	87
MADO072.....	88
MADO073.....	89
MADO074.....	90
MADO075.....	91
MADO076.....	92
MADO077.....	93
MADO078.....	94
MADO079.....	95
MADO080.....	96
MADO081 MADO082.....	97
MADO083.....	98
MADO084 & MADO085	99
MADO086.....	100
MADO087.....	101
MADO088.....	102
MADO089.....	103
MADO090.....	104
MADO091.....	105
MANAGEMENT PLAN	107
CONCLUSION.....	108
REFERENCES.....	109
EXPERIENCE OF THE HERITAGE CONSULTANT	110
DECLARATION OF INDEPENDENCE.....	110
APPENDIX A.....	111
PIA LETTER OF EXEMPTION.....	111

TABLE OF FIGURES

FIG. 1 GENERAL LOCATION OF THE PROPOSED DEVELOPMENT	10
FIG. 2: AERIAL OVERVIEW OF THE PROPOSED DEVELOPMENT	11
FIG. 3: TOPOGRAPHICAL MAP OF THE PROPOSED DEVELOPMENT.....	12
FIG. 4: SCENIC VIEWS OF THE STUDY AREA	13
FIG. 5: LOCATION OF KNOWN HERITAGE SITES IN THE GENERAL AREA	20
FIG. 6: LOCATION OF PROPOSED DEVELOPMENT IN 1968.....	21
FIG. 7: PALAEOANTHROPOLOGICAL SENSITIVITY MAP	22
FIG. 8: TWO GRAVES SHOWING DIFFERENT TYPES OF DEMARCATION.....	24
FIG. 9: MADO01	25

FIG. 10: MADO02.....	26
FIG. 11: FRUIT TRESS AT MADO04.....	27
FIG. 12: MADO05.....	28
FIG. 13: MADO07.....	29
FIG. 14: MADO08.....	30
FIG. 15: MADO09.....	31
FIG. 16: MADO010.....	32
FIG. 17: MADO011.....	33
FIG. 18: MADO012.....	34
FIG. 19: MADO014.....	35
FIG. 20: MADO015.....	36
FIG. 21: MADO016.....	37
FIG. 22: MADO017.....	38
FIG. 23: MADO018.....	39
FIG. 24: MADO019.....	40
FIG. 25: MADO020.....	41
FIG. 26: MADO021.....	42
FIG. 27: MADO022.....	43
FIG. 28: MADO023.....	44
FIG. 29: MADO026.....	45
FIG. 30: ARTEFACTS AT MADO025.....	46
FIG. 31: MADO026.....	47
FIG. 32: MADO027.....	48
FIG. 33: MADO028.....	49
FIG. 34: GENERAL AREA FOR MADO029.....	50
FIG. 35: MADO030 & MADO031.....	51
FIG. 36: MADO032.....	52
FIG. 37: MADO033.....	53
FIG. 38: MADO035.....	54
FIG. 39: MADO036.....	55
FIG. 40: MADO037.....	56
FIG. 41: MADO038.....	57
FIG. 42: GRAVES AT MADO036.....	58
FIG. 43: MADO039.....	59
FIG. 44: MADO041.....	60
FIG. 45: GRAVES AT MADO043.....	61
FIG. 46: CAIRNS AT MADO044.....	62
FIG. 47: SETTLEMENT AT MADO045.....	63
FIG. 48: SETTLEMENT AT MADO046.....	64
FIG. 49: OPENING AT MADO047.....	65
FIG. 50: GRAVE AT MADO048.....	66
FIG. 51: MADO049.....	67
FIG. 52: MADO050.....	68
FIG. 53: GRAVES AT MADO051.....	69
FIG. 54: MADO053.....	70
FIG. 55: MADO054.....	71
FIG. 56: MADO055.....	72
FIG. 57: MADO056.....	73
FIG. 58: MADO057.....	74
FIG. 59: MADO058.....	75
FIG. 60: MADO059.....	76
FIG. 61: MADO060.....	77
FIG. 62: POSSIBLE GRAVES AT MADO061.....	78
FIG. 63: MADO062.....	79
FIG. 64: MADO083.....	80

FIG. 65: MADO064	81
FIG. 66: SETTLEMENT AND GRAVES AT MADO065.....	82
FIG. 65: MADO064	83
FIG. 68: MADO067	84
FIG. 69: MADO068.....	85
FIG. 70: SETTLEMENT AND HOUSE FLOOR AT MADO069	86
FIG. 72: SETTLEMENT AND GRAVE AT MADO071	87
FIG. 73: MADO072	88
FIG. 74: MADO073.....	89
FIG. 75: MADO074.....	90
FIG. 76: AERIAL IMAGE OF MADO075	91
FIG. 77: SETTLEMENT AND GRAVE AT MADO076	92
FIG. 78: MADO077	93
FIG. 78: MADO079.....	94
FIG. 80: POSSIBLE GRAVE AT MADO079.....	95
FIG. 81: MADO080.....	96
FIG. 82: MADO081	97
FIG. 83: GRAVE AT MADO083.....	98
FIG. 84: MADO084 & MADO95.....	99
FIG. 85: STONE TOOLS AT MADO086	100
FIG.87: HOUSE REMAINS AT MADO087	101
FIG.88: SETTLEMENT AT MADO088	102
FIG. 89: SETTLEMENT AT MADO089	103
FIG. 90: SETTLEMENT AT MADO090	104
FIG. 91: SETTLEMENT AT MADO091	105
FIG. 92: LOCATION OF RECORDED SITES	106

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

GFK Consulting Engineers cc (GFK hereafter) were appointed by the Department of Rural Development and Land Reform for the complete design and construction monitoring for Imfunda Yophongolo irrigation cluster one project in Umhlabuyalingana Local Municipality within Umkhanyakude district municipality in Kwazulu-Natal

The Imfunda Yophongolo irrigation cluster one project is located in Umlalazi Umhlabuyalingana Local Municipality within Umkhanyakude District Municipality in Kwazulu-Natal. The nearest town is Jozini, approximately 21 km South West of proposed irrigation scheme.

It is estimated that there is approximately 870 ha of soils which are suitable for irrigation that can be practically irrigated in the area. At present only 400 ha is planned for phase 1 of the project in the Madonela area.

Umlando was contracted by Afzelia Environmental Consultancy to undertake the heritage survey of the proposed study area, relating to the farm land and associated irrigation system.

Figures 1 – 4 show the locality of the project.

FIG. 1 GENERAL LOCATION OF THE PROPOSED DEVELOPMENT

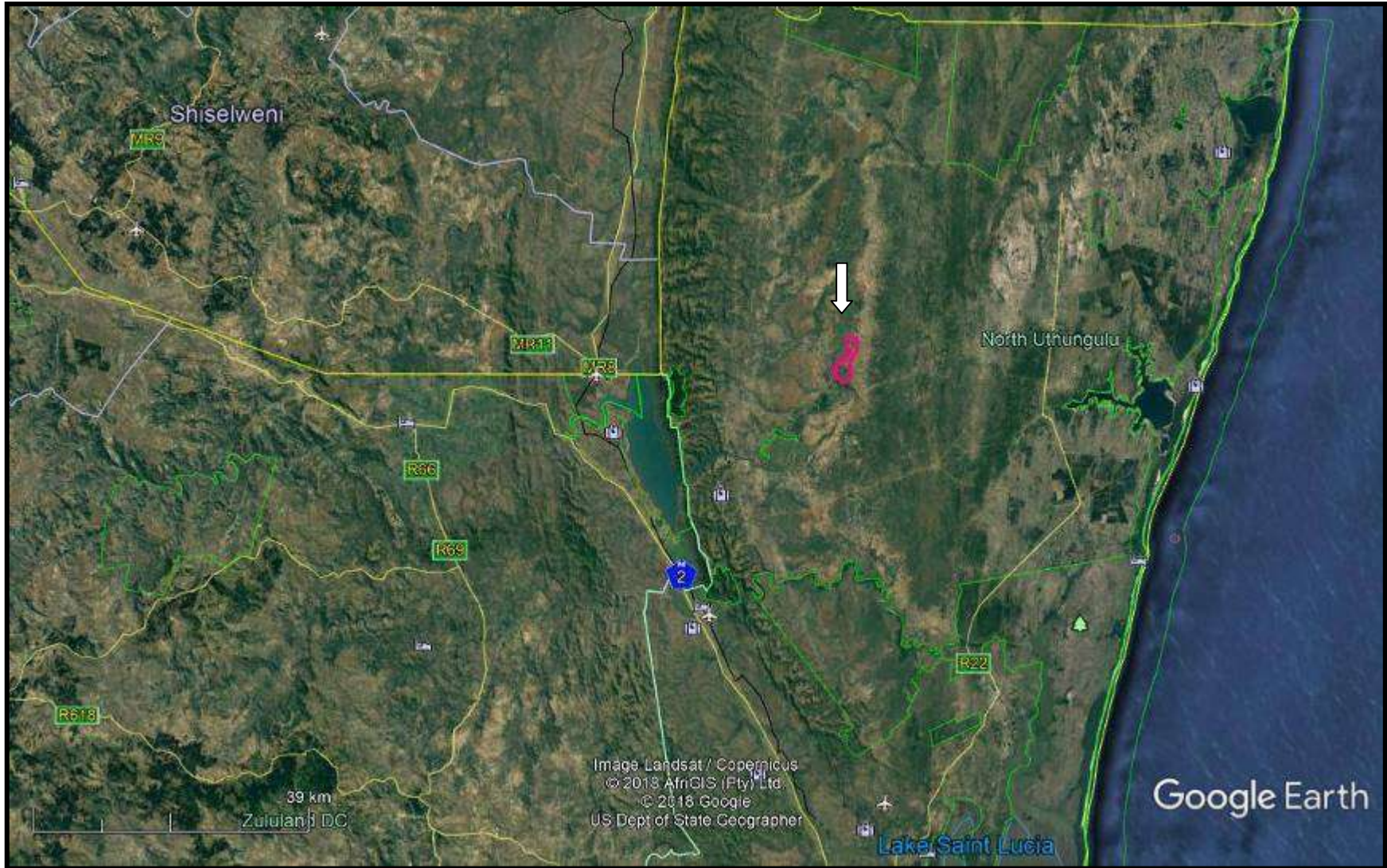


FIG. 2: AERIAL OVERVIEW OF THE PROPOSED DEVELOPMENT

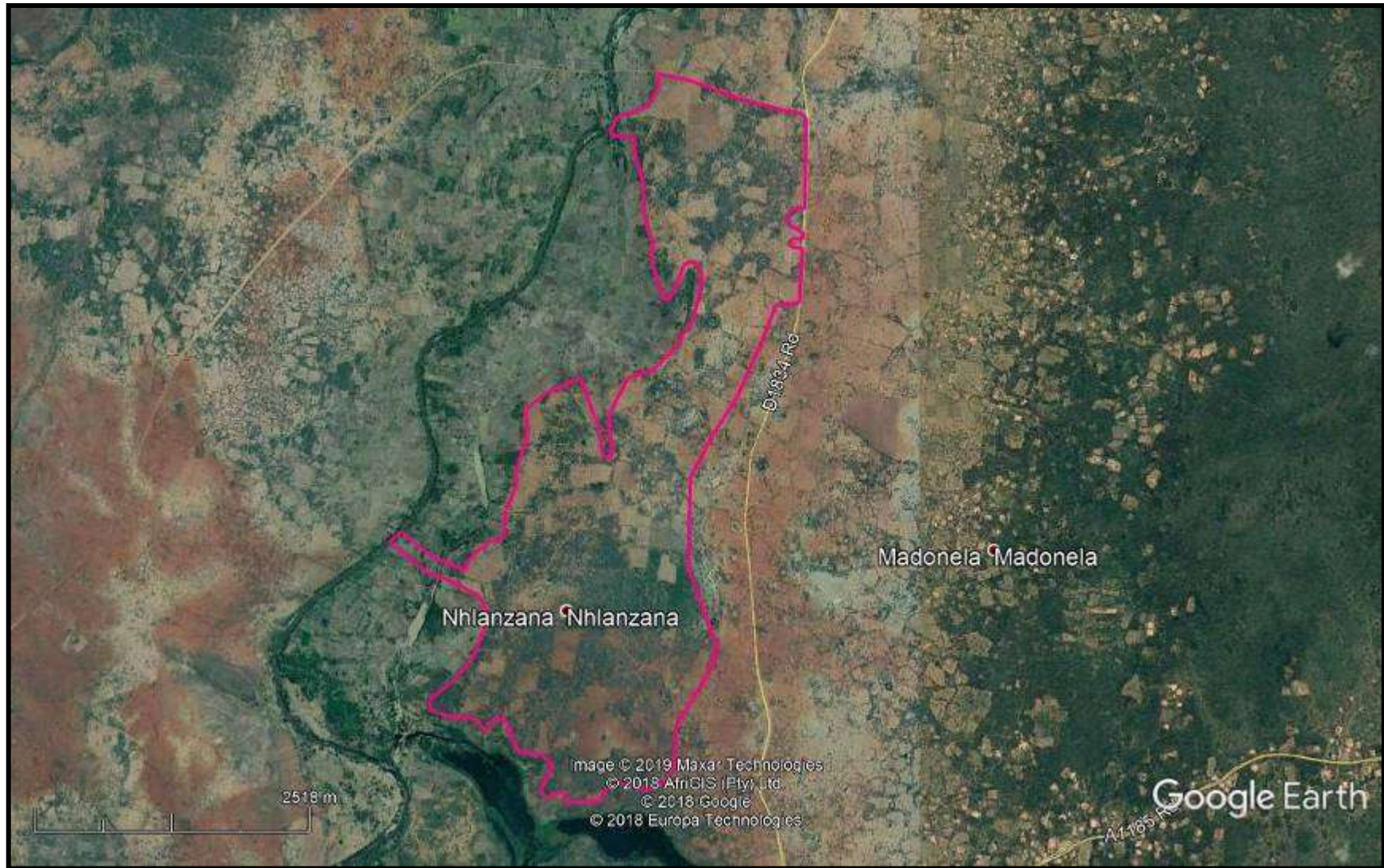


FIG. 3: TOPOGRAPHICAL MAP OF THE PROPOSED DEVELOPMENT

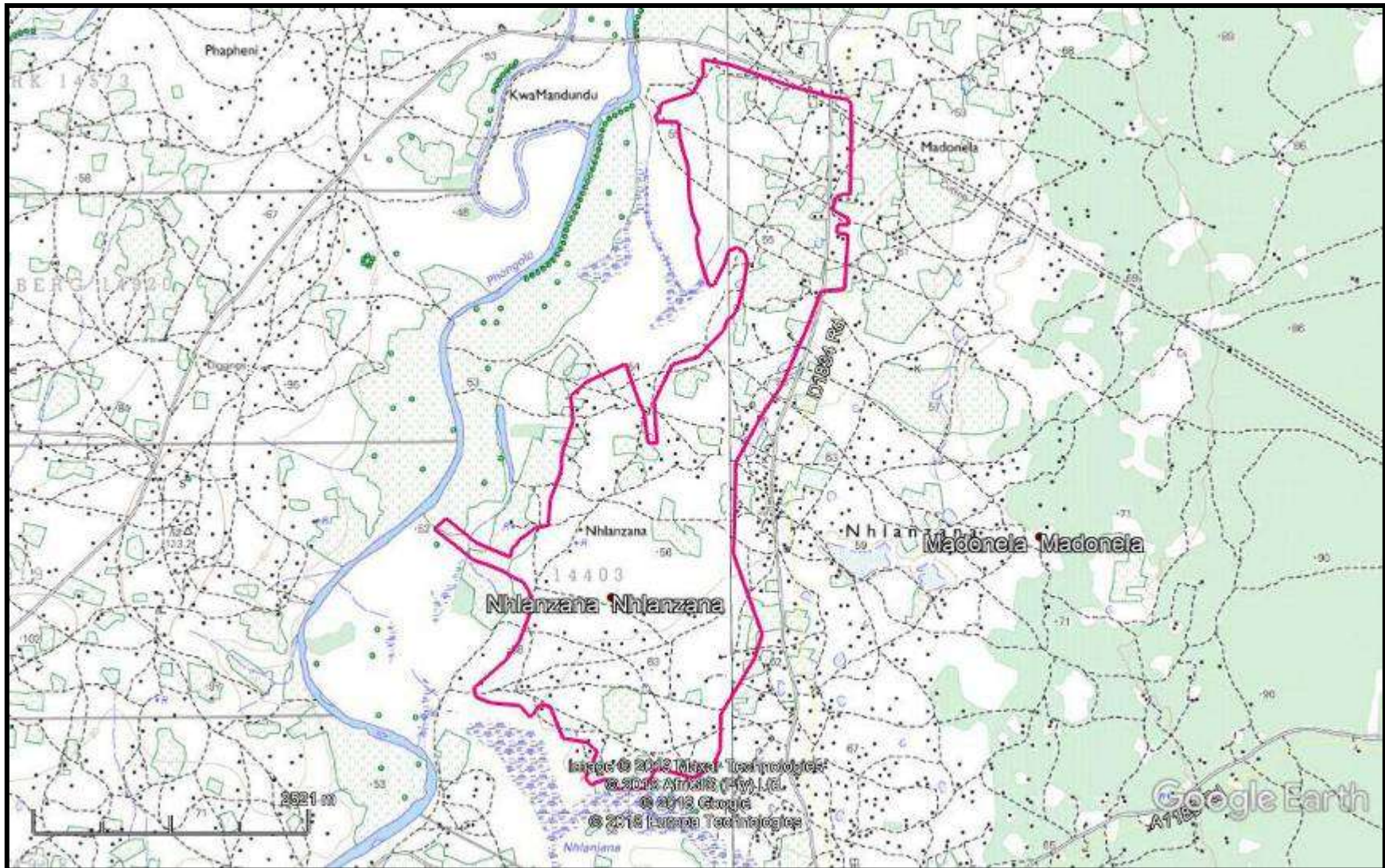


FIG. 4: SCENIC VIEWS OF THE STUDY AREA



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.

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. There have been no prior surveys in the study area; however, Anderson (2008, 2011, 2015a, 2015b, 2017) has undertaken several surveys in the general area (fig. 5). The surveys found mostly post 1960s settlements, while individual artefacts are common occurrence on the hard clay layers. This is a result of sites occurring on soft sand and ending up as a lag deposit on these clays. The artefacts now have no significance and tend to be noted.

Fig. 6 shows the study area in 1968. Individual settlements can be seen within the area and were labelled h1 – h64. These will be visited during the survey.

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

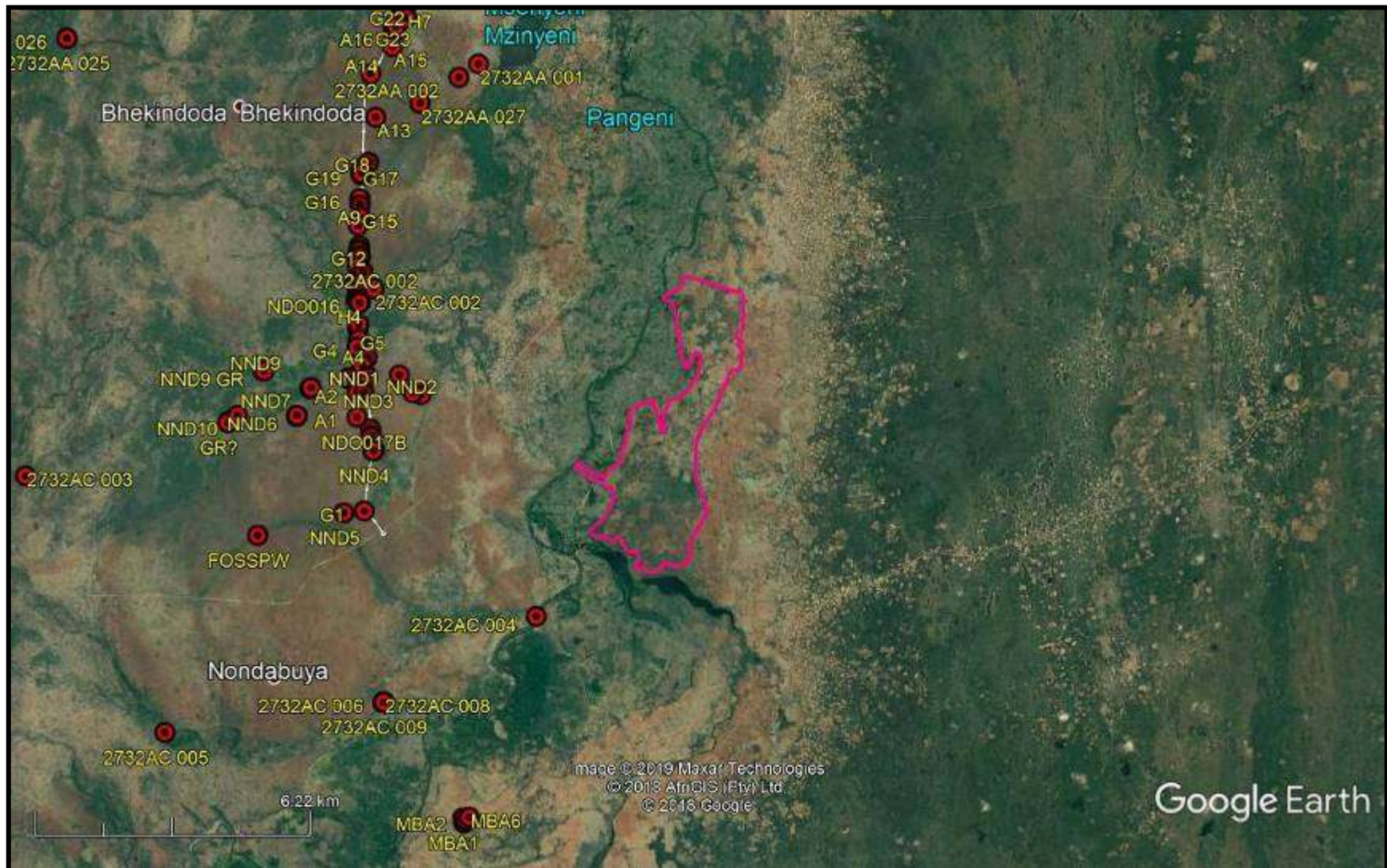
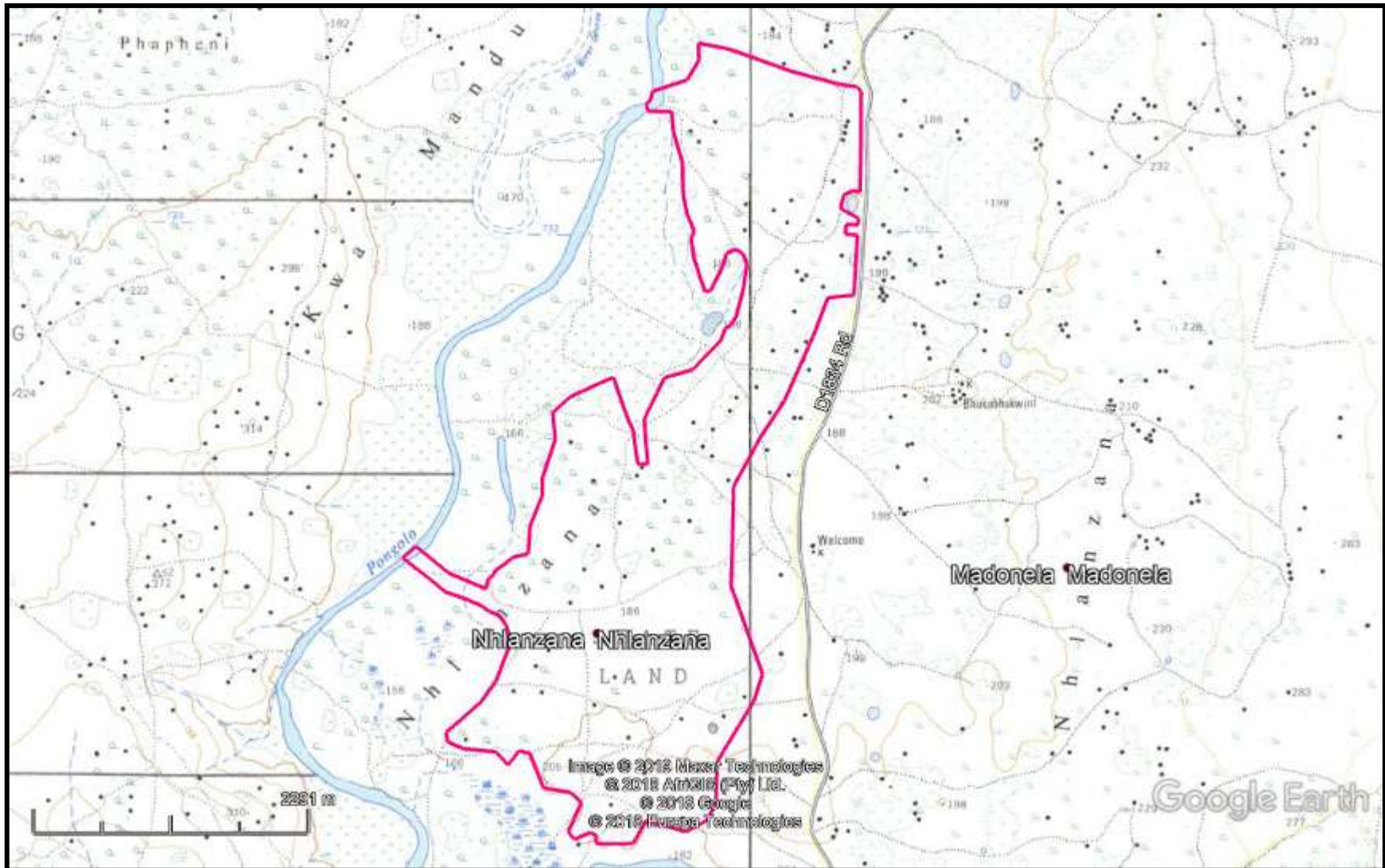


FIG. 6: LOCATION OF PROPOSED DEVELOPMENT IN 1968

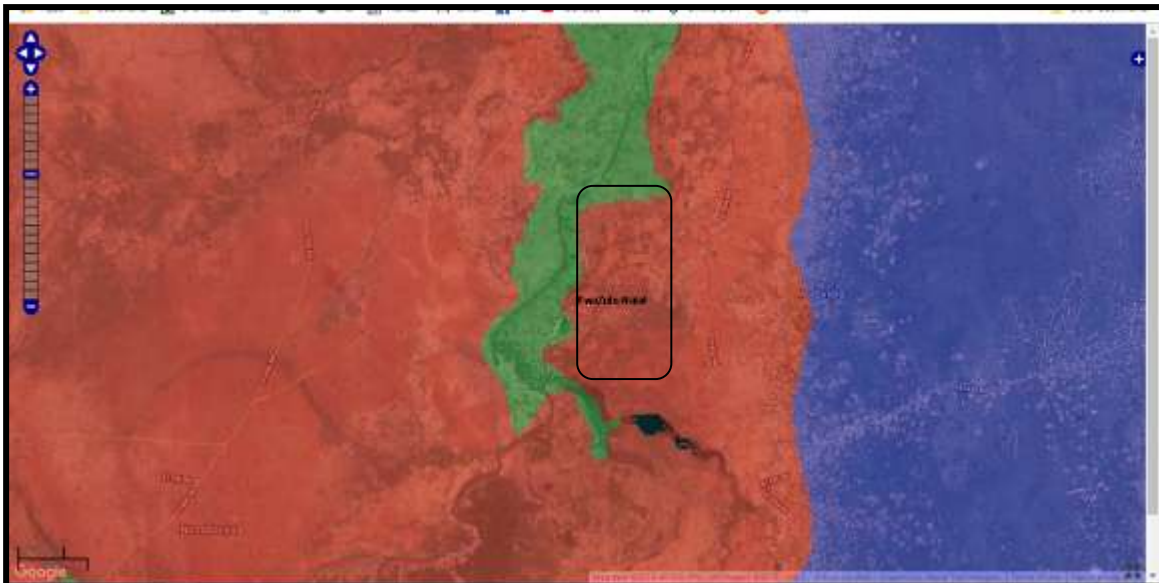


The 1968 topographical map indicates that there are two buildings in the study area. One is the current house and the other occurs where the existing hatchery is placed. The house will not be affected by the development proposal.

PALAEONTOLOGICAL SENSITIVITY

A desktop PIA was undertaken by Dr. A. Smith who has provided a letter of exemption for a PIA study for this project. “This project falls under green and red on the SAHRIS Map (Fig. 4). However this is due to inadequate mapping. This entire project is within soil (Pongolo River Floodplain alluvium). Cretaceous rocks will be present at depth (>2m). Although these are highly fossiliferous, this project will be contained within soil (alluvium) that has been produced by weathering of the Cretaceous rocks. A field visit will not add any value to this project. It is possible that fossil “chance finds” may occur. For this reason a “Chance Find” Protocol s been added” (see Appendix A).

FIG. 7: PALAEONTOLOGICAL SENSITIVITY MAP



FIELD SURVEY RESULTS

The survey used the desktop 1968 topographical map to indicate where human settlements would occur. The 1937 aerials were omitted from analyses as

experience from previous surveys in this general area has shown that these sties have totally disappeared by 2019. Existing current ploughed fields were also omitted from the survey, as they would have been cleared of previous occupations. Houses in these fields were noted. I also worked on the assumption that these houses would be known to the community, and any graves would be protected. The settlements on the 1968 maps were labelled as H1 – H64. Where possible these sites were associated with field survey sites.

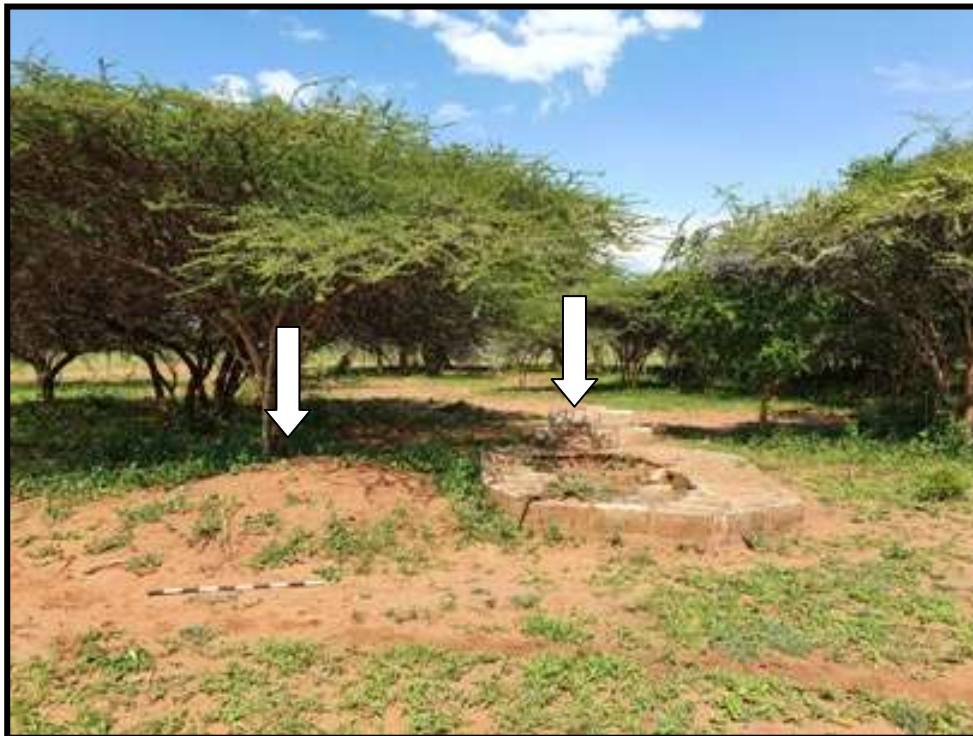
Some areas in the survey could not be accessed due to dense vegetation, especially the areas with *Acacia* spp. regrowth, or the *Acacia* spp. fences used to demarcate agricultural fields. However, those few that were not accessed would have the same management plan as those that were accessed. Furthermore the settlements from the 1968s maps all have similar settlements patterns, and these were extrapolated to the unsurveyed sites. The survey covered all access roads, where possible, to note more recent sites. This works on the assumption that settlements tend to be close to roads and are visible due to the “empty” spaces within the vegetation. I thus targeted these “empty” spaces and recorded several settlements.

The last obstacle to the survey is that of human graves. In most cases graves are demarcated with mound of sand and/or *Acacia* spp trees. If unattended, these graves will disappear within 15 -20years. Fig. 8 shows two grave types side-by-side. Only a few graves are demarcated with tombstones or cairns. The more traditional method of demarcating graves would be to plant *Euphorbia ingens*, *Erythrenia* spp., or *Ziziphus mucranata* on top of the grave. There are regional variants as well. No old *Z. mucranata* and *Erythrenia* spp. were observed during the survey however several old *E. ingens* were noted. The rule of thumb is that these older plants are on graves until proven otherwise. In a few instances stone cairns are used to demarcate a grave. These tend to be oval in shape and on the side of the settlement. Stone cairns are by default graves until proven otherwise. It is not possible to record subsurface and unmarked graves however these can be managed and this is discussed later.

Clearings within the thickets tend to be the remains of settlements. These settlements could have been in use for several decades. Most of the clearings are dominated by an old Marula tree (*Sclerocarya birrea*), *Acacia spp.* tree and sometimes fruit trees on the side. Artefacts from several decades would be found on the surface, as well as house post stumps, (daga) house floors, and occasionally grass patches from the cattle byre (*isibaya*). A guesstimate average is that each of these settlements are approximately 50m in diameter, and this will cover a few individual houses and related features.

The survey took GPS locations of the main central area, any possible graves and/or house floors. These individual waypoints (numbers 905 – 1030) together to form a settlement, referred to as MADO1 – MADO091. Some of the settlements will overlap but the separation is based on field experience. The locations were supplied in Google Earth format to the client.

FIG. 8: TWO GRAVES SHOWING DIFFERENT TYPES OF DEMARCATION



MADO01

The site is located in the northeastern corner of the study area. The site consists of a recent main rectangular house and some smaller building foundations around it (fig. 9). No graves were noted in the area.

The site consists of

Significance: The site is of low significance

Mitigation: No further direct mitigation is required

SAHRA Rating: 3C

FIG. 9: MADO01



MADO02 & MADO03

The site consists of two slightly separate sites that I grouped together in retrospect. The site is located in a cleared area and consists of modern artefacts, house remains and possible graves. There are three possible graves on the western part of the site. The “graves” were covered with thornbush and I could not discern if they were natural mounds of sand or human made (fig. 10). The site is recent enough for members of the community to identify if these are graves and if so, to whom they belong. They must be treated as graves until further confirmation.

Significance: Human graves are of high significance. The rest of the site is of low significance.

Mitigation: The area needs to be demarcated as sensitive. 20m no disturbance buffer around the graves

SAHRA Rating: 3a

FIG. 10: MADO02



MADO04

The site is located in a previously cleared area that has now overgrown. It was identified as 'h5' on the desktop study. The site consists of house floor, modern artefacts and fruit trees (fig. 11). No graves were visible; however this is probably due to the dense vegetation.

Significance: The site is currently of low significance

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3c

FIG. 11: FRUIT TRESS AT MADO04



MADO05 & MADO06

The site is located in a previously cleared area that has now become overgrown. The site consists of two Marula trees that have been used for muthi purposes. The trees are probably part of a settlement (fig. 12). Trees that have been used for medicinal purposes are part of the heritage of the area and are protected by heritage legislation. The area was too overgrown to detect a settlement.

Significance: the trees are of medium significance

Mitigation: All Marula trees should not be removed, especially the older ones, as they form part of the traditional medicine.

SAHRA Rating: 3b

FIG. 12: MADO05



MADO07

The site is located near an (overgrown) track and probably relates to 'h7'.the area is overgrown but two house floors were barely visible (fig. 13). The rest of the site is probably under the vegetation. No graves were noted.

Significance: The site is of low significance

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 13: MADO07



MADO08

The site is located south of the track at MADO07 and correlates with 'h8'. The site consists of a cleared area with modern artefacts on the surface. There is an *E. ingens* at the south of the site that might be part of a grave. Fig. 14 shows these features

Significance: The *E. ingens* is of high significance.

Mitigation: The area needs to be demarcated as sensitive. A 20m buffer must be placed around the *E. ingens*.

SAHRA Rating: 3A for the possible grave.

FIG. 14: MADO08



MADO09

The site is located in a previously cleared area. The site is slightly overgrown, and consists of at least one house with modern artefacts (fig. 15). No graves were noted in the area.

Significance: the site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 15: MADO09



MADO010

The site is located in a cleared area that has now slightly overgrown. The site consists of alien cacti normally associated with settlements. (fig. 16). A few modern artefacts were noted on the surface.

Significance: The site is of low significance

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 16: MADO010



MADO011

The site is an *E. ingens* located in the middle of a ploughed field (fig. 17). The *E. ingens* should be treated as a grave. Access to the tree was limited.

Significance: 3A

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around the *E. ingens*.

SAHRA Rating: 3A

FIG. 17: MADO011



MADO012

The site is located to the east of a ploughed field. The site consists of three *E. ingens* in close proximity to each other (fig. 18). No house floors or artefacts were noted.

Significance: The *E. ingens* should be treated as graves.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around each *E. ingens*.

SAHRA Rating: 3a

FIG. 18: MADO012



MADO013

The site is located in a thicket of thornbush with an ephemeral scatter of modern artefacts. This suggests a house was in the area. No photographs were taken.

Significance: The area is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

MADO014

The site is located in a previously cleared area and correlates with 'H9'. The site consists of a scatter of artefacts, cacti and a central tree (fig. 19). No graves were noted.

Significance: The site is of low significance

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 19: MADO014



MADO015

The site is located to the west of an existing cleared field. The site could correlate with 'h3'. The site consists of a settlement with daga house floors, modern artefacts, a central tree and an *E. ingens*

Significance: Most of the site is of low significance except for the *E. ingens* that is of high significance and could be part of H3.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around each *E. ingens*.

SAHRA Rating: 3A for the possible grave.

FIG. 20: MADO015



MADO016

The site is located just south of MADO015 and could be part of 'h3'. The site consists of a daga house floor that is being exposed from the vegetation (fig. 21). No graves were noted in the area.

Significance: the site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 21: MADO016



MADO017

The site is located in the middle of an old cleared area. The site consists of house floors, a large Marula tree and an *E. ingens* (fig. 22). Semi-modern and modern artefacts were noted on the floor.

Significance:

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around each and a 20m buffer should occur around each *E. ingens*.

SAHRA Rating: 3A

FIG. 22: MADO017



MADO018

The site is located on the edge of a wetland and near the main track. The site consists mainly of a post 1970s settlement in an open area with house floors and *E. ingens* (fig. 23).

Significance:

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around each *E. ingens*.

SAHRA Rating: 3A

FIG. 23: MADO018



MADO019

The site is located near an area cleared for farming and a road. The site might be related to 'h2'. No artefacts were noted; however, a single *E. ingens* occurs on the edge of the field (fig. 24).

Significance: The *E. ingens* is of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around the *E. ingens*.

SAHRA Rating: 3A

FIG. 24: MADO019



MADO020

The site is located in a previously cleared area and could be associated with 'h20'. The site consists of a house floor and some artefacts that include glass, clothing, plastic and pottery (fig. 25).

Significance: the site is of low significance

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 25: MADO020



MADO021

The site is located 55m southeast of MADO20 and might be associated with 'h2'. The site consists of several house floors and modern artefacts (fig. 26). No graves were noted. MADO20 and MADO21 might be part of the same settlement.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 26: MADO021



MADO022

The site is located near the eastern edge of the development. The site consists of a large open area surrounded by sisal. There is one *E. ingens* nearby (fig. 27). The area between MADO022 and MADO023 is a concentration of stone tools and pottery shards. However, these are all in a secondary context and form part of a lag deposit.

Significance: The *E. ingens* are of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around each *E. ingens*.

SAHRA Rating: 3A

FIG. 27: MADO022



MADO023

The site is located near the eastern edge of the development. The site consists of three *E. ingens* and scatter of pottery near the one *E. ingens* (fig. 28). The area between MADO022 and MADO023 is a concentration of stone tools and pottery shards. However, these are all in a secondary context and form part of a lag deposit.

Significance: The *E. ingens* are of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around each *E. ingens*.

SAHRA Rating: 3A

FIG. 28: MADO023



MADO024

The site is located next to the main track. It consists of a single *E. ingens*.

Significance: The *E. ingens* is of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around each.

SAHRA Rating: 3A

MADO025

The site is located in a previously ploughed field (fig. 29). The site consists of a high concentration of pottery shards, of which some are EIA shards, and a range of other pottery (fig. 30). The artefacts are in a secondary context.

Significance: The site is of low significance.

Mitigation: No further mitigation is required

SAHRA Rating: 3C

FIG. 29: MADO026



FIG. 30: ARTEFACTS AT MADO025



MADO026

The area is located in a previously cleared area and was 'h15' in the desktop study (fig. 31). While no artefacts or features were found, I noted the site as an example of how fast sites can 'disappear' if not continuously inhabited. Many of the other 'h' or desktop sites were inhabited for 20+ years and left many plastic and glass artefacts even in ploughed fields. MADO026 had no artefacts

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 31: MADO026



MADO027

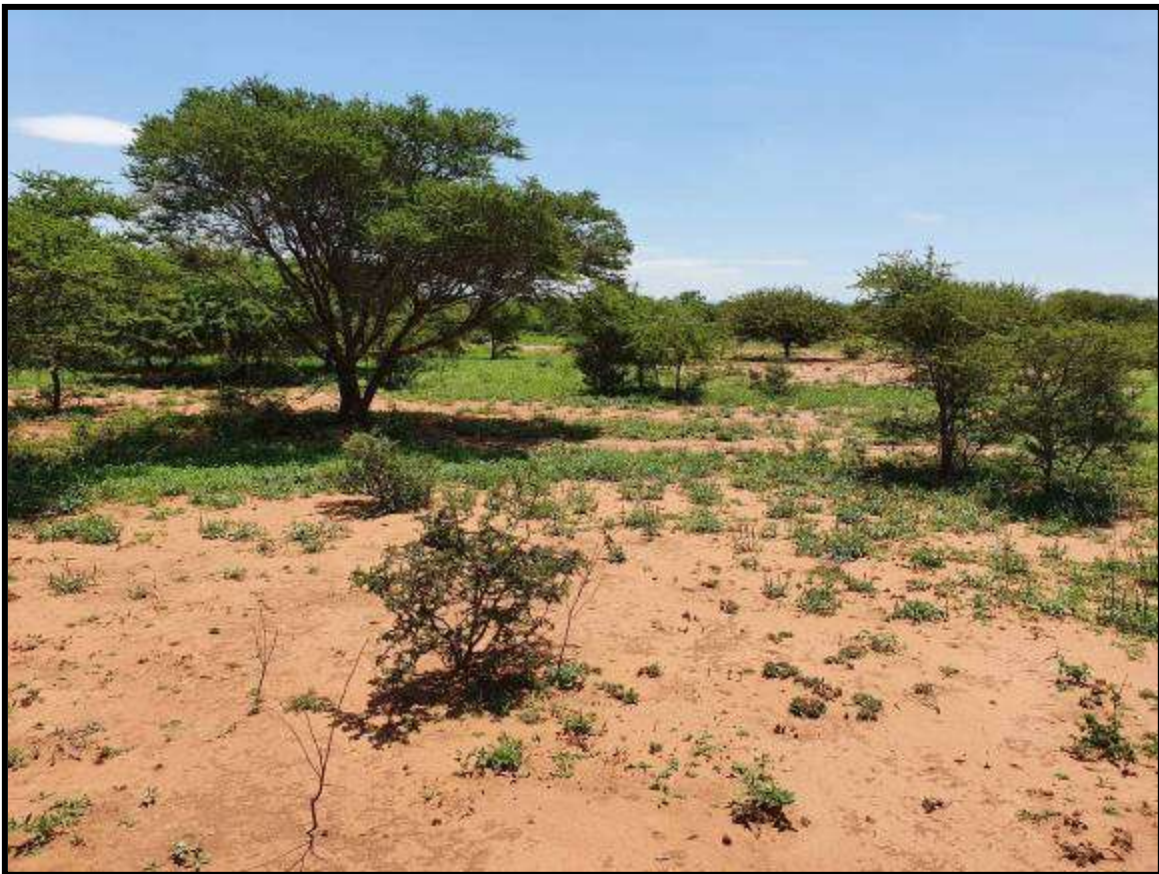
The site is located in an older cleared area. The site consists of house floors and semi- to modern artefacts (fig. 32). No graves were noted.

Significance: The area is of low significance

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 32: MADO027



MADO028

The site is located 100m south of MADO27, but in the same cleared area.

The site consists of a single grave covering made of 'cement' (fig. 33). The grave could be associated with 'h16'. There are probably more graves in the immediate area.

Significance:

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around the grave.

SAHRA Rating: 3A

FIG. 33: MADO028



MADO029

The site is located in a cleared area. The site consists of a house floor and some modern artefacts (fig. 33).

Significance: The area is of low significance

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 34: GENERAL AREA FOR MADO029



MADO030 & MADO031

The sites are located on the opposite side of a cleared area. The sites consists of several house floors and modern artefacts (fig. 35: MADO031 in background. No graves were noted.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 35: MADO030 & MADO031



MADO032

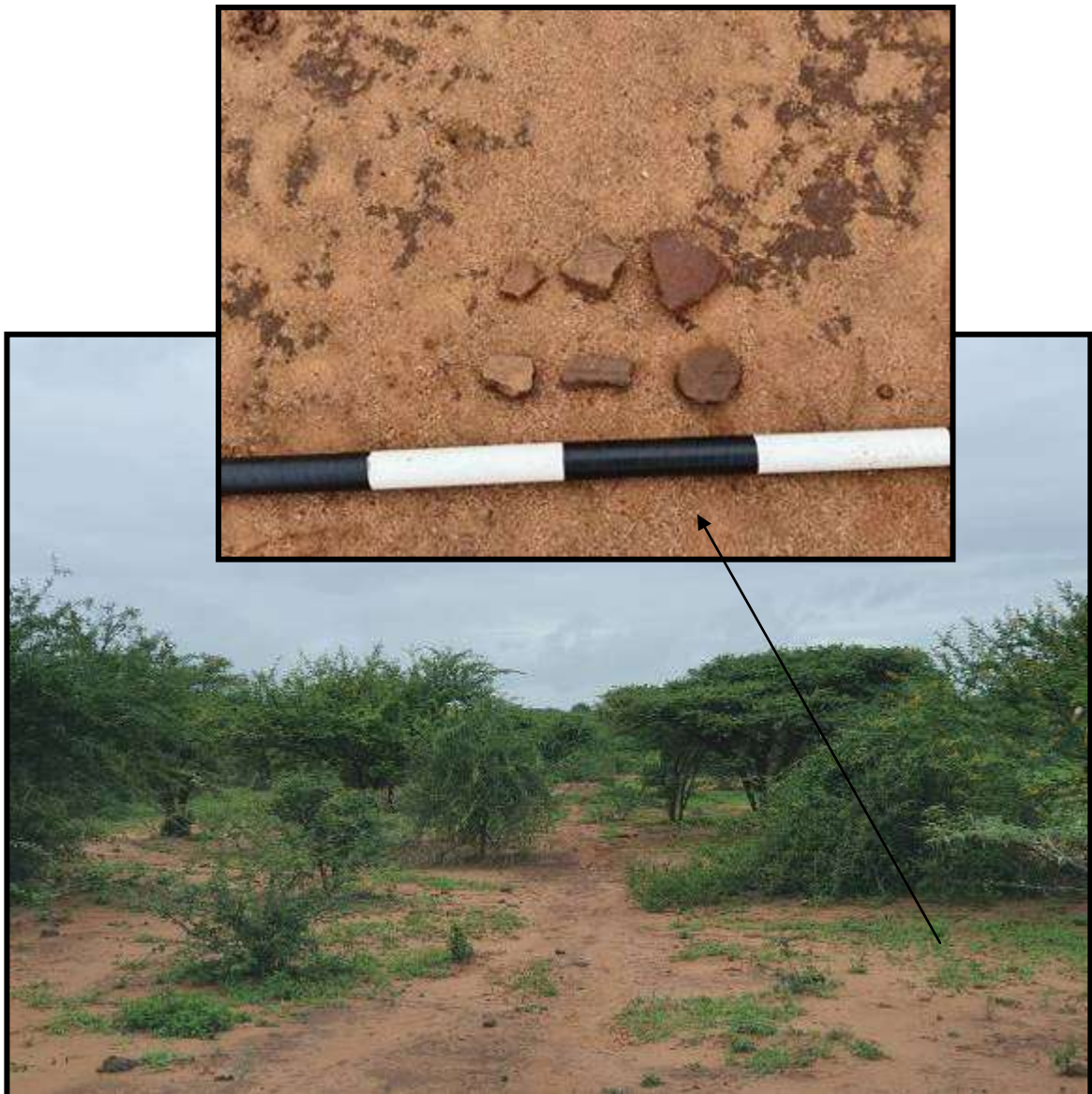
The site is located in a previously cleared area. The site consists of a scatter of Early Iron Age Pottery (fig. 36). The pottery dates to the Mzonjani Phase and dates between 1 700 and 1 500 years in age.

Significance: The site is of low significance as it is in a secondary context.

Mitigation: No mitigation is required

SAHRA Rating: 3C

FIG. 36: MADO032



MADO033 & MADO034

The site is located on the edges of, or in a wetland (fig. 37). It correlates with 'h21'. There is a more recent house ~30m to the east. Modern artefacts were noted.

Significance: The site is of low significance

Mitigation: The area needs to be demarcated as being sensitive if used; however, it is in a demarcated wetland buffer so it is unlikely to be affected.

SAHRA Rating: 3C

FIG. 37: MADO033



MADO035

The site is located in a demarcated wetland and will not be affected. The site consists of a large opening with several house floors and artefacts (fig. 38). No graves were noted.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as being sensitive if used; however, it is in a demarcated wetland buffer so it is unlikely to be affected.

SAHRA Rating: 3C

FIG. 38: MADO035



MADO036

The site is located in the middle of a cleared area. The site was not accessible during the survey but is noticeable on the Google Earth map. Several features occur to the east and southeast of the main house, and these could be graves (fig. 39). Since the house is modern, the community will know if there are graves associated with it. The circle in fig. 40 indicates the area of potential graves.

Significance: The graves are of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around each grave.

SAHRA Rating: 3a

FIG. 39: MADO036



MADO037

The site is located to the southeast of two older agricultural fields. The site consists of several house foundations that form a settlement (fig. 40). The site is associated with 'h63'. No human graves were noted.

Significance: The area is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating:

FIG. 40: MADO037



MADO038

The site is located on the edge of a demarcated wetland, with the majority of the features just inside the current wetland boundary. The site consists of a modern house with three additional buildings (fig. 41). There are three graves 15m – 20m to the east of the main house (fig. 42). One grave might be a different feature, but was rated as a grave due to its proximity to the others.

Significance: The graves are of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around each grave.

SAHRA Rating: 3a

FIG. 41: MADO038



FIG. 42: GRAVES AT MADO036



MADO039

The site is located in a cleared are amongst the thornbush. The site consists of several house floors, modern artefacts, and a [possible sunken grave (fig. 43).

Significance: The site is of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around the possible grave.

SAHRA Rating: 3A

FIG. 43: MADO039



MADO040

The site is located in a previously ploughed area. The site consists of a scatter of pottery shards in the field.

Significance: The site is of low significance.

Mitigation: No further mitigation is required

SAHRA Rating: 3C

MADO041

The site is located on the edge of an agricultural field. The site consists of a single *E. ingens* next to the fence (fig. 44). Houses may occur inside the field.

Significance: The *E. ingens* is of high significance

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around the *E. ingens*.

SAHRA Rating: 3A

FIG. 44: MADO041



MADO042 & MADO043

The site is located adjacent to a used track. The site consists of a more recent building that is currently occupied (MADO042). Approximately 50m to the east are ruins are six graves (MADO043) of various constructions (fig. 45). The two may/not be related.

Significance: The graves are of high significance

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around each grave.

SAHRA Rating: 3A

FIG. 45: GRAVES AT MADO043



MADO044

The site is located to the south of MADO032/033. The general site consists of a modern, currently used, house and some ruins to the east. Amongst the ruins are two stone cairns that resemble graves (fig. 46).

Significance: The graves are of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around each grave.

SAHRA Rating: 3A

FIG. 46: CAIRNS AT MADO044



MADO045

The site is located on a cleared area and is probably related to 'h26'. The site consists of house floors and modern artefacts (fig. 47). No graves were noted in the area.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 47: SETTLEMENT AT MADO045



MADO046

The site is located on a cleared area just north of two recently abandoned settlements. The site consists of house floors (fig. 48). No graves were noted in the area.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 48: SETTLEMENT AT MADO046



MADO047

The site is located on the eastern side in a cleared area. The site consists of house floors and two possible graves (fig. 49). One graves has a cement covering, while the other is covered with wooden branches.

Significance: The graves are of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around each grave.

SAHRA Rating: 3A

FIG. 49: OPENING AT MADO047



MADO048

The site is located 40m southwest of MADO47. It was separated as it appeared to be a different settlement and the grave was separate from the other graves. The site consists of a single grave (fig. 50).

Significance:

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around the grave.

SAHRA Rating:

FIG. 50: GRAVE AT MADO048



MADO049

The site is located in a cleared area on the western side of the study area.

The site consists of two ruined buildings that appear to be of the same settlement (fig. 51). Modern artefacts occur on the surface. No graves were noted.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 51: MADO049



MADO050

The site is located to the east of a currently ploughed field. The site consists of the foundations of five houses, one grave, and a few modern artefacts (fig. 52). The site is related to 'h38'.

Significance:

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around the grave.

SAHRA Rating:

FIG. 52: MADO050



MADO051 & MAD052

The sites are located in a cleared area and are probably the same site now separated by vegetation regrowth. The site consists of two houses 30m apart (MADO052), and two potential graves (MADO051) near the entrance to the settlement from the road (fig. 53). The potential graves are stone cairns.

Significance: The graves are of high significance

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around each grave.

SAHRA Rating: 3A

FIG. 53: GRAVES AT MADO051



MADO053

The site is located in an old clear area. The site consists of a recently abandoned settlement of a house floors and a 'long drop' (fig. 54). Modern artefacts were visible on the surface. No graves were noted.

Significance: The site is of low significance

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 54: MADO053



MADO054

The site is located on the southeast of an agricultural field. The site consists of house floor remains and modern artefacts (fig. 55). No graves were noted.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 55: MADO054



MADO055

The site is located in a previously cleared area. The site consists of a single house floor (fig. 56). The artefacts at the settlement are modern, and not extensive.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 56: MADO055



MADO056

The site is located in a clear area northeast of MODO055. MAD056 consists of modern house remains and artefacts and two possible graves (fig. 57). The possible graves occur on the eastern side of the settlement.

Significance: The potential graves are of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around each.

SAHRA Rating: 3A

FIG. 57: MADO056



MADO057

The site is located in the northern part of a cleared area. The site consists of a 3m x 3m outer foundation (fig. 58). This is either a foundation for a house, or for a (double) grave.

Significance: The feature should be treated as a grave until further notice.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around the possible grave.

SAHRA Rating: 3C

FIG. 58: MADO057



MADO058

The site is located in a cleared area approximately 50m south of MADO057.

The site consists of several house floors and modern artefacts (fig. 59). The site postdates the 1989 as a 10c coin with an arum lily was noted at the one house. No human graves were found.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 59: MADO058



MADO059

The site is located ~40m south of MADO058 in the same cleared area. The site consists of three graves under the *Acacia spp.* (fig. 60).

Significance: The graves are of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around each grave.

SAHRA Rating: 3A

FIG. 60: MADO059



MADO060

The site is located in an older cleared area between two agricultural fields.

The site consists of a few house floors and modern artefacts (fig. 61). No human graves were noted.

Significance: The area is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 61: MADO060



MADO061

The site is located in a previously cleared agricultural field. The site consists of a modern house, smaller houses, and three possible graves (fig. 62). The two graves are stone cairns on the western side of the house. The third possible grave is a mound of sand to the east of the house.

Significance: The graves are of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around each grave.

SAHRA Rating: 3C

FIG. 62: POSSIBLE GRAVES AT MADO061



MADO062

The site is located in a cleared area in the thornbush. The site consists of a settlement and possible grave (fig. 63). Modern artefacts occur in the area.

Significance: The grave is of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around the grave.

SAHRA Rating: 3A

FIG. 63: MADO062



MADO063

The site is located next to the main access road and in a cleared area. The site consists of a settlement with house floors and modern artefacts (fig. 64). No graves were observed.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: No further mitigation is required.

FIG. 64: MADO083



MADO064

The site is located on the western side of the study area. The site was not accessible due to dense vegetation. The site consists is a settlement in a previously ploughed area (fig. 65).

Significance: The site is of low significance

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 65: MADO064



MADO065

The site is located in a cleared area in the thornbush. The site consists of recent settlement with house floors, modern artefacts and two graves (fig. 66).

Significance: The graves are of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around each grave.

SAHRA Rating: 3A

FIG. 66: SETTLEMENT AND GRAVES AT MADO065



MADO066

The site is located in a cleared area into the thornbush. The site consists of pottery, modern ceramics, glass and house foundations (fig. 65). The site shares the same location as 'h41'. No graves were noted.

Significance: The site is of low significance

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 65: MADO064



MADO067

The site is located in a cleared area in the thornbush. The site consists of settlement with two possible unmarked human graves (fig. 68). Modern artefacts occur in the settlement.

Significance: The possible graves are of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around each grave.

SAHRA Rating: 3A

FIG. 68: MADO067



MADO068

The site is located next to a main access road and in a cleared area. The site consists of settlements with house floors and modern artefacts (fig. 69). No human graves were noted.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 69: MADO068



MADO069 & MAD070

The site is located in a cleared area in the thornbush and on the edge of an agricultural field. The site is associated with 'h45'. The site consists of a settlement with house floors and modern artefacts (fig. 70). No graves were noted. MADO070 is probably an extension of this settlement.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 70: SETTLEMENT AND HOUSE FLOOR AT MADO069



MADO071

The site is located in a cleared area besides the road. The site consists of a settlement with house floors and modern artefacts (fig. 72). A stone cairn occurs in the northeastern part of the site and it is possibly a grave.

Significance: The cairn is of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around the grave.

SAHRA Rating: 3A

FIG. 72: SETTLEMENT AND GRAVE AT MADO071



MADO072

The site is located on the edge of a ploughed field. The site consists of a settlement with house floors, modern artefacts and a possible grave (or small floor) (fig. 73).

Significance: The possible grave is of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around the grave.

SAHRA Rating: 3C

FIG. 73: MADO072



MADO073

The site is located in a cleared area near the main track. The site consists of a settlement with modern artefacts and house floors (fig. 74). No human graves were noted.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 74: MADO073



MADO074

The site is located in the middle of a fallow agricultural field. The site consists of a single main house (fig. 75). There was no access to the overgrown field, but Google Earth imagery indicates three smaller houses nearby.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 75: MADO074



MADO075

The site is located within a thornbush thicket with no access. There are two abandoned houses at the site.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 76: AERIAL IMAGE OF MADO075



MADO076

The site is located on the edge of an agricultural field and near a wetland. The site might be associated with 'h60'. The site consists of a settlement with house floors, modern artefacts and a possible grave (fig. 77).

Significance: The grave is of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around the grave.

SAHRA Rating: 3A

FIG. 77: SETTLEMENT AND GRAVE AT MADO076



MADO077

The site is located near the main track and in a semi-cleared area. The site consists of several house floors and modern artefacts (fig. 78). No graves were noted in the area.

Significance:

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 78: MADO077



MADO078

The site is located next to the main track. The site consists of a single house floor (fig. 79). No graves were noted.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 78: MADO079



MADO079

The site is located in a previously cleared area and near an agricultural field.

The site consists of a stone cairn that could be a grave (fig. 80). No other features were noted, but the area is consistent with other settlements.

Significance: The grave is of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around the grave.

SAHRA Rating: 3A

FIG. 80: POSSIBLE GRAVE AT MADO079



MADO080

The site is located in the middle of an *Acacia spp.* thicket. There was no access to the site. The site consists of a single house (fig. 81).

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3A

FIG. 81: MADO080



MADO081 MADO082

The site is located in an *Acacia spp.* regrowth area. The site consists of two recently abandoned houses. The one house was made from wooden poles (fig. 82). No graves were noted.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 82: MADO081



MADO083

The site is located near the main track and south of MADO82. The site consists of several shortened wooden poles that are covering a hole in the ground (fig. 83). This is probably a grave.

Significance: The grave is of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around the grave.

SAHRA Rating: 3A

FIG. 83: GRAVE AT MADO083



MADO084 & MADO085

The site is located next to a main track. The site consists of two houses (MADO084), modern artefacts, and a stone cairn (MADO085) (fig. 84). The stone cairn might be a grave.

Significance: The cairn is of high significance.

Mitigation: The area needs to be demarcated as being sensitive and a 20m buffer should occur around the grave.

SAHRA Rating: 3A

FIG. 84: MADO084 & MADO095



MADO086

The site is located in an erosion gully. The site consists of a lag deposit of ESA, MSA and LSA stone tools (fig. 85). All of these tools are in a secondary context. The tools occur on this hardened clay layer throughout the study area.

Significance: The site is of low significance.

Mitigation: No further mitigation is required.

SAHRA Rating: 3C

FIG. 85: STONE TOOLS AT MADO086



MADO087

The site is located next to the main track. The site consists of two ruined houses (fig. 87). No other artefacts or features were noted due to the dense vegetation.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG.87: HOUSE REMAINS AT MADO087



MADO088

The site is located in a cleared area near an agricultural field. The site consists of house floors (fig. 88). No other artefacts or features were noted due to the dense vegetation.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG.88: SETTLEMENT AT MADO088



MADO089

The site is located in a cleared area near an agricultural field. The site consists of a settlement with house floors and modern artefacts (fig. 88). No graves were noted.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 89: SETTLEMENT AT MADO089



MADO090

The site is located in a cleared area near an agricultural field. The site consists of a settlement with house floors and modern artefacts (fig. 90). No graves were noted.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

SAHRA Rating: 3C

FIG. 90: SETTLEMENT AT MADO090



MADO091

The site is located in a cleared area near an agricultural field. It might relate to 'h36'. The site consists of a settlement with house floors and modern artefacts (fig. 91). No graves were noted. There is a more recent building in the area.

Significance: The site is of low significance.

Mitigation: The area needs to be demarcated as sensitive.

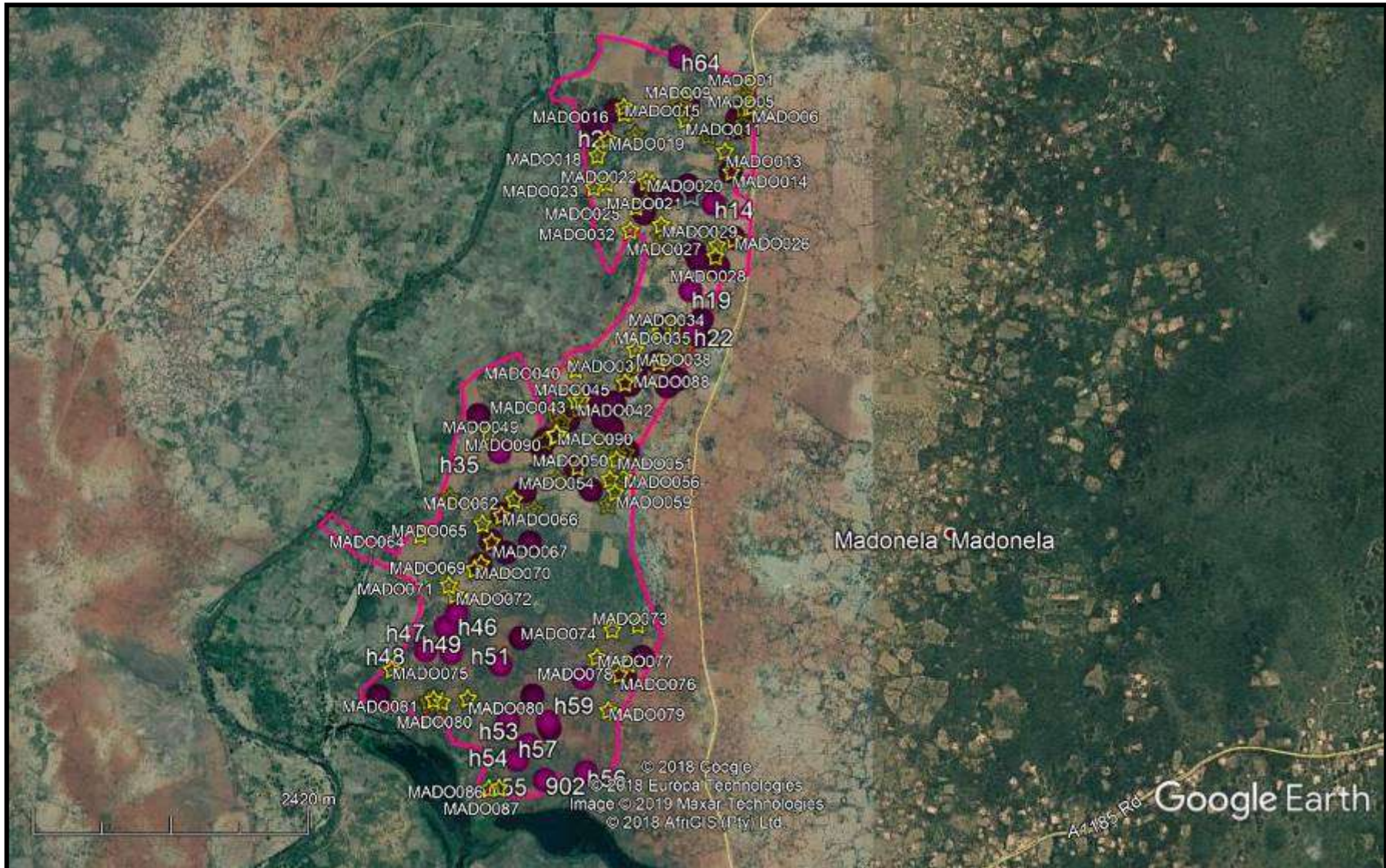
SAHRA Rating: 3C

FIG. 91: SETTLEMENT AT MADO091



Figure 92 show the locations of the various sites. The locations of the sites and features have been supplied to the client in Google Earth Format.

FIG. 92: LOCATION OF RECORDED SITES



MANAGEMENT PLAN

All of the recorded archaeological material in the study area is in a secondary context and part of a lag deposit. That is, thousands of years of human occupation have filtered down onto the hardened clay layer creating a single cultural horizon. The artefacts have no significance and are out of context. They can only give a general indication of what occurred in the area. This is the case for most of the Makhatini Flats. I do not record these as sites rather as occurrences of artefacts. It is highly unlikely that ploughing activity will reach these layers.

The main heritage related concern for this project is the occurrence of human remains. Most of the graves in the general area are unmarked. It is only in more recent times that graves are marked with a cap or head stone. Fig. 8 showed two of these methods next to each other. The sand mound will disappear within 10 years, if not sooner. This was noticeable when surveying the 1968 sites, in that very few graves relating to this time were recorded. It is for this reason that I did not use the 1937 aerial photographs: the sites would not be visible.

The only way to mitigate for these known graves is to place a 50m sensitivity area around each recorded site, or settlement. Those graves that are unmarked will be at least a meter below the surface, and thus ploughing activity will not disturb the human remains. This only holds for burials in a lying position, and not those in a sitting position.

Thus ploughing activity will not affect unmarked graves as the blades are ~30cm in diameter. Trenches for pipes might affect unmarked graves. However, this can be mitigated by using the opposite side of the road, or a different route. If the 50m sensitivity buffer is placed around each settlement, then the routing of pipelines can be planned accordingly

Euphorbia ingens, and other species, were traditionally used to demarcate graves. In the study area, all old, or large, *E. ingens* should be treated as a grave with the same 5m and 20m buffers.

Marula trees are often used for traditional medicine. These trees should not be removed as they form part of the cultural heritage.

The recorded graves need a visible barrier that is 5m from the grave. This is best done by fencing. In addition to this, there must be a 20m buffer of no development around each grave. This is to ensure that other graves near the recorded grave are not affected, and for post-depositional slumping within the grave. These graves need to be marked before construction activity occurs. I suggest Umlando undertakes this activity, in conjunction with the community, as they have recorded the sites and now the locations.

If any graves are uncovered during the course of construction, then work in that area needs to stop immediately. A 20m area around the grave should be cordoned off in the mean time. The SAPS and Kwazulu Natal Amafa And Research Institute need to be informed immediately.

CONCLUSION

A heritage survey was undertaken for the proposed Imfunda Yophongolo irrigation cluster. Several nearby surveys have indicated that the archaeological material occurs as a lag deposit and is mostly of low significance. The main heritage feature that occurs are human graves from the various settlements. Given the nature of the sandy soils, unmarked graves disappear quickly if they are not maintained. This is unfortunately the case for most of the graves in the general area.

The survey recorded 91 settlements, and noted several others that could not be accessed. Some of these have graves, while most do not. I suggested that

each settlement has a 50m sensitivity radius placed around it. This should be used to avoid placing irrigation piping on the site. It is unlikely that ploughing activity will affect unmarked graves as they are too deep for the blades.

Those graves that were recorded require a physical buffer around them at the 5m mark. In addition to this, there must be a 20m buffer of no disturbance around the grave.

The PIA study noted that the area is too disturbed to have significant alluvial palaeontological deposits.

No further HIA mitigation is required.

REFERENCES

Anderson, G. 2008. Heritage Survey Of The Proposed Tembe Masizwane Lodge, Kwazulu-Natal

Anderson, G. 2011. Heritage Desktop Survey Of The Propopsed Candover-Mbazwana-Gezisa 132kv Powerlines And 132/22kv Mbazwana And Gezisa Substations, Kwazulu-Natal.

Anderson, G. 2015. Heritage Survey For The Ndumo-Gezisa Transmission Line, Kwazulu-Natal

Anderson, G. 2015. Proposed Makhathini Expansion Irrigation Scheme, Northern Kwazulu-Natal

Anderson, G. 2017. Heritage Survey Of The Proposed Manguzi Bulkwater Pipeline

EXPERIENCE OF THE HERITAGE CONSULTANT

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

DECLARATION OF INDEPENDENCE

I, Gavin Anderson, declare that I am an independent specialist consultant and have no financial, personal or other interest in the proposed development, nor the developers or any of their subsidiaries, apart from fair remuneration for work performed in the delivery of heritage assessment services. There are no circumstances that compromise the objectivity of my performing such work.

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

Gavin Anderson
Archaeologist/Heritage Impact Assessor

APPENDIX A
PIA LETTER OF EXEMPTION

**DEPARTMENT OF RURAL DEVELOPMENT AND LAND REFORM
FEASIBILITY REPORT FOR THE PROPOSED IMFUNDA
YOPHONGOLO IRRIGATION CLUSTER ONE PROJECT
JULY 2019: Desk-
Top PIA**

FOR

**UMLANDO: Archaeological Surveys & Heritage Management
PO Box 102532, Meerensee, KwaZulu-Natal 3901
phone (035)7531785 fax: 0865445631
cell: 0836585362 / 0723481327
Facebook: Umlando and Umlando SouthAfrica
Email:umlando@gmail.com**

by

**Dr Alan Smith
Alan Smith Consulting
29 Browns Grove, Sherwood, Durban, 4091, South Africa
Telephone: 031 208 6896
asconsulting@telkomsa.net
December 2019**

EXECUTIVE SUMMARY

This project is to be developed in soils derived from weathering of Cretaceous Rocks. As the proposed project is within the Pongolo River floodplain a Field Visit will serve no purpose. Loose fossils may be found but these are already weathered out of the rock and probably badly damaged by river transport. Should good

condition fossils be found then they need to be curated as stated in the chance find protocol.

1. BACKGROUND

GFK Consulting Engineers cc have been appointed by the Department of Rural Development and Land Reform to conduct a feasibility study, complete design and construction monitoring for “Imfunda Yophongolo irrigation cluster one project” in Umhlabuyalingana Local Municipality within Umkhanyakude district municipality in Kwazulu-Natal, order number KN 022093. The project is located at: 27°18'32.22"S 32°14'21.95"E Umhlabuyalingana Local Municipality within Umkhanyakude district municipality in Kwazulu-Natal, 21 km SW of Jozini (Krugel, 2019).



Figure 1: Location map. (Image source Krugel, GFK-ETL JOINT VENTURE & Google Earth).

This project concerns a change of land use and water irrigation scheme. This land is located in the Pongolo River Floodplain (Fig. 2). It has previously been used for agricultural purposes. The present vegetation will be removed and the land ploughed with blades that are 30-40cm diameter.



Fig. 2: *The proposed project area (red) is located in the Pongolo River flood plain (Image source Naidu Consulting, 2014).*

3. GEOLOGY

The land in question comprises alluvium deposited by the Pongolo River. This alluvium formed from weathering of Cretaceous rocks. This surface layer will be underlain by fossiliferous Cretaceous Rocks at depth (Fig. 3). Cretaceous rocks will underlie the alluvium (at depths of at least 2m) and are likely to be weathered.



Figure 3: *Proposed project area (yellow), superimposed on the 1: 1000 000 Geological map (Arcgis). This project is within Pongolo River alluvium with no fresh or weathered rock being effected.*

4. PALAEOLOGY

This project falls under green and red on the Sahris Map (Fig. 4). However this is due to inadequate mapping. This entire project is within soil (Pongolo River Floodplain alluvium). Cretaceous rocks will be present at depth (>2m). Although these are highly fossiliferous, this project will be contained within soil (alluvium) that has been produced by weathering of the Cretaceous rocks. A field visit will not add any value to this project. It is possible that fossil “chance finds” may occur. For this reason a “Chance Find” Protocol s been added.

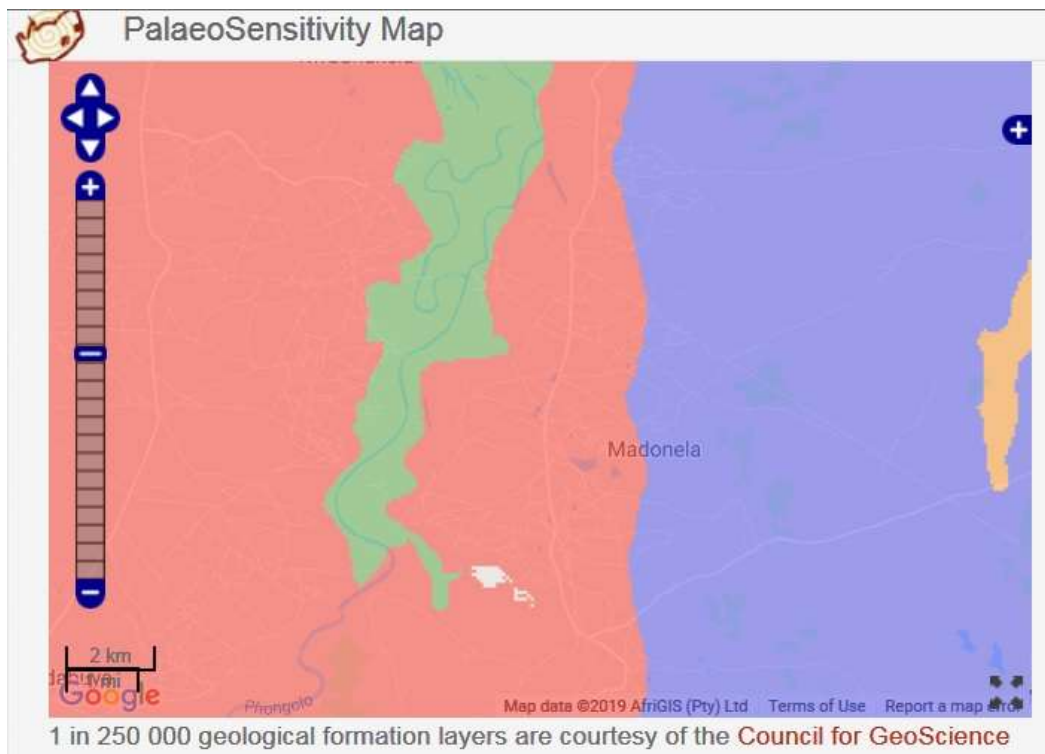


Fig. 4: Extract from the Sahris Palaeontological Sensitivity Map.

5. CHANCE FIND PROTOCOL

Although complete fossils are unlikely to be found I recommend a “Chance Find Protocol. This protocol is based on that of Groenevald (2017). This Protocol will ONLY kick-in if palaeontological material is found.

In the case of any unusual structures, the 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, 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 in the sample archive at the Museum in Durban (labels, boxes, shelving and, if necessary, specifically-tasked temporary employees) as specified by or agreed with AMAFA. Documentary record of palaeontological occurrences
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 accurately surveyed. Sample locations, measured sections, etc., must be recorded three-dimensionally if any “significant fossils” are recorded during the time of excavation. Functional responsibilities of the appointed palaeontologist
10. Establishment of a representative collection of fossils and a contextual archive of appropriately documented and sampled palaeoenvironmental and sedimentological geodata at the Museum in Durban.
11. Undertake an initial evaluation of potentially affected areas and of available exposures in excavations.
12. On the basis of the above, and evaluation during the early stages of excavation development, in collaboration with the contractor management team, more detailed practical strategies to deal with the fossils encountered routinely during excavation, as well as the strategies for major finds.
13. Informal on-site training in responses applicable to “normal” fossil finds must be provided for the ECO and environmental staff by the appointed specialist.
14. Transport of material from the site to the Museum in Durban.
15. Reporting on the significance of discoveries, as far as can be preliminarily ascertained. This report is in the public domain and copies of the report must be deposited at ESI, AMAFA, and the South African Heritage Resources Authority (SAHRA). It must fulfill the reporting standards and data requirements of these bodies.
16. Reasonable participation in publicity and public involvement associated with palaeontological discoveries. In the event of construction exposing new palaeontological material, not regarded as normative/routine as outlined in the initial investigation, such as a major fossil plant find, the following procedure must be adhered to:
17. The appointed specialist or alternates (AMAFA, SAHRA; University) must be notified by the responsible officer (e.g. the ECO or contractor manager), of major or unusual discoveries during excavation, found by the Contractor Staff.
18. Should a major in situ occurrence be exposed, excavation will immediately cease in that area so that the discovery is not disturbed or altered in any way until the appointed specialist or scientists from the ESI at WITS University, or its designated representatives at AMAFA, have had reasonable opportunity to investigate the find. Such work will be at the expense of the Developer.

6. CONCLUSIONS & RECOMMENDATIONS

The possibility of finding fossils is very low, but Not Zero and a “Chance Find” Protocol has been inserted into this report as the chance of finding Palaeontological Material is NOT zero.

7. REFERENCES

arcgis.com/home/webmap/viewer.html

Groenevald, G (2017). Chance find protocol “for the proposed Greater Bulwer DonnyBrook Bulk Water Supply A Scheme (GBDBWSS): Harry Gwala district Municipality, KwaZulu-Natal.

Kreugel (2019). Department of Rural Development and Land Reform feasibility report for the proposed Imfunda Yophongolo Irrigation Cluster One Project

8. DETAILS OF SPECIALIST

Dr Alan Smith Pr. Sc. Nat., I.A.H.S.

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:

- MSc in stromatolites (University of KwaZulu-Natal)
- PhD in Geology (University of KwaZulu-Natal).
- 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 more than 50 journal articles with 360 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.
- 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.