HARDING TOWNSHIP ESTABLISHMENT, UMUZIWABANTU LOCAL MUNICIPALITY, KZN

FOR K2M ENVIRONMENTAL

DATE: 20 AUGUST 2021

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EXECUTIVE SUMMARY

The Harding Township Establishment forms part of the Umuziwabantu Municipality's strategic objective of regeneration of the town of Harding and bring in new housing opportunities in the area for affordable and middle-income housing. The total extent of the project area is approximately 34.65 hectares and is situated within Ward 3 of the Umuziwabantu Municipality. The proposed development entails the establishment of a Township together with supporting infrastructure.

A desktop study for the general heritage of the study area indicated that the area has been open field for several decades and is mostly undisturbed. The palaeontological desktop study noted that the area is very sensitive to fossil material and these will be exposed during construction. A suitably qualified palaeontologist needs to monitor and/or collect fossil material during the construction phase.

No archaeological material was noted in the study area.

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Abbreviations

HP	Historical Period
IIA	Indeterminate Iron Age
LIA	Late Iron Age
EIA	Early Iron Age
ISA	Indeterminate Stone Age
ESA	Early Stone Age
MSA	Middle Stone Age
LSA	Late Stone Age
HIA	Heritage Impact Assessment
PIA	Palaeontological Impact Assessment

INTRODUCTION

The Umuziwabantu Municipality has, through its IDP process, and extensive consultation with respective communities residing within the local municipality, identified the need to provide a housing development within its area of jurisdiction. This process was initiated as a means to address the municipality's housing need due to the growth of the population.

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- Approximately 343 BNG (Breaking New Ground) single-storey stand-alone residential units
- 4 storey residential blocks with approximately 210 social housing units
- Pipelines for the transportation of water supply and waterborne sewage
- Internal roads and stormwater infrastructure
- Erven will be set aside for commercial, conservation, active and public open space as well as a hospital facility.

Umlando was requested to undertake an assessment of the proposed development. Figures 1 – 3 show the location of the development.

FIG. 1 GENERAL LOCATION OF THE PROPOSED DEVELOPMENT

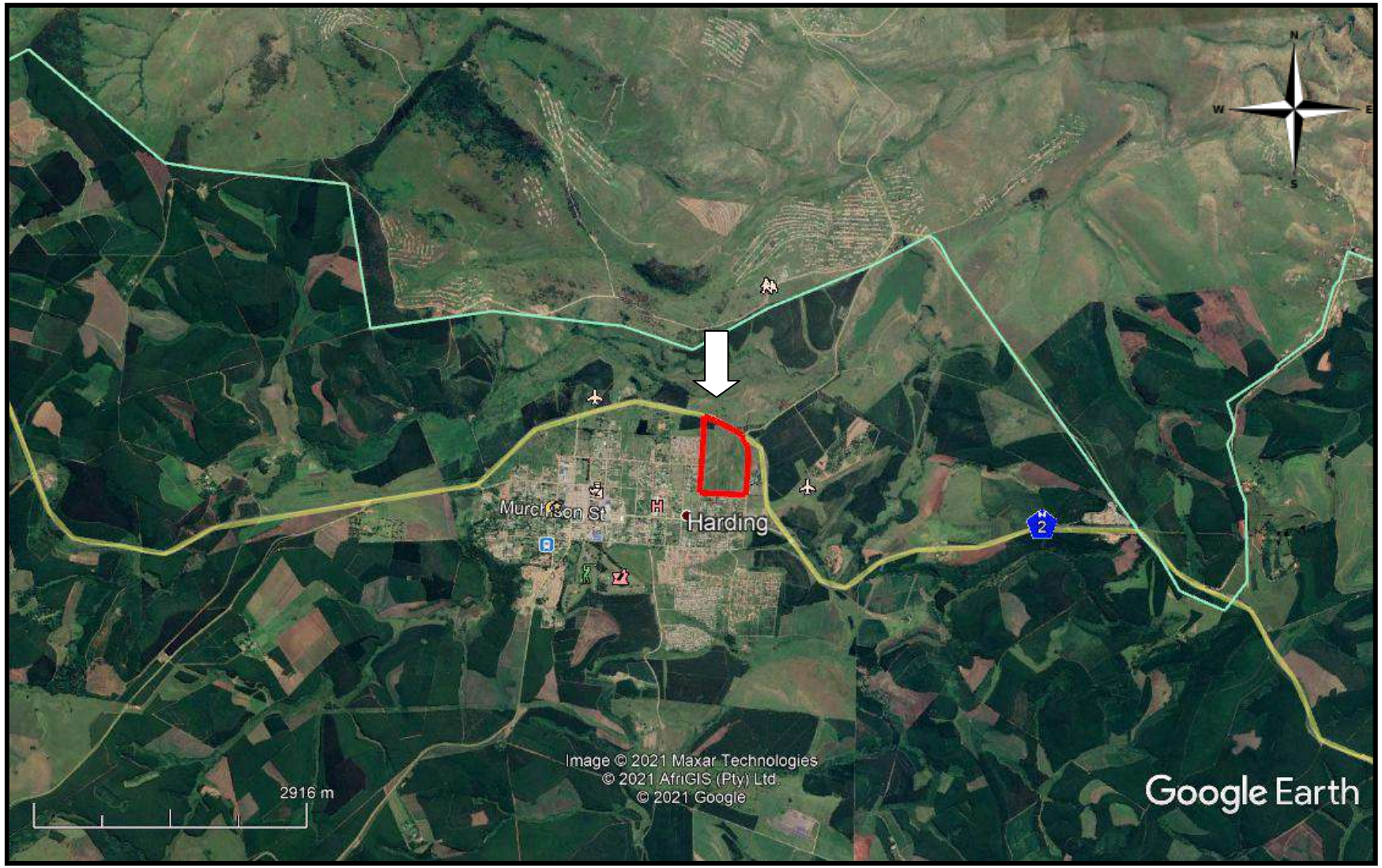


FIG. 2: AERIAL OVERVIEW OF THE PROPOSED DEVELOPMENT

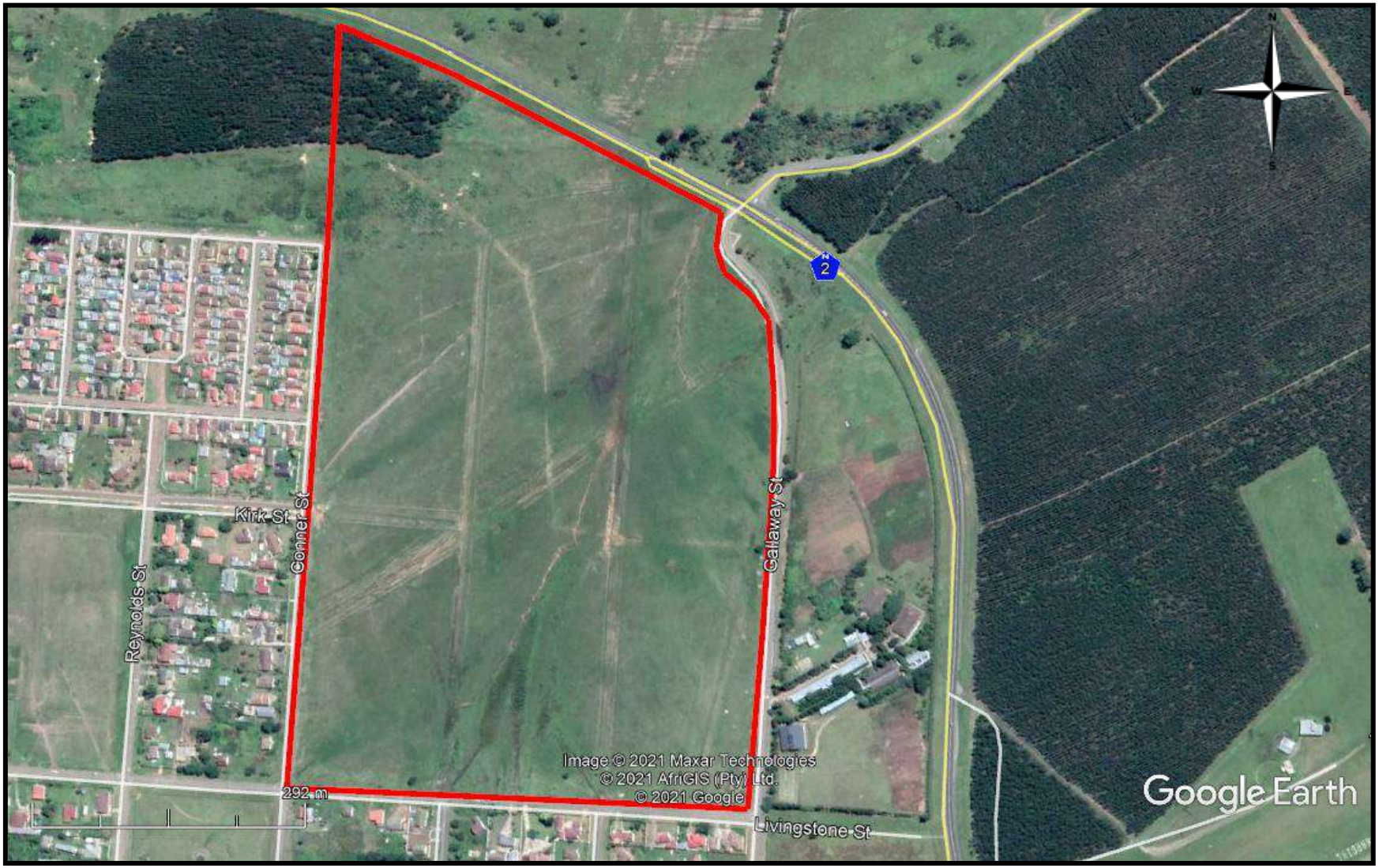


FIG. 3: TOPOGRAPHICAL MAP OF THE PROPOSED DEVELOPMENT (2002)

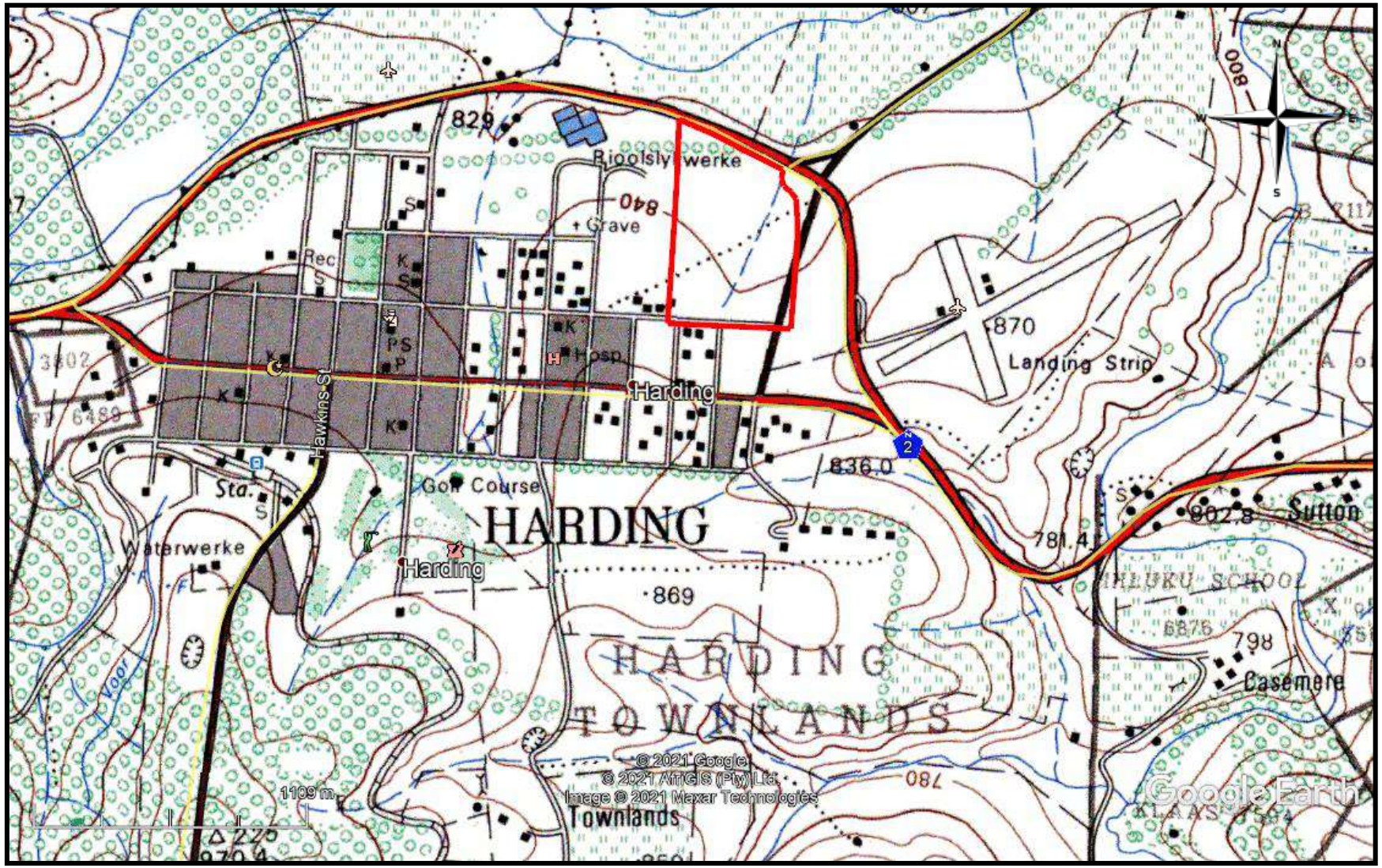


FIG. 4: SCENIC VIEW OF THE STUDY AREA

KWAZULU NATAL AMAFA AND RESEARCH INSTITUTE, ACT 05, 2018

"General protection: Structures.—

- No structure which is, or which may reasonably be expected to be older than 60 years, may be demolished, altered or added to without the prior written approval of the Council having been obtained on written application to the Council.
- Where the Council does not grant approval, the Council must consider special protection in terms of sections 38, 39, 40, 41 and 43 of Chapter 9.
- The Council may, by notice in the *Gazette*, exempt—
- A defined geographical area; or
- defined categories of sites within a defined geographical area, from the provisions of subsection where the Council is satisfied that heritage resources falling in the defined geographical area or category have been identified and are adequately protected in terms of sections 38, 39, 40, 41 and 43 of Chapter 9.
- A notice referred to in subsection (2) may, by notice in the *Gazette*, be amended or withdrawn by the Council.

General protection: Graves of victims of conflict.—No person may damage, alter, exhume, or remove from its original position—

- the grave of a victim of conflict;
- a cemetery made up of such graves; or
- any part of a cemetery containing such graves, without the prior written approval of the Council having been obtained on written application to the Council.
- General protection: Traditional burial places.—
- No grave—
- not otherwise protected by this Act; and
- not located in a formal cemetery managed or administered by a local authority, may be damaged, altered, exhumed, removed from its original

position, or otherwise disturbed without the prior written approval of the Council having been obtained on written application to the Council.

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

- the applicant has made a concerted effort to consult with communities and individuals who by tradition may have an interest in the grave; and
- the applicant and the relevant communities or individuals have reached agreement regarding the grave.

General protection: Battlefield sites, archaeological sites, rock art sites, palaeontological sites, historic fortifications, meteorite or meteorite impact sites.—

- No person may destroy, damage, excavate, alter, write or draw upon, or otherwise disturb any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Council having been obtained on written application to the Council.
- Upon discovery of archaeological or palaeontological material or a meteorite by any person, all activity or operations in the general vicinity of such material or meteorite must cease forthwith and a person who made the discovery must submit a written report to the Council without delay.
- The Council may, after consultation with an owner or controlling authority, by way of written notice served on the owner or controlling authority, prohibit any activity considered by the Council to be inappropriate within 50 metres of a rock art site.
- No person may exhume, remove from its original position or otherwise disturb, damage, destroy, own or collect any object or material associated with any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Council having been obtained on written application to the Council.
- No person may bring any equipment which assists in the detection of metals and archaeological and palaeontological objects and material, or

excavation equipment onto any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, or meteorite impact site, or use similar detection or excavation equipment for the recovery of meteorites, without the prior written approval of the Council having been obtained on written application to the Council.

- The ownership of any object or material associated with any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site, on discovery, vest in the Provincial Government and the Council is regarded as the custodian on behalf of the Provincial Government."

METHOD

The method for Heritage assessment consists of several steps.

The first step forms part of the desktop assessment. Here we would consult the database that has been collated by Umlando. This databases contains archaeological site locations and basic information from several provinces (information from Umlando surveys and some colleagues), most of the national and provincial monuments and battlefields in Southern Africa (http://www.vuvuzela.com/googleearth/monuments.html) and cemeteries in southern Africa (information supplied by the Genealogical Society of Southern Africa). We use 1st and 2nd edition 1:50 000 topographical and 1937 aerial photographs where available, to assist in general location and dating of buildings and/or graves. The database is in Google Earth format and thus used as a quick reference when undertaking desktop studies. Where required we would consult with a local data recording centre, however these tend to be fragmented between different institutions and areas and thus difficult to access at times. We also consult with an historical architect, palaeontologist, and an historian where necessary.

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

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

Defining significance

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

These criteria are:

1. State of preservation of:

1.1. Organic remains:

1.1.1. Faunal

1.1.2. Botanical

1.2. Rock art

1.3. Walling

1.4. Presence of a cultural deposit

1.5. Features:

1.5.1. Ash Features

1.5.2. Graves

1.5.3. Middens

1.5.4. Cattle byres

1.5.5. Bedding and ash complexes

2. Spatial arrangements:

2.1. Internal housing arrangements

2.2. Intra-site settlement patterns

2.3. Inter-site settlement patterns

3. Features of the site:

3.1. Are there any unusual, unique or rare artefacts or images at the site?

3.2. Is it a type site?

3.3. Does the site have a very good example of a specific time period, feature, or artefact?

4. Research:

4.1. Providing information on current research projects

4.2. Salvaging information for potential future research projects

5. Inter- and intra-site variability

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

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

6. Archaeological Experience:

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

7. Educational:

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

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

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

8. Other Heritage Significance:

8.1. Palaeontological sites

8.2. Historical buildings

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

8.4. Graves and/or community cemeteries

8.5. Living Heritage Sites

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

The more a site can fulfill the above criteria, the more significant it becomes. Test-pit excavations are used to test the full potential of an archaeological deposit. This occurs in Phase 2. These test-pit excavations may require further excavations if the site is of significance (Phase 3). Sites may also be mapped and/or have artefacts sampled as a form of mitigation. Sampling normally occurs when the artefacts may be good examples of their type, but are not in a primary archaeological context. Mapping records the spatial relationship between features and artefacts. Table 1 lists the grading system.

TABLE 1: SAHRA GRADINGS FOR HERITAGE SITES

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

RESULTS

DESKTOP STUDY

The desktop study consisted of analysing various maps for evidence of prior habitation in the study area, as well as for previous archaeological surveys. The general area has very few recorded heritage sites (fig. 5). These sites are Stone Age and Iron Age, while the town has a registered historical building. Prins (2013) undertook a heritage survey for the landfill site and did not record any sites.

“Harding was established as a military outpost following the British annexation of East Griqualand in 1874. Named after Sir Walter Harding (c 1812-1874) who in 1858 became the first Chief Justice in Natal. It was declared as a township in 1911” (Raper 1986:198)

The 1937 aerial photograph indicates that there are no built structures within the study area (fig. 6).

The 1969 topographical map indicates that there are no built structures in the study area.

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

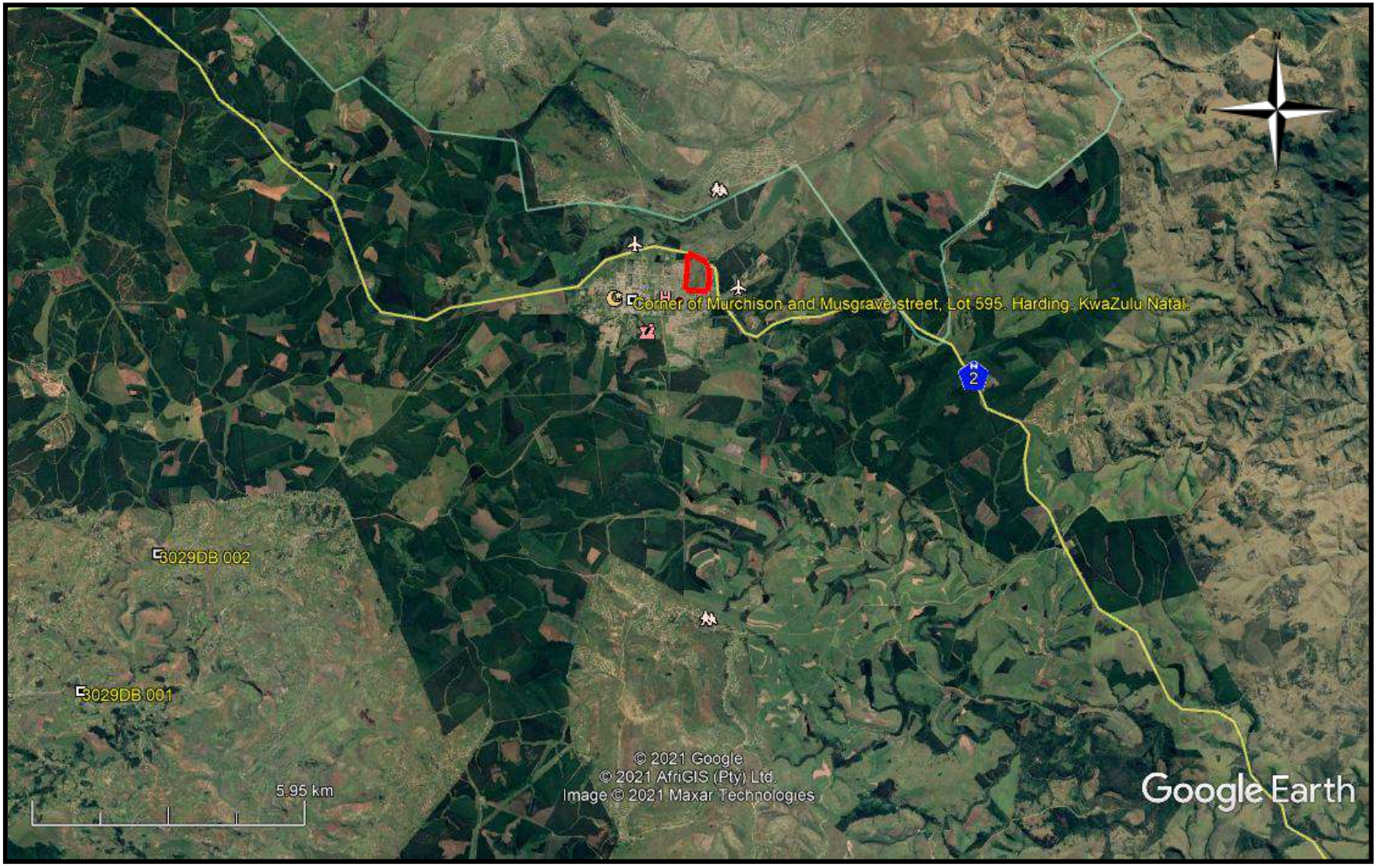


FIG. 6: LOCATION OF THE STUDY AREA IN 1937

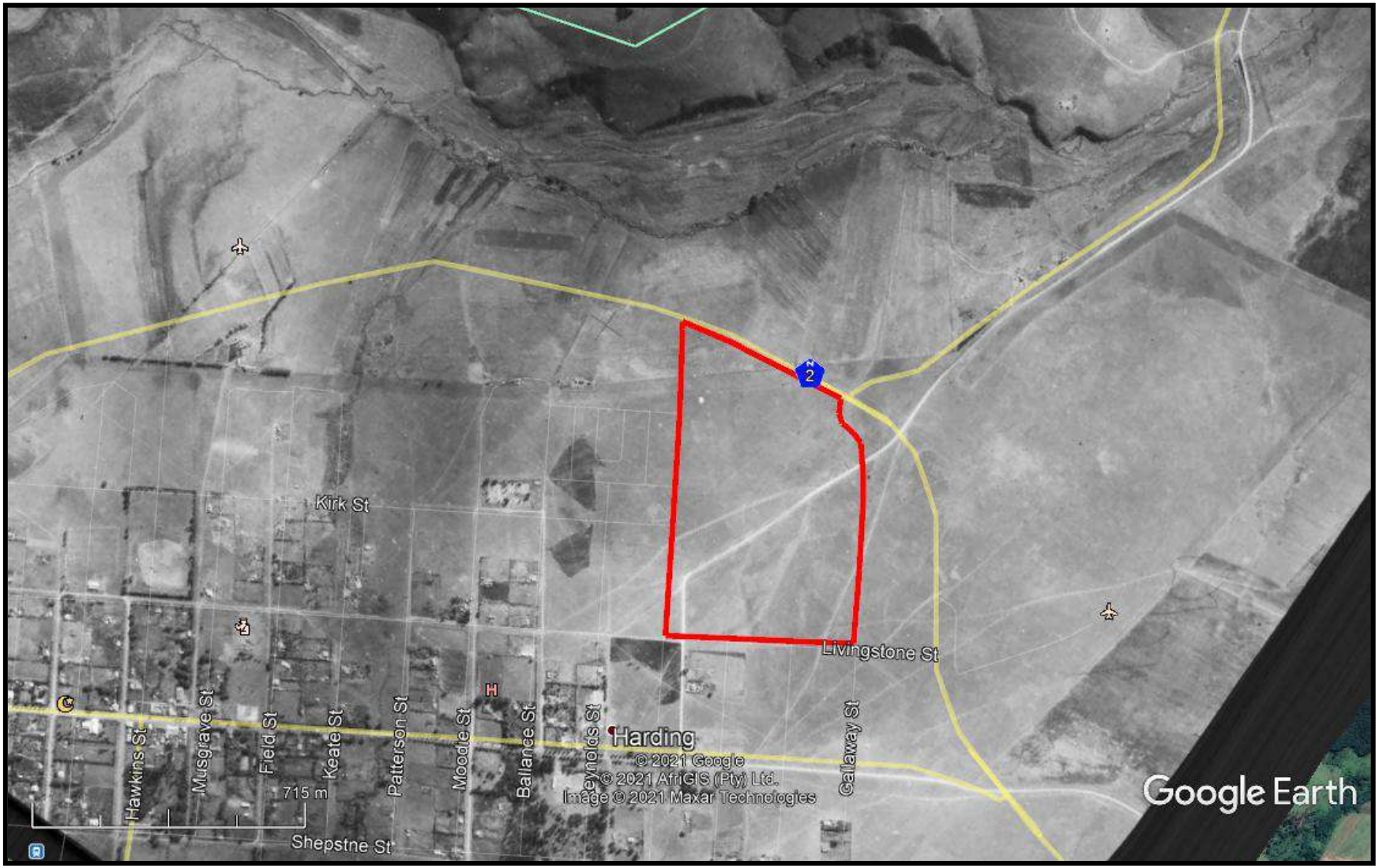
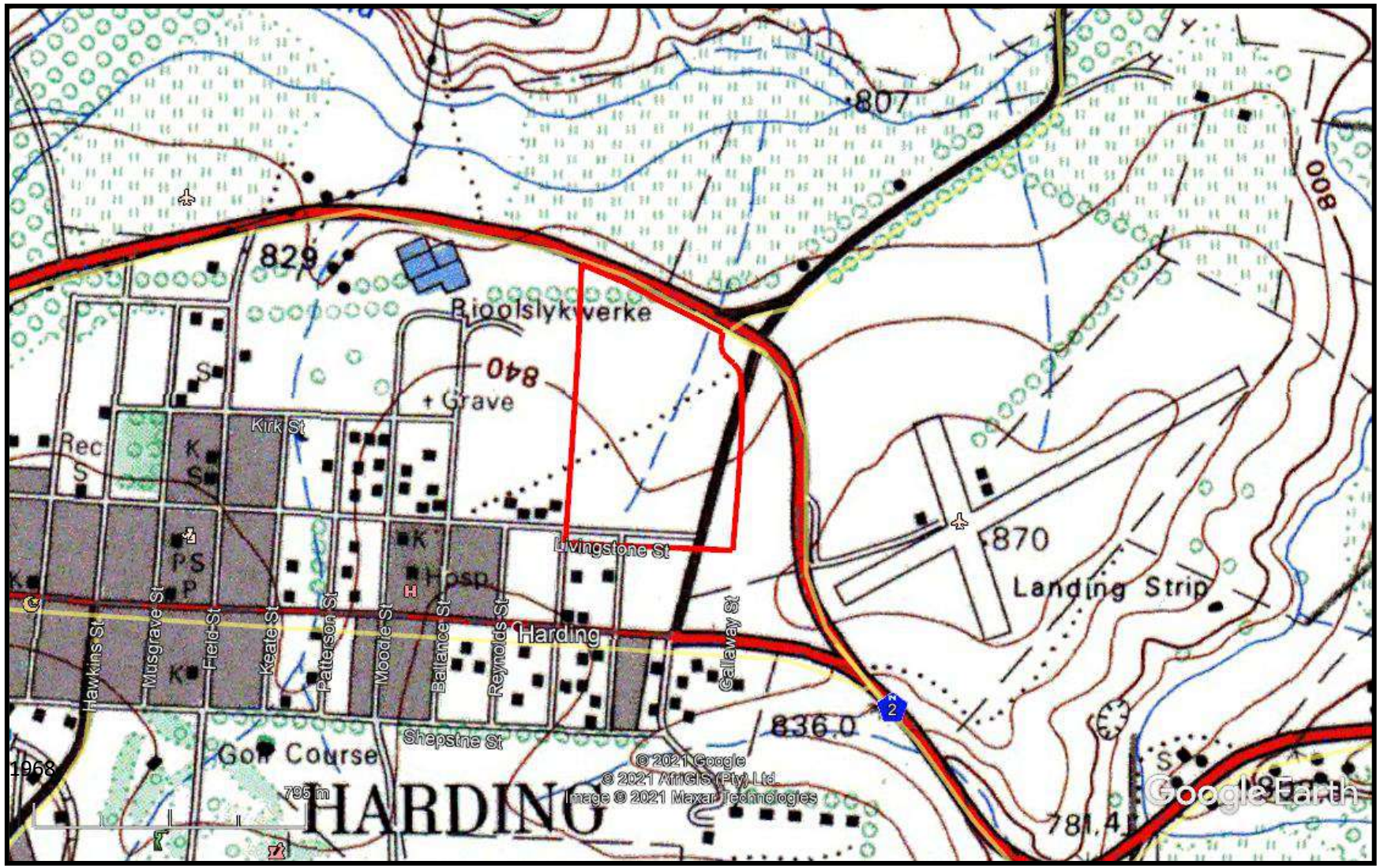


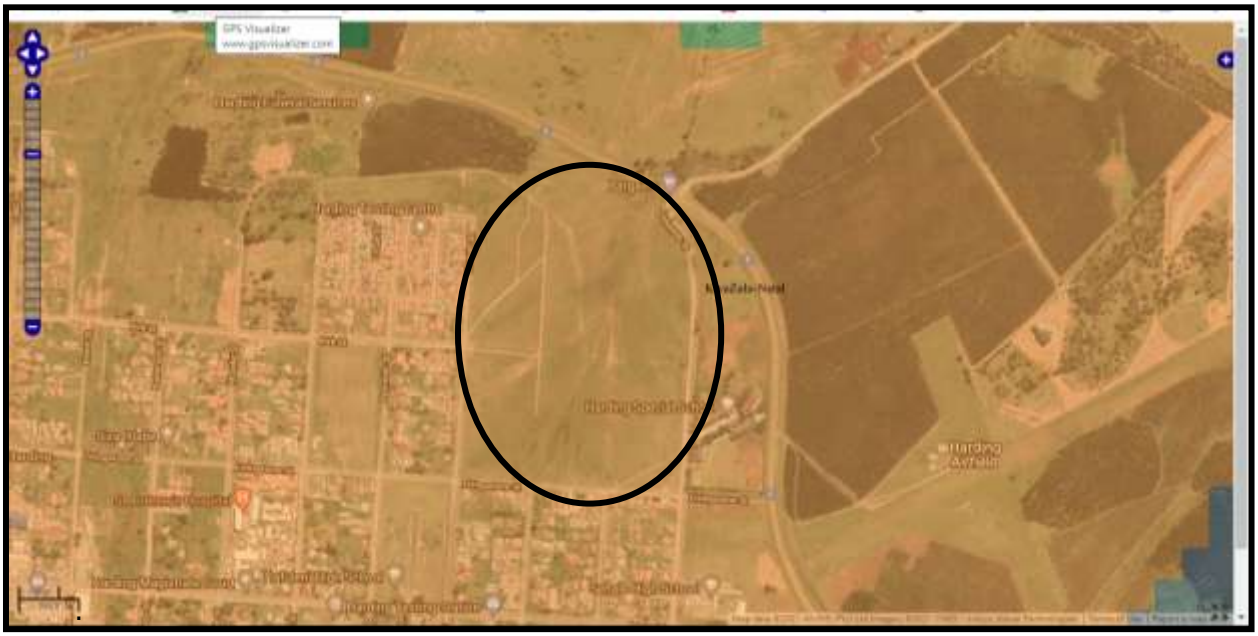
FIG. 7: LOCATION OF THE STUDY AREA IN 1969



PALAEONTOLOGICAL SENSITIVITY

The area is in an area of very high palaeontological sensitivity (fig. 8). Dr Alan Smith undertook a desktop PIA survey for the development (Appendix A).

FIG. 8: PALAEONTOLOGICAL SENSITIVITY MAP



COLOUR	SENSITIVITY	REQUIRED ACTION
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

He states: “The Estcourt Formation (basal unit of the Beaufort Group) is present on this site. This lithology is internationally renowned for palaeontological material and it is highly likely that palaeontological material will be found during excavation of this large area.

A field Palaeontological Investigation should be undertaken by a suitably qualified palaeontologist. This should take place only after excavations get under way. At present the site has little outcrop and the rock is weathered, reducing the chance of valuable palaeontological material being found.

A “Chance Find” Protocol has been incorporated into this report and MUST be incorporated into the EMP”.

FIELD SURVEY

The field survey was undertaken on 3 August 2021. Ground visibility was very good, as the area had been recently burnt.

The area is still open grassland as indicated on the various maps. There is a single pipeline servitude running in an approximate north-south line across the whole property

The soils were mostly shallow and bedrock was exposed in several areas.

No artefacts were noted within the study area.

MANAGEMENT PLAN

No further archaeological mitigation is required for this housing project. However, a qualified palaeontologist needs to visit the site during construction. This needs to be planned in advance so that a regular timetable for inspection can be made. This should occur in advance of construction and form part of the EMP. Permits to destroy and/or collect palaeontological material will be required from KZNARI.

CONCLUSION

A heritage survey was undertaken for the proposed Harding housing development. The study area appears to have been left open with minimal disturbances.

No heritage sites were recorded within the study area. However, the geology has high palaeontological sensitivity and monitoring during construction is required. Permits for the collection and/or destruction of fossil material will be required...

REFERENCES

Active Heritage. 2013 Phase One Heritage Impact Assessment Of The Harding Landfill Site Umuziwabantu Municipality, Kwazulu-Natal.

Raper, P.E. 1986. *Dictionary of Southern African Place Names*, p98

3029DB Harding 1969, 1981

117A_018_41453

SAHRIS Database

Umlando Database

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

THE HARDING TOWNSHIP ESTABLISHMNET, HARDING, UMUZWABANTU MUNICIPALITY, KZN: DESK-TOP PALAEONTOLOGICAL IMPACT ASSESSMENT

FOR

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August 2021

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

The Estcourt Formation (basal unit of the Beaufort Group) is present on this site. This lithology is internationally renowned for palaeontological material and it is highly likely that palaeontological material will be found during excavation of this large area.

A field Palaeontological Investigation should be undertaken by a suitably qualified palaeontologist. This should take place only after excavations get under way. At present the site has little outcrop and the rock is weathered, reducing the chance of valuable palaeontological material being found.

A "Chance Find" Protocol has been incorporated into this report and MUST be incorporated into the EMP.

1. BACKGROUND AND PROPOSED PROJECT

The proposed Harding Township development forms part of the Umuziwabantu Municipality's strategic objective of regenerating Harding Harding and bring in new housing opportunities in the area for affordable and middle-income housing. The project l extent is approximately 34... The proposed development entails the establishment of a Township together with supporting infrastructure, and includes construction of the following:

- • Approximately 343 BNG (Breaking New Ground) single-storey stand-alone residential units
- • 4 storey residential blocks with approximately 210 social housing units
- • Pipelines for the transportation of water supply and waterborne sewage
- • Internal roads and stormwater infrastructure
- Erven will be set aside for commercial, conservation, active and public open space as well as a hospital facility.

Figure 1: Location Map (Image source Umlando & GoogleEarth).

Figure 2: Location map zoomed in.

2. GEOLOGY

The geology of this proposed development site comprises basal Beaufort Group rocks which are Upper Permian- in age and Karoo Dolerite (Fig. 3).

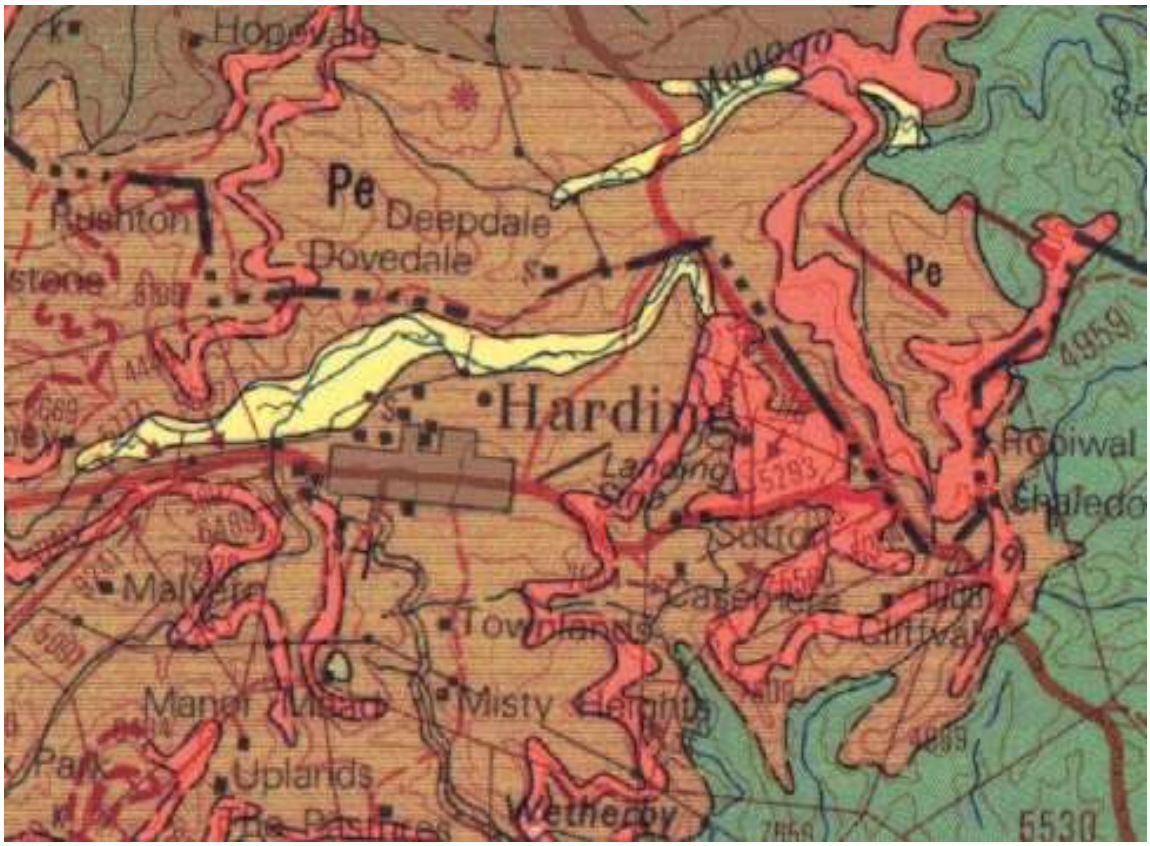

Figure 3: Extract from the Kokstad (3038) 1: 250 000 Geological Map. Grey (Pa) is the Estcourt Formation and red is Karoo Dolerite.

At this locality the Beaufort Group is represented by the Upper Permian Estcourt Formation (Figure 3). The Estcourt Formation is considered as being the basal unit of the Beaufort-aged Adelaide Subgroup, itself a part of the Karoo Supergroup (Green, 1998). The Adelaide Subgroup is a sequence of fluvio-lacustrine sedimentary rocks that accumulated in a landlocked, intra-cratonic foreland basin in SW Gondwana during the Middle Permian to Middle Triassic (Neveling et al., 2005). The Estcourt Formation is usually weathered (Figure 4) but may be fresher at depth (>2m deep).

Figure 4: An example of the Estcourt Formation as it could occur in the proposed development area. However this lithology is expected to be deeply weathered on this site, but there could be fresh rock at depth (>2m).

Karoo dolerite intrusions (these are 184 million years (Ma) old) and represent the onset of the break-up of the Gondwana Supercontinent (Hastie et al (2014). According to Watkeys (2006), Gondwana rifting commenced between 155 and 135 Ma. Karoo Dolerite is an igneous intrusive rock and by definition cannot be fossiliferous (Figure 5).

Figure 5: An example of dolerite as it could occur at the proposed site.

3. PALAEONTOLOGY

The Estcourt Formation is flagged as red in Sahris Palaeontological sensitivity map (Figure 6).

Figure 6: Extract from SAHRIS PalaeoSensitivity Map. Yellow is Estcourt Formation Green is alluvium and Grey is dolerite (https://sahris.sahra.org.za/map/palaeo).

Trace fossils

Evidence of bioturbation is ubiquitous within the Estcourt Formation siltstones and mudstones, however the various trace fossil (ichnofossil) types are not always identifiable. In general, trace fossils are very common within the Beaufort Group.

Body fossils

The Beaufort Group is known internationally for its palaeontological content (Cisneros et al., 2008). The Estcourt Formation contains plant- and body- fossils. The latter include the mammal-like reptiles such as the Upper Permian-Dicynodon (Neveling et al., 2005) and trace fossils (Green, 1998) (Figure 7).

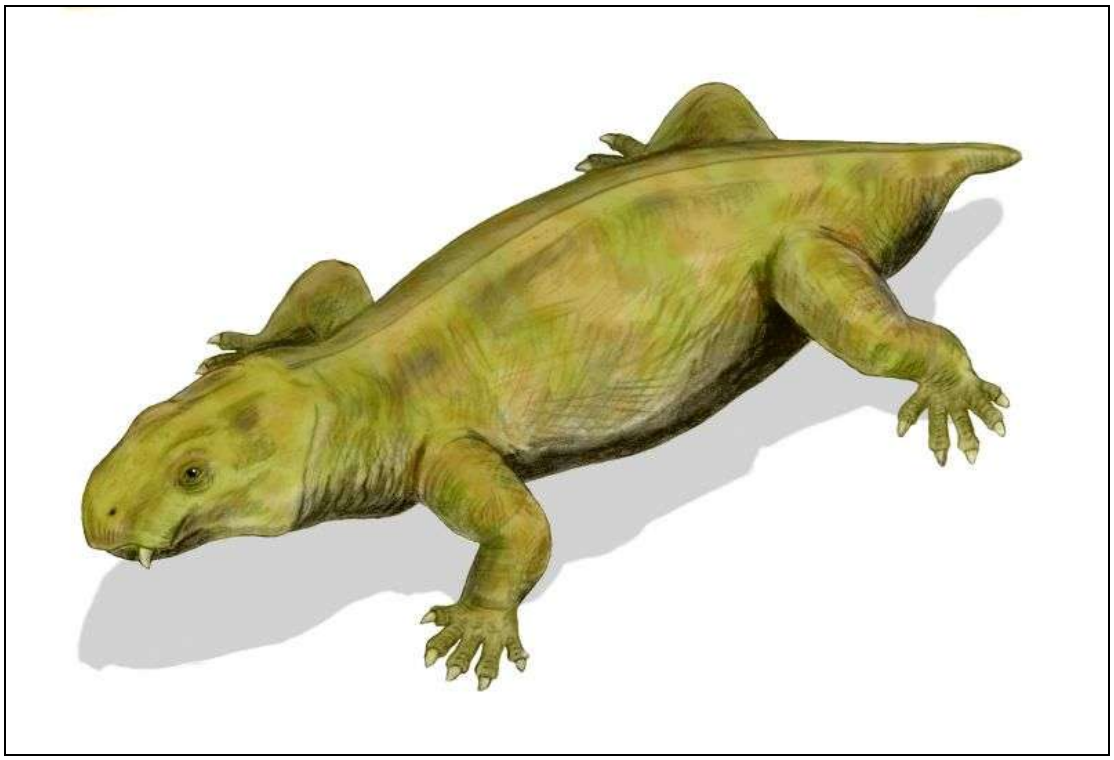

Figure 7: Dicynadon reproduction (image source Wikepedia).

4. CHANCE FIND PROTOCOL

As this site includes areas flagged red on the SAHRIS PalaeoSensitivity Map (Fig. 4), a “Chance Find Protocol” is Recommended. This Protocol is based on that of Groenevald (2017).

In the case of any unusual finds, 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, 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 characterise 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 Pietermaritzburg (labels, boxes, shelving and, if necessary, specifically-tasked temporary employees) as specified by or agreed with AMAFA. 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.

Functional responsibilities of the appointed palaeontologist

1. Establishment of a representative collection of fossils and a contextual archive of appropriately documented and sampled palaeoenvironmental and sedimentological geodata at the Museum in Pietermaritzburg.

2. Undertake an initial evaluation of potentially affected areas and of available exposures in excavations.

3. On the basis of the above, and evaluation during the early stages of excavation development, in collaboration with the contractor management team, devise more detailed, practical strategies to deal with the fossils encountered routinely during excavation, as well as the strategies for major finds.

4. Informal on-site training in responses applicable to “normal” fossil finds must be provided for the ECO and environmental staff by the appointed specialist.

5. Respond to significant finds and undertake appropriate mitigation.

6. Initially, for the first three months of operation, at least two weekly visits to “touch base” with the monitoring progress, process and document interim Page 10 of 14 GBDBWSS Development Harry Gwala District Municipality 06/01/2017 “normal” finds and to undertake an inspection and documentation of new excavation faces. A strategy for further visits during the life of the excavation must then be determined.

7. Transport of material from the site to the Museum in Pietermaritzburg.

8. 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.

9. Reasonable participation in publicity and public involvement associated with palaeontological discoveries.

Exposure of palaeontological material

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:

1. The appointed specialist or alternates (AMAFA, SAHRA; ESI WITS 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.

2. 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, or its designated representatives at AMAFA, have had reasonable opportunity to investigate the find. Such work will be at the expense of the Developer.

5. CONCLUSIONS AND RECOMMENDATIONS

The Beaufort Group Estcourt Formation geology is flat-lying. Based on the geology and extent of the development area, palaeontological material is **VERY** likely to be found on this site. It is more likely to be found in mudstone and siltstone lithologies. Palaeontological material is less likely to be found in the sandstones, but is still possible

It is a recommendation of this report that a suitably qualified Palaeontologist should conduct a field visit. This must be done **only** when construction

excavations have taken place. This rock is weathered at the surface and covered by vegetated soil, however at depth (>2m) it is likely to be fresher and needs to be expected for palaeontological material.

A “Chance Find” Protocol has also been incorporated into this report and this MUST be incorporated into the EMP.

6. REFERENCES

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APPENDIX 1: 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 (Sedimentology) University of KwaZulu-Natal), Pr. Sc. Nat., I.A.H.S.
- MSc in Palaeontology (Stromatolites)
- 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 420 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.