

**HERITAGE SURVEY OF THE PROPOSED ERF 1
LADYSMITH HOUSING DEVELOPMENT, KZN**

FOR MAHLORI DEVELOPMENT CONSULTANTS

DATE: 3 November 2019

By Gavin Anderson

**Umlando: Archaeological Surveys and Heritage
Management**

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ABSTRACT

Mahlori Development Consultants (MDC) are appointed to serve in a panel of Town Planning Consultants to provide Town Planning services to the Alfred Duma Local Municipality for a period of three (3) years on Contract No: DP&HS 06/2018. Mahlori Development Consultants has been appointed by the Alfred Duma Local Municipality on 16 February 2019 to undertake a turnkey project which entails the establishment of town planning services installation of services and construction works. We hereby apply in terms of the provisions of Chapter 4, Section 53 (1) of the Alfred Duma Local Municipality Spatial Planning and Land Use Management By-Law, 2016 for the establishment of the proposed township on the Remainder of Erf 1, Erven 17273 and 3673 Ladysmith to provide for the following erven:

- *1 988 erven zoned "Special Residential 1"*
- *2 erven zoned "General Residential 1"*
- *2 erven zoned "Institutional"*
- *2 erven zoned "Educational"*
- *Six (6) erven zoned "Public Open Space"*

Umlando was contracted by Mahlori Consultants to undertake the heritage survey of this project. At the onset of the appointment Umlando pointed out that the Phase 1 of the project had already been surveyed and did not require a resurvey. Phase 2 was on a 2nd Anglo-Boer War site and several Late Iron Age sites. Other types of sites have extensive walling and human graves. The Phase 2 area forms part of Maidens Ridge and would be automatically disqualified for development. A permit will be needed to damage any part of these sites as they are protected by heritage legislation. Umlando suggested a desktop study for motivation for these statements.

The PIA desktop study noted the Phase 1 area was very sensitive for fossil remains. However, unweathered deposits would only occur 2m and below the existing surface. A Chance Find Protocol was initiated for the study.

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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

Mahlori Development Consultants (MDC) are appointed on a panel as of 05 November 2018 to serve in a panel of Town Planning Consultants to provide Town Planning services to the Alfred Duma Local Municipality for a period of three (3) years on Contract No: DP&HS 06/2018. Mahlori Development Consultants has been appointed by the Alfred Duma Local Municipality on 16 February 2019 to undertake a turnkey project which entails the establishment of town planning services installation of services and construction works. We hereby apply in terms of the provisions of Chapter 4, Section 53 (1) of the Alfred Duma Local Municipality Spatial Planning and Land Use Management By-Law, 2016 for the establishment of the proposed township on the Remainder of Erf 1, Erven 17273 and 3673 Ladysmith to provide for the following erven:

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FIG. 1 GENERAL LOCATION OF THE PROPOSED DEVELOPMENT

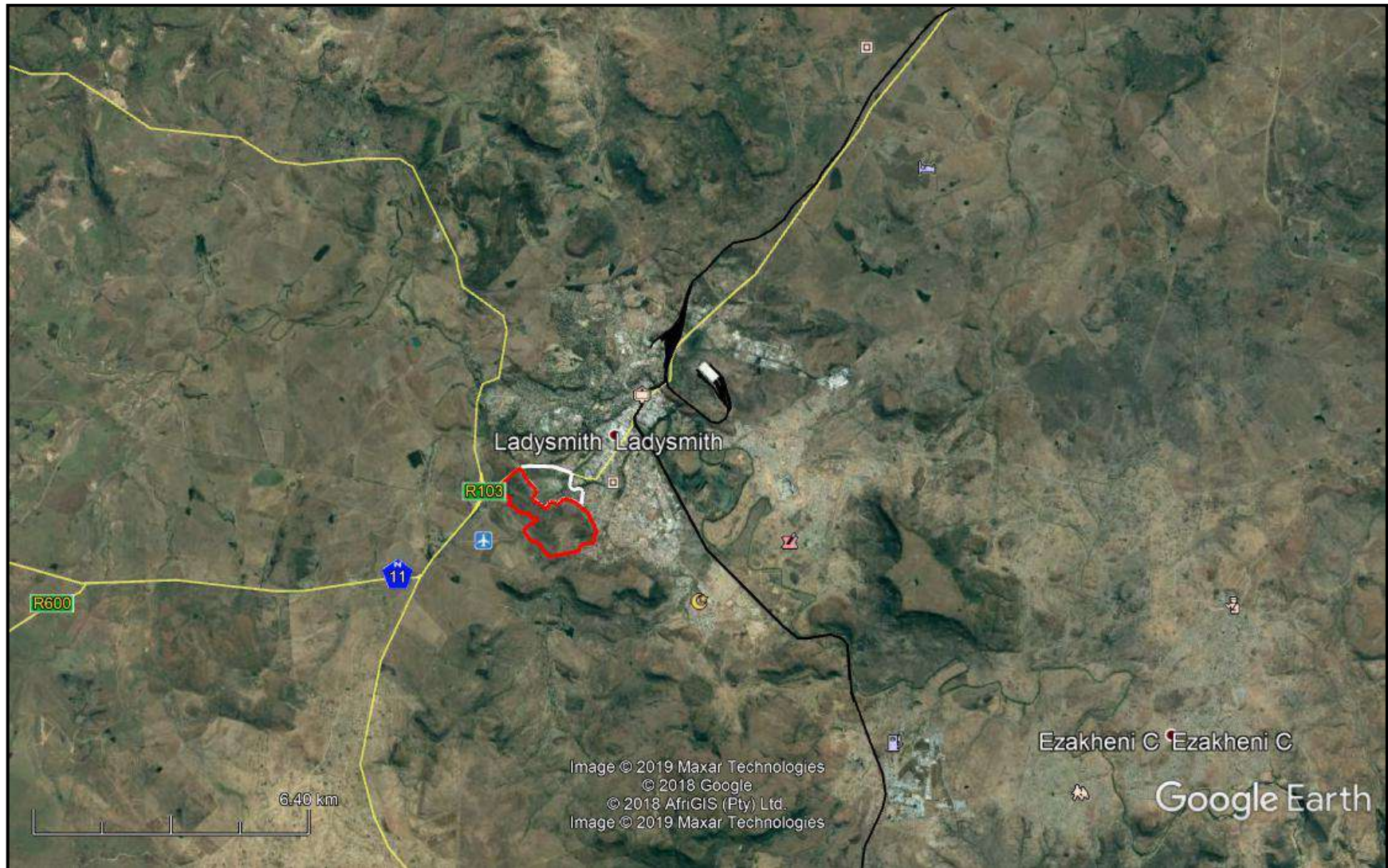


FIG. 2: AERIAL OVERVIEW OF THE PROPOSED DEVELOPMENT



FIG. 3: TOPOGRAPHICAL MAP OF THE PROPOSED DEVELOPMENT

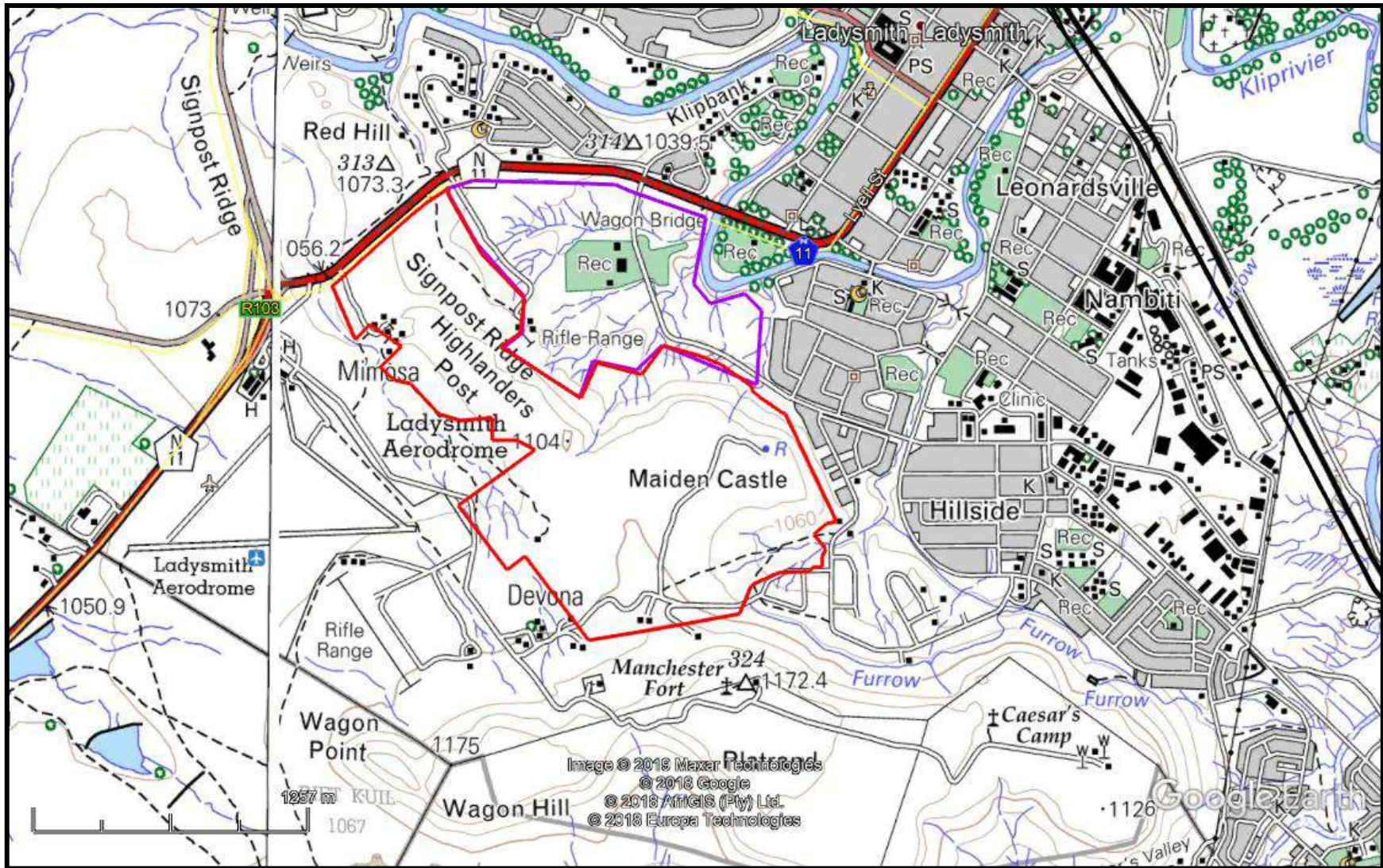


FIG. 4: SCENIC VIEWS OF THE STUDY AREA



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 several surveys in the general area (Anderson 2008, 2009, 2015; eThembeni 2013; Prins 2014, 2015). The surveys (fig. 5 – 7) recorded a wide range of palaeontological, archaeological and historical sites. The most important sites would be those related to the 2nd Anglo-Boer War (2ABW) and the LIA settlements with human graves.

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

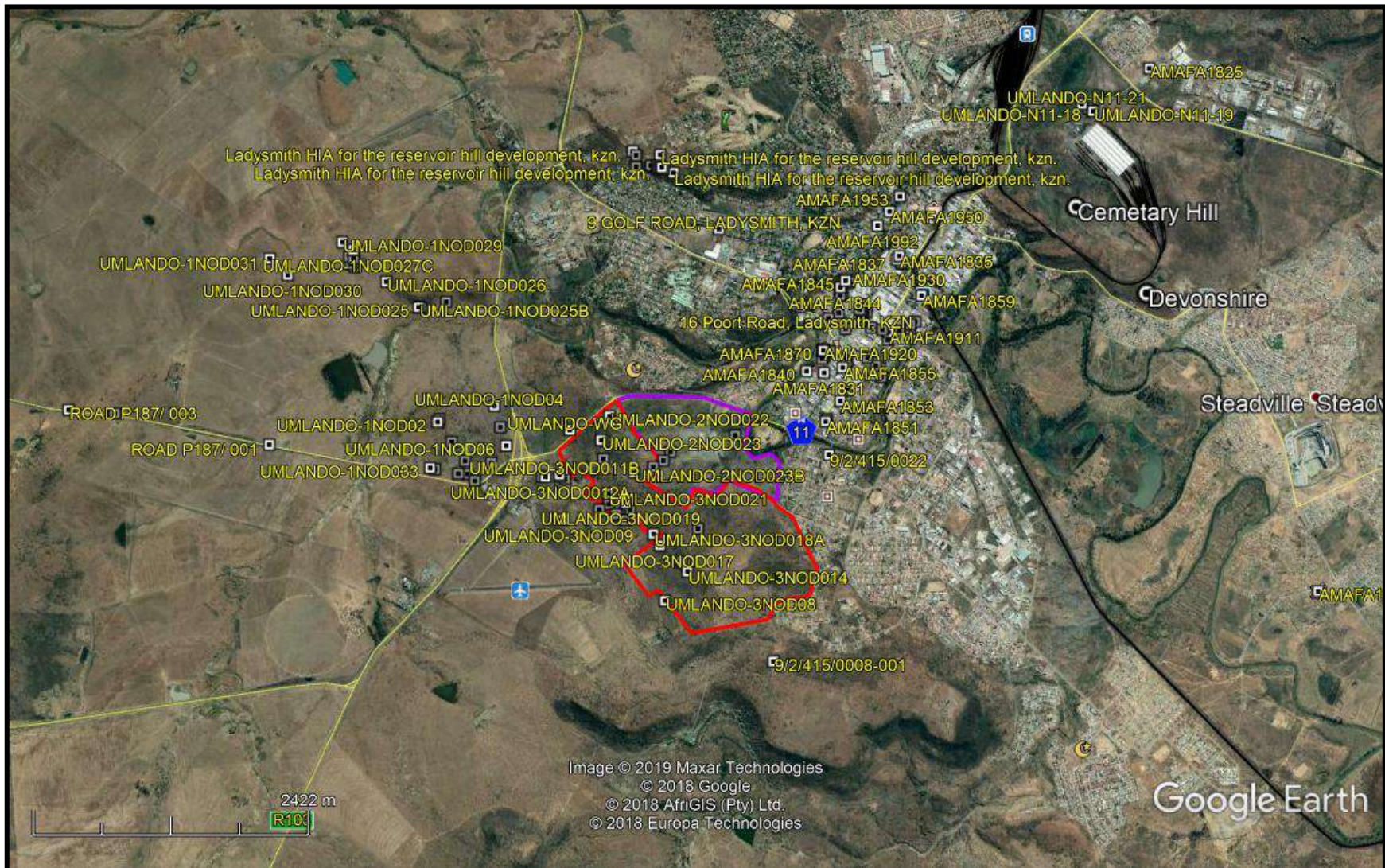


FIG. 6: LOCATION OF PREVIOUS ARCHAEOLOGICAL SURVEYS IN THE GENERAL AREA

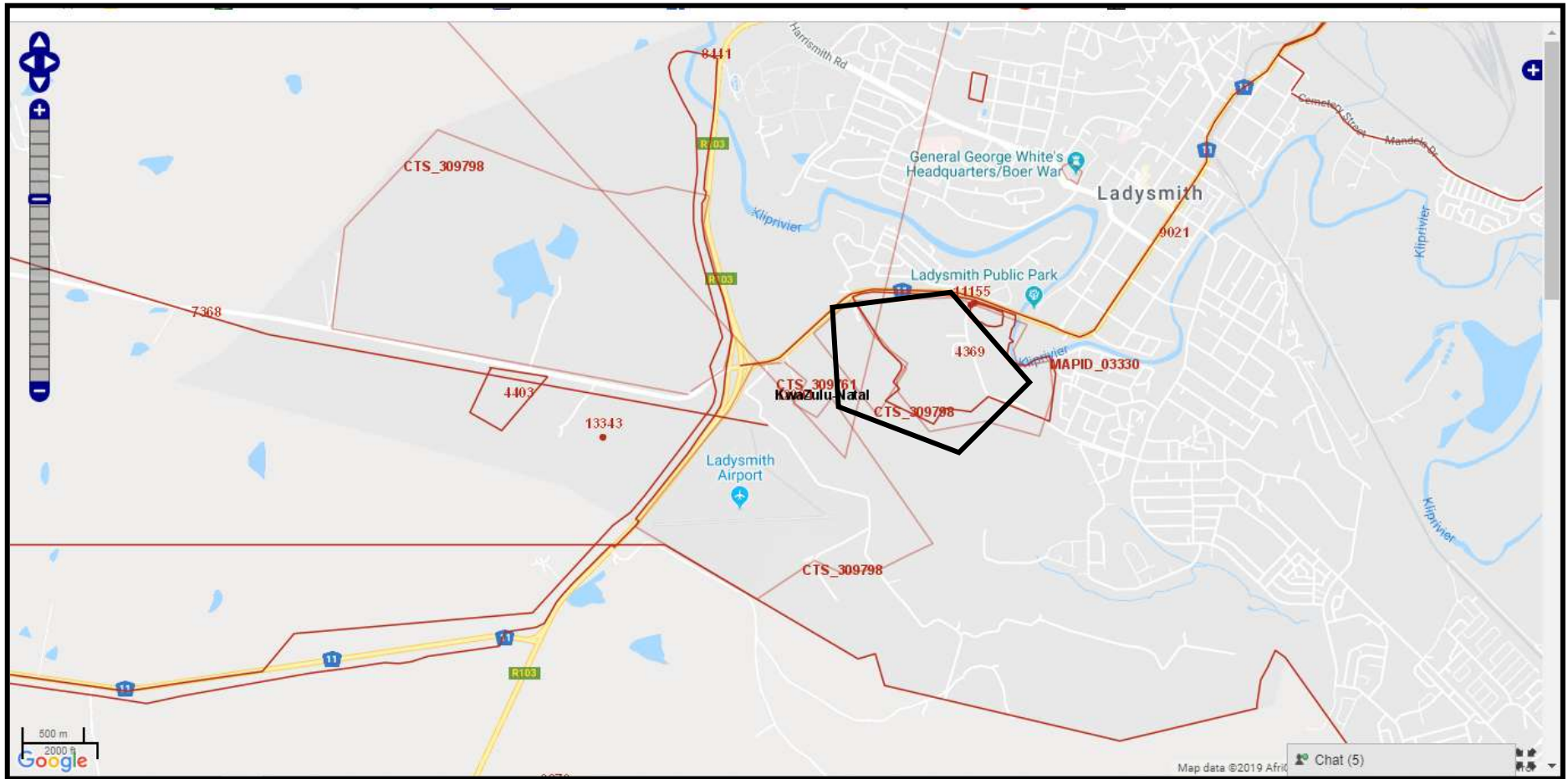


FIG. 7: LOCATION OF KNOWN HERITAGE SITES IN THE DEVELOPMENT AREA

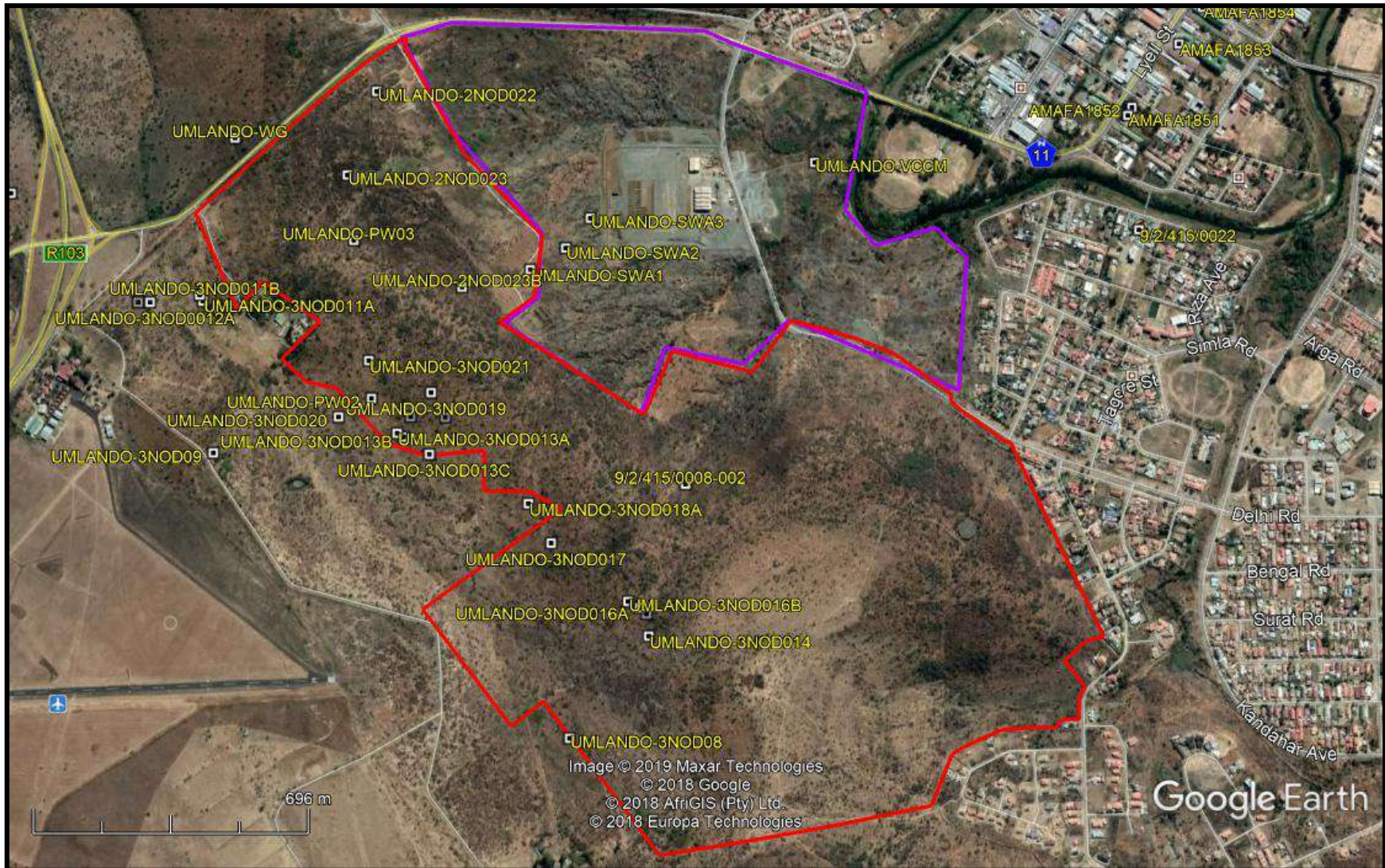
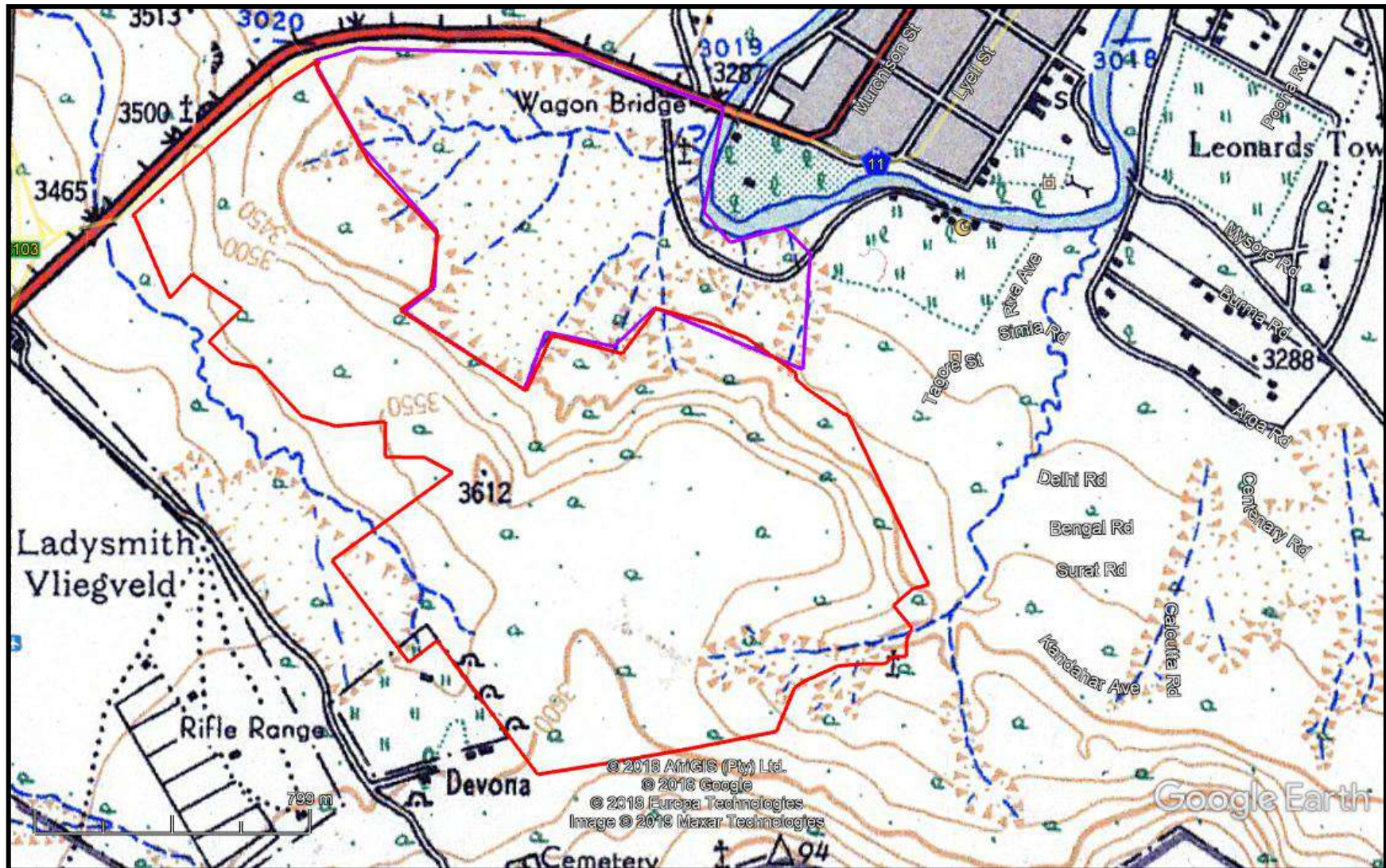


FIG. 8: LOCATION OF PROPOSED DEVELOPMENT IN 1937



FIG. 9: LOCATION OF PROPOSED DEVELOPMENT IN 1954



Anderson (2008, 2009) has previously surveyed the area for Phase 1 and Phase 2, and noted several stone walls, graves and walling related to the 2ABW. Anderson noted walling and mid 20th century rubbish dumps in Phase 1. The Colonel Dick-Cunningham VC Memorial was also noted to occur in Phase 1 area. The Colonel was killed at that spot by a stray bullet. eThembeni surveyed the area in 2013 and noted the memorial. Three sites (SWA01, SWA02, SWA03) occur in Phase 1, but do not require further mitigation.

Anderson noted (2009) noted that the walling in Phase 2 would need to be extensively surveyed, excavated if development was to occur. However, since this is part of the Siege of Ladysmith, it is protected by the heritage legislation. The human remains are also protected. Only half of Phase 2 was surveyed for the 2009 project.

The 1937 aerial photograph of the general study area indicates that Phase 1 is severely eroded, while Phase 2 is well preserved grassland and some trees (fig. 8). There are no buildings visible on this map; however, several stone walled features are visible. There are settlements in the southwestern corner.

The 1954 topographical map indicates that there no buildings in the study area (fig. 9). However, there are settlements in the southwestern corner. These settlements would probably have human graves. 2ABW graves are shown on the eastern border.

PALAEONTOLOGICAL SENSITIVITY

The Palaeontological sensitivity map indicates that Phase 1 is of very high sensitivity, while Phase 2 is of no sensitivity (fig. 9). The latter is on a dolerite outcrop.

The PIA desktop was undertaken by Dr A. Smith (Appendix A). “The Volksrust Formation (upper Ecca Group) and Karoo dolerite is present on this site. The Dolerite is igneous and not fossiliferous. The Volksrust Formation can contain trace fossils, which are common and of little palaeontological significance. The bivalve *Megadesmus* has been recorded from the Volksrust Formation but is very rare. Quaternary sediments are present, which could contain, but are unlikely to, Palaeontological Material. Significant Palaeontological Material is unlikely to be found on this site. In mitigation this site is likely to be weathered, reducing the chance of valuable palaeontological material being found. Although it is unlikely that Significant Palaeontological Material will be found a “Chance Find” Protocol has been incorporated into this report and MUST be incorporated into the EMP.”

FIG. 9: PALAEOLOGICAL SENSITIVITY MAP



MITIGATION AND MANAGEMENT PLAN

Phase 2 is in an area of very high heritage sensitivity and should not be developed. This means anything above the 1040m contour cannot be developed. This area is related to the 2nd Anglo-Boer War, as well as LIA, HP settlements, and early 20th century settlements. This area contains stone walling as well as human graves. These sites are automatically protected by the heritage legislation and would require permits to damage and/or disturb.

Phase 1 is in a highly disturbed area. Erosion gullies are visible in the 1937 aerial photographs. The sites recorded by Anderson are of low significance and do not require further mitigation. The Colonel Dick-Cunningham Memorial will need to be incorporated into the development. The road to the memorial should be upgraded, and a 20m buffer should be placed around the memorial. Permission from Kwazulu Natal Amafa And Research Institute will be required to impact on the space of the memorial.

The palaeontology will not require further mitigation unless material is uncovered in the deposits greater than 2m.

CONCLUSION

A desktop heritage survey was undertaken for the proposed Erf 1 development. I suggested to the client to undertake the desktop as Phase 1 of the project was in an area that had been surveyed twice before. Phase 2 was in an area that was partially surveyed in 2008, and the rest was part of Maiden Castle. Maiden Castle was part of the British encampments during the Siege of Ladysmith. It would be pointless to survey the red flag area as permission would not be granted for it to be developed.

The development is unlikely to expose palaeontological remains. A “Chance Find Protocol” has been initiated for the project.

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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
PALAEONTOLOGICAL DESKTOP ASSESSMENT

LADYSMITH HOUSING DEVELOPMENT PHASE 1: DESK-TOP PALAEOLOGICAL IMPACT ASSESSMENT

FOR

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November 2019

EXECUTIVE SUMMARY

The Volksrust Formation (upper Ecca Group) and Karoo dolerite is present on this site. The Dolerite is igneous and not fossiliferous. The Volksrust Formation can contain trace fossils, which are common and of little palaeontological significance. The bivalve *Megadesmus* has been recorded from the Volksrust Formation but is very rare. Quaternary sediments are present, which could contain, but are unlikely to, Palaeontological Material. Significant Palaeontological Material is unlikely to be found on this site. In mitigation this site is likely to be weathered, reducing the chance of valuable palaeontological material being found. Although it is unlikely that Significant Palaeontological Material will be found a “Chance Find” Protocol has been incorporated into this report and MUST be incorporated into the EMP.

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1. BACKGROUND AND PROPOSED PROJECT

It is proposed that a Housing Development Project be considered within the Ladysmith urban area (Fig. 1). The proposed project is on the SW side of Ladysmith (Fig. 1). This development project will be guided by the results of the specialist reports (Umlando).

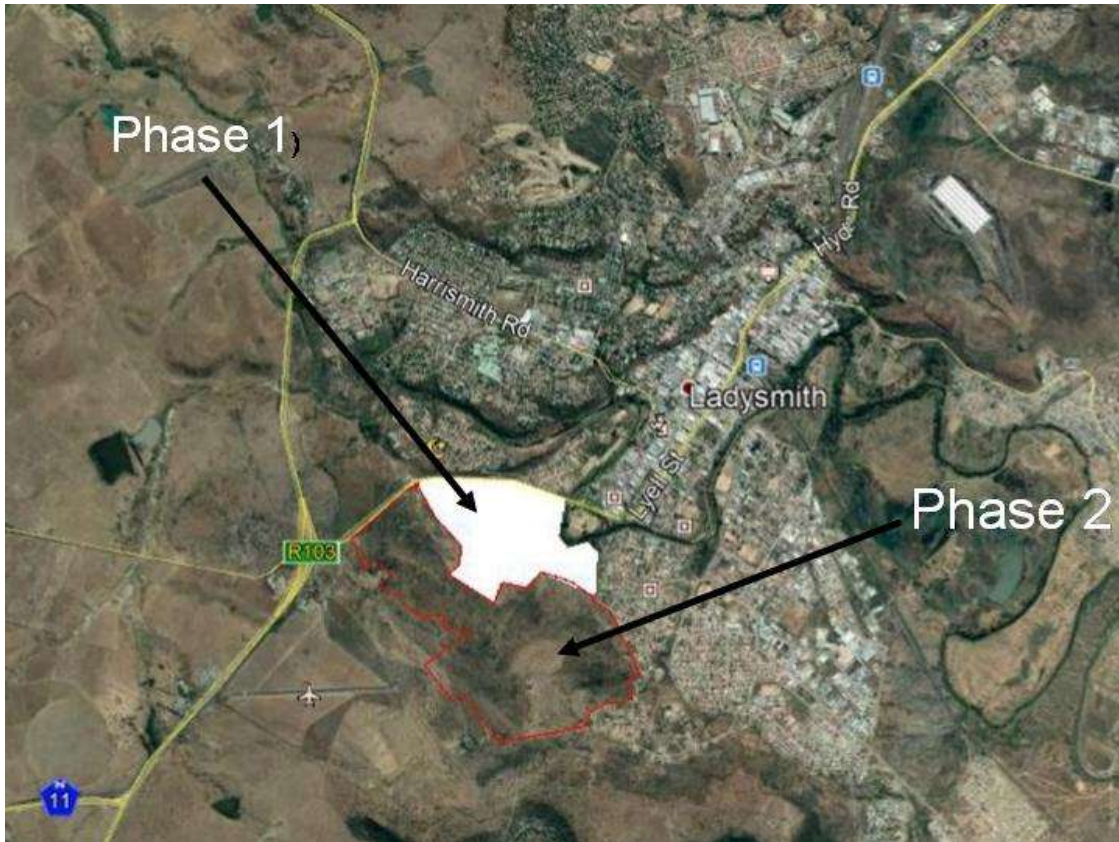


Figure 1: Location Map (Image source Umlando & GoogleEarth). This report concerns Phase 1, Phase 2 has been rejected on Archaeological Grounds.

2. GEOLOGY

The geology of this proposed development site comprises the Volksrust Formation and Karoo Dolerite intrusions (Fig. 2).

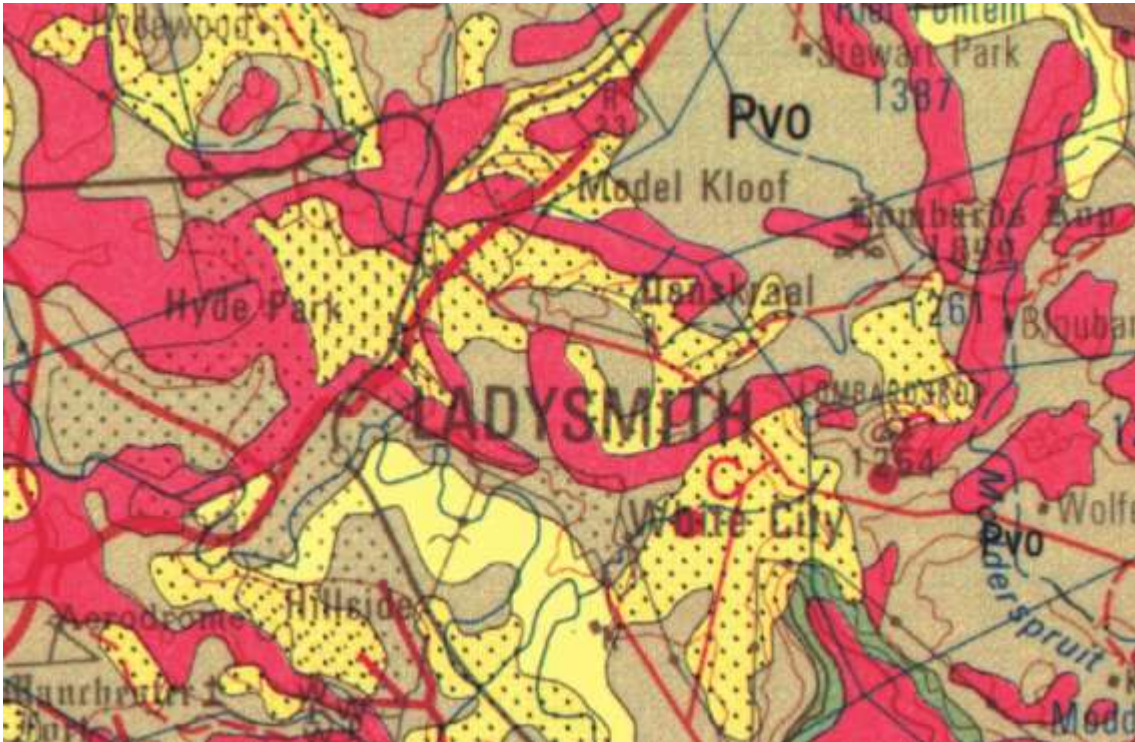


Figure 2 (a): Extract from the Harrismith (2828) 1: 250 000 Geological Map. Grey (Pvo) is the Volksrust Formation, red is Karoo Dolerite and the yellow is Quaternary sediments.

The Volksrust Formation is Late Permian in age (Cairncross et al. 2005). Typically it comprises a blue-black shale. This unit was deposited in generally non-marine conditions (Cataneneau et al., 1998), but pockets of marine conditions were present (Cairncross et al., 2005). Karoo dolerite intrusions are present. 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. Quaternary sediments comprise alluvium (river deposits) and colluvium (hill slope deposits).



Figure 3: Example of the Volkstrust Formation. This lithology is typically a blue shale and very weathered.

3. PALAEOLOGY

3.1 Trace fossils

Evidence of trace fossil bioturbation is common within the Volkstrust Formation siltstones and mudstones, however the various trace fossil (ichnofossil) types are not always identifiable. These are common and of little Palaeontological Significance.

3.2 Body fossils

The bivalve *Megadesmus* has been recoded from the Volkstrust Formation (Cairncross et al., 2005). This fossil is large, 9 cm dorsally and 8.4 cm laterally (Fig. 4). *Megadesmus* is known from other parts of the Gondwana Supercontinent (Australia, India, Siberia, South America and Tasmania). Its presence indicates exclusively marine conditions. The implication for the northeastern Karoo Basin during the Late Permian is that a marine enclave still existed in this geographic area and that terrestrial conditions did not yet prevail as in the southern basin region (Cairncross et al, 2005).

Palaeontological Material could be found in the Quaternary sediments, but is unlikely.



Fig. 4: Megadesmus bivalve. This image was obtained from Cairncross et al. (2005).

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

The Volksrust Formation is not known for its Palaeontological Content, however the fossil *Megadesmus* has been recorded. This fossil is very rare. Palaeontological Material could be, but is unlikely to, found in the Quaternary deposits. Overall Palaeontological Material is unlikely to be encountered, but a “Chance Find” Protocol has been incorporated into this report and this MUST be incorporated into the EMP.

6. REFERENCES

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7. APPENDIX 1: DETAILS OF SPECIALIST

Dr Alan Smith

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

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

Role: Specialist Palaeontological Report production

Expertise of the specialist:

- PhD in Geology (University of KwaZulu-Natal), Pr. Sc. Nat., I.A.H.S.
- Expert in Vryheid Formation (Ecca Group) in northern KZN, this having been the subject of PhD.
- Scientific Research experience includes: Fluvial geomorphology, palaeoflood hydrology, Cretaceous deposits.
- Experience includes understanding Earth Surface Processes in both fluvial and coastal environments (modern & ancient).
- Alan has published in both national and international, peer-reviewed journals. He has published 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.