

**HERITAGE SURVEY OF A PROPOSED QUARRY IN
LADYSMITH**

FOR AFZALEA

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By Gavin Anderson

**Umlando: Archaeological Tourism and Resource
Management**

PO Box 102532, Meerensee, 3901

Phone/fax: 035-7531785 Fax: 0865445631

Cell: 0836585362



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INTRODUCTION

Umlando was contracted by Afzalea Environmental consultants to undertake the heritage survey of a proposed quarry near Ladysmith, KZN (fig. 1 - 3). The quarry intends to refine aggregates for the concrete industry. The proposed quarry occurs on an existing quarry that was abandoned after 1954.

The whole area of Ladysmith and its surrounds is very sensitive for heritage sties, especially those relating to the 2nd Anglo-Boer War (ABW), the Late Iron Age and palaeontological sites. Since there has been much development in the Ladysmith area in the past, there are few 2nd ABW sites remaining. Those few remaining sites need as much protection as possible, as Ladysmith's main tourist attraction is related to the ABW.

This Heritage Impact Assessment includes archaeological, historical and palaeontological assessments. The existing and proposed extension to the quarry is in an area known to be occupied by the German Corps and Boer (Utrecht) Commandos during the Siege of Ladysmith. The occupation was in the forms of encampments just behind the Utrecht Commando. Any form of walling and altered landscape could thus relate to these encampments.

The quarry will be 100m x 150m in size. The assessment only covered this specific area and any deviations from this area will require additional surveys.

A few remnants of encampments and/or archaeological sites were observed during the survey in the study area. Many sites, with human graves, were noted just outside of the area as well. These would need fencing off before the quarry process begins. The study area requires basic mitigation and a survey with a metal detector before construction phase.

FIG. 1 GENERAL LOCATION OF THE PROPOSED QUARRY SITE

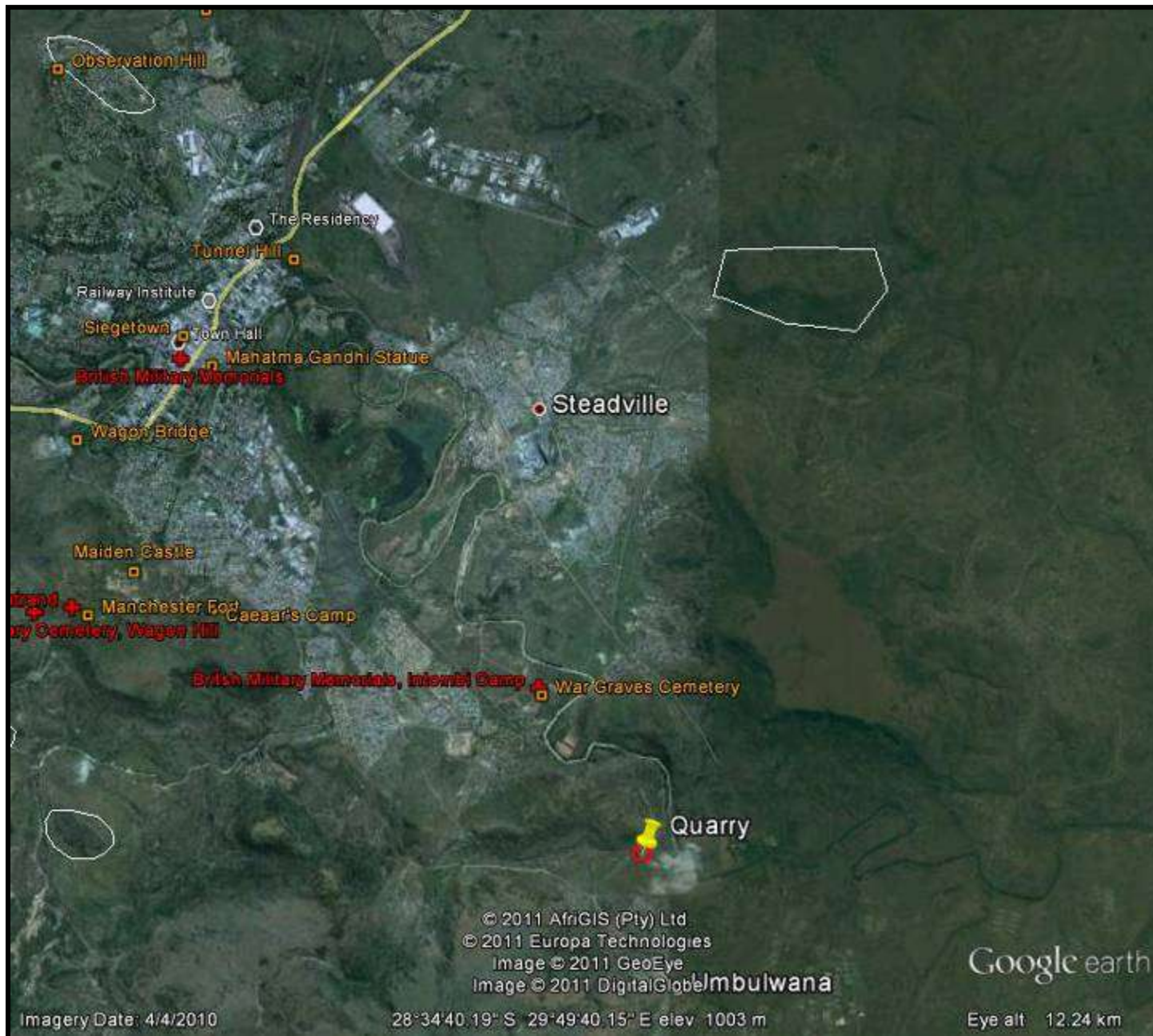
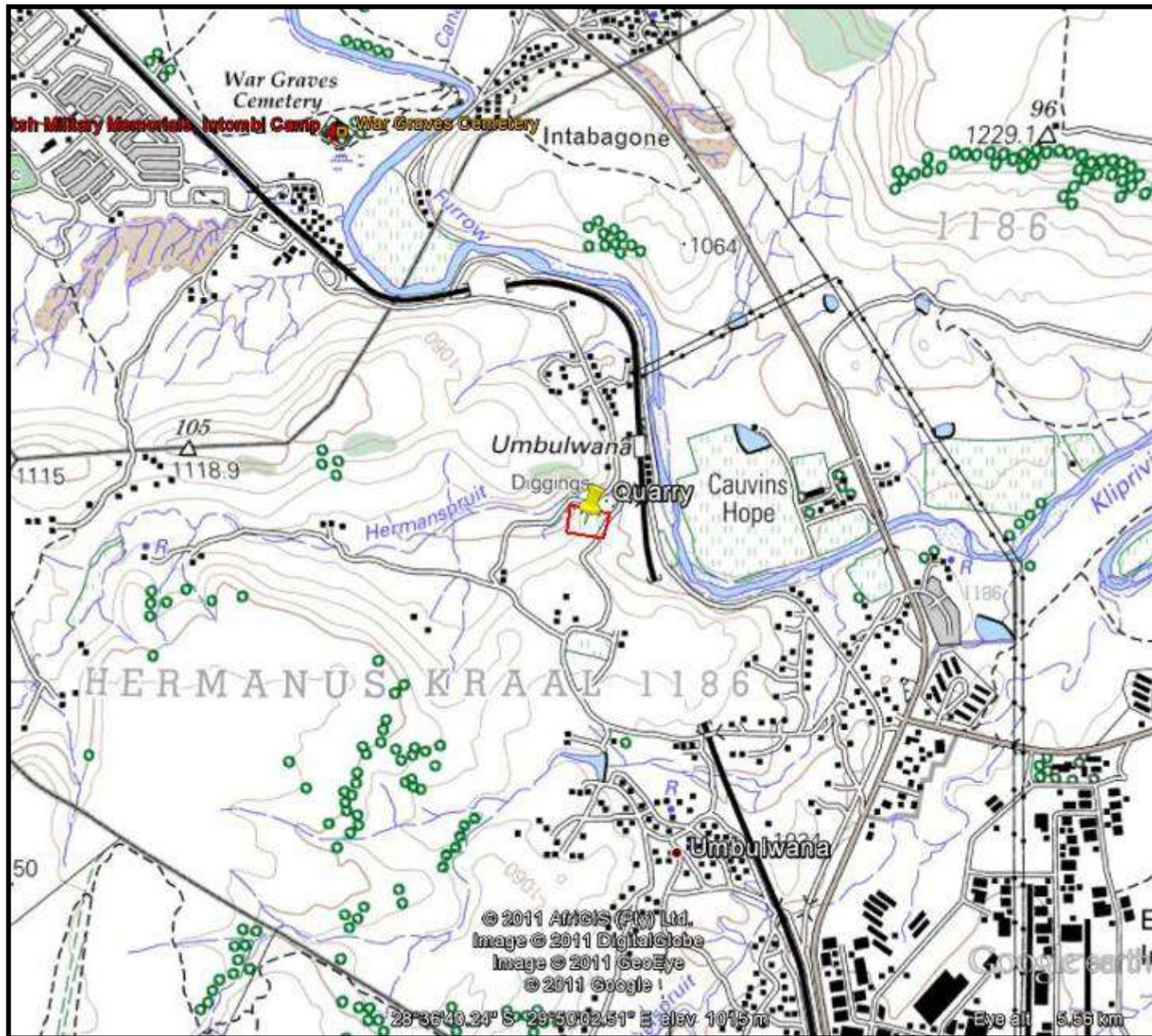


FIG. 2: AERIAL OVERVIEW OF THE PROPOSED QUARRY SITE¹



¹ Red polygon is original outline; Yellow polygon is area defined by developer and area surveyed

FIG. 3: TOPOGRAPHICAL MAP OF THE NORTHERN SECTION OF THE PROPOSED QUARRY SITE



KWAZULU-NATAL HERITAGE ACT NO. 4 OF 2008

1. “General protection: Structures.—
 - a. No structure which is, or which may reasonably be expected to be older than 60 years, may be demolished, altered or added to without the prior written approval of the Council having been obtained on written application to the Council.
 - b. 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.
2. The Council may, by notice in the *Gazette*, exempt—
 - a. a defined geographical area; or
 - b. defined categories of sites within a defined geographical area, from the provisions of subsection where the 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.
 - c. A notice referred to in subsection (2) may, by notice in the *Gazette*, be amended or withdrawn by the Council.
3. General protection: Graves of victims of conflict.—No person may damage, alter, exhume, or remove from its original position—
 - a. the grave of a victim of conflict;
 - b. a cemetery made up of such graves; or
 - c. any part of a cemetery containing such graves, without the prior written approval of the Council having been obtained on written application to the Council.
4. General protection: Traditional burial places.—
 - a. No grave—
 - b. not otherwise protected by this Act; and
 - c. 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.

5. The Council may only issue written approval once the Council is satisfied that—
 - a. the applicant has made a concerted effort to consult with communities and individuals who by tradition may have an interest in the grave; and
 - b. the applicant and the relevant communities or individuals have reached agreement regarding the grave.
 - c. 36. General protection: Battlefield sites, archaeological sites, rock art sites, palaeontological sites, historic fortifications, meteorite or meteorite impact sites.—
6. 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.
7. 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.
8. 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.
9. 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.

10. 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.
11. 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.” (KZN Heritage Act of 2008)

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

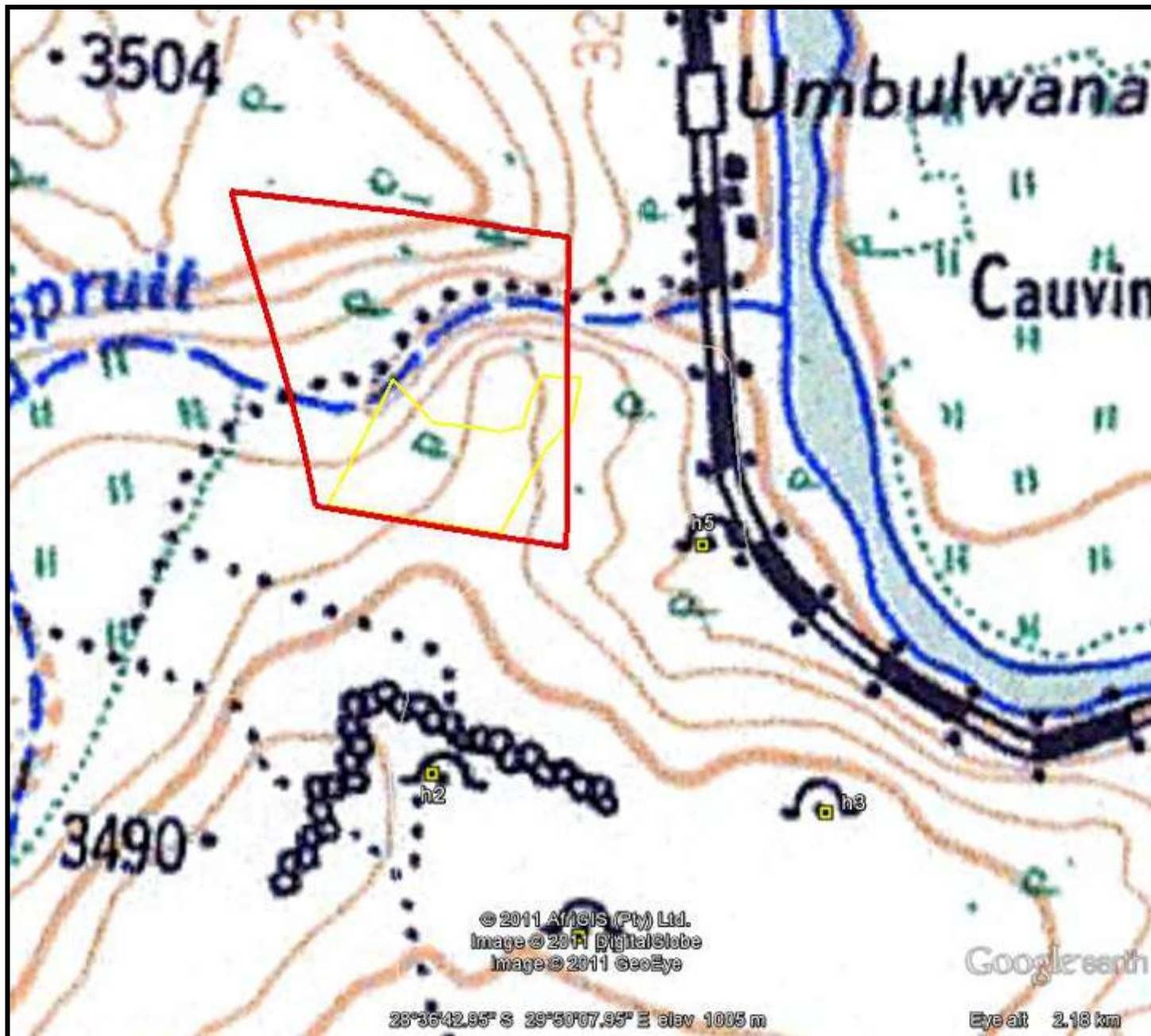
The desktop study consisted of analysing various maps for evidence of prior habitation in the study area, as well as for previous archaeological surveys. Several types of maps were used for this study:

- Anglo-Boer War maps indicating positions of Boer and English forces (see Appendix C)
- 1937 aerial photographs (fig. 4)
- 1953 1:50 000 topographical (fig. 5)
- 2000 1:50 000 topographical (fig. 3)
- 2006 Google Earth Aerial photographs (fig. 2)

FIG. 4: LOCATION OF SETTLEMENTS ALONG THE QUARRY SITE IN 1937



FIG.5: LOCATION OF SETTLEMENTS ALONG THE QUARRY SITE IN 1953



The desktop studies indicated the following:

1. There was a Boer encampment in the study area
2. The German Forces encampment occurred further uphill
3. There are two possible stonewalled areas within the study area, and an additional three within 100m of the study area.
4. The existing quarry postdates 1953
5. In 1953, there are no farm labourers' houses within the study area, however several occur outside it.
6. There are settlements in the general area in 1937

FIELD SURVEY

The field survey was undertaken over one day with Mr Gilbert Torlage and one of the developers. The developer showed the exact location of the quarry, and this is indicated in figure 2. The quarry size thus differed to our original map. The field survey concentrated on the developers' area, and for ~50-100m outside of it. However, this report mainly deals with the new outline, and any deviations from the developers' area would require a new assessment, especially since there are 50+ human graves within 100m of the quarry.

As it stands, the proposed quarry will only continue to 100m inwards from the existing quarry face.

The maps relating to the Siege of Ladysmith were used to locate the various encampments, and these are shown in Appendix C

The study area has been severely affected by the previous quarry and its roads. There is very little undamaged ground, with the exception of the southern area. There are several existing stonewalls, but these are related to a water reservoir, and erosion control. These were noted, but not recorded.

Table 1 lists these sites, while Figure 6 shows the locations of the finds.

Name	Description	South	East	Requires Mitigation
HER01	Floor foundation	-28.611119	29.833844	Yes
HER02	Walling?	-28.611056	29.834272	No
HER03	HER03 grave	-28.611513	29.835451	Yes
HER03	HER03 grave	-28.611556	29.835143	Yes
HER03	HER03 grave	-28.611811	29.834916	Yes
HER04	Engraving?	-28.611019	29.833887	Yes
HER05	Walling	-28.611491	29.833884	Yes
HER06	Walling	-28.61204	29.833977	Yes
HER07	Walling	-28.612245	29.833557	Yes
HER08	Western edge of stone walling	-28.613272	29.833347	Yes
HER08	HER08 Grave	-28.613721	29.832636	Yes

FIG. 6: LOCATIONS OF RECORDED SITES AT THE QUARRY SITE



HER01

HER01 is located near the edge of the quarry. The site consists of a small area that has been levelled with rocks (fig. 7). The rocks at the base of this platform are recent and have been pushed there by recent bulldozer activity. Either side of the platform has been partly to completely, removed, and there is a bulldozer path on each side. Approximately 10m to the north (at HER04) is another platform. There is a bulldozed path between the two platforms, and the platforms were probably linked before the damage. This platform may have been one of the Boer Commando encampments as it is located in a similar position on the war maps.

Significance: The platforms would have been of high significance if they were undamaged. However, they are so damaged that they are not significant.

Mitigation: The site should be mapped and photographed. The area should be surveyed with a metal detector.

FIG. 7 LOCATION OF HER01



HER02

HER02 is a small rectangular stone walled kraal. The kraal, however, postdate the quarry, as the stones have bulldozer scratch marks. It was noted and given a GPS reference, although it is younger than 50 years in age. There are several similar modern kraals in this area and they are probably related to HER03.

Significance: The site is of low significance.

Mitigation: No mitigation is required.

HER03

HER03 is located on the northern side of the one road to the site. The site dates between 1954 and 2000, according to the maps and graves (fig. 8). Parts of HER03 may also post-date 1937; however, the aerial photograph is not very clear. The site consist of 40+ human graves, stonewalls for cattle kraals and house foundations. It is unlikely that the current community living above this site are related to this site, as the former have graves in the area, with more recent dates.

Significance: The site is of high significance due to the graves. It is a red flag.

Mitigation: The site should not be affected in any manner, and if it were a full social impact assessment would be required for the graves. If the graves are not to be affected then the area needs to be fenced off with an access gate and clearly demarcated before construction phase.

FIG. 8: GRAVES AT HER03



HER04

HER04 is a specific artefact on the one side of HER01. The artefacts consist of two engraved circles on a rock. Fig. 9 shows the engravings in normal colours and then in a negative image. The latter enhances the engravings and makes them more visible.

Significance: The engravings are of medium significance as they probably relate to the Boer occupations.

Mitigation: The engraving should be removed and curated at an appropriate institution. In this case, it would be Amafa KZN.

FIG. 9: POSSIBLE ENGRAVINGS AT HER04



HER05

HER05 is located in the approximate centre of the proposed quarry. The site consists of a modest stonewall circle approximately 2m in radius (fig. 10). It would be the size of a small tent and/or goat kraal. There is currently no means of obtaining a date for the feature. It is also partially obscured by vegetation.

It is possible that the feature was originally a kraal that was then re-used in the 2nd ABW, as this was the custom with Late Iron Age and Historical Period stonewalls.

Significance: The feature is of low-medium significance. There is nothing extraordinary about the walling, however it may be related to the ABW, and should be treated with some significance.

Mitigation: The walling should be mapped and photographed. The surrounding area should be surveyed with a metal detector.

FIG. 10: STONE WALLING AT HER05



HER06

HER06 is an area that appears to have walling and/or a cleared floor. The vegetation was too thick to photograph and properly assess the site. The site is ~5m from the edge of the proposed quarry, and is thus protected by the heritage legislation.

Significance: The feature needs to be re-assessed.

Mitigation: The site needs to be re-assessed after the vegetation has been cleared, and photographed. Since it is within 100m of the edge of the quarry it should be mitigated and fenced off after the second assessment. The second assessment should map in the features and survey the surrounds with a metal detector.

HER07

HER07 is an area that appears to have walling and/or a cleared floor. The vegetation was too thick to photograph and properly assess the site. The site is ~35m from the edge of the proposed quarry, and is thus protected by the heritage legislation.

This feature is near where the possible German encampment occurred.

Significance: The feature needs to be re-assessed.

Mitigation: The site needs to be re-assessed after the vegetation has been cleared, and photographed. Since it is within 100m of the edge of the quarry it should be mitigated and fenced off after the second assessment. The second assessment should map in the features and survey the surrounds with a metal detector.

HER08

HER08 is a unique site in that it appears to originally date to the Late Iron Age, and has then been subsequently rebuilt, modified and extended for the last 500 years. It extends for ~100m x 100m. The site consists of a multiple series of stone walled circles. Some of these circles have aged, or patinated, rocks, while the more recent ones have little patination. There are at least four graves associated with the various walls.

Some of the features occur on the 1937 and 1954 maps. The site is also in the general location of the German Encampment.

The site is 130m from the edge of the proposed quarry and will not be affected by the current proposed quarry.

Significance: The site is of high significance due to the graves and variety of stonewalling.

Mitigation: no mitigation is required since the site will not be affected. If the quarry comes within 100m of the site, then it will need to be fenced off. The site cannot be destroyed by an extension to the quarry.

PALAEONTOLOGICAL IMPACT ASSESSMENT

The PIA was undertaken at a desktop level by Dr. Gideon Groenewald. The results can be summarised as follows:

“The desktop survey indicates that the planned quarry development is on a hill slope consisting of a Dolerite sill that is underlain by the Volksrust Formation and overlain by mudstone of the Adelaide Subgroup. Quaternary sediments occur in the valley floors.

The igneous character of the Dolerite has no significance for palaeontological finds and no management measures for the preservation or rescue of palaeontological data are needed.

If the quarry's depth or width moves outside the Dolerite sill into the under- or overlain sedimentary rock types the palaeontological significance can be moderate to high. If the quarry footprint moves outside the dolerite area, the following palaeontological mitigation measures are recommended:

1. A professional palaeontologist must monitor all earth-moving activities with potential impact on the Volksrust and Adelaide sedimentary sequences. After completion of the earth-moving activities, a monitoring report should be submitted to SAHRA.
2. A professional palaeontologist must train the resident ECO to recognise fossil material. If fossil material is later discovered it must be appropriately protected and the discovery reported to a palaeontologist for the removal thereof as per SAHRA legislation" (PIA report Appendix B)

Fig. 11 shows the geology of the quarry. The previous quarry had stopped just above the shale formations. The quarry is unlikely to impact on the palaeontological horizons, as the quarry will only remove the dolerite formations.

FIG. 11: VIEW OF THE QUARRY AND THE GEOLOGY



HISTORICAL IMPACT ASSESSMENT

The Historical Impact Assessment was undertaken by Mr Gilbert Torlage and is located in Appendix C. This assessment concurs with the general survey in that many of the structures related to the Boer/Utrecht Encampment have been destroyed by the existing quarry.

This assessment did not find any features that would require more than a Phase 2 type of mitigation. The mitigation has been discussed above for sites HER01 – HER08

MANAGEMENT PLAN

All sites and features within the quarry footprint and within 100m of the perimeter of the proposed quarry will need to be photographed and mapped to some degree. Those sites such as HER03 and HER08 would require general mapping and photographs.

HER03 would need to be fenced off around the graves, with an access gate. I would suggest that the living descendants are contacted regarding this quarry to ensure that they are comfortable with the quarry occurring this close to ancestral graves. This would be more important if there is going to be blasting. HER03 in general should be clearly demarcated as a no-go area during construction phase, especially if heavy machinery will be used to clear the surface.

Small sites such as HER01, HER02, HER04, HER05, HER06 and HER07 should be mapped and photographed after the area has been cleared of some vegetation.

The entire footprint needs to be surveyed with a metal detector. This is important since both the Utrecht Commando and the German Corps were in this area, and their artefacts may now be the only remaining evidence.

If the quarry extends below the dolerite formations, and into the shale formations, then a palaeontologist will need to be on site.

CONCLUSION

A heritage survey was undertaken for the proposed Ladysmith Quarry site. This area is known to be part of the Boer line of defence during the Siege of Ladysmith, as well as having a high density of Late Iron Age and Historical Period stone walled settlements. The palaeontology of the general area is also very significant. There was thus good reason to undertake a Heritage Impact Assessment.

The quarry is located ~6km southeast of Ladysmith. Boer Forces were known to have set up an encampment in the area of the quarry footprint.

The survey located several small features that could relate to the 2nd Anglo Boer War as well as many human graves and stone walled features. The human graves occur outside of the footprint.

No sites of high significance occur in the study area; however, some form of mitigation will be required. The mitigation for features will be in the form of photographing and mapping. Cemeteries and/or individual graves will need to be fenced off if they occur within 100m of the quarry.

Since artefacts may still occur in the footprint relating to the Anglo-Boer War, I have suggested that a metal detector survey is undertaken in the study area.

The developer will need to apply to Amafa KZN for a permit to destroy the features and the site in general.

**APPENDIX A
SITE RECORD FORMS**

UMLANDO ARCHAEOLOGICAL SITE RECORD FORM**SITE CATEGORY:** (X where applicable)

Stone Age:

Early Iron Age:

Late Iron Age X

Historical Period: X and ABW

Recorder's Site No.: HER01 – HER08

Official Name: Hermanskraal 1186

Local Name: Hermanskraal

Map Sheet: 2829DB Ladysmith

GPS reading:

HER01 -28.611119	29.833844	HER02	-28.611056	29.834272
HER03 -28.611513	29.835451	HER03	-28.611556	29.835143
HER03 -28.611811	29.834916	HER04	-28.611019	29.833887
HER05 -28.611491	29.833884	HER06	-28.61204	29.833977
HER07 -28.612245	29.833557	HER08	-28.613272	29.833347
HER08 -28.613721	29.832636			

**DIRECTIONS TO SITE: SKETCH OR DESCRIPTION.**

From Ladysmith drive past Steadville, along the P325. towards Umbulwana Station. Just before the main T-Junction with the P333 (and Caltex Station), take the dirt road to the right (although this will be upgraded to tar road shortly). Take 1st right and drive towards Umbulwana Station. Cross the railway, line near the station and Hermanskraal River and quarry is on left. The sites are on the top of the hill, in various places and will require GPS.

SITE DESCRIPTION:

Type of Site: Stone walling, graves

Merits conservation: Yes

Threats: Yes

What threats: Quarry

RECORDING:

Graphic record: Yes

Digital pictures: x

Tracings :

Re-drawings:

Recorder/Informant: Name: Gavin Anderson, Gilbert Torlage

Address: PO Box 102532, Meerensee, 3901

Date: 28 Nov. 2011

Owner: Private

References:

Description of site and artefactual content.

Site consists of various types of walling dating from the LIA and HP, to the ABW. All stone walled settlements have graves. All sites occur within 100m of each other and thus are clumped into a general site.

HER01 is located near the edge of the quarry. The site consists of a small area that has been levelled with rocks. The rocks at the base of this platform are recent and have been pushed there by recent bulldozer activity. Either side of the platform has been partly, to totally, removed, and there is a bulldozer path on each side. Approximately 10m to the north (at HER04) is another platform. There is a bulldozed path between the two platforms, and the platforms were probably linked before the damage. This platform may have been one of the Boer Commando encampments as it is located in a similar position on the war maps.

HER02 is a small rectangular stone walled kraal. The kraal does, however, postdate the quarry, as the stones have bulldozer scratch marks. It was noted and given a GPS reference, although it is younger than 50 years in age. There are several similar modern kraals in this area and they are probably related to HER03.

HER03 is located on the northern side of the one road to the site. The site dates between 1954 and 2000, according to the maps and graves. Parts of HER03 may also post-date 1937; however, the aerial photograph is not very clear. The site consist of 40+ human graves, stonewalls for cattle kraals and house foundations. It is unlikely that the current community living above this site are related to this site, as the former have graves in the area, with more recent dates.

HER04 is a specific artefact on the one side of HER01. The artefacts consist of two engraved circles on a rock.

HER05 is located in the approximate centre of the proposed quarry. The site consists of a modest stonewall circle approximately 2m in radius. It would be the size of a small tent and/or goat kraal. There is currently no means of obtaining a date for the feature. It is also partially obscured by vegetation. It is possible that the feature was originally a kraal that was then re-used in the 2nd ABW, as this was the custom with Late Iron Age and Historical Period stonewalls.

HER06 is an area that appears to have walling and/or a cleared floor. The vegetation was too thick to photograph and properly assess the site. The site is ~5m from the edge of the proposed quarry, and is thus protected by the heritage legislation.

HER07 is an area that appears to have walling and/or a cleared floor. The vegetation was too thick to photograph and properly assess the site. The site is ~35m from the edge of the proposed quarry, and is thus protected by the heritage legislation. This feature is near where the possible German encampment occurred.

HER08 is a unique site in that it appears to originally date to the Late Iron Age, and has then been subsequently rebuilt, modified and extended for the last 500 years. It extends for ~100m x 100m The site consists of a multiple series of stone walled circles. Some of these circles have aged, or patinated, rocks, while the more recent ones have little patination. There are at least four graves associated with the various walls. Some of the features occur on the 1937 and 1954 maps. The site is also in the general location of the German Encampment.

APPENDIX B
PALAEONTOLOGICAL IMPACT ASSESSMENT

PALAEONTOLOGICAL ASSESSMENT OF LADYSMITH QUARRY DEVELOPMENT

FOR Umlando

DATE: 21 NOVEMBER 2011

By

Gideon Groenewald

**Metsi Metseng Geological and Environmental
Services**

Fax: 086 619 2136

Cell: 082 829 4978

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EXECUTIVE SUMMARY

The planned LADYSMITH QUARRY DEVELOPMENT is located on a hill slope consisting of a Dolerite sill that is underlain by the Volksrust Formation and Quaternary sediments and overlain by mudstone of the Adelaide Subgroup.

The igneous character of the dolerite and the alluvium character of the Quaternary have no significance for palaeontological finds and no mitigation measures will be needed to preserve or rescue palaeontological data. .

If the quarry's footprint moves outside the Dolerite sill or Quaternary alluvium into the under- or overlain sedimentary rock types the significance for palaeontological finds are moderate to high and mitigation measures will be needed to preserve or rescue palaeontological data.

INTRODUCTION

Metsi-Metseng Geological Services CC was appointed to undertake a desktop survey, assessing the potential palaeontology impact of the LADYSMITH QUARRY DEVELOPMENT on the Farm Hermanus Kraal 1186 in the District Ladysmith KwaZulu-Natal.

SAHRA ACT OR KWAZULU-NATAL HERITAGE ACT NO. 4 OF 2008

The National Heritage Resources Act of 1999 (pp 12-14) and the KwaZulu Heritage Act of 2008 protects a variety of heritage resources. These resources are defined as follows:

1. “For the purposes of this Act, those heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of heritage resources authorities.
2. Without limiting the generality of subsection (1), the national estate may include -
 - 2.1. Places, buildings, structures and equipment of cultural significance;
 - 2.2. Places to which oral traditions are attached or which are associated with living heritage;
 - 2.3. Historical settlements and townscapes;
 - 2.4. Landscapes and natural features of cultural significance;
 - 2.5. Geological sites of scientific or cultural importance;
 - 2.6. Archaeological and palaeontological sites;
 - 2.7. Graves and burial grounds, including—
 - 2.8. Ancestral graves;
 - 2.9. Royal graves and graves of traditional leaders;
 - 2.10. Graves of victims of conflict;
 - 2.11. Graves of individuals designated by the Minister by notice in the Gazette;
 - 2.12. Historical graves and cemeteries; and

- 2.13. Other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
3. Sites of significance relating to the history of slavery in South Africa;
- 3.1. Movable objects, -
4. Objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
- 4.1. Objects to which oral traditions are attached or which are associated with living heritage;
- 4.2. Ethnographic art and objects;
- 4.3. Military objects;
- 4.4. objects of decorative or fine art;
- 4.5. Objects of scientific or technological interest; and
- 4.6. books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).
5. Without limiting the generality of subsections (1) and (2), a place or object is to be considered part of the national estate if it has cultural significance or other special value because of—
- 5.1. Its importance in the community, or pattern of South Africa's history;
- 5.2. Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- 5.3. Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- 5.4. Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- 5.5. Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- 5.6. Its importance in demonstrating a high degree of creative or technical achievement at a particular period;

- 5.7. Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- 5.8. Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
- 5.9. sites of significance relating to the history of slavery in South Africa”

METHODOLOGY

The potential palaeontology of a rock unit relates directly to the geology of the area. The desktop survey includes the comparison of relevant referenced geological maps and locality maps and/or waypoints provided for the development project. The potential impact and significance of the palaeontology for a specific rock unit is determined through comparison of existing geological and palaeontology database information.

The only limitation on this methodology is the scale of mapping, which restricts comparison of the geology to a scale of 1:250 000. This restriction only applies in areas where major changes in the geological character of the area occur over very short distances.

RESULTS

The planned Ladysmith Quarry Development site is on a hill slope consisting of a Jurassic Dolerite sill (Red Areas Figure 1) overlaying a Permian Volksrust Formation (Brown Areas Figure 1) of the Eccca Group and more recent Quaternary (Yellow Areas Figure 1) aged sediments. On the uphill side of the quarry, the late Permian Adelaide Subgroup (Green Areas Figure 1) of the Beaufort Group overlies the Dolerite sill. Both the Eccca and Beaufort Groups are part of the Karoo Supergroup.

The igneous character of the Dolerite has no significance for palaeontological finds. However, if the quarry's depth or width move outside the Dolerite sill into the under- or overlain sedimentary rock types the palaeontological significance can be moderate to high.

DISCUSSION

The desktop survey indicate that the planned quarry development is on a hill slope consisting of a Dolerite sill that is underlain by the Volksrust Formation and Quaternary sediments and overlain by mudstone of the Adelaide Subgroup.

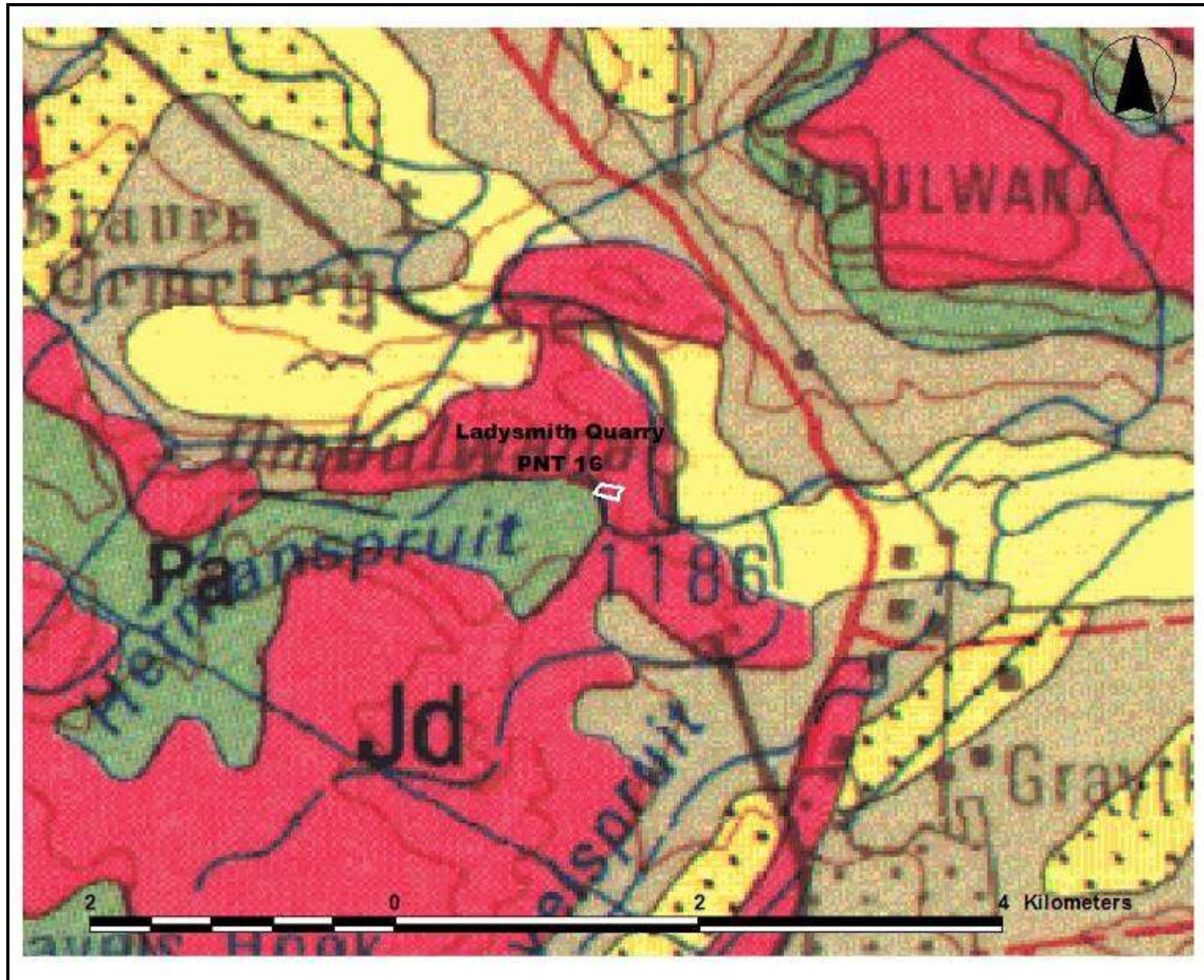
The blue-grey to dark-grey shale of the early Permian Volksrust Formation can have plant fossils such as *Phyllothea australis*, *Raniganjia kilburnensis*, *Schizoneura Africana* and *Glossopteris spp.* and animal fossil such as *Anteosauridae*, *Eodicynodon* and *Pristerognathus*. (Bamford, 2011).

The grey mudstone, dark-grey shale (carbonaceous in places), siltstone and sandstone of the late Permian Adelaide Subgroup can have a moderate to high potential for fossils from the *Eodicynodon*, *Tapinocephalus*, *Pristerognathus*, *Tropidostoma*, *Cistecephalus* and *Dicynodon* Assemblage Zones (Rubidge et al, 1995; Johnson et al, 2006). Plant fossils expected from these rocks include examples of *Glossopteris* assemblages and examples of other genera include *Cyclodendron*, *Phyllothea* and *Noeggerathiopsis*. Invertebrate fossils are restricted to trace fossils, including casts of some vertebrate burrows (Groenewald, 1996)

The Jurassic Dolerite sill will have no fossil material due to its igneous character.

The alluviums of the more recent deposits of the Quaternary aged sediments are not known to yield fossil material.

FIG. 1 GEOLOGY OF THE LADYSMITH QUARRY DEVELOPMENT



MANAGEMENT PLAN

The desktop survey indicates that the planned quarry development is on a hill slope consisting of a Dolerite sill that is underlain by the Volksrust Formation and overlain by mudstone of the Adelaide Subgroup. Quaternary sediments occur in the valley floors.

The igneous character of the Dolerite has no significance for palaeontological finds and no management measures for the preservation or rescue of palaeontological data are needed.

If the quarry's depth or width moves outside the Dolerite sill into the under- or overlain sedimentary rock types the palaeontological significance can be moderate to high. If the quarry footprint moves outside the dolerite area, the following palaeontological mitigation measures are recommended:

3. A professional palaeontologist must monitor all earth-moving activities with potential impact on the Volksrust and Adelaide sedimentary sequences. After completion of the earth-moving activities, a monitoring report should be submitted to SAHRA.
4. A professional palaeontologist must train the resident ECO to recognised fossil material... If fossil material is later discovered it must be appropriately protected and the discovery reported to a palaeontologist for the removal thereof as per SAHRA legislation

CONCLUSION

The planned LADYSMITH QUARRY DEVELOPMENT is located on a hill slope consisting of a Dolerite sill that is underlain by the Volksrust Formation and Quaternary sediments and overlain by mudstone of the Adelaide Subgroup.

The igneous character of the dolerite and the alluvium character of the Quaternary sediments have no significance for palaeontological finds and no mitigation measures will be needed to preserve or rescue palaeontological data. .

If the quarry's footprint moves outside the Dolerite sill or Quaternary alluvium into the under- or overlain sedimentary rock types the significance for palaeontological finds are moderate to high and mitigation measures will be needed to preserve or rescue palaeontological data.

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**APPENDIX C
HISTORICAL IMPACT ASESMENT**

Quarries Ladysmith & Winterton areas

Historical Sites report

November 2011

G.P. Torlage

Introduction and Methodology

G.P. Torlage through Umlando, South Africa: Archaeological Surveys and Heritage Management were contacted to carry out a survey on land surrounding two quarries that are to be further developed. The one quarry is situated to the southeast of Ladysmith on the farm PTN 16 of the Farm Hermanus Kraal. The other quarry lies to the north of Winterton on the farm *Poortjie* at GPS coordinates S28 45 56, E29 32 38. Vacant pieces of land surround the quarries in the directions in which further development is proposed. An investigation is to be carried out at both sites to establish whether there are any existing historic sites relating to the Second Anglo-Boer War that would be impacted upon during an envisaged development in those areas.

The following methods were employed in the brief time available: some of the key historical literature and documents with the data relating to the area were surveyed. A search on the internet was carried out. A physical survey of the terrain was made, with a visual search being carried out for any physical remains. This survey was carried out on 28 November 2011.

The physical surveys were carried out with the assistance of Gavin Anderson, (Umlando, South Africa).

The physical survey at the Ladysmith site was impeded to a degree because of the bush encroachment that has taken place over the years. The dense vegetation makes it more difficult to locate certain historical sites and fully appreciate the contextual situation of sites under investigation in relation to other features and sites in the area.

Historical Sites and Events.

Ladysmith site

From information gathered about the site near Ladysmith the most significant historical events relate to the South African War (Second Anglo-Boer War 1899 – 1902) and in particular to the Siege of Ladysmith from 2 November 1899 to 28 February 1900.

After the Boers had rebuffed the British on 30 October 1899 they then set about to fully encircle the town of Ladysmith which was occupied by a British force numbering approximately 13 745 men and several civilians. Boer forces during 2 and 3 November 1899 took up positions around the town to besiege it and all those who were within it.

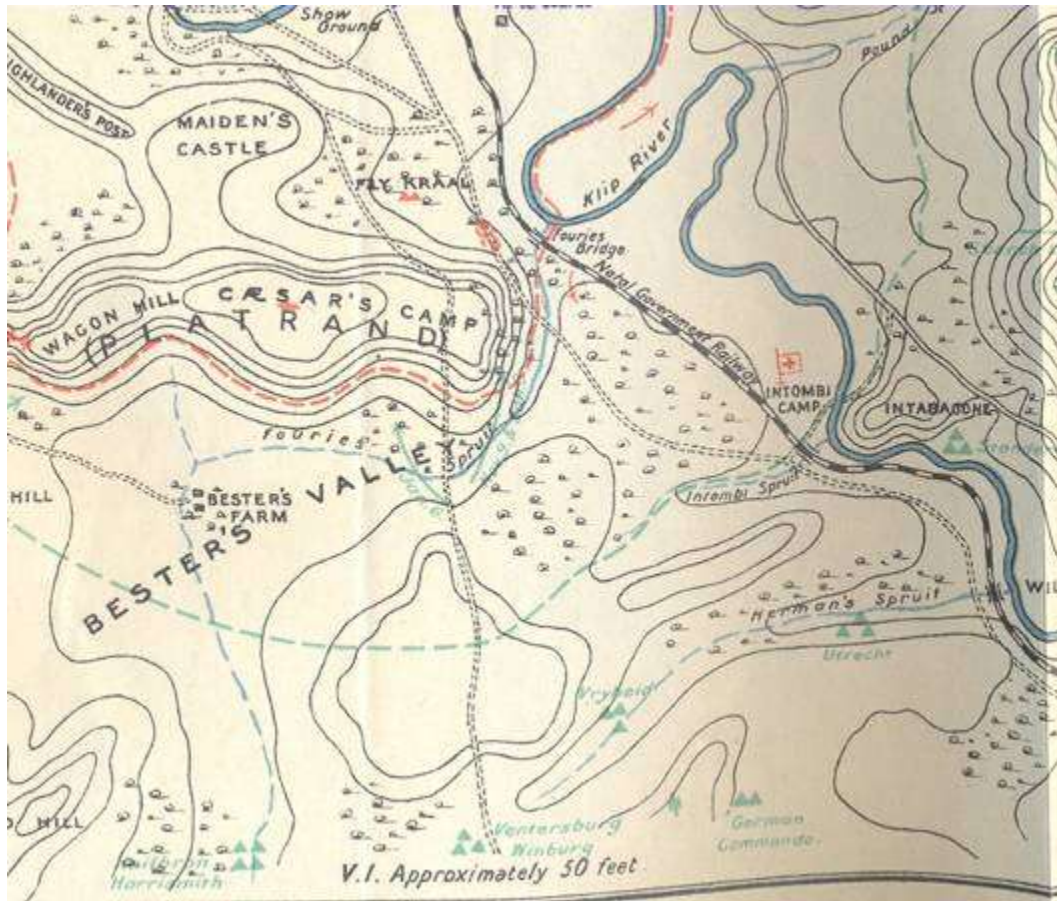
As a result, the ridge lying immediately to the north of the Hermanspruit just west of where it flows into the Klip River was occupied by the Utrecht Commando of the Zuid Afrikaansche Republiek (Transvaal) forces. They formed an almost continuous siege line around Ladysmith. Immediately south of them and south of the Hermanspruit on the next ridge were stationed the Pretoria German Corps under command of Acting Commandant Paul Krantz.

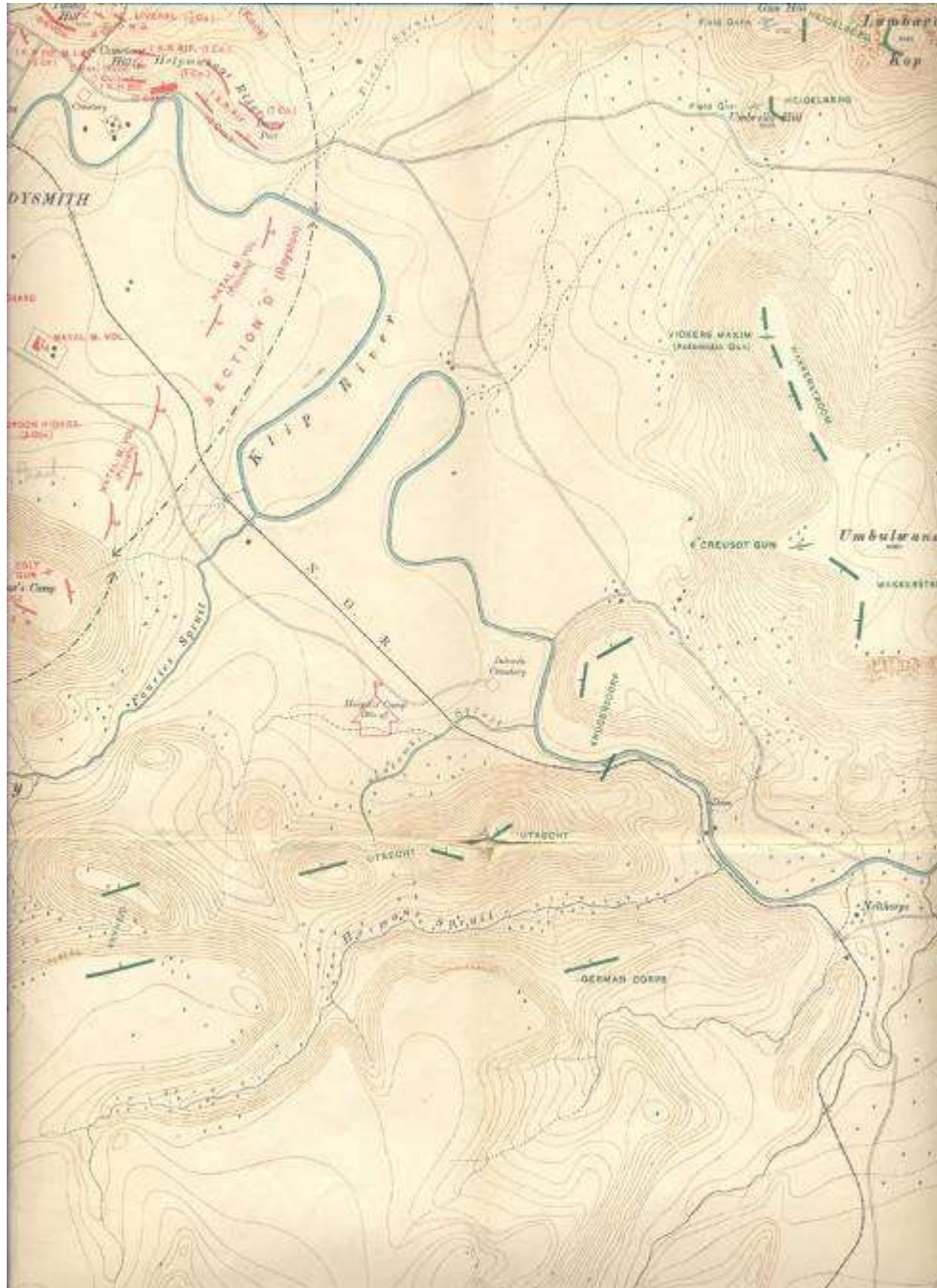


Germans with the Boers around Ladysmith in November 1899.

From there they were in a position to carry out a supporting role to the Utrecht Commando. They were also able to control the Hermanspruit valley to both west and east and they had a view into the Klip River valley and could cover the plains to the south of the town from whence a relieving force moving in from Colenso and the Tugela (Thukela) River may advance.

From historic maps published by 1910 (see Amery & Maurice) it is evident that it is highly possible that the Utrecht Commando encampment was placed on or near the terrain that is envisaged for development. Also located in the vicinity were the German Corps positions and camp as well as an artillery gun. In the valley just to the east of the quarry site was the Vryheid Commando camp.





Early in November 1899 because of negotiations between the British and Boer, commanding officers in and around Ladysmith the British established a neutral camp, the Intombi Camp in which British civilians and recuperating British soldiers were accommodated. This camp was situated a mere one kilometre from the Utrecht Commando lines. The presence of this camp in this area would have meant that the Utrecht Commando would have had to be especially vigilant, and with it also the German Corps who were in support of them.



Intombi Camp. Note how close it is to the encircling hills around the town occupied by besieging Boers.

In early February 1900 the Boers set in motion a plan to flood the town of Ladysmith by damming the Klip River at a position approximately 1.5 kilometres north-east of the German Corps' position. There is some evidence that it may have been the German Commandant Paul Krantz who designed the dam. Although there is also conflicting evidence which challenges this conclusion. The dam was never completed as Ladysmith was relieved before the Boer plan could be completed.

Physical Search Finds

It is evident that during the earlier quarrying work carried out at this site that there has been extensive disturbance of the terrain that is to be quarried in the future. As a result, most historical remains have been either destroyed or seriously disturbed. However, there is evidence of some remaining fortifications.

Image 5491



This is one of the many road remains that criss-cross the site which have been the reason why there has been so much damage to the historic sites in the area. This is an Eskom service road.

Image 5477 Lat. -28.611119S, Long 29.833844E

Remains of small fortifications that were probably constructed by members of the German Corps during the time that they held this position from early November 1899 to late February 1900.

They are built on strategic ridges from where they had views looking west up the Hermanspruit, north onto the Utrecht Commando positions and east towards the Klip River plain.



Image 5495

Lat 28.612245S, Long 29.833557E



Image 5487



*Fortification clearly visible to the north of the German Corps position
North of the Hermanspruit which the Germans would have been in support of.*

Image 5492



Signs of soil reclamation work on the site to be quarried.

Image 5498



*Remains of a small rectangular structure of more recent construction.
Possibly a domestic stock pen.*

Image 5505



*Remains of a more recent construction, which appears to have been used
repeatedly with various occupants re-using the stone material.*

Recommendations

As this site at Ladysmith has previously been extensively disturbed, but was evidently occupied by members of the German Corps during the Siege of Ladysmith it is recommended that the historic features identified be surveyed with the aid of a metal detector. Furthermore, that the site is surveyed with the aid of a metal detector from north to south along lines at 50-meter intervals.

Should any significant finds be located dating to the Siege of Ladysmith period that these be excavated, the material collected, fully documented, further researched and stored in an appropriate repository.

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