HERITAGE SURVEY OF THE PROPOSED MIDMAR CRUSHERS QUARRY EXTENSION, MPOPHOMENI, KWAZULU-NATAL

FOR TERRATEST (PTY) LTD DATE: 5 SEPTEMBER 2018

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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

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INTRODUCTION

"The westward expansion of the Midmar Crushers quarry aims at increasing the reserve available to quarry as the current reserve, at the existing quarry is almost depleted. It is therefore a business development strategy to mine available resources in close proximity to the existing quarry as this will save on transportation costs, as well as quarry development expenses. All operational infrastructure required to quarry dolerite, including crusher and administration facilities, are already present at the existing and authorised Midmar Crushers quarry site. Resources quarried off-site to the existing quarry can therefore be processed at the existing quarry, utilising existing infrastructure.

The westward expansion of the existing Midmar Crushers quarry, over confirmed dolerite deposits, is also considered to be a continuation of the quarrying activity, which is in-keeping with the surrounding land use activities and is therefore considered to be a continuation of activities within the same area.

The westward expansion of the Midmar Crushers site ensures that Midmar Crushers continues their operations given the presence of the existing dolerite deposit. In this regard, the current Midmar Crushers employees (150 staff) will retain their positions. Further, Midmar Crushers is the main supplier of dolerite to the uMngeni Municipality given their location and is the only supplier of dolerite stone between Mpophomeni and Underberg. They are therefore a local supplier of dolerite.

The westward expansion of Midmar Crushers will therefore ensure the future operation of the company and continued employment for the 150 staff members. It must be noted, however, that the westward expansion of the Midmar Crushers quarry will not create additional employment opportunities.

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The preferred site alternative is located over the confirmed dolerite outcrop, located to the west of the existing Midmar Crushers operations, on the opposite side of the Ngkulu River. Given the close proximity of the site to the existing operations the Midmar Crushers quarry, this is considered to be the only site alternative which can meet the need and desirability of the project.

A Visual Geological Assessment of the site was undertaken on 05 September 2013 to assess the feasibility of the proposed westward expansion of Midmar Crushers, in terms of the presence of dolerite. The assessment was undertaken by Mr T. Spiers of Terratest (Pty) Ltd, an Engineering Geologist. The exercise entailed undertaking a visual assessment of the area lying between the Ngkulu River and the Main Road R617 for the purposes of defining the dolerite rock body, according to visible surface features and exposures. The results indicated that the outcrop, or the near surface occurrence of dolerite within the area of interest, occupies an area of approximately 70 000m², with an elevation difference of approximately 100m. Extending westwards from the crest of the hill towards Main Road R617 increases this area by at least a further 20 000m².

In calculating the volumes of feasibility exploitable material, only the hillslope east of the crest was considered, as restricting quarrying to this area minimised the visual impact from the Main Road. Depending on the bench configurations adopted and assuming average depths of exploitation ranging between 15m and 30m, a conservative estimate would yield between 1 and 2 million m³ of commercially crushable dolerite rock" (Terratest, BID 2018)

Terratest (Pty) Ltd subcontracted Umlando to undertake the HIA for the proposed project.

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VEGETATION

"Mucina and Rutherford (2006) note that the site is comprised of Midlands Mistbelt Grassland and Southern KwaZulu-Natal Moist Grassland. Midlands Mistbelt Grassland is found scattered throughout KwaZulu-Natal and the southwestern portion of the Eastern Cape. It occurs on hilly, rolling landscapes and is dominated by forb-rich, tall, sour Themeda triandra grasslands. These grasslands, however, are generally found to be transformed due to the invasion of the native 'Ngongoni grass' (*Aristida junciformis subsp. junciformis*). Only a few patches of the original species-rich grasslands remain.

As illustrated by the 2008 Ezemvelo KZN Wildlife dataset (see Figure 9), the site is located within a transformed area and thus the presence of *Themeda triandra* grasslands is limited, especially given the fact that the property has been utilised as a *eucalyptus* plantation for the past several years. This is further substantiated by uMngeni Municipality's Critical Biodiversity Areas Map which notes that the site is located in a transformed area" (Terratest, BID 2018).

Umlando was appointed by Terratest to undertake the HIA for this project.

Fig.'s 1 - 4 show the location of the development.

FIG. 1 GENERAL LOCATION OF THE STUDY AREA



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FIG. 2: AERIAL OVERVIEW OF THE STUDY AREA

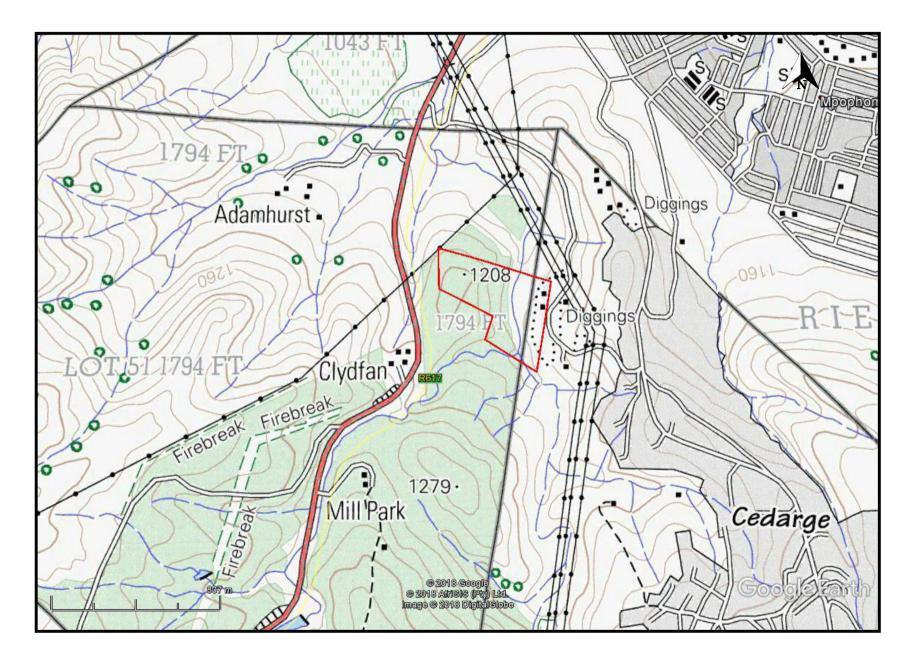


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FIG. 3: TOPOGRAPHICAL OVERVIEW OF THE STUDY AREA



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FIG. 4: SCENIC VIEWS OF THE PROPOSED QUARRY



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KWAZULU-NATAL HERITAGE ACT NO. 4 OF 2008

"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

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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." (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. These 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.

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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.

The above significance ratings allow one to grade the site according to SAHRA's grading scale. This is summarised in Table 1.

SITE SIGNIFICANCE	FIELD RATING	GRADE	RECOMMENDED MITIGATION
High	National	Grade 1	Site conservation / Site
Significance High	Significance Provincial	Grade 2	development Site conservation / Site
Significance	Significance		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

TABLE 1: SAHRA	GRADINGS FOR	HERITAGE SITES
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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 archaeological database indicates that there are archaeological sites in the general area (fig. 5). These sites include all Stone Age and Iron Age sites as well as historical buildings. No known sites occur in the study area.

No national monuments, battlefields, or historical cemeteries are known to occur in the study area. There are several cemeteries outside of the study area.

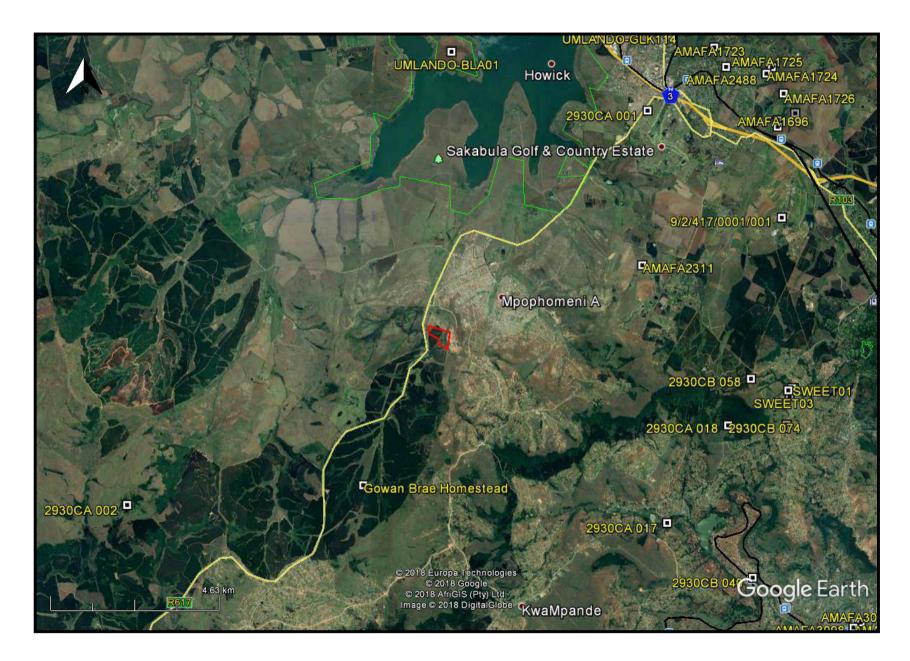
Lot 51 No 1794 was first surveyed in 1894. No buildings are shown on this map (fig. 6).

The 1937 aerial photographs indicate that there is an agricultural field and possible houses within the study area (fig. 7).

The 1972 topographical map indicates that the area is grassland and no buildings occur in the area (fig. 8).

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FIG. 5: LOCATION OF KNOWN HERITAGE SITES NEAR THE STUDY AREA



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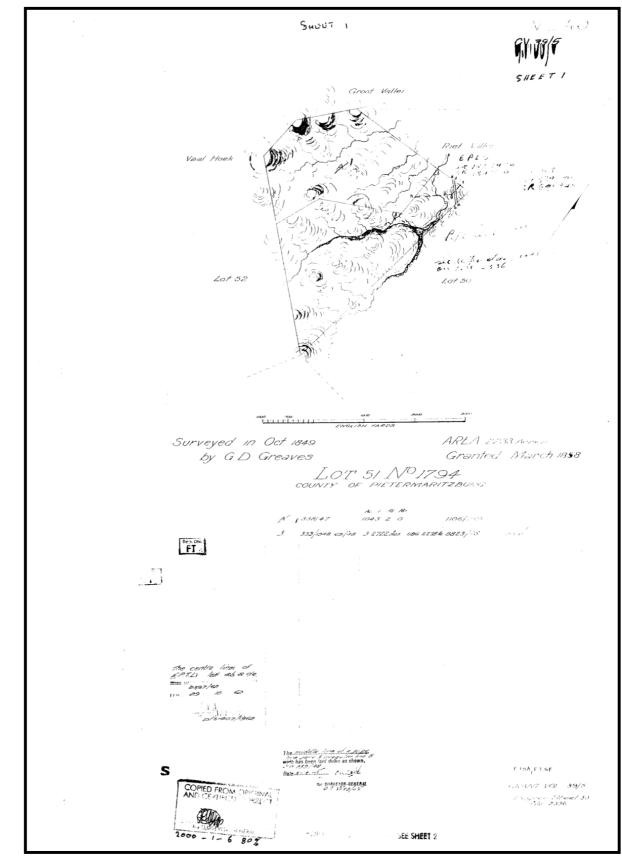


Fig. 6: Original Surveyor General Map of Lot 51 No. 1794 (1849)¹

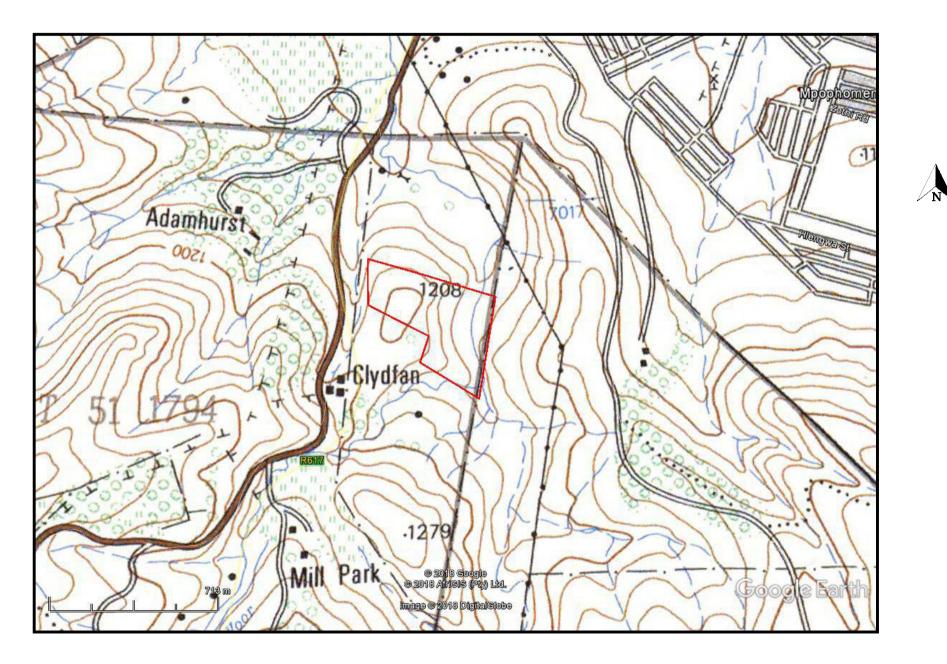
¹ 102V4J01



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FIG. 8: STUDY AREA IN 1972



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PALAEONTOLOGICAL IMPACT ASSESSMENT

The SAHRIS map indicates that some of the area is of medium palaeontological sensitivity (fig. 9). This map is slightly inaccurate in that the study area is mostly dolerite and only the fringes have fossil bearing shale deposits. The quarry will be mining dolerite only.

FIG. 9: PALAEONTOLOGICAL SENSITIVITY MAP



COLOUR	SENSITIVITY	REQUIRED ACTION	
RED	VERY HIGH	field assessment and protocol for finds is required	
ORANGE/YELLOW	нідн	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 howeve 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.	

FIELD SURVEY

The field survey was undertaken in May 2018. Ground visibility was good in the grasslands; however, the afforested area had dense ground cover resulting in poor visibility. A single pottery shard was noted on the northwestern edge of the proposed quarry, and several terraces were observed outside of the footprint.

The neighbouring landowner informed me that there was a settlement with graves on the top of the hill. Apparently, these graves are still visited by a descendent who lives nearby. This confirms the observation from the 1937 aerial photograph. I surveyed the top of the hill and located the foundations of one feature. It was ~2m in diameter and could also be a grave (fig. 10: top left). The location of the features are given in Table 2.

The ground cover was very dense in this area; however, I noted three areas that appeared to be possible sunken cairns (fig. 10 clockwise from top right). No specific graves were observed. The location of these features are shown in fig. 11.

Significance: The general area where GPS points were taken should be considered of high significance until further public participation has occurred. There should be a 50m buffer around this area.

Mitigation: A Public Participation Process will be required specifically aimed at possible graves. However, since the living descendent, he might be directly approached for information. This is discussed further under 'Management Plan'.

SAHRA Rating: 3A

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FIG. 10: FEATURES AT THE PROPOSED QUARRY SITE



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FIG. 11: LOCATION OF RECORDED FEATURES



Name	Latitude	Longitude	Altitude	Name	Description
			(m)		
Stone Circle	-29.577457000	30.165878000	1237.2	Circle	House or
					grave)
Cairn 1	-29.577412000	30.166005000	1238.5	Cairn	Grave
Cairn 2	-29.577171000	30.165676000	1239.5	Cairn	Grave
Cairn 3	-29.577440000	30.165749000	1241.0	Cairn	Grave

TABLE 2: LOCATION OF RECORDED FEATURES

MANAGEMENT PLAN

The developer must follow the guidelines mentioned below otherwise the project may be brought to halt. The process of grave removals is a complex one that requires community consultation, advertisements, several permits, and finally reburial. Moreover, those graves older than 60 years require a qualified archaeologists to undertake the entire process. This process is summarised as follows²:

In terms of the National Heritage Resources Act (No. 25 of 1999), and KZN Heritage Act of 1997 and 2008, graves older than 60 years (not in a municipal graveyard) are protected. Human remains younger than 60 years should be handled only by a registered undertaker or an institution declared under the Human Tissues Act. Anyone who wishes to develop an area where there are graves older than 60 years is required to follow the process described in the legislation (section 36 and associated regulations). The specialist will require a permit from the heritage resources authority:

² Information supplied by SAHRA, and it applies to KZN, although falling under the KZN Heritage Act.

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• Determine/ confirm the presence of the graves on the property. Normally the quickest way to proceed is to obtain the service of a professional archaeologist accredited to undertake burial relocations. The archaeologist will provide an estimate of the age of the graves. There may be a need for archival research and possibly test excavations (permit required).

• The preferred decision is to move the development so that the graves may remain undisturbed. If this is done, the developer must satisfy SAHRA/KZN Heritage that adequate arrangements have been made to protect the graves on site from the impact of the development. This usually involves fencing the grave(yard) and setting up a small site management plan indicating who will be responsible for maintaining the graves and how this is legally tied into the development. It is recommended that a distance of 10-20 m is left undisturbed between the grave and the fence around the graves.

• If the developer wishes to relocate or disturb the graves:

∘A 60-day public participation (social consultation) process as required by section 36 (and regulations - see attachment), must be undertaken to identify any direct descendants of those buried on the property. This allows for a period of consultation with any family members or community to ascertain what their wishes are for the burials. It involves notices to the public on site and through representative media. This may be done by the archaeologist, who can explain the process, but for large or sensitive sites a social consultant should be employed. Archaeologists often work with undertakers, who rebury the human remains.

 \circ If as a result of the public participation, the family (where descendants are identified) or the community agree to the relocation process then the graves may be relocated.

 $_{\odot}$ The archaeologist must submit a permit application to SAHRA/KZN Heritage for the disinterment of the burials. This must include written

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approval of the descendants or, if there has not been success in identifying direct descendants, written documentation of the social consultation process, which must indicate to SAHRA's satisfaction, the efforts that have been made to locate them. It must also include details of the exhumation process and the place to which the burials are to be relocated. (There are regulations regarding creating new cemeteries and so this usually means that relocation must be to an established communal rural or formal municipal cemetery.)

○Permission must be obtained before exhumation takes place from the landowner where the graves are located, and from the owners/managers of the graveyard to which the remains will be relocated.

○Other relevant legislation must be complied with, including the Human Tissues Act (National Department of Health) and any ordinances of the Provincial Department of Health). The archaeologist can usually advise about this.

MITIGATION

Subsequent to the survey and original report, the quarry area has been changed (fig. 12). The following has been implemented:

- The alternative layout (and the preferred in the Draft BAR), is to avoid the graves in their entirety, while implementing a 50m no-go buffer (as per Umlando recommendation). This no-go area will therefore be cordoned off so no activity whatsoever will occur there. (fig. 13),
- 2. In terms of Public Participation Process for the Basic Assessment, Terratest will be holding a double round of consultation before they submit the Final BAR to the DMR. This is to ensure that everyone has a decent opportunity to comment and so the client does not lapse the legislated BA timeframes. The plan is to circulate Version 1 of the Draft BAR and then hold a Public Meeting. Midmar Crushers is already

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extensively involved with the community as per the Social and Labour Plan requirements and so Terratest will be able to notify a great portion of the community. During this period, we can canvass comment from the community, including whether they know who the graves belong to, if in fact they are graves. Terratest will then update the Draft BAR and circulate to all IAPs and Key Stakeholders (including SAHRIS / AMAFA) again (i.e. 2nd Version of Draft BAR). Only once the second commenting period is finalised will Terratest submit the Final BAR to the DMR. This should, hopefully, allow for adequate time to gather further information, remembering that the client will in fact not go within 50m of the potential grave sites.

3. The changed study area may include more palaeontological sensitive areas. A PIA will be conducted based on the new layout alternative proposed (preferred alternative), but it will only be included in the second Version of the Draft BAR. This will give the client and Terratest time to conduct the PIA while Terratest distributes Version 1 of the Draft BAR and then the PIA can be included in the 2ndVersion of the Draft BAR and in the Final BAR.





³ Red polygon = original layout. Blue polygon = amended layout

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FIG. 13: BUFFER ZONE RELATING TO POTENTIAL GRAVES



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CONCLUSION

A heritage survey was undertaken for the proposed Midmar Crushers extension, Mpophomeni, KwaZulu-Natal. The existing quarry intends to expand its operation northwards to extract dolerite.

The desktop heritage study noted that there was an agricultural field with possible houses in the study area in 1937. The neighbouring landowner confirmed that someone from the nearby community visits the ancestral graves on the top of the hill. The survey confirmed that structures occurred on the hill and that there could be graves. I suggested a PPP is undertaken, but it targets the potential living relative first for the interviews. This should occur timorously as it can take at least 6 months to complete the PPP. A 50m buffer needs to be placed around the recorded features until the PPP is completed. The PPP will form part of the Phase 2 of the BAR.

The PIA desktop was not undertaken as the SAHRIS palaeontological map was slightly incorrect and had some of the study area as being medium sensitive when it was on dolerite. While shale does occur on parts of the hill it will hardly be affected. The shale deposits are shallow in these areas and probably weathered. However, since the study area has changed, more shale deposits will be effected. A PIA desktop study will be undertaken as part of the Phase 2 BAR.

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REFERENCES

Aerial Photographs

117B_003_399168

1:50 000 topographical maps

2930CA Howick 1972, 2002

Data Base

Natal Museum Site Record Database SHARIS 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