# PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT OF THE PROPOSED EXPANSION OF THE KLEINGELUK **QUARRY ON PORTION 11 OF THE FARM** HARTENBOSCH NO. 217 MOSSEL BAY<sup>1</sup>

Prepared for:

## SITE PLAN CONSULTING

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On behalf of

#### TRANSAND (PTY) LTD By



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#### **Executive summary**

The Agency for Cultural Resource Management was requested by Site Plan Consulting to conduct a Phase 1 Archaeological Impact Assessment for the proposed expansion of the Kleingeluk Quarry on Portion 11 of the Farm Hartenbosch No. 217 near Mossel Bay in the Western Cape Province.

Four areas (Section B, C, D and F) have been identified for proposed mining of industrial aggregate. While the extent of the new mining application area is about 130 ha, an area covering only 54 ha has been targeted for proposed mining operations. It is established that about 57% of the targeted areas comprises old, or currently ploughed agricultural lands. The remainder comprises very steep, hill slopes with dense thicket vegetation.

The aim of the study is to locate and map archaeological sites and remains that may be impacted by proposed mining operations, to assess the significance of the potential impacts and to propose measures to mitigate against the impacts.

The following findings were made:

Section B: No archaeological remains were documented in Section B

**Section C**: Low density scatters of Middle Stone Age and a few Early Stone Age tools were documented in Section C. The tools occur in old agricultural lands, in a highly disturbed context.

Section D: Low density scatters of Middle Stone Age and a few Early Stone Age tools were found in Section D. The tools occur in old agricultural lands, in a highly disturbed context.

**Section F**: Large numbers of Middle Stone Age and Early Stone Age tools (including utilized and retouched blade tools, denticulates, retouched pieces and handaxes) were documented in Section F. Most of the tools occur on the upper slopes of old agricultural lands that have been partially contoured and terraced and are littered with many thousands of unworked river cobbles. The large numbers of flakes and waste artefacts relative to the (smaller) numbers of formal tools counted, suggests that the `site' may represent the remains of a Stone Age quarry and manufacturing site. Possible activity areas have also been identified. Such near coastal Stone Age quarry sites are rare in the southern Cape landscape and the remains have been rated as having a medium-high local significance, subject to further, more detailed investigation.

#### 1. INTRODUCTION

Site Plan Consulting, on behalf of Transand (Pty) Ltd requested that the Agency for Cultural Resource Management undertake an Archaeological Impact Assessment for the proposed expansion of the existing Kleingeluk Quarry on Portion 11 of the Farm Hartenbos No. 217, near Mossel Bay in the southern Cape.

Four areas (Section B, C, D and F), covering a total area of about 54 ha, have been targeted for new mining operations. The extent of the mining application area is about 130 ha.

Sections A and B of the Kleingeluk Quarry are currently being operated under an existing Environmental Management Plan (or EMP). The proposed mining of Section B (extension), C and D will, at current production, increase the life span of the quarry by 44 years (Site Plan 2009). In order to maximize future mining rights, Section F has been included as a possible future mining area, but will only be mined in about 20 years time (Mr Billy Robertson pers. comm.).

The type of mineral/stone to be mined is aggregate for the Industrial sector (mainly the building industry and increasingly for road works). Mining will take place by excavator and front end loader, loading material directly onto waiting trucks for transport to either the market or the plant. Mined material will be processed using existing on-site facilities. Existing quarry roads will be used. All mined areas will be rehabilitated and re-vegetated. Visual impact considerations are also taken into account during excavation shaping and rehabilitation. For example, all sharp edges will be rounded to mimic natural contours. Mining operations will not be visible from the N2.

The aim of the study is to locate and map archaeological sites and remains that may be impacted by proposed mining operations, to assess the significance of the potential impacts and to propose measures to mitigate against the impacts.

### 2. TERMS OF REFERENCE

The terms of reference for the archaeological study were:

- to determine whether there are likely to be any archaeological sites within the proposed new mining areas;
- to identify and map any sites of archaeological significance within the proposed new mining areas;
- to assess the sensitivity and conservation significance of archaeological sites in the proposed new mining areas;
- to assess the status and significance of any impacts resulting from proposed mining operations; and
- to identify mitigatory measures to protect and maintain any valuable archaeological sites that may exist within the proposed new mining areas.

#### 3. THE STUDY SITE

A locality map is illustrated in Figure 1.

An aerial photograph of the study site and the proposed new mining area is illustrated in Figure 2.

The study area is situated to the north east of the town of Hartenbos, near Mossel Bay. Access to the site is via the turn off to the Transand Quarry on the R328 to Oudtshoorn. It is established that about 57% of the proposed target areas have already been transformed through many years of ploughing and contouring and is therefore in a disturbed and altered state. Some of the lands are currently being cultivated, while the remainder has lain fallow for several years. More recently, some of the fields have been ripped and seeded to provide feed for a number of game farm animals that have been introduced onto the farm. The remainder of the property comprises rounded hills and very steep slopes and valleys with dense, almost impenetrable thicket vegetation. Surrounding land use comprise a neighboring quarry to the north west, farmland, wilderness/natural areas and several residential developments (including Outeniquasbosch and Monte Christo) situated to the east and north east. The Brak River is located about a kilometer to the north, while the Hartenbos River is situated about 1.3 km to the south west.



Figure 1. Locality map (3422AA Mossel Bay)



Figure 2. Aerial photograph of the study site indicating proposed Sections to be mined

**Section B**: The extent of Section B is about 8.7 ha. The site comprises rounded hills with very steep sides which are extremely well vegetated. The site is a bit flatter in the north west where it overlooks an existing quarry operation. Access to the site is via an existing gravel road (Figures 3-7).



Figure 3. Section B. View facing west taken from Section D. Note the rehabilitated hills.



Figure 4. Section B. View facing north taken from the existing quarry.



Figure 5. Section B. View facing north west



Figure 6. Section B. View facing west



Figure 7. Section B. View facing south



Figure 8. Section C. View facing south east



Figure 9. Section C. View facing east



Figure 10. Section C. View facing west

**Section C**: The extent of Section C is 4.1 ha, of which 2.9 ha (or 70.7%) is currently ploughed for cultivation. Some of the lands have recently been heavily ripped and are contoured and shaped. There are large patches of land that are littered with rounded stones and cobbles, and sections of the land that have also recently been burnt. The fields are very disturbed. The slopes above the ploughed lands are fairly steep and well vegetated. The lower, south facing slopes are more, gentle in the middle and very steep overlooking the road (Figures 8-10). There is an area (well) below Section C that has been set aside as a farm worker burial site, but mining will not impact on this area at all (Mr Billy Robertson pers. comm.). This area has been fenced off.

**Section D**: The extent of Section D is 23.4 ha, of which 16.5 ha (or 70.5%) is currently ploughed for cultivation. The upper portions of the lands have been heavily ripped and seeded and relatively large numbers of loose stone and rounded cobbles are lying scattered about. The lower portions have lain, fallow for some years and are steeply contoured and shaped. These old lands are well grassed and there is very little surface stone lying about, apart from where several test pits have been excavated. The steep south and south east facing slopes are also heavily vegetated (Figures 11-16).



Figure 11. Section D. View facing south



Figure 12. Section D. View facing south east



Figure 13. Section D. View facing south



Figure 14. Section D. View facing north west



Figure 15. Section D. View facing north west

**Section F**: The extent of Section F is 17.8 ha of which 11.35 ha (or 63.7%) comprises old agricultural lands that were cultivated but have lain fallow for a number of years. These lands slope gently from north – south, but are steep in the south (Figure 17). The remainder of the site comprises rounded hills and steep slopes that are extremely well vegetated (Figures 18 and 19). Section F has been included as a possible future mining area, but will only be mined in about 20 years time.



Figure 17. Section F. View facing north



Figure 16. Section D. View facing north



Figure 18. Section F. View facing south west



Figure 19. Section F. View facing south

### 4. APPROACH TO THE STUDY

#### 4.1 Method

The approach followed in the archaeological study entailed a foot survey of the proposed mining areas (Sections B, C, D and F). The focus of the study area was on the flatter, more accessible agricultural lands. Old excavation and some road cuttings were also inspected for archaeological remains.

The site visit and assessment took place over three days, on the 17<sup>th</sup>, 18<sup>th</sup> and 19<sup>th</sup> March, 2009.

Archaeological remains were recorded using a Garmin Geko 201 GPS unit set on map datum wgs 84. A desktop study was also undertaken.

#### 4.2 Constraints and limitations

There were no major constraints or limitations associated with the study. Most of the archaeological remains were documented on the already disturbed agricultural lands, where nearly 60% of proposed mining operations will take place. The steep hill slopes were not searched, as access was very difficult and at times impossible. These areas are also extremely well vegetated resulting in low archaeological visibility. It is assumed, however, that proposed mining operations will not impact negatively on archaeological material in these areas as the nature of the terrain (very steep slopes) is not conducive to finding any remains, and if such remains to occur, they are unlikely to occur in any significant numbers.

#### 4.3 Identification of potential risks

Proposed mining operations will impact negatively on potentially important archaeological remains in Section F.

#### 4.4 Results of the desk top study

Apart from early archaeological investigations of the Cape St. Blaize Cave in Mossel Bay (Leith 1888; Goodwin & Malan 1935) and the mapping of known archaeological sites in the coastal zone (Kaplan 1993) very little systematic archaeological work has been carried out in the Mossel Bay area. It has taken several archaeological impact assessments, particularly at Pinnacle Point (Kaplan 1997), to focus attention on the importance of the area in the study of early modern humans in Southern Africa (Marean & Nilssen 2002). Baseline studies have documented relatively large numbers of Early Stone Age (ESA) and Middle Stone Age (MSA) tools at the Paradise Beach Golf Estate in Dana Bay (Kaplan 2003), Pinnacle Point (Kaplan 1997), as well as on the Farm Droogfontein in Dana Bay (Kaplan 2007). More than 70 000 ESA tools have also been collected during monitoring of bulk earthworks at the Pinnacle Point Golf Estate (Nilssen 2007). Well preserved shell middens and many open sites have been documented at Nautilus Bay, a large residential development situated to south west of Dana Bay (Kaplan 2005). More recently, medium-low density scatters of mainly MSA tools were documented on the farm Outeniquasbosch situated directly alongside (i.e. east of) the farm Hartenbos (Kaplan 2007 & refer to Figure 2).

#### 5. FINDINGS

**Section B**: No archaeological remains were documented in Section B. The receiving environment is very well vegetated and the hill slopes are extremely steep.

**Section C**: A low density scatter of a few Middle Stone Age (MSA) and Early Stone Age (ESA) tools were documented in Section C. The tools are spread very thinly and unevenly over the surrounding landscape, on fairly steep, east facing slopes. The tools occur in old agricultural lands, in a highly disturbed context. The lithics comprised a few (mostly broken) flakes, two cores and several broken/flaked cobbles. No formal tools were counted. All the tools are made on rounded quartzite cobbles. A collection of tools is illustrated in Figure 20.

A GPS reading for Section C is S 34° 05' 58.3" S 22° 05' 18.2"

#### The archaeological remains have been rated as having low local significance.

**Section D**: A low density scatter of a few MSA and ESA tools were found in Section D. The tools occur in old agricultural lands, in a highly disturbed context. The tools are spread very thinly and unevenly over the surrounding landscape. One flake tool was found on the upper, ripped slopes, while the remainder was found on the lower, heavily contoured (steep) slopes. Two flakes were found in the gravel road on the northern boundary of the proposed site. The remainder of the tools comprises several large, side-struck flakes, a few smaller flakes, one large core and one smaller (possible Later Stone Age) core. No formal tools were counted. All the tools are made on rounded quartzite cobbles.

A GPS co-ordinate for Section D is S 34° 05' 40.8" E 22° 05' 24.5"





Figure 20. Collection of stone tools in Section C. Scale is in cm



Figure 21. Collection of stone tools in Section D. Scale is in cm

**Section F**: Large numbers of MSA, ESA and smaller numbers of Later Stone Age tools were documented over a very wide area in Section F (Figure 22). Most of the tools occur on the upper slopes on old agricultural lands that have been partially contoured and terraced and are littered with many thousands of unworked round river cobbles. These lands have been quite heavily grazed and the tools are clearly visible on the surface. Smaller numbers of tools occur on the middle slopes as well as on the lower, steeper slopes, but these have mostly likely worked themselves downhill and are probably not insitu. Several hundred tools, including large and smaller flakes (both unmodified retouched and utilized), utilized and retouched blade tools (including several denticulates), miscellaneous retouched pieces, hammerstones, cores and many broken/flaked cobbles were counted. Several whole and incomplete (bifacial and unifacial) handaxes were also documented. All the tools are in quartzite and struck form large and medium sized round quartzite cobbles.

The large numbers of unworked flakes, cores, flaked and broken/smashed cobbles (including several hammerstones), relative to the (smaller) numbers of formal and utilized/retouched tools, suggest that this `site' may represent the remains of a Stone Age quarry and/or manufacturing site. Possible activity areas have also been identified (at S 34° 05 14.6 E 22° 05 30.5), where a handful of blades tools, flakes and a flat (worked out) core were found together in a small ( $\frac{1}{2}$  m<sup>2</sup>) area.

Such near coastal open air quarry sites are rare in the southern Cape landscape.

A collection of tools is illustrated in Figures 23-28, while Figures 29-34 indicate the context in which the tools occur.

The following GPS co-ordinates indicate the location of some of the tools described above.

S 34° 05' 14.3" E 22° 05' 30.1" S 34° 05' 23.6" E 22° 05' 4.0" S 34° 05' 27.5" E 22° 05' 31.9" S 34° 05' 31.5" E 22° 05' 34.6"

The archaeological remains have been rated as having medium-high local significance.



Figure 22. The estimated extent of the quarry site in Section F. Note that the majority of stone tools and manuports are concentrated on the upper partially terraced slopes, while archaeological material that occurs on the middle and steep lower slopes has most likely rolled downhill.



Figure 23. Collection of stone tools in Section F. Scale is in cm



Figure 24. Collection of stone tools in Section F. Scale is in cm



Figure 25. Handaxe in Section F. Scale is in cm



Figure 26. Collection of stone tools in Section F. Scale is in cm



Figure 27. Collection of stone tools in Section F. Scale is in cm



Figure 28. Collection of blade tools in Section F. Scale is in cm



Figure 29. Context in which stone tools occur in Section F



Figure 30. Context in which stone tools occur in Section F



Figure 31. Context in which stone tools occur in Section F



Figure 32. context in which stone tools occur in Section F



Figure 33. Context in which stone tools occur in Section F.



Figure 34. Context in which stone tools occur in Section F

It is interesting to note that no tools were found during an inspection of several old excavations and road cuttings, on the study site. These cuttings are characterised by sediments of the 'Buffelskloof Formation' and consist of conglomerates and gravels of extremely hard quartzite rounded cobbles and coarse to medium gravel clast in a matrix of clayey silty sand (M.J. Mountain and Partners 2008:2). This conglomerate forms the potential mining resource.

The `Buffelskloof Formation' is overlain by the younger `Hartenbos Formation' comprising mainly fine grained sandstones, siltstones and clayey siltstones of Late to mid Cretaceous Period (i.e. 65-100 million years ago.)

Sandy silts and colluvial gravels of Quaternary Age (i.e. younger than 1.5 million years) overlie much of the remainder of the site. These transported gravels include a layer of organic rich topsoil, between 5 and 25 cm thick. The inference is that most of the stone tools documented during the archaeological study are derived from these deposits (i.e. colluvial gravels).

#### 6. IMPACT STATEMENT

It has been shown that nearly 57% of the proposed new mining areas (i.e. Sections B, C, D and F) have already been transformed as a result of many years of agricultural activity. Excluding the very steep and vegetated hill slopes of Section B, this increases to almost 68%.

The archaeological study has shown, however, that proposed mining operations will impact negatively on important archaeological heritage remains in Section F. The archaeological scatters on this section may comprise the remains of a rare Stone Age quarry site, while possible activity areas have also been identified.

Proposed mining operations will impact (negatively) on archaeological remains in Section C and D but these remains have been rated as having low local significance, as they occur in an already disturbed context.

It is unlikely that proposed mining operations will impact negatively archaeological remains in Section B.

#### 7. RECOMMENDATIONS

With regard to the proposed prospecting for stone on Portion 11 of the Farm Hartenbosch No. 217 the following recommendations are made.

- Survey and mapping of the artefact scatter in Section F must be undertaken by a professional archaeologist, after which the material must be collected for analysis and storage. This is despite the fact that Section F may only be mined in about 20 year's time. No archaeological material may be collected without a permit issued by Heritage Western Cape.
- 2. Mining operations may proceed in Sections B, C and D

 Should any unmarked human remains be disturbed, exposed or uncovered during excavations and earthworks for the proposed project, these should immediately be reported to the South African Heritage Resources Agency (Mrs Mary Leslie 021 462 4502), or Heritage Western Cape (Mr Nic Wiltshire 021 483 9692). Burial remains should not be disturbed or removed until inspected by the archaeologist.

These measures must be included in the Environmental Management Plan (EMP) for the proposed project.

#### 8. REFERENCES

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