HERITAGE SURVEY OF THE KAMEELHOEK 477, ADMINISTRATIVE DISTRICT OF HAY,

FOR DOORNRIVIER MINERALS LIMITED

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INTRODUCTION

Umlando cc was contracted by Doornrivier Minerals Limited to undertake an archaeological impact assessment of a proposed mining area on the farm Rem. of Kameelhoek 477, Postmasburg, N. Cape. While the company holds prospecting rights for the area, they are undecided as to the type of mining that would occur, e.g. open versus shaft mines. No significant sites were observed to limit proposed mining activity.

The study area is located 14km west of Postmasburg (see figures 1 – 2). The immediate landscape is relatively flat with a few small raised hills. Larger hills do occur on the landscape, and many of these are being mined. Between these small hills are several small natural dams allowing for water catchments. The environment is mostly arid with small thorn bush vegetation. The thorn bush occurs throughout the study area, and is some places it is so dense one cannot walk through it. These occurred mostly in the middle of the study area and on the hills.

Archaeological visibility was very good in most of the areas due to the lack of ground vegetation. The surface geology of the area consists of manganese deposits, Dwyka outcrops, and the Whitehill Shale (Dr. G. Groenewald pers. comm.). The Whitehill Shale contains some important palaeontological species.

The impacts on the area will be:

- Prospecting areas
- Mining
- Access roads
- Excavations for mining activity

METHOD

The method for Heritage assessment consists of several steps.

The first step forms part of the desktop assessment. Here we would consult the databases. These databases contain most of the known heritage sites, and known memorials and other protected sites, battlefields and cemeteries in southern Africa. 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.

FIG. 1: GENERAL LOCATION OF THE PROPOSED MINE

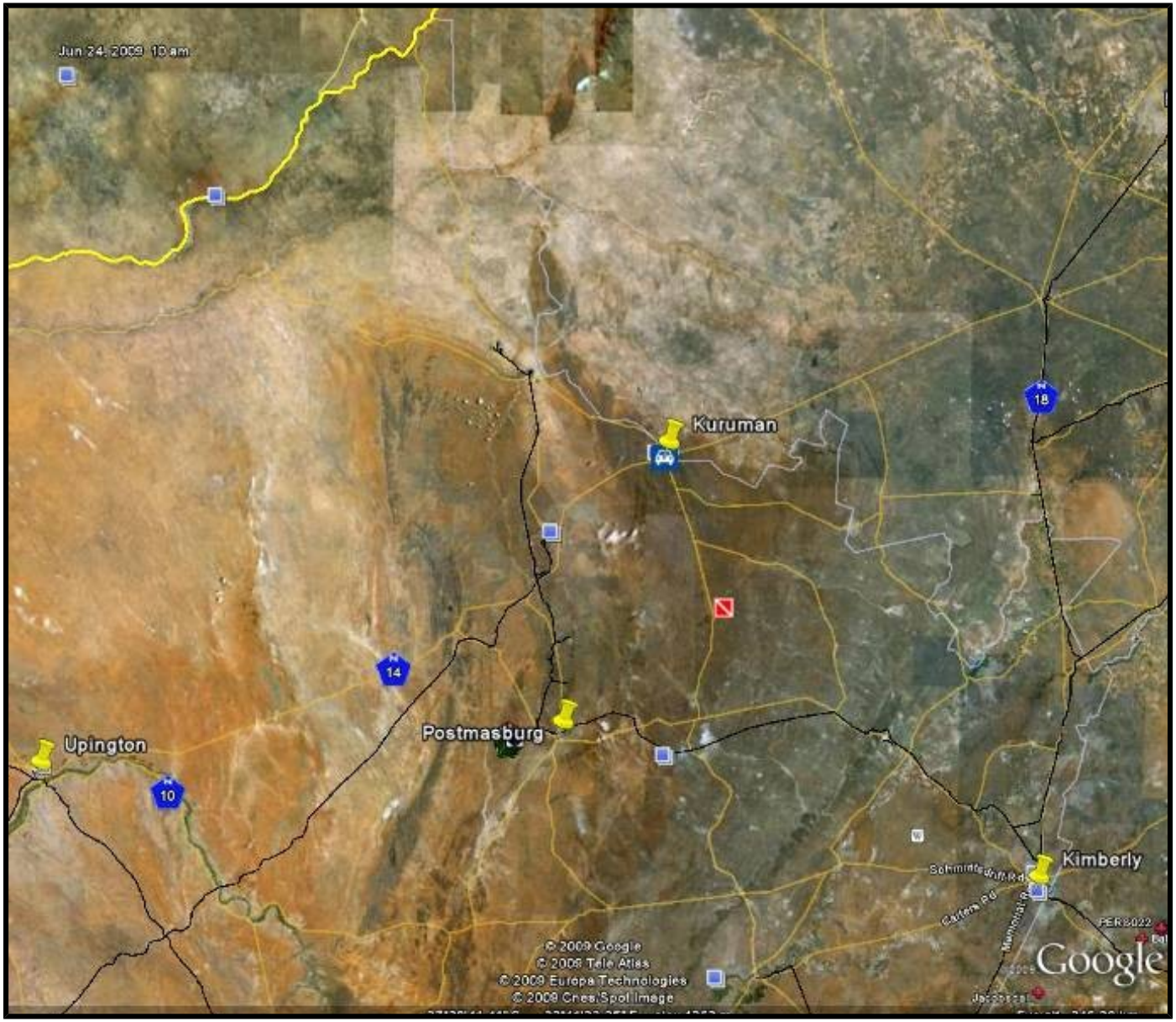


FIG. 2: LOCATION OF KAMEELHOEK

Survey Method

I began the survey in the western corner of the study area. This area was less dense with thorn bush and was relatively easy to survey. I undertook the survey walk paths close to each other working on the assumption that I would be able to observe many of the artefacts. This would allow me to make assumptions on artefact density and similarities/differences in the study area. That is if one area is intensely surveyed and yields the same types of artefacts, then other areas need not be as surveyed as intensely if they still yield the same material.

The survey yielded consistently similar types of artefacts across the entire study area. I believe this to be a representative sample of the study area. Any additional work would only be recording more of the same type of material. Figure 3 illustrates the walk paths over a three day period.

RESULTS

My definition of a Stone Age site requires at least ten stone tools in a specified area. The occurrence of other artefacts, such as pottery, beads, rock art, engravings, etc. adds to the definition of a site. This definition is mainly for the Late Stone Age (LSA), but it can be adapted for the Middle Stone Age (MSA), and Early Stone Age (ESA).

A total of 375 sites and/or artefacts were recorded during the survey. Figure 4 illustrates these finds.

For the purpose of this survey, I recorded artefacts and sites with the following definitions:

- LSA
    - Areas with 3 or less artefacts are considered as isolated scatters
    - Areas with 10 or more stone tools are considered sites. These included stone knapping areas, quarries, and scatters of artefacts
    - Includes engravings

- MSA
    - Artefacts that have facetted platforms and are generally ascribed o the MSA. This excludes MSA artefacts that have been re-used in the LSA
- ESA
    - These would generally consists of hand-axes or cleavers
- Quarries
    - This refers to previous prospecting that occurred in the 1950s
- Features
    - These are small structures made by humans and excluded houses, but may relate to houses
- Houses
    - Houses built for domestic or agricultural purposes and are older than 60 years in age.

LATE STONE AGE

A total of 261 areas had fewer than four artefacts. Most of these are individual artefacts. Of these individual artefacts, most are formal tools[1], and include backed blades[2], adzes[3], and scrapers[4]. The adzes tend to be made on MSA flakes. The adzes may date from 4000 years ago to the recent historical past. The scrapers vary in size and style; some are medium 'duck-bill scrapers, but none were related to the small thumbnail scrapers. This suggests that some of the scrapers predate 4000 years ago. The other types of stone tools observed were (utilised) flakes and various types of cores. The most common type of core is the irregular core, although I did observe two bladelet cores.

[1] This means that they have been purposefully modified into a certain shape for a specific function.
[2] Generally used for cutting
[3] Used for wood working
[4] Used for the removal of fat from animal hides

FIG. 3: WALKPATH FOR THE KAMEELHOEK SURVEY

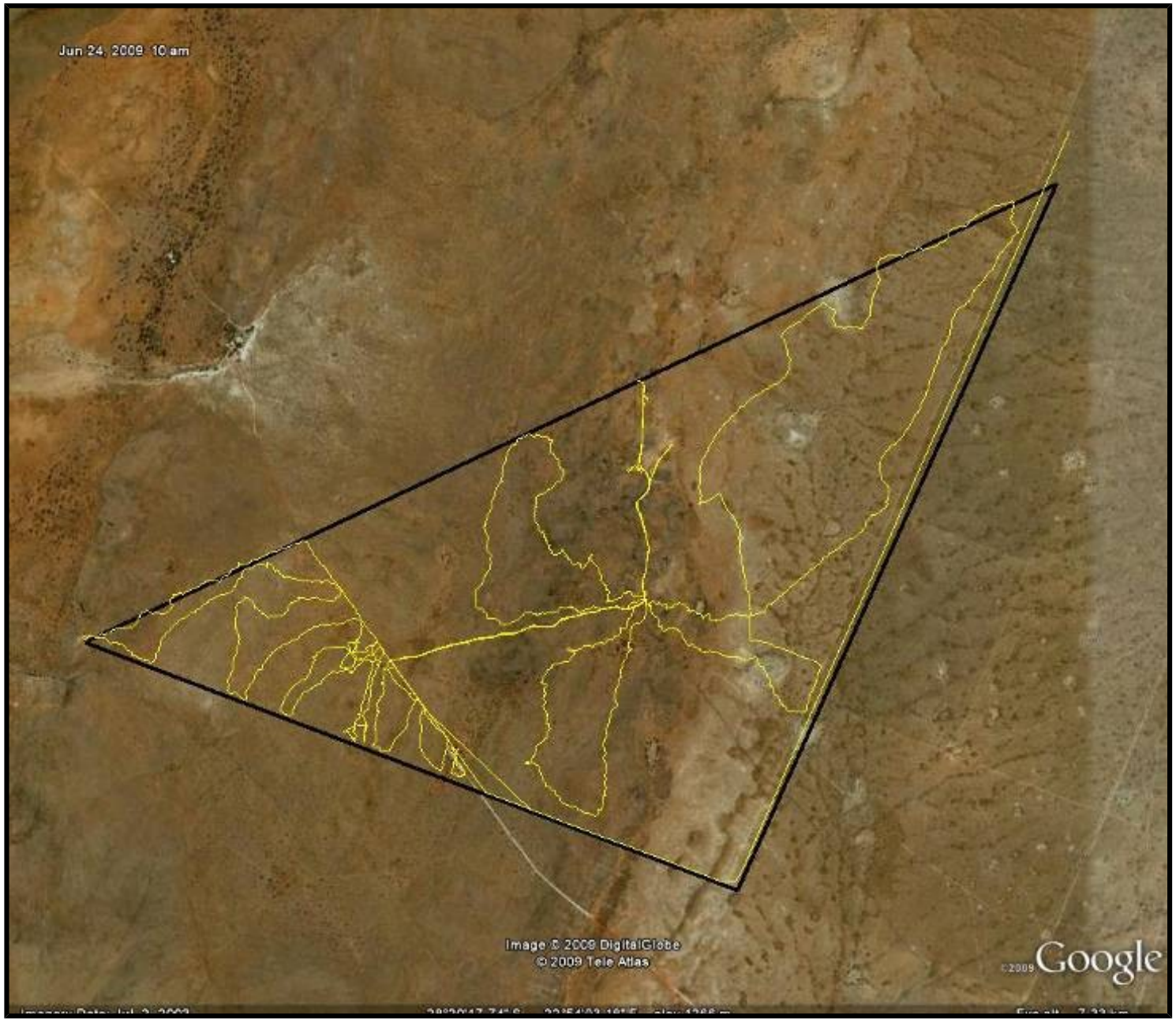
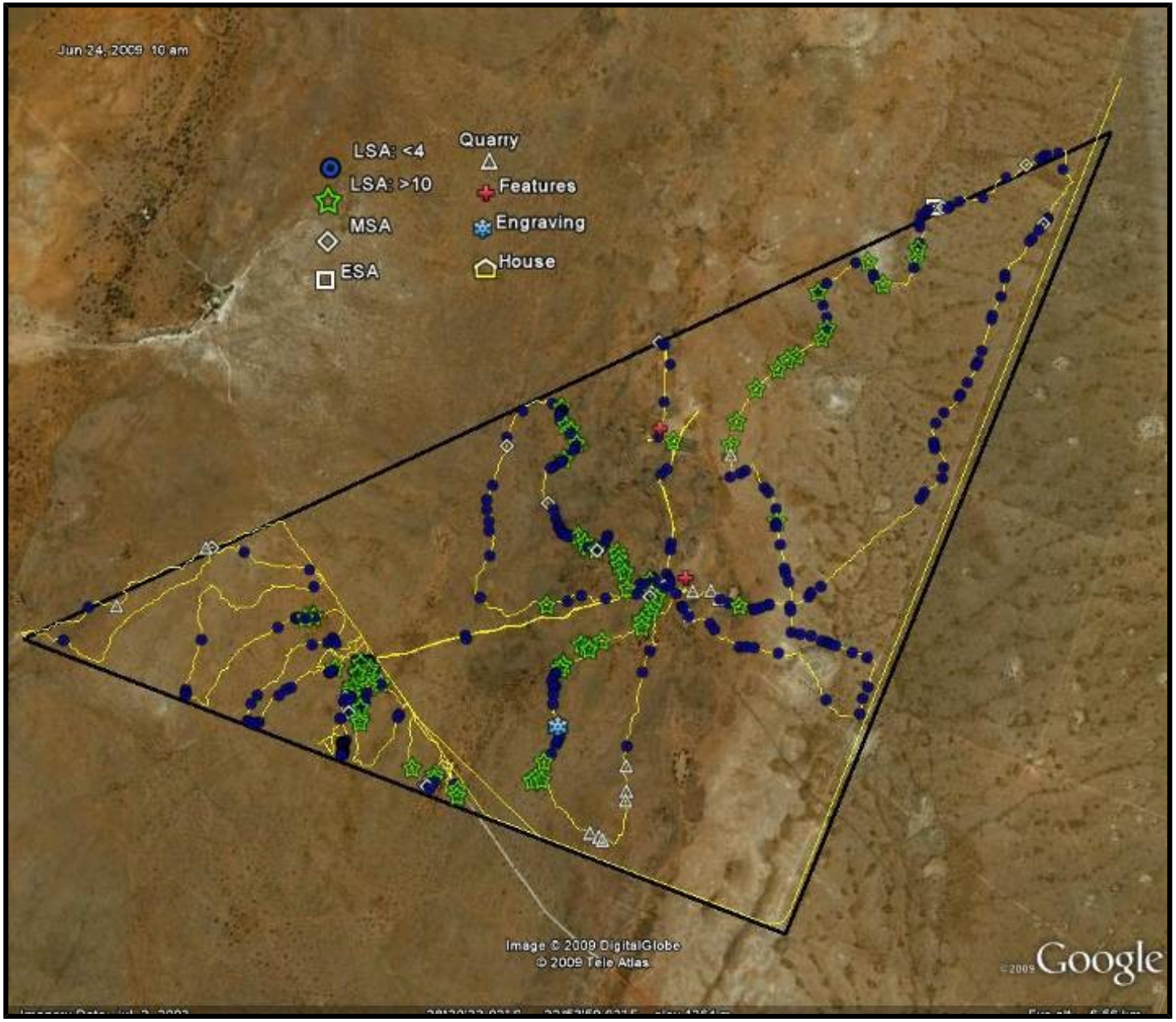


FIG. 4: LOCATION OF ARTEFACTS AND SITES FOR THE KAMEELHOEK SURVEY



The LSA sites, i.e. >10 stone tools, were surprisingly numerous. A total of 78 scatters were observed. The scatters were concentrated in tow types of areas: those with manganese and other hard rock outcrops, and just above watering holes. At the rocky outcrops, there was a variety of stone tools, and some of the sites were either stone knapping or stone tool quarry sites. That is, these are areas where the outcrops are used to obtain and then manufacture stone tools. Those areas above watering holes tended to have (utilised) flakes and formal tools, with no cores. The latter appears to be more of a hunting activity area, as opposed to a manufacturing area.

The LSA dates from ~25 000 years ago to the 19th century.

Significance: The individual occurrences of artefacts are of low significance. The sites, especially the manufacturing and possible “hunting activity” areas are of low to medium significance.

Mitigation: No mitigation is required for the individual scatters of stone tools. A selection of the sites with >10 tools should be systematically sampled if they are to be disturbed.

ENGRAVINGS

One piece of rock was located in the open and had several striations on it (fig. 5). It appears that these are engraved with a sharp object, as opposed to natural grooves. The former is V-shaped and the latter tends to be U-shaped.

Significance: The engraved stone is of high significance.

Mitigation: The engraving should be sampled.

MIDDLE STONE AGE

A total of 18 MSA artefacts were observed: this excludes MSA tools that have been modified in the LSA. All of these artefacts were isolated instances except for two areas where three MSA tools were observed near each other.

The MSA dates from ~120 000 years ago to ~25 000 years ago.

FIG. 5: ENGRAVED ROCK

Significance: The artefacts are of low significance.

Mitigation: No further mitigation is required.

EARLY STONE AGE

Only one small hand-axe was observed during the survey. By definition, the hand-axe is associated with the ESA.

The ESA dated from ~1 million years ago to ~120 000 years ago.

Significance: The artefact is of low significance.

Mitigation: No further mitigation is required, although it should be sampled, as it was the only one observed in the area.

QUARRIES

The term ‘quarry’ is broadly used to define the excavated prospecting holes. The quarries relate to the initial prospecting that occurred in the area in the 1950s (according to a local informant). I recorded a total of 13 quarries, although there may be more. In terms of the heritage legislation all features, or structures, older than 60 years may be

protected. Since these quarries are on the border of the 60-year mark, I recorded them anyway.

Significance: The quarries are of low significance, as there is nothing unique or special about they way in which they were excavated.

Mitigation: No further mitigation is required.

HOUSE

One house was observed in the study area (fig. 6). It does not appear to be older than 60 years, and the rubbish dump around the house attests to this. There is one area behind the main house that consists of eroded mud bricks. These probably predate the main house.

Significance: The house is of low significance and is not older than 60 years.

Mitigation: No further mitigation is required.

FEATURES

Two small features were observed. The first one is an oval-shaped area of manganese ~1.5m x 0.5m (fig. 7). The manganese has been broken, and placed into its formation. The second feature is of similar size and near the only house in the study area. This feature is almost rectangular, and is situated between the house and the ash dump.

Both features are probably only functional features of the general area; however, they may also be human graves.

Significance: The significance of the features needs to be tested.

Mitigation: While I do not believe these features are graves, this will need to be verified. Small test excavations can be undertaken to determine this.

FIG. 6: HOUSE AND ERODED MUD BRICK FEATURE

FIG. 7: TWO SMALL FEATURES

PALAEONTOLOGY

I gave the co-ordinates of the area to Dr Gideon Groenwald[5], with a brief explanation of the material I had observed. Dr Groenwald noted that the area, and specifically the calcrete formations, was significant for the occurrence of the Mesosaurus

> Mesosaurus was one of the first reptiles to return to the water in which its amphibian ancestors originally lived. It was around 1 metre (3.3 ft) in length, with webbed feet, a streamlined body, and a long tail that may have supported a fin. It probably propelled itself through the water with its long hind legs and flexible tail. Its body was also flexible and could easily move sideways, but it had heavily thickened ribs, which would have prevented it from twisting its body. Mesosaurus had a small skull with long jaws. The nostrils were located at the top, allowing the creature to breathe with only the upper side of its head breaking the surface, in a similar manner to a modern crocodile. Its most striking feature was its numerous, thin teeth. Each tooth had its own socket, but they were too thin to catch prey. Instead, they are thought to have been used to filter plankton from the water. Mesosaurus was significant in providing evidence for the theory of continental drift, because its remains were found in southern Africa and eastern South America, two far away places. As Mesosaurus was a freshwater animal, and therefore could not have crossed the Atlantic Ocean, this distribution indicated that the two continents used to be joined together[6].

Significance: The significance of the palaeontological remains may be high

Mitigation: depending on the type of mining activity, there are two options available for palaeontological mitigation, although both options would require a pre-assessment by a qualified palaeontologist. If open cast mining is the chosen option, then a palaeontologist may be required to be on site for the duration of the impact on the palaeontological sites/remains.

MANAGEMENT PLAN

There are two types of management plans for Kameelhoek: prospecting and mining.

[5] Dr Groenewald is the palaeontologist with whom Umlando subconsults on a regular basis. He is accredited with SAHRA as a palaeontological impact assessor. Dr Groenewald's comments were given without detailed geological reports.

[6] Source: Wikopedia

The activity associated with prospecting is unlikely to damage, or impact, the heritage sites. No further management will be required for the prospecting activity, provided that it does not occur on the two features that may (not) be graves. The cores to be taken are small and will not affect the palaeontological sites.

The management plan for the various types of sites is related to the type of mining that is planned for the study area. If there is opencast mining then every heritage resource in the study area will be affected and all sites (not individual artefacts) would require some form of mitigation. If the mining operation is via shafts, then only the areas where there are shafts and related infrastructure (such as roads, buildings, stockpiles, etc) would need mitigation. For the latter, the final construction footprints will need to be assessed in terms of their impact on the various sites, and these sites will need to be managed.

With the above in mind, the mitigation for the various types of sites and finds are as follows.

The possible human graves need to be tested: i.e. I would suggest that these two are excavated until either human remains are observed, or bedrock is reached. If human remains are observed, the excavations would need to stop, and a social impact assessment will need to be undertaken. I do not believe these are graves, but would suggest that this is verified. It is often too difficult to assess this without an excavation.

If open cast mining is favoured then I would suggest that at least 50% of sites (i.e. have >10 artefacts) are sampled. Open cast mining will destroy every site and thus needs to be adequately managed. The sampling size may be between 25m^2 – 50m^2 in size. The sampling would remove every artefact in that specified area. The sampling should also note the various types sites (e.g. manufacture versus hunting) in the area and ensure that these are equally sampled.

If the shaft mining option was chosen, then only a selected few areas would be affected. These areas would thus require immediate mitigation in the form of sampling or excavation. The numbers of sites affected will depend on the mining footprint.

The calcrete and Dwyka formations in the study area are of palaeontological significance. The type of mining operations will determine the type of mitigation required. If there will be open cast mining, then a palaeontologist should access the site after bush clearance and possibly during mining operations. This will need to be built into the safety regulations for the mine. This is because open cast mining will expose, and damage, the entire fossil horizon. Only a competent palaeontologist would be able to assess the horizons for palaeontological remains. If shafts are used, then a palaeontologist will need to assess only those areas that are affected by mining construction.

CONCLUSION

Umlando undertook an archaeological impact assessment of the farm Rem. of Kameelhoek 477, for Doornrivier Minerals Limited, near Postmasburg, N. Cape. The area currently has prospecting rights and the type of mining to be undertaken is undecided. The type of mining that will occur will determine the type of management plan that is undertaken. The area is currently marked for prospecting, and no further mitigation would be required.

While the sites are of low to medium significance, they should be sampled if they are going to be affected. Similarly, the palaeontological remains occur over the entire study area and need to be systematically sampled and monitored during construction activity. Two areas will need to be partially excavated to ensure that they are not graves.

If the archaeological management plan becomes part of the general management plan for the mine, then there is no reason for the archaeology to limit the proposed mining.