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INTRODUCTION

The archaeological survey of the Zulti North and Tisand mining lease areas began near the end of 1994. The survey program emerged from recommendations of earlier work by a Richards Bay Minerals initiative for a systematic archaeological survey ahead of dune mining activity. Both the initial and current survey form part of Richards Bay Minerals Integrated Environmental Management Program for dune mining. This report serves to consolidate the results of the 2004 archaeological survey undertaken by Umlando, in conjunction with Kwa-Zulu Natal Heritage (Amafa aKwa-Zulu Natali).

The terms of reference for this project are to:

- undertake an archaeological survey of the Zulti North and Tisand Lease area;
- to record archaeological sites and undertake appropriate mitigation,
- the results will be written in a report.

The 2004 survey and excavation season began with a new strategy. We changed the survey dates to monthly visits as too much information was being lost in the bi-monthly visits. This is important for when the mining ponds move faster than expected in some areas, e.g. MPC.

THE ENVIRONMENT

The area consists of a flat coastal plain interspersed with dune cordons, often greater than 150m in height. These dune cordons were formed during the Late Pleistocene as the sea retreated. This marine transgression resulted in several lakes being formed; often being estuarine, and the rivers were deflected to run parallel with the coastline. The KwaZulu-Natal coastal plains have been described as Coastal Dune Forest. Present day vegetation tends towards grasses along the flatter plains, although in the past they were Coastal Dune Forest. These changes in vegetation are probably a result of Iron Age farmers' slash-and-burn methods for clearing plots of land.

The soil tends to have a low nutrient status, although exceptions do exist. This is likely a result of the soil consisting of weathered marine deposits formed during the Cretaceous Period. This is in contrast to the hinterland that is mainly formed on the Karoo formations.

METHODOLOGY

All sites have been grouped according to low, medium and high significance for the purpose of this report. Sites of low significance have no diagnostic artefacts, especially pottery. Sites of medium significance have diagnostic artefacts and these are 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 or extensively sampled. The sites that are extensively sampled have high research potential, yet poor preservation of features. I attempt to recover as many artefacts from these sites by means of systematic sampling, as opposed to sampling diagnostic artefacts only.

Significance is generally determined by several factors. However, in this survey, a wider definition of significance is adopted since the aim of the survey is to gather as much information as possible from every site. This strategy allows for an analysis of every site in some detail, without resorting to excavation.

DEFINING SIGNIFICANCE

Archaeological sites vary according to significance and several different criteria relate to each type of site. However, several criteria 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 varies 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 before 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.

The more a site can fulfil the above criteria, the more significant it becomes. Test-pit excavations are used to test the full potential of an archaeological deposit. These test-pit excavations may require further excavations if the site is of significance. 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.

RADIOCARBON DATES AND NEW SAMPLING STRATEGIES

We have recently received a new set of radiocarbon dates from the CSIR that were submitted in 2003. Two samples from the same layer of four different sites were submitted. Each sample consisted of bone and marine shell. Marine shell and organic remains will yield two different dates from material from the same deposit: Marine shell tends to give an older date. The dating was necessary as there is no radiocarbon correlation between marine shell and organic terrestrial remains for the southern African East Coast. Most of the datable material in the RBM mining lease is marine shell, and thus a correction factor is needed if any of the marine shell dates are to be meaningful.

The CSIR and ourselves began an informal project to date both types of material to yield better, and more precise, radiocarbon dates from marine shell. This is important as organic material decomposes very quickly in the dune system, and is rare occurrences in most sites. The opposite occurs for marine shell: it is abundant and does not decompose as fast. Previous radiocarbon dates at RBM are from marine shell (Table 1 tabulates all of the dates; Appendix A is a copy of a letter from the CSIR).

The result of the new radiocarbon dates indicates that there is a range of variance between marine shell and organic remains (before and after calibration). This variance is not consistent. Moreover there are only four samples and this does not allow for statistical tests. The variance is also very different to the West Coast samples.

The result of these dates is that we need to sample sites with both marine shell and organic remains in the same layer. These types of sites can vary between multicomponent sites or single occupation sites. One of our new strategies is to target, sample, and/or excavate more shell middens that have the required material for radiocarbon dates.

This “new” strategy necessitated a meeting with the exploration teams who tend to locate several middens, and inadvertently damage these middens. The result of the meeting is that an on-site meeting will be held with RBM personnel and the contractors for:

- archaeological site awareness
- archaeological site significance[1]
- formulate a policy regarding the reporting of sites

We hope that this will allow us to sample more sites ahead of the actual mining program, and thus increase the sample size. A few sites have been damaged by the exploration department in the past, and we believe the above will counter further damage to archaeological sites.

THE SURVEYS

MPA

MPA31 is located south of MPC80 along the track that runs parallel with the electricity lines. The site consists of a variety of sherds. The site appears to have been partially disturbed by the construction of the electricity line. The rest of the site probably occurs uplsope in the undisturbed vegetation. The pottery appears to date to the Early Iron Age.

Significance and mitigation: The site will be monitored in the future.

MPA32 is located in front of MPA's mining face. The site consists of one shell midden and a scatter of pottery. The shell midden consists mainly of oysters, and a few mussels. This is unusual, as brown mussels tend to be more abundant in the shell middens. The pottery is thin-walled with a

[1] That is, significant, or large, sites are worth noting, while small, insignificant sites are not worth reporting.

red burnish. While the pottery is undecorated, it probably belongs to Group 7 pottery, early Late Iron Age.

Significance and mitigation: The site is of low-medium significance and no further mitigation is required.

MPA33 is located along a ridge of a high dune cordon eastward of MPA. Most of the site is still under vegetation. Several otoliths (fish ear bones) and one cockle shell. Otoliths are important in fish species identification and are rare occurrences in the dunes (often because of their small size)

We observed, and excavated, a human skeleton during a subsequent visit to the site. This is described below.

Significance and mitigation: The site is of high significance and further mitigation is required.

MPC

MPC76 has been described in the 2003 report. The part of the site that was re-recorded on this survey consisted of the western side of MPC76, along the eco-strip. Several Mzonjani and Ndondondwane sherds were observed, as well as shell, bone and slag. The bone consisted of aquatic mammal (hippo?). The shell consisted of mostly brown mussel and oyster fragments.

Significance and mitigation: The site was sampled, and has been previously excavated and sampled.

MPC 79 is located along the first dune cordon from Lake Nhlabane. MPC 79 is ±20 m x 50 m in area. The site consists of a single shell midden in a dark brown-black deposit. The shell consists of brown mussels. The pottery is thin-walled and undecorated. This suggests that it dates to the Late Iron Age. One white beach sandstone grinding stone was recorded as well.

Significance and mitigation: The site is of low significance and no further mitigation is required.

MPC80 is located south along the same dune cordon as MPC79. The site is a scatter of artefacts in a 30 m x 50 m area. The artefacts consist of limpets, brown mussels and pottery. The pottery sherds appear to date to both the Early and Late Iron Ages. It is possible that this site is a result of dune slumping due to dune mining.

Significance and mitigation: The site is of low significance and no further mitigation is required.

MPC81 is located south along the same dune as MPC80. The site is a scatter of pottery and shell over an approximate area of 50 m x 30 m. The shell consists of mussels and limpets. The pottery appears to include both Early and Late Iron Age fragments.

Significance and mitigation: The site is of low significance and no further mitigation is required.

MPC82 is located on a slightly raised area near the top of a sand dune. It is near MPC81, however, there is a definite separation between the sites, i.e. there is a no continuation of MPC81 to MPC82. MPC82 consists of a single disturbed shell midden, and no other artefacts. The shell consists of *Perna perna* and O*strideae*.

Significance and mitigation: The site is of low significance and no further mitigation is required.

MPD

MPD70 is located along the second dune cordon from Lake Nhlabane. The site consists of a scatter of artefacts that have been exposed by bulldozer activity. One shell midden was visible on the surface. The shell species consisted of brown mussels, oysters and limpets. Several grinding stones were recorded and these occurred on white beach sandstone and quartzite river pebbles. The pottery sherds are undecorated and vary in thickness. The site dates to the Iron Age, however it is not possible to allocate a precise date.

Significance and mitigation: The site is of low significance and no further mitigation is required.

MPE

MPE55 is located along the eastern back road of MPE. The site is a scatter of artefacts that have been disturbed by dune mining. There is a small shell midden in the section that has been opened by bulldozer activity. The artefacts consist of thin-walled pottery that is indicative of the Late Iron Age. The faunal remains consist of the ribs and metapodials of a large bovid (probably domesticated bovid). The shell consists only of *Perna perna* (brown mussel).

Significance and mitigation: The site is of low significance and no further mitigation is required.

MPE56 is located on the second dune cordon from Lake Nhlabane. The site has been exposed, and damaged by exploration drilling and bush clearance. MPE56 consists of at least two shell middens, several pottery sherds, and faunal remains and an ochre nodule. The shell includes *Perna perna, Patella spp.* (limpets) and O*strideae* (oyster). The faunal remains are from a large bovid and are well preserved. The pottery sherds are thin-walled and one has a red burnish. This suggests that it dates to the early to middle Late Iron Age.

Significance and mitigation: MPE56 was sampled and no further mitigation is required.

MPE57 was exposed by one of the exploration tracks. The site is currently ±5 cm below the surface of the track and extends beyond both sides of the track. MPE57 consists of at least one undisturbed shell midden: more of the site probably occurs in the vegetation adjacent to that rack. The midden appears to be well preserved and consists mostly of *Perna perna*. A few pottery sherds were observed near the midden. One of these sherds is part of a pot lid. The pottery appears to be Early Iron Age, or early Late Iron Age. The lid fragment from MPE57 was sampled.

Significance and mitigation: The site is of medium significance. Shell middens tend to preserve organic remains that otherwise decompose very fast in the dune environment. Furthermore, shell middens tend to occur behind houses, or in cattle byres, and thus a spatial component may exist. The site should have test-pit excavations to determine its full significance.

AMS

AMS1 is located at the in the container area of AMS. The sherds are probably displaced from various sites, however they were noted for their occurrence. The sherds include comb-stamped Late Iron Age pottery, as well Early Iron Age pottery.

Significance and mitigation: AMS1 was sampled and no further mitigation is required.

AMS2: Umlando was informed on the 27 August 2004 of a possible human cranium that was discovered at the Ascent Mining Services (AMS) area. This a dry mining area, north of Mining Pond E. Umlando was requested to write a report regarding the age of the skeleton, as this has implications for reburial. Part of a human cranium was found on the conveyor belt and we were requested to locate the rest of the remains.

The remains consist of the upper part of a human cranium: from the orbit sockets to the top of the cranium, i.e. less than a quarter of the cranium. No further human remains had been observed by the time of the site visit. Umlando and RBM personnel visited the dune above the AMS operations in order to locate the rest of the burial. No human burial was observed. It appears that the rest of the skeletal remains had already collapsed with the dune during mining.

Several artefacts were observed on the surface of the site (AMS2). These include pottery sherds, one large piece of slag, *Perna perna* fragments, and grinding stone fragments. No decorated pieces of pottery were observed, thus making it difficult to establish a more precise date for the site.

The cranial fragment is relatively well preserved suggesting that it has not been in the ground for a long time. The large piece of slag suggests that the site may be older. The more recent sites, especially those of the last 200 years, tend to have small pieces of slag and in low quantities. One sherd had a brown burnish, and another sherd had a red burnish. These tend to be associated with older sites.

It is not possible to associate a specific linguistic/cultural group to the skeleton without the occurrence of decorated pottery and/or radiocarbon dating. The site, and thus

skeleton, would have a maximum age of ±400 years, and a minimum age dating to the more recent past. That is, the skeleton may be associated with a Zulu or pre-Zulu culture[2].

Appendix B notes the policy regarding human remains, and the agreement made with RBM, Amafa aKwaZulu-Natali (then Kwa-Zulu Natal Monuments Council), and the relevant Tribal Authorities, in 1995. In this case, it is not possible to associate the skeleton conclusively to any specific group of people. Since the skeletal remains are very small, it has very little scientific and research value.

Significance and mitigation: AMS2 was sampled and no further mitigation is required. The AMS staff working the conveyor belts should keep all bone remains (irrespective if they are human or not) as well as all decorated pottery, whilst in this area. These should be handed in to the ecology department.

AMS3 is located on the top of a tall dune along the first dune cordon from the side of Lake Nhlabane. The top of the dune consists of an extensive scatter of artefacts. These artefacts may have slumped and form part of AMS2 artefactual content. A few undecorated pottery sherds and a dagga pipe fragment (with rim and lip) were sampled from AMS2. The pipe is decorated with a double row of impressions.

AMS3 had a variety of artefacts. These included: decorated pottery, grinding stones, slag, and an iron armband/bracelet. The bracelet has oxidised and is a thin hollow tube of iron. Several decorated sherds were sampled. These are as follows:

- Circular impressions on (everted rim and) lip
- Oval impressions on (everted rim and) lip
- Lip notching
- Row of four horizontal circular impressions on the body
- Isumpa on body
- Horizontal row of rectangular impressions on the neck

We observed several marine shell fragments and faunal remains indicating that a deposit may exist.

[2] Zulu-speaking people arrived in the are north of Richards Bay *c.* 1790AD

Significance and mitigation: Test-pit excavations should occur at this site.[3]

THE EXCAVATIONS

MPE 56 and MPE57

MPE57 was marked for further excavations from a previous survey. The survey noted an area with shell deposit. The test-pit excavations were undertaken in the same area previously tested. Unfortunately, the area with shell was very small and it appears that most of the midden had been previously removed when the road / track was made.

We then targeted MPE56 that is located further uphill from MPE57. The site had been exposed by bulldozer bush clearance, and several middens were visible. These middens were, however, very disturbed and were not sampled either. More in tact middens were observed in the bush area itself and these should be excavated at a later stage.

The final site marked for test-pit excavations was at MPD[4].This site had a potential midden that extended over a ±2m radius. We sampled a 1 m x 1 m square. The shell was on the surface and partially *in situ.* Some *in situ* deposit occurred at the base of the shell midden. Very little bone occurred in this midden, although some charcoal was observed. The shell consists mainly of *Perna perna*. This site did not yield enough material for radiocarbon dates.

MPA33

MPA33 was previously recorded early this year. The site was noted for its occurrence of otoliths (fish ear bones) and marked for re-inspection. The site was tentatively dates to the

[3] The site had been bulldozed by the time of our following visit to the site.

[4] The location for this site will be given in the next report.

Late Iron Age. The site was re-inspected this month after it had been cleared of vegetation.

A few human cranial fragments were observed on the surface of the site. These remains are near the crest of the dune. Closer inspection revealed that parts of the cranium still occurred below the surface, and four finger bones were busy eroding from the surface.

We proceeded with the excavation of the skeleton in an attempt to determine if it was in tact or fragmented by bulldozer activity: as was the case for the cranium. We realised that most of the skeletal remains were *in situ*, although the skeleton had collapsed northwards and eastwards. The skeletal remains were relatively well preserved especially the larger bones. The skeleton would have been in a seated position. The left arm had been placed between the tibia-fibula and femur while the right arm was above the femur, possibly near the chest. Most of the cranium had been crushed and was ±30 cm away from the rest of the skeleton, apart from the mandible that was inverted and above the chest. Very few rib bones were recovered. The skeleton is unusual in that it was facing eastwards or sunrise: The other excavated RBM skeletons have faced westwards (towards sunset)[5].

Unfortunately the wind picked up halfway through the excavation and started a mini-sandstorm (it was located on the crest of the dune that had been cleared of vegetation). The sand began filling the excavations faster than we could remove it and we were left with two options. First, stop the excavations and come back at a later stage. Second, excavate faster to recover as much as possible. The former was not viable, as my experience in the dunes has been that the skeleton would disappear underneath the windblown sand. This has been the case in the past even after an area has been demarcated. We chose the second option, which meant that detailed drawings were not possible, nor was it possible to photograph the history of the excavations. We did manage

[5] This is only the second Iron Age skeleton, along the east cost, that I have excavated that has faced sunrise and not sunset.

to photograph the initial phase of the excavation that showed the mandible and relative position of the forelimbs[6]

A general analysis of the skeleton can be made so far. The skeleton appears to be that of an adult male (all of the epiphysis and cranial sutures are formed, and the chin has a characteristic male appearance). The male was relatively tall (150cm – 180 cm). The bones do not show any initial signs of trauma and appear to be well formed. The teeth have been ground down, however this is the case for most of the skeletal remains in the dunes. The reason is probably due to the sand granules that would occur in the food from grinding stones and sand. A more detailed analysis would need to e undertaken by a physical anthropologist.

It is not possible to give a direct date for the skeleton. However, I believe that the skeleton dates to the Late Iron Age, rather than the Historical Period. While the pottery is, so far, undecorated, it is generally thin-walled. Other Late Iron Age sites occur near this site, and these may all be related.

SHARK TOOTH MIDDEN (STM)

STM was recorded in 2000, and noted for the shark tooth on the surface, the well preserved bone and a shell midden. This part of the site had been previously exposed by the RBM exploration team The lack of pottery, and high incidence of stone suggested that this site may be a Stone Age site, and not an Iron Age site. If this were correct, then it would be the first Stone Age site to be excavated in the RBM mining lease.

STM was excavated over three seasons (2001, 2002, and 2004). The aims of the excavations were to determine:

- the age of the site

[6] This is not ideal for skeletal excavations, however the severity of the wind and sand made it impossible to photograph, nor could we leave the excavations for a later date. The general area of the site was also to be burnt and we were concerned that this may affect the skeleton.

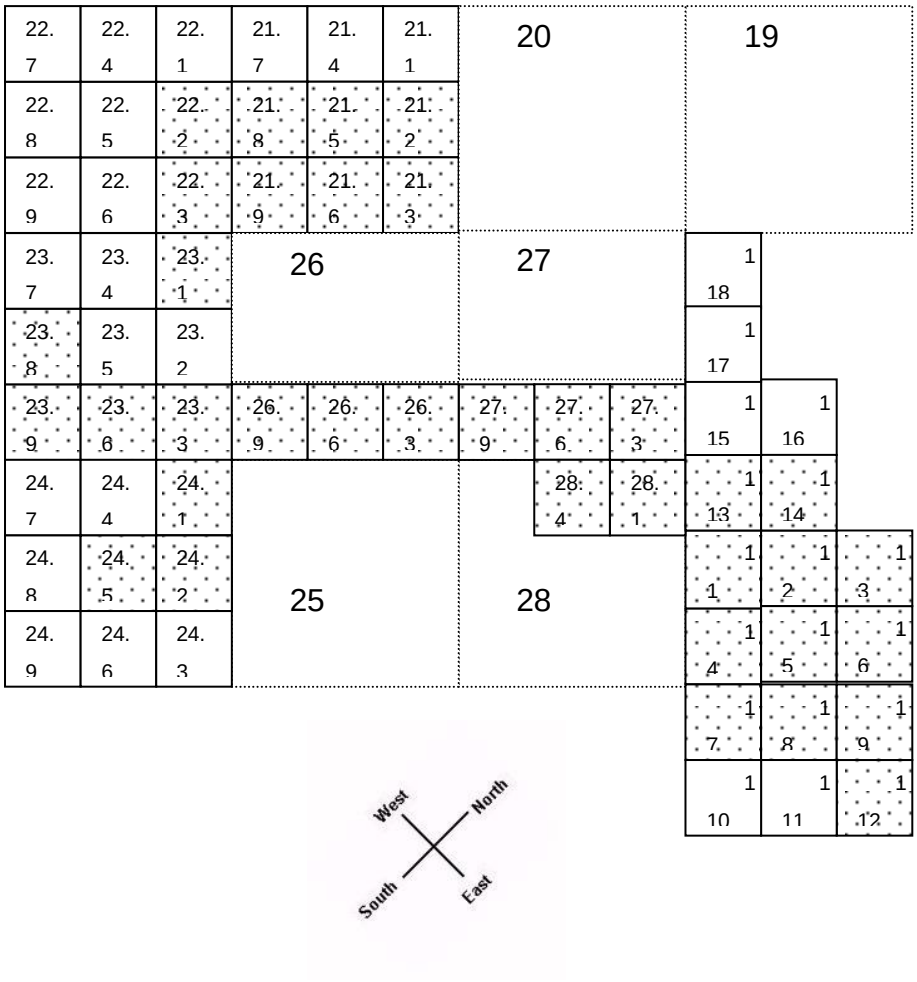
- if spatial patterns existed
- the degree of preservation of organic remains

The site was initially covered by dense vegetation (*Crimolina spp.*, *Casurina spp., Strelitzia spp. and Acacia spp)*. These were cleared and the site was set out in a grid. The initial grid along the old road was in 1m x 1m squares, while the later was in $3m^2$, or nine 1 m x 1 m squares. The western squares had little shell and I was hoping to locate a living area (fig. 1).

A total of 33 1 m x 1 m squares have been excavated (fig. 1). Several smaller test pits were excavated to the south, west and north of the main excavations to determine if the site extended beyond our estimate. A smaller shell midden was located southeast of the main excavations in the existing track. This will be excavated at a later stage.

Representative samples from each main shell lens were taken. These are referred to as bulk samples. All material from a bulk sample is kept for later analyses. A non-bulk sample will only keep the non-shell remains (unless there are rare shell species). The main reason for this is that shell middens have a high density of material and many institutions do not have adequate storage space.

FIG. 1: EXCAVATION PLAN OF STM [7]



[7] coloured areas indicate ecavated squares or areas with large roots damaging the stratigraphy

STRATIGRAPHY

STM consisted of several shell middens, ashy layers, pits and humic sand layers. The humic layers tend to be part of the shell lenses above or below them, and represent a hiatus between each depositional episode. Figures 2a – 2d illustrate the section drawings of some of these layers and lenses.

Lens 1 is mostly a scatter of shell near the surface of the site. Below Lens 1 is a grey ashy soil and a thicker, or more compacted, shell lens, called Lens 2. Most of the lenses occur in this manner. That is, there is a fragmented layer of shell on top, a thin sandy layer below, followed by a proper shell lens. The fragmented upper layer is probably a result of post-depositional disturbances, while the lower lens is the main lens. In this way, several lenses have been grouped together in the analyses, as they are the same lenses. Lens 2 lies on the sterile dune sand. Lenses 1 and 2 are the largest lenses of the site.

Lens A occurs at the top of the site 1 and 2. Lens A is a fragmented layer of shell near the surface of the site, but becomes thicker towards the south. Parts of Lens A are truncated by DFP.

Lens C is a thick compacted lens just above Lens 1. It becomes thicker towards the south and southwest. Occasionally Lens C lies directly on Lens 1, and at these interfaces it was difficult to discern between the two layers. There is a semicircle of stones in Lens C, but they do not appear to be any specific feature.

Lens B is located in the centre of Square 4 and is ± 1 cm below Lens A. Lens B forms a small basin of shell ±5 cm in depth. An animal burrow runs along the southern side of Lens B and into the section.

Ash Hearth Below Lens 1 occurs in Square 4 near Lens B. This hearth is a small pit of ash and burnt shell.

Dolphin Pit (DFP) truncates Lenses 1, A and C in Squares 1, 2 and 13. DFP consists of an ashy pit with some burnt shell at the base. The main part of this pit is a crocodile

cranium (originally thought to be a shark, then a dolphin!). DFP also includes bushbuck teeth and some fish bone.

Squares 27.3, 28.1, 3, 6, 7, 8 and 9 tend to have the edges of the various lenses.

Lens 20 consists of very compacted fragmented shell (mostly *Perna perna* and *Ostrideae spp.).* Lens 20 occurs most densely in squares 23.3 and 23.6, and then peters out. Beside it is Lens 20A, which is separated from Lens 20 by a large root, and thus may be part of the same lens. However, Lens 20A is less compacted than Lens 20 and it peters out towards the east. Lens 20B originally appeared to be part of Lens 20A, however there is a definitive difference in soil colour and texture, as well as shell species. The shell, *P. Perna*, is less fragmented. The soil becomes a lighter brown (than Lens 20) and the shell is noticeably less fragmented. The lenses angle downward towards the east section. Lens 20B peters out in Sq. 24.2.

Lens 21 and Lens 21A are below each other, except that Lens 21A extends into the north section of Sq. 23.9. There is a thin sandy layer between these two lenses. There is another thin sandy layer between Lens 21A and Lens 21B. Below these lenses is an ashy grey soil that appears to be the base of the site. Lens 21C is in a small pit, or deflation, in the northeast quadrant of Sq. 23.9. The shell is a layer of unopened *P. Perna*. The pit appears to be lined with waterworn shell and stone. The Lens 21 series angles downwards sharply towards the east. In general, the lenses appear to angle downwards sharply along the Square 23, 26 and 27 line. Lens 21C has the highest concentration of complete P. perna from all of the squares.

Lens 22 occurs adjacent to Lens 20. Lens 22 is very ephemeral along the edges and remains fragmented throughout its area.

Lens 23 lies adjacent to Shell Fragments B, and the latter may be the periphery of this lens. Lens 23 becomes more compacted and thicker towards the north. Above Lens 23 is Lens 23A. This is very similar to Lens top of Lens 1: i.e. very fragmented and ephemeral. Between these two lenses is a Dark Brown Sand (DBRS1-3). Lens 23B occurs in the DBRS as a separate shell lens. The Lens 23 series peters out before it reaches the 2001 excavations. There is a definitive separation between the lenses. This separation is in the

dorm of a Mottled and/or Dark Brown Sand with fragmented shell. Lens 23C is a very thick lens and similar in content as Lens 20B.

Shell Fragments and Shell Fragments B is below Lens 22. Shell Fragments A is a fragmented layer of shell and grey sand lying on Mottled Brown Sand. It appears to be a small dumping episode of some shell. Shell Fragments B is also an ephemeral layer of shell, but more dense than Shell Fragments. The two lenses are separated by a large root and may be the same lens.

Ash Pit is located along the northeast section of Sq. 23.3. It is situated between Lens 20 and lens 20B. The Ash pit consists of unburnt shell in a black and ashy soil. The shell is very fragmented and compacted.

ARTEFACTS

The analyses of the artefacts from this site are restricted to the 2004 excavations (Tables 2 – 4). The other material is at the Natal Museum and we have not had the time to analyse this material[8].

Stone tools

A total of 375 stone tools were recorded at STM: this number increases to 450 if grindingstones. Ochre, worked stone, etc. are included (Tables 3-4; Fig. 3).

The most common raw material for stone tools making is quartzite, followed by shale/dolerite, and quartz. The quartzite is locally available in the from of beach pebbles. A few stone tools are made from cryptocrystalline silicates (agates, jaspers, chalcedony, etc.). These tend to be found several hundred kilometres away[9].

[8] The material has been curated and boxed, however, the curatorial notes do not detail the number and/or types of special finds, nor to the weights of the bulk samples.

[9] I have observed other CCS flakes in the dunes during previous surveys

Formal Tools

A formal tool is a stone tool that has been purposefully modified into a specific shape for a specific function. Only two formal tools were recorded at STM: a backed blade and a miscellaneous retouched piece (MRP). This is a very low frequency of formal tools.

Utilised tools

These stone tools show evidence of being utilised. There is often small wear marks or chips of the utilised edge. There is a very low frequency of utilised pieces from STM. This may be because of sandblasting on the stone tools, thus masking utilisation.

Debitage

Debitage refers to the waste products from stone tools making, and are fragments of stone that were not utilised for any purpose. This includes chips (fragments of stone less than 10 mm big), chunks (cores with less than three negative bulbs of percussion), and flakes (stone with a positive bulb of percussion). Flakes are the highest occurring types of debitage, followed chunks. I would presume that many of these flakes have utilisation, and do not fall into debitage category. Chunks tend to be made broken upper grinding stones, or hammer stones. They mostly consist of large pebbles with few flakes removed. Chips are very scarce.

Cores

Cores are the pieces of stone from which flakes are struck. Irregular cores (no specific shape) are the most commonly occurring types of cores. These tend to be made from broken grinding stones, or hammer stones. These are mostly from beach pebbles. Bipolar cores (cores that have flakes removed from opposite sides at the same time), and single platform cores (only one side has been used to produce flakes) occur less frequently.

Other

Grinding stones form the majority of the ‘other’ category. Most of these are upper grinding stones, with a few lower grinding stones included. The upper grinding stones were

also used as hammer stones and/or mortars. Most of these are made from quartzite beach pebbles. A few manuports (on CCS) occur as well fragments of ochre.

In general, the stone tools from STM are average and consistent with the stone tools associated with Stone Age shell middens.

Bone

STM has well preserved faunal remains (fig. 4). The faunal remains fall into the following categories:

- Small bovid (*e.g.* duiker)
- Medium-small bovid (*e.g.* sheep)
- Medium Bovid (*e.g.* wildebeest)
- Aquatic mammal (*e.g.* crocodile)
- Pig (*e.g.* bushpig and/or warthog)
- Bird

These remains would need to be analysed by a specialist for identification. The faunal remains can suggest the type of environment in the dunes at the time of occupation. Several lenses have enough bone for radiocarbon dates (over 50g is needed per date) – discussed below.

Fish

The fish species vary, as there are a variety of sizes in the deposit. Several otoliths (ear bones) were recovered and these are important in fish species identification. A specialist will need to identify the fish remains. However, mussel cracker teeth and/or mandibles occur in many of the lenses.

Fish must have been a common food as the remains often equal, or better, that of animal bones in some lenses (fig. 4).

Bulk Shell Samples

The edible shell from STM consists mainly of *Perna perna*, followed by oyster, and some limpets fig. 5). Other species do occur however it is unlikely that these were for food.

Table 5 is a list of shell species previously recorded in other archaeological sites in the RBM mining lease[10].

The *P. perna* is the most common shell along the coast and in STM. Table 6 indicates the general statistics of these shell sizes from the various bulk samples. These shell lengths are from the 2002 excavations, as few complete *P. perna* were excavated from the other excavation seasons. The shell lenses tend to have the larger mussels. The small sizes of some mussels indicate that mussel collection was not selective (for the biggest); rather, that they were removed in bunches.

Table 6: *Perna perna* measurements

Layer	n	Mean	Median	Max	Min	Standard deviation
Ash Pit	5	2.191	2.410	3.390	1.295	0.883
Lens 20B	156	6.932	6.900	12.200	1.300	1.942
Lens 20C	247	7.146	2.410	11.755	2.150	1.719
MBS2	18	5.588	5.778	7.445	3.240	1.364
Roots	4	6.071	5.983	6.480	5.840	0.295
SGBS2	1	3.115	3.115	3.115	3.115	0.000
Spit 1	3	5.733	5.400	7.000	4.800	1.137
Total	434	6.918	6.965	12.200	1.295	1.878

Waterworn shell and stone are used to estimate, amongst other things, on sea turbidity. We have not analysed the material for this, as it is a specialised study.

Whale Barnacle

One complete whale barnacle was recovered. These barnacles are usually found on whales. The occurrence of whale barnacle in a shell midden implies that the people had access to a beached whale at some time.

[10] These were identified by Dr. R. Kilburn, Dept. of Malachology, Natal Museum, 1998.

Shell Scrapers

Two types of shell were used as scrapers: *Donax spp.* and *Tivela spp.*. They occur in varying quantities but there does not appear to be a preference for either shell. Shell scrapers are probably used in food or animal skin preparations.

Beads

Various types and sizes of beads were recovered. These consist of (in order of abundance):

- *Achatina spp.* (large land snail)
- *Nassarius kraussianus*
- Stone
- Bone

Achatina spp. beads (similar to ostrich eggshell beads) are the most common, followed by *Nassarius kraussianus* beads (Nassa.). The stone and bone beads are ±30 mm in diameter, and occur infrequently at STM.

Worked Stone

Worked stone excludes stone tools. Worked stone includes:

- Stone beads
- Stone sinkers
- Pendants

Only one sinker (for possible fishing) was recovered. It is a small pebble with grooves around it. The pendant is a possible pendant with a conical hole near the apex of the flake.

Worked Bone

The most common form of worked bone is the bone link shaft, or bone point. A bone point is used as an arrow head, while the link shaft is the piece between the arrow shaft and the arrow head. No complete examples were excavated.

A few pieces of bone had been polished. These normally occur on rib bones. No specific shape could be discerned

Worked Shell

Apart from the scrapers, other worked shell included pendants and an awl. The pendants are made from oyster or *Donax spp.*, and are not decorated. The 'awl' is made from a Donax spp. fragment and has the same appearance as a stone awl (or drill). These are used for piercing soft objects to make holes, e.g. into clothes, or for shell beads.

Seaweed

A few fragments of seaweed were recovered. These cannot be identified.

Seeds

A few seeds were recovered from the excavations. The seeds are carbonised and occur in shell lenses. That is, they are not post-depositional occurrences.

Coral

A few pieces of coral occur in the shell lenses. The isotopes from coral are useful palaeoenvironmental indicators.

DISCUSSION

One of the aims of the STM excavations was to increase the sample size of faunal remains and marine shell for radiocarbon dating. At least 50g of bone are required for a radiocarbon date. While this is not a large amount, it is rare due to the bioactive nature on organic remains in the mining lease. The 2004 excavations have at least three layers with enough material (faunal and shell) for radiocarbon dates. Four other layers may have enough organic material radiocarbon dates. These samples are important in building up the eastern seaboard radiocarbon database.

Another aim of these excavations was to excavate the living area of the site. That is, to locate the hearths, working and sleeping areas of the site. Unfortunately, these no longer exist. We placed several test-pit squares to the north and west of the main site, as well as several larger excavations besides the midden. The excavated squares were sieved with 2 mm sieves (to ensure debitage would not be missed), and excavated below the depth of

the middens themselves. A living area could not be located, nor could a significant amount of artefacts. The larger squares yielded very few stone tools, fire-cracked rocks (indicators of hearths) or other artefacts. I believe roots have disturbed the living area and the organic remains decomposed over time. Hearths were located, but only in shell middens.

STM is also important in that it is the first Stone Age site to be excavated in the dune system. The site has been radiocarbon dated to 2285 ± 40 BP[11], or 368BC. While this is not the oldest site along the coast, it is one of the first Stone Age sites to be systematically excavated along the eastern seaboard, and is thus of high significance. The remaining parts of STM will not be excavated as they are heavily disturbed by root activity. However, I have observed another shell midden ±20m from STM. This midden appears to be similar to STM. We will excavate this site in 2005.

CONCLUSION

The archaeological survey of the RBM mining lease has yielded more sites of which some have been excavated. The results of these surveys and excavations have yielded at least two rare finds: Late Iron Age skeleton facing sunrise, and the Late Stone Age shell midden.

The various excavations have produced more material for radiocarbon dates. A much larger sample is still needed to make comparisons viable. All of the early RBM radiocarbon dates are from marine shell, and these dates are not accurate. The formative years of the late Iron Age are thus still unknown.

Future surveys and excavations will be concentrating on sampling and/or excavating sites with datable material as well as diagnostic pottery.

The results from the surveys and excavations clearly show that valuable research material still occurs in the RBM mining lease.

[11] Before Present, i.e. 1950

APPENDIX A

COPY OF EMAIL FROM THE CSIR REGARDING THE RADIOCARBON DATES

Dear Gavin

I have just come from a meeting with Dr. Vogel and Siep Talma in which we discussed the implications of the recent set of radiocarbon dates that we analysed for you. The paired shell and bone samples allow us to calculate an offset for the marine reservoire effect which makes all marine radiocarbon dates appear older than they really are. Your results seem to suggest that this is a relatively constant value of 500 years. This is valuable data for us, and we spent some time comparing this to the West coast results that we have. Surprisingly they are in the same range. We anticipated that the W-coast offset should have been larger because of the upwelling of deeper, older water.

Unfortunately your samples provide 6 datapoints on the curve which is not sufficient to make any conclusive statements, especially as one or two of the results are obviously errors (probably becuase of the association between the shell and the bones). If we really want to advance the science we will require more samples that we hope can fill some of the gaps. We also need to re-analyse samples from the problem data in order to exclude bad data.

All of this work will help us to better understand the use of radiocarbon in dating E-coast samples. Obviously this is very important for archaeologists, but it is also directly relevant in some of the other research that I am involved in. This includes understanding dune dynamics where we use radiocarbon to date shell inclusions, and also our collaborative work with the council for geoscience in which we are using 14C to date subtidal geomorphological features. These link together to help us understand coastal morphology and sediment mobility in response to sea level changes.

I would be most appreciative if you could continue to look out for paired shell and bone/charcoal samples in the course of your work. What I can offer to do is to analyse the bone samples at my expense where this can be twinned with your own sampling strategy using shell. Although this is not really the way that it works - I would also like to try to fill the gaps in the current data set, particularly betweeen 1000 and 3000 years ago. I have no doubt that with a few more data points we will confidently be able to draw the appropriate conclusions. We would like then to go to print in a scientific journal and would obviously make you a co-author. If there is any other contribution we would acknowledge that appropriately.

Please will you let me know if you are able to help us further.

Regards

Stephan

APPENDIX B

POLICY FOR TREATMENT OF HUMAN REMAINS AT RICHARDS BAY MINERALS

Umlando was requested to draw up a policy document for the treatment of human remains at RBM. The initial archaeological program at RBM had a general policy and procedure. This was agreed to by the relevant Tribal Authorities, RBM, Kwa-Zulu Natal Monuments Council and Gavin Anderson (then from the Natal Museum).

This policy was as follows:

1. Skeletons in the dunes may be excavated by an archaeologist
2. The site, and position of the skeleton, will be recorded by a GPS
3. The accession institute will curate the remains.
4. The skeletal remains may be analysed by a physical anthropologist.
5. If the skeletal remains date before the arrival of the MBonambi and MThiyane, then the accession institute shall continue to curate the remains.
6. If the skeletal remains date after the arrival of the Mbonambi and Mthiyane, then they would be temporarily curated at the accession institute. However, once the dune had been mined and then rehabilitated, the skeleton would be returned to its original burial place (hence the use of GPS). The appropriate rituals would then be observed.

I do not believe there is any reason to change this policy. However, a procedure needs to be established for future skeletal remains. This is also important since there is new legislation since the original agreement.

Human remains, and specifically old ones, are governed by the Human Tissues Act, the KZN Heritage Act, and the South African Heritage Resources Act. The latter two may claim human remains that are older than 60 years. The police MAY NOT claim such remains unless they have been given permission by the above agencies. If there is possible dispute regarding the age of the skeleton, then the burial needs to be visited by both a qualified archaeologist and a member of the SAPS. A good indicator for the age of a skeleton, in the dunes, is to note if any flesh exists. If there is flesh then the police can remove the remains. If no flesh occurs, then it is in all likelihood an archaeological skeleton.

The area needs to be immediately demarcated and designated a "no-go" area. That is no more earthmoving and/or bush clearance should be allowed within 10 m radius of the remains (I use 10m for convenience although a wider area may be claimed). We need to

discuss what kind of demarcation may be used. For the time I think we could use the green for the ecology sign since people all know green markers mean a no go area. If a skeleton is found then the person who located the skeleton should go through the RBM chain of command until ending up at ecology, and thus at Rynhard Kok, who will in turn inform Umlando. Since we are only 1.5 hours drive away we can often be there at short notice.

Ethics: I am not sure about the law, but our professional association has ethics regarding the treatment of human remains. If any remains are visible from the surface they should be covered (with sand or netting), and not removed. If any remains have been removed, they need to be placed in a box, and stored in their own area (e.g. a cupboard). Human remains are not allowed to be photographed, displayed or treated in an undignified manner. All remains are to be treated with respect. It is traditional to enter a burial site without shoes, and by association, the excavation of human remains should be undertaken barefoot. However, RBM safety regulations do not allow for this.

According to the Kwa-Zulu Natal Heritage Act of 1997, historical and archaeological skeletal remains need to go through a specific process. Amafa aKwaZulu-Natali is the government agency that deals with human remains. All ancestral claims to any human skeletal remains in Kwa-Zulu Natal need to be made via Amafa aKwaZulu-Natali. They are the curators of these remains until an agreement has been reached. This is important as local communities and developers, such as RBM, cannot automatically request skeletal remains to be returned.

The following is a step-by-step process for human remains:

1. Graves are noted and an estimated date is given to the graves.
2. If the graves appear to be less than 60 years old, then they do not fall under the archaeological/historical Acts. Local communities should be involved in order to determine if anyone claims the ancestors/human remains of the graves. If no one claims the graves then they become the property of the state.
3. If the remains are older than 60 years, then the relevant communities need to be informed. If they claim the graves then they need to prove that these are indeed their “ancestral remains”. Such a claim needs to go via Kwa-Zulu Natal Heritage or SAHRA.

4. The relevant authority (Kwa-Zulu Natal Heritage or SAHRA) then takes over the process of reburial or removal.

5. The graves need to be “advertised” in the newspapers as if it were a notification of intent as in environmental scoping exercises.

6. If no one claims the human remains, and if they are older than 60 years, then a qualified archaeologist needs to excavate the remains and store them at the correct institution.