

**The Archaeological Surveys and Excavations of the  
Zulti North Mining Lease**

*For Richards Bay Minerals*

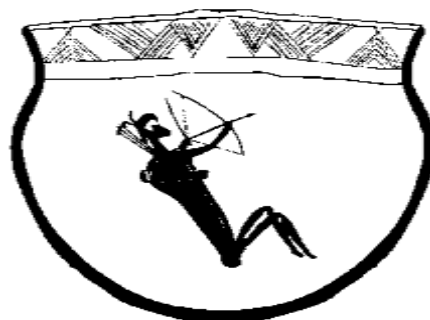
**2017 Annual Report**

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**Umlando: Archaeological Tourism and Resource  
Management**

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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

## INTRODUCTION

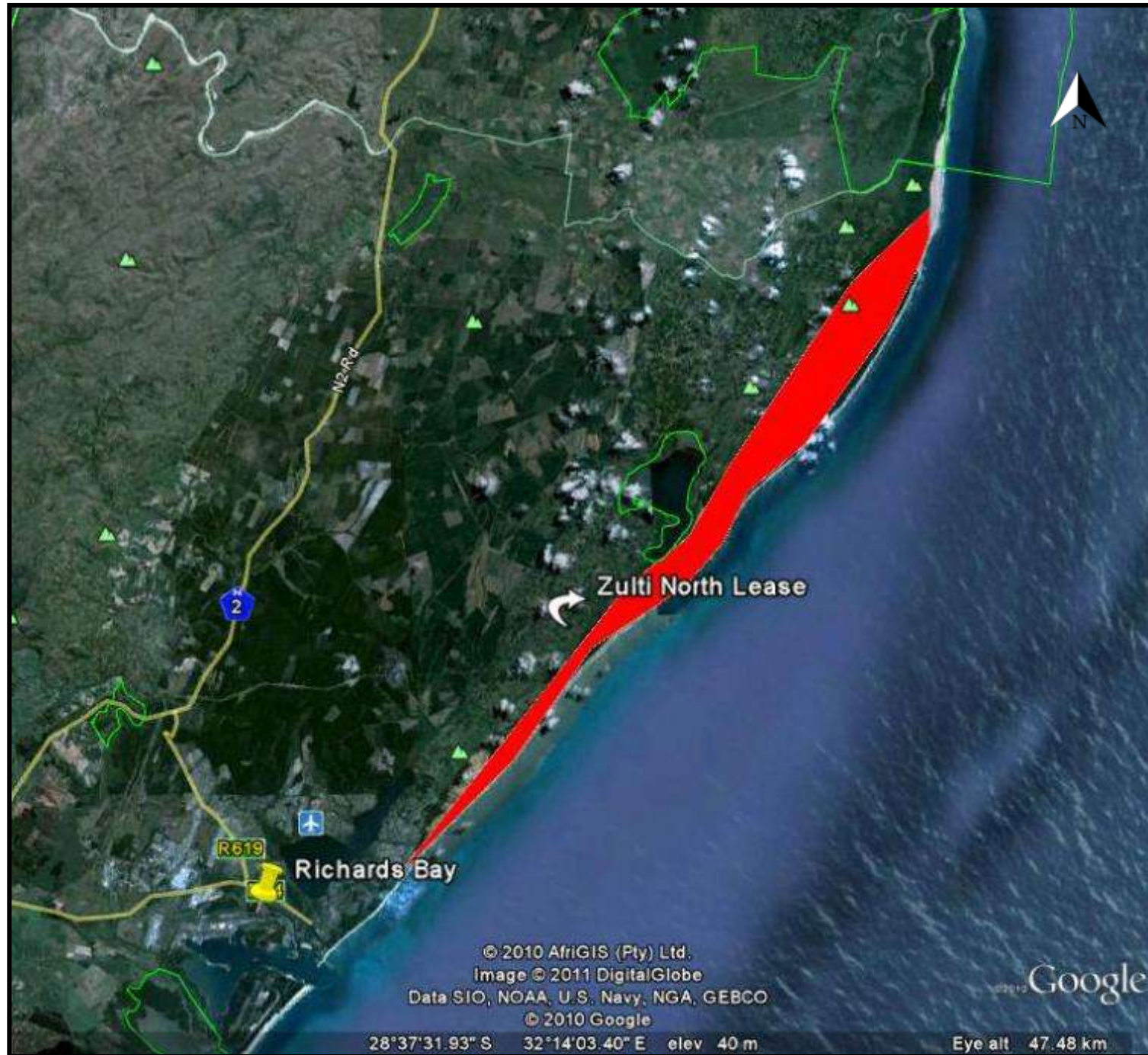
Umlando is contracted by Richards Bay Minerals (Pty) Ltd to undertake archaeological surveys and excavations in the Zulti North mining lease. The mining lease is located north of Richards Bay, KwaZulu-Natal and occurs along the eastern seaboard. (Fig.'s 1 - 2).The program consists of bi-monthly surveys, while excavations occur when needed. The archaeological program has been in progress at RBM Zulti North since 1995.

A total of 13 new sites were recorded in 2017, while several sites were continuously monitored and sampled. Three sites were excavated and others have been noted for future excavation. It appears that MPE and Red Dunes still continue towards archaeologically sensitive areas and MPC remains in an area that has been partially mined by dry mining. MPA and MPD did not progress far in terms of distance in 2017.

There have been at total of 462 archaeological sites recorded in the Zulti North mining lease since 1995. This number excludes large sites that have been subdivided. Most of these sites date to the Late Iron Age and Historical Period, while a few date to the Early Iron Age. Three San hunter-gatherer sites have been recorded and/or excavated. These sites are rare in the dune system as they tend to be ephemeral or assumed to be Iron Age sites.

The excavation results have yielded an increase in general sample size of faunal remains, shellfish species data, such as mean sizes and density. These have relevance to contemporary research. The excavation also continued to yield results that are different to previously excavated sites. The importance in the excavations is that there is a very tight sequence over the last 1700 years in the dune system. That is, the sites will eventually give a near continual coverage of the last 1700 years in the dunes. It is rare to cover a long continual period in a well defined area. The excavation of five human graves from the same site is very significant as it opens research options.

**Fig. 1: Location Of The Zulti North Mining Lease**



**Fig. 2: Location Of Recorded Archaeological Sites In The Mining Lease**





# METHOD

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, 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 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. We attempt to recover as many artefacts from these sites by means of systematic sampling, as opposed to sampling diagnostic artefacts only.

## Defining significance

Archaeological 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?
  - 3.2.1. 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.

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.

# **RESULTS**

## **SURVEYS**

Often sites are covered by vegetation during a survey and thus their extent is estimated. We continue to monitor the site until it is mined and update the records accordingly. Some sites are not photographed as the dense vegetation does not allow for any representation. All diagnostic pottery, unique finds, well preserved faunal remains, and occasionally shell, is sampled from each site regardless of its significance. The sampling strategy allows for most sites to be represented since dune mining will destroy the entire site. It is also for this reason that sites with intact middens and/or deposit are targeted for excavations, since few of these remain intact after bush clearance.

Most sites are photographed, except those that have been widely dispersed and the general shape of the hill has been changed.

### **MINING POND A**

No new sites recorded.

### **MINING POND C**

No new sites recorded.

### **MINING POND D**

## MPD 106

MPD 106 is located on the first dune cordon from the ocean. It consists of an ephemeral surface scatter of brown mussel and thin walled pottery, over a 30m x 20m area (fig. 3). The site dates to the Late Iron Age.

Significance: The site is of low significance.

Mitigation: Monitor

**Fig. 3: MPD 106 General View**



## **MPD 107**

MPD 107 is located next to the road, on the ocean-side of the RBM main road, which runs adjacent to the district road to Maphelane.

It consists of a surface scatter of human bone fragments which were exposed by bulldozer activity during the positioning of the nearby pipeline (Fig. 4). It appears as if the skeletal remains were originally on the top of the dune, but were thereafter scattered along the slope.

The pottery associated with the site appears to be Group 8 – 9 pottery, and thus are related to the Mbonambi people.

Significance: The site is of high significance.

Mitigation: We have removed the remains and we are monitoring the site.

## **MPD 108**

MPD 108 is located in the valley between the first and second dune cordons from the ocean. It consists of a single, small, *in situ* shell) patch of *Perna perna* in the middle of the road.

Significance: The site is of low significance.

Mitigation: Monitor

**Fig. 4: Human Remains On The Surface At MPD 107**



## MINING POND E

### MPE 170

MPE 170 is located at the top of a single, small dune within the third dune cordon from the ocean, or the first dune overlooking the hinterland (Fig's. 5 – 7). It consists of a several dispersed and *in situ* shell middens, scatters of pottery, faunal remains and grinding stones. The pottery is decorated with comb-stamped impressions indicating that it is Group 7 pottery and associated with the Thembi-Tsonga people. The artefacts occur over a 200m x 60m area with the edge of the dune being reserved for shell middens.

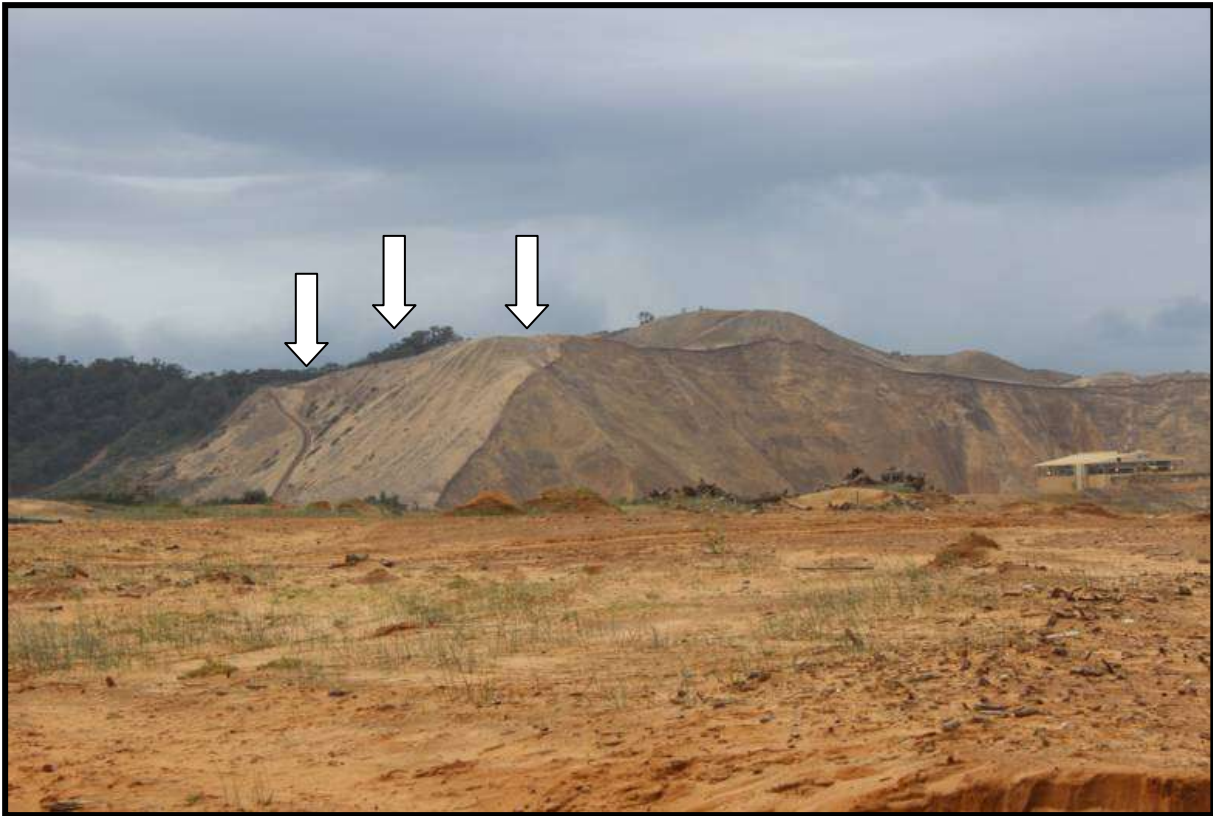
The site was first recorded in 2016 whilst under dense vegetation. Several fragments of human bone were noted around the site. These were recorded and the specific area was monitored. In April 2017 the area was being cleared for mining, and we noticed a single human burial. This was excavated and the area monitored. Thereafter we excavated two shell middens, and one more human grave, while more human fragments were noted. We then requested the area to be cleared and not mined for a month so that we can undertake proper monitoring for human remains. RBM agreed to move the mining plant away from the area with immediate effect. This is only the second time since 1995 that a mining pond was requested to be diverted for an archaeological site. RBM should be commended for doing this.

A total of six human burials were excavated and/or salvaged, while three areas of small human fragments were recorded and sampled. Two shell middens were sampled. The site is discussed in detail under "EXCAVATIONS".

Significance: The site is of high significance

Mitigation: Excavation and monitoring.

**Fig. 5: MPE 170 Viewed From RD014<sup>1</sup>**



**Fig. 6: MPE 170 Westwards**



<sup>1</sup> The left and right arrow indicate the edge of the site



**Fig. 7: MPE170 From The Southeast**



### **MPE170f**

The site is on the edge of the first dune cordon form the hinterland. It is situated between the base of MPE170 and the edge of MPE174. The site has a large shell midden that has been cleared by the bush clearance activity and exploration drilling teams. The site is ~40m in diameter and probably consists of two houses.

The pottery is varied, but one sherd had circular impressions. This makes it part of Group 6 pottery. Some lips have incisions and impressions and some Group 7 pottery was also noted. Several upper and lower grinding occur around the site, as well as faunal remains. The pottery from the site appears to be a mix of Group 6, 7, and some Group 8 pottery as it is in the middle of the two sites.

The site was monitored since April due to its proximity to MPE170. In late November we noted two human skeletons being exposed. The excavations of the human remains are discussed under “EXCAVATIONS”

Significance: The site is of high significance

Mitigation: Excavation and monitoring.

### **MPE 173**

MPE 173 is located on the first high dune cordon from the shoreside of the Red Dunes. The site consists of a surface scatter of fragmented white beach sandstone, lower grinding stone fragments and shell (*Perna perna*, oyster, whelk, limpet), over a 10m x 20m area. No *in situ* midden was visible. The site is not dated.

Significance: The site is of low significance

Mitigation: Monitor.

### **MPE 174**

MPE174 is very similar to MPE173. It is located on the first high dune cordon from the hinterland of the Red Dunes. The site consists of a surface scatter of white beach sandstone, lower grinding stone fragments, undecorated pottery and shell (*Perna perna*, oyster, whelk, limpet), over a 10m x 20m area. No *in situ* midden was visible. Much of the site was still under vegetation.

Significance: The site is of low significance

Mitigation: Monitor.

### **MPE174b**

MPE174b is located about 50m from MPE174 and 30m northeast from MPE170f. It was exposed at a later stage by bush clearance. The site appears to be a single homestead with some pottery, shell and more importantly two glass bottles. The one bottle appears to be a case gin bottle dating to the late 19<sup>th</sup> century. The second bottle has the “Kilmarnock” stamp on it: but only the “Kilm” is visible as the rest broke off. The story behind this stamp is as follows:

“Originally known as *Walker's Kilmarnock Whisky*, the Johnnie Walker brand is a legacy left by John "Johnnie" Walker after he started to sell whisky in his grocer's shop in Kilmarnock. The brand became popular, but after Walker's death it was his son Alexander 'Alec' Walker and grandson Alexander Walker II who were largely responsible for establishing the whisky as a favoured brand. British Prime Minister Gladstone's Spirits Act of 1860 legalised the blending of grain whiskies with malt whiskies and ushered in the modern era of blended Scotch whisky Andrew Usher of Edinburgh, Scotland, was the first to capitalise on blended Scotch whisky, a more accessible whisky that was lighter and sweeter in character, making it much more marketable to a wider audience, followed by the Walkers in due course ([https://en.wikipedia.org/wiki/Johnnie\\_Walker](https://en.wikipedia.org/wiki/Johnnie_Walker))

“When John finally passed away after a full and prosperous life in 1857, he left his son, Alexander, with a very healthy business.

These were fast moving times. Britain was the pulsating heart of an Industrial Revolution that was set to change absolutely everything. In Kilmarnock, the railway had arrived, carrying goods to the great ships that were plying regular routes to the four corners of the world.

Alexander knew a golden opportunity when he saw one. In 1867, he launched Johnnie Walker's first commercial blend and called it 'Old Highland Whisky'. He then made the astute move of engaging ships' captains as his agents to carry his whisky wherever ships could sail. Before long, his unique blend was available around the globe.

Soon afterwards, Alexander began using the famous square bottle to reduce breakages and made sure much more of his whisky arrived intact at its destination. He also added the distinctive label, slanted at precisely 24 degrees, to make it stand out even further from the crowd.

In 1889, it was Alexander's turn to pass on the Walker name, leaving the company to his sons, Alexander II and George - the former a master blender and the latter a master businessman.

In 1909, Alexander and George renamed their successful new range of whiskies after the colours of their distinctive labels. Johnnie Walker Red Label and Johnnie Walker Black Label were born" (<https://www.johnnie-walker.com/en-za/the-world-of-johnnie-walker/the-johnnie-walker-story/>)

The bottle is thus an 'Old Highland Whisky' and arrived at MPE174b either via Durban or the 'Port of Richards Bay' between 1870 – 1909. Fig. 8 shows an example of the bottle found at the site. These dates coincide with the case gin bottle of which an example is shown in fig. 9. The site is being monitored and several shards of the two bottles are exposed at each survey.

Significance: The site is of medium significance due to the rarity of the bottle.

Mitigation: Monitor.

Fig. 8: Example Of Walker's Kilmarnock Whisky Bottle



**Fig. 9: Example Of Case Gin Bottles**



**MPE177**

RD040 is located on the eastern edge of the Red Dunes before the main dune cordon begins (fig. 10). The site was noted by bush clearance team who then notified Umlando via the correct channels. The bulldozer had started to expose a shell midden when it was noticed. Work was halted and the site was assessed by Umlando. The midden is very well preserved and contains possible crocodile and/or hippopotamus bones.

The sensitive area was demarcated and permission to clear the rest of the site was given. We did note that there is a very high chance of finding human remains at this site. The site is marked for excavations in 2018/2019.

**Fig. 10: Location Of RD040 And Exposed Midden**



## **RED DUNES**

Several sites were recorded along this section. The area was originally referred to as “Red Dunes” on the 1942 1:50 000 topographical map and we have retained the name for historical reasons. It is the dunes inland of the main mining area that have a distinctive red appearance, presumably from a high mineral content. We are discussing these dunes with two RBM geologists as the archaeological material can be used to provide a relative date for these specific dunes. There is one area of the dunes that has a high concentration of stone tools. These tools date from the Early, Middle and Late Stone Ages. The important date is that of the Early Stone Age. This Period is not older than 1.5 million years. Since we are finding artefacts of this age in the dunes it means that the Red Dunes predate 1.5 million years in age.

### **RD014**

We revisited RD014, a site previously recorded in November 2013. Then it was a surface scatter of Late Stone Age flakes and Early Iron Age pottery. Now, almost

three years later, Dry Mining and erosion by wind and rain, has exposed a hard, geological layer upon which lies a conflation of Early, Middle and Late Stone Age stone tools. These are shown in figures 11 -13. A brief analysis is shown in Table 1. The tools include:

- Choppers
- Possible hand axe
- Unifacial points
- Various utilised flakes
- Various cores

RD014 was systematically sampled over four visits. This site is important as it is the first ESA and MSA site recorded in the dune system. We have recorded several of these sites in Richards Bay area, but not in the dune system itself. The ESA tools date to c. 1.5 million years ago, and thus the Red Dunes are older than this as the artefacts were dropped into an existing dune system. The Red Dunes are part of the Port Durnford Formation that is distinctive from the rest of the sand dunes that are much younger in age.

**Fig. 11: Stone Tools At RD014**





**Fig. 12: Stone Tools At RD014**



**Fig. 13: RD014 After Initial Dry Mining**



**Table 1: List Of Stone Tools Sampled From RD014**

Period	Type	Raw Material				Total
		Quartz	Quartzite	Hornfels	CCS	
LSA	Flakes	3	8			11
	Utilised flakes		8	1	2	11
	Chunks		3			3
	Irregular core	1	33		2	36
MSA	Unifacial point			2		2
	Flakes	185		34	3	222
	Cores		12	27		39
ESA	Chopper		35			35
	Hand axe		2			2
	Cleaver		1			1
ISA	Upper grinding Stone		11			11
	Flakes		49			49
	Irregular core		65			65
	Single platform core		1			1
<b>Total</b>		<b>189</b>	<b>228</b>	<b>62</b>	<b>7</b>	<b>486</b>

## RD032

RD032 is a small shell midden ~4m x 4m in size. It is located on the top of a small dune in a valley between the main dune cordon and the highest points of the Red Dunes (fig. 14). The pottery is undecorated and it probably dates to the historical period. The shell is *Perna perna*.

Significance: The site is of low significance.

Mitigation: Monitor.

**Fig. 14: Location Of RD032**



### **RD033**

RD033 is located on the eastern edge of the Red Dunes before the main dune cordon begins. It is an ephemeral surface scatter of bovid bone, pottery and marine shell. The pottery is undecorated. The marine shell is *Perna perna*.

Significance: The site is of low significance.

Mitigation: Monitor.

## RD034

RD034 is located on the eastern edge of the Red Dunes before the main dune cordon begins (fig. 15). It consists of an intact shell midden and a surface scatter of artefacts and ecofacts. The midden is ~2m in diameter. The ecofacts include *P. perna*, limpets and bovid bone. The artefacts include undecorated pottery and upper grinding stones.

Significance: The site is of low significance.

Mitigation: Monitor.

**Fig. 15: Location Of RD034**



## RD035

RD035 is located on the eastern edge of the Red Dunes before the main dune cordon begins (fig. 16). RD035 is located ~140m southwest of RD034. The site is an open midden. The midden is partially intact and consists mainly of *P. perna*. The pottery is undecorated. The artefacts occur over a 10m radius.

Significance: The site is of low significance.

Mitigation: Monitor.

**Fig. 16: Location Of RD035**



## RD036

RD036 is located on the eastern edge of the Red Dunes before the main dune cordon begins. It is ~80m south of RD035 (fig. 17). The site consists of possible two shell middens and a scatter of artefacts over a 40m radius. Much of the site has been disturbed by bulldozer activity for the drilling teams; however parts of the site remain intact under the existing bush.

The artefacts in the open area include:

- Group 6 pottery of lip notching and circular impressions on the shoulder of the pot
- Bovid, bird and warthog/bush pig bones
- Various grinding stones
- Fragments of potential human remains.

The possible human remains were collected and kept separate from the other artefacts.

Significance: The site is of high significance due to potential human remains.

Mitigation: Monitor.

**Fig. 17: Cleared Area At RD036**



### **RD037**

RD037 is located on the eastern edge of the Red Dunes before the main dune cordon begins. It is located 190m southwest of RD036 and 10m in front of the northern wall of Sokhulu Reservoir. The site consists of a single shell midden that was exposed by a cutting for the drilling team (fig. 18). The artefacts from the survey and excavation include:

- Undecorated pottery
- *P. perna*, *Fissurellidae spp.*, *Siphonaria capensis*, and *Ostreidae spp.* (oyster).
- Upper grinding stones and smoothed beach pebbles (indicating a shell midden in the area)
- A large portion of a domestic bovid

- Three different types of glass beads
- 1 Case Gin bottle
- Upper and lower grinding stones
- A stratified shell midden

The site was excavated over a two week period in November and December. The results are given under EXCAVATIONS... This case gin bottle is very similar to the one from MPE171f which is ~330m northeast (and ~100m higher). The two sites are probably contemporaneous and thus the inhabitants are possibly related.

Significance: The site is of high significance due to potential human remains.

Mitigation: Monitor.

**Fig. 18: Exposed Shell Midden At RD037**





## RD038

RD038 is located on the eastern edge of the Red Dunes before the main dune cordon begins. It is located 500m west of RD037. The site currently consists of an open scatter of artefacts and shell midden that have been exposed by bulldozer activity (fig. 19). The site is approximately 30m x 40m in size. The site includes:

- *Perna perna*
- Bovid bone and possible human bone
- Undecorated pottery

It appears that some of the midden might be intact and that a second midden occurs under the undisturbed sand.

Significance: The site is of high significance due to potential human remains.

Mitigation: Monitor.

### **Fig. 19: RD038**

## RD039

RD039 is located on the eastern edge of the Red Dunes before the main dune cordon begins and adjacent to the Maphelane Road. The site is a scatter of artefacts over an area of 40m x 50m (fig. 20). The artefacts include:

- Mzonjani pottery (including a bowl) – this is 1 700 – 1 500 years old and represents the first farmers along the eastern seaboard.
- Upper grinding stones
- Undecorated Historical Period pottery
- *Perna perna*
- Bovid bone

Significance: The site is of low significance.

Mitigation: Monitor.

**Fig. 20: Location Of RD039**



# EXCAVATIONS

We normally excavate in the mornings, and then undertake sorting and data basing in the afternoon. This is especially important in summer months when the heat and humidity can impact on company health and safety policies.

This is a brief summary of the excavated finds and is not meant to be a full analysis, as that is beyond the scope of work of this project.

All shell middens are excavated in their entirety. However, we select the best example of each lens in a square and bulk sample these. Bulk sampling implies that every artefact and ecofact is sorted and curated for storage. Normal sampling would only keep the important finds (such as pottery, charcoal, bone, adornments), shell measurements are taken, but the shell itself is discarded after sorting and weighing. This is a standard practice for shell midden excavations and is aimed at reducing storage place at the relevant intuitions.

## MPE159

MPE 159 is located at the base of the last dune cordon from the ocean. The site appears to be a complete settlement where two shell middens and possible house floors have been excavated. The middens consist of a lower one that was excavated in November 2014 (MPE 159), and another that was partially exposed by bush clearance and excavated in November 2015 (MPE 159b). The middens are ~20m apart. There are two human bone fragments in the vicinity of the lower midden which makes the site of high significance. The middens are very well preserved, and the 2014 - 2016 excavations yielded a lot of material. The plan for 2017 was to continue with the remaining shell midden and then link the two middens together with an excavated 2m x 2m transect. In addition to this, we requested a bulldozer to clear the area directly behind the second excavations as this could be the location of the main cattle byre (*isibaya*).

Initial excavations started in October 2017 for about a week; however, we then had to change plans for emergency excavations at RD037 and skeletons at MPE170f. Further excavations are planned for 2018.

The description for these excavations is two excavated sites show the difference between two households probably of the same period, and of the same family.

### **Excavations & Stratigraphy:**

The site was divided into 17 2m x 2m squares along a 34m baseline, with the squares to the East of the baseline forming the A-line and the squares to the West of the baseline forming the B-line (fig. 21 – 22). The A C-line was also included for the shell middens in the road cutting. The squares were excavated from the outer edges first, working our way towards the obvious shell middens located roughly in the centre. The middens were exposed by removing the overburden (fig. 17). The shell middens were excavated stratigraphically; while the areas around it were excavated in 10cm spits (fig.'s 17 - 20). The second midden appears to be separate from the main midden; however this could have been a result of root and/or bulldozer activities. They were excavated separately, but combined in the analysis.

Rows A and B were excavated in 2m x 2m squares with 1m x 1m quadrants. Squares A9 – A17 and B9 – B17 have been excavated. The C row or shell middens, were excavated in 1m x 1m squares and 50cm x 50cm quadrants.

During the 2016 excavations 4 middens were removed, some partially to be excavated further during the 2017 excavations. The soil above the middens had mostly been removed by bush clearance activity. The middens were located in Squares B14, B13 and C14. The middens did extend slightly into the western squares; however they had mostly petered out and were not worthwhile excavating. The middens were compacted and fragmentary on the edges. This is a partially a result of the bush clearance and the basin shape of the midden: a few animal burrows also occurred in the midden.

The 2017 excavations only had time to do Squares B13 and half of C13, and B9 and one quad in B10. One morning was spent monitoring during bulldozer clearance.

Originally Lens 1 was thought to be the same as Lens 2. They are in fact different lenses. Lens 1 lies below Lens 2 and is a dense shell layer, 15cm thick in the centre where it forms a basin shape. Lens 1 slopes slightly towards the west. Lens 2 lies on top of Lens 1. It slopes radically towards the west and gets thicker towards the north and east. This is the area of the Malachite Kingfisher burrow, so it will only be excavated in 2017. Lens 3 and Lens 1A appeared in the squares to the north of Lens 1 and Lens 2. Lens 1A is at the same level as Lens 1 and may be part of the same midden, but that will be determined during the 2017 excavation. Lens 3 occurs much deeper than the other middens and if the current depth and angle continues in 2017, Lens 3 could possibly lie beneath Lens 1, making it the oldest lens of the site. The squares to the south of the middens were excavated to 50 – 90cm below the surface. The western row (Line C) was significantly deeper than the two rows (Lines A and B) to the east, possibly because of the westward slope of the dune.

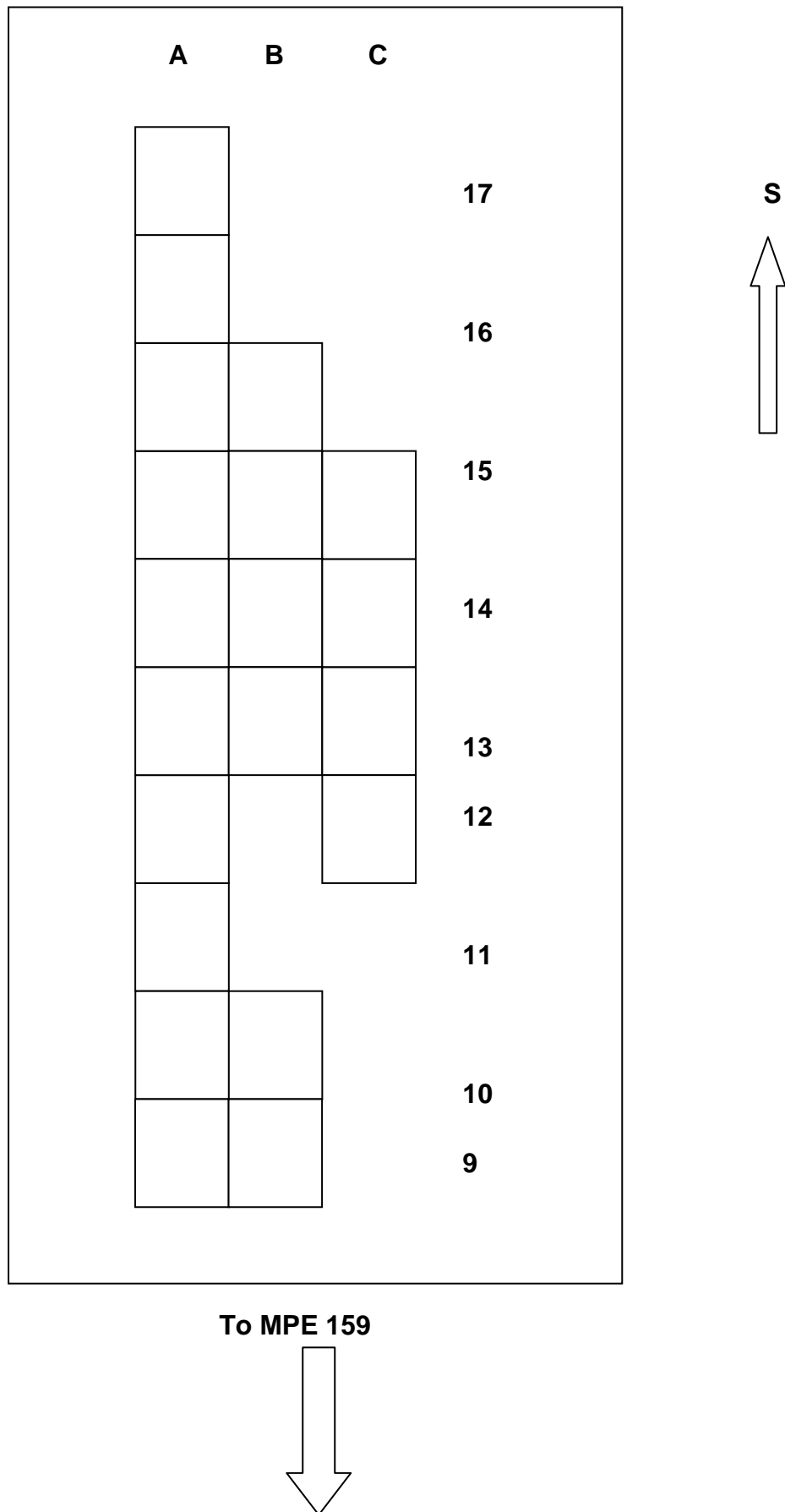
The 2017 excavations of the midden removed Lens 2 and Lens 3, which still remained from the previous excavations (fig. 23).

The excavations at B9 and B10 continued to expose a layer rich in artefacts and faunal remains. Two complete pots were excavated, of which one still had food residue attached to it.

**Fig. 21: General View Of The 2016 Excavation Area**



**Fig. 22: MPE 159 Site Excavation Map**



**Fig. 23: West Section Showing Lens 2, Lens 1, Lens 3 And Lens 1a**

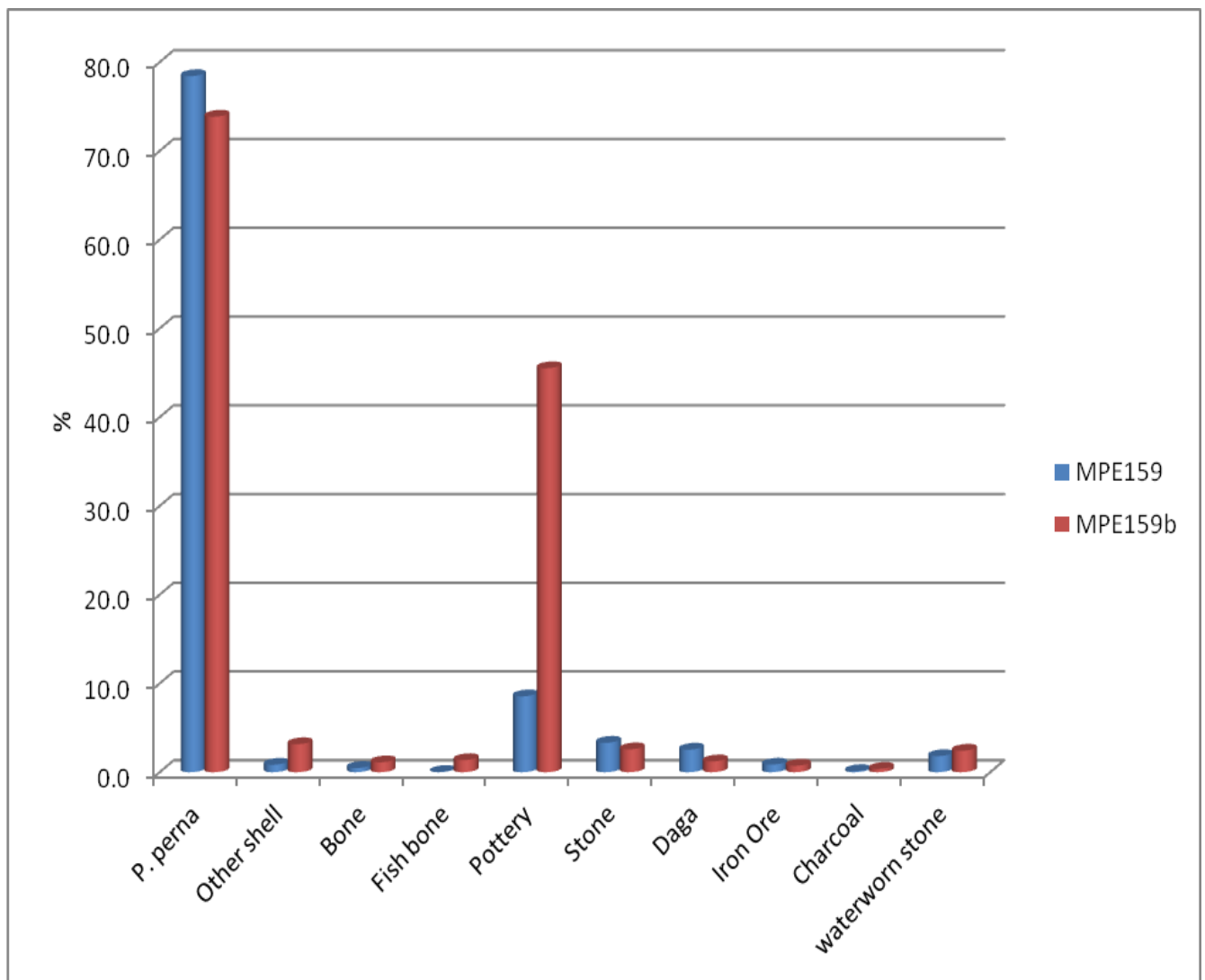




## Results:

Fig. 24 (and Table 2) shows the total artefacts and ecofacts as a percentage of total weight. These are also compared with MPE159b excavations. The middens at MPE159 are substantially larger than the midden at MPE159b, and thus some of the results are slightly skewed. MPE159b has 84 x 15l buckets (or 1260cm<sup>3</sup>) and this is for the middens only, and excludes non-shell midden excavations. MPE159 had 58.6 x 15l buckets (878.7cm<sup>3</sup>). The main difference between the two excavations is that MPE159 has more shell remains, whilst MPE159b has higher variety and/or quantity of artefacts and ecofacts.

**Fig. 24: Artefacts & Ecofacts As Percentage Of Total Weight**



**Table 2: Summary Of Excavated Material**

		Weight (g)/ frequency (n)	MPE159	MPE159b
Buckets		n	58.583	84
Faunal remains	Bovid	g	755	1737.5
	Otolith	n	3	6
	Fish Bone	g	59	1158
Daga		g	3765.5	2603.5
Charcoal		g	212	322.5
Iron ore/slag		g	1352	624
Stone	Smoothed stone	g	185	361
		n	27	50
	water worn stone	g	2858	2057
	Upper G/Stone	g	1676	718
		n	7	9
	Lower G/Stone	g	3350	1114
n		7	11	
Worked Bone		n	2	2
Coral		n	7	1
Shell	Other shell	g	1337	950
	Limpet	n	0	1731
	Nassa.	n	72	21
	P. perna left hinge	n	497	3117
	P. perna right hinge	n	413	3410
	P. perna weight	n	123210	62630
Pottery		g	13443	38602
soil samples		n	0	4
Total Weight		g	152212.5	112884.5

## **Faunal Remains**

There are some faunal remains in the middens. Most of the bone comes from a few bovid fragments. The bovid remains tend to be associated with the middens or on the edge of the midden. Sq. A9/A10 and B9/B10 had a layer of pottery and bovid remains (fig. 25). One bovid long bone has extensive cut marks on it (fig. 26). One small avian bone was excavated from the midden.

There is a sharp increase in the amount of fish in the MPE 159 middens compared to the MPE 159b middens, as well as when compared to other excavations. Six otoliths were recovered from the excavations. These remains varied in size, in conjunction with the vertebra, there appears to be at least one large fish (fig. 27). This could be from several large fish that were discarded onto this midden. This is the highest fish sample from a site so far excavated in the dunes.

A few rodent bones were excavated from the middens. These faunal remains are post depositional.

## **Charcoal**

A small amount of charcoal was excavated. Most of the charcoal came from the shell midden. One quadrant has enough charcoal for radiocarbon dating. Only the charcoal from the middens can be reliably associated with the site.

## **Stone**

The stone from the site consists mainly of water worn stone and smoothed stones. The water worn stone comes mainly from the shell middens. These are related to the stones that are caught in the byssus threads as the mussel grows. Only four smoothed stones were excavated. These are stones that have been used to polish daga floors or pottery. The lower grinding stones were mostly fragments, while the upper grinding stones were mostly whole.

## **Small finds**

There are a 21 *Nassarius krausiarius* shells from the MPE159b midden. MPE159 had 72 beads. These shells are often used as beads.

Most of the daga fragments came from the shell midden. These tend to be small fragments. More daga occurs on the surface of the unexcavated squares.

**Fig. 25: Pottery And Bovid Bone From Sq A9 And B9/B10**



**Fig. 26: Cut Marks On Bovid Long Bone**



**Fig. 27: Fishbone From Lens 2**



The iron ore occurs mostly as one large chunk in Square B9.2. Smaller fragments were noted in the shell midden.

## Pottery

Very few decorated pottery was found at the site. The decorated sherds are as follows (fig. 28):

- 5+ rows of triangular impressions
- An *intsumpa* on the neck of the pot, with lip impressions.
- Alternating bands of square impressions

The decorated sherds suggest that they belong to the Group 5 and 6 classes of decorated pottery. This would date the sherds anywhere from 1250 ACE – 1500 ACE. A single Early Iron Age decorated sherd occurred in the midden. This sherd was probably picked up from one of the many EIA sites in the area, and then dropped at the site.

Two pot lids were excavated near two different middens.

**Fig. 28: Decorated Pottery**



## Shell

The most common shell is *Perna perna*, or the brown mussel, and it appears to be the staple food, in all shell middens and lenses. Other types of edible shellfish include limpets (specifically *Siphonaria capensis*), oyster, and whelk. A single *Patella concolor* was excavated from Lens 2. Other shell species that were probably not eaten include chitons, barnacle and key-hole limpets.

Only 47 *P. perna* shells were measured, and they had an average length of 5.3cm. This is slightly larger than the mussels from the MPE159b excavations (Table 3, Fig. 29). There is, however, a wider range of sizes in MPE159b

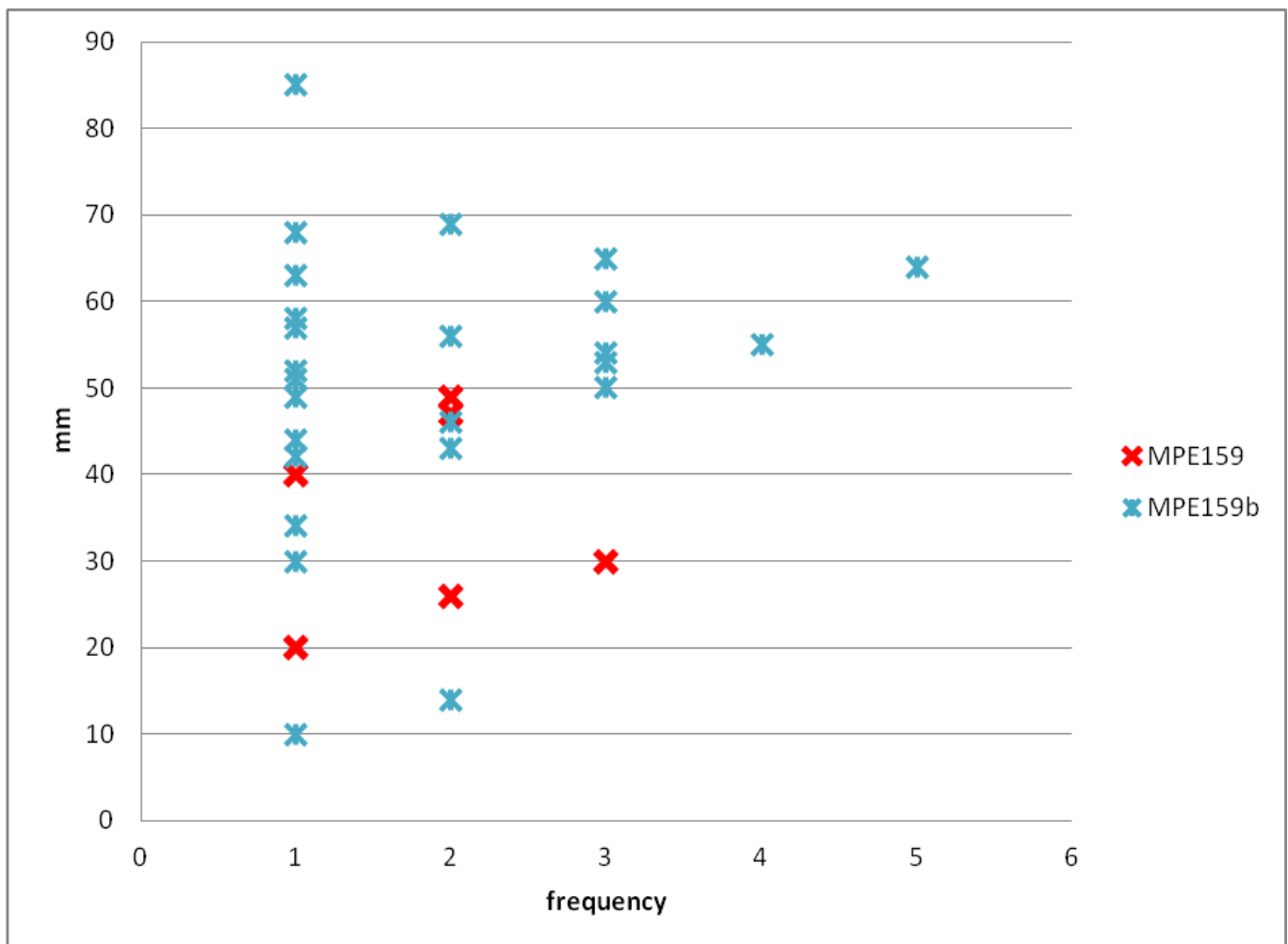
There is a substantial increase in the amount of *Siphonaria capensis* at MPE159, and these formed most of the 'other shell' category. These limpets occurred in a specific area of the excavations: C14.2 and C13.4. The limpets appear to be removed at an average size of 30mm; however, most of the shells were removed at 35mm in size. (Fig. 30, Table 4). Table 3 from this report is a corrected version from the 2016 report that incorrectly nearly doubled the amount of *S. capensis*.

Both shell species indicate that shellfish gathering targeted all sizes. That is there was no selective gathering/harvesting for larger samples. Of interest is the significant difference in *S. capensis* between the two houses, as well as the fish remains (fig. 31). MPE159B has a noticeable more amount of *S. capensis* than MPE159.

**Table 3: *Perna perna* Measurements At MPE159**

	MPE159			MPE159b		
	Left	Right	Total	Left	Right	Total
<b>average</b>	34.	41.5	37.6	53	53	53
<b>median</b>	30	47	40	55	53	55
<b>max</b>	49	49	49	65	85	85
<b>min</b>	20	30	20	14	10	10
<b>STD</b>	12.	4.7	11.1	13.	15.1	14.2
<b>Deviation</b>	9			4		
<b>Total</b>	5	4	9	18	29	47
<b>Juveniles</b>	182			10		
<b>Juvenile</b>	<10					
<b>Length</b>	cm					

**Fig. 29: *P. perna* Lengths At MPE159 And MPE159b<sup>2</sup>**

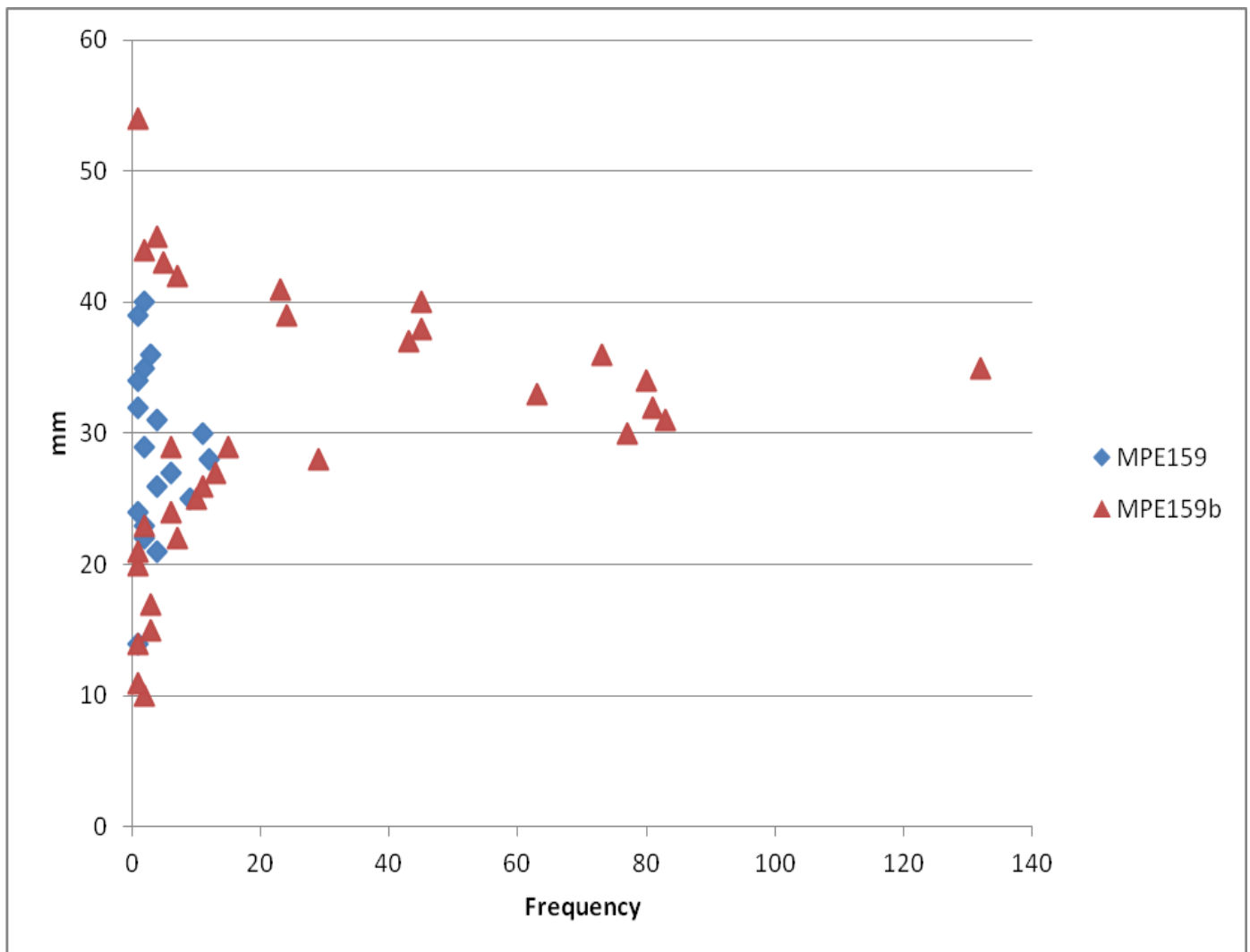




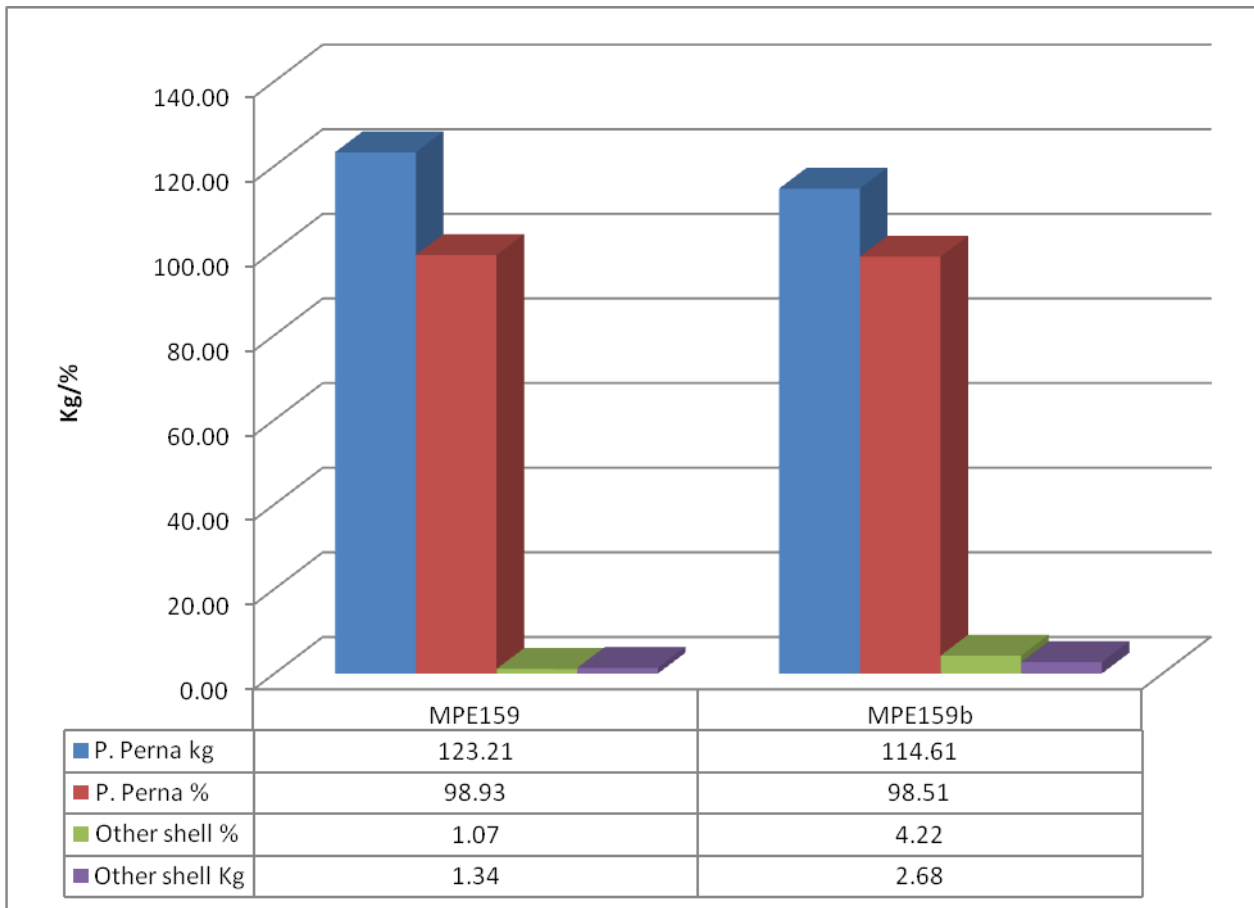
**Table 4: *Siphonaria capensis* Measurements**

	MPE159	MPE159b
<b>Average</b>	28.7	30.15
<b>Median</b>	28.5	30
<b>Max</b>	40	54
<b>Min</b>	14	10
<b>Std deviation</b>	6.7	10.6
<b>Frequency</b>	68	889
<b>not measurable</b>		328

**Fig. 30: *Siphonaria capensis* Measurements At MPE 159**



**Fig. 31: Shell Weight And Percentages To Total Shell Weight**



The shell middens represent a change in the general midden patterns we have noted in other excavations. More of the site will be excavated in 2018 where we intend to expose another shell midden, as well as the living area. One of the more obvious differences is in the high number of *Siphonaria capensis* and fish, which puts this site apart from other excavated sites. The living area of individual houses beside the shell middens also has well preserved material and *in situ* remains.

Future excavations will complete the middens at MPE159b and the Squares 1 – 8 will also be excavated. We are hoping to find the main cattle byre in 2018.

## MPE170

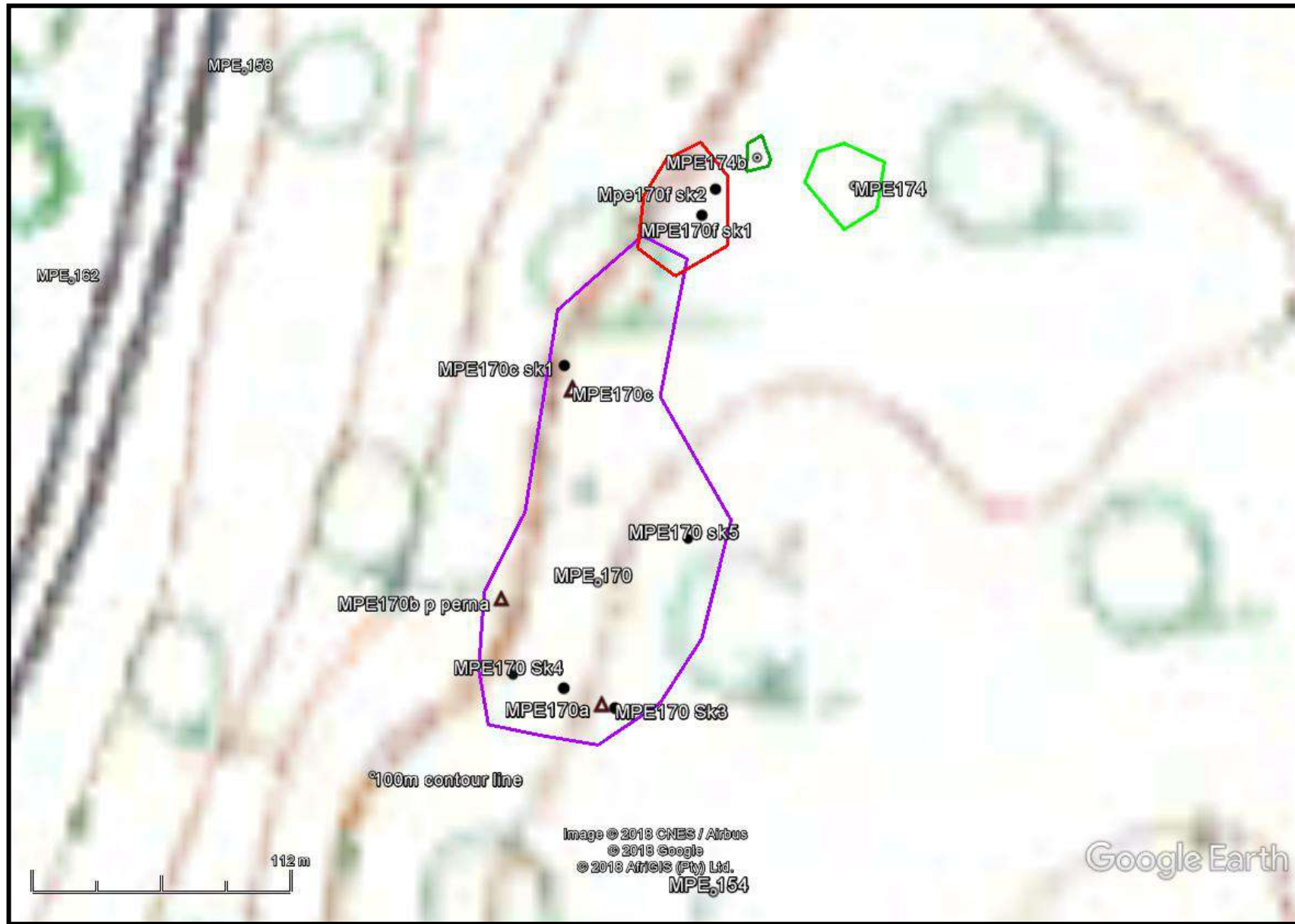
MPE 170 is located at the top of a single, high dune within the third dune cordon from the ocean, or on the westernmost dune overlooking the hinterland (fig.'s 5 – 7). The site was originally recorded in 2016 and noted for monitoring. It consists of several, dispersed shell middens of *P. perna*, oyster and limpets and a surface scatter of decorated and undecorated pottery and bovid bone. By March 2017 the site had settled after the initial dune clearance exposing several shell concentrations and possible *intact* middens.

For clarity purposes we have divided the site into A, B and C. MPE 170a is the main part of the site, at the top of the dune, MPE 170b is the part that occurs along the road, downhill and MPE 170c is the part of the site where the dune flattens out again. Just below MPE170c is MPE170f. This area lies between MPE170c and MPE174 (a Historical Period site). MPE170f either predates MPE170a-c, or it might be an extension of it. Figure 32 shows the location of these sites.

MPE170 is an important site in that it has a high frequency of (related) human remains. After the second human skeleton was discovered we requested the mining pond to move away from the area for a month. We wanted the sand to settle and expose potential middens and burials. We had already noted two possible human fragments, and suspected that more skeletal remains would occur. The site was visited every second to third day for the duration. Two more human remains were excavated.

The site was monitored from March to December 2017 and mostly every second week. Several decorated pottery shards were sampled as well as some faunal remains.

**Fig. 32: Location Of MPE170, MPE170f And MPE174**



## Shell Middens

Two shell middens were demarcated for excavations. Unfortunately the demarcation poles for one midden had been removed and subsequently partially damaged by bulldozer activity. We had a site meeting to discuss these issues. At the meeting we discussed the fact that our demarcation poles were removed (not for the first time), better demarcation methods and the possible lack of successful communication with mine managers and in turn, shift changes. Despite the site meeting, another incident occurred the very next day when a bulldozer moved the anchor above MPE 170A main midden, and despite the demarcation poles, drove straight over the main midden several times while moving the anchor. We have hopefully sorted out these issues.

### MPE170a midden

The initial photographs indicate that it was a single lens shell midden over an area of 5m x 4m+ - the rest extended underneath the sand (fig. 33). We excavated a 1m x 1m sample square after the bulldozer had driven over the midden.

**Fig. 33: MPE170a: Main Midden**



## **MPE170c**

The lower midden (MPE170c) was intact when we started to expose it. However, a bulldozer had driven over half of the midden in the morning. We were left with 1.5m x 1m for excavation. This midden was a less compacted single lens midden (fig. 34).

**Fig. 34: MPE170c: Smaller Midden After Set Up**



## **MPE170b midden**

This midden was located on the eastern face of the dune and consisted of large *P. perna* that had slumped with the dune (fig. 35). Unlike the other middens, this midden appeared to be mainly *P. perna*. One bucket (15l) was sampled from this midden.

**Fig. 35: MPE170b Midden**



## **RESULTS**

Table 5 and fig. 36 summarises the results from the three sampled middens.

### **Faunal Remains**

Very few faunal remains came from the middens (fig. 37). This is not unexpected since the samples were small compared to other excavations. The faunal remains consisted mainly of bovid remains. MPE170c had a probably had at least two fish as 4 similar sized otoliths were recorded.

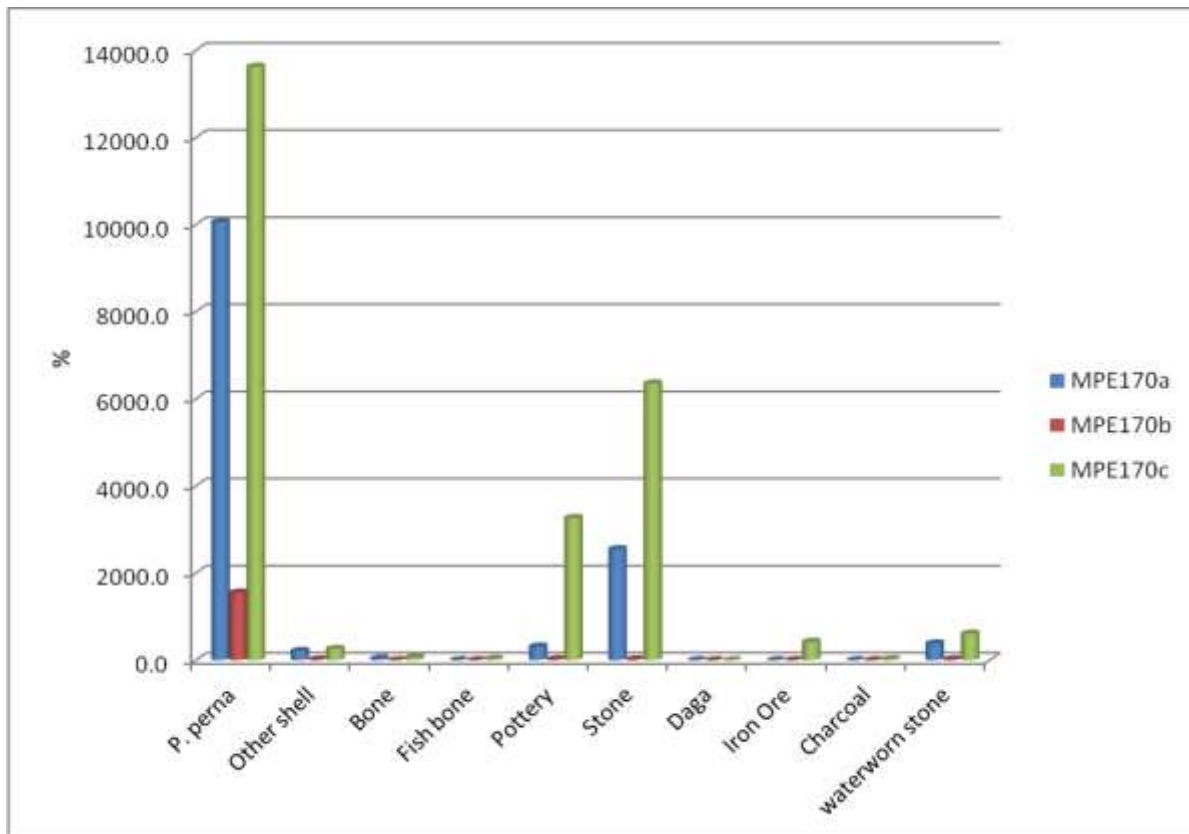
### **Charcoal**

The charcoal remains were sparse in these excavations and mainly from MPE170c. These fragments should be used with caution as they might be contaminated with recent charcoal. Charcoal is the best material for radio carbon dates. This is one of the reasons why intact middens are important as we can determine if the charcoal sample is *in situ* or intrusive.

**Table 5: Summary Of Excavated Finds at MPE170**

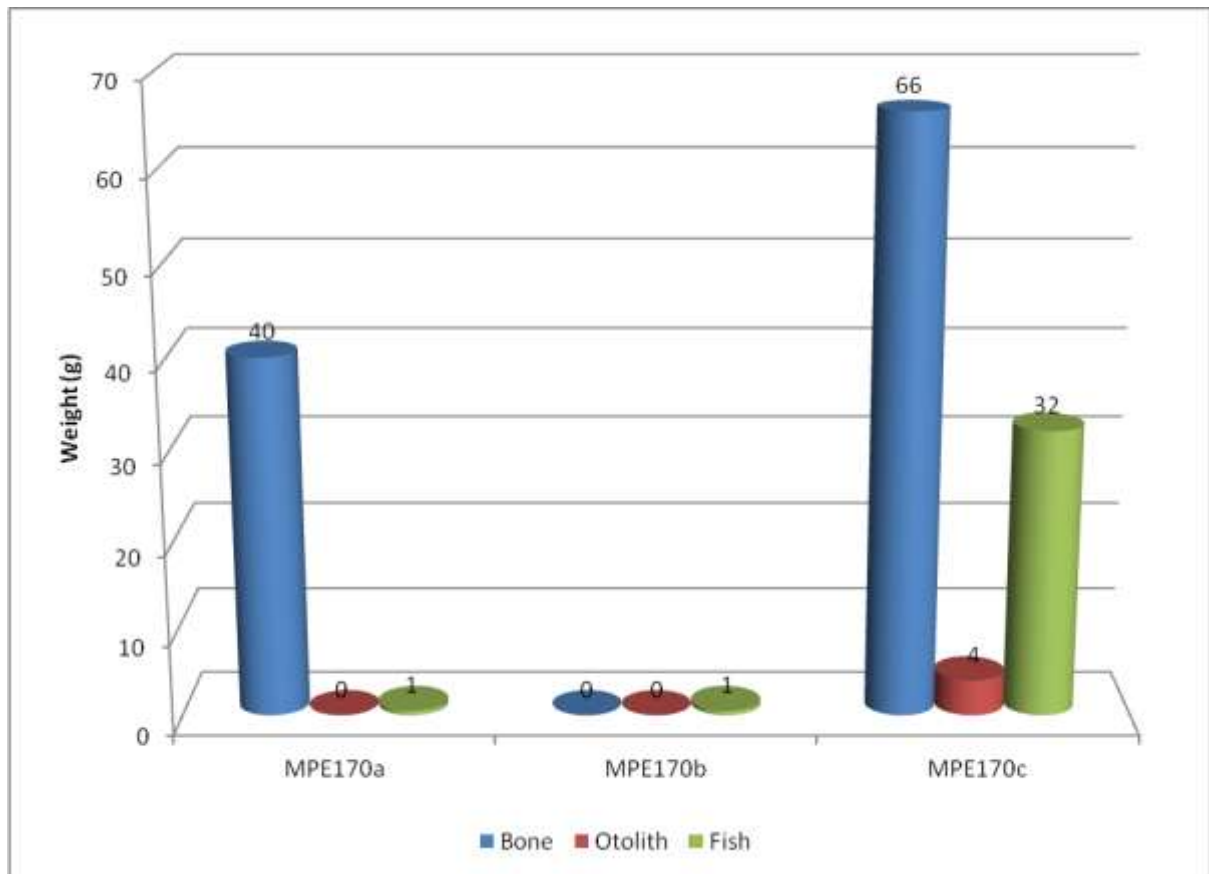
		Weight/ frequency	MPE170a	MPE170b	MPE170c	Total:
Bucket (15l)s		n	2	1	14	17
Faunal Remains	Bovid	g	40	0	66	106
	otolith	n	0	0	4	4
	Fish bone	g	0.5	0.5	32	33
Daga		g	0	0	4	4
Charcoal		g	0.5	0	22.5	23
Iron fragment		g	0	0	424	424
Shell	Other shell	g	212	14	262	488
	S. Capensis	n	99	0	0	99
	Nassa. beads	n	2	0	2	4
	Coral	g	0	0	1.5	1.5
	P. perna left	n	306	83	709	1098
	P. perna right	n	321	80	761	1162
	Weight	g	10058	1554	13627	25239
Stone	Water worn stone	g	386	18	610	1014
	Upper G/Stone	g	2164	0	5736	7900
		n	4	0	10	14
Pottery		g	316	22	3266	3604
Total		g	13177	1608.5	23578.55	38364.05

**Fig. 36 Summary Of Excavated Sites**





**Fig. 37: Summary Of Faunal Remains**



## Stone

The lower grinding stones are made on white beach sandstone. The fragments did not resemble maize or sorghum grinding stones. All of the upper grinding stones are from quartz pebbles. Some of these have been used as hammer stones. Many upper grinding stones of various sizes were noted throughout the site.

## Small finds

Only two *Nassa* beads came from MPE170. One bone button was sampled from the surface near MPE170 SK1 (fig. 38). The button may or may not be related to the site as it appears to be more recent in age due to the four holes. That is, this could be a chance “drop” from someone else walking past the site, e.g. MPE174b is ~100m from the find.

**Fig. 38: Bone Button From MPE170 Surface**



## **Pottery**

The pottery decorations are as follows:

- Rim/Lip:
  - Slightly everted
  - Straight
  - Oval lip impressions
  - Semi-circular lip impressions
  - Thin oblique notching
  - Vertical notching
  - Single groove along the base of the rim
- Decorations
  - 9+ Horizontal rows of shell impressions on the neck-shoulder-body

- Single band of rounded rectangle impressions on the shoulder
- Double row of circular impressions on the neck – various sizes on different pots
- Single horizontal row of shell impressions
- Double row of broken incisions on my shoulder.
- 7 rows of shell impressions, with 9 diagonal rows to the right.
- Oblique rows of shell impressions between two single horizontal rows of shell impressions
- Hanging triangular motifs of shell impressions on the shoulder-neck interface.
- 11 horizontal rows of shell impressions between two vertical rows of shell impressions

There are several undecorated pots, a tuyere fragment and one lid.

The decorated pottery from the site is predominantly related to Thembi-Tsonga pottery, or Group 7. The various shell-impressed motifs are typical to this grouping. There are two Group 6 decorated shards within this sample. These were located to the north of the site, i.e. MPE170c. These are similar to the Group 6 pots found at MPE170f. This highlights the problems of sampling from disturbed sites: the pottery cannot be related to a specific layer, and the different edges of sites get mixed via bulldozer activity.

## Shell

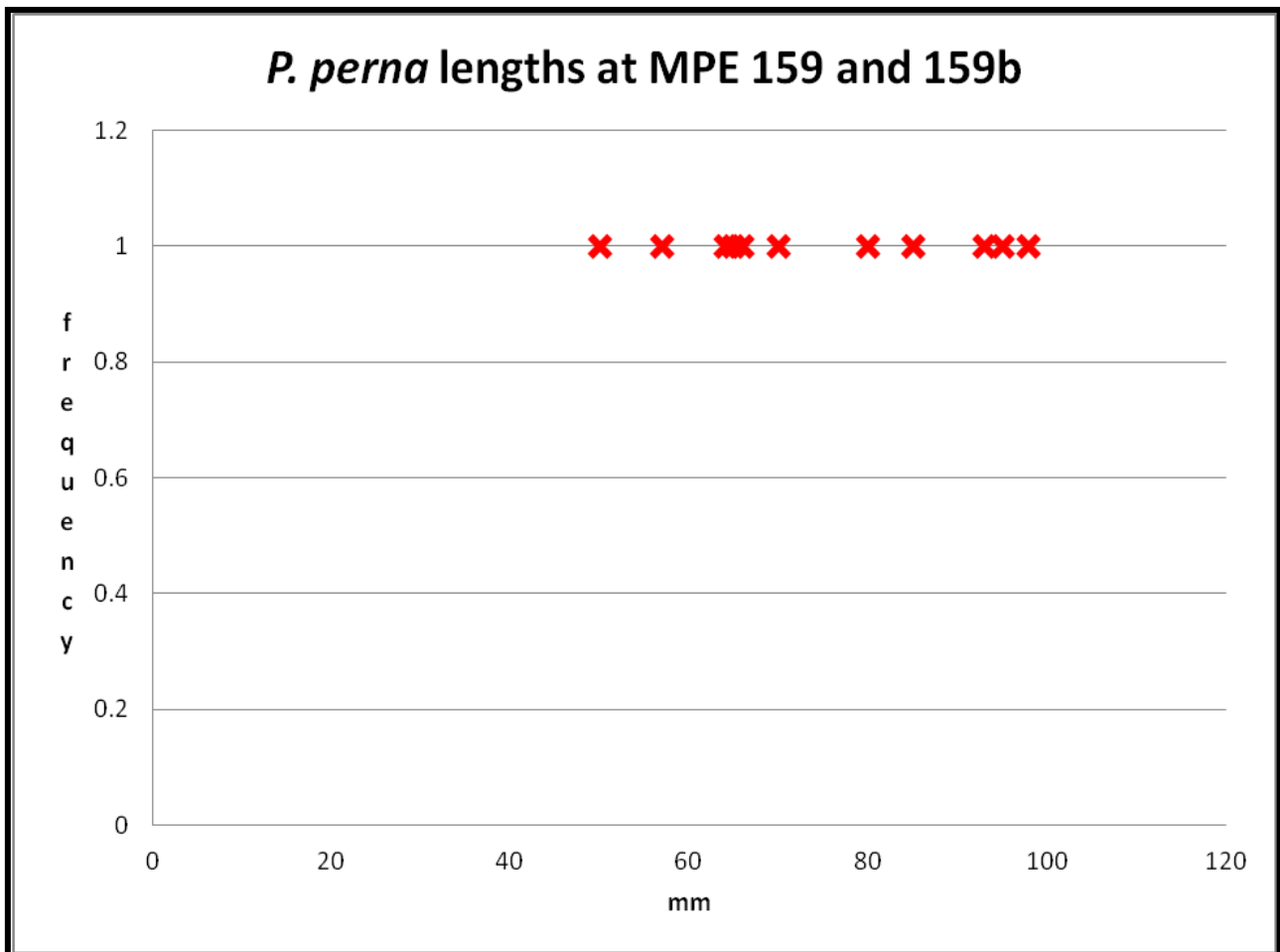
The shell remains are predominantly those of *P. perna*, with some *S. capensis*. The ranges of other shell species normally associated with these middens occur as well.

The measurable *P. perna* from MPE170b tend to be on the large size; however the sample size is too small to make proper comparisons. This is summarized in Table 6 and Fig. 39.

**Table 6: *P. perna* measurements at MPE170**

average	81.2	67.2
median	86.5	66
max	98	85
min	57	50
f	6	5
std	17.3	12.5

**Fig. 39: *P. perna* Measurements At MPE170**

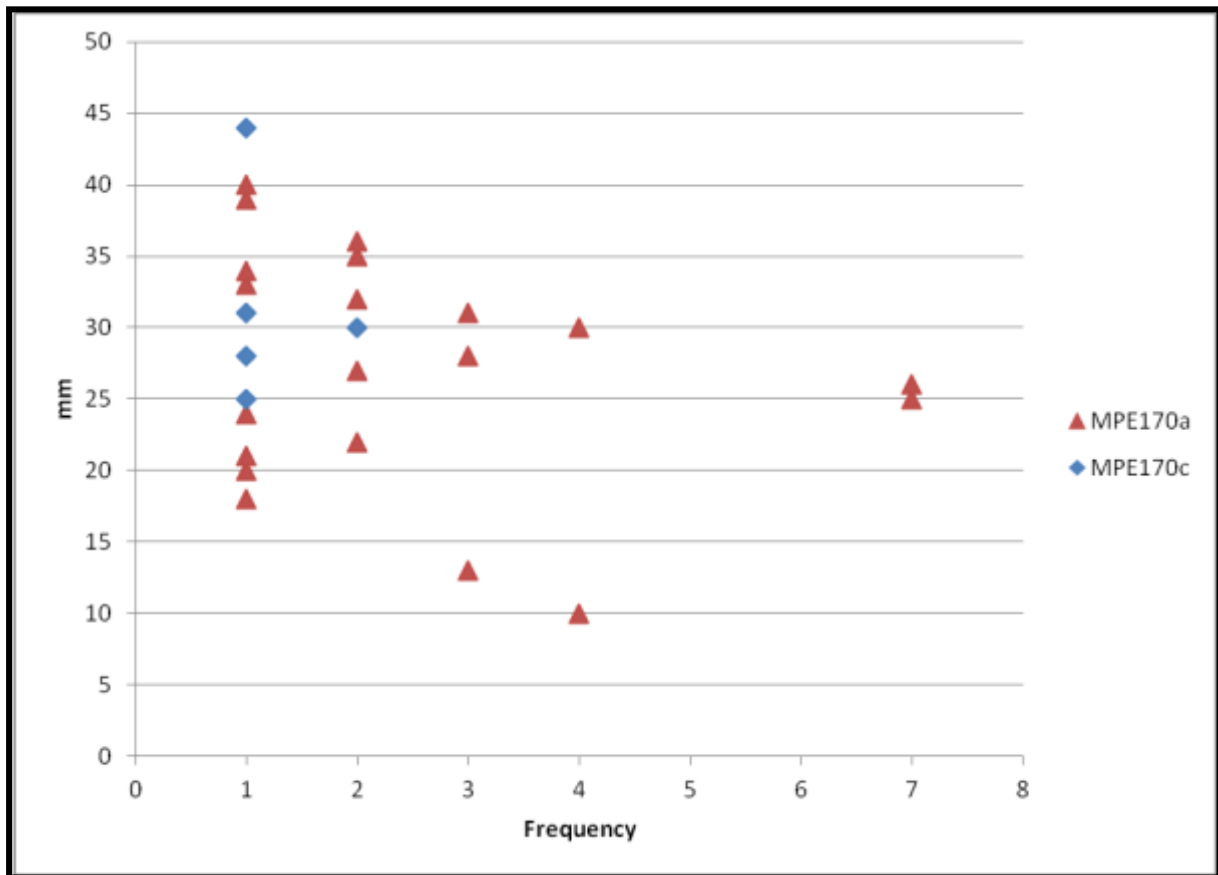


The *S. capensis* sample comes from both MPE170a and MPE170c. While the sample is small, it shows similar general gathering patterns, and there are no large differences between the two middens. Table 7 and Fig. 40 show these results.

**Table 7: *S. capensis* measurements at MPE170**

	MPE170a	MPE170c	Total
average	27.2	31.6	28.08
median	27.5	30	28
max	40	44	44
min	10	25	10
f	20	5	25
std	8.22	7.30	8.10

**Fig. 40: *S. capensis* Measurements At MPE170**



## Human Burials And Remains

During routine monitoring at the site we discovered human remains on the inland side slope, just further downhill from MPE170c. The remains were named SK 1 (Skeleton 1). A further three skeletons were recovered and these were called SK2 – SK5. There is no SK4, as these remains turned out to be that of a warthog/bush pig which initially looked like human remains. The excavations were hampered by severe weather conditions, mainly gale force winds and heavy rains on an open dune slope. During the days that followed the removal of SK1, we also located and removed a SK2 and SK3.

### SK1

SK1 was exposed with the tip of the upper vertebrae, tibiae and humeri just above the ground. This meant that the cranium had already dislodged. We managed to find several cranial fragments, mandible fragments and teeth further down the slope.

It was difficult to determine the exact position of the remains as natural dune movement had slumped the remains forward, so that the child was now sitting with her head between her knees, bending forward. In addition to this, the bulldozer driving over the burial had literally compressed the remains downwards. However, SK1 was buried in a sitting position, facing sunset. There were indications that the arms were placed underneath the hips, suggesting the human was a female.

According to the teeth we found, and a mandible fragment which contained teeth still embedded inside the jaw, i.e. not having erupted yet, we were able to determine that she died between the ages of 6 to 8 years. She was the size of a child at least two years younger than herself, making her a very tiny individual for her age.

Fig. 41 shows some of the burial excavations

**Fig. 41: Human Remains At MPE170c SK1**



## SK2 (Nomvula)

The second burial was located at the southern end of the site. This grave was also on the edge of the dune. The remains were noted by RBM personal who then reported it via the correct channels. Only the top of the cranium was visible suggesting that there was intact burial. There had been heavy rain that weekend and the sand and bones were very wet. This makes it difficult to remove the remains without them breaking. On the other side if we let the remains dry out there is a risk of the grave collapsing and we lose contextual information, as well as skeletal parts. We have used special glue in the past, but found out that it influences any chemical analyses, especially radiocarbon dating.

SK2 was prepared for excavation as per normal human excavations. That is, one has an idea where the various limbs should be and can strategise the excavation. It soon became clear after half of the section of the grave that this particular skeleton was facing sunrise. Moreover, the bones were diminutive and very fragile. The arms were placed underneath the pelvis, thus suggesting a female burial. The teeth suggest that the child was ~4 years old at death. Fig. 42 shows the burial.

We forwarded pictures of the skeletal remains to a paediatrician based in Liverpool, UK, who has in turn forwarded it to a Paediatric Osteologist for an opinion. Initial feedback is that the child suffered from a form of Hydrocephalus or alternatively Paediatric Craniosynostosis (PS). Hydrocephalus is a condition that occurs when fluid builds up in the skull and causes the brain to swell, in turn causing deformation of the skull. This can result from: a birth defect in which the spinal column doesn't close, a genetic abnormality, certain infections that occur during pregnancy or even head trauma. Paediatric Craniosynostosis occurs when 1 or more cranial sutures fuse prematurely, resulting in an abnormal head shape. A physical anthropologist from KwaZulu-Natal has tentatively concurred. This is the first recording of either such a case in the southern African archaeological record. We intend to have these remains analysed further for possible academic publication.



We named her Nomvula as she was found 'after the rain'. We like to give names to the more complete skeletons as it is a reminder to us that we are dealing with people, and not objects. This is the first burial the Zulti North mining lease to face sunrise. It is very rare for a Late Iron Age person (or Nguni-speaking person) to be buried in such a manner: as they are always buried facing sunset. We have only come across one other burial like this during the pre-construction excavation at Sibaya Casino near Umhlanga.

**Fig. 42: Nomvula at MPE 170a**



### SK3

SK 3 was buried ~10m east of Nomvula. The burial is also that of a child, but the remains are not well preserved. Only some teeth and long bones remained (fig. 44). The few remaining bones were not enough to determine the age, sex or burial position of this individual (fig. 43).

**Fig. 43: SK3 At MPE170A**



### SK5

SK5 was located in the central part of the site, where we believe the cattle byre would occur. There was no formal burial, but a scatter of human remains that had been dispersed by bulldozer activity over a 10m<sup>2</sup> area. Some of the remains were also found on the slope. A conservative estimate would be that ¼ of the human was recovered (fig. 44).

**Fig. 44: Location of SK5**



### **Other Human Remains**

We have noted parts of human remains on the surface at several different locations of the site as well. This suggested that more remains would occur. It must be noted that although the younger child (SK 2) survived for a certain amount of time, if she suffered from a condition that malformed her cranium prior to birth, it is highly unlikely that her mother would have survived the birthing process, which in turn means that her mother is buried in close proximity to her. When the bulldozer demolished the midden to move the anchor, it went through a skeleton, possibly the mother. We found some human remains of which the pelvic fragments indicated possible trauma.

## MPE170f

The site is on the edge of the first dune cordon from the hinterland. It is situated between the base of MPE170 and the edge of MPE174b. The site has a large shell midden that has been cleared by the bush clearance activity and exploration drilling teams. The site is ~40m in diameter and probably consists of two houses. The site/area was monitored since April due to its proximity to MPE170. In late November we noted two human skeletons being exposed (fig. 45).

The pottery is varied, but two sherds had circular impressions. This makes it part of Group 6 pottery. Some pottery lips have incisions and impressions. Several upper and lower grinding occur around the site, as well as faunal remains.

The southern skeleton (SK1) initially appeared to only have the lower torso remaining. However, the excavations indicated that the entire skeleton had been pushed sideways and then forwards. Only the cranium was missing. The skeleton was facing sunset with the hands near the chest. The remains appear to be that of a male who was at least 1.80m tall. No immediate pathologies were noticed. Figure 46 shows aspects of the excavation.

It took three half days to remove this burial. The second day's work had to be cancelled when the high winds made it impossible to excavate as the sand was being blown in and covering the excavations. The next day had heavy rains and we left the burial over the weekend. The burial was clearly demarcated and covered and no incidences occurred. Photographs of the demarcations were sent to Nelisa Dladla who informed the rest of the mining teams.

**Fig. 45: Human Skeletons At MPE171f**



**Fig. 46: SK1 At MPE170f**



The northern skeleton had been severely damaged by bush clearance: only the fragmented lower torso remained and this was no *in situ* (fig. 47). It appears that the skeleton was facing sunset.

**Fig. 47: Surface of SK2 At MPE171f**



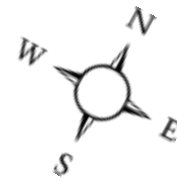
### **RD037**

RD037 is located ~40m north of the old Sokhulu Reservoir north wall. The midden is situated on a slightly raised dune. The site was noted for a small section of the shell midden that had been exposed by the drilling activity. We noted several artefacts on the surface and decided to undertake test-pit excavations to determine the value of the site. The site was in danger of being bulldozed and it became a rescue excavation.

The site was divided into twelve 1m x 1m squares (fig. 48 - 49). The squares with shell midden were further sub-divided in 4 x 50cm x 50cm quads.

**Fig. 48: Site Plan For RD037**

10	11	12
7	8	9
4	5	6
1	2	3



**Fig. 49: View Of RD037 Excavations Squares 2, 5, & 8**



## Stratigraphy

The site consisted of one main midden in Squares 2, 3, 5, 6 and 9. A concrete pole had been excavated into the midden, and was later pushed over. This cut Lens 1 in half. The main midden is ~3m in diameter, with a single main lens and was fairly compact (fig. 50).

**Fig. 50: Lens 1 At RD037**





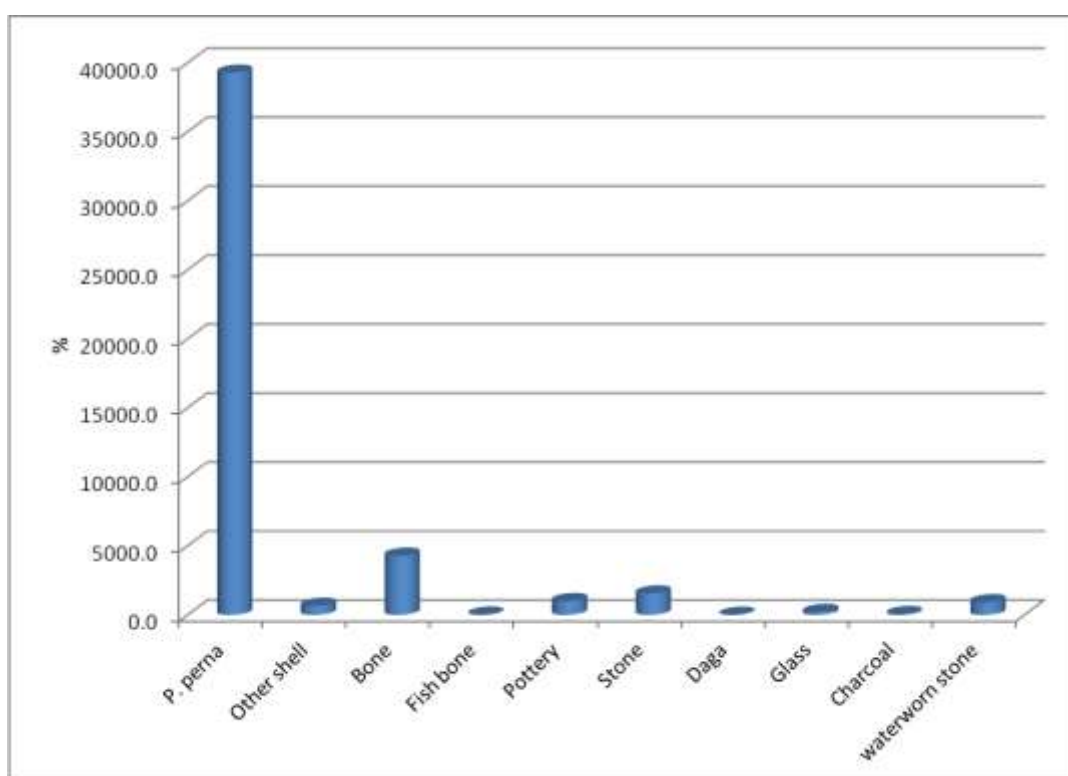
## RESULTS

Table 8 and fig. 51 summarises the results from the three sampled middens.

**Table 8: Summary Of Excavated Finds at MPE170**

<b>Buckets</b>			34.5
<b>Faunal Remains</b>	Bovid	g	4285
	Fish	g	14.5
<b>Stone</b>	Smoothed Stone	g	82.5
		n	9
	water worn Stone	g	911.5
	Upper grinding stone	g	632
n		4	
<b>Nassa. bead</b>		n	3
<b>Coral</b>		n	1
<b>Charcoal</b>		g	52
<b>Glass</b>		g	203
<b>Shell</b>	Limpet	n	73
	Other Shell'		652
	P. perna	Left	2626
	P. perna	Right	2638
	P. perna weight	g	39286.5
	Total	Weight	51375
<b>Pottery</b>		g	991.5
<b>Total weight</b>			103874

**Fig. 51: Summary Of Excavated Sites**



## Faunal Remains

The midden had two main types of remains: domestic bovid and warthog/bush pig. The former appears to come from a single animal that was lying over 2 – 3 squares. Some fish bone was recovered from the midden.

**Fig. 52: Domestic Bovid in RD037 Lens 1**



## Charcoal

The charcoal remains were sparse in this excavation; however the faunal remains are sufficient for radiocarbon dating.

## Stone

One complete lower grinding stone was sampled from the general site. There was a low amount of water worn stone.

## Small finds

Three glass beads were excavated from the midden. The beads were 3mm – 4mm in width. They consisted of the following colours:

- White
- Light green
- Red on white

The glass fragments are of a case gin bottle (fig. 53). A complete example can be shown in Fig. 9. As previously stated, this bottle is similar to the case gin bottle at 174b,

**Fig. 53: Case Gin Bottle Fragment**



## Pottery

There is a very low amount of pottery on this site, in comparison to other sites. All of the pottery is undecorated.

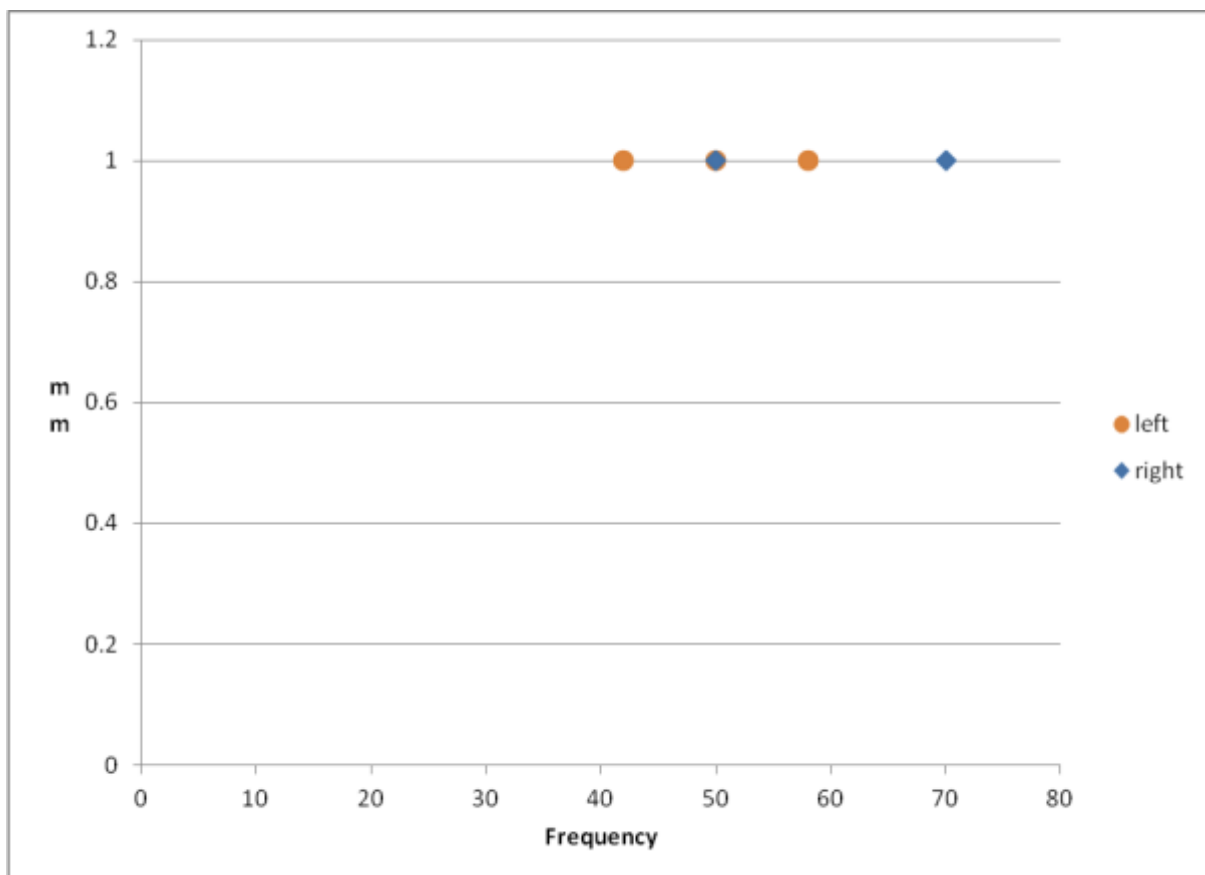
## Shell

The shell remains are predominantly those of *P. perna*, with some *S. capensis*, oyster, and chiton. The ranges of other shell species normally associated with these middens occur as well. The sample of measurable *P. perna* from RD037 is too small to make valid comparison. Table 9 and fig. 54 summarises these finds. The measurements indicated that the sizes are generally small.

**Table 9: *P. perna* sizes at RD037**

average	54
median	50
max	70
min	42
f	5
Std deviation	10.6

**Fig. 54: *P. perna* Sizes at RD037**

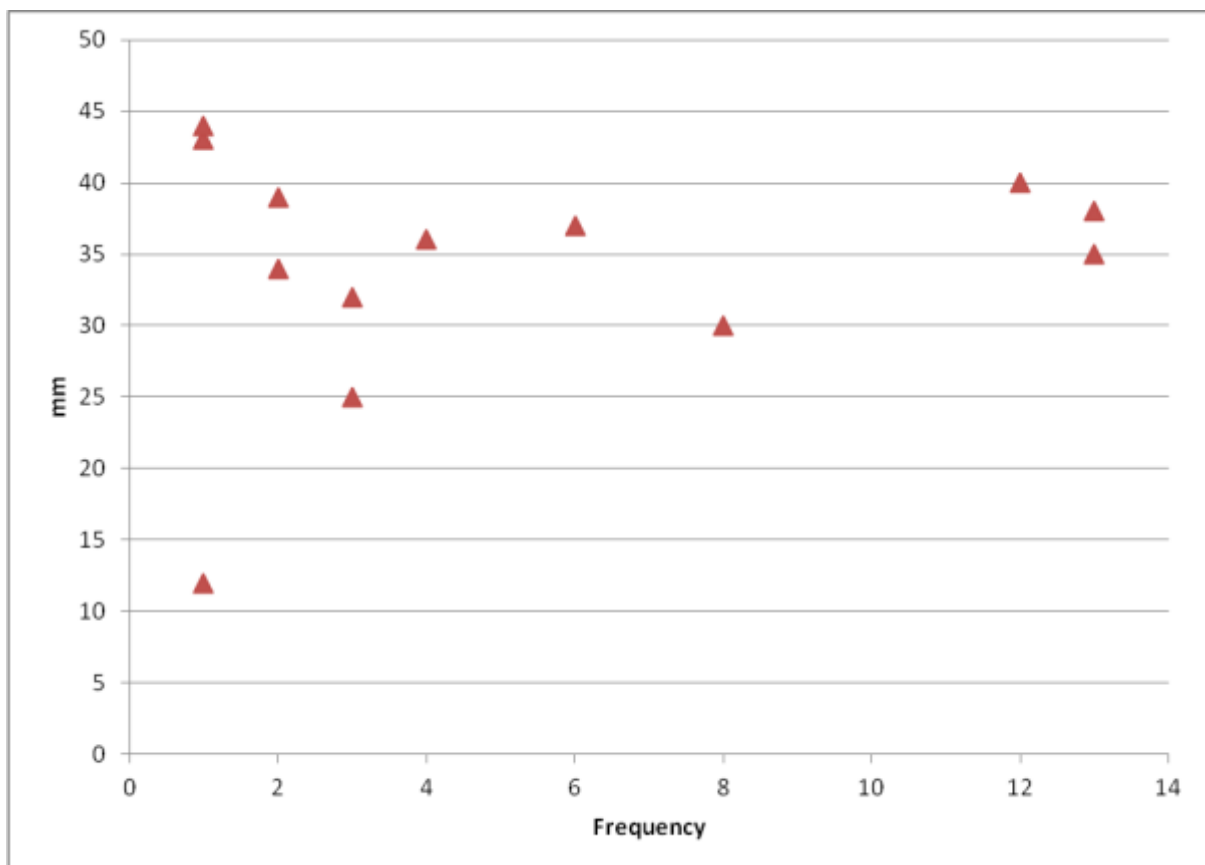


The *S. capensis* sample indicates that the shells were on average smaller than other sites. However the range is consistent with other sites. Table 10 and Fig. 55 show these results.

**Table 10: *S. capensis* measurements at MPE170**

<b>average</b>	<b>34.2</b>
<b>median</b>	36.0
<b>max</b>	44.0
<b>min</b>	12.0
<b>f</b>	13.0
<b>std. deviation</b>	8.4

**Fig. 55: *S. capensis* Measurements At MPE170**



## Discussion

RD037 is important in that it is a site near the end of the human occupation in the dunes. The site predates 1937 since it does not show on these aerial photographs. RD037 is probably contemporaneous with MPE174b. We expect human remains to occur at the site and will monitor it accordingly.

## CONCLUSION

A total of 13 new archaeological sites were recorded in 2016, and three sites were excavated. Many of the sites from 2015 - 2016 were also monitored during the year and sampled when necessary. The sites dated from the Early Stone Age to the early 20<sup>th</sup> century and form part of an increased sample size of archaeological sites in the mining lease. Early Iron Age sites appear to have decreased in occurrences, while there is an increase in Late Iron Age and Historical Period sites. This is, however, due to the location of the mining operations that are currently concentrating on taller dunes, which were favoured by the latter settlements. There should be an increase in Early Iron Age sites once MPE extends along the lower areas north of Sokhulu Reservoir.

The current heritage mitigation is still uncovering new finds, and increasing data to the general heritage of the area. The shell middens at MPE159 that had a marked change in shell species are examples. The low numbers of recorded sites in 2016 is mostly due to fewer areas being cleared for mining, not due to a decrease in potential finds.

Shell middens, and their surrounding areas, are always targeted as these yield better preserved artefacts and human remains. The increase in faunal remains assemblages is important for the eventual reconstruction of the animal species over time in this area. Smaller mammal and bird remains would also be informative, as would be the smaller shell species that are palaeo-environmental indicators. The coral fragments, limpets and even the *P. perna* have potential for scientific research if the isotopes are analysed, e.g. in sea temperature changes over time. The *P. perna* size measurements have use through not only indicating human harvesting patterns through time, but also the impact this may have made on the shellfish

populations. This in turn would have relevance for more recent impact studies undertaken brown mussel exploitation KwaZulu-Natal and further afield. Some of the research (e.g. Proudfoot et al, 2006) suggests that there is a significant change in species size over time due to human exploitation. The archaeology tends to suggest that the opposite. It is important that the shell middens along the eastern seaboard are systematically sampled and excavated as these have relevance to contemporary research (see research undertaken by the Oceanographic Research Institute (<http://www.seaworld.org.za/research/>) as one example. The sampling and excavations of these middens is also important in that dune mining removes the entire midden during operations, and thus the material is lost forever.

We expect an increase in 18<sup>th</sup> – 20<sup>th</sup> century human remains in the area around Sokhulu Reservoir, as the recorded sites suggest this area was more recently occupied.

MPE 159 has been marked for continued excavation in 2019, as well as MPE177.

The University of Johannesburg, in conjunction with the University of Uppsala, has approached Umlando to do a joint study in the DNA analysis of specific human remains. We are currently working out the feasibility of this potential study.

## REFERENCES

Oceanographic Research Institute 2014. <http://www.seaworld.org.za/research/>

Proudfoot, L., Kaehler, S. McGarry, D. , Uppink, P. Aereboe, M and Morris, K. 2006 Exploitation status of infralittoral abalone (*Haliotis midae*) and alikreukel (*Turbo sarmaticus*) in the southern section of the Eastern Cape coast. *South Africa. South African Journal of Science* **102** 162 - 168

**APPENDIX A**  
**SITE RECORD FORMS**



# UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA	<b>X</b>	IIA			
Historical	Historical Period:	<b>X?</b>	Recent Past (last 60 yrs):	<b>X?</b>				

Recorder's Site No.: **MPD 106**

Official Name:

Local Name:

Map Sheet:

GPS reading: S: 28 33.298' E: 32 2.573' Alt: 100m

DIRECTIONS TO SITE: SKETCH OR DESCRIPTION



MPD 106 is located on the first dune cordon from the ocean. The site is of low significance. It will be monitored for as long as it remains possible.

SITE DESCRIPTION:

Type of Site: Open. Surface scatter

Merits conservation: The site is of low significance. It will be monitored for as long as it remains possible.

Threats: Yes

What threats: RBM Mining

RECORDING:

Digital pictures Yes Tracings: Drawings:

Recorder/Informant: Name: Gavin and Louise Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 16/03/2017

Owner:

References:

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

It consists of an ephemeral surface scatter, over a 30m x 20m area, of brown mussel and thin walled pottery.

# UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA		IIA	<b>X</b>		
Historical	Historical Period:	?	Recent Past (last 60 yrs):	?				

Recorder's Site No.: MPD 107

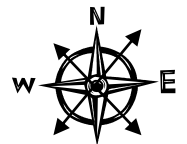
Official Name:

Local Name:

Map Sheet:

GPS reading: S: 28 32' 23.9" E: 32 21' 07.9" Alt: 40m

DIRECTIONS TO SITE: SKETCH OR DESCRIPTION



MPD 107 is located next to the road, on the ocean-side of the RBM main road, which runs adjacent to S the district road to Maphelane.

SITE DESCRIPTION:

Type of Site: Burial

Merits conservation: The site is of high significance due to the human remains. We have removed the remains and we are monitoring the site and will continue to do so for as long as it remains possible.

Threats: Yes

What threats: RBM Mining

RECORDING:

Digital pictures Yes Tracings: Drawings:

Recorder/Informant: Name: Gavin and Louise Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 12/04/2017

Owner:

References:

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

It consists of a surface scatter of human bone fragments which was exposed by bulldozer activity during the positioning of the nearby pipeline.

## UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA		IIA			
Historical	Historical Period:	<b>X</b>	Recent Past (last 60 yrs):					

Recorder's Site No.: MPD 108

Official Name:

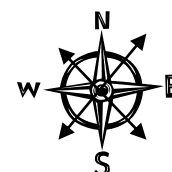
Local Name:

Map Sheet:

GPS reading: S: 28 33' 32.4"E: 32 21' 33.1"Alt: 80m

DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

MPD 108 is located in the valley between the first and second dune cordons from the ocean.



SITE DESCRIPTION:

Type of Site: Open. Midden.

Merits conservation: The site is of low significance. It will be monitored for as long as it remains possible.

Threats: Yes

What threats: RBM Mining

RECORDING:

Digital pictures Yes Tracings: Drawings:

Recorder/Informant: Name: Gavin and Louise Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 18/04/2017

Owner:

References:

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

It consists of a single, small, *in situ* shell (*Perna perna*) patch in the middle of the road.

## UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA		IIA	<b>X</b>		
Historical	Historical Period:		Recent Past (last 60 yrs):					

Recorder's Site No.: MPE 173

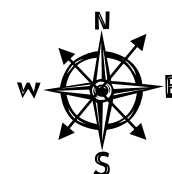
Official Name:

Local Name:

Map Sheet:

GPS reading: S: 28 31' 45.5" E: 32 22' 42.1" Alt: 146m

DIRECTIONS TO SITE: SKETCH OR DESCRIPTION



MPE 173 is located on the first high dune cordon shoreside of the Red Dunes.

SITE DESCRIPTION:

Type of Site: Open. Surface scatter.

Merits conservation: The site is of low significance. It will be monitored for as long as it remains possible.

Threats: Yes

What threats: RBM Mining

RECORDING:

Digital pictures Yes Tracings: Drawings:

Recorder/Informant: Name: Gavin and Louise Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 18/04/2017

Owner:

References:

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

The site consists of a surface scatter of WBS (white beach sandstone) lower grinding stone fragments and shell (*Perna perna*, oyster, whelk, limpet), over a 10m x 20m area. No *in situ* midden was visible.

# UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA		IIA			
Historical	Historical Period:	<b>X</b>	Recent Past (last 60 yrs):	?				

Recorder's Site No.: MPE 174

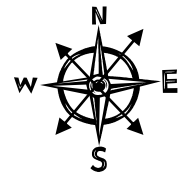
Official Name:

Local Name:

Map Sheet:

GPS reading: S: 28 31' 49.5" E: 32 22' 38.3" Alt: 137m

DIRECTIONS TO SITE: SKETCH OR DESCRIPTION



MPE 174 is located on the first high dune cordon shoreside of the Red Dunes.

SITE DESCRIPTION:

Type of Site: Open. Surface scatter

Merits conservation: The site is of low significance. It will be monitored for as long as it remains possible.

Threats: Yes

What threats: RBM Mining

RECORDING:

Digital pictures Yes Tracings: Drawings:

Recorder/Informant: Name: Gavin and Louise Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 18/04/2017

Owner:

References:

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

The site consists of a surface scatter of WBS (white beach sandstone) lower grinding stone fragments, undecorated pottery and shell (*Perna perna*, oyster, whelk, limpet), over a 10m x 20m area. No *in situ* midden was visible

## UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

**SITE CATEGORY:**

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA		IIA	<b>x</b>		
Historical	Historical Period:	<b>x</b>	Recent Past (last 60 yrs):					

Recorder's Site No.: MPE 174b

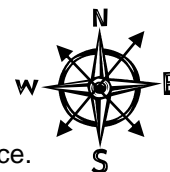
Official Name:

Local Name:

Map Sheet: 2832CA St Lucia

GPS reading: S: 28 31' 49.6" E: 32 22' 39.3" Alt: 116m

**DIRECTIONS TO SITE: SKETCH OR DESCRIPTION**



MPE174b is located about 50m from MPE174. It was exposed at a later stage by bush clearance.

**SITE DESCRIPTION:**

Type of Site: Open

Merits conservation: Yes. Monitor

Threats: Yes

What threats: RBM Mining

**RECORDING:**

Digital pictures: Yes      Tracings:

Drawings:

Recorder/Informant: Name: Gavin and Louise Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 19/07/2017

Owner:

References:

**DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.**

The site appears to be a single homestead with some pottery, shell and more importantly two glass bottles. The one bottle appears to be a case gin bottle dating to the late 19<sup>th</sup> century. The second bottle has the "Kilmarnock" stamp on it. The story behind this stamp is as follow

The bottle is thus an 'Old Highland Whisky' and arrived at MPE174b either via Durban or the 'Port of Richards Bay' between 1870 – 1909. These dates coincide with the case gin bottle. The site is being monitored and several shards of the two bottles are exposed at each survey.

## UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA		IIA			
Historical	Historical Period:	<b>x</b>	Recent Past (last 60 yrs):					

Recorder's Site No.: RD032

Official Name:

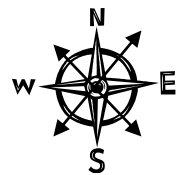
Local Name:

Map Sheet: 2832CA St Lucia

GPS reading: S: 28 31' 44.3" E: 32 22' 20.9" Alt: 4 m

DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

The site is located in the Red Dune system, inland from MPE 174b



SITE DESCRIPTION:

Type of Site: Open. Midden

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

Threats: Yes

What threats: RBM Mining

RECORDING:

Digital pictures: Yes

Tracings:

Drawings:

Recorder/Informant: Name: Gavin and Louise Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 05/10/2017

Owner:

References:

DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

RD032 is a small shell midden ~4m x 4m in size. The shell is *Perna perna*. The pottery is undecorated and it probably dates to the historical period.

## UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

### SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA	?	IIA			
Historical	Historical Period:	<b>x</b>	Recent Past (last 60 yrs):					

Recorder's Site No.: RD033

Official Name:

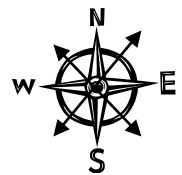
Local Name:

Map Sheet: 2832CA St Lucia

GPS reading: S: 28 31' 48.8" E: 32 22' 26.7" Alt: 21 m

### DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

RD033 is located on the eastern edge of the Red Dunes before the main dune cordon begins.



### SITE DESCRIPTION:

Type of Site: Open. Surface Scatter

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

Threats: Yes

What threats: RBM Mining

### RECORDING:

Digital pictures: Yes

Tracings:

Drawings:

Recorder/Informant: Name: Gavin and Louise Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 05/10/2017

Owner:

References:

### DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

It is an ephemeral surface scatter of bovid bone, pottery and marine shell. The pottery is undecorated. The marine shell is *Perna perna*.



# UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

## SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA	?	IIA			
Historical	Historical Period:	<b>x</b>	Recent Past (last 60 yrs):					

Recorder's Site No.: RD034

Official Name:

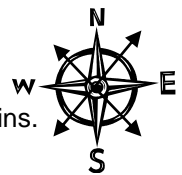
Local Name:

Map Sheet: 2832CA St Lucia

GPS reading: S: 28 31' 47.0" E: 32 22' 27.1" Alt: 30 m

## DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

RD034 is located on the eastern edge of the Red Dunes before the main dune cordon begins.



## SITE DESCRIPTION:

Type of Site: Open. Midden

Merits conservation: The site was sampled and will be monitored. It is of low significance.

Threats: Yes

What threats: RBM Mining

## RECORDING:

Digital pictures: Yes

Tracings:

Drawings:

Recorder/Informant: Name: Gavin and Louise Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 05/10/2017

Owner:

References:

## DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

It consists of an intact shell midden and a surface scatter of artefacts and ecofacts. The midden is ~2m in diameter. The ecofacts include *P. perna*, limpets and bovid bone. The artefacts include undecorated pottery and upper grinding stones.

# UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

## SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA	?	IIA			
Historical	Historical Period:	x	Recent Past (last 60 yrs):					

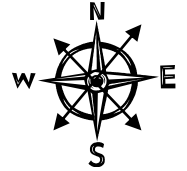
Recorder's Site No.: RD035

Official Name:

Local Name:

Map Sheet: 2832CA St Lucia

GPS reading: S: 28 31' 49.3" E: 32 22' 22.7" Alt: 26 m



## DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

RD035 is located on the eastern edge of the Red Dunes before the main dune cordon begins. It is located ~140m southwest of RD034.

## SITE DESCRIPTION:

Type of Site: Open. Midden

Merits conservation: Yes. Monitor

Threats: Yes

What threats: RBM Mining

## RECORDING:

Digital pictures: Yes

Tracings:

Drawings:

Recorder/Informant: Name: Gavin and Louise Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 05/10/2017

Owner:

References:

## DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

The site is an open midden. The midden is partially intact and consists mainly of *P. perna*. The pottery is undecorated. The artefacts occur over a 10m radius.

# UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

## SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA	<b>X</b>	IIA			
Historical	Historical Period:	?	Recent Past (last 60 yrs):					

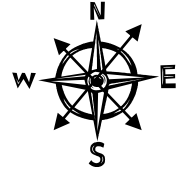
Recorder's Site No.: RD036

Official Name:

Local Name:

Map Sheet: 2832CA St Lucia

GPS reading: S: 28 31' 51.9" E: 32 22' 22.4" Alt: 25m



## DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

RD036 is located on the eastern edge of the Red Dunes before the main dune cordon begins. It is ~80m south of RD035.

## SITE DESCRIPTION:

Type of Site: Open. Midden

Merits conservation: The site is of medium significance and we will monitor it in the future.

Excavations might occur at this site.

Threats: Yes

What threats: RBM Mining

## RECORDING:

Digital pictures: Yes

Tracings:

Drawings:

Recorder/Informant: Name: Gavin and Louise Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 05/10/2017

Owner:

References:

## DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

The site consists of possible two shell middens and a scatter of artefacts over a 40m radius. Much of the site has been disturbed by bulldozer activity for the drilling teams; however parts of the site remain intact under the existing bush. The artefacts include:

- Group 6 pottery of lip notching and circular impressions on the shoulder of the pot
- Bovid, bird and possible wild pig bones
- Various grinding stones
- Fragments of potential human remains.

The possible human remains were collected and kept separate from the other artefacts.

# UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

## SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA	<b>x</b>	IIA			
Historical	Historical Period:	<b>x</b>	Recent Past (last 60 yrs):					

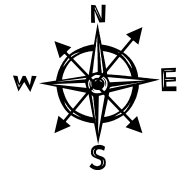
Recorder's Site No.: RD037

Official Name:

Local Name:

Map Sheet: 2832CA St Lucia

GPS reading: S: 28 31' 56.8" E: 32 22' 18.2" Alt: 24 m



## DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

RD037 is located on the eastern edge of the Red Dunes before the main dune cordon begins. It is located 190m southwest of RD036 and 10m in front of the northern wall of Sokhulu Reservoir.

## SITE DESCRIPTION:

Type of Site: Open. Midden

Merits conservation: Yes. The site was excavated

Threats: Yes

What threats: RBM Mining

## RECORDING:

Digital pictures: Yes

Tracings:

Drawings:

Recorder/Informant: Name: Gavin and Louise Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 05/10/2017

Owner:

References:

## DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

The site consists of a single shell midden that was exposed by a cutting for the drilling team. Several artefacts occur on the surface. The artefacts include: Undecorated pottery; *P. perna*, *Fissurellida spp.*, oyster and various limpets; large amounts of bovid bone; Upper grinding stones and smoothed beach pebbles (indicating a shell midden in the area)

The site was excavated over a two week period in November. The excavations yielded case gin bottle fragments. These are similar to the ones at MPE171f which is ~330m northeast. The two sites are probably contemporaneous and thus the inhabitants are possibly related.

## UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

### SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:		LIA	<b>x</b>	IIA			
Historical	Historical Period:		Recent Past (last 60 yrs):					

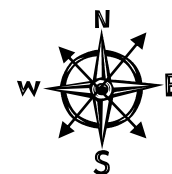
Recorder's Site No.: RD038

Official Name:

Local Name:

Map Sheet: 2832CA St Lucia

GPS reading: S: 28 32' 01.9" E: 32 22' 00.5" Alt: 40 m



### DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

RD038 is located on the eastern edge of the Red Dunes before the main dune cordon begins. It is located 500m west of RD037.

### SITE DESCRIPTION:

Type of Site: Open. Surface Scatter

Merits conservation: The site was sampled and will be monitored.

Threats: Yes

What threats: RBM Mining

### RECORDING:

Digital pictures: Yes

Tracings:

Drawings:

Recorder/Informant: Name: Gavin and Louise Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 03/11/2017

Owner:

References:

### DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

The site currently consists of an open scatter of artefacts and shell midden that have been exposed by bulldozer activity. The site is approximately 30m x 40m in size. The site includes:

- *Perna perna*
- Bovid bone and possible human bone
- Undecorated pottery

It appears that some of the midden might be intact and that a second midden occurs under the undisturbed sand.

## UMLANDO ARCHAEOLOGICAL SITE RECORD FORM

### SITE CATEGORY:

Stone Age	ESA:		MSA		LSA		ISA	
Rock Art	Paintings		Engravings		Other			
Iron Age	EIA:	<b>x</b>	LIA	<b>?</b>	IIA			
Historical	Historical Period:		Recent Past (last 60 yrs):					

Recorder's Site No.: RD039

Official Name:

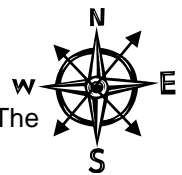
Local Name:

Map Sheet: 2832CA St Lucia

GPS reading: S: 28 31' 59.2" E: 32 21' 21.7" Alt: 29m

### DIRECTIONS TO SITE: SKETCH OR DESCRIPTION

RD039 is located on the eastern edge of the Red Dunes before the main dune cordon begins. The site is located along the first (red) dune cordon adjacent to the Maphelane Road.



### SITE DESCRIPTION:

Type of Site: Open. Midden

Merits conservation: The site is very disturbed and of low significance. The site was sampled and will be monitored.

Threats: Yes

What threats: RBM Mining

### RECORDING:

Digital pictures: Yes

Tracings:

Drawings:

Recorder/Informant: Name: Gavin and Louise Anderson

Address: PO Box 102532, Meerensee, 3901

Date: 03/11/2017

Owner:

References:

### DESCRIPTION OF SITE AND ARTEFACTUAL CONTENT.

The site is a scatter of artefacts over an area of 40m x 50m. The artefacts include: Mzonjani pottery (including a bowl), Upper grinding stones, Undecorated Historical Period pottery, *Perna perna*, Bovid bone