

# ARCHAEOLOGICAL IMPACT ASSESSMENT OF NEW MINING AREAS ALONG THE BUFFELS RIVER, NAMAQUALAND, NAMAKWALAND MAGISTERIAL DISTRICT, NORTHERN CAPE

(AIA conducted under Section 38(8) of the NHRA and as part of an EIA)

Prepared for

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## EXECUTIVE SUMMARY

The UCT Archaeology Contracts Office was appointed by ERM SA to conduct an archaeological and heritage assessment of three proposed mining blocks on two farms (Verdun and Klip Drift) in Namaqualand for which new mining licences are being sought. The farms lie some 10 to 12 km inland of Kleinsee on the north bank of the Buffels River. The areas examined totalled approximately 240Ha. We were asked to study the project area, list all sites found, establish their significance and make recommendations on their mitigation, conservation or relocation as necessary.

The receiving environment consists of gently undulating terrain draining southwards into the Buffels River. The surface consists primarily of red Pleistocene sand and has approximately 20% coverage by low vegetation. Occasional exposures of ferruginous hardpan deposits are present within deflated areas, primarily on the higher lying areas. In general, the basement consists of granite gneiss and is overlain by Cenozoic to Recent sediments. Some calcrete occurs within the sand. Some surface disturbance is evident in the form of old and recent prospecting damage and some areas have been impacted by the kraaling of small stock.

Two archaeologists surveyed the areas on foot recording all archaeological sites encountered. In addition local farmers were canvassed for information on sites (Stone Age or historical) in the area. Ground visibility was excellent throughout and the disturbed areas were not seen as a limitation on the survey. It is likely that buried sites are present in the area.

A number of sites were located including stone artefact scatters dating to the Early, Middle and Later Stone Ages. A number of small scatters of marine shell represent campsites of the recent pre-colonial inhabitants of the region. Random finds of isolated stone artefacts were common throughout the study area and testify to an ephemeral human presence over the whole area. No palaeontological material was noted at the surface but may be present in channel deposits that will be exposed by mining. A single broken bottle was the only item of historical material noted. No structures are present within any of the three proposed mining blocks.

No sites of particular significance were noted but it is recognised that the small shell and artefact scatters have the potential to inform on a segment of the archaeological landscape about which we know relatively little. As such, mitigation is recommended for a number of these shell scatters. Sites containing only stone artefacts cannot be directly dated and, where appropriate, we believe that the recording of particular diagnostic artefacts during the present survey constitutes suitable mitigation.

We thus recommend that the mining licence be granted but subject to the following conditions:

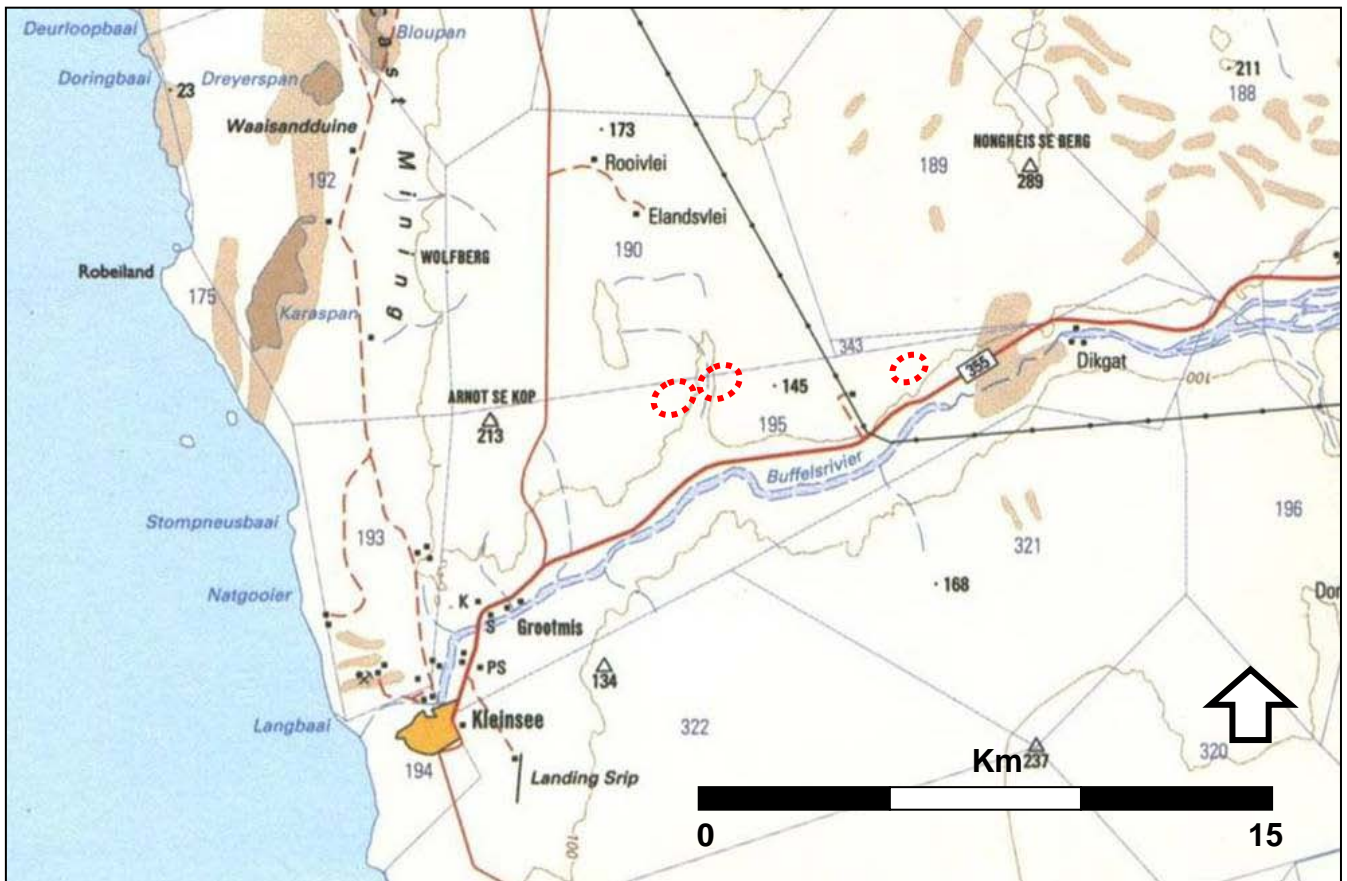
- Mitigation of archaeological sites within the three proposed mining blocks should be carried out as described in this report;
- Further Phase 1 assessments should be carried out in the event of new mining blocks being proposed within the licence areas; and
- The possibility always exists to uncover unmarked human burials during the clearing of topsoil. All employees of De Beers involved in topsoil stripping must be briefed by the environmental officer on actions to be taken in the event of such finds being made;
- Prior to backfilling, mining pits must be inspected by a palaeontologist.

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# 1. INTRODUCTION

The Archaeology Contracts Office (ACO) was appointed by ERM to undertake a Phase 1 Archaeological Impact Assessment of proposed new mining blocks on Portion 4 (Verdun, ~512 Ha) and the remainder of Portion 6 (Klip Drift, ~1762 Ha) of Farm Dikgat 195. These properties are hereafter referred to as Verdun and Klip Drift respectively. The area lies to the east of Kleinsee, approximately 10 to 12 km from the coast (Figure 1). The assessment was conducted as part of an Environmental Impact Assessment for a new mining licence application for the two farms concerned. An Environmental Management Plan will also be compiled. One of the proposed mining blocks extends to the north onto the neighbouring farm, Predikant Vlei (Farm 190), for which De Beers already holds a mining licence. Although only the currently proposed mining blocks were examined (an area of some 240 Ha), it should be noted that new mining blocks are surveyed as the need arises as part of the mine's Environmental Management Plan.



**Figure 1:** Approximate location of the three new mining blocks (ringed in red) to the north of the Buffels River.

## 2. TERMS OF REFERENCE

The following specialist terms of reference were provided by ERM SA:

- Review existing information (EMPR and EMPR Addendum);
- Undertake a field study to understand The Proposed Project Area and collect data;

- Liaise with relevant community members in identifying sites of significance;
- Analyse material found to establish significance of sites or material;
- Describe the importance or significance of these sites and whether these sites need to be conserved, protected or relocated;
- Describe possible procedures for conservation, protection or relocation;
- Determine the need for palaeontological input and elicit comment from a specialist (not in the original brief).

### **3. PROJECT DESCRIPTION**

The project is being carried out for a new mining area. The mining is open cast and entails the following steps:

- Topsoil is removed and stockpiled or reused in the rehabilitation of other mining areas;
- Overburden is excavated and stockpiled in dumps to be used for later backfilling;
- Diamond-bearing ore is then removed and processed in nearby processing plants;
- During subsequent expansions of the mine, overburden is back dumped into the first cut so as to keep the amount of surface disturbance through dumping to a minimum.

Structures to be erected will be of a temporary nature and roads will all be removed and the area rehabilitated after mining.

### **4. DESCRIPTION OF THE AFFECTED ENVIRONMENT**

The proposed new mining blocks are located on the northern side of the Buffels River, on parts of the farm Dikgat 195. They lie some 10 to 12 km from the coast and about 2 km from the river. The entire area is on red sand of Pleistocene age covered by low bushes with an average coverage of perhaps approximately 20% (Figure 2). The topography is generally gently angled towards either the main Buffels River Valley or towards small, sandy side valleys. The latter do not contain water courses and are merely low areas in the landscape. The ground is often gently undulating with low dunes and ridges present from time to time. These may only be half a meter above the surrounding ground level but form relatively prominent features on the otherwise featureless landscape. Occasional deflated areas are noted and never reach the size that characterise some coastal areas. In the Verdun area in particular, exposures of consolidated ferruginous hardpan are visible where sand has deflated. Shallow deflations on Klip Drift were entirely sandy and usually partly vegetated.

Much of the area is pristine but prospecting has occurred in the vicinity and has resulted in many areas being disturbed, particularly on Verdun. This disturbance is often restricted to the surface in the vicinity of the drill locations where the disturbed areas have been ploughed to promote the re-growth of vegetation (e.g. Figure 3). Several informal jeep tracks also cross the area with many of these having been made for the purposes of drilling. Prospecting has also occurred on Klip Drift but this was not recently. Disturbance in this area is relatively minor, although one large hole has been excavated down to the calcrete two or three meters below the surface in the southern part of the proposed mining block.

All the farms are currently used for grazing sheep and several fenced stock enclosures have been completely denuded due to the activity there. One large enclosure falls within the Verdun mining block (e.g. Figure 4). Fences stretch across the landscape demarcating the various camps in which sheep are grazed.

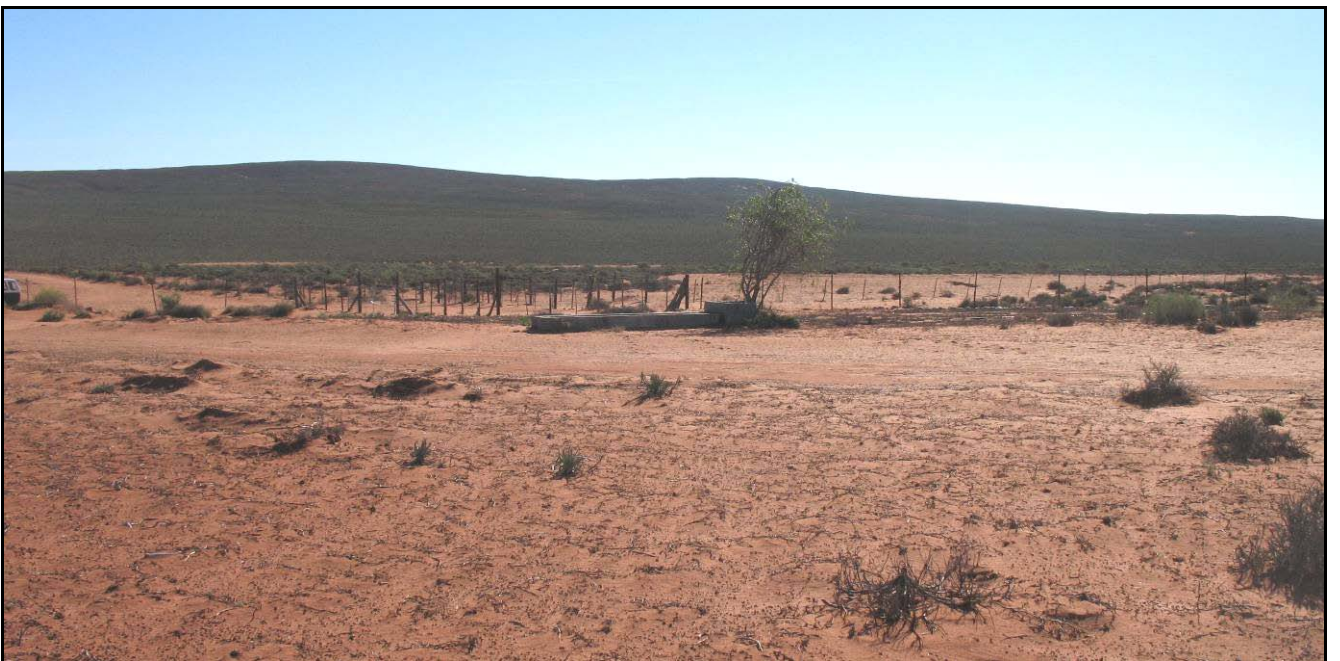
Only one subsurface exposure was seen during the survey and lies on the farm Klip Drift. Here, the red Pleistocene sand overlies a ferruginous hardpan deposit which in turn caps a layer of calcrete (Figure 6). On Verdun, some drill cores were visible in the veld and these indicate red sand which becomes progressively paler and slightly yellow before becoming white and gritty. These sediments are Cenozoic to Recent in age and overlie a Precambrian basement of granite gneisses belonging to the Namaqua Metamorphic Complex.



**Figure 2:** View towards the southeast across the Verdun Farm. The Buffels River valley is faintly visible in the background.



**Figure 3:** View towards the northeast over the Verdun area showing an area disturbed during prospecting activities.



**Figure 4:** View over one of the heavily denuded stock enclosures on Verdun.



**Figure 5:** View to the southeast over Klipdrift. The Buffels River Valley is visible in the background.



**Figure 6:** Photograph showing the calcrete overlain by ferruginous hardpan and unconsolidated Pleistocene red sand.



## 5. METHODS

The survey was conducted by two archaeologists from the 21<sup>st</sup> to the 23<sup>rd</sup> May 2007. Maps showing the edges of the mining blocks were provided by ERM SA. The search was conducted on foot. Although a mining licence for Predikant Vlei is already held by De Beers, we examined the entire footprints of the proposed blocks regardless of which farms they lay on. Past experience has shown that it is useful to search an area greater than the mining block itself, as much disturbance also occurs around the mine pits due to dumping of sand along the edges of the hole. Furthermore, access roads and spoil heaps will also cause damage to areas outside of the mining blocks.

Archaeological sites are invariably associated with some sort of landscape features so, although we were constantly on the lookout for traces of shell or stone artefacts, we were also concerned with identifying likely landscape features. These areas were then subjected to more intense searches and, in certain parts of the search area these features yielded higher frequencies of archaeological occurrences. The features include primarily small mounds and dune ridges and deflated areas with hardpan exposures.

All archaeological sites were recorded in the manner usually employed by the ACO in the De Beers mining areas. This involves filling out a standard site record form on which all relevant data are recorded. Estimations of what mitigation requirements are appropriate is done on site and recorded on the site record form. The site names that are allocated have three components comprised of farm name, year recorded and site number. As an example, DKG2007/001 represents the first site recorded on the farm Dikgat in 2007.

Photographs of the landscape and some sites and artefacts were taken. We do not photograph every site at this stage as many, especially in the setting under consideration here, are virtually identical and would be recorded in greater detail anyway during the mitigation phase. GPS co-ordinates are taken using a hand-help GPS receiver on the WGS84 datum.

We also spoke to the local farmers (Mr J. Bekker - Verdun, Mr E. Mostert - Dikgat) who currently use the land for grazing purposes to establish whether they were aware of any heritage resources that might be present in the area. For clarity we made specific reference to graves and marine shells which are the most tangible heritage items likely to be recognised by lay people.

On return to Cape Town, Dr John Pether, was canvassed for his opinion on the potential for palaeontological material occurring in the area. Recommendations that are included in relation to those resources are based on his response.

### 5.1. Limitations

Some areas were disturbed as described above. These disturbances may have damaged, destroyed or buried archaeological sites, but in some instances have actually resulted in the exposure of sites that might not otherwise have been visible. Vegetation posed no problem to visibility. Shifting sand is likely to have buried sites (particularly MSA and ESA sites), as shown by the sites exposed in disturbed areas, but this is unfortunately never possible to quantify.

## 6. ARCHAEOLOGICAL BACKGROUND

In general, Namaqualand has until recently been vastly understudied compared to other parts of South Africa. In the mid 1960's, Mr Jalmar Rudner visited the mining areas along the coast to study archaeological sites, and to particularly record and collect indigenous ceramics (Rudner 1969). Between that time and 1997, Ms Lita Webley worked in the area. She conducted doctoral research that included excavations at several small inland sites as well as at Spoeg River Cave, at the mouth of the Spoeg River (Webley 1992b). Subsequently she returned to this cave and carried out further excavations (Webley 2002). This cave has proved significant in the search for the first introduction of domestic stock into South Africa with particularly early evidence having been uncovered there (Webley 1992a).

The majority of previous archaeological impact assessments and mitigation projects in Namaqualand have been carried out in the coastal strip, usually within 5 km of the coastline (Halkett 1997; 2001a, 2001b, 2002a, 2002b, 2003, 2006; Halkett & Dewar 2007; Halkett & Hart 1997, 1998; Halkett & Orton 2004, 2005; Orton & Halkett 2004, 2006; Orton 2005a, 2005b). Mitigation of coastal and near-coastal sites has resulted in the publication of several academic journal articles (Dewar & Jerardino 2007; Dewar *et al.* 2006; Orton *et al.* 2005; Orton 2007), and a PhD thesis examining settlement and subsistence has also been written (Dewar 2007). Rescue of pre-colonial burials not collected during normal mitigation projects has also taken place (Dewar 2003; Halkett 2001c; Jerardino *et al.* 1992). Limited work has been undertaken in the inland areas with two assessments in recent years addressing proposed mining areas and related developments to the south of the areas considered by this report and some 9 to 12 km from the coast (Coetzee 2004; Morris 2004, Halkett & Hart 1998). A small assessment for the construction of a communications tower was also conducted at Gys se Berg to the east of the present survey area (Orton 2006).

Our work in Namaqualand has shown that settlement in near coastal areas was heavily concentrated within about 1 km of the coast with the number and size of sites dropping off significantly beyond that limit. There are occasional large shell middens up to 5 km from the coast but these are few in number. No major sites have been recorded further inland than this, although an important finding of MSA Still Bay stone artefacts has been made in the large dunefield just north of Koingnaas (Halkett & Orton 2005a).

## 7. FINDINGS

All the sites found were either very small or else large but not very dense. The former were generally more recent sites (Later Stone Age) and the latter tended to be older, probably Middle Stone Age, stone artefact scatters. These latter probably have some admixture of Early and Later Stone Age material from time to time.

It should be noted that many random finds, usually of quartz flakes, were noted over the whole area. These were more common near the recorded sites and tended to be rare in areas with no sites. These artefacts indicate an ephemeral human presence over much of the area even though sites are generally few and far between. A single large ostrich eggshell bead of approximately 11 to 12 mm diameter was found on Verdun.

## 7.1. Palaeontology

Due to the surface nature of the survey and the general lack of subsurface exposures, no palaeontological sites were noted during the survey. This does not exclude the possibility of material being present in the channel deposits to be exposed by mining.

## 7.2. Stone Age

All the sites found and recorded during the survey pertain to the Stone Age period. The vast majority are relatively recent and belong to the Later Stone Age (LSA) but a few are older. These latter are Middle Stone Age (MSA). Two ESA hand-axes were also found side by side on a dune on Klip Drift. This occurrence is out of place as artefacts of that age should not occur on the surface of wind blown sand. It is likely that these were collected by someone in the recent past and discarded where we found them. The LSA sites were of two types. The first group are simply scatters of artefacts, usually predominantly of quartz, while the second group comprises marine shell scatters, sometimes with a few associated artefacts or other finds. All recorded sites are tabulated in Tables 1 and 2. Figures 7 to 14 show a selection of sites and artefacts recorded during the survey.



**Figure 7:** View over site DKG2007/003 showing the typical environment of the ephemeral shell scatters.



**Figure 8:** View over one of the deflated areas at DKG2007/006 in which the ferruginous hardpan

is exposed and covered by a light scatter of artefacts.



**Figure 9:** The shells exposed by prospecting activity at DKG2007/008. Scale bar is 15 cm.



**Figure 10:** One of the deflated areas on the proposed haul road with ferruginous hardpan exposed. This is at DKG2007/015.



**Figure 11:** Artefacts from DKG2007/015. The large piece on the right is a crude hand-axe while the remaining items are probably all MSA. Raw materials present include quartz, silcrete, CCS and quartzite. Scale bar is 15 cm.



**Figure 12:** Artefacts from KDT2007/001. All but one are quartz with the brown flake at the top being quartzite. Scale bar is 15 cm.



**Figure 13:** The two hand-axes found at KDT2007/002. That on the left is a sub-classic pick-like hand-axe while that on the right seems to be unfinished, perhaps due to an undesired break. Scale bar is 15 cm.



**Figure 14:** The artefacts from KDT2007/004, the most ephemeral site recorded. Scale bar is 5 cm.

### 7.3. Historical period

No historical sites or structures were located but a single broken old mineral water bottle was found on Verdun (Figure 15). The bottle is made from clear moulded glass, has a flat bottom and the upper part missing. It bears the following text in relief on one side:

THE ...STOR  
MINERAL WATERS  
PURITY GUARANTEED.

These bottles were most commonly used during the later part of the 19<sup>th</sup> century. Local farmers knew of no historical structures or graves within either of the study areas.



**Figure 15:** The broken mineral water bottle found on Dikgat.

## 8. CONCLUSIONS

The coastal areas contain very high densities of sites of varying size but generally all containing vast quantities of marine shell. In contrast, site density inland was very low. In this section we briefly discuss the kinds of sites recorded and provide an assessment of their significance.

It is important to note that significance of archaeological sites is not determined in the manner usually employed by environmental practitioners. Use of that system (which largely determines the significance of *impact*) results in unreasonably high significance ratings for sites which might otherwise be relatively unimportant. This is due to the fact that archaeological sites are non-renewable and permanent loss often results from mining impact. The significance of archaeological sites must thus be determined within an archaeological context and relies on a combination of the following factors:

- Content of the site in terms of both uniqueness and abundance of finds;
- Depth of deposit;
- How it fits into the local and/or regional context; and
- The amount of archaeological data available for the general area.

These criteria give us a sense of how serious it would be to lose the sites if no mitigation was carried out. The significance ratings applied below thus indicate the significance of the sites *within an archaeological context* and not the significance of the impacts on them should they go unmitigated.

## **8.1. Palaeontology**

No palaeontological material was noted at the surface and, although fossils have been known to occur in the deep deposits close to bedrock, these are rare. During previous assessments along the coast, we have occasionally noted the presence of marine (whale) and terrestrial mammal bones as well as fossil marine shells. However, the true fossil potential of the area has yet to be realised since the difficulty of conducting assessments has meant that these have not occurred. Significance ratings can thus not be applied to palaeontological resources as yet. Mining pits should be inspected by a palaeontologist whenever opened to determine if any significant material is present and to build up a picture of the palaeontological resource.

## **8.2. Stone Age**

Those LSA sites that were found tended to be very small and often quite ephemeral. Although generally of fairly low significance in and of themselves, these sites have the potential to inform on the presence of prehistoric camps in areas that have not yet been studied. Sites with no organic remains and lacking diagnostic stone artefacts remain of low significance but those with shell (which can be radiocarbon dated to find out the approximate date of deposition) are more important. Within the wider regional context these latter sites can be considered as of medium archaeological significance.

Although far nearer the coast, a similar collection of small ephemeral shell scatters was mitigated near Mitchells Bay in 2006 (Orton & Halkett 2006). Mitigation of such small sites has often been overlooked in South Africa and it is likely that there is much to be learned from them since they potentially offer windows into the lives of different groups of people to those that left the large shell middens along the immediate coastal areas (Orton 2007). Surface scatters often represent bioturbated material brought to the surface through the action of plant roots or burrowing animals and can denote the presence of more concentrated buried archaeological deposits.

The ESA and MSA sites were all exposures of artefacts on deflated hardpan surfaces. Such collections of artefacts are probably present below the Pleistocene sands in many areas. As such their significance is rated as low and mitigation is unlikely to provide more meaningful data than what could be gathered at the Phase 1 stage. The main points to be gleaned from them is where they are, what raw materials were used and what kinds of diagnostic artefacts, if any, are evident.

# **9. RECOMMENDATIONS**

## **9.1. Palaeontology**

It is recommended that a professional palaeontologist be contracted to examine the mine pits prior to their being back-filled. This will enable an assessment of palaeontological resources to be made and will help in the assessment of additional mining blocks in the area if they are opened.



## 9.2. Stone Age

The importance of the small shell scatters located during this survey has been explained above. Mitigation is recommended for some of the better examples located during this survey (see Table 1 for details). This mitigation only needs to take the form of obtaining a sieved sample of material from each site. Mitigation of all these sites could be comfortably carried out in one day. Formal excavations would be meaningless given the low density of finds. Sites without shell cannot be dated. The LSA artefacts scatters are thus of no use in terms of establishing an occupational history of the area and need no mitigation. The older artefact scatters also cannot be directly dated but the presence of occasional diagnostic elements has been noted during this survey. Nothing further can be gained from their study and they too need no mitigation.

## 9.3. General recommendations

Three mining blocks are proposed in the area for which the mining licence is being sought. Mitigation of archaeological resources within these blocks will be very easily accomplished.

It should be noted that unmarked prehistoric burials can occur unpredictably across the landscape. Given the very low density of archaeological sites in the area, the likelihood of finding human burials is extremely low, but not impossible.

We thus recommend that the mining licence be granted subject to the following conditions:

- Archaeological and palaeontological mitigation as stipulated above is carried out in the three proposed mining blocks;
- Further, that Phase 1 archaeological assessments be carried out on any new blocks, or extensions to existing blocks that might be proposed within the licence area in the future; and
- All De Beers personnel involved with soil stripping must be briefed by the environmental officer as to procedures to be followed in the event that human remains are uncovered particularly during the initial stages of mining.

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## Appendix 1

### INVENTORY OF ARCHAEOLOGICAL SITES LOCATED IN MAY 2007 SHOWING MITIGATION STATUS

Abbreviations used in appendices:

*Location:* s – shoreline                      c – coastal                      i – inland

*Character:* sm – shell midden                      smwa – shell midden with artefacts  
ss – shell scatter                      sswa – shell scatter with artefacts  
as – artefact scatter                      asws – artefact scatter with shell  
sp – spatial patterning                      str – stratification

*Age:*                      ESA (Early Stone Age)                      MSA (Middle Stone Age)  
LSA post 2000BP (Later Stone Age <2000), LSA pre 2000BP (>2000),  
LSA unk (unknown)

*Position:* a – deflation                      b – dunetop                      c – dune lee  
d – rocky platform                      e – open area                      f – rock shelter  
g – boulder                      h – disturbed

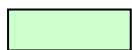
*Ph1 description:* sc – surface collection                      sa – sample                      exc – excavate

*Mining status:* nym – not yet mined

*Mitigation status:*



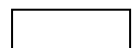
*No mitigation required*



*Mitigation has been completed at the Ph1 stage*



*Mitigation has been completed at the Ph2 stage*



*Mitigation still required at Ph2*

SITE	MINE	TARGET AREA / BLOCK	LAT/LON	DATE RECORDED	CHARACTER	AGE	MITIGATION STATUS AFTER PH1	PH1 DESCRIPTION	MITIGATION STATUS AFTER PH2	PH2 TIME ESTIMATE	PH2 DESCRIPTION	ARCHAEOLOGY PERMIT	DESTRUCTION PERMIT	MINING STATUS	REPORT REFERENCE	RECORDER'S NAME	COMMENT
DKG2007/001	BIC		S29 35 44.6 E17 08 15.5	21.05.2007	sswa	LSA				0.5 hr	sample all			nym	May 2007	DH	ephemeral site
DKG2007/002	BIC		S29 35 49.1 E17 08 12.5	21.05.2007	as	LSA								nym	May 2007	DH	ephemeral site
DKG2007/003A	BIC		S29 36 13.4 E17 07 57.2	21.05.2007	ss	LSA				0.25 hr	sample all			nym	May 2007	DH	site complex
DKG2007/003B	BIC		S29 36 14.0 E17 07 57.5	21.05.2007	ss	LSA				0.25 hr	sample all			nym	May 2007	DH	part of above
DKG2007/003C	BIC		S29 36 13.5 E17 07 58.7	21.05.2007	ss	LSA				0.25 hr	sample all			nym	May 2007	DH	part of above
DKG2007/003D	BIC		S29 36 12.9 E17 07 58.6	21.05.2007	ss	LSA				0.25 hr	sample all			nym	May 2007	DH	part of above
DKG2007/004	BIC		S29 36 15.8 E17 08 06.9	21.05.2007	ss	LSA								nym	May 2007	DH	very minimal
DKG2007/005A	BIC		S29 36 09.9 E17 08 09.2	21.05.2007	sswa	LSA								nym	May 2007	DH	very minimal
DKG2007/005B	BIC		S29 36 09.9 E17 08 08.7	21.05.2007	ss	LSA								nym	May 2007	DH	very minimal
DKG2007/006	BIC		S29 35 37.5 E17 08 07.8	21.05.2007	as	MSA/LSA								nym	May 2007	JO	
DKG2007/007A	BIC		S29 36 18.7 E17 08 06.8	21.05.2007	ss	LSA				0.25 hr	sample all			nym	May 2007	JO	ephemeral site
DKG2007/007B	BIC		S29 36 19.1 E17 08 06.4	21.05.2007	ss	LSA				0.25 hr	sample all			nym	May 2007	JO	ephemeral site
DKG2007/008	BIC		S29 35 41.3 E17 08 07.7	21.05.2007	ss	LSA				0.5 hr	sample all			nym	May 2007	JO	good shell
DKG2007/009	BIC		S29 36 19.8 E17 08 08.1	21.05.2007	ss	LSA				0.5 hr	sample all			nym	May 2007	JO	
DKG2007/010	BIC		S29 36 20.3 E17 08 08.8	21.05.2007	ss	LSA				0.5 hr	sample all			nym	May 2007	JO	
DKG2007/011	BIC		S29 36 14.9 E17 08 10.3	21.05.2007	ss	LSA								nym	May 2007	JO	
DKG2007/012A	BIC		S29 36 20.5 E17 08 05.9	21.05.2007	ss	LSA				0.25 hr	sample all			nym	May 2007	JO	two patches
DKG2007/012B	BIC		S29 36 20.9 E17 08 06.0	21.05.2007	ss	LSA				0.25 hr	sample all			nym	May 2007	JO	part of above
DKG2007/013	BIC		S29 36 13.7 E17 08 08.2	21.05.2007	ss	LSA								nym	May 2007	JO	very minimal
DKG2007/014	BIC		S29 35 53.9 E17 07 27.9	22.05.2007	as	MSA								nym	May 2007	JO	on proposed haul road
DKG2007/015	BIC		S29 35 55.5 E17 07 20.6	22.05.2007	as	ESA/MSA								nym	May 2007	JO	on proposed haul road
DKG2007/016	BIC		S29 35 51.0 E17 07 17.7	22.05.2007	as	MSA								nym	May 2007	JO	minor exposure to north of 015

SITE	MINE	TARGET AREA / BLOCK	LAT/LON	DATE RECORDED	CHARACTER	AGE	MITIGATION STATUS AFTER PH1	PH1 DESCRIPTION	MITIGATION STATUS AFTER PH2	PH2 TIME ESTIMATE	PH2 DESCRIPTION	ARCHAEOLOGY PERMIT	DESTRUCTION PERMIT	MINING STATUS	REPORT REFERENCE	RECORDER'S NAME	COMMENT
DKG2007/017	BIC		S29 36 01.4 E17 07 04.4	22.05.2007	as	MSA								nym	May 2007	JO	on proposed haul road
DKG2007/018	BIC		S29 35 46.9 E17 08 49.9	22.05.2007	sswa	LSA								nym	May 2007	JO	very minimal
KDT2007/001	BIC		S29 35 24.2 E 17 12 26.2	23.05.2007	as	LSA/MSA								nym	May 2007	DH	ephemeral but widespread
KDT2007/001A	BIC		S29 35 24.2 E 17 12 02.2	23.05.2007	as	LSA/MSA								nym	May 2007	DH	part of above
KDT2007/002	BIC		S29 35 21.9 E 17 11 59.5	23.05.2007	as	ESA								nym	May 2007	DH	just 2 hand-axes
KDT2007/003	BIC		S29 35 24.5 E 17 12 23.5	23.05.2007	as	LSA								nym	May 2007	JO	very minimal
KDT2007/004	BIC		S29 35 24.9 E 17 12 29.3	23.05.2007	as	LSA								nym	May 2007	JO	very minimal
KDT2007/005	BIC		S29 35 19.6 E 17 12 29.3	23.05.2007	as	LSA								nym	May 2007	JO	very minimal

## **Appendix 2**

# **INVENTORY OF ARCHAEOLOGICAL SITES LOCATED IN 2005 SHOWING SUMMARIES OF THE CONTENT**



SITE #	
AGE	
POSITION	
LOCATION	
CHARACTER	
STONE MATERIALS	
FORMAL TOOLS & UT MANUPOINTS	
HISTORICAL MATERIAL	
CERAMICS	
OES	
BONE	
LOBSTER	
SHELL UNSPEC	
C. GRANATINA	
S. GRANULARIS	
S. ARGENVILLEI	
S. BARBARA	
C. MERIDIONALIS	
OTHER	
SURFACE COLL	
SAMPLED	
C14 SAMPLE	
COMMENT	

