

**PHASE 1 ARCHAEOLOGICAL ASSESSMENT OF  
PROPOSED DIAMOND MINING AREAS SITUATED AT  
THE FARMS GEELWAL KAROO, KLIPVLEY KAROO  
KOP AND GRAAUDUINEN, VREDENDAL DISTRICT,  
WESTERN CAPE**

Prepared for

**SRK Consulting**

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## EXECUTIVE SUMMARY

The Archaeology Contracts Office (ACO) of the University of Cape Town was appointed by SRK Consulting to undertake a phase 1 archaeological assessment of localities in the Namakwa Diamond Company concession on the west coast north of the Oliphants River Mouth. It was found that the major heritage risks were pre-colonial archaeological sites of the Early, Middle and Late Stone Age. ~~It was found that:~~

- Pre-colonial Late Stone Age sites are common close to rocky shorelines and small bays.
- Shorelines adjacent to long stretches of sandy beach contain very few Late Stone Age archaeological sites.
- Although the concession area is generally archaeologically rich, the majority of sites are not of high archaeological sensitivity, but will need to be mitigated prior to mine development. This will be achieved through excavation and sampling of archaeological sites in the effected areas.
- Only one site (LBM 8) is considered to be of very high significance and needs to be excluded from mining activities.
- Liebenbergbaai and Langstrand are low risk areas requiring minimal mitigation of archaeological material.
- The majority of small bays and coves identified for mining will require mitigation of archaeological sites.
- No other significant heritage issues have been identified.

## 1 Introduction

The Archaeology Contracts Office (ACO) of the University of Cape Town was appointed by SRK Consulting to undertake a Phase 1 archaeological assessment of a number of localities situated at the farms Geelwal Karoo, Klipvley Karoo Kop and Graauw Deuinen on the west coast. The land in question forms part of a diamond mining concession held by Namakwa Diamond Company (NDC) (see Figure 1). NDC intend developing mining operations at Langstrand and Liebenbergbaai as well as at a number of small bays and coves where diamondiferous gravels occur. These activities have the potential to impact a number of heritage resources, in particular pre-colonial archaeological sites.

### 1.1 Terms of Reference

SRK Consulting (the proponent's environmental consultants) provided the scope and terms of reference for the specialist archaeological study. Furthermore, the format of this report answers to guidelines provided by SRK Consulting. ACO were requested to conduct the study according to the following requirements.

- The Phase I assessment must consider the archaeological resource of the area. In addition, should any other significant heritage resources exist, these must be identified and recommendations made regarding any potentially required further work.

The Terms of Reference for a specialist *Phase 1 archaeological impact assessment* are to:

- Identify and map archaeological (heritage) resources in the potential mining areas;
- Determine the importance of the archaeological (heritage) resources in a regional and national context;
- Determine and assess the impact of the proposed mining operations on the archaeological (heritage) resources;
- Recommend mitigation measures to minimise impacts associated with the proposed mining operations;
- Recommend and implement additional terms of reference, based on professional expertise and experience;
- Liaise with SAHRA or the equivalent provincial heritage resources body, in conjunction with SRK Consulting, regarding their requirements.

The Terms of Reference are not intended to be definitive, but rather to provide a guide as to the focus of the specialist study.

## 2 Method

The primary method of obtaining data was a field survey, and the recording of heritage sites found. Evaluation of the status/importance of these sites was informed by a number of extensive previous projects conducted in the Namakwa Sands owned land immediately to the north, a previous survey of Trans Hex Mining concessions in the Admiralty Zone and the immediate shore area as well as cumulative knowledge resulting from evaluation of heritage resources on De Beers Namaqualand Mines Division owned properties.

Two archaeologists spent 3 days doing the field survey of archaeological sites in the NDC mining area. The mine Geologist and Environmental Officer indicated the locations of the proposed mining areas, after which the localities were searched on foot by the archaeologists using a pattern of meandering search paths. Surface indications of archaeological sites were recorded and positions established using handheld Garmin GPS 3 Plus global positioning receivers set on

map datum WGS84. Walk and drive paths have also been recorded. No material was collected and no trial excavations were conducted. Co-ordinates of individual sites are presented Table 2 in this report. Liebenbergbaai was assessed by Hart and Nilssen (ACO) in 1999. While this area was not re-surveyed during this study, the relevant findings have been incorporated.

## **2.1 Restrictions**

Surface visibility in the study is generally good due to sparse low vegetation. Inspection of various prospecting excavations showed that there is archaeological material buried below surface, indications of which are not visible on the surface. Boundaries of proposed mining [areatranches](#) have not been laid out so survey area boundaries at the small bays are not precise, but focus on the general area around recent prospecting borehole lines. Some survey areas were larger than originally anticipated.

## **3 Description of the affected environment**

### **3.1 The study area**

The area that will be affected by NDC's mining operations amounts to some 30 km of coastline, the southernmost boundary of which lies some 12 km north of the Olifants River Mouth. The northern boundary lies at Jakkalshok just south of the Namakwa Sands mineral mining area. The coastline consists of large expanses of rocky shore (quartzites) punctuated by small bays and coves. There are two long stretches of sandy beach (Langstrand and Liebenberg Bay). Immediately inland of the rocky shore are the remnants of the coastal dune system, most of which has now been disturbed by small mining operations. The low scrub covered coastal plains slope gently down to the shorelines apart from in the south where the slope breaks rather more steeply down to places such as Baaivals and Sam se Baai. Many informal tracks lead off the coastal road to old diamond diggings resulting in deflated and de-vegetated areas.

In general, the area has seen very little development as it was diamond concession land since the early 20<sup>th</sup> century. The nearest small settlement of any consequence is Koekenaap some 30 km inland. There is one ruined farmhouse situated at Sterkfontein.

### **3.2 Mining activities**

NDC will limit its activities to specific areas, namely a number of small bays and coves where there are deposits of diamondiferous gravels, while the main operations will take place at Liebenbergbaai and Langstrand. The mining method involves open cast excavation to reach the gravels, which are then taken to a temporary processing plant. Excavations are then backfilled and re-vegetated.

### **3.3 Previous work relevant to the study area**

The Namaqualand coast north of the Olifants River was archaeologically unknown until 1987 when John Parkington of the ACO was appointed by the Environmental Evaluation Unit (EEU) on behalf of Namakwa Sands to assess the impacts of proposed heavy mineral sands mining. It became clear at that time that the dry areas of the West Coast were surprisingly archaeologically rich. This observation was further illustrated in 1991 when Halkett and Hart (ACO) sample-surveyed the coastline of De Beers owned properties between Mitchell's Bay and Port Nolloth recording details of almost 1000 archaeological sites.

Parkington and Poggenpoel (1991) after several preliminary assessments in the Brandsebaai area suggested that occupation of the coast during the Late Stone Age had taken place as a single burst of prehistoric occupation, probably within the last 2000 years. However, subsequent research including archaeological excavation at several localities between Brandsebaai and the Orange River Mouth have shown that people have been exploiting coastal resources since the Eemian interglacial period about 120 000 years ago with the discovery of two rare Middle Stone Age shell middens, at Brandsebaai and Boegoeberg.

Although the picture is still far from clear, occupation of the area during the last 10 000 years (Holocene) was probably continuous but pulsed according to environmental patterns with events such as the "little ice age" circa 1400 AD playing a significant role. Radio carbon dates obtained from Late Stone Age sites indicate that ancestors of the San (Bushmen) were in the area at least 5000 years ago. Although there is still much to be learned about the archaeology of the region, some interesting patterns in the distribution of archaeological sites are beginning to emerge. There are numerous archaeological sites on the immediate coast, mostly associated with rocky shoreline areas where marine resources were easy to obtain. Many of these sites contain ceramics and appear to be less than 2000 years old judging by the types of artefacts that are found on them. In contrast the few sites that we have located further inland tend to be much older dating to over 3000 years ago. This hints at changes in the way that people used the landscape over time, which may reflect a combination of environmental and social factors combined with population pressure. Coastal occupation and pressure on coastal resources may have increased after 2000 years ago when Khoekhoen arrived in the Cape bringing with them herds of sheep, ceramic technology and a new economic order.

### 3.3.1 Conservation status of sites

In more than any other area of the Cape, impact assessments and mitigatory studies commissioned by both Namakwa Sands (Pty) Ltd, De Beers Namaqualand Mines Division, Trans Hex Mining Ltd and now NDC have provided the bulk of what is known about the archaeology of the Namaqualand coast. Not only has this work contributed to research, but also importantly it has allowed us to gauge the condition of the "National Estate" of archaeological sites on the west coast.

During the early 20<sup>th</sup> century large-scale diamond mining began and it was only in the 1990s that mining companies began to implement policies for the conservation and assessment of heritage sites. This means that in certain areas massive destruction of coastal archaeological sites has occurred without any mitigatory provisions. The worst hit areas are between Alexander Bay and Port Nolloth, the coastal areas of the Buffels Marine Complex at Kleinsee, parts of the Koningnaas mining area. However, the fact that many of these areas are off-limit to the public has resulted in the excellent preservation of archaeological sites in those parts of these high security areas that have not been developed. Unfortunately the area between the Spoeg and the Olifants River mouths have been impacted very seriously by years of small *ad hoc* diamond operations which has resulted in a plethora of jeep tracks in the coastal zone. Furthermore, there is hardly an area of the coastal fore-dunes that has not been subject to some form of disturbance. This means that virtually the entire archaeology of the immediate coastline (ie the Admiralty Zone – the coastal fore dunes) has already been lost. Fortunately, many sites have survived in the areas immediately inland of the coast. These are threatened by not only continued mining of these areas but especially by undisciplined use of off-road vehicles and the mass of informal roads/tracks that result.

The loss of heritage sites on the west coast is destined to continue as long as the coast and near coastal areas are subject to uncontrolled diamond mining, and in some instances, uncontrolled access by off-road vehicles. In the light of the substantial collective impacts that have already occurred to the population of archaeological sites, it is imperative that all effort is made to conserve them, and where impacts will inevitably occur, sample them to ensure that loss of historical/cultural/scientific information resulting from their destruction is minimised.

## 4 Sources of risk, impact identification and assessment

### 4.1 General observations

Pre-colonial archaeological sites are prolific with most Late Stone Age sites located within 1 km of the shoreline. Areas adjacent to rocky shorelines and small bays attracted prehistoric

occupation by ancestors of San hunter-gatherers and Khoekhoen herders. The higher slopes and coastal plains show evidence of Early and Middle Stone Age artefact scatters: material is visible in virtually any area where red Aeolian sand have become deflated and the underlying *Dorbank* (hard calcretised feldspathic soils) exposed.

In summary, the heritage of this area is almost entirely archaeological – the cultural landscape consisting of the distribution of a range of pre-colonial archaeological sites from different time periods. The colonial period cultural landscape is almost entirely limited to a legacy of old diggings, prospecting trenches and places where temporary structures were erected to accommodate diamond mining (the exception being a single historical ruin). Virtually all of this recent history is less than 100 years old and does not constitute archaeological material as defined by the National Heritage Resources Act of 1999. In terms of the Act the main sources of risk in terms of both site specific and cumulative impacts are archaeological, however impacts to historical sites as well as visual impacts do require some commentary.

In summary, the primary sources of risk in terms of heritage are mainly near shore Late Stone Age archaeological sites, Middle Stone Age artefact scatters and buried sites and to a lesser extent, intangible heritage such as visual impacts.

#### **4.2 Criteria for determining significance of impacts**

The criteria used are based on that used by natural and social scientists to determine environmental impacts. Heritage assessment requires the application of slightly different values as required by section 38 of the National Heritage Resources Act and further defined by various documents on heritage conservation planning and evaluation (National Heritage Resources Act, Icomos Burra Charter, Heritage Lottery Fund UK). Although these assessment criteria do not marry precisely with those used in assessing other kinds of impacts, we have attempted to adapt our assessment criteria accordingly.

*Spatial Impact:* The degree to which mining activities will damage the site (wholly or partially).

*Intensity or magnitude:* Assessment is based on evaluation of whether the loss of, or damage to the site will effect its information potential, its intrinsic values - will this be a loss to the National Estate, will it constitute a loss to regional spatial information? Will it be a loss to the scientific community (now and for the future), is it of value to any given community and does it reflect the history of any given community?

*Duration:* While plant communities and animal species are able to regenerate (resulting in impacts that are temporary), archaeological historical sites are essentially irreplaceable therefore any form of direct physical impact will inevitably be permanent in duration.

*Probability of impact:* Mining impacts have a very definite physical affect on the landscape and what may be in or on it at any given time. Therefore the probability of a site in a mining area being impacted is inevitably high in the face of highly invasive mining activity.

*Rating of impacts:* In heritage terms, rating of the significance of an impact is invariably linked to the degree of material damage to a site or place which in turn results in a commensurate loss of historical information, or loss of a heritage asset.

*Status of an impact:* Physical impacts to a site or place are generally considered to be a loss or a negative impact in terms of physical damage or loss of information. However mitigation measures can be used to make impacts less negative or neutral. The active identification and conservation of sites/places with exceptional value, the gaining of scientific information and the

opening of areas for public display are positive impacts that can result from development activities.

*Confidence of an impact occurring:* Assuming that the consultant is familiar with his or her subject matter as well as the various processes that will give rise to impacts, the consultant will assess the confidence in defining likely impacts taking into account the accuracy of the information provided with respect to the scope/extent of any proposed activity.

### 4.3 Mitigation of archaeological sites

There are a number of ways in which impacts to heritage sites can be achieved.

*In-situ conservation* of archaeological material is the most desirable mitigation option, but not always achievable. This involves identifying the perimeter of the site, and then developing a management strategy to ensure that it is left in perpetuity. This involves physically protecting the site and educating people as to its significance and appropriate activities that can take place in the vicinity. Where it is possible to avoid physical impacts, *in situ* conservation is encouraged, but this is normally only insisted on for sites of high significance.

*Mitigation through excavation and/or recording:* sites that are not unique but contain the potential to provide useful historical or scientific information can be mitigated through archaeological sampling. This would involve controlled excavation of a representative portion of the site to characterize its contents, as well as the recording of relative positions of any surface features. This can involve extensive photography and detailed measurements, especially in the case of historic buildings. Any excavated material has to be curated (a process of sorting and accessioning). The curated material then serves as an archive of information that is available for future detailed research. The heritage authority will issue a permit for the demolition of a site provided that they are satisfied that mitigation measures taken are adequate.

*Mitigation of less significant sites;* most archaeological sites, no matter how small, have the ability to contribute information. Such sites can be mitigated within a matter of hours by collection of visible surface artefactual material, observing the relative frequencies of shellfish species and collection of organic material (an archive for future radio carbon dating). They may be demolished under a permit issued by the heritage authority.

#### 4.3.4 Specific observations

Specific observations are commented on by mining area starting at the northern end of the mining concession. Details of specific archaeological sites are summarised in Table 1 and their co-ordinates are presented in Table 2.

##### 4.3.14.4.1 Jakkalshok

Seven archaeological sites (JH1-7) were recorded in the areas as defined by the prospecting lines. Most of these were Late Stone Age, however scatters of Middle Stone Age material were observed in vegetated areas higher up the slopes. Preservation of the Late Stone Age sites was generally good with a number of sites showing excellent spatial characteristics in terms of layout of shell piles and artefact scatters. Mining activities will partially or completely destroy archaeological material (spatial and stratigraphic evidence) depending on location of temporary roads, activity areas and mining trenches.

JAKKALSHOK	Without mitigation	Assuming mitigation
Spatial extent	High	Low
Intensity of impact	High	Low
Duration	Permanent	Permanent

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<b>Probability</b>	High	High
<b>Significance</b>	High	Low
<b>Status</b>	Negative	Low - neutral
<b>Confidence</b>	High	High

#### 4.3.24.4.2 Voelklip

Two Late Stone Age archaeological sites were found in areas as defined by the prospecting lines. This area has been subject to much past prospecting activity and is fairly disturbed. Nevertheless one of the two surviving identified Late Stone Age (VK1) is well preserved showing multiple shell midden discard areas (spatial patterning), stone artifacts.

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<i>Voelklip</i>	Without mitigation	Assuming mitigation
<b>Spatial extent</b>	High	Low
<b>Intensity of impact</b>	Medium	Low
<b>Duration</b>	Permanent	Permanent
<b>Probability</b>	High	High
<b>Significance</b>	High	Low – very low
<b>Status</b>	Negative	Neutral
<b>Confidence</b>	High	High

#### 4.3.34.4.3 Stompneus

This is a rocky headland immediately north of Langstrand which attracted intense prehistoric settlement. Ten sites LS 1-10 were located in this area. These include some substantial multiple patch Late Stone Age shell middens as well as Middle Stone Age artefact middens on the higher slopes above the point (see Plates 1-3).-

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<i>STOMPNEUS</i>	Without mitigation	Assuming mitigation
<b>Spatial extent</b>	High	Low
<b>Intensity of impact</b>	High	Low
<b>Duration</b>	Permanent	Permanent
<b>Probability</b>	High	High
<b>Significance</b>	High	Low
<b>Status</b>	Negative	Neutral
<b>Confidence</b>	High	High

#### 4.3.44.4.4 Langstrand

Langstrand is a substantial length of beach without much rocky shoreline. Very few archaeological sites were found close to the immediate shoreline, it is clear that prehistoric people were targeting rocky headlands and bays where they could obtain readily available marine resources (lobsters, shellfish etc). Two artefact scatters of mixed Middle and Early Stone Age (LS 9 –19) origin were found on the higher slopes above the bay just on the western side of the coastal road.

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<i>LANGSTRAND</i>	Without mitigation	Assuming mitigation
<b>Spatial extent</b>	Low (site specific)-no impact (regional)	Low
<b>Intensity of impact</b>	Low	Low
<b>Duration</b>	Permanent	Permanent
<b>Probability</b>	High	High
<b>Significance</b>	Low	Low
<b>Status</b>	Negative	neutral
<b>Confidence</b>	High	High

[4.3.54.4.5](#) Leon se Baai

A highly sensitive area where 10 archaeological (LSB 1-10) sites were recorded. Most of these are well-preserved Late Stone Age middens, some with clear spatial patterning, while others are very ephemeral and may be largely buried. Particular attention is drawn to site LSB 1 ([see Plate 4](#)), which probably lies outside the envisaged mining area, but consist of an unusually dense scatter of Middle Stone Age artifacts lying exposed on the *Dorbank* in an area above the bay that has been impacted by informal roads and old mining activities. Rehabilitation of this area will result in destruction of these exposed archaeological remains.

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LEON SE BAAI	Without mitigation	Assuming mitigation
Spatial extent	High <del>medium</del>	Low
Intensity of impact	High	Low
Duration	Permanent	Permanent
Probability	High	High
Significance	High	Low
Status	Negative	Neutral
Confidence	High	High

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[4.3.64.4.6](#) Skulpbaai

Two archaeological sites were located at Skulpbaai (SB 1-2). SB 1 is a Middle Stone Age artefact scatter which is visible in de-vegetated patches on the break of the slope above the bay (possibly too far inland for mining). SB 2 is a shell midden, which has already been badly impacted by earth moving activities and is not worth conserving.

SKULPBAAI	Without mitigation	Assuming mitigation
Spatial extent	low	Low – very low
Intensity of impact	High	Low – very low
Duration	Permanent	Permanent
Probability	Low	Low
Significance	High	Low
Status	Negative	Neutral
Confidence	High	High

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[4.3.74.4.7](#) Waterbakke

No surface indications of archaeological sites were located in the vicinity of the prospecting lines.

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[4.3.84.4.8](#) Liebenbergbaai

This area consists an expanse of sandy beach broken in places by small stone outcrops. Like Langstrand, this area shows very little evidence of Late Stone Age archaeological material. All but one of the 10 sites located by Hart and Nilssen (1999) are Middle and Early Stone Age scatters situated on the slopes above the bay. The *exception* is site LBM 8 ([see Plates 5-7](#)), a small mound of debris located at an old prospecting hole. The material, which contains fossil bone, shell, ostrich egg shell and a variety of stone tools suggests a buried Middle Stone Age site with excellent preservation (normally only stone artifacts are preserved on sites of this age). If this is the case, it is certainly one of the most important sites in the area with only 4 others like it having been recorded on the entire west coast to date. The *in situ* conservation of this potentially unique site is recommended.

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Apart from the vicinity of site LBM 8, Liebenbergbaai is generally archaeologically insensitive with few risks or impacts expected.

<b>LIEBENBERGBAAI</b>	<b>Without mitigation</b>	<b>Assuming mitigation</b>
<b>Spatial extent</b>	Low <del>weat</del>	Low <del>weat</del>
<b>Intensity of impact</b>	Low	Low
<b>Duration</b>	Permanent	Permanent
<b>Probability</b>	Low	Low
<b>Significance</b>	Low – very low	Low – very low
<b>Status</b>	Negative	Neutral
<b>Confidence</b>	High	High

<b>LIEBENBERG BAY 8</b>	<b>Without mitigation</b>	<b>Assuming mitigation</b>
<b>Spatial extent</b>	High	No impact
<b>Intensity of impact</b>	High	Very low
<b>Duration</b>	Permanent	Permanent
<b>Probability</b>	High	High
<b>Significance</b>	High	Very low
<b>Status</b>	Negative	Neutral – positive
<b>Confidence</b>	Medium	Medium

#### [4.3.94.4.9](#) Pikkersbaai

Five archaeological sites (PB 1-5) were recorded in the immediate vicinity of the prospecting lines. Of these, 4 are Late Stone Age middens, while the remainder is a Middle Stone Age artifact scatter. All of these sites have suffered some impact as a result of previous prospecting and mining activities.

<b>PIKKERSBAAI</b>	<b>Without mitigation</b>	<b>Assuming mitigation</b>
<b>Spatial extent</b>	Medium	Low
<b>Intensity of impact</b>	High	Low
<b>Duration</b>	Permanent	Permanent
<b>Probability</b>	High	High
<b>Significance</b>	High	Low
<b>Status</b>	Negative	Negative – neutral
<b>Confidence</b>	High	High

#### [4.3.104.4.10](#) Kol se Duin

No surface indications of archaeological sites were located in the vicinity of the prospecting lines.

#### [4.3.114.4.11](#) Baaivals

Baaivals is a highly disturbed area as a result of mining. Two archaeological sites were located. BV 1 is a very large but highly disturbed shell midden transected by jeep tracks and deflated areas. BV 2 is a stone artifact scatter of indeterminate age, - possibly older than 10 000 years.

<b>Baaivals</b>	<b>Without mitigation</b>	<b>Assuming mitigation</b>
<b>Spatial extent</b>	Medium	Low
<b>Intensity of impact</b>	Low	Low
<b>Duration</b>	Permanent	Permanent
<b>Probability</b>	High	High
<b>Significance</b>	Low	Low
<b>Status</b>	Neutral	Neutral
<b>Confidence</b>	High	High

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#### 4.3.124.4.12 Sam se Baai

A single very large Middle Stone Age scatter was found on the hillside above the old house. This is likely to be outside any of mining trenches. The near-shore areas of the bay have already been heavily impacted by mining activities.

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<i>Sam se Baai</i>	Without mitigation	Assuming mitigation
<b>Spatial extent</b>	Low (site specific)	Low
<b>Intensity of impact</b>	Low	Low
<b>Duration</b>	Permanent	Permanent
<b>Probability</b>	Low	Low
<b>Significance</b>	Low	Low
<b>Status</b>	Neutral	Neutral
<b>Confidence</b>	High	Low

#### 4.3.134.4.13 Visual impacts

Visual impacts for a component of the EIA and are not specifically commented on in this report, are considered in the EIA.

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## 5 Recommended Mitigation Measures and Management Actions

The recommended heritage management policy is to encourage continued conservation of important heritage sites through a policy of non-intervention. Archaeological sites that are not as significant can be mitigated before destruction by means of sampling and excavation programmes. Since all archaeological are protected, a permit has to be obtained from the Provincial Heritage Authority to destroy them in the face of development. Permits for destruction of archaeological material may be issued to the developer provided that the authority regards that measures to mitigate through archaeological sampling and excavation are adequate and that mechanisms for management of other heritage resources on the affected properties are in place.

The mitigation measures that are suggested in this report are similar to that implemented by other mining organisations and has been accepted by SAHRA as being adequate to date. The detailed mitigation measures for each site found are indicated in Table 1 while general policies for different kinds of sites are presented below.

### 5.1 Archaeological sites of exceptional significance

Only one site provisionally assigned this status has been identified (LBM 8). It would be preferable that once the boundaries of this buried site have been established, it is left *in-situ* (if its high significance is justified) and buffer zone be established. Although mitigation through excavation is possible, the costs of this will be extremely high and may render mining of the immediate area of the site unviable.

### 5.2 Shell middens, artefact scatters and historic site.

Late Stone Age shell middens and Middle Stone Age scatters are the most common kind of archaeological site within 1 km of the coast. Mitigation can be achieved by sampling the sites, collecting artefacts and mapping features. The purpose of this is to capture an archive of knowledge about the site before it is destroyed. Typically, each site containing undisturbed material will be mitigated as follows:

- Marginal sites: shells to be collected for radio carbon dating, species count made over 2x1m grid, all visible artefactual material collected (Field time required 1-2 hours per site)
- Stratified or multiple feature sites: excavation and bulking of material from 4-6<sup>2</sup> m, sampling of ash patches and shell piles, collection of all visible artefactual material.
- Artefact scatters: collection of visible material (Field time required 8-16 hours per site)
- Historical site: detailed photography, measured drawings, sampling of domestic middens, archival research (field time required 16 hours).
- All excavated material has to be subject to preliminary sorting and curation normally done off-site.

### 5.3 Site management

Many sites lie outside of the proposed mining areas. It is best that these are conserved by non-intervention. They remain vulnerable to illegal collection, *ad hoc* construction of access roads, parking areas, camps sites and the effects of off-road vehicles. Mine staff are encouraged to record the positions of archaeological sites they may come across (so these can be verified at a future date) but are requested not to collect anything from the surface. Heritage consultants can contribute to this by increasing the conservation capacity of mine staff through either casual contact or preferably heritage training workshops.

## 6 Recommendations and Conclusion

### 6.1 Recommendations

#### 6.1.1 Small bays:

Once mining trenches, access roads, infrastructure and spoil heap areas at small bays have been set out, those archaeological sites that are situated within or bordering these areas will need to be identified and sampled as required (Table 1). The programme can be implemented per individual mining area, or for the whole concession (as would suit NDC's planning schedule).

#### 6.1.2 Langstrand

The entire length of the Langstrand beach is archaeologically insensitive and will need ~~very moderate minor~~ mitigation ~~at the northern end and collection of some of the artefact scatters~~ prior to mining (see plate 8). Any material found during the course of excavation should be reported to an archaeologist immediately so that it can be evaluated, and mitigatory measures implemented if required.

#### 6.1.3 Leon se Baai

Although this is one of the more sensitive localities in the concession area, surface indications are that the sites (LSB 2,7,8,6) that will be impacted are not of critical conservation value (according to the latest information provided concerning the exact location of proposed trenches). A series of trial excavations, collection and bulk sampling programme will be adequate for mitigation purposes (see Plate 8).

#### 6.1.4 Site LBM 8 Liebenbergbaai

Liebenbergbaai is also archaeologically insensitive apart from site LBM 8 to which we have provisionally assigned a high conservation value. The proposed mining area encroaches very close to the site locality (see Plate 9) and may well impact material. Mitigation of this site will be potentially time consuming and expensive and may not be in the interest of NDC. More worthwhile would be a program of exploratory excavations to determine the extent of the buried site, provide a better evaluation of its significance, and if necessary, establish an exclusion zone around it.

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#### 6.1.46.1.5 Human burials

Human burials are specifically protected by legislation. No matter how old they are, a public consultation program is normally required prior to the issuing of an exhumation permit. Although no formal cemeteries were identified during the survey, it is possible that pre-colonial human burials may be exposed during mining operations. In the event of this happening, the burial should be left as undisturbed as possible and should be reported to a National Museum, SAHRA or an archaeologist. The exhumation will need to be done by an archaeologist who will apply for an emergency exhumation permit (which SAHRA can issue if remains are unearthed by accident).

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#### 6.2 Permits

The current legal impasse in the administration of heritage legislation means that at this moment there is no legal way in which SAHRA can issue permits for archaeological sampling or approve destruction of archaeological sites for development purposes. Nevertheless, heritage sites remain protected. The reason for this situation is that management of heritage is now due to fall under the responsibility of Provincial Heritage Authorities. The difficulty is that Provincial Governments have not established these offices within required time of two years after implementation of the NHRA in 2000 resulting in an administrative vacuum. A Western Cape Heritage Authority (Heritage Western Cape) has been constituted, has an appointed council and is fast-tracking its capacity to fulfil its legal obligations. It is expected that within a month or two it will be in a position to issue the relevant permits.

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In the meantime, it is suggested that an archaeologist be approached to formulate a proposal to do the necessary mitigation work. The appointed archaeologist will be responsible for applying for a permit to excavate and sample the sites. The developer (with the help of the project archaeologist) is responsible for applying for a permit to demolish remaining archaeological material once the sites have been sampled. Until the provincial heritage authority is in place, permit applications should be sent to the SARAH archaeologist, Ms Mary Leslie, (111 Harrington Street, Cape Town, 8001) who will direct them to the relevant person within the Provincial Heritage Authority.

#### 6.26.3 Conclusion

Archaeological sites and the related cultural landscape form the bulk of heritage sites that are likely to be impacted by mining operations. ~~Visual impacts are a minor concern, however the mine rehabilitation policy is likely to result in an overall improvement in the visual qualities of the coastline in the medium and long term.~~ No further heritage issues have been identified within the study area.

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The survey has revealed that Late Stone Age middens are common close to rocky coastlines, small bays and coves, while long stretches of sandy beach were far less likely to attract prehistoric settlement. This means that impacts are likely with respect to mining located at small bays. Langstrand and Liebenbergbaai are archaeologically insensitive and will require minor mitigation (apart from site LBM 8). Mining operations will result in the loss of some archaeological sites of medium and low significance, however caring for the general environment will help conserve the multitude of sites in the area that won't be directly impacted.

## 7 References

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**TABLE 1**

Site characteristics and mitigation

BAAIVALS

Site No	Characteristics	Significance	Contents	Mitigation
BV 1	LSA Midden Very large, highly disturbed	Low	Quartz waste, OES, pottery Shell: <i>P. Argenvillei</i> , <i>P. granatina</i> , <i>P. granularis</i> , <i>Burnupena sp.</i>	Sample shell Collect artefacts
BV 2	MSA artefact scatter Ridge top	Low	Quartz waste dominated, meta-volcanics	Collect artefacts

JAKKALSHOK

Site No	Characteristics	Significance	Contents	Mitigation
JH 1	LSA midden Multiple shell patches Ceramic period	High	Quartz waste, hammerstone, manuports, pottery, Shell: <i>P. Argenvillei</i> , <i>P. granatina</i> , <i>P. granularis</i> , <i>Burnupena sp.</i> Lobster mandibles	Excavate bulk samples from patches, collect artefacts
JH 2	LSA midden (5x5m) Low density surface site	Low	Manuport, Shell: <i>P. Argenvillei</i> , <i>P. granatina</i> , <i>P. granularis</i> , <i>Burnupena sp.</i>	Sample shell Collect artefacts
JH 3	MSA artefact scatter Deflated area	Low	Quartz and quartzite waste	Collect artefacts
JH 4	LSA midden Multiple shell patches Dispersed by Meerkats	Medium	Quartz waste, Shell: <i>P. Argenvillei</i> , <i>P. granatina</i> , <i>P. granularis</i> , <i>Burnupena sp.</i>	Excavate bulk samples from patches Collect artefacts
JH 5	LSA midden Multiple shell patches	High	Quartz waste, pottery Shell: <i>P. Argenvillei</i> , <i>P. granatina</i> , <i>P. granularis</i> , <i>Burnupena sp.</i> , <i>P. Barbara</i> , <i>C. meridionalis</i> , <i>Burnupena sp.</i>	Excavate bulk samples from patches, collect artefacts
JH 6	LSA midden Multiple shell patches	High	Quartz waste, manuports, stone feature. Shell: <i>P. Argenvillei</i> , <i>P. granatina</i> , <i>P. granularis</i> , <i>Burnupena sp.</i>	Excavate bulk samples from patches, collect artefacts
JH 7	LSA midden Multiple shell patches	Medium	Quartz waste, Shell: <i>P. Argenvillei</i> , <i>P. granatina</i> , <i>P. granularis</i> , <i>Burnupena sp.</i>	Sample shell Collect artefacts



LIEBENBERGBAAI

SITE NO	Characteristics	Significance	Contents	Mitigation
LBM 2	MSA artefact scatter Ridge top	Low	Quartz waste dominated, meta-volcanics	No mitigation
LBM 3	MSA artefact scatter Ridge top	Low	Quartz waste dominated, silcrete, triangular silcrete flake	No mitigation
LBM 5	MSA artefact scatter Disturbed	Low	Quartz waste dominated, silcrete, hornfels	No mitigation
LBM 6	Indeterminate scatter, secondary disturbance	Low	Quartz waste	No mitigation
LBM 7	LSA midden Secondary disturbance	Low	Quartz waste, Shell: <i>P. granatina</i> , <i>P.granularis</i> .	No mitigation
LBM 8	Buried MSA midden Evidence found in prospecting tailings	Very high	Fossil bone, shell, OES, numerous quartz artifacts	Conserve area with 100m radius buffer zone until site dimensions are confirmed by trial excavation
LBM 13	MSA artefact scatter Eroding out of trench section	Low	Quartz waste dominated	No mitigation
LBM 15	MSA artefact scatter Exposed in deflated area	Low	Quartz waste dominated, also silcrete, quartzite Faceted platform flake	No mitigation
LBM 16	MSA artefact scatter Disturbed by prospecting	Low	Quartz waste dominated, silcrete. Large quartzite blade, retouched flakes, faceted platform flakes	No mitigation
LBM 17	ESA scatter in tailings	Low	Flaked cobble and small quartz biface	No mitigation

LANGSTRAND AND STOMPNEUS

Site No	Characteristics	Significance	Contents	Mitigation
LS 1	MSA artefact scatter deflated onto hard surface	Low	Quartz (dominated), quartzite, silcrete waste	Surface collection
LS 2	LSA midden (20x20m)	Medium	Quartz waste, Shell: <i>P. Argenvillei</i> , <i>P. granatina</i> , <i>P.granularis</i>	Excavate bulk sample, collect surface artefacts
LS 3	LSA midden (10x10m) Surface site only	Low	Quartz waste, Ostrich egg shell(OES), Shell: <i>P. Argenvillei</i> , <i>P. granatina</i> , <i>P.granularis</i> ,	Sample shell, collect artefacts
LS 4	LSA midden Multiple shell patches, ceramic period.	High	Quartz waste, silcrete, irregular core, body sherd. tortoise and whale bone,	Excavate bulk samples from patches, collect

LS 5	LSA midden Multiple shell patches Buried site	Medium	OES Shell: <i>P. Argenvillei</i> , <i>P. granatina</i> , <i>P. granularis</i> <i>Bullia sp</i> , <i>burnupena sp</i> , Quartz waste, tortoise bone, seal bone. Shell: <i>P.</i> <i>Argenvillei</i> , <i>P. granatina</i> , <i>P. granularis</i> , <i>Aulacomya</i> <i>arter</i> , <i>Bullia sp</i> .	artefacts  Excavate bulk samples from patches, collect artefacts
LS 6	LSA Midden (small) Surface scatter	Low	Quartz waste, Shell: <i>P.</i> <i>Argenvillei</i> , <i>P. granatina</i> , <i>P. granularis</i> , <i>Burnupena</i> <i>sp</i> .	Sample shell, collect artefacts
LS 7	LSA Midden (small) Surface scatter	Low	Quartz waste, cobble manuport. Shell: <i>P.</i> <i>Argenvillei</i> , <i>P. granatina</i> , <i>P. granularis</i> , <i>Burnupena</i> <i>sp</i> .	Sample shell, collect artefacts
LS 9	Indeterminate scatter (30x30m) Ridge top deflated area	Low	Quartz and quartzite waste.	Collect artefacts
LS 10	ESA/MSA artefact scatter Ridge top	Low	Quartz and quartzite waste, small broken bi-face	Collect artefacts
LS 11	LSA Midden Disturbed by mining	Low	Quartz waste, Upper Grindstone, OES bead (4.5mm) Shell: <i>P.</i> <i>Argenvillei</i> , <i>P. granatina</i> , <i>P. granularis</i> , <i>Burnupena</i> <i>sp. C. meridionalis</i> .	No mitigation
LS 12	LSA Midden Disturbed by prospecting	Low	Quartz waste, Shell: <i>P.</i> <i>Argenvillei</i> , <i>P. granatina</i> , <i>P. granularis</i> , <i>Burnupena</i> <i>sp</i> .	No mitigation

#### LEON SE BAAI

Site No	Characteristics	Significance	Contents	Mitigation
LSB 1	MSA artefact scatter Extensive, exposed in de-vegetated area. Many LSA sites nearby.	High	Wide variety of raw materials, artifacts include blade elements, prepared platform flakes	Collect artifacts if area is to be mined or rehabilitated.
LSB 2	LSA Midden (4x4) dense	Medium	Quartz waste, Shell: <i>P.</i> <i>Argenvillei</i> , <i>P. granatina</i> , <i>P. granularis</i> , <i>Burnupena</i> <i>sp</i>	Bulk sample Collect artifacts
LSB 3	LSA Midden Ephemeral	Low	Quartz waste, Shell: <i>P.</i> <i>Argenvillei</i> , <i>P. granatina</i> , <i>P. granularis</i> , <i>Burnupena</i> <i>sp</i>	Sample shell Test for buried deposit, sample as required.
LSB 4	LSA Midden Multiple patches	High	Quartz waste, OES, Shell: <i>P. Argenvillei</i> , <i>P. granatina</i> ,	Bulk sample shell patches, collect

			<i>P.granularis, Burnupena sp</i>	artefacts
LSB 5	LSA Midden and ash pile Ceramic period	High	Ostrich Egg Shell, bone, pottery, specularite, Manuports. Shell: <i>P. Argenvillei, P. granatina, P.granularis, Burnupena sp</i>	Bulk sample shell patches, collect artifacts
LSB 6	LSA Midden Ephemeral	Low	Quartz waste, Shell: <i>P. Argenvillei, P. granatina, P.granularis, Burnupena sp</i>	Sample shell Test for buried deposit, sample as required.
LSB 7	LSA Midden Ephemeral	Low	Quartz waste, Shell: <i>P. Argenvillei, P. granatina, P.granularis, Burnupena sp</i>	Sample shell Test for buried deposit, sample as required.
LSB 8	LSA Midden Ephemeral	Low	Quartz waste, Shell: <i>P. Argenvillei, P. granatina, P.granularis, Burnupena sp</i>	Sample shell Test for buried deposit, sample as required.
LSB 9	LSA Midden Multiple patches	Medium	Shell: <i>P. Argenvillei, P. granatina, P.granularis, Burnupena sp</i>	Bulk sample shell, collect artifacts

#### PIKKERSBAAI

Site No	Characteristics	Significance	Contents	Mitigation
PB 1	LSA Midden Very ephemeral	Low	Quartz waste, Shell: <i>P. Argenvillei, P. granatina, P.granularis, Burnupena sp</i>	Sample shell Collect artifacts
PB 2	LSA Midden	Low	Quartz waste, Shell: <i>P. Argenvillei, P. granatina, P.granularis, Burnupena sp</i>	Sample shell Collect artifacts
PB 3	LSA Midden Secondary disturbance	Low	Quartz waste, Shell: <i>P. Argenvillei, P. granatina, P.granularis, Burnupena sp</i>	Sample shell Collect artifacts
PB 4	LSA Midden Secondary disturbance	Low	Quartz waste, Shell: <i>P. Argenvillei, P. granatina, P.granularis, Burnupena sp</i>	Sample shell Collect artifacts
PB 5	LSA Midden Heavily disturbed	Low	Quartz waste, Shell: <i>P. Argenvillei, P. granatina, P.granularis, Burnupena sp</i>	No mitigation

#### SKULPBAAI

Site No	Characteristics	Significance	Contents	Mitigation
SB 1	MSA artefact scatter (very dense) Ridge top	Medium	Quartz waste, silcrete, quartzite, ccs, silcrete prepared platform flake	Collect artefacts
SB 2	LSA Midden Disturbed by mining	Low	Quartz waste, Shell: <i>P. Argenvillei, P. granatina, P.granularis, Burnupena</i>	No mitigation

SB 3	LSA Midden Disturbed by mining	Low	<i>sp.</i> Quartz waste, Shell: <i>P. Argenvillei</i> , <i>P. granatina</i> , <i>P. granularis</i> , <i>Burnupena sp.</i>	No mitigation
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SAM SE BAAI

Site No	Characteristics	Significance	Contents	Mitigation
SSB 1	MSA/ESA scatter Extensive dispersed visible in tracks	Low	Wide variety of raw materials, mostly quartz,	Collect artefactual material

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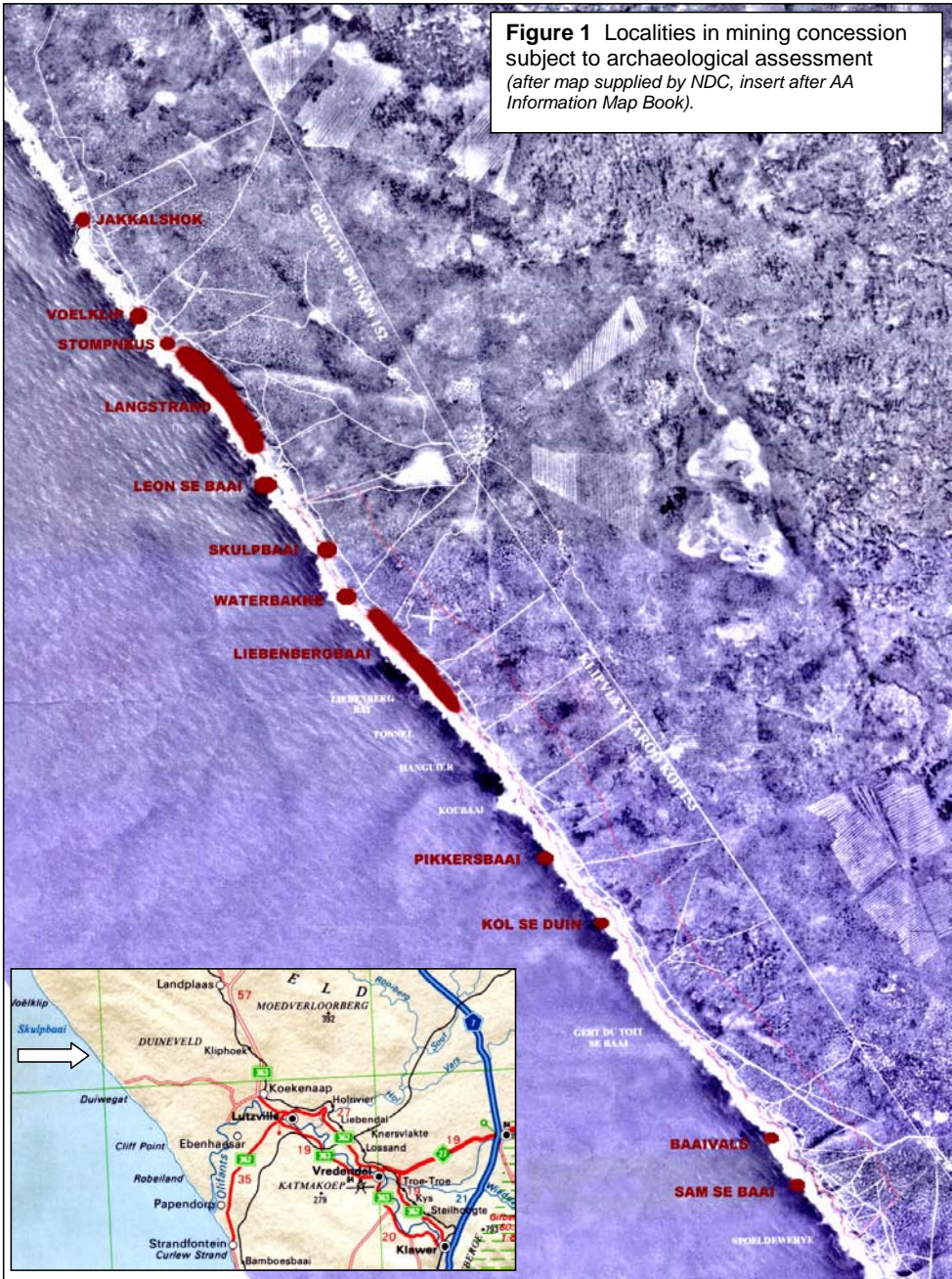
Site No	Characteristics	Significance	Contents	Mitigation
VK 1	LSA Midden (15x15m) Secondary disturbance	Low	Quartz waste, Shell: <i>P. Argenvillei</i> , <i>P. granatina</i> , <i>P. granularis</i> , <i>Burnupena sp</i>	Sample shell Collect artifacts
VK 2	LSA Midden) Secondary disturbance	Low	Quartz waste, Shell: <i>P. Argenvillei</i> , <i>P. granatina</i> , <i>P. granularis</i> , <i>Burnupena sp</i> , <i>C. Meridionalis</i>	Sample shell Collect artifacts

TABLE 2

Co-ordinates of sites

SITE NO	South	East	SITE NO	South	East
BV1	31.496	18.03495	LS4	31.3656	17.91744
BV2	31.4949	18.03509	LS4A	31.3656	17.91754
JH1	31.3427	17.90057	LS5	31.3658	17.91711
JH1A	31.343	17.90082	LS5A	31.3659	17.91681
JH1B	31.343	17.9007	LS5B	31.3661	17.91703
JH1C	31.3429	17.90075	LS6	31.3658	17.91821
JH1D	31.3427	17.90094	LS7	31.3655	17.91932
JH1E	31.3432	17.90086	LS8	31.3736	17.93076
JH1F	31.3432	17.90105	LS9	31.3769	17.93258
JH1G	31.3432	17.90135	LSB1	31.3854	17.93799
JH1H	31.3433	17.90138	LSB2	31.3871	17.93957
JH2	31.344	17.90155	LSB2A	31.387	17.93955
JH3	31.3442	17.90184	LSB2B	31.3868	17.93979
JH4	31.3461	17.90198	LSB3	31.3882	17.94065
JH4A	31.3466	17.90223	LSB4	31.3889	17.94047
JH5	31.3472	17.90207	LSB4A	31.3896	17.94067
JH5A	31.3472	17.90236	LSB5	31.3891	17.94015
JH5C	31.3474	17.90218	LSB6	31.3868	17.9404
JH6	31.3484	17.90224	LSB7	31.387	17.94017
JH6A	31.3483	17.90214	LSB8	31.3873	17.94006
JH6B	31.3484	17.90202	LSB9	31.3879	17.93985
JH6C	31.3485	17.90191	LSB9A	31.3879	17.93998
JH6D	31.3486	17.90216	NDC1	31.344	17.90222
JH6E	31.3485	17.90201	PB1	31.4469	17.99097
JH7	31.3492	17.90214	PB2	31.4451	17.98983
JH7A	31.3493	17.90204	PB3	31.4467	17.99038
JH7B	31.3492	17.90196	PB4	31.4469	17.99046
JH7C	31.3491	17.90197	PB5	31.4476	17.9905
LBM 8	31.4154	17.96156	SB1	31.4013	17.9475
LS1	31.365	17.91688	SB2	31.4006	17.94709
LS10	31.3793	17.93438	SB3	31.3997	17.94735
LS11	31.3803	17.93255	SSB1	31.5089	18.04534
LS12	31.3818	17.93503	VK1	31.3625	17.91359
LS2	31.3647	17.91777	VK2	31.3615	17.91424
LS3	31.3644	17.91827			

Note: GPS Co-ordinates not available for Liebenbergbaai apart from site LBM 8  
 GPS co-ordinates should be accurate within 10 m  
 WGS 84 map datum used





**Plate 1**

Stompneus with Langstrand in the background. The area in the foreground adjacent to the rocky coast is archaeologically sensitive while the long sandy beach (background) attracted very little prehistoric settlement.



**Plate 2**

Stompneus headland attracted pre-colonial settlement. In the foreground is an old prospecting trench, which has penetrated site LS 5 exposing shell, bone and artefacts.



**Plate 3**

An area above the Stompneus headland where vegetation has been destroyed and the underlying top soil-eroded.

Areas like this are common in the study area. Middle Stone Age artefacts are inevitably exposed in such areas where they have been conflated onto the underlying compacted sediments.

This particular site is LS 1.



**Plate 4**

Site LSB 1. Old mining operations, vehicle tracks and resulting erosion of top-soils ~~has~~ have exposed a very dense Middle Stone Age artefact scatter. Measures to rehabilitate this area may result in further destruction of archaeological material.





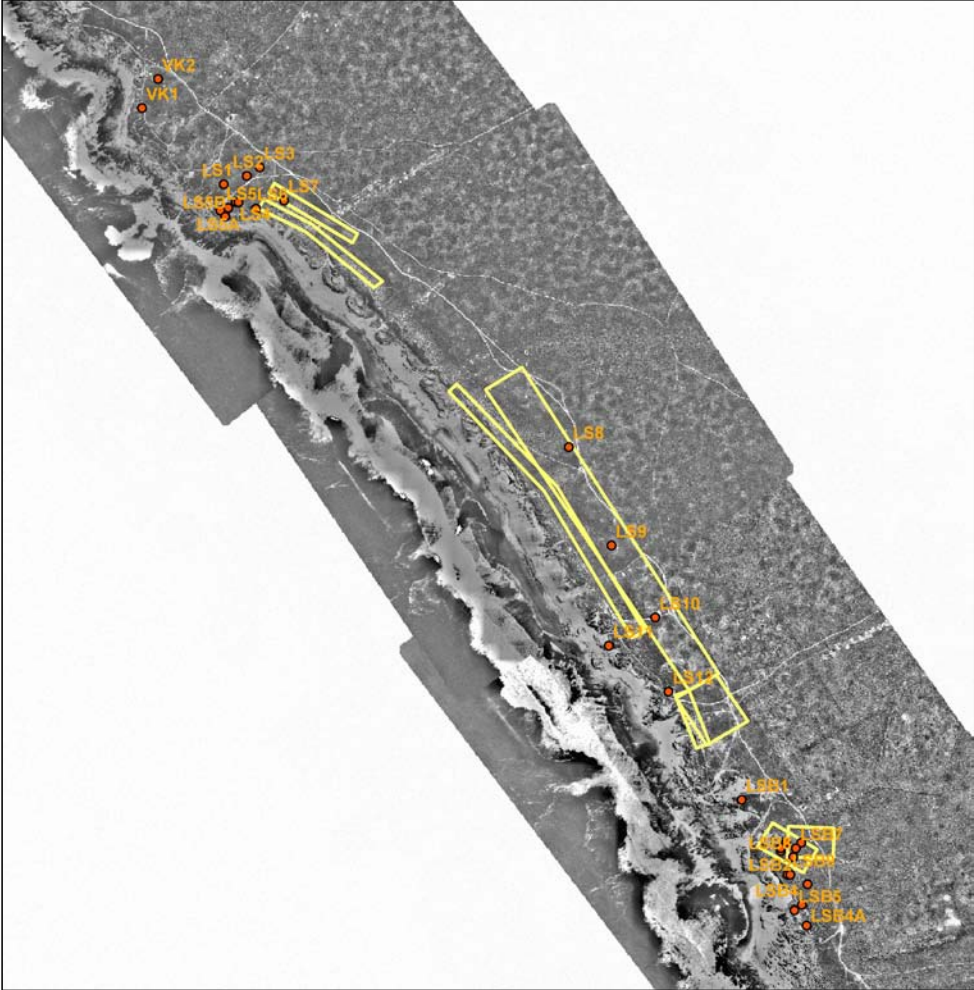
**Plate 5**  
Location of site LBM 8 looking east



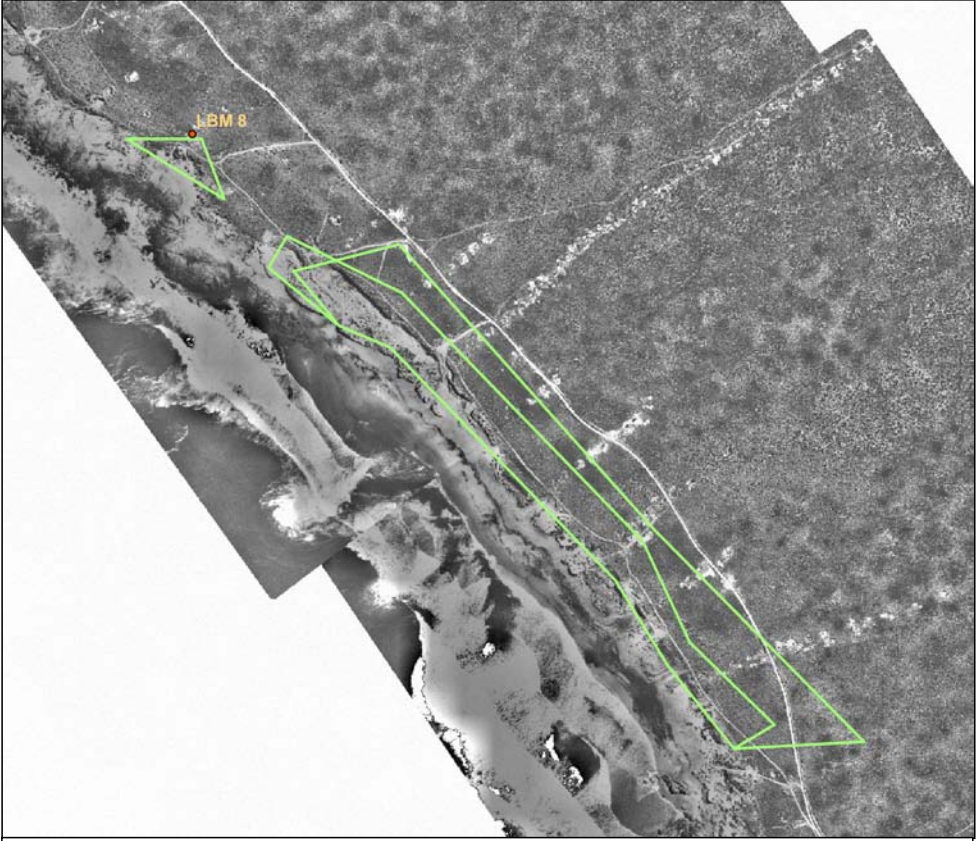
**Plate 6**  
Location of site LBM 8 looking west



**Plate 7**  
The small pile of prospecting tailings containing artefacts, fossil bone, shell and ostrich eggshell indicating the possible presence of a very important Middle Stone Age site.



**Plate 7**  
Location of archaeological sites relative to mining areas at Langstrand and Leon se Baai



**Plate 8**  
Location of site LBM 8 relative to proposed mining area