

# INITIAL HERITAGE SCOPING ASSESSMENT OF A PROPOSED ESKOM TRANSMISSION LINE ROUTE FROM GARIEP RIVER TO VREDENDAL (ESKOM KUDU INTEGRATION PROJECT)

Prepared for

SEF Pty Ltd  
(as part of a scoping EIA)

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## **Executive summary**

The Archaeology Contracts Office of the University of Cape Town was appointed by SEF (Pty) Ltd to produce a scoping-level heritage impact assessment of the corridor in which a proposed electricity transmission line is to be built. Since the proposed route covers a variety of landscapes between the Gariiep River (Oranjemund substation) and Vredendal (Juno substation), the specialist team was shown the area from the air. The findings of this study are therefore extrapolated from aerial observations, prior experience, work of colleagues and others. While the coastal areas and to some extent the Kamiesberg Mountains are relatively well understood in terms of heritage, no work has taken place on the coastal plains.

While no specific preferences are given in terms of the corridor, it is suggested that rocky outcrops, low hills and ridges be avoided as this is where the predominant heritage of the area (archaeological sites) are likely to occur. It will also be necessary (where appropriate) to consult with Nama communities where the route passes close to their grazing lands. It is also suggested that the route be kept away from the N7 so as not to impact its visual amenity value.

Impacts to heritage are likely to be low due to the sparse nature of human settlement away from the coast. It is recommended that the route be ground-proofed (and mitigation applied through minor adjustment or recording and sampling) once other environmental and economic considerations allow for design of a proposed route.

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## **1. Introduction**

The Archaeology Contracts Office of the University of Cape Town was appointed by SEF (Pty) Ltd to undertake a heritage scoping assessment of a corridor of land (figure1) extending from the Gariiep River in the Northern Cape (Oranjemund substation) to the Olifants River Valley, South Western Cape (Juno substation near Vredendal). Eskom is proposing the construction of an electricity transmission line within the corridor; however at this early stage of the project an exact route has not been identified. This study is one of a number of specialist studies that will contribute to identification of the most environmentally appropriate route.

### **1.1 The need for the project**

Studies completed by Eskom and their various consultants have forecast that the company's electricity generating capacity will be under pressure to meet the needs of the nation by 2007 considering the current growth rate of the economy. This is particularly so in the Western Cape Province where local growth rates exceed the national average and are now further exacerbated by Koeberg requiring downtime. Eskom is responding to this situation by taking measures to expand the company's generating and distribution capacity in a number of ways. Locally this will take the form of various upgrades to the power distribution system as well as the proposed construction of two Open Cycle Gas Turbine power stations. These power stations would provide supplementary power during periods of peak electricity usage.

A further measure that is currently being investigated is the purchase of power from Namibia. Namibia has proposed to build a Closed Cycle Gas Turbine (CCGT) power station at Oranjemund, fuelled from the offshore Kudu gas field. It is proposed that the power be transmitted to South Africa via transmission lines over the Gariiep River to the Oranjemund substation and then on via Gromis substation (close to Kleinzee) to Juno substation (near Vredendal) where it will be integrated into the National Grid.

### **1.2 The receiving environment**

The proposed transmission line corridor (Figure 1) affects an extensive linear track of land within both the Northern and Western Cape Provinces. While an exact route has not yet been finally decided on, a broad corridor has been identified – this follows a fairly direct route across the Northern Cape to Vredendal, however the route is obliged to avoid the Namaqualand National Park (the Park is to be extended to include the coastal areas between the Groen and Spoeg River Mouths). At this point the corridor makes a substantial easterly deviation onto the escarpment and granite hills of the Kamiesberg before turning westwards to Juno substation at Vredendal. The corridor therefore crosses a wide variety of landscapes and topography within the arid western side of the country. These range from the Knersvlakte to Namaqualand granite outcrops, coastal flatlands and sandy plains. The dominant heritage resources known in this area relate to pre-colonial archaeology, the history of the Nama speaking people of Namaqualand and the sparse built environment and historical sites of colonial settlers of the 19<sup>th</sup> and 19<sup>th</sup> centuries.

While the corridor as depicted on the map is very wide, the area of impacts of the transmission lines is limited to permanent impacts at tower bases (each in the region of 400m apart) and ground surface disturbance where temporary roads and workers camps are to be constructed.

### 1.3 Research background

The history and pre-history of Namaqualand, despite its obvious rich cultural resources, has been until recently one of the most neglected areas of study in the country. The first serious academic archaeological and anthropological studies of the area did not take place until the 1980's (Webley 1984, 1992) These focussed on the Spoeg River Mouth, Nama reserves of the Kamiesberg mountains and the edge of bushmanland while a few initial archaeological studies has been conducted in the Richtersveld and southern Namibia (Robersshaw 1977).

The archaeological wealth of the Namaqualand coast was only demonstrated circa 1990 when Eskom commissioned a series of preliminary studies to identify potential power station sites along the Namaqualand coast. Hundreds of Late Stone Age (LSA) archaeological sites were located in the apparently waterless landscape (Parkington and Hart, 1991). This observation was further illustrated in 1991-92 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 (Halkett and Hart, 1997). Archaeological work in the mining areas has been ongoing since 1991 with the result that a great deal of information is now available with respect to the coastal areas and the Gariiep River. Recent research in the Kleinzee area (Halkett and Orton, pers comm) has revealed that parts of Namaqualand were occupied by people almost a million years ago, evidenced by massive scatters of Early Stone Age (ESA) artefacts on high ground overlooking the coastal plain. However, the greatest numbers of archaeological sites are those that relate to the ancestors of the San and Khoekhoen (LSA). Radiocarbon dates suggest almost continuous occupation of the coast for the last 5000 years. These sites are densest along the immediate coastline but may be found further inland close to water sources or natural foci (dunefields, rock outcrops) on the landscape. Colonial period sites, apart from those related to the relatively recent heritage of mining, are extremely sparse.

#### 1.3.1 The Vredendal Coastal 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 (Parkington and Poggenpoel 1990, Parkington and Hart 1993). It became clear at that time that the dry areas of the West Coast were surprisingly archaeologically rich. Parkington and Poggenpoel (1991) after several preliminary assessments in the Brandsebaai area near Vredendal suggested that occupation of the coast during the Late Stone Age (LSA) 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 (Halkett, Hart *et al* 1994 -1997) and the Gariiep 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 rare Middle Stone Age (MSA) shell middens, at Brandsebaai, liebenbergsbaai and Boegoeberg.

Historically the primary inhabitants of Namaqualand were San (Bushmen) and Khoekhoen herders – the ancestors of the Nama-speaking South Africans of the present day. Occupation of the area by San 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. 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 on the coastal plains 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.

### 1.3.2 The inland areas

To date very little is known about these areas, with the few archaeological surveys that have been completed limited to the Nama reserves and the western edge of Bushman Land (Webley 1984,1992). There are vast tracks of land in the mountains and between the escarpment and the coast for which absolutely no information is available. The proposed Eskom corridor lies within this zone.

### 1.3.3 Colonial period occupation

When Colonel Robert Jacob Gordon journeyed into Namaqualand in 1779 he observed that there were 19 stock farmers in the Groen River area, all of whom were co-habiting with one or more “Hottentot” women outside of the formal legislation as it was then. These unions produced many “bastard” children who were not recognised by more “pure” Afrikaners, the government or the groups of Khoekhoen. They formed communities in Namaqualand that lived outside the law as best as they could. The political situation in the Northern Cape was poor, if not chaotic. Bands of displaced people clashed with farmers, Khoekhoen and San groups alike, the general milieu exacerbated by the scarce grazing and water. San were officially declared “vermin” by the Council of Policy in 1777, who actually put a bounty on captured San children and the dead bodies of adults. The attrition continued for years until the San were finally wiped out by the loosely organised commando operations launched from regional centres in the Northern Cape, the various groups of “bastards” subdued (Penn 1995). A group of San who were captured were transported to Cape Town and put to work on building the breakwater. Their folklore, which was written down by Bleek and Loyd is now regarded as a priceless testimony. Rumour has it that the last “wild Bushman” died in Namaqualand in about the 1890’s (Steenkamp 1975).

Built environment heritage tends to be restricted towns and mines. Farms tend to be very large so farmhouses are widely scattered and sparse. Nevertheless, many of these are greater than 60 years old and have unique vernacular characteristics. Formal building conservation studies in the region are in their infancy.

The industrial archaeology of Namaqualand is significant, and among some of the earliest mining, railway and transport heritage in South Africa. Much of it is related to the copper deposits around Springbok which was first mined on a large scale in the 1850. Ore was transported initially by mule train to Hondeklipbaai where it was loaded on to steam coasters, later railed when a railway was built to Port Nolloth, the empty cars being drawn up the escarpment by mules, and then freewheeled full of ore to the coast. Steam locomotives were eventually introduced (Steenkamp 1975, Ross 2003). Like so much of Namaqualand heritage, it has never been subject to any form of academic assessment or conservation study, although several authors have researched its history. Diamond mining, the current economic mainstay, only began in 1926.

## **1.4 Conservation status of heritage**

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 Kleinzee and parts of the Koingnaas 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 has been impacted very seriously by years of small *ad hoc* diamond operations that have 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 material heritage 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.

The conservation status of colonial period archaeology, industrial archaeology and the built environment has never been audited.

## **2. Applicable heritage legislation**

The National Heritage Resources Act (NHRA) of 1999 protects the following, amongst other heritage resources. Furthermore section 38 requires that heritage impacts assessments (HIA's) are required for certain kinds of development such as rezoning of land greater than 5000 sq m in extent or exceeding 3 or more sub-divisions. Stand-alone HIA's are not required where an EIA is carried out as long as the EIA contains an HIA component.

### **2.1 Section 35**

**"Archaeological"** means - *material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures.* This means that an archaeological site is any area where there are artefacts (objects made by human hand) and

ruins that are over 100 years of age. An archaeological find is therefore any object or collection of objects or structures in disuse made by human hand that is over 100 years old. This can range from ancient stone tools and ruins to the contents of historic rubbish dumps containing ceramic shards and bottles.

**“Palaeontological”** means - *any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.* The term fossil means mineralised bones of animals, shellfish, plants, marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

## **2.2 Section 34**

**“Structure”** means - *any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.* Protected structures are those which are over 60 years old.

## **2.3 Section 48.2**

**“Cultural landscapes”** are protected by the Act. Section 48.2 permits the compliance authority to intervene and comment on the design and aesthetic qualities of any development that forms part of or is within sight of a heritage place or site.

## **2.4 Compliance authorities**

Management of heritage sites of regional and local significance as well as archaeology and palaeontology has been delegated to provincial heritage authorities, while overall management of sites of national significance lies with the South African Heritage Resources Agency (SAHRA). Since the corridor passes through two provinces, three compliance agencies are involved which will need to be considered I&AP's. These are:

- Heritage Western Cape (the province archaeologist, Dr A Jerardino)
- SAHRA (Northern Cape archaeology and palaeontology managed by state archaeologist Mary Leslie)
- The SAHRA office of Northern Cape and the Northern Cape Heritage Authority (currently being established).

## **3. Method**

This study has been commissioned as a scoping assessment that attempts to predict the possible impact in terms of accumulated knowledge of the area. No physical ground proofing of the corridor has taken place. The use of helicopter was made available to the specialist team for a two-day period in 2005. During this time Tim Hart (archaeologist) was able to view much of the proposed corridor from an altitude of 100m-200m. While this did not allow for location of individual archaeological sites, the flight provided an opportunity to examine the different landforms and their possible heritage potential, get a sense of the distribution of farms and settlements as well as rocky outcrops, dune seas and deflation bays. The report



considers the proposed corridor in sections roughly according to convenient landmarks, showing examples of landforms and possible heritage site localities.

### **3.1 Restrictions and assumptions.**

This study is restricted in the sense that no ground proofing took place. Assessment of sensitivity is based on assumptions in the absence of any published information on the Eskom Kudu corridor. We have extrapolated extensively from secure knowledge that we have from other areas of Namaqualand, especially the coastal area, the Gariiep River and Richtersveld area, as well as from the work of Lita Webley, one of few archaeologists who have worked in the Nama Reserves and Kamiesberg. It must therefore be borne in mind that any assessments we make are based upon our experience and that of colleagues rather than verified field data.

## **4. Findings**

### **4.1 Section 1 Oranjemund sub-station to Holgat River.**

This is an extremely arid and remote area characterised by sandy plains, mobile dunes and very occasional rocky outcrops (Plate 1) which tend to be associated with the banks of the Gariiep and Holgat Rivers. Late Stone Age archaeological sites have been recorded on the flood plains of the Gariiep and adjacent rocky outcrops but become increasingly scarce the further away they are from a water source. Early and Middle Stone Age material has been recorded in parts of the southern Namib and may occur in dispersed scatters on the calcrete and dorbank surfaces that underlie the aeolian sands. Colonial period sites are extremely sparse within this section of the corridor.

There is an existing transmission line in the corridor which in itself is a minor impact to the landscape. The greatest threat to heritage sites, especially ESA and MSA material, is the erosion caused by the service road (Plate 2) which is used by Eskom staff to service the transmission lines. This is particularly noticeable along the banks of the Holgat River.

Likelihood of impacts:      Late Stone Age: Low – very low.  
   Early and Middle Stone Age – medium.  
   Historical and built environment – very low  
   Intangible heritage and landscape – low

Corridor preference:

No preferred route within the corridor.

### **4.2 Section 2 Holgat River – Gromis substation.**

Aridity decreases in a southerly direction, which means that the chances of locating heritage sites grow. Sandy plains give way to red feldspathic sands, which is sparsely vegetated and characterised by occasional blow-outs and shallow pans. A range of low hills and outcrops is present along the eastern edge of the corridor. Early and Middle Stone Age material is likely to occur, especially on outcrops of silcrete, or in pans and blow-outs where the dorbank is exposed. Occasional Late Stone Age sites are to be expected associated with springs, pans and rocky outcrops and especially blowouts (which were favoured by prehistoric people throughout the western side of the country). Sites have been recorded in and close to the

Buffelsrivier. The built environment is restricted to scattered farmhouses and stock posts. These are unlikely to suffer any direct impact.

The existing transmission line in the corridor links with the Gromis substation. The greatest threat to heritage sites, especially ESA and MSA, and to a lesser extent LSA material is the erosion caused by the service road which is used by Eskom staff to service the transmission lines. This is particularly noticeable along the existing servitude along the banks of the Holgat River.

Likelihood of impacts:       Late Stone Age -Low  
  Early and Middle Stone Age – high (but impact likely to be of low significance).  
  Historical and built environment – very low  
  Intangible heritage and landscape – low

Corridor preference:

It is suggested that the route is kept to the western side of the corridor to avoid the range of hills and outcrops to the east as it is here that the chances of archaeological material is higher due to the likelihood of sheltered areas and springs.

#### **4.3 Section 3 Gromis to Escarpment**

After Gromis the corridor commences a significant deviation to the east towards the edge of the escarpment (foothills of the Kamiesberg) to avoid impacting the Namaqualand National Park. It crosses red aeolian sands and stable vegetated dune systems until it reaches the escarpment where granite outcrops are more prevalent. The area is characterised by vegetated dunes, occasional blow-outs and complexes of blow-outs in ancient dune seas. At the point of reaching the escarpment there is a large riverbed of a significant tributary of the Buffels River. Much of this entire area is very sandy which means that earlier archaeological material (ESA –MSA) is likely to be quite deeply buried unless on exposed terraces close to river beds. Judging by what was seen of this terrain, LSA archaeological sites are likely to be encountered in the many blowouts and dune seas that were so favoured by San hunter-gatherers. Colonial period sites are sparse.

Likelihood of impacts:       Late Stone Age -medium.  
  Early and Middle Stone Age – medium.  
  Historical and built environment – low  
  Intangible heritage and landscape – low

Corridor preference:

No preferences are indicated.

#### **4.4 Section 4 Escarpment to Garies**

This section of the corridor climbs the escarpment into the Namaqualand Granites of the Kamiesberg. Very little is known about the archaeology of these areas. Webley, who conducted archaeological surveys in the Leliefontein reserve and Bushmanland noted that LSA archaeological sites were associated with features on the landscape such as large boulders with hollows or shelters underneath, granite outcrops which contained “waterbakke”. Water sources would have been particularly important after 2000 years ago when Khoekhoen

came into Namaqualand with herds of domestic animals. Colonial period sites are scarce, being limited to small towns, occasional farms and stock posts. There is an early transport and railway system that linked the copper mines with Hondeklip Bay. An anticipated heritage issue is the possible proximity of the transmission lines to the western side of the N7 which is considered to be a scenic drive. The possibility of impacts to traditional lifestyles of the Nama people of the Kamiesbergs must also be established. Consultation with affected communities would be necessary.

Likelihood of impacts:      Late Stone Age -Low  
   Early and Middle Stone Age – Low  
   Historical and built environment – low  
   Intangible heritage and landscape – medium

Corridor preference:

In the light of impacts to intangible heritage, it is suggested that the route be situated as far west as possible of the N7 as well as outside the boundaries of Nama reserves.

#### **4.5 Section 5 Garies-Juno**

As the route moves away from the escarpment it passes over broken granite hills, granite domes and eventually into flat landscape (red aeolian sand) closer towards the Olifants River Valley. The granite foothills of the Nuwerus area are likely to be archaeologically sensitive in certain localities. Any form of rock shelter or sheltered boulder is likely to contain an archaeological site. Granite rock domes where water collection hollows have formed are likely to have dense scatters of archaeological material nearby. Extensive scatters of ESA and MSA archaeological material have been recorded on the Knersvlakte (Yates and Orton, pers comm.). Archaeological assessments in the Vredendal area have revealed that scattered ESA and MSA material are almost ubiquitous in the area, but tend to be seen where the aeolian sands have eroded, exposing the underlying dorbank layers. Most of this early material is seen in or on the surface of the dorbank. Built environment and colonial period sites are extremely sparse, being limited to occasional farm houses and stock posts.

Likelihood of impacts:      Late stone age - Low  
   Early and Middle Stone Age – medium  
   Historical and built environment – low  
   Intangible heritage and landscape – medium

Corridor preference:

In the light of impacts to intangible heritage, it is suggested that the route be situated as far west as possible of the N7. In terms of heritage, it is not possible to predict a specific preference, due to the paucity of information.

### **5. Mitigation and conservation**

#### **5.1 Impacts**

Apart from issues related to scenic heritage (dealt with by other consultants), the actual impacts to heritage that could be caused by the proposed corridor tend to be a low possibility of physical disturbance to the material remains of past human presence. These impacts will take place at:

- The points on the landscape where the towers are to built (every 400 m or so depending on terrain).
- The establishment of the service road along the transmission line servitude which is used for transporting materials for construction, thereafter periodic maintenance. Ongoing impacts will occur if the service road exacerbates erosion.
- The points on the landscape where construction camps may be established will result in local disturbance to the ground surface.

In terms of intangible heritage, the greatest impact of all will be the loss of “sense of remoteness” which accompanies human intervention in one of South Africa’s last remaining wide open spaces outside of a National Park. Unfortunately, this is impossible to mitigate.

## **5.2 Mitigation**

In terms of route selection, we believe that that the potential impacts to heritage will be low enough to allow other environmental factors to take precedent first. We do recommend that where possible outcrops, hills and mountains are avoided. We draw attention to the Nama Reserves and the need to consult with the effected communities.

Once a route option/s within the corridor has been selected, we would suggest that this be ground-proofed by an archaeological survey team after which mitigation through a heritage management plan, minor adjustment to tower positions or physical collection and removal of heritage material can be implemented.

## **6. Other sources of risk**

### **6.1 Human remains**

Human remains can occur at any place on the landscape. They are regularly exposed during construction activities along the west and south coasts. Such remains are protected by a plethora of legislation including the Human Tissues Act, the Exhumation Ordinance of 1980 and the National Heritage Resources Act. In the event of human bones being found on site, SAHRA must be informed immediately and the remains removed under an emergency permit. This process will incur some expense as removal of human remains is at the cost of the developer. Time delays may result while application is made to the authorities and an archaeologist is appointed to do the work.

## **7. Conclusion**

As an initial statement, it is concluded that the overall impact of the proposed project in terms of heritage, is considered to be low. This is because heritage sites are sparsely distributed in the inland areas of the region, and secondly, construction of transmission lines, by virtue of their relatively small impact and on the landscape has a lower chance of impacting compared with other kinds of development activity.

## **5. References**

Halkett, D. 1998. Report on an initial visit to assess the impact of mining on archaeological sites in the Richtersveld. Unpublished report prepared for Trans Hex Mining Ltd. U.C.T: Archaeology Contracts Office.

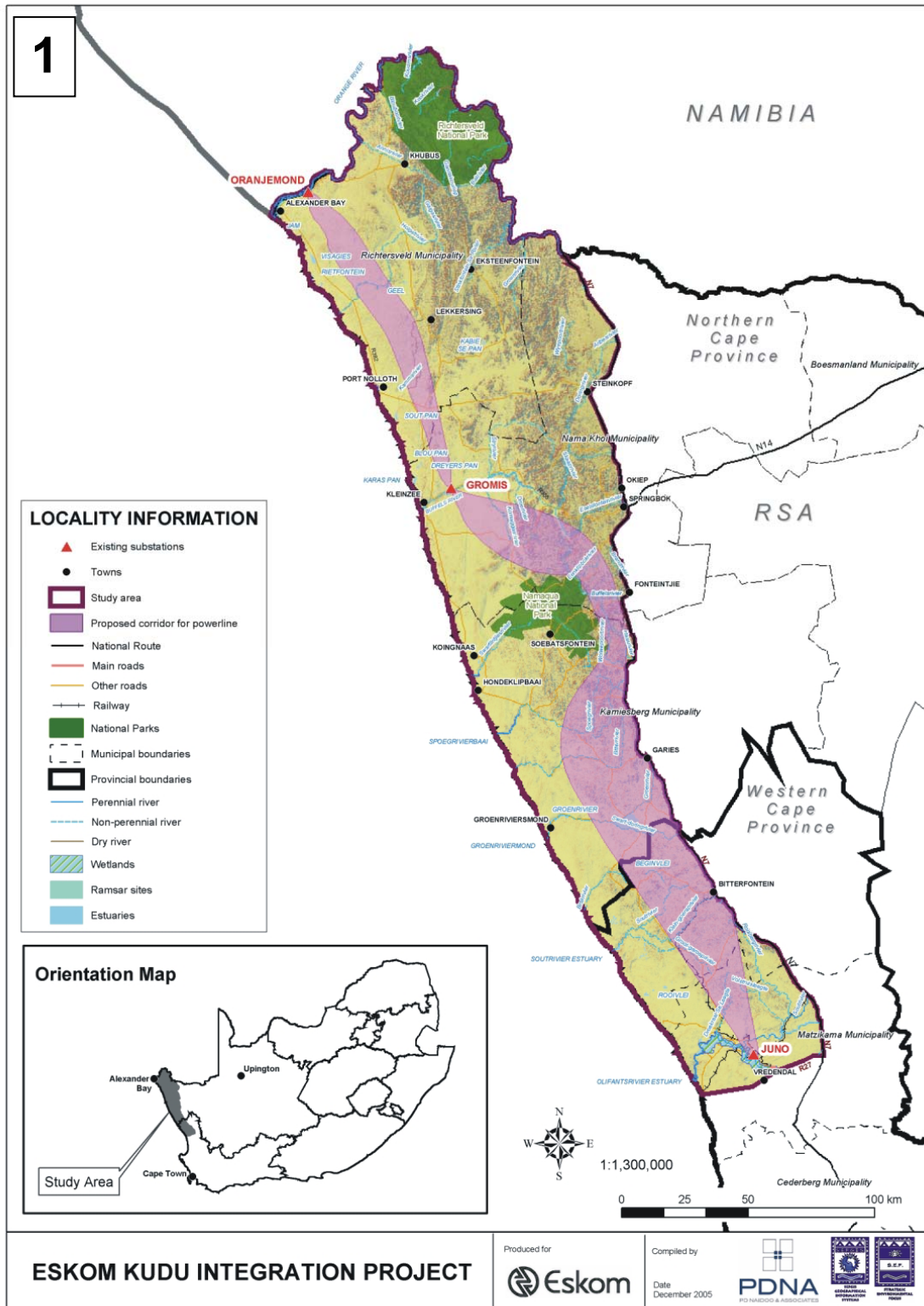
- Halkett, D. 1999. A phase one archaeological assessment of heritage resources in the TransHex Diamond Concession, Richtersveld. Unpublished report prepared for Trans Hex Mining Ltd. U.C.T: Archaeology Contracts Office.
- Halkett, D and Hart, T.J.G.1987. An archaeological assessment of the coastal strip, and a proposed heritage management plan for De Beers Namaqualand Mines. Unpublished report prepared for De Beers Namaqualand Mines Division. U.C.T. Archaeology Contracts Office.
- Halkett, D. 2003 A report on the archaeological mitigation program at DeBeers Namaqualand mines March 2002 to June 2003, Report for DeBeers created by the Archaeology Contracts Office, University of Cape Town, 2003.
- Hart, T.J.G and Halkett, DJ. 1993. Excavations at six archaeological sites in the Near-Shore Diamond Mining Area, Brandsebaai , Namaqualand.
- Hart, T.J.G and Halkett, DJ 1993, Namaqualand, Report on the monitoring of Borrow Pit #3: Namakwa Sands. Namakwa Sands Ltd
- Hart, T.J.G and Halkett, DJ. 1994. Archaeological survey of the Namakwa Sands trucking facility. Namakwa Sands Ltd
- Hart, T.J.G and Halkett, DJ .1994. Report On The Phase 2 Archaeological Excavations at the Namakwa Sands Project (first Phase), Vredendal District, Namaqualand., Namakwa Sands Ltd
- Hart, T.J.G and Lanham, J. 1997. Phase 2 archaeological excavations at two Late Stone Age sites in the Phase II (WOB) mining area, Namakwa Sands, Vredendal District, Namaqualand., Namakwa Sands Ltd
- Parkington, J.E. and Hart, T.J.G 1991 Archaeological assessment of 3 potential power station sites, De Beers Namaqualand mines, Kleinzee. Unpublished report prepared for the EEU
- Parkington, J.E and Poggenpoel, CE. 1990. West Coast Heavy Mineral Sand Project: archaeological report. (Namakwa Sands), Environmental Evaluation Unit, UCT
- Parkington, J.E and Hart, T.J.G. 1993. Namakwa Sands main access road: archaeological survey, Environmental Evaluation Unit, UCT
- Penn, N. 1995. The Orange River Frontier Zone C1700 –1805. In Smith A.B. eds. Einiqualand: University of Cape Town Press.
- Robertshaw, P.T. 1978. Khoi and San: Aspects of the later prehistory of the western Cape, South Africa. Unpublished Ph.D. dissertation, University of Cambridge.
- Robertshaw, P.T. 1978. The archaeology of an abandoned pastoralist camp-site. South African Journal of Science. 74:29-31
- Robertshaw, P.T. 1978. Khoi and San: Aspects of the later prehistory of the western Cape, South Africa. Unpublished Ph.D. dissertation, University of Cambridge.
- Ross, G. 2003. The romance of Cape mountain passes. Cape Town: David Phillip.

Steenkamp, W. 1977 Land of the thirst King. Cape Town: Howard Timmins.

Webley, L 1984. Archaeology and Ethnoarchaeology in the Lelliefontein Reserve and surrounds. Unpublished MA thesis. Department of Archaeology. University of Stellenbosch.

Webley, L 1992. The history and archaeology of pastoralist and hunter gatherer settlement in the North Western Cape, South Africa. Unpublished Phd Thesis. Department of Archaeology, University of Cape Town.

# 8. Figures



## 9. Plates



Plate 1

South of Oranjemund substation the arid environment contains few heritage resources. Archaeological sites probably exist but are likely to be sparsely distributed and mainly associated with water sources or places where shelter from the wind could be obtained.



Plate 2

A tower on the transmission line between Gromis and the Holgat River. Erosion of the vehicle service road has caused deep dongas. Archaeological sites could be affected by this process.



Plate 3

The blow-outs visible as bare patches on the landscape (between Gromis and Vredendal) are the kinds of localities that were favoured by Late Stone Age people for settlement. Archaeological sites probably lie in many of them.





Plate 4

Built environment is limited to sparse farm houses and stock posts.

Plate 5 (right)

The transmission line between Gromis and Oranjemund. Note how the service road has higher visibility than the towers and lines.



Plate 6

This granite outcrop in the foothills of the granites between Vredendal and Bitterfontein is typical of the kinds of foci that attracted prehistoric people – especially if water collection hollows are present. Outcrops must be considered to be sensitive.