

**HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF 132 kV
TRANSMISSION LINES BETWEEN ANKERLIG POWER STATION (ATLANTIS) AND
KOEBERG**

(Assessment conducted under Section 38 (8) of the
National Heritage Resources Act as part of an EIA.)

Prepared for

Savannah Environmental Pty (Ltd).
First draft: March 2014
Revised November 2014
Revised February 2015



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EXECUTIVE SUMMARY

ACO Associates cc (ACO) was appointed by Savannah Environmental Pty (Ltd) to undertake a Heritage Impact Assessment for the construction of a 132 kV transmission line between Ankerlig Power Station (situated at Atlantis Industrial Area) and the substation at Koeberg. This study forms part of a Basic Assessment.

Some four alternative routes were identified, of which two were determined to be technically unfeasible. Eventually it was requested that alternative 2 and the no-go alternative be assessed. Alternative 2 is a 3.5 km route which will link Ankerlig gas turbine power station with an existing power line by traversing the northern edge of the Ankerlig site, then crossing southwards to the linkup.

The study area is well known having been subject to a number of surveys by this office in the past, and a further survey of selected areas completed for this project. No further archaeological sites of significance were identified further to those described in previous work. The impact of the proposed activity is considered to be low-zero in terms of all generally protected heritage.

Reversion to the no-go alternative will have no advantage in heritage terms.

No mitigation actions are required. The proposed action is considered acceptable.

Glossary

Archaeological 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.*

Calcrete *A soft sandy calcium carbonate rock related to limestone which often forms in arid areas.*

Early Stone Age *A very early period of human development dating between 300 000 and 2.6 million years ago.*

Fossil *Mineralised bones of animals, shellfish, plants and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.*

Heritage *That which is inherited and forms part of the National Estate (Historical places, objects, fossils as defined by the National Heritage Resources Act of 2000).*

HWC (Heritage Western Cape) *The provincial compliance agency responsible for the conservation of heritage.*

Late Stone Age (LSA) *In South Africa this time period represents fully modern people who were the ancestors of southern African Khoekhoen and San groups (40 000 – 300 years ago).*

Middle Stone Age (MSA) *An early period in human history characterised by the development of early human forms into modern humans capable of abstract thought process and cognition 300 000 – 40 000 years ago.*

Midden *A pile of debris or dump (shellfish, stone artefacts and bone fragments) left by people after they have occupied a place.*

Palaeontological *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.*

Pleistocene *A geological time period (of 3 million – 20 000 years ago).*

SAHRA *South African Heritage Resources Agency.*

Structure (historic) *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.*

Silcrete *A surface rock formed by particles of silica forming a crust and compacting on the earths surface. Hence it often takes the form of large nodules or rafts. It was often collected by*

prehistoric people who used it to make stone artefacts on accounts of the rocks fine grain and predictable fracturing qualities.

Contents

1. INTRODUCTION	6
2. TERMS OF REFERENCE	6
3. HERITAGE LEGISLATION	8
4. PROJECT DESCRIPTION	9
4.1. The study area	9
4.2. The need for the study	10
4.3. Activities that will affect the heritage environment	10
5. METHOD	11
5.1. Information base	11
5.2. Limitations	11
6. BACKGROUND TO LOCAL HERITAGE	11
6.1. Palaeontology	11
6.2. Archaeology	12
6.3. History	13
7. FINDINGS OF SURVEY	14
7.1. Cultural landscape	14
7.2. Structures	14
7.3. Palaeontology	14
7.4. Archaeology (pre-colonial)	14
8. ASSESSMENT OF IMPACTS	14
8.1. Cultural landscape	14
8.2. Archaeological sites	16
8.3. Assessment of the no-go alternative	17
9. HERITAGE MANAGEMENT PLANNING	17
9.1. Action required during the proposed activity	17
9.2. Human remains	17
10. CONCLUSION	18
11. REFERENCES	18

1. INTRODUCTION

ACO Associates cc (ACO) was appointed by Savannah Environmental to undertake a Heritage Impact Assessment (HIA) as part of a Basic Assessment for the proposed construction of an electrical transmission line (132 kV) between Ankerlig Power Station at the Atlantis Industrial area and the Koeberg substation which is situated at Koeberg nuclear power station just north of Melbostrand on the west coast of South Africa. This HIA is part of a Basic Assessment process which is being carried out by Savannah Environmental for the proponent, Eskom.

For the main part the line follows a previously approved route, however due to technical difficulties associated with finding space in Atlantis for entry of the line into Ankerlig, it has had to be redesigned, hence the need for a further basic assessment. The route was previously comprehensively surveyed (Hart 2008). The new alignment involves limited changes in the Atlantis area in that the lines crosses the Dassenberg Road, passes the Ankerlig facility on the north side before crossing the Dassenberg Road again to enter Ankerlig on its Eastern side. Thus the length of the route that that requires new assessment is less than 5 km in length.

The 132 kV line is required to provide backup power the Koeberg Nuclear power station to sustain essential components (reactor cooling and essential functionality) for emergency purposes.

2. TERMS OF REFERENCE

The Archaeology Contracts Office was requested to undertake a Heritage Impact Assessment as a specialist component of an EIA for the erection of a 132 kV power line which follows an existing servitude. A short new servitude is required in Atlantis to facilitate entry into the Ankerlig site. The study has taken cognisance of heritage generally protected by the National Heritage Resources Act of 1999.

The impacts of the proposed activity were required to be assessed in accordance with the methodological guideline provided by Savannah Environmental Pty Ltd.

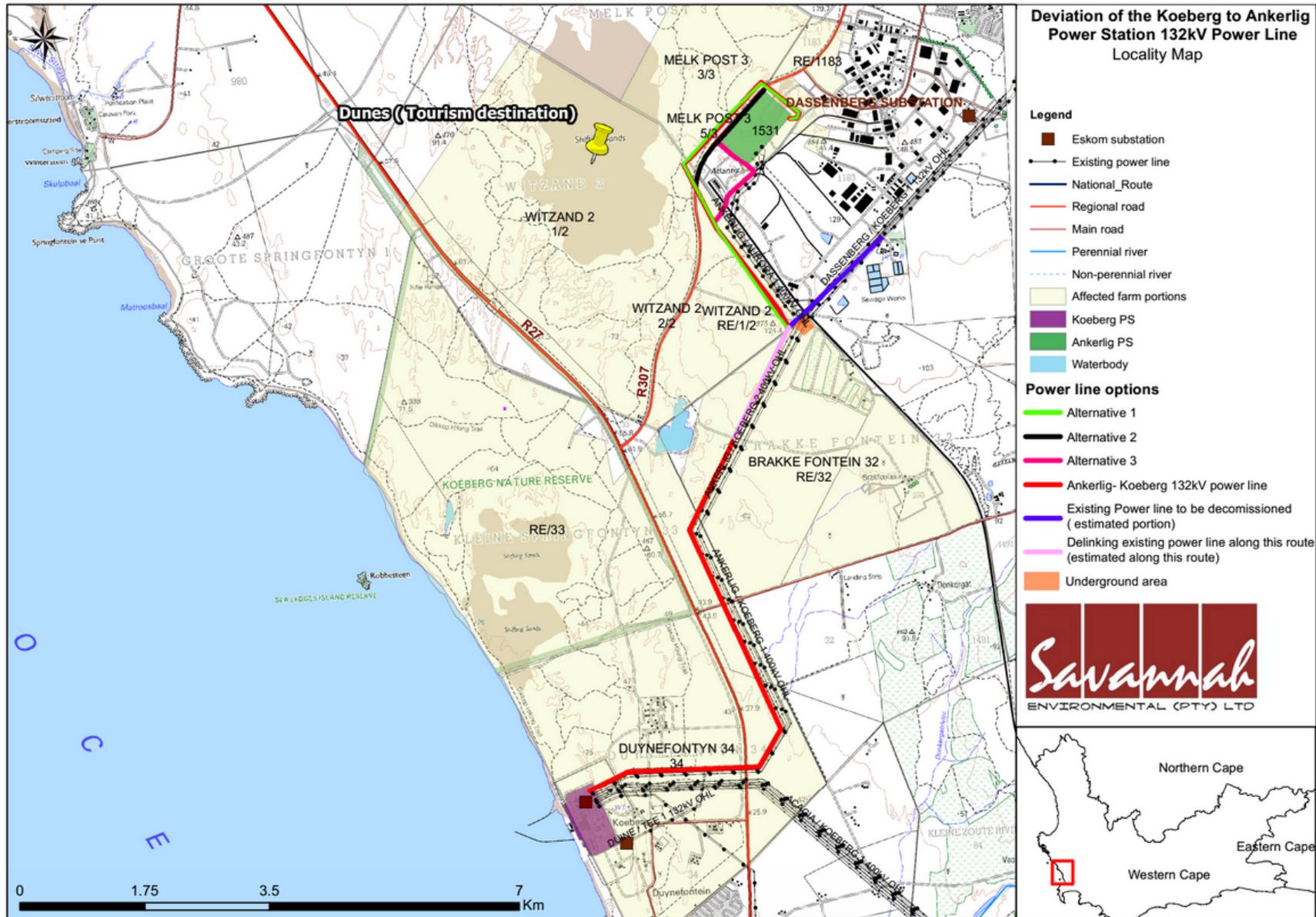


Figure 1 The proposed route of the 132 kV power line between Ankerlig and Koeberg.

3. HERITAGE LEGISLATION

The National Heritage Resources Act (NHRA) (No. 25 of 1999) protects a variety of heritage resources including all palaeontological or prehistoric material, historical artefacts and structures and human remains. Section 38 of the Act states that Heritage Impacts Assessments (HIAs) are required for certain kinds of development including:

- the construction of a road, wall, powerline, pipeline, canal or other similar linear development or barrier exceeding 300 m in length;
- the construction of a bridge or similar structure greater than 50 m in length;
- any development or other activity which will change the character of a site –
 - exceeding 5 000 m² in extent;
 - involving three or more existing erven or subdivisions thereof;
 - involving three or more erven or divisions thereof which have been consolidated within the past five years; or
- the re-zoning of a site exceeding 10 000 m² in extent.

The current project involves the construction of electrical transmission lines longer than 300 m.

Stand alone HIAs are not required where an EIA is carried out as long as the EIA contains an adequate HIA component that fulfils the provisions of Section 38. In such cases only those components not addressed by the EIA should be covered by the heritage component. The South African Heritage Resources Agency (SAHRA) is responsible for the protection of National Heritage Sites (grade 1 sites) as well as all historic graves and human remains. HWC is responsible for the management and protection of all Provincial Heritage Sites (grade 2 sites), generally protected heritage and structures (grade 3a – 3c sites) and prehistoric human remains. Disturbance or destruction of any protected heritage material will require a permit issued by the relevant authority.

In terms of the NHRA, the definitions of protected heritage material covered by the various sections are as follows:

- In 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. All such structures greater than 60 years of age are protected. Note that in terms of the legislation all renovations, alterations or changes to any protected structure will also require a permit.
- In Section 35, “**Archaeological**” refers to any material remains resulting from human activity which are older than 100 years of age, in a state of disuse and are in or on land. It includes 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/or ruins that are over 100 years of age. In terms of rock art it includes all area within 10 m of the art.

- In Section 35, "**Palaeontological**" includes 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 or marine animals and a trace fossil is the track, footprint or cast of a fossil organism that is preserved in stone or consolidated sediment.
- In Section 36, "**Burial Grounds and Graves**" means any place of interment and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place. Note that although isolated **human remains** are not included here, they are protected by other legislation such as the Exhumations Ordinances (12 of 1980) and the Human Tissues Act (No. 65 of 1983).
- "*Cultural landscapes*" are also protected by the Act. Any "**Place**" (site, area, region, structure or group of structures or open space) with "**Cultural significance**" (aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance) can be regarded as a cultural landscape. The compliance authority is permitted 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.

4. PROJECT DESCRIPTION

4.1. The study area

The study area (Figure 1) consists of a corridor of land situated between the R27 (west) and the N7 (east). The northern extent is the industrial township of Atlantis and towards the south, the Melkbos area. Within this envelope lies a variety of landscapes – farm lands, brickfields, the Western Province Shooting Range as well as tracts of *sandveld* which have been infested with alien vegetation. Apart from the Blaauwberg Hills to the south, the terrain is largely flat punctuated by occasional dune fields. Where agriculture is not taking place, alien plant species are prolific.

Much of the proposed route lies immediately adjacent to a large existing servitude for series of 400 kV lines that connect Ankerlig power station with the Omega substation. These have already been comprehensively surveyed.

Eskom Holdings SOC Limited obtained authorisation for the relocation of the turbine units at Acacia Power Station to Ankerlig Power Station in February 2009. These units provide a dedicated off-site power supply to the Koeberg Power Station in terms of the requirements of the National Nuclear Regulator (NNR). As part of this authorisation, a 132kV power line between Ankerlig Power Station and Koeberg Power Station was authorised. During the detailed planning process, and through discussions with the NNR, it has been determined that the authorised power line route is no longer technically viable as the NNR requires that the power line for the dedicated off-site supply to Koeberg is not crossed by any other power line so as to reduce any risks to this power line's normal operation. As the routing of the authorised power line between Ankerlig and Koeberg crosses a number of 400kV power lines, Eskom is proposing to reroute a portion (~5km of the 15km route) of this power line in order to avoid these power line

crossings. The deviation of the power line will be undertaken on the northern portion of the line in close proximity to the Ankerlig Power Station. The deviated portion of the line will be connected to a new 132kV HV yard within the Ankerlig Power Station boundary. After deviation of the power line, the existing portion of the Dassenberg-Koeberg power line which will no longer be required will be delinked and decommissioned (refer to Figure 1).

The project will include the following:

- » The deviation of approximately 5km of the northern section of the existing 132kV Dassenberg-Koeberg power line.
- » Developing access roads along the servitude where required for construction and operational purposes.
- » Decommissioning of a portion of the Dassenberg-Koeberg power line.

The activities associated with the construction of the power line will include site clearance and construction of access roads to facilitate access to the site (where required, where existing access roads are not present). A servitude of 36m will be required along the length of the power line during operation.

4.2. The need for the study

The Koeberg nuclear power station requires backup current to keep essential operations running in the event of the power station going off line. The proposed power lines are intended to fulfil this role by providing essential backup current from the Ankerlig gas turbine power station.

4.3. Activities that will affect the heritage environment

The proposed 132kV line will be supported by monopole steel towers. Each pole will need to be mounted on concrete footings set into the ground surface. Hence each point of land surface disturbance is confined to the few square meters of the towers bases. The actual servitude would normally require a service road (normally an unpaved track) however the close proximity of existing servitudes and roads would probably eliminate the need. During construction the landscape will be subject to a period of minor temporary disturbance when construction equipment is brought onto site for erecting the poles and lifting of the cables.

Heritage sites can be negatively affected disturbance of the land surface, destruction of significant structures and places as well as any action that will alter the feel and appearance of an historic place or building. Hence, transmission lines are likely to result in moderate impacts to the land surface during the construction phase but permanent changes in terms of visual impacts and changes to the feel of a landscape. The landscape under assessment is already heavily developed with electrical infrastructure therefore the addition of a relatively small 132 kV line is unlikely to

be of significant concern compared to what presently exists.

5. METHOD

This study is based on information gained from a site inspection as well as several studies that have already been completed on land in the area. Any heritage sites observed are photographed, assigned a co-ordinate/s using a hand held GPS and described as standard practise.

5.1. Information base

The Ankerlig site, expansion site and transmission line linkages have been subject to previous heritage impact assessments completed as part of an EIA by Hart and Orton (2005-2007).

The farm Brakkekloof has been subject to a heritage impact assessment (as part of an EIA) by Hart and Halkett (2004) for expansion of aspects of the Western Province Shooting Range.

The farms Donkergat, Brakkefontein and Apollo brickfields sites were the subject of a heritage impact assessment as part of an EIA by Halkett and Orton (2005) for the establishment of a new landfill site.

A portion of the farm Vaatjie has been subject to an assessment by Halkett, Orton and Hart (2006) for the purpose of a proposed sand mine.

Portions of the farm Groot Olifantskop have been subject to assessments by Kaplan (ACRM), Hart and Orton (ACO) (2004-2006) as part of the EIA process for the proposed Omega substation.

Extensive research studies involving the ACO team have taken place on the Farm Duinefontein in recent years as part of the surveys for expansion of Eskom's proposed nuclear energy expansion.

Orton has completed a heritage impact assessment for the proposed expansion of the waste water treatment works of the Blaauberg-Melkbos areas (2007).

Halkett has made important observations with respect to open archaeological sites on property adjoining Vaatjie (2006)

Hart has completed an assessment of the Ankerlig, Koeberg and Omega 400 kV lines which involved a detailed field assessment (Hart 2008).

5.2. Limitations

No limitations were encountered.

6. BACKGROUND TO LOCAL HERITAGE

6.1. Palaeontology

The mineralised bones of ancient fauna are often found in this region of the Cape west coast. Fossils are regularly encountered between Woodstock beach, near Cape Town, and Saldanha Bay to the north of Yzerfontein. These include the material excavated from sites such as Elandsfontein (Singer & Wymer 1968), Duinefontein 2 (Klein *et al.* 1999) and Langebaanweg (Halkett & Hart 1999; Hendey 1969; Singer 1961). Fossil bones were also seen at Bakoond (Orton 2007) and Tygerfontein (Halkett & Hart 1995), both to the south of Yzerfontein, and a large collection has been made from an occurrence at Melkbosstrand (Hendey 1968). Material from the Milnerton beach area has also been recorded (Avery 1995; Broom 1909). Fossil material at Milnerton includes terrestrial and marine fauna, as well as shell deposits (Avery 1995). Many of these occurrences occur near the surface with the Melkbosstrand material having been exposed by wind deflation on an old marine terrace some 5 to 6 m above sea level (Hendey 1968). The Duinefontein 2 material occurs buried within red Pleistocene sands immediately north of the Koeberg power station within about 0.7 m of the surface (Klein *et al.* 1999), however it is not clear how far inland the fossiliferous deposits extend.

6.2. Archaeology

Due to the rapid urban expansion of greater Cape Town, little formal archaeological academic research work has been carried out in the general vicinity of the study area; however various impacts assessments have led to the accumulation of some knowledge. Although southern Africa has been occupied by hominids for more than one million years, little evidence of the earliest occupation is preserved within the local region. The fossil site of Duinefontein 2 in the Koeberg Private Nature Reserve contains Early Stone Age (ESA, >200 thousand years ago (kya)) artefacts and similar isolated items are routinely found in ploughed fields across the south-western Cape. Kaplan (1996, 2000b) reports ESA artefacts from farmlands near the study area.

Middle Stone Age (MSA, 200kya – 20kya) artefacts were found in association with the Melkbosstrand fossils (Hendey 1968) indicating at least some MSA presence in the area. MSA artefacts of the Stillbay type have also been collected in the region of Maitland just south of the study area (Goodwin 1926, 1928) and at a site described as being between Milnerton and Maitland (Goodwin & Van Riet Lowe 1929). Artefacts thought to date to the MSA were observed at Groot Oliphantskop to the east of the Melkbosstrand WWTW (Orton & Hart 2004) and in the region of Vissershok (Kaplan 2002a).

In general, Later Stone Age (LSA, <20kya) sites are far more commonly encountered than earlier material. This may be largely due to burial of older sites beneath recent sand. The only formal excavations to have taken place at an LSA site are those in the near coastal dunes of the Atlantic Beach Golf Estate, just northwest of Blaauwberg Hill and at Melkbosstrand. At the Atlantic Beach sites late Holocene LSA occupation probably pertaining to the Khoekhoen people was found. The sites were located in the high sand dunes and consisted of shell middens and associated artefacts. The lowest shell layers were dated to about AD 700 to AD 750 at AB1 and about AD 1050 at AB3 (Sealy *et al.* 2005). Kaplan (2000a) and Gray (2000) conducted excavations in a shell midden with material probably dating back to the mid-Holocene but this has never been studied further. Hendey (1968) and Avery (1995) also mention the existence of LSA shell

middens among the coastal dunes and photographs of Bloubergstrand from the early 1900s in Duminy (1979) show the kind of dunes that would undoubtedly have housed LSA middens.

LSA artefacts have also been noted from the vicinity of Maitland (Goodwin & Van Riet Lowe 1929), the farm Groot Oliphantskop – site of the Omega sub-station (Kaplan 1996; Orton & Hart 2004) as well as other farms in the area (Kaplan 2004). Halkett (per comm.) reports the presence of Early Stone Age scatters on the farm Vaatjie as well as substantial Late Stone Age open sites on an adjoining property. Early Stone Age material has also be located on the farm Brakkefontein just south of Atlantis (Halkett 2005).

Two burials were reportedly excavated from the Groot Oliphantskop farm in the mid-20th century (Kaplan 1996). Morris (1992) has catalogued human burials from South Africa and records numerous burials from the Milnerton (13 listed), Blaauwberg (20 listed) and Melkbosstrand (22 listed) areas. Others have also been recorded in recent years (e.g. Avery 1995; Deacon & Goosen 1997; Kaplan 2000a, 2002b; Yates 2001) and continue to be found at new development sites. Hart (2008) described some informal artefact scatters in disturbed context close to the route of the Koeberg – Omega 400 kV lines.

In general, pre-colonial sites are relatively sparse in the area of the existing Koeberg – Ankerlig servitudes. These areas have been well surveyed.

6.3. History

The landscape inland and to the north of Koeberg is dominated by agricultural land, which has its origin in early Dutch East India company grants and quitrents¹ (the Farm Duynefontein (Koeberg) 34 being one of them). Although along the southern portion of the West Coast many of the early farms have become sub-divided and broken up by developments such as Atlantis Industrial Township, Brickfields, Western Province Shooting range and various sand mining operations. A number of notable farm names and associated structures have survived - Groot Olifantskop (Keert de Koe), Vaatjie, Brakkefontein and Donkergat are but a few that have been recently identified as containing early fabric or as being early farms. Within this area, research into the heritage of early colonial settlement is limited with only site identification surveys being completed to date. The Koeberg site (Duynefontein) is reflected in primary archival documentation. Reference is made to a Hermanus Dempers as 'inhabitant and owner of the 'Opstal' on the loan place named 'Duynefontein' (CA CO 3985 ref, 117, CO 3887 ref 79). Dempers took over the land in 1799, however the location of his farm buildings is not known.

The most significant historical event to take place in the area was the Battle of Blaauwberg which occurred in early January 1806. This battle signalled the end of the Dutch occupation of the Cape when the British forces landed at Melkbosstrand, marched over the saddle at the north-eastern edge of Blouberg Hill and defeated the Dutch in a battle among the sand dunes to the east of Kleinberg. This event took place south of the study area and will not be affected by the proposed

¹ A quitrent is a grant of land given for 15 years for which an annual rent is paid. Quitrent tenure was introduced to South Africa in 1732.

activity.

7. FINDINGS OF SURVEY

7.1. Cultural landscape

The existing servitude to Koeberg already contains two 400 kV transmission lines and towers. Further lines will be an addition to a scenario where electrical infrastructure is a locally accepted feature of the landscape. This is not expected to detract from the scenic and qualities of the area as this has already been impacted by the existing servitude. Alternative 2 which will link Ankerlig with the existing 132kV line amounts to some 5 linear kilometres. Decommissioning of the existing line will not result in any impacts.

7.2. Structures

No generally protected buildings were identified in or close the proposed route.

7.3. Palaeontology

No surface palaeontology was identified.

7.4. Archaeology (pre-colonial)

No archaeological material of any significance was previously observed in this area. The most recent site inspection supports these findings.

8. ASSESSMENT OF IMPACTS

8.1. Cultural landscape

Since the Eskom servitude is already established and now a recognised element of the landscape, the addition of further transmission lines is not expected to constitute a significant impact. Re-use of the existing alignment and consolidation of the electrical infrastructure is far more preferable than creating a completely new route which will subject the area to a new visual intrusion. Mitigation action (if needed) lies within the domain of visual impact assessment.



Figure 2 Land adjacent to Ankerlig over which the proposed power lines will cross has been disturbed by prior earthmoving.

NATURE OF IMPACT: Impacts to cultural landscape (historical pattern of settlement)		
The possible impact would be visible physical disruption of the historical pattern of land- use.		
	Without mitigation	With mitigation
EXTENT	Local (1)	Local (1)
DURATION	Long term (4)	Long term (4)
MAGINITUDE	Small (1)	Small (1)
PROBABILITY	Unlikely (2)	Unlikely (2)
SIGNIFICANCE	Low (12)	Low (12)
STATUS	Neutral – negative	Neutral – negative
REVERSIBILITY	reversible	reversible
IRREPLACEABLE LOSS OF RESOURCES?	No	
CAN IMPACTS BE MITIGATED?	Mitigation not required	
MITIGATION: No mitigation required		
CUMULATIVE IMPACTS: N/a		
RESIDUAL IMPACTS: N/a		

Table 1 Summary of impacts to cultural landscape

8.2. Archaeological sites

NATURE OF IMPACT: Impacts to pre-colonial archaeology caused by destruction and displacement of archaeological material but excavation of bases for towers.		
	Without mitigation	With mitigation
EXTENT	Local (1)	N/a
DURATION	Permanent (5)	N/a
MAGINITUDE	Small (1)	N/a
PROBABILITY	Unlikely (2)	N/a
SIGNIFICANCE	Low (12)	N/a
STATUS	Neutral – negative	N/a
REVERSIBILITY	irreversible	N/a

IRREPLACEABLE LOSS OF RESOURCES?	No	N/a
CAN IMPACTS BE MITIGATED?	Mitigation not required	
MITIGATION: No mitigation required. Site environmental officer is requested to report any unexpected finds of archaeological material, fossil bone or human remains to relevant authority.		
CUMULATIVE IMPACTS: N/a		
RESIDUAL IMPACTS: N/a		

Table 2 Summary of impacts to archaeological material

8.3. Assessment of the no-go alternative

Use of the no-go alternative while technical undesirable for security of essential emergency supply to Koeberg, will have no influence in heritage terms. Its effect will be neutral.

9. HERITAGE MANAGEMENT PLANNING

The objective of this section of the report is to provide a mechanism for the conservation of heritage and associated values within the context of the proposed activity. In terms of the low significance of identified impacts to heritage, minimal management action is necessary.

9.1. Action required during the proposed activity

Should any finds be unearthed during construction activity, an archaeologist and Heritage Western Cape should be informed immediately. The relevant contact person at Heritage Western Cape is Mr Troy Smuts (021 4839685). The person responsible for reporting any finds that evoke concern should be a senior person on site, or an environmental control officer who is on site during construction.

9.2. Human remains

Human remains can occur anywhere on the landscape. Most archaeologists retrieve several skeletons a year from various development projects around the province, so finds of this nature are not necessarily rare. Human remains are protected by several sets of legislation which means that certain protocols must be followed in the event of a find.

- 1) leave the remains in place, nothing should be moved
- 2) Cordon off the area
- 3) Call Ms Mary Leslie at SAHRA (021 4624509)

- 4) Contact an archaeologist
- 5) Once an archaeologist has examined the find, the archaeologist/SAHRA should contact SA Police services and the state pathologist to report human remains
- 6) If the human remains are found to be a legitimate burial or a pre-colonial burial, an emergency exhumation permit will be issued by SAHRA or HWC
- 7) If a crime is suspected, a police docket will need to be opened.

10. CONCLUSION

The proposed activity is considered acceptable in heritage terms.

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