
**HERITAGE IMPACT ASSESSMENT OF GAMMA GRASSRIDGE
POWER LINES AND SUBSTATION,
EASTERN, WESTERN AND NORTHERN CAPE PROVINCES,
SOUTH AFRICA**



Assessment and report by



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For **ACER (Africa)**

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15 June 2007

Management summary

eThembeni Cultural Heritage was appointed by ACER (Africa) to undertake a heritage impact assessment of a proposed power line and substation in the Eastern, Northern and Western Cape Provinces, in terms of the South African Heritage Resources Management Act No 25 of 1999. Two eThembeni staff members inspected the area on 13 February, 17 to 19 April and 15 to 18 May 2007 and completed a controlled-exclusive surface survey, as well as a database and literature search.

Numerous heritage resources are present along the proposed power line route, including buildings and structures; an historical settlement; the landscape of the Camdeboo Karoo and the Springbokvlakte; archaeological sites; graves and traditional building techniques. However, the aim of this heritage impact assessment was to evaluate the six kilometre wide proposed corridor in terms of general heritage resource presence, to obtain a 'best fit' for the eventual power line route.

Once the final servitude has been negotiated, a heritage practitioner will examine all tower placements and other proposed infrastructural locations to ensure that heritage resources are not affected adversely.

From a heritage perspective, the visual impact of the proposed project on this landscape will be minimised by appropriate tower placement along route 01 to 08 (blue route with deviation around the historical settlement of Wolfefontein); either the yellow or green route north of Wolfefontein and Kleinpoort; and the blue route from point 05 to the proposed Gamma Sub-station.

We recommend that this project may proceed with the proposed heritage resource mitigation and have submitted this report to the South African Heritage Resources Agency (SAHRA) and Heritage Western Cape in fulfilment of the requirements of the Heritage Resources Management Act. The client may contact Ms Mary Leslie at SAHRA's Cape Town office (telephone 021 462 4502) and Mr Ndukuyakhe Ndlovu at Heritage Western Cape (021 483 9685) in due course to enquire about the Council's decision.

If permission is granted for the development to proceed, the client is reminded that the Act requires that a developer cease all work immediately and notify SAHRA or Heritage Western Cape should any heritage resources, as defined in the Act, be discovered during the course of development activities.

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Introduction and legislation

eThembeni Cultural Heritage was appointed by ACER (Africa) to undertake a heritage impact assessment of a proposed power line and substation in the Eastern, Northern and Western Cape Provinces, in terms of the South African Heritage Resources Management Act No 25 of 1999. Section 38(1) of the Act requires such an assessment in case of:

- (a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- (b) the construction of a bridge or similar structure exceeding 50 m in length;
- (c) any development or other activity which will change the character of a site –
 - (i) exceeding 5 000 m² in extent; or
 - (ii) involving three or more existing erven or subdivisions thereof; or
 - (iii) involving three or more erven or subdivisions thereof which have been consolidated within the past five years; or
- (d) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- (e) the re-zoning of a site exceeding 10 000m² in extent; or
- (f) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.

A heritage impact assessment is not limited to archaeological artefacts, historical buildings and graves. It is far more encompassing and includes intangible and invisible resources such as places, oral traditions and rituals. In the KwaZulu-Natal Heritage Act 1997 a heritage resource is defined any place or object of cultural significance i.e. of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This includes the following wide range of places and objects:

- (a) places, buildings, structures and equipment;
- (b) places to which oral traditions are attached or which are associated with living heritage;
- (c) historical settlements and townscapes;
- (d) landscapes and natural features;
- (e) geological sites of scientific or cultural importance;
- (f) archaeological and palaeontological sites;
- (g) graves and burial grounds, including -
 - (i) ancestral graves,
 - (ii) royal graves and graves of traditional leaders,
 - (iii) graves of victims of conflict,
 - (iv) graves of important individuals,
 - (v) historical graves and cemeteries older than 60 years, and
 - (vi) other human remains which are not covered under the Human Tissues Act, 1983 (Act No.65 of 1983 as amended);
- (h) sites of significance relating to the history of slavery in South Africa;
- (i) movable objects, including -
 - (i) objects recovered from the soil or waters of South Africa including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
 - (ii) ethnographic art and objects;
 - (iii) military objects;
 - (iv) objects of decorative art;
 - (v) objects of fine art;
 - (vi) objects of scientific or technological interest;
 - (vii) books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings; and
 - (viii) any other prescribed categories, but excluding any object made by a living person;
- (j) battlefields;
- (k) traditional building techniques.

Other sections of the Act with relevance to this project are:

Structures

34 (1) No person may alter or demolish any structure or part of a structure which is older than sixty years without a permit issued by the relevant provincial heritage resources authority.

(2) Within three months of the refusal of the provincial heritage authority to issue a permit, consideration must be given to the protection of the place concerned in terms of one of the formal designations provided for in Part 1 of this Chapter.

(3) The provincial heritage resources authority may at its discretion, by notice in the Provincial Gazette, make an exemption from the requirements of subsection (1) within a defined geographical area, or for certain defined categories of site within a defined geographical area, provided that it is satisfied that heritage resources falling into the defined area or category have been identified and are adequately provided for in terms of the provisions of Part 1 of this Chapter.

(4) Should the provincial heritage resources authority believe it to be necessary it may, following a three-month notice period published in the Provincial Gazette, withdraw or amend a notice under subsection (3).

Definitions

2 (xxxii) “place” includes –

- (a) a site, area or region;
- (b) a building or other structure which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure;
- (c) a group of buildings or other structures which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures;
- (d) an open space, including a public square, street or park; and
- (e) in relation to the management of a place, includes the immediate surroundings of a place.

The South African Heritage Resources Agency (SAHRA) advises heritage practitioners to refer to various sections of the Act to guide management recommendations:

Preamble

This legislation aims to promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations. Our heritage is unique and precious and it cannot be renewed. It helps us to define our cultural identity and therefore lies at the heart of our spiritual well-being and has the power to build our nation. It has the potential to affirm our diverse cultures, and in doing so shape our national character.

Our heritage celebrates our achievements and contributes to redressing past inequities. It educates, it deepens our understanding of society and encourages us to empathise with the experience of others. It facilitates healing and material and symbolic restitution and it promotes new and previously neglected research into our rich oral traditions and customs.

General principles for heritage resources management

5 (1) All authorities, bodies and persons performing functions and exercising powers in terms of this Act for the management of heritage resources must recognise the following principles:

- (a) heritage resources have lasting value in their own right and provide evidence of the origins of South African society and as they are valuable, finite, non-renewable and irreplaceable they must be carefully managed to ensure their survival;
- (b) every generation has a moral responsibility to act as trustee of the national heritage for succeeding generations and the State has an obligation to manage heritage resources in the interests of all South Africans;
- (c) heritage resources have the capacity to promote reconciliation, understanding and respect, and contribute to the development of a unifying South African identity; and
- (d) heritage resources management must guard against the use of heritage for sectarian purposes or political gain.

(4) Heritage resources form an important part of the history and beliefs of communities and must be managed in a way that acknowledges the right of affected communities to be consulted and to participate in their management.

(5) Heritage resources contribute significantly to research, education and tourism and they must be developed and presented for these purposes in a way that ensures dignity and respect for cultural values.

(6) Policy, administrative practice and legislation must promote the integration of heritage resources conservation in urban and rural planning and social and economic development.

(7) The identification, assessment and management of the heritage resources of South Africa must –

- (a) take account of all relevant cultural values and indigenous knowledge systems;
- (b) take account of material or cultural heritage values and involve the least possible alteration or loss of it;
- (c) promote the use and enjoyment of and access to heritage resources, in a way consistent with their cultural significance and conservation needs;
- (d) contribute to social and economic development;
- (e) safeguard the options of present and future generations; and
- (f) be fully researched, documented and recorded.

Nature and description of proposed activities

The Gamma-Grassridge Transmission Lines project comprises the following components:

- Two 765 kV transmission lines,
- Upgrading of the Grassridge Sub-station,
- Construction of the Gamma Sub-station,
- Construction and maintenance of roads,
- Temporary storage of hazardous substances, and
- Telecommunication masts at the Gamma and Grassridge Sub-stations.

The proposed Gamma-Grassridge 765 kV transmission lines traverse the Northern Cape, Western Cape and Eastern Cape Provinces. The study area for the Environmental Impact Assessment is limited to the area between the Gamma Sub-station (situated near Victoria West, Northern Cape) and the Grassridge Sub-station (situated near Port Elizabeth, Eastern Cape). The direct distance between these two sub-stations is approximately 310 kilometres.

A number of technically and environmentally feasible options are being assessed as part of this EIA with input from relevant authorities, Eskom Transmission, affected landowners, the public and the EIA team. Once a preferred corridor has been identified, Eskom Transmission will negotiate a servitude within the corridor with the relevant landowners and agree on compensation terms.

The study area is linear, as a consequence of taking the length of the most direct route between the sub-stations and expanding this by a maximum of 15% in a southerly and northerly direction. The 15% expansion of the most direct route represents the maximum length of the transmission line beyond which significant voltage loss is incurred. For the proposed Gamma-Grassridge transmission lines, two additional constraints are offered by the mountainous nature of much of the study area, and large tracts of land that are formally conserved, both needing to be avoided if and where possible¹.

Each 765 kV transmission line will require a servitude 80 metres wide (40 metres either side of the centre line). If the transmission lines are constructed in parallel, a servitude of 160 metres will be required. Steel towers will be constructed at intervals along the transmission lines, at a spacing of approximately 400 to 500 metres. Each steel tower is approximately 50 to 55 metres high and it is anticipated that most of these will be of the cross rope tower design. However, free-standing strain towers will also be required for bends greater than 3° and in difficult terrain. For safety reasons, the transmission lines require minimum clearance distances.

For the project, the current corridors have been defined at a width of 6 kilometres and the two transmission lines will be aligned somewhere within this corridor, with the final alignment being determined by Eskom in conjunction with individual landowners during the negotiation process.

Recently, the Planning Division of Eskom Transmission decided to move the site of the Gamma Sub-station to the farm Kleinfontein, to the east of Uitvlugtfontein, a distance of 10 kilometres. The primary reason for the change in location was to avoid various transmission lines from crossing one another unnecessarily. Eskom

¹ Refer to attached map for proposed routes and servitudes.

Transmission has already discussed the matter with the owner of the farm Kleinfontein and agreement has been reached in principle that the proposed sub-station may be built on the property. The design of the proposed sub-station will be provided when available.

The authorised site for the Gamma Sub-station is south of Victoria West at S31 40 01.2; E23 21 24.1. Eskom proposes to construct the Gamma Sub-station on the farms Skietkuil 3 and Uitvlugfontein approximately 10 kilometres from the authorised site. The Grassridge Sub-station is situated south west of Port Elizabeth at S33 43 10.5; E25 37 58.5. The existing Grassridge Sub-station will require expansion and upgrading to accommodate the two incoming 765 kV transmission lines.

New access roads may need to be constructed to a Type 6 gravel road that comprises the widening to a final gravel carriageway width of 6 metres on raised earthworks, drainage in the form of meadow drains (flat terrain) and “v” drains (steeper terrain), some new culverts and possible fencing. Hazardous substances (fuels, oils and lubricants) may need to be stored temporarily at construction camps during the construction phase.

One telecommunication mast will be required at each at the Gamma and Grassridge Sub-stations. These masts have yet to be designed but they are expected to be microwave lattice masts, between 30 and 50 metres high. These masts will form an integral part of each sub-station.

Site description and environmental issues

The study area comprises a diverse, natural and physical environment and climatic conditions vary considerably. The following landscape description refers to the various power line route options and should be read in conjunction with the accompanying map.

- Blue corridor – Gamma to Aberdeen

Here the corridor traverses a steeply incised and broken landscape along the flanks of the Onder Sneeuberge. The prime economic activity is typical Arid Karoo extensive small-stock farming. Farmsteads are widely dispersed and services' infrastructure is confined to telephone lines and gravel roads. The population density is very low. The power line will be highly visible where it crosses plateaux but could be disguised within areas of broken terrain.

Two farmsteads, Phillips Plaas (close to Pt 01M) and Boksfontein (S31 41.446; E23 27.849) lie within clear sight of this corridor and the visual impact of the power line on these farmsteads will be very high.

Below the Onder Sneeuberge the corridor traverses the wide flat drainage basin of the Kraal River. Numerous game farms are present. The Kraal River basin contains predominantly Arid Karoo vegetation with extensive *Acacia karroo* thickets and stands of reed beds along the larger drainage lines. This relatively well watered area would have attracted both humans and animals in the prehistoric past and open Later Stone Age hunter-gatherer and herder sites are very likely to occur. Rock shelters with paintings and archaeological deposits are known from the lower valleys of the Onder Sneeuberge (see Appendix A). The line will be highly visible in this part of the route with few options for blending with the landscape.

- Aberdeen to Klipplaat

Here the corridor traverses open and flat small-stock farming lands. The lack of surface water suggests that archaeological deposits and other heritage resources will be confined to major drainage lines. The power line will be very visible in this landscape. Around Spitskop and Tierberg the landscape becomes more broken and the corridor traverses the valleys between clustered kopjes. This area has a higher archaeological potential, since it is being better watered, sheltered and wooded.

Once through these hills the corridor crosses a wide open plain traversed by the R338 and railway line to Klipplaat. The potential for archaeological sites is low. The proposed power line will be very visible, but could be routed parallel to the existing power line to limit the impact on the landscape.

- Klipplaat to Wolwefontein

Here the proposed corridor runs parallel with the R329 and the railway line. It is an existing service corridor, but indicated as the 'Baviaan's Route – Scenic Alternative' on road signage. This recognised tourism route will be marred by the proposed power line, as will the historical hamlets and rail sidings at Baroe and Mt. Stewart, since the railway line and district road lie very low in the landscape, while the power line will be highly visible, particularly where the valley constricts between the Groot Rivier Berg and the Klein Winterhoek range.

- Wolwefontein – Kleinpoort to Grassridge

The proposed corridor parallels the railway line and the R75 through Succulent Karoo and Valley Bushveld thicket between the Klein and Groot Winterberg ranges. It is an existing services' corridor and small stock and game farming predominate. The integrity of the historical hamlets of Wolwefontein and (to a lesser extent) Kleinpoort will be compromised by the power line. The area from Kleinpoort to Grassridge includes intensive ecotourism associated with game farms and the visual impact of the power line on this landscape will be very negative.

- Red corridor

This route should be considered a no-go area, since it is a largely 'unspoilt' landscape being developed for ecotourism, conservation and its scenic qualities. Many absentee landowners and derelict farmsteads are present, but new infrastructure suggests the economic resuscitation of the area as a scenic ecotourism destination e.g., Blaaubosch Game Farm and Lodge and the game farms at Noorslaagte, Krompoort, Kleinrivier, Mouton and Coegarivier. The potential for archaeological and palaeontological sites is high due to the admixture of Karoo and Valley Bushveld vegetation and the better watered environment between the mountain ranges.

- Green and Yellow corridors

These corridors traverse an undulating Arid Karoo landscape with deeply incised drainage lines. Small stock farming predominates, with widely dispersed farmsteads, many of which include structures and buildings that are older than sixty years. Later Stone Age hunter-gatherer and herder archaeological sites can be expected along drainage lines and in the lee of kopjes.

The R75 is observably sunken into the landscape, in marked contrast to the raised road bed between Wolwefontein and Klipplaat. Power lines (particularly in parallel with the R75) would be less visible in this landscape than the relatively 'unspoilt' landscape of Wolwefontein to Klipplaat.

Methodology

eThembeni staff members inspected the area on 13 February, 17 to 19 April and 15 to 18 May 2007, by helicopter, vehicle and on foot. We completed a controlled-exclusive surface survey, where 'sufficient information exists on an area to make solid and defensible assumptions and judgements about where [heritage resource] sites may and may not be' and 'an inspection of the surface of the ground, wherever this surface is visible, is made, with no substantial attempt to clear brush, turf, deadfall, leaves or other material that may cover the surface and with no attempt to look beneath the surface beyond the inspection of rodent burrows, cut banks and other exposures that are observed by accident' (King 1978).

We consulted various provincial databases, including historical, archaeological and geological sources and undertook a limited literature review, included as Appendix A. We assessed the value and significance of heritage resources, as defined in the Heritage Resources Management Act 1999 and the criteria contained in Appendix B. Culturally significant landscapes were assessed according to the criteria in Appendix C.

The client has provided a map of the area, submitted to SAHRA and Heritage Western Cape separately. Geographic coordinates were obtained with a handheld Garmin GPS72 global positioning unit. Photographs were taken with a Hulett Packard digital camera. Appendix D contains a statement of independence and a summary of our ability to undertake this heritage impact assessment.

The assumptions and limitations of this heritage impact assessment are as follows:

- We have assumed that the description of the proposed project, provided by ACER (Africa), is accurate.
- We have assumed that the public consultation process undertaken as part of the Environmental Impact Assessment is sufficient and adequate and does not require repetition as part of the heritage impact assessment.
- Given the nature of this project, fieldwork focussed on the general identification of heritage resource types within the proposed power line route to determine the servitude that will have the least possible impact on such resources. Once the final servitude has been negotiated, a heritage practitioner will examine all tower placements and other proposed infrastructural locations to ensure that heritage resources are not affected adversely.
- Soil surface visibility was moderate overall. However, subsurface heritage resources might be present (including unmarked ancestral graves), and we remind the client that the Act requires that a developer cease all work immediately and notify SAHRA or Heritage Western Cape should any heritage resources, as defined in the Act, be discovered during the course of development activities.
- No subsurface investigation (including excavations or sampling) were undertaken, since a permit from SAHRA or Heritage Western Cape is required to disturb a heritage resource.

Observations and recommendations

No construction activities associated with the proposed project had begun prior to our visit, in accordance with provincial heritage legislation.

⇒ [Places, buildings, structures and equipment](#)

Numerous buildings and structures older than sixty years and which have architectural and other value are located along the proposed power line route. Examples are illustrated in Appendix E (figures 1 to 6). However, tower placements will be such that none will be affected directly by the proposed project.

⇒ [Places to which oral traditions are attached or which are associated with living heritage](#)

None were identified within the proposed development area.

⇒ [Historical settlements and townscapes](#)

Various settlements relating to the European farming history of the Karoo are located along the proposed power line route. However, Wolfefontein (located near Kleinpoort at S33.17.800; E24.49.883) is the only such settlement that could be affected directly and negatively by tower placements. Photographs of the settlement are included in Appendix E (figures 6 to 12).

Wolfefontein has medium to high significance for its aesthetic, architectural, social and historical values. Accordingly, we recommend that the route proceeds from point 01F (Kleinpoort) to point 08 or 08A at the furthest possible distance from Wolfefontein.

⇒ [Landscapes and natural features](#)

The landscape of the Camdeboo Karoo and the Springbokvlakte has evolved over millennia. It has strong aesthetic, social and historical values for residents and visitors alike, but very little of this landscape is formally protected, an exception being the Baviaanskloof Mega Reserve. The visual impact of the proposed project on this landscape will be minimised by appropriate tower placement along route 01 to 08 (blue route with deviation around the historical settlement of Wolfefontein); either the yellow or green route north of Wolfefontein and Kleinpoort; and the blue route from point 05 to the proposed Gamma Sub-station.

⇒ [Geological sites of scientific or cultural importance](#)

None were identified within the proposed development area.

⇒ [Archaeological and palaeontological sites](#)

Archaeological and palaeontological sites are plentiful in the general area (see Appendix A), but they are easily avoided in a project of this nature by appropriate tower placement.

At the site of the new Gamma Sub-station we noted presence of miscellaneous Middle Stone Age stone knapping debris some 50 metres north of a windmill, at S31. 41.400; E23 24.620. Artefacts are water washed and weathered, on patinated shale, and are part of colluvial down slope wash.

Another concentration of archaeological material is present immediately to the west of the existing entrance gate to the property, at S31 41.950; E23 24.325. Here very weathered Early Stone Age flakes and cores are mixed with Middle Stone Age knapping detritus. It appears that episodes of soil deflation and pedogenesis have caused the two temporally disparate traditions to mix. Artefacts are eroding open, exposed by down slope wash, and are mixed with other colluvial debris.

These sites have low heritage significance for their scientific value and, as is the case for all heritage resources, a permit from SAHRA is required for any alteration to them.

⇒ [Graves and burial grounds](#)

We identified one possible grave at S33 14.296; E24 36.166, near Baroe. It comprises a mound of stones located within the railway reserve, as illustrated below:



If this is a grave it has high heritage significance for its social values and may not be disturbed without a permit from SAHRA. However, it will not be affected by the proposed development.

⇒ [Movable objects excluding any object made by a living person](#)

None were identified within the proposed development area.

⇒ [Battlefields](#)

None were identified within the proposed development area.

⇒ [Traditional building techniques](#)

Traditional building techniques associated with structures older than sixty years (see above) occur within the proposed development area, but will not be affected by the project.

Conclusion

From a heritage perspective, the following power line route would be optimal, particularly with respect to landscape impact:

- From Grassridge Sub-station along the Blue corridor to Kleinpoort;
- Between Kleinpoort and Wolwefontein divert north-northwest to the Yellow corridor.
- Rejoin the Blue corridor at point 05 and continue to the proposed Gamma Sub-station site.

Once the final servitude has been negotiated, a heritage practitioner must examine all tower placements and other proposed infrastructural locations to ensure that heritage resources are not affected adversely.

We recommend that this project may proceed with no further heritage resource mitigation and have submitted this report to SAHRA² in fulfilment of the requirements of the Heritage Resources Management Act. According to Section 38(4) of the Act:

The report shall be considered timeously by the Council which shall, after consultation with the person proposing the development, decide -

- (a) whether or not the development may proceed;
- (b) any limitations or conditions are to be applied to the development;
- (c) what general protections in terms of this Act apply, and what formal protections may be applied to such heritage resources;
- (d) whether compensatory action shall be required in respect of any heritage resources damaged or destroyed as a result of the development; and
- (e) whether the appointment of specialists is required as a condition of approval of the proposal.

The client may contact Ms Mary Lesley at SAHRA's Cape Town office (telephone 021 462 4502) and Mr Ndukuyakhe Ndlovu at Heritage Western Cape (021 483 9685) in due course to enquire about the Council's decision.

References

King, T. F. 1989. The archaeological survey: methods and uses. Quoted in Canter, L. W. 1996. Environmental impact assessment. Second Edition. New York: McGraw-Hill, Inc.

²SAHRA's review of the Draft Scoping Report prepared by ACER included the following undertaking: 'Decisions on Built Environment (e.g. structures over 60 years) and Cultural Landscapes must be made by the Eastern Cape and Northern Cape SAHRA Provincial Heritage offices (SAHRA Eastern Cape: Thanduxolo Lungile: sahra.ec1@iafrica.com, Noliitha Ngcai: sahraec@iafrica.com; SAHRA Northern Cape: Molebiemang Manong: sahra.nc1@iafrica.com, Andrew Timothy: sahranc2@iafrica.com; PHRA: jsinthumule@bp.ncape.gov.za Ph: 053 807 4793; Fax: 053 833 1454) to whom we will send this comment and the Draft Scoping Report. 'SAHRA currently has jurisdiction over the Archaeology and Palaeontology of the Northern and Eastern Cape but not the Western Cape, Therefore, decisions on the Archaeology, Palaeontology, Built Environment and Cultural Landscapes in the Western Cape, must be made by the Provincial Heritage Authority, Heritage Western Cape. We will send the relevant documentation and this comment to Heritage Western Cape (Att: Mr Ndlovu 021 4839685; Nndlovu@pgwc.gov.za)'.

APPENDIX A

ARCHAEOLOGICAL DATA – ALBANY MUSEUM, GRAHAMSTOWN

We obtained the following information from Dr Johan Binneman of the archaeology department at the Albany Museum in Grahamstown, which is the repository for provincial archaeological data³:

Summary

The proposed route for the Eskom transmission line runs through an area where no professional surveys of archaeological sites or research projects have ever been undertaken. It is also clear from the desktop search that little is known about the cultural resources in the area. However, the data available provide enough information at this early stage to predict what types of sites may be encountered during the construction of the transmission line.

Only a few sites, mainly reported by the public are known in the wider vicinity of the proposed route. These sites include isolated scatters of stone tools and a small number of rock painting sites. The latter may be found in the mountains but also against small koppies in the Karoo. Scatters of stone artefacts may be encountered on the plains. Consideration should be given to the importance of sources of water in this arid part of the region and the possibility that archaeological sites such as freshwater shell middens containing pottery, bone and ostrich eggshell fragments may be clustered along riverbanks, around pans and flood plains. These sites have often been exposed to the elements for many thousands of years and are usually in secondary context. Some material and features may also be buried, such as human remains and fossil bone in the areas mentioned above.

With respect to the historical structures in this region, the records of SAHRA in the Eastern Cape (East London) and Heritage Western Cape (Cape Town) were not consulted, but it is anticipated that many of the old farmhouses may exceed the 60 year clause. In other words, all building, or part thereof, marker, milestone, grave and gravestone or landmark older than 60 years are protected in terms of the National Heritage Resources Management Act of 1999, and may not be destroyed without a permit. These old buildings, which may relate to the movement of the first Dutch trekboers in the 18th and 19th centuries, are a valuable record of colonial settlement.

It would appear from the desktop study that the construction of the transmission line (placement of the pylons etc.) would have minimum effect and cause little damage to cultural sites. The proposed route also follows the existing roads to a certain extent. Possible archaeological sites along these roads will be already disturbed and/or damaged. It would therefore make no difference which route is taken for the line. Activities such as access roads and campsites that are associated with the project, however, may have a major impact on the heritage sites and remains.

It is recommended that heritage practitioners visit a number of pylon sites to assess the range of possible sites and material that may be encountered during the construction phase. Thereafter the practitioners should meet with the foremen to inform them about the possible heritage resources they may encounter. If heritage resources are encountered during construction SAHRA should be informed immediately so that they can investigate.

Desktop survey

No sites were found close to the proposed routes and sites mentioned in the report are from the same 1:10 000 map sheet the route passes through.

⇒ 3325DA Addo

Several reports referred to Earlier Stone Age stone artefacts in primary and secondary contexts in the vicinity of Grassridge. The extensive gravel terraces exposed by streams and rivers, roads, farming activities and other human development exposed large numbers of flaked cobbles and other debris of stone tool production.

³ Other heritage resource categories, including ancestral graves and intangible heritage, are not documented in formal databases, but are recorded during field inspections.

One of South Africa's most important Earlier Stone Age finds and excavations was conducted just west of Grassridge, at Amanzi Springs. In a series of spring deposits a large number of stone tools were found *in situ* to a depth of 3-4 metres. Remarkably wood and seed material preserved in the spring deposits, possibly dating to between 250 000 to 800 000 years old.

Occurrences of fossil bone remains and Middle Stone Age stone tools were reported south of Grassridge. During excavations the remains were found in the surface limestone, but the bulk of the bone remains were found some 1-1.5 metres below the surface. The excavations exposed a large number and variety of bones, teeth and horn cores *strongly suggesting that they were deposited there by people*. The bone remains included warthog, leopard, hyena, rhinoceros and ten different antelope species. A radiocarbon date of greater than 37 000 years was obtained for the site.

It is unknown if there are any further remains in the region. However, lime deposits elsewhere suggest that similar fossil bone accumulations may be found in other areas of the region. For example, a human skeleton was also found in a lime quarry near Addo station next to the railway line.

Two more Middle and Earlier Stone Age sites were reported next to the Addo road near Addo and Coerney and next to the Sundays River west of Addo.

Several Later Stone Age sites are situated next to the Sundays River close to the existing / proposed power line (pers. observ.). These included mainly freshwater mussel shell middens and/or thin scatters of shell and archaeological material.

Two types of shell middens were identified. The shell middens, which contained pottery, were associated with Khoekhoen pastoralist origin, and middens without pottery were of San hunter-gatherer origin. The latter carried stone tools that are typical of San hunter-gatherer life styles.

The region has witnessed much activity in historical times, but little material evidence probably survived, except in cases where people were living for a number of years. Such a site was reported by a group of Dutch hunters who passed through the area in 1702. They reported that a Khoekhoen group under chief Snel was living in the vicinity of Grassridge / Brakrivier. They used Snel's kraal as a base camp from where they raided other Khoekhoen groups in the area for their cattle and sheep.

⇒ 3325CB Uitenhage Noord

There are no sites reported near the proposed route, but there are many recorded rock shelters with paintings in the Groot Winterhoek Mountains some 8-10 km south. Although it is possible that there may be similar sites in the close vicinity of the propose route. Open sites/scatters of stone tools, possibly also pottery and bone are possible sites in the area.

⇒ 3325AD Kirkwood

No reported sites for this map sheet. The proposed route is relatively close to the Sunday's River. Open-air freshwater middens and other Stone Age campsites are possible sites in the area.

⇒ 3325AC Glenconner

No sites reported for this map sheet. The proposed route comes closer to hills and valleys that may have rock shelters with archaeological deposits and rock art. Open-air Later and Middle Stone Age sites are possible in this area.

⇒ 3324BD Wolfefontein

No sites reported for this map sheet. The route passes through a series of low, rocky mountains that enhances the possibility for rock art sites. Also open sites.

⇒ 3324 BB Greystone

No sites reported for this map sheet. The alternative route turns north and passes through the Klein Winterhoek Mountains - possible rock art sites.

⇒ 3224 DC Jansenville

Two human skeletons were found in the district, in a ploughed field. One was from a stone cairn burial. There may be five more possible burials in the area. One LSA site with rock art on the Sundays River has also been reported. The route is close to the Sunday's River and there may be an increase in freshwater middens and other open-air sites in this area.

⇒ 3324 BA Baroe

No sites reported for this map sheet. Route passes through the Klein Winterhoek and Grootrivier Mountain ranges - possible rock shelters and rock art sites.

⇒ 3324 AB Klipplaat

There is one shelter with rock paintings reported for this map sheet. The paintings include a springbuck but are badly weathered. Open-air campsites are possible.

⇒ 3224 CD Oatlands & 3224 CC Tierberg

No sites reported for these map sheets. Open-air campsites are possible.

⇒ 3224 CB Marais, 3224 CA Wallacedale & 3223 DB Kaapsepoortjie

No sites reported for these map sheets. Open-air campsites are possible.

⇒ 3224 AC Aberdeen

One skeleton has been reported from this area. Open-air campsites are possible.

Note: From Aberdeen northwards to the Eastern Cape border and beyond, Western Cape section - no maps sheets available or any reported sites. The closest records to the route come from:

⇒ 3223 AA

Eight LSA sites, four with rock art. One site reported to contain pottery, ostrich eggshell beads and an upper grindstone.

APPENDIX B

SIGNIFICANCE AND VALUE OF HERITAGE RESOURCE SITES

The following guidelines for determining site significance were developed by the South African Heritage Resources Agency in 2003. We use them in conjunction with tables of our own formulation (see that for the Southern African Iron Age, below) when considering intrinsic site significance and significance relative to development activities, as well as when recommending mitigatory action.

Type of Resource

Place

Structure

Archaeological Site

Palaeontological Site

Geological Feature

Grave

Type of Significance

1. Historical Value

It is important in the community, or pattern of history

- Importance in the evolution of cultural landscapes and settlement patterns
- Importance in exhibiting density, richness or diversity of cultural features illustrating the human occupation and evolution of the nation, Province, region or locality.
- Importance for association with events, developments or cultural phases that have had a significant role in the human occupation and evolution of the nation, Province, region or community.
- Importance as an example for technical, creative, design or artistic excellence, innovation or achievement in a particular period

It has strong or special association with the life or work of a person, group or organisation of importance in history

- Importance for close associations with individuals, groups or organisations whose life, works or activities have been significant within the history of the nation, Province, region or community.

It has significance relating to the history of slavery

- Importance for a direct link to the history of slavery in South Africa.

2. Aesthetic Value

It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group

- Importance to a community for aesthetic characteristics held in high esteem or otherwise valued by the community.
- Importance for its creative, design or artistic excellence, innovation or achievement.
- Importance for its contribution to the aesthetic values of the setting demonstrated by a landmark quality or having impact on important vistas or otherwise contributing to the identified aesthetic qualities of the cultural environs or the natural landscape within which it is located.
- In the case of an historic precinct, importance for the aesthetic character created by the individual components which collectively form a significant streetscape, townscape or cultural environment.

3. Scientific Value

It has potential to yield information that will contribute to an understanding of natural or cultural heritage

- Importance for information contributing to a wider understanding of natural or cultural history by virtue of its use as a research site, teaching site, type locality, reference or benchmark site.
- Importance for information contributing to a wider understanding of the origin of the universe or of the development of the earth.
- Importance for information contributing to a wider understanding of the origin of life; the development of plant or animal species, or the biological or cultural development of hominid or human species.
- Importance for its potential to yield information contributing to a wider understanding of the history of human occupation of the nation, Province, region or locality.

It is important in demonstrating a high degree of creative or technical achievement at a particular period

- Importance for its technical innovation or achievement.

4. Social Value

It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons

- Importance as a place highly valued by a community or cultural group for reasons of social, cultural, religious, spiritual, symbolic, aesthetic or educational associations.
- Importance in contributing to a community's sense of place.

Degrees of Significance

Rarity

It possesses uncommon, rare or endangered aspects of natural or cultural heritage

- Importance for rare, endangered or uncommon structures, landscapes or phenomena.

Representivity

It is important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects

Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class.

Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, Province, region or locality.

Sphere of Significance	High	Medium	Low	
International	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
National	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Provincial	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Regional	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Local	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Specific Community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-----

What other similar sites may be compared to this site?

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Southern African Iron Age

	Significance		
	- low	- medium	- high
Unique or type site			Yes
Formal protection			Yes
Spatial patterning	?Yes	?Yes	?Yes
Degree of disturbance	75 – 100%	25 – 74%	0 – 24%
Organic remains (list types)	0 – 5 / m ²	6 – 10 / m ²	11 + / m ²
Inorganic remains (list types)	0 – 5 / m ²	6 – 10 / m ²	11 + / m ²
Ancestral graves			Present
Horizontal extent of site	< 100m ²	101 – 1000m ²	1000 + m ²
Depth of deposit	< 20cm	21 – 50cm	51 + cm
Spiritual association			Yes
Oral history association			Yes
> Research potential			High
> Educational potential			High

Please note that this table is a tool to be used by qualified cultural heritage managers who are also experienced site assessors.

APPENDIX C

CULTURAL LANDSCAPES

The American National Parks Services sets out various criteria for the identification and management of cultural landscapes:

'Cultural landscapes are complex resources that range from large rural tracts covering several thousand acres to formal gardens of less than an acre. Natural features such as landforms, soils and vegetation are not only part of the cultural landscape, they provide the framework within which it evolves. In the broadest sense, a cultural landscape is a reflection of human adaptation and use of settlement, land use, systems of circulation and the natural resources and is often expressed in the way land is organised and divided, patterns of types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls and vegetation, and by use reflecting cultural values and traditions.

'Identifying the character-defining features in a landscape and understanding them in relation to each other and to significant historic events, trends and persons allows us to read the landscape as a cultural resource. In many cases, these features are dynamic and change over time. In many cases, too, historical significance may be ascribed to more than one period in a landscape's physical and cultural evolution.

'Cultural landscape management involves identifying the type and degree of change that can occur while maintaining the character-defining features. The identification and management of an appropriate level of change in a cultural landscape is closely related to its significance. In a landscape significant for its association with a specific style, individual, trend or event, change may diminish its integrity and needs to be carefully monitored and controlled. In a landscape significant for the pattern of use that has evolved, physical change may be essential to the continuation of the use. In the latter case, the focus should be on perpetuating the use while maintaining the general character and feeling of the historic period(s), rather than on preserving a specific appearance.

'A cultural landscape is a geographic area, including both natural and cultural resources, associated with a historic event, activity or person. The National Park Services recognises four cultural landscape categories: historic designed landscapes, historic vernacular landscapes, historic sites and ethnographic landscapes. These categories are helpful in distinguishing the values that make landscapes cultural resources and in determining how they should be treated, managed and interpreted...

'The four cultural landscape categories are not mutually exclusive. A landscape may be associated with a significant event, include designed or vernacular characteristics and be significant to a specific cultural group.'

APPENDIX D

We declare that Len van Schalkwyk, Beth Wahl and eThembeni Cultural Heritage have no financial or personal interest in the proposed development, nor its developers or any of its subsidiaries, apart from in the provision of heritage assessment and management consulting services.

Len van Schalkwyk and Beth Wahl are equal partners in eThembeni Cultural Heritage and the following synopsis of our respective qualifications and experience demonstrates our ability to complete heritage impact assessments. We are accredited by Amafa aKwaZulu-Natali to complete heritage impact assessments in KwaZulu-Natal, and by the Cultural Resources Management section of the Association of South African Professional Archaeologists to do so in the rest of South Africa.

Len has a master's degree in archaeology (specialising in the history of early farmers in southern Africa) from the University of Cape Town and sixteen years' experience in cultural heritage management. He left his position as assistant director of Amafa aKwaZulu-Natali, the provincial cultural heritage authority, to start eThembeni. Len has worked on projects as diverse as the establishment of the Ondini Cultural Museum in Ulundi, the cultural management of Chobe National Park in Botswana and various archaeological excavations and oral history recording projects. He was part of the writing team that produced the KwaZulu-Natal Heritage Act, 1997. Len has worked with many rural communities to establish integrated heritage and land use plans and speaks good Zulu.

Beth has an honours degree in African studies (majoring in archaeology and sociology) from the University of Cape Town and is completing her masters in heritage and tourism at the University of KwaZulu-Natal. Most recently she was employed by Amafa aKwaZulu-Natali as head of archaeology, which position she left to start eThembeni. Beth was a co-developer of the cultural heritage management plan for the uKhahlamba Drakensberg Park World Heritage Site and has developed and implemented training programmes for community guides and members of the public. Much of this training has focussed on the rock paintings of the uKhahlamba (Drakensberg) mountains.

❖ Heritage impact assessments

Such assessments are required as part of Environmental Impact Assessments by the KwaZulu-Natal Heritage Act 1997, the South African Heritage Resources Management Act 1999 and all national and provincial environmental legislation. We have completed numerous projects and Amafa aKwaZulu-Natali and the South African Heritage Resources Agency have supported our recommendations, without exception. The following projects are a sample of our work during 2005 and 2006:

Eskom power lines

- Braamhoek integrated power supply for PBA International
- Obanjeni, Mtunzini substation and power lines for SIVEST Environment and Planning
- Majuba Mfolozi power lines for BKS Environmental Management Division
- Idwala Carbonates for Stemele Bosch Africa
- Braamhoek power lines for Ludloko Developments

Housing, office and game estate developments

- Shakaskraal residential and commercial estate for ACER (Africa)
- Bird Valley Estate, Cramond; Camdeboo, Hilton and Sundara Estate, Oliviershoek for Alletson Ecologicals
- Muluja Heights, uKhahlamba Drakensberg for Brousse-James & Associates
- Lot 938 Port Edward for Buk'Indalo Consultancy cc
- Uitvlugt equestrian and wildlife estate, Pietermaritzburg for DR A'Bear & Associates
- New Forest, Dargle for Environmental Assessments cc
- Burlington Greenfield, Queensburgh; Hillary, Durban; Umkhumbaan, Cato Manor; Rem of Lot 125 Ifafa; Lot 6417 Tongaat, Westbrook Beach
- Erf 121 Bazley Beach and Rem of Lot 1 Umzumbe for Environmental Solutions
- Intathakusa Retreat, Inanda for futureWORKS!
- Alverstone, Assagay for Gary van Wyk and Scott Gelder
- Bishopstowe; Brookdales, Howick; Himeville; Kamberg; Northington, Mooi River; Phinda Game Reserve; Rietvallei equestrian estate, Lidgetton; Rietvlei, Craigieburn; Riversdale, Himeville; Spring Grove, Nottingham Road;

- Inhluzani, Dargle / Impendle; Umdloti; Lot 535 Kloof; Meycol Farm, uThukela Mouth; New Guelderland, Blythedale Beach; Simbithi eco-estate, Shakas Rock
- Zinkwazi Lagoon Lodge and forest estate for Indiflora cc Environmental Services
- Umbogintwini golf course for Kerry Seppings Environmental Management Services
- Zwelisha, Bergville for McFerran & Associates
- Executive Village, Umhlanga Triangle and Umhlanga New Town Centre for Moreland Developments (Pty) Ltd
- Cherry Farm, Port Shepstone; Kingthorpe equestrian estate, Pietermaritzburg; San Marina estate, Marina Beach; Shelly Ridge, Marburg Commonage; Sunrise Bay eco-estate; The Plantation agri eco-estate, Ramsgate; Uplands, Margate for NMH Consulting
- Buffelshoek, Winterton for Peter Jewell Consulting Services
- Umdloti Lagoon Valley and KwaDabeka C, Durban for SiVEST Environment and Planning
- Garden Park residential and commercial development for Spencer Gore Construction
- Manzengwenya dive camp for Strategic Environmental Focus (Pty) Ltd
- Balcomb, Mtunzini; Braeside Farm, Umhlali; Hillside farm, Umhlali; Helmsley Farm, Umhlali; Lot 617 Sheffield Beach; Mtikini, Ulundi; Palm Lakes, Umhlali; Tara Estate, Salt Rock for Sustainable Development Projects
- Allemans Drift and Waterford, Howick for WSP Environmental
- Almond Bank, Pietermaritzburg for Afzelia Environmental Consultants cc
- Nodunga and Cele-Nhlangweni for CHS Developments
- Eendvogel Vley and Gordon Hill, Ladysmith for DEK Simpson Professional Land Surveyors
- Mhlumayo housing for Inkonjane Developments

Road upgrades

- Road 1B Mkhazeni, Mgai farm road, Esifubeni road and Sani Pass Phase 1 for ACER (Africa)
- Ncengeni road, Tugela Ferry for J Mitchell & Associates
- Vukani Phase 2, Inanda for Pravin Amar Development Planners
- P230 road, Empangeni / Eshowe and Zwelimbomvu road for Terratest Incorporated
- Hillcrest roads for WSP Environmental

Bridge construction

- Bridge 1 Batshe and Bridge 18 Diki for ACER (Africa)
- Mfule River bridge, Nkwalini for Eyethu Engineers

Water supply projects

- Fairbreeze mine and Simdlangentsha for ACER (Africa)
- Makhabeleni, Masihambisane and Ntanzu for Saunders & Wium Trust
- Ozwathini / Mathulini and Wosiyane, Emalangeni and Cibane for SiVEST Environment and Planning
- KwaDeyi / St Faiths, KwaFodo and Stuartsville for Stemele Bosch Africa
- KwaGqungquma for Terratest Incorporated
- Albert Falls and south coast water supply system, Amanzimtoti to Umzinto / Scottburgh for Umgeni Water Amanzi

Dams

- Nsami, Molepo and Acornhoek dams, Limpopo Province for Cave Klapwijk & Associates
- Sundara, Oliviershoek for Alletson Ecologicals

Virgin soil assessments

- Ideal View and Mid-Selbourne farms, Underberg for Alletson Ecologicals

Other

- Gautrain tunnel and portal variants, Johannesburg for Bohlweki Environmental
- Gautrain route variants, Tshwane for Felehetsa Environmental (Pty) Ltd
- Ermelo Majuba rail realignments for Cave Klapwijk & Associates
- Nondabuya and Welcome agricultural development programmes for ACER (Africa) and Institute for Natural Resources
- Ntingwe tea estate, N11 and N12 borrow pits for ACER (Africa)
- Ashburton quarry, Pietermaritzburg and Idwala mining, Port Shepstone for Council for Geoscience
- King Matiwane cultural village for NDG Africa
- Alton North ferrochrome smelter, Richards Bay for CSIR Environmentek
- Chieveley, KwaDlamini, Injasuthi and Elandsdraal base stations for David Totman & Associates
- Msukeni and Lugelweni ecotourism developments, Eastern Cape for Environmental and Rural Solutions

- KwaBulawayo tourism development for ZAI Consultants
- Avon and Geogedale peaking power plants for Environmental Impact Management Services (Pty) Ltd
- Riverside industrial park, Durban for Environmental Planning & Design
- Port Shepstone commercial development for Environmental Solutions
- Nquthu artefact collection for Ernst Cloete & Associates
- Braamhoek Pumped Storage Scheme impact assessment and monitoring for Eskom
- Erf 50 Cato Ridge and Westway commercial developments for Guy Nicolson Consulting cc
- Wellington wine estate, Rosetta for Harbour Rocks Properties (Pty) Ltd
- Enyokeni, KwaKhangela for SiVEST Environment and Planning
- Nanxing mining, Wartburg for Terratest Incorporated
- Sappi Saiccor Amakhulu expansion, Umkomaas and underground cable installation, Richards Bay for WSP Environmental
- 10 000BC filming location, Garden Castle for Brousse-James & Associates
- Heritage resources component of the KwaDukuza Strategic Environmental Assessment for SiVEST Selatile Moloji

APPENDIX E



Figures 1 to 6: Buildings older than sixty years located within the proposed power line servitude.



Figures 7 to 9 – historical settlement of Wolwefontein.



Figures 10 to 12 – historical settlement of Wolwefontein.

