HERITAGE IMPACT ASSESSMENT OF ZEBRA SUBSTATION EXTENSION AND LINK LINES, CRADOCK, EASTERN CAPE PROVINCE, SOUTH AFRICA



Assessment and report by



For Jeffares & Green

Telephone Dumisani Bokveldt 041 363 1900

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Management summary

eThembeni Cultural Heritage was appointed by Jeffares & Green to undertake a heritage impact assessment of a proposed Eskom project in Cradock, in terms of the Heritage Resources Act No 25 of 1999. Two eThembeni staff members inspected the area on 21 and 22 July 2009 and completed a controlled-exclusive surface survey and database search.

We identified no heritage resources within the proposed development area.

The landscape within which the proposed development will occur comprises the townlands of Cradock, including existing power lines and a substation. The impact on this landscape will be long term to permanent, but in keeping with existing infrastructure.

We recommend that the development proceed with no further heritage resource mitigation and have submitted this report to the South African Heritage Resources Agency in fulfilment of the requirements of the Heritage Resources Act 1999. The relevant SAHRA personnel are Dr Antonieta Jerardino (telephone 021 462 4502) and Mr Thanduxolo Lungile (telephone 043 722 1740/2/6).

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 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 Jeffares & Green to undertake a heritage impact assessment of a proposed Eskom project in Cradock, in terms of the Heritage Resources 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 Act 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.

A 'place' is defined as:

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

'Structures' means any building, works, device, or other facility made by people and which is fixed to land and any fixtures, fittings and equipment associated therewith older than 60 years.

'Archaeological' means:

- material remains resulting from human activity which are in a state of disuse and are in or on land and are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
- rock art, being a form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and is older than 100 years including any area within 10 m of such representation; and
- wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land or in the maritime cultural zone referred to in section 5 of the Maritime Zones Act 1994 (Act 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which are older than 60 years or which in terms of national legislation are considered to be worthy of conservation;
- features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

'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.

'Grave' means a place of interment and includes the contents, headstone or other marker of and any other structures on or associated with such place. The South African Heritage Resources Agency will only issue a permit for the alteration of a grave if it is satisfied that every reasonable effort has been made to contact and obtain permission from the families concerned. The following procedures are usually required in the event of exhumation and re-interment:

- Notification of the impending removals (using appropriate language media and notices at the grave site);
- o Consultation with individuals or communities related or known to the deceased;
- Satisfactory arrangements for the curation of human remains and / or headstones in a museum, where applicable;
- Procurement of a permit from SAHRA;
- Appropriate arrangements for the exhumation (preferably by a suitably trained archaeologist) and re-interment (sometimes by a registered undertaker, in a formally proclaimed cemetery);
- Observation of rituals or ceremonies required by the families.

Nature of proposed activities (information obtained from the client)

Jeffares & Green Consulting Engineers (Pty) Ltd have been appointed by Eskom to undertake a Scoping and Environmental Impact Assessment for the proposed extension of Zebra substation and associated 22/132kV link lines in Cradock. The substation will be extended to have enough capacity for the strengthening of electrical supply system in the Cradock area.

Two ± 1,2km 22kV lines will be constructed from the proposed Zebra 132kV substation to the existing Kwagga-Visrivier 22kV network. The Kwagga-Visrivier 22kV network will split and one 22kV line will tie into the Kwagga side and the other into the Visrivier side of the split. Two ± 2,3km 132kV lines will be constructed from the proposed Zebra 132kV substation to the Drennen-Cradock 132kV traction line. The traction line will split and the one 132kV line will tie into the Drennen side and the other will tie into the Cradock side of the split. The existing 66kV line between Kwagga and Zebra substation will then be dismantled once the new Zebra 22/132kV substation has been commissioned. This development is required in order to reinforce and improve the reliability of supply to Cradock and surrounding areas, as well as providing additional network capacity for future load growth in these areas.

Eskom is also applying for an exemption in considering route alternatives for the proposed development, because this project involves the extension of an existing substation and link lines. This development is required in order to reinforce and improve the reliability of supply to the area, as well as providing additional network capacity for future load growth in the Cradock area.

Location and environmental issues (information obtained from the client)

The study area is located just outside the town of Cradock in Inxuba Yethemba Local Municipality in the Eastern Cape. The existing substation will be extended to a size of about 130m x 65m towards the direction of Lingelihle Township. The coordinates are Start: 3561600X, -58800Y; End: 356300X, -56700Y

According to Mucina and Rutherford (2006¹) the vegetation type that is likely to be found in the proposed development area is Eastern Upper Karoo (NKu 4). This vegetation type is dominated by dwarf microphyllous shrubs, with 'white' grasses of the genera *Aristida* and *Eragrostis*. *Medi-cago laciniata* is a common and widespread alien plant within this vegetation type.

The line route is across terrain mostly devoid of large trees save for the area around the Fish River crossing, which will have to be cleared. This is expected to be an ongoing activity even after construction and commissioning. The site where the line will be constructed is accessible and fairly easy to traverse. The site has an existing substation and power lines. The proposed extension of the substation and link lines will be done on the existing footprint.

Key environmental issues include:

- Access to watercourses Access to watercourses by construction vehicles will cause damage to the fauna and flora associated with these systems, and will alter water and soil characteristic and flow patterns, and must be prevented.
- Surface water runoff The construction activities will affect the area through changed hydrological patterns and may have an ecological impact. Permanent alteration of flow patterns is a risk and could lead to detrimental effects on the stream if these are not mitigated for during and after construction.
- Rehabilitation A rehabilitation programme must be developed for all areas to be affected by the
 development, which will not be landscaped in association with the development. Alien plants should be
 removed and replaced with indigenous vegetation. This must be an on going process and should not be
 left to the end of the projected construction period.
- Vegetation clearance Where it is necessary for vegetation to be removed, this should not occur as a once off clearance, but should be phased, in order to reduce soil erosion and the proliferation of exotic

¹ Mucina, L. and Rutherford, M.C. (eds) 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.

- weeds. Weeds will thrive on disturbed soil, and will present an eradication problem later should these plants set seed, especially near watercourses. Protected plant species should be relocated.
- Erosion Potential erosion should always be considered during and after construction. If strict mitigation measures are implemented these can be prevented / reduced. These include soil stabilisation and revegetation of affected areas as well as avoidance (during construction and operation) of all areas susceptible to erosion.
- Access to private land This development will involve access to private properties along the proposed routes for construction of the power line and maintenance thereof. Eskom has undergone an extensive negotiation process with all the affected landowners and agreement must be reached between the landowners and Eskom before commencement of such an activity.
- The opportunities created by this development are likely to outweigh the negative impacts on indigenous fauna and flora. The development disturbance areas are expected to occur over relatively small areas, and will be succeeded by rehabilitation, if necessary. It is imperative however that the construction and operation activities occur over a small an area as is practical.

Methodology

Two eThembeni staff members inspected the area on 21 and 22 July 2009. 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 1978²).

We consulted various provincial databases, including historical, archaeological and geological sources and sourced a concise account of South Africa's pre and postcolonial history (available on request). We assessed the value and significance of heritage resources, as defined in the Heritage Resources Act 1999 and the criteria contained in Appendix A. Culturally significant landscapes were assessed according to the criteria in Appendix B.

Geographic coordinates were obtained with a handheld Garmin GPS72 global positioning unit. Photographs were taken with a Nikon Coolpix S200 digital camera. A statement of independence and a summary of our ability to undertake this heritage impact assessment are available on request.

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

- o We have assumed that the description of the proposed project, provided by the client, 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.
- o Soil surface visibility was moderate overall.
- No subsurface investigation (including excavations or sampling) were undertaken, since a permit from SAHRA is required to disturb a heritage resource. Accordingly, subsurface heritage resources might be present and we remind the client that the Act requires that a developer cease all work immediately and notify SAHRA should any heritage resources, as defined in the Act, be discovered during the course of development activities.

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² 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.

Observations and recommendations

No development activities associated with the proposed project had begun at the time of our visit, in accordance with national heritage legislation.

⇒ Places, buildings, structures and equipment

None were identified within the affected development area.

⇒ Places to which oral traditions are attached or which are associated with living heritage

None were identified within the affected development area.

⇒ Historical settlements and townscapes

None were identified within the affected development area.

⇒ Landscapes and natural features

The landscape within which the proposed development will occur comprises the townlands of Cradock, including existing power lines and a substation. The impact on this landscape will be long term to permanent, but in keeping with existing infrastructure.

⇒ Geological sites of scientific or cultural importance

None were identified within the affected development area.

⇒ Archaeological and palaeontological sites

None were identified within the affected development area.

⇒ Graves and burial grounds

None were identified within the affected development area.

⇒ Sites of significance relating to the history of slavery in South Africa

None were identified within the affected development area.

⇒ Movable objects excluding any object made by a living person

None were identified within the proposed development area.

Summary of findings in terms of the Heritage Resources Act 1999 Section 38(3)

(a) the identification and mapping of all heritage resources in the area affected

None.

(b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in regulations

Not applicable.

(c) an assessment of the impact of development on such heritage resources

Not applicable.

(d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development

Not applicable.

(e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources

The client has undertaken such consultation in terms of statutory requirements and retains the relevant documentation.

(f) if heritage resources will be adversely affected by the proposed development, the consideration of alternatives

Not applicable.

(g) plans for mitigation of any adverse effects during and after completion of the proposed development

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

Conclusion

We recommend that the development proceed with no further heritage resource mitigation and have submitted this report to SAHRA in fulfilment of the requirements of the Heritage Resources Act 1999. 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:

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

The relevant SAHRA personnel are Dr Antonieta Jerardino (telephone 021 462 4502) and Mr Thanduxolo Lungile (telephone 043 722 1740/2/6).

APPENDIX A

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 International National Provincial Regional Local Specific Community	High	Medium Low	
What other similar sites may b	·		
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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 / m²	11 + / m ²
Inorganic remains (list types)	0 – 5 / m²	6 – 10 / m²	11 + / m ²
Ancestral graves			Present
Horizontal extent of site	< 100m²	101 – 1000m²	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 B

THE MANAGEMENT OF CULTURAL LANDSCAPES

The Cultural Landscape Foundation³ defines cultural landscapes as follows:

A cultural landscape is a geographic area that includes resources and natural resources associated with a historic event, activity, or person. Sometimes cultural landscapes are the result of one person or group of people acting upon the land. Other times they are the result of an idea one person or a group had and then created at that time. Cultural landscapes can range from thousands of acres of rural lands to a small homestead with a front yard of less than one acre. They include grand estates, farmland, public gardens and parks, college campuses, cemeteries, scenic highways and even industrial sites.

Four general types of Cultural Landscapes, not mutually exclusive, are:

- Historic Sites
- o Historic Designed Landscapes
- Historic Vernacular Landscapes
- o Ethnographic Landscapes

Cultural Landscapes can:

- Be man-made expressions of visual and spatial relationships.
- Serve as texts and narratives of cultures.
- o Be valuable expressions of regional identity.
- Be works of art that are part of our national heritage.
- o Exist in relationship to their ecological contexts.

What are cultural landscapes? by Alice E. Ingerson, Institute for Cultural Landscape Studies

Virtually all landscapes have cultural associations, because virtually all landscapes have been affected in some way by human action or perception. Therefore, the Institute for Cultural Landscape Studies does not use the phrase "cultural landscape" to mean a special type of landscape. Instead, we use "cultural landscape" to mean a way of seeing landscapes that emphasizes the interaction between human beings and nature over time. ICLS also works with many other organizations, some of which have contrasting or even conflicting definitions of "cultural landscape":

individual, special, aesthetic, collective, representative, useful, cultural, related to the arts (consciously designed objects), ideas of enduring value related to the everyday beliefs and practices of a group of people, the work of landscape architects or garden designers, scenery portrayed in a painting or photograph, or that is seen as worth painting or photographing, the land that can be seen from a single vantage point (usually larger than a "site", smaller than a "region"), "nearly everything we see when we go outdoors" — Peirce Lewis 1979

³ Though professional techniques for identifying, documenting, and managing cultural landscapes have evolved rapidly in the past 30 years, the results of the professionals' work often fails to reach the general public. Consequently, many of the places in which we live, work, and play often change considerably—sometimes over years and sometimes overnight! The Cultural Landscape Foundation is the only not-for-profit foundation in America dedicated to increasing the public's awareness of the importance and irreplaceable legacy of cultural landscapes. Through education, technical assistance, and outreach, the Cultural Landscape Foundation aims to broaden the support and understanding for cultural landscapes nationwide in hopes of saving our priceless heritage for future generations. The CLF achieves this mission by: (1) heightening the awareness of those who impact cultural landscapes; (2) assisting those groups and organizations who are working to increase the appreciation and recognition of cultural landscapes; and, (3) developing educational tools for young people to better connect them to their cultural landscape environs.

⁴ From the website of the Institute for Cultural Landscape Studies of the Arnold Arboretum (http://www.icls.harvard.edu), © The President and Fellows of Harvard College. The Institute for Cultural Landscape Studies was formed in 1997 to support the emerging community of professionals and volunteers who manage and interpret landscapes with a significant history of human use, particularly in the northeastern United States. These practitioners work with a wide variety of places, from historic gardens and public parks to urban streetscapes, broad agricultural or industrial regions, and conservation or ecological reserves. These landscapes are neither static nor self-contained. Managing them requires active experimentation and continuous learning, to understand how past events and decisions produced today's landscapes, and how today's decisions and events are already producing tomorrow's landscapes. The Institute for Cultural Landscape Studies worked with nonprofit organizations, public agencies, and colleges and universities to capture place-based knowledge about cultural landscapes, and to respond to emerging issues.

The National Park Service and the National Register of Historic Places, as well as organizations that look to these agencies for management models and standards, use the operational definition of "cultural landscape" from the 1996 Secretary of the Interior's . . . Guidelines for the Treatment of Cultural Landscapes:

a geographic area (including both cultural and natural resources and the wildlife or domestic animals therein), associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values.

Historic landscapes, unlike works of art, have to function as contemporary environments — we have literally to enter and become involved with them. — Catherine Howett 1987

Much public discussion about cultural landscapes is about preserving special or historic places. Yet the definition of "special" varies over time, among different cultures, and in different places. A landscape valued by one group may be simply invisible, or even offensive, to another. Next to an official historic district may be a neighborhood that is not eligible for any special treatment but has deep meaning and associations for the people who live there. Mobile homes may be critical to a farm economy, though they jar the sensibilities of visitors expecting to see only white clapboard houses and wooded hillsides from a "scenic overlook" in a state forest. The historic district and the ordinary neighborhood, working farms and protected forests, are all cultural landscapes.

Even when landscape preservation standards are broadened to include a wide range of landscape types, strict preservation is not always an appropriate stance. Designers and communities may also choose to transform existing landscapes or create new ones. Managing cultural landscapes thus involves planning for positive change as well as preventing negative change.