PGS
HERITAGE & GRAVE
RELOCATION CONSULTANTS

Environmental Impact Management Services (Pty) Ltd

Environmental Impact Assessment process for the Eros –Vuyani 400kV line towers within 32m of a watercourse in KwaZulu Natal

Heritage Impact Assessment

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Declaration of Independence

The report has been compiled by PGS Heritage & Grave Relocation Consultants an appointed Heritage Specialist for Environmental Impact Management Services (Pty) Ltd. The views stipulated in this report are purely objective and no other interests are displayed during the decision making processes discussed in the Heritage Impact Assessment Process that includes the Scoping as well as this final report

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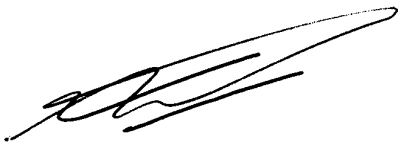

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ACKNOWLEDGEMENT OF RECEIPT

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EXECUTIVE SUMMARY

PGS Heritage & Grave Relocation Consultants was appointed by Environmental Impact Management Services (Pty) Ltd to undertake a Heritage Impact Assessment that forms part of the Environmental Impact Assessment process for the Eros –Vuyani 400kV line towers within 32m of a watercourse in KwaZulu Natal.

Heritage resources are unique and non-renewable and as such any impact on such resources must be seen as significant.

During the field work no heritage site were identified that is on or inside the boundary of the proposed pylon footprints.

The following general mitigation measures are recommended:

- If during construction any possible finds are made, the operations must be stopped and the qualified archaeologist be contacted for an assessment of the find.

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1 INTRODUCTION

PGS Heritage & Grave Relocation Consultants was appointed by Environmental Impact Management Services (Pty) Ltd to undertake a Heritage Impact Assessment that forms part of the Environmental Impact Assessment process for the Eros –Vuyani 400kV line towers within 32m of a watercourse in KwaZulu Natal.

1.1 Scope of the Study

The aim of the study is to identify possible heritage sites and finds that may occur in and on the areas where infrastructure will be sited. The Heritage Impact Assessment aims to inform the Basic Environmental Assessment to assist Eskom in managing the discovered heritage resources in a responsible manner, in order to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (NHRA) (Act 25 of 1999).

1.2 Specialist Qualifications

This Heritage Scoping Report was compiled by PGS Heritage & Grave Relocation Consultants (PGS).

The staff at PGS has a combined experience of nearly 40 years in the heritage consulting industry. PGS and its staff have extensive experience in managing HIA processes. PGS will only undertake heritage assessment work where they have the relevant expertise and experience to undertake that work competently.

Wouter Fourie, Principal Archaeologist for this project, is registered with the Association of Southern African Professional Archaeologists (ASAPA) and Amafa has CRM accreditation within the said organisations.

1.3 Assumptions and Limitations

Not subtracting in any way from the comprehensiveness of the fieldwork undertaken, it is necessary to realise that the heritage resources located during the fieldwork do not

necessarily represent all the possible heritage resources present within the area. Various factors account for this, including the subterranean nature of some archaeological sites and the current dense vegetation cover. As such, should any heritage features and/or objects not included in the present inventory be located or observed, a heritage specialist must immediately be contacted.

Such observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that the heritage specialist had been able to make an assessment as to the significance of the site (or material) in question. This applies to graves and cemeteries as well. In the event that any graves or burial places are located during the development the procedures and requirements pertaining to graves and burials will apply as set out below.

1.4 Legislative Context

The identification, evaluation and assessment of any cultural heritage site, artefact or find in the South African context is required and governed by the following legislation:

i. National Environmental Management Act (NEMA) Act 107 of 1998
ii. National Heritage Resources Act (NHRA) Act 25 of 1999
iii. Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002
iv. Development Facilitation Act (DFA) Act 67 of 1995

The following sections in each Act refer directly to the identification, evaluation and assessment of cultural heritage resources.

i. National Environmental Management Act (NEMA) Act 107 of 1998
    a. Basic Environmental Assessment (BEA) – Section (23)(2)(d)
    b. Environmental Scoping Report (ESR) – Section (29)(1)(d)
    c. Environmental Impacts Assessment (EIA) – Section (32)(2)(d)
    d. EMP (EMP) – Section (34)(b)
ii. National Heritage Resources Act (NHRA) Act 25 of 1999
    a. Protection of Heritage resources – Sections 34 to 36; and
    b. Heritage Resources Management – Section 38
iii. Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002
    a. Section 39(3)

iv. Development Facilitation Act (DFA) Act 67 of 1995

a. The GNR.1 of 7 January 2000: Regulations and rules in terms of the Development Facilitation Act, 1995. Section 31.

The NHRA stipulates that cultural heritage resources may not be disturbed without authorization from the relevant heritage authority. Section 34(1) of the NHRA states that, "no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority…" *The NHRA is utilized as the basis for the identification, evaluation and management of heritage resources and in the case of CRM those resources specifically impacted on by development as stipulated in Section 38 of NHRA, and those developments administered through NEMA, MPRDA and the DFA legislation. In the latter cases the feedback from the relevant heritage resources authority is required by the State and Provincial Departments managing these Acts before any authorizations are granted for development. The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of Environmental Impacts Processes required by NEMA and MPRDA. This change requires us to evaluate the Section of these Acts relevant to heritage* (Fourie, 2008):

The NEMA 23(2)(b) states that an integrated environmental management plan should, "*…identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage*".

A study of subsections (23)(2)(d), (29)(1)(d), (32)(2)(d) and (34)(b) and their requirements reveals the compulsory inclusion of the identification of cultural resources, the evaluation of the impacts of the proposed activity on these resources, the identification of alternatives and the management procedures for such cultural resources for each of the documents noted in the Environmental Regulations. A further important aspect to be taken account of in the Regulations under NEMA is the Specialist Report requirements laid down in Section 33 of the regulations (Fourie, 2008).

Terminology

Abbreviations	***Description***
BA	Basic Environmental Impact Assessment
AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
DEA	Department of Environmental Affairs
DWA	Department of Water Affairs
EIA practitioner	Environmental Impact Assessment Practitioner
EIA	Environmental Impact Assessment
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&AP	Interested & Affected Party
LSA	Late Stone Age
LIA	Late Iron Age
MSA	Middle Stone Age
MIA	Middle Iron Age
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
PSSA	Palaeontological Society of South Africa
ROD	Record of Decision
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Agency

Archaeological resources

This includes:

i. 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;

ii. rock art, being any 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 which is older than 100 years, including any area within 10m of such representation;

iii. wrecks, being any vessel or aircraft, or any part thereof which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation;

iv. features, structures and artefacts associated with military history which are older than 75 years and the site on which they are found.

Cultural significance

This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance

Development

This means any physical intervention, excavation, or action, other than those caused by natural forces, which may in the opinion of the heritage authority in any way result in the change to the nature, appearance or physical nature of a place or influence its stability and future well-being, including:

i. construction, alteration, demolition, removal or change in use of a place or a structure at a place;
ii. carrying out any works on or over or under a place;
iii. subdivision or consolidation of land comprising a place, including the structures or airspace of a place;
iv. constructing or putting up for display signs or boards;
v. any change to the natural or existing condition or topography of land; and
vi. any removal or destruction of trees, or removal of vegetation or topsoil

Early Stone Age

The archaeology of the Stone Age between 400 000 and 2500 000 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 25 of 1999).

Heritage resources

This means any place or object of cultural significance

Holocene

The most recent geological time period which commenced 10 000 years ago.

Late Stone Age

The archaeology of the last 30 000 years associated with fully modern people.

Late Iron Age (Early Farming Communities)

The archaeology of the last 1000 years up to the 1800's, associated with iron working and farming activities such as herding and agriculture.

Middle Stone Age

The archaeology of the Stone Age between 30-300 000 years ago associated with early modern humans.

Palaeontology

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.

Refer to **Appendix A** for further discussions on heritage management and legislative frameworks

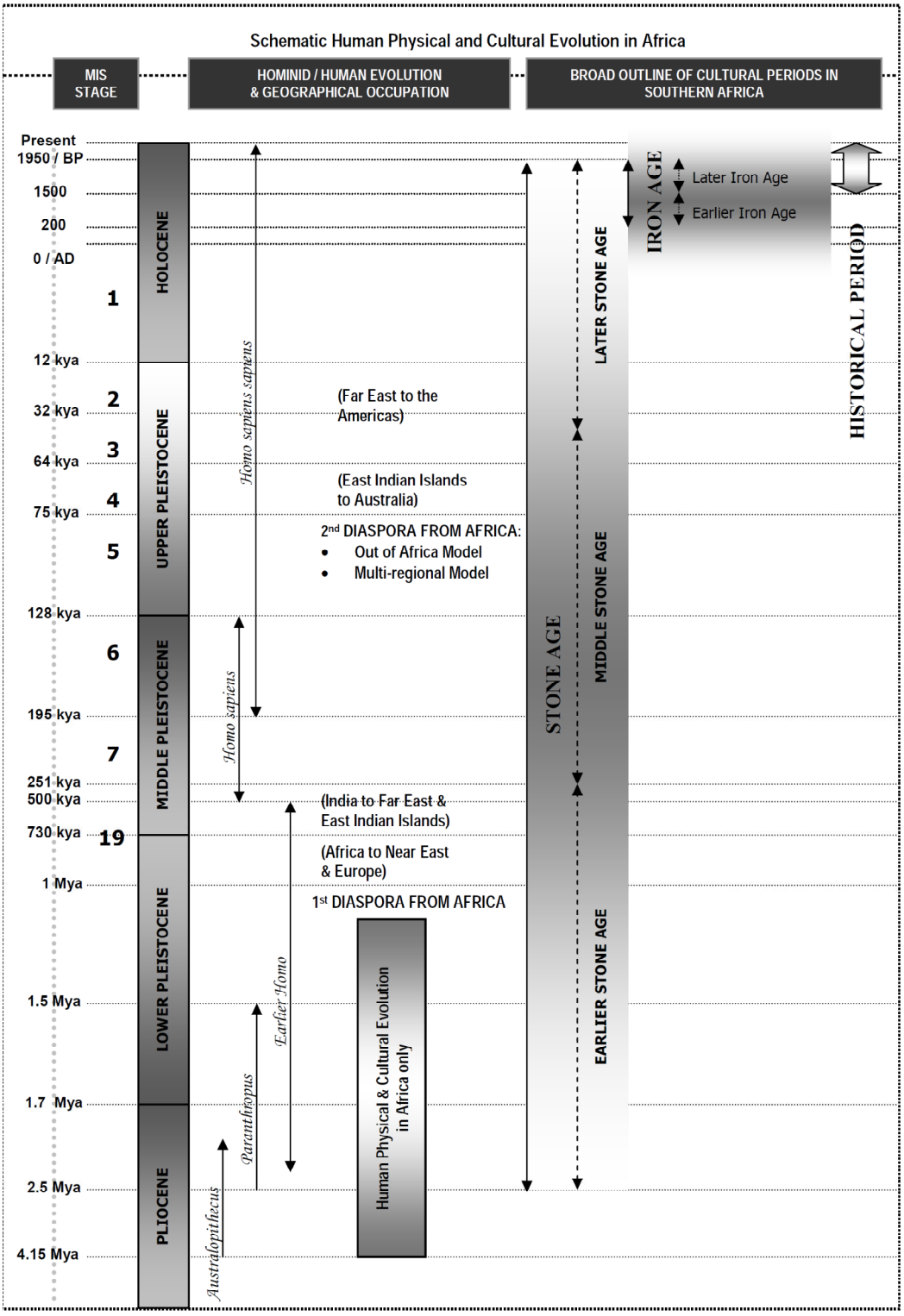

Figure 1: Human and Cultural Time line in Africa (Morris, 2008)

2 TECHNICAL DETAILS OF THE PROJECT

2.1 Project Background

The Eros-Mthata section of the Eros Neptune 400kV Transmission Line (**Figure 2**) was subject to an archaeological walk down, completed by PGS Heritage and Grave Relocation Consultants during March 2010. During this walk down no heritage resources were identified at the pylon position as provided at the time of the 2010 study.

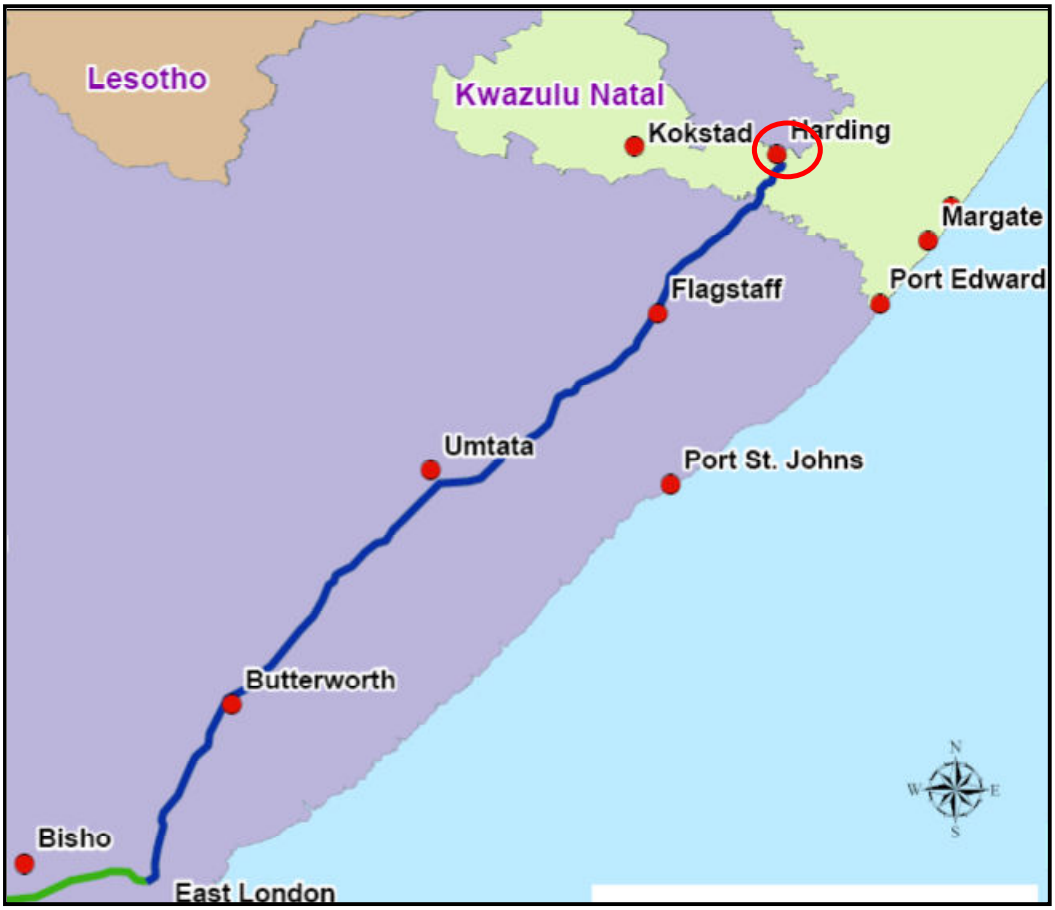

Figure 2: Locality Map of Eros-Neptune Line – Study are indicated in red

The positions of these pylons had to be repositioned due to environmental factors, and new localities for the sites have been surveyed and marked prior to construction (**Figure 3**). This repositioning requires the completion of a Basic Environmental Assessment for the new pylon localities.

Figure 3: Map indicating previous assessed pylon positions (Blue) and new allocated positions (Red)

2.2 Technical project description

This project involves the construction of towers 4, 6, 8 and 9 in the town of Harding, Umuziwabantu Local Municipality, which falls under the jurisdiction of the Ugu District in KZN. These towers fall within 32 metres of a watercourse whereby Tower 4 is in close proximity to a dam; Towers 6, 8 & 9 are in close proximity to a seasonal wetland area. The towers will be part of the current construction of a 400 kV power line from Eros Sub-Station in Harding (KZN) to Vuyani Sub-Station in Mthatha (EC).

2.3 Transmission line construction process

Table 1 provides an outline of the construction process to be followed on the proposed transmission line.

Table 1: A description of the construction process, activities, and time frames

The Construction Process

The following is a process that will be adopted for the entire route, beginning at the starting point of the new line. Each activity will follow the previous one, such that at any one point an observer will see a chain of events, with different teams involved over time. At any one time some or all of the different teams may be working at different points along the line. There may be days of no activity in the process. There are some 35 active days of construction at any point, though this may take place over a period of two years.

The following details are provided for each construction activity:

- Approximate team size per contractor: -
- An indication of the likely number of construction staff involved in each exercise.
- Approximate duration at a point: -
- An indication of the likely time spent by the team at a point (typically a tower location) as they move along the route. These times may vary significantly depending on local conditions.

Activity		**Approx team size**	**Approx. duration at a point**
1.	Centre line pegging and identification of new gates *(light vehicle access)*	3	1 day
2.	Access Negotiations • an access plan is developed and agreed to by the landowner, Eskom and the contractor • rehabilitation measures are agreed to • photographs are taken before hand • access road will be established through recurring use (i.e. there will be no blading or scraping of a new road) *(light vehicle access)*	1	1 day
3.	Tower Pegging • the contractor will appoint a surveyor to undertake this work • the footing of the pylons will be set out • the contractor will report back if anything odd is found and the tower will be moved accordingly *(light vehicle access)*	5	1 days
4.	New gate installation *(light vehicle access)*	5	1 days
5.	Foundation nominations (for main structure and anchors) • soil types are checked to determine foundation requirements • trial pits are dug at the main foundation points – usually using mechanical back-actor/auger methods, though in a few circumstances manual labour may be used. *(heavy vehicle access)*	5	2 days
6.	Excavation of foundation • foundations of up to 4 m x 4 m square are excavated and up to 4m deep depending on soil conditions • foundation pits then need to be covered or fenced off until foundation is poured *(heavy vehicle access)*	15	2 days
7.	Foundation steelwork (reinforcing) • the steelwork is usually made up at the base camp and brought on to site by truck • all fitting, wiring is done on site (limited welding on site) *(heavy vehicle access)*	10	2 days

8.	Foundation (concrete) pouring • shuttering • standard concrete truck used • if there are access problems, concrete will be mixed on site • helicopters will be used in exceptional circumstances • 28 day period required after concrete has been laid *(heavy vehicle access)* *(heavy usage of the servitude roads during this phase)*	20	2 days
9.	Delivery of tower steelwork • steelwork is delivered in sections and assembled on site • one truck can transport one tower • transported from the factory to site (the towers are individually designed for each location) • access roads are clearly marked to ensure the correct tower is delivered *(heavy vehicle access)* *(extra long trucks will be used)*	5	1 day
10.	Assembly team / Punching and painting • the steelwork is fitted together and assembled on the ground • nuts are punched and non-corrosive paint is placed on the nuts *(light vehicle access)*	10	3 days
11.	Erection • Cranes (minimum of 50 tonne cranes) pick up the towers for final assembly. *(abnormal load vehicle access)*	20	2 days
12.	Stringing • cable drums are placed next to each other within the servitude • stringing takes place in both directions from the drum stations - 5-10 km can be strung from 1 station • the working area at each drum station will be as long as 130m, but will be confined to the servitude width. Intensive vehicle movement may take place within this working area • a pilot tractor will place the pilot cable on the ground • this cable is then pulled up through the use of a pulley • conductors are never to touch the ground • in mountainous areas, a helicopter can be used or the pilot rope can be shot across valleys *(abnormal load vehicle access)* *(intensive vehicle activity likely within the working area)*	50	7 days
13.	Sag and tension The line is tensioned from each cable station to ensure minimum ground clearance heights are achieved (8.4m for 765 kV lines and 10m for 765kv lines) *(heavy vehicle access)*	10	3 days
14.	Rehabilitation • rehabilitation is a continuous process during the construction phase • rehabilitation will typically only commence after the first 100 towers have been strung • there is a one year guarantee on the contractors work during which rehabilitation must be concluded– thereafter he is paid the outstanding amount *(heavy and light vehicle access)*	5 - 15	2 – 10 days dependent on site conditions

3 FINDINGS OF BACKGROUND RESEARCH

3.1 Harding Town History

The town of Harding was established in 1874 as a military outpost following the annexation of East Griqualand. The town was named after Sir Walter Harding the First chief Justice of Natal (Cele, 2009). Cele further notes that, "*…After the territory between the uMthavuna and uMzimkhulu Rivers in the south of the present KwaZulu- Natal was annexed to Natal in the 1860s, it came to be called Alfred County, and later Port Shepstone and Harding districts."*

3.2 Anthropological background of the area

Cele (2009), indicates that the KwaMachi chiefdom is located outside the town of Harding and within the Harding District. Other chiefdoms around Harding include the KwaMbotho, Kwacele, and KwaJali (**Figure 4**).

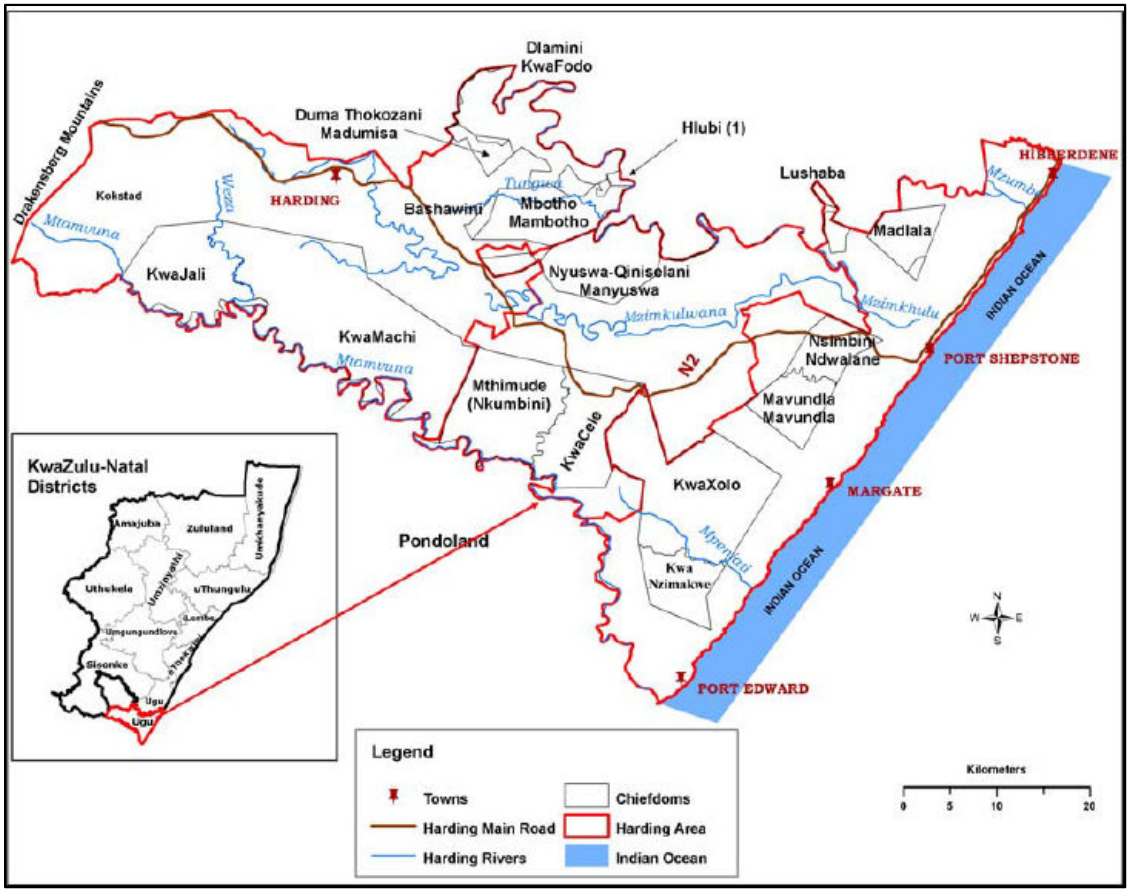

Figure 4: chiefdom distributions within the Harding Area (Cele, 2009)

4 FINDINGS OF FIELD WORK

The pylon footprint positions were surveyed by an archaeologist from PGS over 3 days by foot and vehicle with the aim of identifying all heritage resources on or close to the pylon positions.

The following is a summary of the findings of the field work.

HTN 4

Tower is situated in a recently harvested bluegum plantation. The area is heavily disturbed (**Figure 5** and **Figure 6**). No heritage sites were observed.

Figure 5: View of Pylon 4 foot print area – red flag centre of pylon

Figure 6: View of Pylon 4 towards dam

HTN 6

Tower is situated in a recently harvested pine plantation, next to a dry stream. The area is heavily disturbed (**Figure 7** and **Figure 8**). No heritage sites were observed.

Figure 7: Pylon 6 disturbed by recent logging

Figure 8: View of disturbed vegetation at Pylon 6 area

HTN 8

Tower is situated approximately 100m from a dry stream in an area that might have been a plantation in the recent past. It is bordered by pine plantations (**Figure 9** and **Figure 10**). No heritage sites were observed.

Figure 9: Pylon 8 view of footprint area

Figure 10: Pylon 8 wide view of pylon footprint area

HTN 9

Tower is situated in a recently harvested bluegum plantation. The area is heavily disturbed (**Figure 11** and **Figure 12**). No heritage sites were observed.

Figure 11: Pylon 9 view of harvested plantation area

Figure 12: View of Pylon 9 foot print towards stream

It is important to note that although these sites were heavily disturbed by forestry and no heritage resources were observed, the possibility of subterranean resources cannot be discounted.

5 CONCLUSIONS AND RECOMMENDATIONS

Heritage resources are unique and non-renewable and as such any impact on such resources must be seen as significant.

During the field work no heritage site were identified that is on or inside the boundary of the proposed pylon footprints.

The following general mitigation measures are recommended:

- If during construction any possible finds are made, the operations must be stopped and the qualified archaeologist be contacted for an assessment of the find.

6 REFERENCES

FOURIE, WOUTER. 2008. *Archaeological Impact Assessments within South African Legislation*. South African Archaeological Bulletin 63 (187): 77–85, 2008

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APPENDIX A

LEGISLATIVE REQUIREMENTS – TERMINOLOGY AND ASSESSMENT CRITERIA

3.1 General principles

In areas where there has not yet been a systematic survey to identify conservation worthy places, a permit is required to alter or demolish any structure older than 60 years. This will apply until a survey has been done and identified heritage resources are formally protected.

Archaeological and palaeontological sites, materials, and meteorites are the source of our understanding of the evolution of the earth, life on earth and the history of people. In the new legislation, permits are required to damage, destroy, alter, or disturb them. People who already possess material are required to register it. The management of heritage resources are integrated with environmental resources and this means that before development takes place heritage resources are assessed and, if necessary, rescued.

In addition to the formal protection of culturally significant graves, all graves, which are older than 60 years and are not in a cemetery (such as ancestral graves in rural areas), are protected. The legislation protects the interests of communities that have interest in the graves: they may be consulted before any disturbance takes place. The graves of victims of conflict and those associated with the liberation struggle will be identified, cared for, protected and memorials erected in their honour.

Anyone who intends to undertake a development must notify the heritage resource authority and if there is reason to believe that heritage resources will be affected, an impact assessment report must be compiled at the construction company's cost. Thus, the construction company will be able to proceed without uncertainty about whether work will have to be stopped if an archaeological or heritage resource is discovered.

According to the National Heritage Act (Act 25 of 1999 section 32) it is stated that:

An object or collection of objects, or a type of object or a list of objects, whether specific or generic, that is part of the national estate and the export of which SAHRA deems it necessary to control, may be declared a heritage object, including –

- objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects, meteorites and rare geological specimens;
- visual art objects;
- military objects;
- numismatic objects;
- objects of cultural and historical significance;
- objects to which oral traditions are attached and which are associated with living heritage;
- objects of scientific or technological interest;
- books, records, documents, photographic positives and negatives, graphic material, film or video or sound recordings, excluding those that are public records as defined in section 1 (xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996), or in a provincial law pertaining to records or archives; and
- any other prescribed category.

Under the National Heritage Resources Act (Act No. 25 of 1999), provisions are made that deal with, and offer protection, to all historic and pre-historic cultural remains, including graves and human remains.

3.2 Graves and cemeteries

Graves younger than 60 years fall under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925) as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the Office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning, or in some cases the MEC for Housing and Welfare. Authorisation for exhumation and reinterment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. In order to handle and transport human remains the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act) as well as the Human Tissues Act (Act 65 of 1983) and are the jurisdiction of the South African Heritage Resource Agency (SAHRA). The procedure for Consultation Regarding Burial Grounds and Graves (Section 36(5) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in the category located inside a formal cemetery administrated by a local authority will also require the same authorisation as set out for graves younger than 60 years over and above SAHRA authorisation.

If the grave is not situated inside a formal cemetery but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws set by the cemetery authority must be adhered to.