

**Heritage impact assessment for the
ESKOM THYSPUNT TRANSMISSION LINES INTEGRATION PROJECT
400KV ELECTRICITY TRANSMISSION LINES, GRASSRIDGE TO
THYSSPUNT, PORT ELIZABETH REGION,
EASTERN CAPE PROVINCE**



HERITAGE IMPACT ASSESSMENT FOR THE ESKOM THYSPUNT TRANSMISSION LINES INTEGRATION PROJECT 400KV ELECTRICITY TRANSMISSION LINES, GRASSRIDGE TO THYSSPUNT, PORT ELIZABETH REGION, EASTERN CAPE PROVINCE

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Prepared for:

SIVEST ENVIRONMENTAL DIVISION
Representative: Mr P da Cruz

Tel: (011) 798 0600
E-mail: pauld@sivest.co.za
Postal Address: P O Box 2921, Rivonia, 2128

Prepared by:

J van Schalkwyk (D Litt et Phil), Heritage Consultant
ASAPA Registration No.: 168
Principal Investigator: Iron Age, Colonial Period, Industrial Heritage

Postal Address: 62 Coetzer Avenue, Monument Park, 0181
Mobile: 076 790 6777
Fax: 012 347 7270
E-mail: jvschalkwyk@mweb.co.za

Declaration:

I, J.A. van Schalkwyk, declare that I do not have any financial or personal interest in the proposed development, nor its developers or any of their subsidiaries, apart from the provision of heritage assessment and management services.



J A van Schalkwyk (D Litt et Phil)
Heritage Consultant
December 2010

EXECUTIVE SUMMARY

HERITAGE IMPACT ASSESSMENT FOR THE ESKOM THYSPUNT TRANSMISSION LINES INTEGRATION PROJECT -400KV ELECTRICITY TRANSMISSION LINES, GRASSRIDGE TO THYSPUNT, PORT ELIZABETH REGION, EASTERN CAPE PROVINCE

Eskom propose to develop a nuclear powered electricity generation facility at Thyspunt, southwest of Port Elizabeth. Some of this electricity will be fed into the national grid by means of transmission lines to the Grassridge substation, located to the northeast of Port Elizabeth. For this purpose Eskom has identified two corridors for the development of 400kV transmission lines. Each of the two corridors, referred to as the Northern Corridor and Southern Corridor, has a number of shorter alternatives to be considered.

Therefore, in accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by **SiVEST Environmental Division** on behalf of the applicant, Eskom Holdings Limited, to conduct a Heritage Impact Assessment (HIA) as part of an Environmental Impact Assessment (EIA) for the assessment of two proposed corridors and their alternatives for the construction of the transmission line.

Power lines on the scale required for a project such as this put particular constraints on heritage resources. It is anticipated that overall the impact of the development would largely be indirect, as it might pass over or in close proximity of a heritage site or feature. The impact therefore would largely be visual. In other cases the impact will be direct as it would focus on a particular node, i.e. tower positions or access/ inspection roads. This would give rise to the physical disturbance of the material and its context.

The cultural landscape qualities of the region essentially consist of two components. The first is a rural area in which the human occupation is made up of a pre-colonial element (Stone Age) as well as a much later colonial (Settler farmers) component. The second component is an urban landscape dating to the colonial period.

The following heritage sites were identified in the study area:

- Pre-colonial archaeological sites dating to all phases of the Stone Age have been identified to occur in the study area. At present it seems as if these sites cluster into three distinct areas. However, this might only be a viewpoint based on a perception created by the available information. In some cases the impact of the development would only be indirect, e.g. the power line crossing over a site. In other areas of the proposed development, even though the impact will be focused on a particular node, i.e. tower positions or access/ inspection roads, it will give rise to the physical disturbance of the material and its context. This would result in irreplaceable loss of resources.
- Colonial period or historic period heritage manifest in a wide variety. As the power lines are to cross a rural landscape for the most part, the impact would only be indirect, e.g. the power line crossing over a site. In other areas of the proposed development the impact will be focused on a particular node, i.e. tower positions or access/ inspection roads and will therefore give rise to the physical damage of the features or structures and its context.

Heritage sites are not only fixed features in the environment, occurring within specific spatial confines, but they are also finite in number. Avoiding of impacts on sites is therefore the preferred form of mitigation. In areas where a high density of sites occurs, such as at the Thyspunt end of the corridors, if at all possible, exclusion zones where no development is to

take place, should be set aside. If that is not possible, mitigation can only be achieved through archaeological investigation.

For the project to continue, we propose the following:

- The management measures, as set out in Section 7 of this report should be implemented prior to construction taking place.
- Mitigation should be based on avoiding of sites rather than anything else. In order to achieve this, a full “walk down” of the corridors must be done prior to construction taking place, to document all sites, features and objects, in order to propose adjustments to the routes and thereby to avoid as many impacts as possible.
- No impact on heritage sites, features or objects can be allowed without a valid permit from SAHRA.



J A van Schalkwyk
Heritage Consultant
December 2010

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GLOSSARY OF TERMS AND ABBREVIATIONS

TERMS

Study area: Refers to the entire study area as indicated by the client in the accompanying Fig. 1 & 2.

Stone Age: The first and longest part of human history is the Stone Age, which began with the appearance of early humans between 3-2 million years ago. Stone Age people were hunters, gatherers and scavengers who did not live in permanently settled communities. Their stone tools preserve well and are found in most places in South Africa and elsewhere.

Early Stone Age	2 000 000 - 150 000 Before Present
Middle Stone Age	150 000 - 30 000 BP
Late Stone Age	30 000 - until c. AD 200

Iron Age: Period covering the last 1800 years, when new people brought a new way of life to southern Africa. They established settled villages, cultivated domestic crops such as sorghum, millet and beans, and they herded cattle as well as sheep and goats. These people, according to archaeological evidence, spoke early variations of the Bantu Language. Because they produced their own iron tools, archaeologists call this the Iron Age.

Early Iron Age	AD 200 - AD 900
Middle Iron Age	AD 900 - AD 1300
Late Iron Age	AD 1300 - AD 1830

Historical Period: Since the arrival of the white settlers - c. AD 1840 - in this part of the country

ABBREVIATIONS

ADRC	Archaeological Data Recording Centre
ASAPA	Association of Southern African Professional Archaeologists
BP	Before Present
CS-G	Chief Surveyor-General
EIA	Early Iron Age
ESA	Early Stone Age
LIA	Late Iron Age
LSA	Later Stone Age
HIA	Heritage Impact Assessment
MSA	Middle Stone Age
NASA	National Archives of South Africa
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
SAHRA	South African Heritage Resources Agency

HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED ESKOM 400KV ELECTRICITY TRANSMISSION LINES, GRASSRIDGE TO THYSPUNT, PORT ELIZABETH REGION, EASTERN CAPE PROVINCE

1. INTRODUCTION

Eskom propose to develop a nuclear powered electricity generation facility at Thyspunt, southwest of Port Elizabeth. Some of this electricity will be fed into the national grid by means of transmission lines to the Grassridge substation, located to the northeast of Port Elizabeth. For this purpose Eskom has identified two corridors for the development of 400kV transmission lines. Each of the two corridors, referred to as the Northern Corridor and Southern Corridor, has a number of shorter alternatives to be considered.

South Africa's heritage resources, also described as the "national estate", comprise a wide range of sites, features, objects and beliefs. According to Section 27(18) of the National Heritage Resources Act (NHRA), No. 25 of 1999, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site.

Power lines on the scale required for a project such as this put particular constraints on heritage resources. It is anticipated that overall the impact of the development would largely be indirect, as it might pass over or in close proximity of a heritage site or feature. The impact therefore would largely be visual. In other cases the impact will be direct as it would focus on a particular node, i.e. tower positions or access/ inspection roads. This would give rise to the physical disturbance of the material and its context.

Therefore, in accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by **SiVEST Environmental Division** on behalf of the applicant, Eskom Holdings Limited, to conduct a Heritage Impact Assessment (HIA), as part of an Environmental Impact Assessment (EIA).

2. TERMS OF REFERENCE

The aim of this HIA, broadly speaking, is to determine if any sites, features or objects of cultural heritage significance occur within the boundaries of the area where it is planned to develop the transmission lines.

The scope of work for this study consisted of:

- Conducting of a desk-top investigation of the area, in which all available literature, reports, databases and maps were studied;
- A visit to the proposed development area.

The objectives were to

- Identify possible archaeological, cultural and historic sites within the proposed development area;
- Evaluate the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources;

- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.

Type of study	Aim	SAHRA involved	SAHRA response
Screening	<p>The aim of the screening investigation is to provide an overview of possible heritage-related issues regarding the proposed development by an appropriate heritage specialist. It is based on the review and use of existing heritage data pertaining to the site.</p> <p>The result of this investigation is a brief statement indicating potential heritage impacts/issues and can assist the developer in preliminary planning.</p> <p>This report does grant the developer permission to proceed with the proposed development.</p>	Not necessary	
Scoping (basic assessment)	<p>The aim of the scoping investigation is to provide an informed heritage-related opinion about the proposed development by an appropriate heritage specialist. The objectives are to assess heritage sites and their significance (involving site inspections, existing heritage data); to review the general compatibility of the development proposals with heritage policy and possible heritage features on the site.</p> <p>The result of this investigation is a heritage scoping report indicating the presence/absence of heritage resources and what would be required to manage them in the context of the proposed development.</p> <p>This report does not grant the developer permission to proceed with the proposed development.</p>	Not compulsory	
Heritage Impact Assessment	<p>The aim of a full HIA investigation is to provide an informed heritage-related opinion about the proposed development by an appropriate heritage specialist. The objectives are to identify heritage resources (involving site inspections, existing heritage data and additional heritage specialists if necessary); assess their significances; assess alternatives in order to promote heritage conservation issues; and to assess the acceptability of the proposed development from a heritage perspective.</p> <p>The result of this investigation is a heritage impact assessment report indicating the presence/ absence of heritage resources and how to manage them in the context of the proposed development.</p> <p>Depending on SAHRA's acceptance of this report, the developer will receive permission to proceed with the proposed development, on condition of successful implementation of proposed mitigation measures.</p>	Provincial Heritage Resources Authority	Comments on built environment and decision to approve or not
		SAHRA Archaeology, Palaeontology and Meteorites Unit	Comments and decision to approve or not

Table 1: Applicable category of heritage impact assessment study and report.

3. HERITAGE RESOURCES

3.1 The National Estate

The NHRA (No. 25 of 1999) defines the heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations that must be considered part of the national estate to include:

- places, buildings, structures and equipment of cultural significance;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features of cultural significance;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds, including-
 - ancestral graves;
 - royal graves and graves of traditional leaders;
 - graves of victims of conflict;
 - graves of individuals designated by the Minister by notice in the Gazette;
 - historical graves and cemeteries; and
 - other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- sites of significance relating to the history of slavery in South Africa;
- movable objects, including-
 - objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
 - objects to which oral traditions are attached or which are associated with living heritage;
 - ethnographic art and objects;
 - military objects;
 - objects of decorative or fine art;
 - objects of scientific or technological interest; and
 - books, records, documents, photographic positives and negatives, graphic, film or video material 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).

3.2 Cultural significance

In the NHRA, Section 2 (vi), it is stated that „cultural significance“ means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This is determined in relation to a site or feature’s uniqueness, condition of preservation and research potential.

According to Section 3(3) of the NHRA, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of

- its importance in the community, or pattern of South Africa's history;
- its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;

- its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
- sites of significance relating to the history of slavery in South Africa.

A matrix was developed whereby the above criteria were applied for the determination of the significance of each identified site (see Appendix 1). This allowed some form of control over the application of similar values for similar sites.

4. STUDY APPROACH AND METHODOLOGY

4.1 Extent of the Study

This survey and impact assessment covers the area as presented in Section 5 and as illustrated in Figures 1 & 2.

4.2 Methodology

4.2.1 Preliminary investigation

4.2.1.1 Survey of the literature

A survey of the relevant literature was conducted with the aim of reviewing the previous research done and determining the potential of the area. Some published books and papers deal with Stone Age occupation of the region (e.g. Deacon 1970; Binneman 2001, 2006/2007), whereas others deal with the colonial history (Bryer & Hunt 1987; Butler 1974; Ferreira 1983; Playne 1910-1911; Richardson 2001). Other sources are unpublished reports, mostly scoping studies and HIAs done in the region (Albany Museum n.d; Archaeological Contracts Office 2010e; Binneman 2003, 2009, 2010a, 2010b; eThembeni 2007; Van Schalkwyk 2010).

- All of these sources contributed some information on historic events in the larger region as well as on the location of specific heritage sites and features.

4.2.1.2 Data bases

The *Heritage Atlas Database*, the *Environmental Potential Atlas*, the *Chief Surveyor General (CS-G)* and the *National Archives of South Africa (NASA)* were consulted.

- Database surveys produced information on a number of sites located in the larger region of the proposed development.
- The original Title Deeds of some of the farms were located and produced some information of use such as the dating of farmsteads, etc.
- A few references were found in NASA, all dealing with aspects of development of roads, bridges, etc.

4.2.1.3 Other sources

Aerial photographs and topocadastral and other maps were also studied - see the list of references below.

- Information of a very general nature were obtained from these sources

4.2.2 Field survey

The area that had to be investigated was identified by **SiVEST Environmental Division** by means of maps and during a site visit.

As this is a linear development the survey was done by travelling the corridors as far as possible. This turned out not to be difficult as in most cases the corridors are easily accessible by means of roads and tracks.

In some cases land owners were interviewed as to the significance or locality of sites on their property.



Fig. 1. Research strategy and findings.

Figure 1 illustrates one of the methods followed. The current 1:50 000 topocadastral map (top left) shows the northern route over the farm Zuurbron. On the right (top) is copy of the title deed of the farm (Zuurbron) dating to 1918, clearly indicating some built features already existing on the site. Below are photographs showing some of the features that date to the time of the Title Deed, in effect dating them to more than 60 years. Unfortunately, this type of information is not available for all properties.

4.3 Limitations

- In some sections dense vegetation has limited archaeological visibility. In those cases assumptions had to be made on the occurrence of heritage sites, especially Stone Age sites, for example in the Amanzi Springs region and the Thyspunt area.
- Financial and time constraints did not allow visits with all land owners. Only in those cases where a corridor was identified to cross over or in close vicinity of a farmstead were the owners interviewed.
- In many cases the proposed power lines will have a visual impact, i.e. indirect impact, on heritage sites. This is not addressed in this report as a separate report will be dealing with visual impacts.

5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

5.1 Site location and description

5.1.1. Southern Corridor

There are three alternative sections within the Southern Corridor namely:

- Southern Corridor Thyspunt (HV Yard) to Port Elizabeth – Northern Alternative
 - Southern Corridor Thyspunt (HV Yard) to Port Elizabeth – Southern Alternative

 - Southern Corridor Port Elizabeth to Grassridge – Fitches Corner Alternative 1
 - Southern Corridor Port Elizabeth to Grassridge – Fitches Corner Alternative 2

 - Southern Corridor Port Elizabeth to Grassridge – Motherwell Alternative 1
 - Southern Corridor Port Elizabeth to Grassridge – Motherwell Alternative 2
- Southern Corridor Thyspunt (HV Yard) to Port Elizabeth – Northern Alternative

This alternative runs within the same corridor as the Northern Corridor. The corridor exits the High Voltage (HV) yard associated with the proposed Thyspunt Power Station to the north of the transverse dunes and moves in a northerly direction towards Humansdorp. The corridor crosses the unsurfaced road between Oyster Bay and Humansdorp in the vicinity of the Farm Kleinrivier. The corridor crosses the steeply incised Krom River Valley at the Farm Elandsjagt (downstream of the Impofu Dam) and then crosses the Geelhoutboom River. The corridor crosses the R102 provincial road and then the Seekoei River in the vicinity of the farm Geelhoutboom and a small portion of the farm Platjesdrift to the west of Kruisfontein. The Corridor turns east after crossing the Seekoei River. After the turn towards the east, the Corridor then crosses the N2 northwest of Humansdorp in the Kruisfontein area. The Corridor then traverses hilly ground crossing the R330 provincial road and the Rondebos River on the farm Zwarteboosch. The alternative crosses farmland and grazing land through the farms Melkhoutbosch, Misgund and the Backbone before re-joining the Southern Alternative in the area of the Mondplaas Siding to the west of the Gamtoos Valley.

- Southern Corridor Thyspunt (HV Yard) to Port Elizabeth Southern Alternative

The Southern Corridor Southern Alternative exits the High Voltage (HV) yard associated with the proposed Thyspunt Power Station to the north of the transverse dunes, heading in a north-easterly direction. The corridor crosses the farm Klein Rivier and the un-surfaced road

linking St Francis Bay with Oyster Bay and heads towards the Krom River valley. The corridor crosses the Krom River to the north-west of the town of St Francis Bay, downstream of where the Geelhoutboom River tributary joins the Krom. After crossing the Krom River, the corridor turns towards the north and crosses grazing land and the R330 provincial road as well as the Seekoei River and the Geelhout Dam. The corridor then traverses the area to the east of Humansdorp, turning north-east to cross the R102 and N2 highway. To the north of the N2 the corridor crosses the farm Melkhoutbosch and the upper reaches of the Swart River. The corridor traverses open grazing land on the farms Rooi Hoek, Kabbeljauwsrivier and Misgund. The corridor traverses the Kabeljous River valley, traversing the farms Papiesfontein and Vlakke (where the Northern Alternative intersects this alternative). In this area, the Corridor runs parallel to N2 and R102 roads heading down towards the Gamtoos River valley. The Gamtoos River valley as traversed by the Southern Corridor in this area is characterised by intensive cultivation in the Mondplaas area.

- Southern Corridor Thyspunt (HV Yard) to Port Elizabeth – section east of Mondplaas and the Gamtoos Valley

The N2 and R102 highways run within the Corridor for most of its length in the section east of the Gamtoos Valley up to the proposed Port Elizabeth Substation Alternative in the Fitches Corner area. The corridor crosses the Gamtoos River to the south of the Gamtoos Ferry Hotel. To the east of the valley the area is dominated by farming activities and the corridor crosses the farms Nocton, Brakfontein, Florence and Tecoma in a hilly, incised area of thicket and farmland. The corridor then traverses the village of Thornhill before traversing the farm Sunnyvale in the vicinity of the new Crossways development. The Corridor crosses the Van Stadens River to the north of the Van Stadens Bridge (N2) and Van Stadens Pass (R102). To the east of the Van Stadens Gorge, the corridor continues in an easterly direction, running to the south of the Van Stadensberg (Lady Slipper) mountains in a largely agricultural area of smallholdings traversed by the N2 and R102 highways up to the area of the proposed Fitches Corner PE Substation Alternative 1. Two short alternatives to the Southern Corridor exist in the Fitches Corner area, as described below.

- Southern Corridor Port Elizabeth to Grassridge – Fitches Corner Alternative 1

This alternative traverses the farms Geduldrivier and Betshanger, initially running parallel to, and then crossing the N2 highway and R102 (Cape Road) to the west of the Blue Horizon Bay off ramp, heading northwards. The alternative runs to the south-east and roughly parallel to the R334 road to the north of its intersection with the R102 Cape Road. In this area it runs through an area of smallholdings to the west of the St. Albans Prison Complex. The alternative further crosses several more smallholdings on the farm Brakwater Flats before joining with the Fitches Corner Alternative 2 to the south of Rocklands.

- Southern Corridor Port Elizabeth to Grassridge – Fitches Corner Alternative 2

The alternative starts at the Geduldrivier Siding to the south of Fitches Corner and the intersection of the R102 Cape Road and the R334. The alternative turns north-eastwards to cross both the R102 and the R334 in the Greenbriars area. The alternative runs roughly parallel to the R334 through an area of smallholdings to the south of Rocklands. To the east of the link road between Rocklands and the St Albans Prison Complex, the alternative intersects Fitches Corner Alternative 1.

- Southern Corridor Port Elizabeth to Grassridge between Rocklands and Despatch

The Southern Corridor continues in a north-easterly direction east of Rocklands traversing the farms Brakkefontein and Brak River through hilly, incised terrain in the direction of KwaNobuhle. The corridor skirts the northern edge of the proposed Hopewell Conservancy, turning south-eastwards and then north-eastwards as it skirts the southern boundaries of the township of KwaNobuhle, up to the area of the proposed KwaNobuhle Substation Alternative 2 – a vacant area to the east of KwaNobuhle. The corridor heads east across this vacant area of disturbed thicket vegetation, running to the south of Khayamandi and crossing the tarred

road linking Booyens Park and Despatch. It heads across an open hilly area of thicket vegetation east of Reservoir Hills, crossing the R75 and R367 (M19) roads to Uitenhage, straddling the northern parts of KwaDwesi. The Corridor then turns northwards to the east of Asalia Park, crossing the railway and the Swartkops River. North of the river the Motherwell Alternatives 1 and 2 begin.

- Southern Corridor Port Elizabeth to Grassridge – Motherwell Alternative 1

Alternative 1 heads northwards, traversing farmland to the north of the Swartkops River at Totteridge Park and then heading up the thicket vegetation on the northern slopes of the Swartkops River Valley. The alternative turns north-eastward as it crosses the R334 (M20), traversing the farms Coegaskop, Welbedachsfontein and Klein Gras Rug, to the area where it intersects the Motherwell Alternative 2.

- Southern Corridor Port Elizabeth to Grassridge – Motherwell Alternative 2

Motherwell Alternative 2 splits from the Motherwell Alternative 2 to the east of Totteridge Park, heading up to the north-east, out of the Swartkops River Valley. Alternative 2 continues in a north-easterly direction straddling the Swartkops Soutpan and salt works, running to the north-west of Motherwell and crossing the R334. The Alternative intersects Alternative 1 to the north of Motherwell where the Corridor crosses the R335 and the Coega River on the farm Welbedachtsfontein.

- Southern Corridor Port Elizabeth to Grassridge – Motherwell to Grassridge

From the area in which the two Motherwell Alternatives meet, the Southern Corridor crosses the Coega River and R335, traversing natural rangeland and a number of brickworks. The Southern Corridor re-joins the Northern Corridor, continuing eastwards towards the Grassridge Substation.

5.1.2 Port Elizabeth Substation

There are two proposed alternative locations for the proposed Port Elizabeth Substation:

- Fitches Corner Substation Alternative 1

The location of this substation alternative is proposed in the Fitches Corner area, southeast of Lady's Slipper Nature Reserve. It is located on farms Gedults River and Willowdene. The area is bisected by the R102 Cape Road, and lies to the north of the N2 highway and to the south of the R334.

- KwaNobuhle Substation Alternative 2

This substation is located in vacant land between KwaNobuhle to the east, Manor Heights and Khayamandi to the west and Uitenhage and the Swartkos River to the north.

5.1.3. Northern Corridor

The Northern Corridor exits the High Voltage (HV) yard associated with the proposed Thyspunt Power Station to the north of the transverse dunes and moves in a northerly direction towards Humansdorp. The corridor crosses the unsurfaced road between Oyster Bay and Humansdorp in the vicinity of the Farm Kleinrivier. The corridor crosses the steeply incised Krom River Valley at the Farm Elandsjagt (downstream of the Impofu Dam) and then crosses the Geelhoutboom River at the Farm Platjesdrift. The corridor crosses R102 and then the Seekoei River and in the vicinity of the farm Geelhoutboom and a small portion of the farm Platjesdrift to the west of Humansdorp. The corridor continues in a northerly direction further traversing the farm Geelhoutboom and across N2 and some hilly terrain to the north of the

highway on the farm Pampoensland Rivier. At the farm Pampoensland Rivier, the Corridor turns in a north-easterly direction crossing R332 and some hilly ground at the farm Honeyville. From this section (around Honeyville farm) up to the area around Rocklands, there are three alternatives within the Northern Corridor:

- Alternative 1 – This alternative splits from Alternative 3 in the area of farms Weltevreden and Zuurbron. Alternative 1 traverses the R330 Provincial Road on the farm Weltevreden. It continues through the farm Zuurbron where it crosses the upper reaches of the Kabeljous River. The route alternative then traverses the Gamtoos River Valley in the vicinity of the farms Rooidraai, Bosch Bok Hoek and Spitsbak Estate. It continues in an easterly direction through hilly incised terrain on farms Buffels Hoek and Loerie River where it crosses the R331 Provincial Road. The alternative then traverses the area around Loerie Dam and the Loerie Dam Nature Reserve to the north of the town of Loerie, crossing the farms Loerie River, Geelhoutboom and Jagersfontein. Most of this portion of the route runs to the south of the boundary of Otterford State Forest and the Longmore State Forest, traversing the Longmore Forest offices, housing and saw mill (the Longmore Forest Station). To the east the alternative crosses the farms Platberg, Klaarefontein and before entering the Longmore State Forest to the north of the Van Stadens River Mountains. The corridor traverses forestry land (plantations) through this section, crossing the Van Stadens River. The alternative exits the Longmore area to the north of Van Stadensberg Natural Heritage Site Nature Reserve through the farm Boschfontein where it reconnects to Northern Corridor - Thyspunt (HV Yard) to Grassridge alternative 3 (described below).
- *(Please note – Alternative 2 is a deviation off Alternative 3)* Alternative 2 splits from Alternative 3 south-east of the town of Hankey. The route alternative continues in a north-easterly direction traversing the R331 on the farm Roedfontein and continuing through very hilly, natural terrain on the farms Limebank and Klein Rivier, running parallel with the valley of the Klein River. In the vicinity of the Otterford and Forest Reserve (to the west of the old Otterford Forest Station), the route curves towards the northwest through a very steeply incised area. It continues north-westwards through plantations until it re-joins Alternative 3.
- Alternative 3 splits from Alternative 1 in the vicinity of the R332 Provincial Road and the Diep River at the farms Honeyville, Weltevreden and Zuurbron. To the east of this point the alternative runs roughly parallel to the R330 provincial road down the Hankey Pass into the Gamtoos River Valley. The alternative crosses the Gamtoos Valley to the south of the hamlet of Weston, traversing the farms Rooidraai, Gamtoos Riviers and Wagendrift. The alternative passes to the east of Hankey, continuing in a north-easterly direction traversing the R331 Provincial Road. The alternative crosses hilly, incised terrain crossing the Klein River valley on the farms Klein Rivier and Kleinfontein. The alternative continues across very hilly, incised terrain across a portion of the Stinkhoutberg Nature Reserve, entering the Otterford Forest as the route curves to the south-east through a very steep area within Otterford State Forest, crossing the Hankey Forest reserve and the farm Sand River Heights. The alternative crosses the Sand River upstream of the Sand River Dam through forestry land. The alternative continues in a south-easterly direction, following the southern side of the Elands River valley across the farms Palmiet River and Peneheale, and running parallel to the Elands River Road. The alternative enters the Longmore State Forest, crossing the Bulk River Dam and running through the farm Uplands before linking up with Alternative 1 in the vicinity of the farm Boschfontein.

From the point at which alternative 1 and 3 join, the corridor runs in a north-easterly direction, crossing the farms Boschfontein, Brakkefontein, Ruigteveli and Burghley Hills through an uninhabited hilly area to the north of Rocklands. The corridor heads north-eastwards along the eastern boundary of Groendal Wilderness Area, traversing the Elands River valley through the Wincanton Estate, Kruisrivier and Mimosadale West. The Corridor then crosses the Swartkops River in the Kruisrivier area west of Uitenhage, crossing a number of small farms

in the valley. The corridor then climbs into uninhabited land to the west and north of Rosedale, turning to the east. The Corridor traverses uninhabited farm land to the north of Uitenhage, crossing a minor roads as well as the R75 Provincial Road, running between Levydale and the Springs Nature Reserve and Resort. To the east of the R75, the corridor then crosses farming land on the farms Sandfontein, Gras Rug, Longwood, Rietheuwel and Papenkuils Vley. The corridor crosses the farm Welbedachsfontein, crossing the R335 provincial road before feeding into the Grassridge Substation.

East of the Grassridge Substation the Northern Corridor (existing Servitude) Grassridge to Dedisa runs eastwards across largely natural thicket vegetation on the farm Brak River, then south-eastwards and finally southwards until it terminates at the Dedisa Substation which is located to the north of the R334 and R102.



Fig. 3. Elements of the landscape through which the corridors pass.

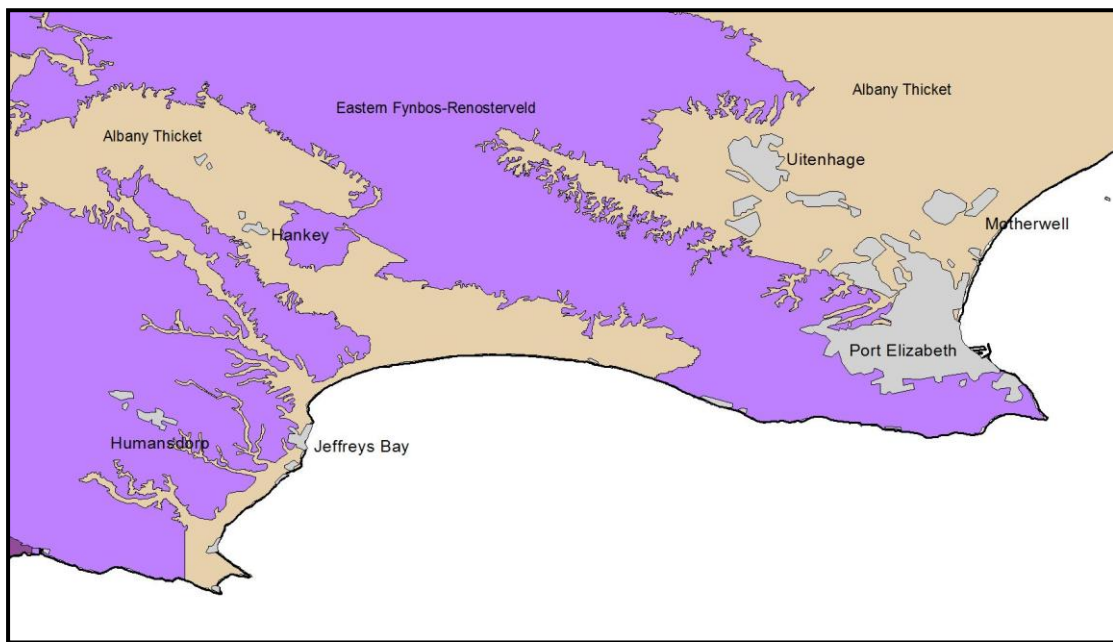


Fig. 4. The two vegetation zones that occur in the study region.

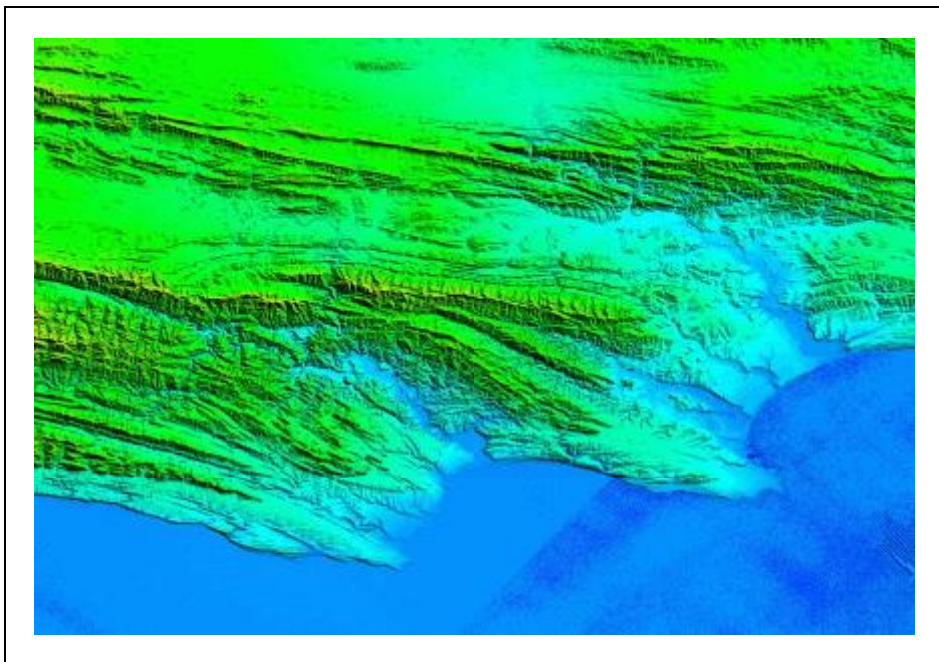


Fig. 5. Digital elevation map showing the topography of the study region.

5.2 Overview of the region

The cultural landscape qualities of the region essentially consist of two components. The first is a rural area in which the human occupation is made up of a pre-colonial element (Stone Age) as well as a much later colonial (Settler farmers) component. The second component is an urban landscape dating to the colonial period.

5.2.1 Rural landscape

The rural landscape has always been sparsely populated and it was only in a few areas where, through the application of specific economic strategies such as shellfish harvesting or farming, people succeeded to occupy a section of the region for any length of time.

- Archaeological sites

Archaeological sites in this area predominantly date to the Stone Age as early farmer communities, also referred to as Iron Age communities, did not settle this far south (Derricourt 1977).

The Stone Age archaeology of the larger region has been intensively researched and published in a number of publications and reports. The most significant contribution is that of Dr J Binneman of the Albany Museum (e.g. Binneman 2001, 2003, 2005, 2006/2007, 2009, 2010a, 2010b). In addition, a number of other publications and HIA reports also indicate the occurrence of sites/find spots in the larger region (Archaeology Contracts Office 2010; Deacon 1970; eThembeni 2007; Kaplan 2007; Van Schalkwyk 2010).

NHRA Category	Archaeological and palaeontological sites
Protection status	
General Protection - Section 35: Archaeology, palaeontology and meteorites	



Fig. 6. View over Amanzi springs and some stone tools found in the Grassridge area. The stone tools (bottom left) are not from the region and are only used to illustrate the difference between Early (left), Middle (middle) and Later Stone Age (right) technology.

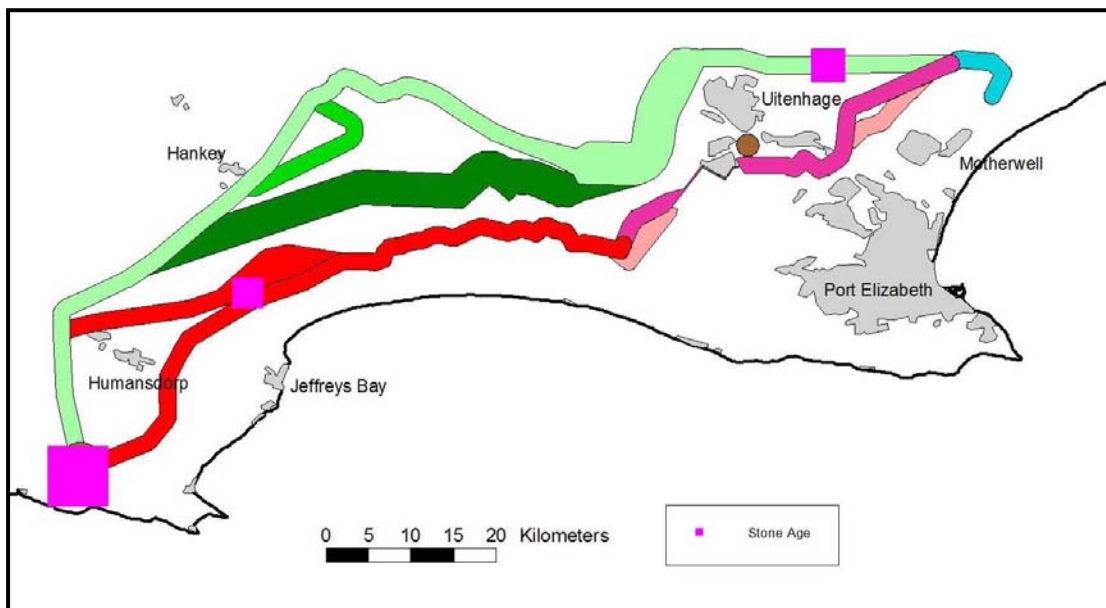


Fig. 7. Map showing the location of known concentrations of Stone Age sites.

Human occupation of the larger geographical region took place since Early Stone Age (ESA) times. Tools dating to this period are mostly, although not exclusively, found in the vicinity of watercourses. The oldest of these tools are known as choppers, crudely produced from large pebbles found in the river. Later, *Homo erectus* and early *Homo sapiens* people made tools shaped on both sides, called bifaces. Biface technology is known as the Acheulean tradition, from St Acheul in France, where bifaces were first identified in the mid-19th century. Biface technology is found over a large area of Africa, some parts of India, Arabia and the Near East, as well as parts of western Europe. This is one of the longest-lasting technologies the world has known, spanning a period of more than 1,5 million years.

During Middle Stone Age (MSA) times (c. 150 000 – 30 000 BP), people became more mobile, occupying areas formerly avoided. The MSA is a technological stage characterized by flakes and flake-blades with faceted platforms, produced from prepared cores, as distinct from the core tool-based ESA technology. Open sites were still preferred near watercourses, but the people also became adept at exploiting the coastal resources, especially the shellfish.

Occupation of the region seems to have increased during the Later Stone Age (LSA). These people had even more advanced technology than the MSA people and therefore succeeded in occupying even more diverse habitats. A number of sites are known to occur in the region, located to the west and north of the study area. Also, for the first time (with a limited number of exceptions) we get evidence of people's activities derived from material other than stone tools. Ostrich eggshell beads, ground bone arrowheads, small bored stones and wood fragments with incised markings are traditionally linked with the LSA. The LSA people have also left us with a rich legacy of rock art, which is an expression of their complex social and spiritual beliefs.

Although the larger country side probably contains hundreds of sites dating from the Early Stone Age, through the Middle and Later Stone Age, within the proposed power line corridors they tend to cluster in three distinct areas (Fig. 7).

One of the more important Early Stone Age sites in the region occurs at Amanzi Springs, in close vicinity of the northern corridor (located to the west of the Grassridge Substation, in the vicinity of the Coega River valley). The site was excavated by Deacon (1970). Apart from stone tools dating to the Early and Middle Stone Age, the site also produced well-preserved

bone, wooden artefacts and seed remains (probably food material), making this a very significant site. At present it is unsure what else remains of this site as well as similar springs in the region, but the site is viewed to have a high significance on a regional level.

In addition, stone tools dating to the Early and Middle Stone Age have been identified in the Grassridge area (Kaplan 2007; Van Schalkwyk 2010). These are found in a secondary context (open surface material), where they have been exposed in gravel terraces by rivers and streams. Normally this material is viewed to have a low significance and the localities where they are found are referred to as find spots rather than sites.

Further to the west, in the southern corridor, research by Binneman (2001; 2006/2007) has shown that a number of very important Later Stone Age sites occur in the Kabeljousrivier area (roughly to the north of, and inland of Jeffreys Bay). In fact, Binneman was able to demonstrate that these sites belong to a whole new artefact tradition, which he termed the Kabeljous industry. As such they shed important light on human occupation and cultural development in the region and therefore have very high significance on a regional level.

At the Thyspunt end of the corridors, the density and significance of sites dating to the Stone Age have ably been demonstrated by the work done by Binneman (2001, 2005, 2006/2007) and the HIA done for the site selection of the proposed power station (Archaeology Contracts Office 2010 - ACO) and we accept that that report would be read in conjunction with the current report. In summary they report that Later Stone Age sites are very common within 200m of the shoreline, and common within 400m. After 400m the frequency drops off, but in places can be expected to occur as much as 5km from the shore. These sites, according to the ACO, represent the heritage of a great many South Africans who have KhoiKhoi and/or San lineage. We concur with the findings of that report. However, as the High Voltage Yard of the power station is proposed to be located to the north of the shifting dunes, on the farm Penny Sands, in an area which is intensely cultivated, there would be less of a risk of the power lines impacting on this type of sites.

- Farmsteads

NHRA Category	Buildings, structures, places and equipment of cultural significance
Protection status	General Protection - Section 34: Structures older than 60 years



Fig. 8. Examples of farmsteads identified in the region.

Farmsteads are complex features in the landscape, being made up of different yet interconnected elements. Typically these consist of a main house, gardens, outbuildings,

sheds and barns, with some distance from that labourer housing and various cemeteries. In addition roads and tracks, stock pens and wind mills complete the setup. An impact on one element therefore impacts on the whole.

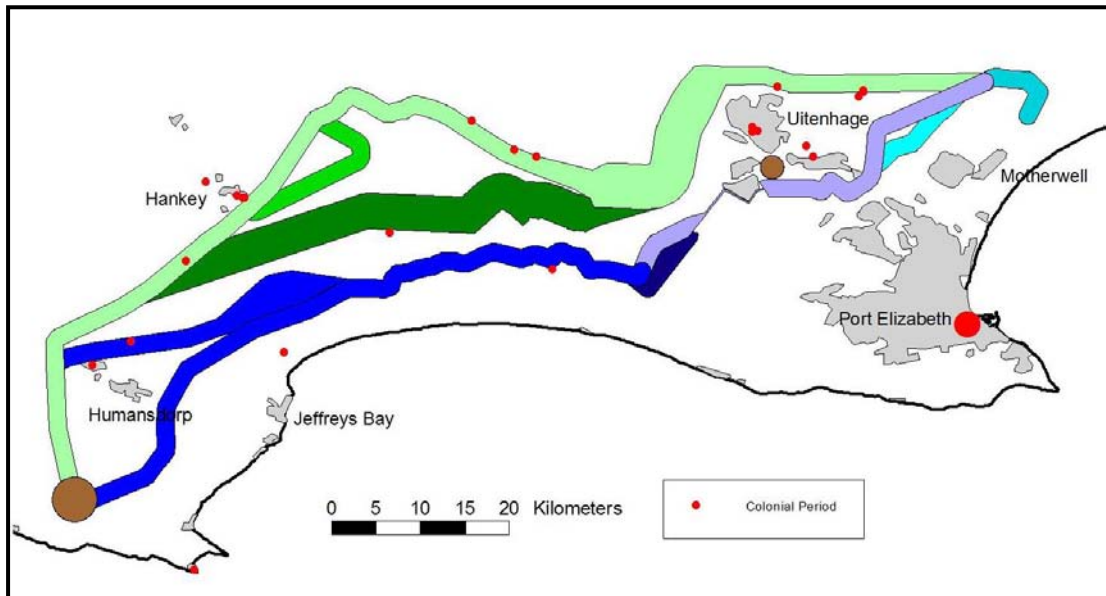


Fig. 9. Distribution of Colonial Period sites.

By the late 18th century some Dutch speaking settlers took up farms, but it was only with the arrival of the 1820 Settlers that population numbers started to take off. An investigation of the Title Deeds of most of the farms under consideration indicated that they were surveyed as early as the 1820s, implying that they would have been occupied by colonists since then.

The architecture of these farmsteads can be described as a modified English vernacular tradition that was brought by these settlers to the Eastern Cape region after the 1820s. Farm buildings were generally single storied but town houses often reached two floors. Walls were thick and built in stone and the ridged roof, thatched or tiled, was terminated at either end by simple linear parapet gables (see image above).

In some cases outbuildings would be in the same style as the main house, if they date to the same period. However, they tend to vary considerably in style and materials used as they were erected later as and when they were required.

It is accepted that the power line would not be built across a farmstead and the direct impact can therefore be considered to be low. However, it would have a big visual impact, which might be a problem for some land owners as they have or are planning to have some form of tourism activity on their property. The farmsteads are viewed to have a medium significance on a regional level.

- Cemeteries

Apart from the formal cemeteries that occur in municipal areas (towns or villages), a number of these, some quite informal, i.e. without fencing, occur in both corridors. Many also seem to have been forgotten (see image below), making it very difficult to trace the descendants in a where the graves are to be relocated.

NHRA Category	Graves, cemeteries and burial grounds
Protection status	
General Protection - Section 36: Graves or burial grounds	



Fig. 10. Examples of burial places.

Most of these cemeteries, irrespective of the fact that they are for land owner or farm labourers (with a few exceptions where they were integrated), are family orientated. They are therefore serve as important „documents“ linking people directly by name to the land.

The various cemeteries, burial places and graves are viewed to have a high significance on a local level.

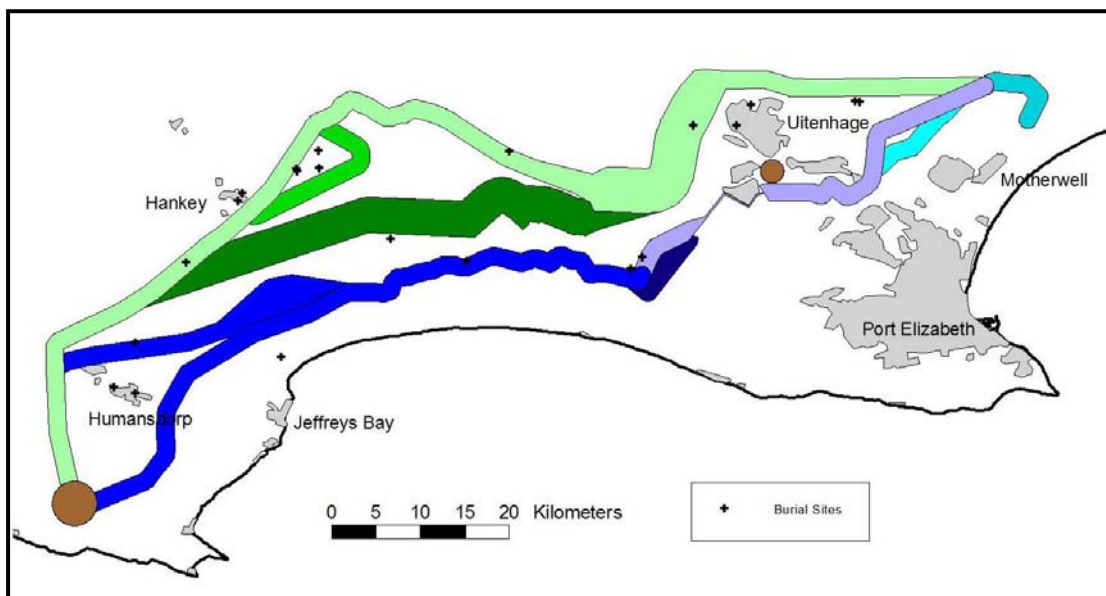


Fig. 11. Distribution of cemeteries and burial sites.

- Infrastructure and industrial heritage

In many cases this aspect of heritage is left out of surveys, largely due to the fact that it is taken for granted. However, the land and its resources could not be accessed and exploited without the development of features such as roads, bridges, railway lines, electricity lines and telephone lines.

NHRA Category	Buildings, structures, places and equipment of cultural significance
Protection status	
General Protection - Section 34: Structures older than 60 years	



Fig. 12. The narrow gauge railway line across a steel bridge at Hankey and an old brick chimney.

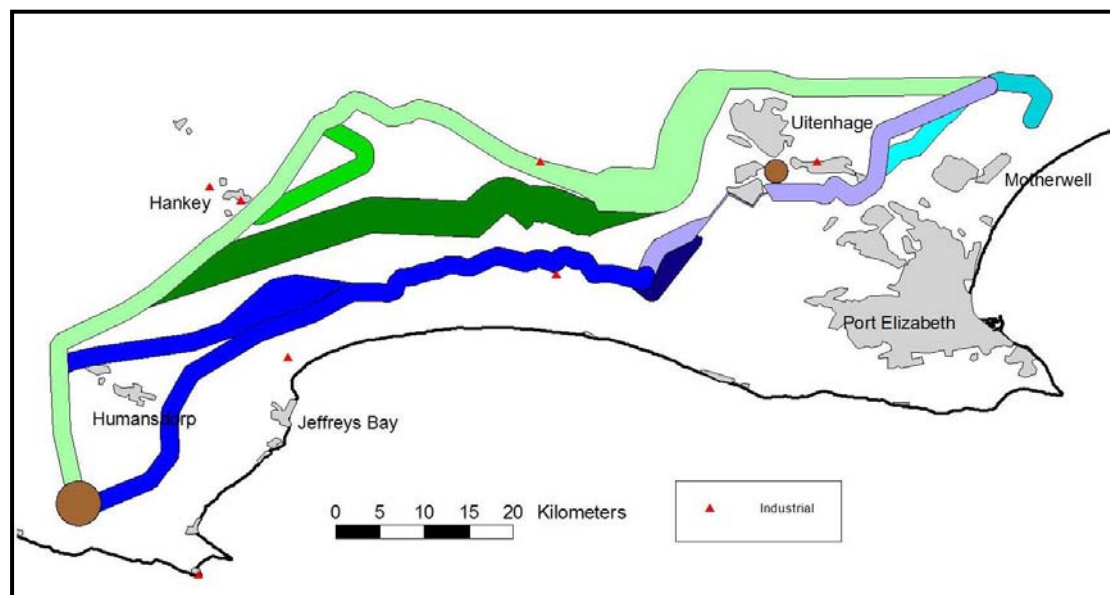


Fig. 13. Distribution of infrastructural/industrial heritage sites.

A variety of bridges, railway lines and other features that can be included in this category occur in or near the corridors. The oldest such features in the region would be the tidal fish

traps found in the coastal area, ascribed by some as dating to the Later Stone Age times, although many were constructed and used during early historic times. Other interesting features are the so-called Philips Tunnel that was developed in the late 19th century to bring water to communities in the Hankey region. The Bulk River water supply system that supplies Port Elizabeth with most of its water is a further example.

Most features that can be included in this category are located on the outer fringes of towns.

It is unlikely that the development of the power line would have a direct impact on any of these sites. However, it will have big visual impact, which would be detrimental from a tourism point of view.

5.3.2 Urban landscape

The corridors pass in close proximity of the outskirts of a number of towns. This part of the study area falls within that zone usually located on the front edge of (city) urban-sprawl where the land previously used for agricultural use (only) have become subdivided into small holdings. What used to be a large single agricultural unit or farm now consists of tens of small properties. These units do not have their economic base in traditional agriculture but are sustained by a variety of land uses and economic activities with strong urban associations. This phenomenon happened in the past forty to fifty years. Therefore most of the built fabric dates from this period. The result is that any historic farmsteads older than 60 years that may have existed have either disappeared or have been „upgraded“.

Research on colonial settlement in the region seems to be more focussed on what can be described as conventional history (Bryer & Hunt 1987; Butler 1974) and is less concerned with heritage sites and features, although some regional studies/surveys have been done (Binneman 2003; Ferreira 1983).

NHRA Category	Buildings, structures, places and equipment of cultural significance
Protection status	
	General Protection - Section 34: Structures older than 60 years

NHRA Category	Graves, cemeteries and burial grounds
Protection status	
	General Protection - Section 36: Graves or burial grounds

NHRA Category	Buildings, structures, places and equipment of cultural significance
Protection status	
	General Protection - Section 37: Public Monuments and Memorials





Fig. 14. Various heritage elements found in the urban environment.

- Hankey:

This is a small town 70 km west of Port Elizabeth. The town was established as a mission station by the London Missionary Society in 1825 and named after William Alhers Hankey, its treasurer.

According to the various databases consulted it has more than 50 houses, buildings and other structures listed as of conservation worthy status.

- Humansdorp

A large town 80 km west of Port Elizabeth. It was laid out on the farm Rheebofsfontein in 1849. It originated as a church village and was after Matthys Human, the owner of the farm.

According to the various databases consulted it has approximately 100 houses, buildings and other structures listed as of conservation worthy status.

- Port Elizabeth

This city grew around Fort Frederick, a military station established in 1799. However, it only developed and expanded after the arrival of the 1820 Settlers. It was named Port Elizabeth in 1820 by Sir Rufane Donkin, Acting Governor of the Cape, after his wife Elizabeth Frances.

According to the various databases consulted it has approximately 250 houses, buildings and other structures listed as of conservation worthy status.

- Uitenhage:

This town was founded on the loan farm of Elizabeth Scheepers and was named in honour of J A Uitenhage de Mist, Commissioner-General. The town attained municipal status in 1841.

According to various databases consulted it has approximately 50 houses, buildings and other structures listed as of conservation worthy status.

5.3.3 Proposed development

The area indicated in Fig. 15 is earmarked to be used as a cultural centre where it is planned to relocate Khoisan remains from the St Francis Bay area. However, as this is still in the planning stadium, it is difficult to determine any impact the development of the power line would have on the site.

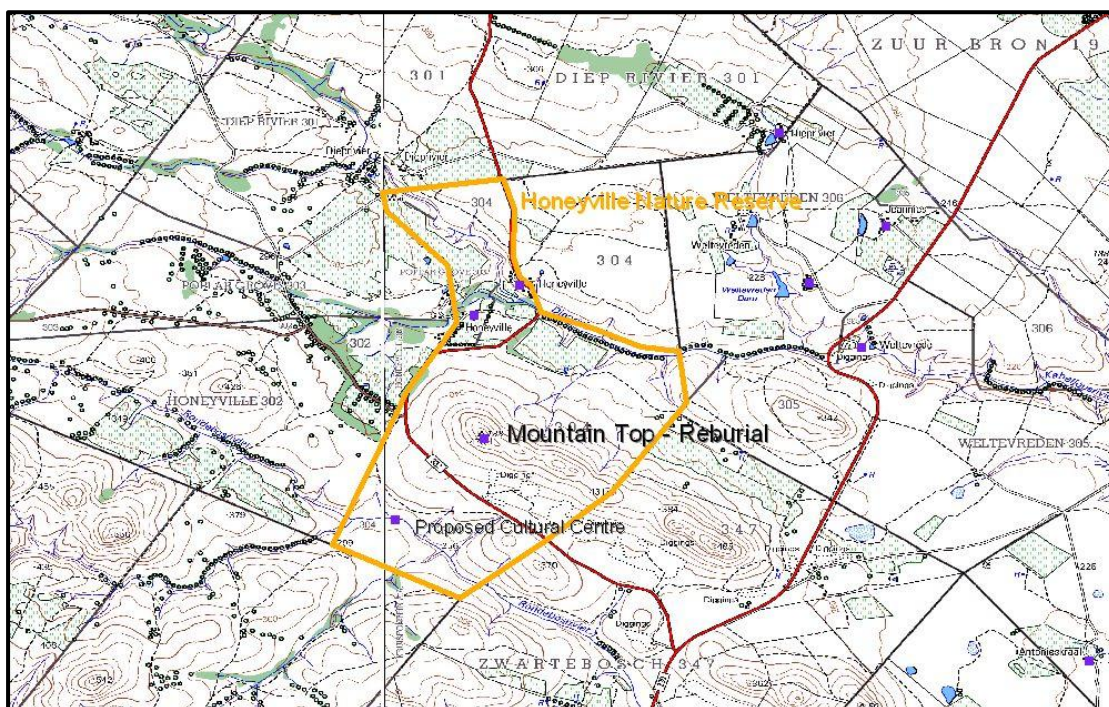


Fig. 15. Proposed cultural centre.

6. SITE SIGNIFICANCE AND ASSESSMENT

6.1 Heritage assessment criteria and grading

According to the NHRA, No. 25 of 1999, Section 2(vi), the *significance* of heritage sites and artefacts is determined by its aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential.

The NHRA stipulates the assessment criteria and grading of archaeological sites. The following categories are distinguished in Section 7 of the Act:

- **Grade I:** Heritage resources with qualities so exceptional that they are of special national significance;
- **Grade II:** Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region; and
- **Grade III:** Other heritage resources worthy of conservation, on a local authority level.

The occurrence of sites with a Grade I significance will demand that the development activities be drastically altered in order to retain these sites in their original state. For Grade II and Grade III sites, the application of mitigation measures would allow the development activities to continue.

A matrix was developed whereby the above criteria, as set out in Sections 3(3) and 7 of the NHRA, No. 25 of 1999, were applied for each identified site (see Appendix 1). This allowed some form of control over the application of similar values for similar sites.

6.2 Statement of significance

In terms of Section 7 of the NHRA, the sites currently known or which are expected to occur in the study area are evaluated to have the following significance:

- Stratified Stone Age sites and shell middens are viewed to have a high significance on a regional level and have Grade II significance;
- Farmsteads are viewed to have medium significance on a regional level and have Grade III significance;
- Graves and cemeteries are viewed to have high significance on a local level and have Grade III significance;
- Industrial heritage sites are viewed to have medium significance on a regional level and have Grade III significance.

6.3 Impact assessment

Impact analysis of cultural heritage resources under threat of the proposed development, are based on the present understanding of the proposed development.

Environmental Parameter	Pre-colonial: Stone Age sites	
Issue/Impact/Environmental Effect/Nature	Many sites are still unknown. Their potential and significance therefore unknown. The impact will be the physical disturbance of the material and its context. Impact will be focused on a particular node, i.e. tower positions or access/ inspection roads	
Extent	Local	
Probability	Definite	
Reversibility	Irreversible	
Irreplaceable loss of resources	The impact will result in significant loss of resources	
Duration	Permanent	
Cumulative effect	High cumulative impact	
Intensity/magnitude	Very high	
Significance Rating	Sites have a high significance on a region level – viewed as NHRA Grade II sites. Distinguish from find spots, which have low significance	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	2
Probability	3	3
Reversibility	4	4
Irreplaceable loss	3	3
Duration	4	4
Cumulative effect	4	4
Intensity/magnitude	4	2
Significance rating	80 (negative very high)	44 (negative medium)

Mitigation measures	All of these sites should be avoided as far as possible. This is especially the case with type-sites such as identified in the Kabeljousrivier area by Binneman. Sites that cannot be avoided should be excavated in full by an archaeologist qualified in Stone Age archaeology.
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Environmental Parameter	Colonial Period - farmsteads	
Issue/Impact/Environmental Effect/Nature	The various features are subject to damage. Easier to identify and therefore easier to avoid. Variety of interconnected elements makes up the whole. Impact on part therefore implies an impact on the whole	
Extent	Site	
Probability	Possible	
Reversibility	Partly reversible	
Irreplaceable loss of resources	Marginal loss of resource	
Duration	Long term	
Cumulative effect	Low cumulative impact	
Intensity/magnitude	Medium	
Significance Rating	Sites have a medium significance on a region level – viewed as NHRA Grade III sites.	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	1	1
Probability	2	2
Reversibility	2	2
Irreplaceable loss	2	1
Duration	3	3
Cumulative effect	2	1
Intensity/magnitude	2	2
Significance rating	24 (low negative)	20 (low negative)
Mitigation measures	Mitigation should take the form of isolating known sites and declare them as no-go zones with sufficient large buffer zones around them for protection. In exceptional cases mitigation can be implemented after required procedures have been followed.	

Environmental Parameter	Colonial Period – industrial heritage	
Issue/Impact/Environmental Effect/Nature	Different features are subject to damage. Most are unique – no alternatives or second examples. Easy to identify and therefore easy to avoid	
Extent	Site	
Probability	Possible	
Reversibility	Partly reversible	
Irreplaceable loss of resources	Marginal loss of resources	
Duration	Permanent	

Cumulative effect	Long term	
Intensity/magnitude	Medium	
Significance Rating	Sites have a medium significance on a region level – viewed as NHRA Grade III sites.	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	1	1
Probability	2	2
Reversibility	2	2
Irreplaceable loss	2	1
Duration	3	3
Cumulative effect	2	1
Intensity/magnitude	2	2
Significance rating	24 (low negative)	20 (low negative)
Mitigation measures	Mitigation should take the form of isolating known sites and declare them as no-go zones with sufficient large buffer zones around them for protection. In exceptional cases mitigation can be implemented after required procedures have been followed, but only as last case scenario	

Environmental Parameter	Graves, cemeteries and burial grounds	
Issue/Impact/Environmental Effect/Nature	The impact will be the physical disturbance of the features and its context. Many are hidden and forgotten, i.e. difficult to identify. Impact will be focused on a particular node, i.e. tower positions or access/inspection roads	
Extent	Local	
Probability	Probable	
Reversibility	Irreversible	
Irreplaceable loss of resources	Significant loss of resources	
Duration	Permanent	
Cumulative effect	Medium cumulative impact	
Intensity/magnitude	Very high	
Significance Rating	Sites have a high significance on a local level – viewed as NHRA Grade III sites.	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	1	1
Probability	2	2
Reversibility	4	4
Irreplaceable loss	3	3
Duration	4	2
Cumulative effect	3	1
Intensity/magnitude	4	1
Significance rating	68 (high negative)	13 (low negative)

Mitigation measures	Mitigation should take the form of isolating known sites and declare them as no-go zones with sufficient large buffer zones around them for protection. Plan of action should be developed if unknown burial places are discovered. In exceptional cases, relocation of graves can be implemented after required procedures have been followed.
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7. RECOMMENDED MANAGEMENT MEASURES

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the proposed development can be excavated / recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the environmental management plan, whence they can be avoided or cared for in the future.

7.1 Objectives

- Protection of archaeological, historical and any other site or land considered being of cultural value within the project boundary against vandalism, destruction and theft.
- The preservation and appropriate management of new discoveries in accordance with the NHRA, should these be discovered during excavation activities.

The following shall apply:

- Once the power line routes have been confirmed and the location (coordinates) of the various tower structures are available, a walkdown of the routes should be done prior to construction taking place, to document all sites, features and objects, in order to propose adjustments to the routes and thereby to avoid as many impacts as possible.
- Known sites should be clearly marked in the construction Environmental Management Plan (CEMP) in order that they can be avoided during construction activities.
- The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51.

7.2 Control

In order to achieve this, the following should be in place:

- A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage sites and should be held accountable for any damage.
- Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above.
- In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.

8. CONCLUSIONS

The aim of the survey was to locate, identify, evaluate and document sites, objects and structures of cultural significance found within the corridors in which it is proposed to develop electricity transmission lines.

The cultural landscape qualities of the region essentially consist of two components. The first is a rural area in which the human occupation is made up of a pre-colonial element (Stone Age) as well as a much later colonial (Settler farmers) component. The second component is an urban landscape dating to the colonial period.

The following heritage sites were identified in the study area:

- Pre-colonial archaeological sites dating to all phases of the Stone Age have been identified to occur in the study area. At present it seems as if these sites cluster into three distinct areas. However, this might only be a viewpoint based on a perception created by the available information. In some cases the impact of the development would only be indirect, e.g. the power line crossing over a site. In other areas of the proposed development, even though the impact will be focused on a particular node, i.e. tower positions or access/ inspection roads, it will give rise to the physical disturbance of the material and its context. This would result in irreplaceable loss of resources.
- Colonial period or historic period heritage manifest in a wide variety. As the power lines are to cross a rural landscape for the most part, the impact would only be indirect, e.g. the power line crossing over a site. In other areas of the proposed development the impact will be focused on a particular node, i.e. tower positions or access/ inspection roads and will therefore give rise to the physical damage of the features or structures and its context.

Heritage sites are not only fixed features in the environment, occurring within specific spatial confines, but they are also finite in number. Avoiding of impacts on sites is therefore the preferred form of mitigation. In areas where a high density of sites occurs, such as at the Thyspunt end of the corridors, if at all possible, exclusion zones where no development is to take place, should be set aside. If that is not possible, mitigation can only be achieved through archaeological investigation.

For the project to continue, we propose the following:

- The management measures, as set out in Section 7 of this report should be implemented prior to construction taking place.
- Mitigation should be based on avoiding of sites rather than anything else. In order to achieve this, a full “walk down” of the corridors must be done prior to construction taking

place, to document all sites, features and objects, in order to propose adjustments to the routes and thereby to avoid as many impacts as possible.

- No impact on heritage sites, features or objects can be allowed without a valid permit from SAHRA.

9. REFERENCES

9.1 Data bases

Chief Surveyor General
Environmental Potential Atlas, Department of Environmental Affairs and Tourism.
Heritage Atlas Database, Pretoria.
National Archives of South Africa
South African Heritage Resources Agency

9.2 Literature

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9.4 Maps and aerial photographs

1:50 000 Topocadastral maps: 3324DB, 3324DC, 3324DD, 3325CA, 3325CB, 3325CC, 3325CD, 3325DA, 3325DC, 3424BA, 3424BB.

Google Earth

APPENDIX 1: CONVENTIONS USED TO ASSESS THE IMPACT OF PROJECTS ON HERITAGE RESOURCES

Significance

According to the NHRA, Section 2(vi) the **significance** of heritage sites and artefacts is determined by its aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

Matrix used for assessing the significance of each identified site/feature

1. Historic value				
Is it important in the community, or pattern of history				
Does it have strong or special association with the life or work of a person, group or organisation of importance in history				
Does it have significance relating to the history of slavery				
2. Aesthetic value				
It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group				
3. Scientific value				
Does it have potential to yield information that will contribute to an understanding of natural or cultural heritage				
Is it important in demonstrating a high degree of creative or technical achievement at a particular period				
4. Social value				
Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons				
5. Rarity				
Does it possess uncommon, rare or endangered aspects of natural or cultural heritage				
6. Representivity				
Is it 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.				
7. Sphere of Significance		High	Medium	Low
International				
National				
Provincial				
Regional				
Local				
Specific community				
8. Significance rating of feature				
1.	Low			
2.	Medium			
3.	High			

Significance of impact:

- low where the impact will not have an influence on or require to be significantly accommodated in the project design
- medium where the impact could have an influence which will require modification of the project design or alternative mitigation
- high where it would have a “no-go” implication on the project regardless of any mitigation

Certainty of prediction:

- Definite: More than 90% sure of a particular fact. Substantial supportive data to verify assessment
- Probable: More than 70% sure of a particular fact, or of the likelihood of that impact occurring
- Possible: Only more than 40% sure of a particular fact, or of the likelihood of an impact occurring
- Unsure: Less than 40% sure of a particular fact, or the likelihood of an impact occurring

Recommended management action:

For each impact, the recommended practically attainable mitigation actions which would result in a measurable reduction of the impact, must be identified. This is expressed according to the following:

- 1 = no further investigation/action necessary
- 2 = controlled sampling and/or mapping of the site necessary
- 3 = preserve site if possible, otherwise extensive salvage excavation and/or mapping necessary
- 4 = preserve site at all costs
- 5 = retain graves

Legal requirements:

Identify and list the specific legislation and permit requirements which potentially could be infringed upon by the proposed project, if mitigation is necessary.

APPENDIX 2. RELEVANT LEGISLATION

All archaeological and palaeontological sites, and meteorites are protected by the National Heritage Resources Act (Act no 25 of 1999) as stated in Section 35:

(1) Subject to the provisions of section 8, the protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority: Provided that the protection of any wreck in the territorial waters and the maritime cultural zone shall be the responsibility of SAHRA.

(2) Subject to the provisions of subsection (8)(a), all archaeological objects, palaeontological material and meteorites are the property of the State. The responsible heritage authority must, on behalf of the State, at its discretion ensure that such objects are lodged with a museum or other public institution that has a collection policy acceptable to the heritage resources authority and may in so doing establish such terms and conditions as it sees fit for the conservation of such objects.

(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.

(4) No person may, without a permit issued by the responsible heritage resources authority-

- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
- (c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
- (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

In terms of cemeteries and graves the following (Section 36):

(1) Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.

(2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.

(3) No person may, without a permit issued by SAHRA or a provincial heritage resources authority-

- (a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
- (b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
- (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

(4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.