Phase1 Heritage Impact Assessment Report for proposed 132kv ±4km powerline for John Dube Ext 1 Development within City of Ekurhuleni Metropolitan Municipality, Gauteng

Phase 1 HIA Study, Gauteng

INTEGRATED SPECIALIST SERVICES (PTY) LTD

November 13, 2018

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DOCUMENT SYNOPSIS (EXECUTIVE SUMMARY)

Item	Description
Proposed development and location	Phase1 Heritage Impact Assessment Report for proposed 132kv ±4km powerline for John Dube Ext 1 Development within City of Ekurhuleni Metropolitan Municipality, Gauteng
Purpose of the study	Phase 1 Archaeological Impact Assessment to determine the presence of cultural heritage sites and the impact of the proposed project on these resources within the area demarcated for the proposed development.
1:50 000 Topographic Map	2628CC
Coordinates	26°14'0.18"S and 28°23'37.558"E
Municipalities	City of Ekurhuleni Metropolitan Municipality
Predominant land use of surrounding area	Agriculture, commercial, residential, social, powerlines, road and transport
Applicant/Developer	John Dube Development Company (Pty) Ltd
EAP	Mawenje Consulting Mawenje Consulting Africa (Pty) Ltd Cnr William Nicol Drive and Broadacres Drive, Dainfern, 2055 Johannesburg, SA. Tel:010 492 6580 Cell:076 901 4006 Email: gabriel@mawenje.com
Reference no.	002/18-19/E0142
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Date of Report	14 November 2018

This document serves to inform and guide the developer (John Dube Development Company (Pty) Ltd) and contractors about the possible impacts that the proposed 132kv ±4km powerline and substation for John Dube Ext 1 Development may have on heritage resources (if any) located in the study area. In the same light, the document must also inform South African heritage authorities (SAHRA/PHRA-G) about the presence, absence and significance of heritage resources located in the study area. As required by South African heritage legislation, linear developments such as this require pre-development assessment by a competent heritage practitioner in order to identify, record and if necessary salvage the irreplaceable heritage resources that may be impacted upon by the development. In compliance with these laws Mawenje Consulting Africa (Pty) Ltd commissioned Integrated Specialist Services (Pty) Ltd to conduct a Phase 1 Archaeological and Heritage Impact Assessment (A/HIA) of the proposed 132kv ±4km powerline and substation for John Dube Ext 1 Development located in Nigel in the City of Ekurhuleni Metropolitan Municipality of Gauteng Province. Desktop studies, drive-throughs and field walking were conducted in order to identity heritage landmarks on and around the proposed development route. The project site is not on pristine ground, having seen significant transformations owing to agriculture, mining infrastructure, bulk water supply infrastructure, access roads, boundary fence lines and residential developments. Although the area is known for historical and LIA occurrences, no archaeological resources were identifiable on the surface, even though this may be due to the tall grass that inhibits ground surface visibility. In terms of the built environment of the project area, structures older than 60 years of age occur within the project area, however not on the direct footprint of the proposed powerline development. No mitigation is required prior to construction in terms of the archaeology of the area under study. Nonetheless, sub-surface archaeological material and unmarked graves may still exist and when encountered during construction, work must be stopped forth-with and the finds must be reported to the South African Heritage Resource Agency (SAHRA) or the heritage practitioner. This report must also be submitted to the SAHRA or PHRA-G for review.

NATIONAL LEGISLATION AND REGULATIONS GOVERNING THIS REPORT

This is a specialist report' and is compiled in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014.

DECLARATION OF INDEPENDENCE

In terms of Chapter 5 of the National Environmental Management Act of 1998 specialists involved in Impact Assessment processes must declare their independence.

I, **Trust Mlilo**, do hereby declare that I am financially and otherwise independent of the client and their consultants, and that all opinions expressed in this document are substantially my own, notwithstanding the fact that I have received fair remuneration from the client for preparation of this report.

Expertise:

Trust Mlilo, MA. (Archaeology), BA Hons, PDGE and BA & (Univ. of Pretoria) ASAPA (affiliation member) and more than 15 years of experience in archaeological and heritage impact assessment and management. Mlilo is an accredited member of the Association for Southern African Professional Archaeologists (ASAPA), Amafa akwaZulu Natali and Eastern Cape Heritage Resources Agency (ECPHRA). He has conducted more than hundred AIA/HIA Studies, heritage mitigation work and heritage development projects over the past 15 years of service. The completed projects vary from Phase 1 and Phase 2 as well as heritage nomination work for government, parastatals (Eskom) and several private companies such as BHP Billiton and Rhino Minerals.

Independence

The views expressed in this document are the objective, independent views of Mr Trust Mlilo and the survey was carried out under Mawenje Consulting Africa (Pty) Ltd. Integrated Specialist Services (Pty) Ltd has no any business, personal, financial or other interest in the proposed development apart from fair remuneration for the work performed.

Conditions relating to this report

The content of this report is based on the author's best scientific and professional knowledge as well as available information. Integrated Specialist Services (Pty) Ltd reserves the right to modify the report in any way deemed fit should new, relevant or previously unavailable or undisclosed information become known to the author from on-going research or further work in this field, or pertaining to this investigation.

This report must not be altered or added to without the prior written consent of the author and Mawenje Consulting Africa (Pty) Ltd and the author. This also refers to electronic copies of the report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

Authorship: This AIA/HIA Report has been prepared by Mr Trust Mlilo (Professional Archaeologist). The report is for the review of the Heritage Resources Agency (PHRA-G).

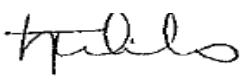
Geographic Co-ordinate Information: Geographic co-ordinates in this report were obtained using a hand-held Garmin Global Positioning System device. The manufacturer states that these devices are accurate to within +/- 5 m.

Maps: Maps included in this report use data extracted from the NTS Map and Google Earth Pro.

Disclaimer: The Authors are not responsible for omissions and inconsistencies that may result from information not available at the time this report was prepared.

The Archaeological and Heritage Impact Assessment Study was carried out within the context of tangible and intangible cultural heritage resources as defined by the SAHRA Regulations and Guidelines as to the authorisation of proposed powerline and substation being proposed by John Dube Development Company (Pty) Ltd.

Signed by



14/ 11/ 2018

Acknowledgements

The authors acknowledge Mawenje Consulting Africa (Pty) Ltd (Pty) Ltd for their assistance with project information, and the associated project BID as well as responding to technical queries related to the project.

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2 Abbreviations

AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
EIA	Environmental Impact Assessment
EIA	Early Iron Age *(EIA refers to both Environmental Impact Assessment and the Early Iron Age but in both cases the acronym is internationally accepted. This means that it must be read and interpreted within the context in which it is used.)*
EIAR	Environmental Impact Assessment Report
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
ICOMOS	International Council of Monuments and Sites
LIA	Late Iron Age
LFC	Late Farming Community
LSA	Late Stone Age
MIA	Middle Iron Age
MSA	Middle Stone Age
NEMA	National Environmental Management Act 107 of 1998
NHRA	National Heritage Resources Act 25 of 1999
PHRA	Provincial Heritage Resource Agency
SAHRA	South African Heritage Resources Agency
ISS	Integrated Specialist Services (Pty) Ltd

ToR	Terms of Reference

Key concepts and terms

Periodization

Periodization Archaeologists divide the different cultural epochs according to the dominant material finds for the different time periods. This periodization is usually region-specific, such that the same label can have different dates for different areas. This makes it important to clarify and declare the periodization of the area one is studying. These periods are nothing a little more than convenient time brackets because their terminal and commencement are not absolute and there are several instances of overlap. In the present study, relevant archaeological periods are given below;

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

Early Iron Age (~ AD 200 to 1000)

Late Iron Age (~ AD1100-1840)

Historic (~ AD 1840 to 1950, but a Historic building is classified as over 60 years old)

Definitions

Definitions Just like periodization, it is also critical to define key terms employed in this study. Most of these terms derive from South African heritage legislation and its ancillary laws, as well as international regulations and norms of best-practice. The following aspects have a direct bearing on the investigation and the resulting report:

Cultural (heritage) resources are all non-physical and physical human-made occurrences, and natural features that are associated with human activity. These can be singular or in groups and include significant sites, structures, features, ecofacts and artefacts of importance associated with the history, architecture or archaeology of human development.

Cultural significance is determined by means of aesthetic, historic, scientific, social or spiritual values for past, present or future generations.

Value is related to concepts such as worth, merit, attraction or appeal, concepts that are associated with the (current) usefulness and condition of a place or an object. Although significance and value are not mutually exclusive, in some cases the place may have a high level of significance but a lower level of value. Often, the evaluation of any feature is based on a combination or balance between the two.

Isolated finds are occurrences of artefacts or other remains that are not in-situ or are located apart from archaeological sites. Although these are noted and recorded, but do not usually constitute the core of an impact assessment, unless if they have intrinsic cultural significance and value.

In-situ refers to material culture and surrounding deposits in their original location and context, for example an archaeological site that has not been disturbed by farming.

Archaeological site/materials are remains or traces of human activity that 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. According to the National Heritage Resources Act (NHRA) (Act No. 25 of 1999), no archaeological artefact, assemblage or settlement (site) and no historical building or structure older than 60 years may be altered, moved or destroyed without the necessary authorisation from the South African Heritage Resources Agency (SAHRA) or a provincial heritage resources authority.

Historic material are remains resulting from human activities, which are younger than 100 years, but no longer in use, including artefacts, human remains and artificial features and structures.

Chance finds means archaeological artefacts, features, structures or historical remains accidentally found during development.

A grave is a place of interment (variably referred to as burial) and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place. A grave may occur in isolation or in association with others where upon it is referred to as being situated in a cemetery (contemporary) or burial ground (historic).

A site is a distinct spatial cluster of artefacts, structures, organic and environmental remains, as residues of past human activity.

Heritage Impact Assessment (HIA) refers to the process of identifying, predicting and assessing the potential positive and negative cultural, social, economic and biophysical impacts of any proposed project which requires authorisation of permission by law and which may significantly affect the cultural and natural heritage resources. Accordingly, an HIA must include recommendations for appropriate mitigation measures for minimising or circumventing negative impacts, measures enhancing the positive aspects of the proposal and heritage management and monitoring measures.

Impact is the positive or negative effects on human well-being and / or on the environment.

Mitigation is the implementation of practical measures to reduce and circumvent adverse impacts or enhance beneficial impacts of an action.

Mining heritage sites refer to old, abandoned mining activities, underground or on the surface, which may date from the prehistorical, historical or the relatively recent past.

Study area or '**project area'** refers to the area where the developer wants to focus its development activities (refer to plan).

Phase I studies refer to surveys using various sources of data and limited field walking in order to establish the presence of all possible types of heritage resources in any given area.

Assumptions and disclaimer

The investigation has been influenced by the unpredictability of buried archaeological remains (absence of evidence does not mean evidence of absence) and the difficulty in establishing intangible heritage values. It should be remembered that archaeological deposits (including graves and traces of mining heritage) usually occur below the ground level. Should artefacts or skeletal material be revealed at the site during construction, such activities should be halted immediately, and a competent heritage practitioner, SAHRA or PHRA-G must be notified in order for an investigation and evaluation of the find(s) to take place (see NHRA (Act No. 25 of 1999), Section 36 (6). Recommendations contained in this document do not exempt the developer from complying with any national, provincial and municipal legislation or other regulatory requirements, including any protection or management or general provision in terms of the NHRA. ISS assumes no responsibility for compliance with conditions that may be required by SAHRA in terms of this report.

3 Terms of Reference (ToR)

The author was instructed to conduct an AIA/HIA study addressing the following issues:

- Archaeological and heritage potential of the proposed 132kv ±4km powerline for John Dube Ext 1 Development route and substation site including any known data on affected areas;
- Provide details on methods of study; potential and recommendations to guide the PHRA-G/ SAHRA to make an informed decision in respect of authorisation of the proposed development.
- Identify all objects, sites, occurrences and structures of an archaeological or historical nature (cultural heritage sites) located along the proposed development route;
- Assess the significance of the cultural resources in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value;
- Describe the possible impact of the proposed 132kv ±4km powerline for John Dube Ext 1 Development on these cultural remains, according to a standard set of conventions;
- Propose suitable mitigation measures to minimize possible negative impacts on the cultural resources;
- Review applicable legislative requirements;

4 Introduction

Integrated Specialist Services (Pty) Ltd was commissioned by Mawenje Consulting Africa (Pty) Ltd on behalf of John Dube Development Company (Pty) Ltd to carry out a Phase 1 AIA/ HIA of the proposed 132kv powerline and substation. The study area is located within Nigel in the City of Ekurhuleni Metropolitan Municipality of Gauteng Province. As prescribed by SAHRA and stipulated by legislation, an A/HIA is a pre-requisite for this kind of development. The overall purpose of this heritage report is to identify, assess any heritage resources that may be located in the study area and evaluate the positive and negative impacts of the proposed development on these resources in order to make recommendations for their appropriate management. To achieve this, we conducted background research of published literature, maps and databases (desktop studies) which was then followed by ground-truthing by means of drive-through surveys and field walking. Desktop studies had shown that Iron Age and historical sites were a possibility in the study area but no such sites were recorded during ground-truthing. While heritage resources may have been located in the study area, subsequent developments such as agriculture and infrastructure development work have either obliterated these materials or reduced them to isolated finds that can only be identifiable as chance finds during construction. If the recommendations of this report are adopted, there is no archaeological reason why construction cannot proceed, taking full cognizance of clear procedures to follow in the event of chance findings.

5 Project Location

The site is situated in the eastern part of the City of Ekurhuleni Metropolitan Municipal area, within the Nigel administration area. The Powerline servitude and the substation lies between Fred Wegner Road and the Nigel Dunnottar (M63) Road. The proposed project will be locate on RE of Portion 51 of the Farm Grootfontein 165 IR held by title deed number T49847/96 and the RE of Portion 41 of the farm Grootfontein 165 IR held by title deed number T148185/99.The substation will be situated within the John Dube Village boundary area within fenced premises, and will consist of three 40MVA 88/11kV transformers together with the necessary energy flow monitoring, control, and protection equipment, which will include indoor type 11kV switch gear equipment that will be supplying power to the John Dube Village development via 11kV underground network.

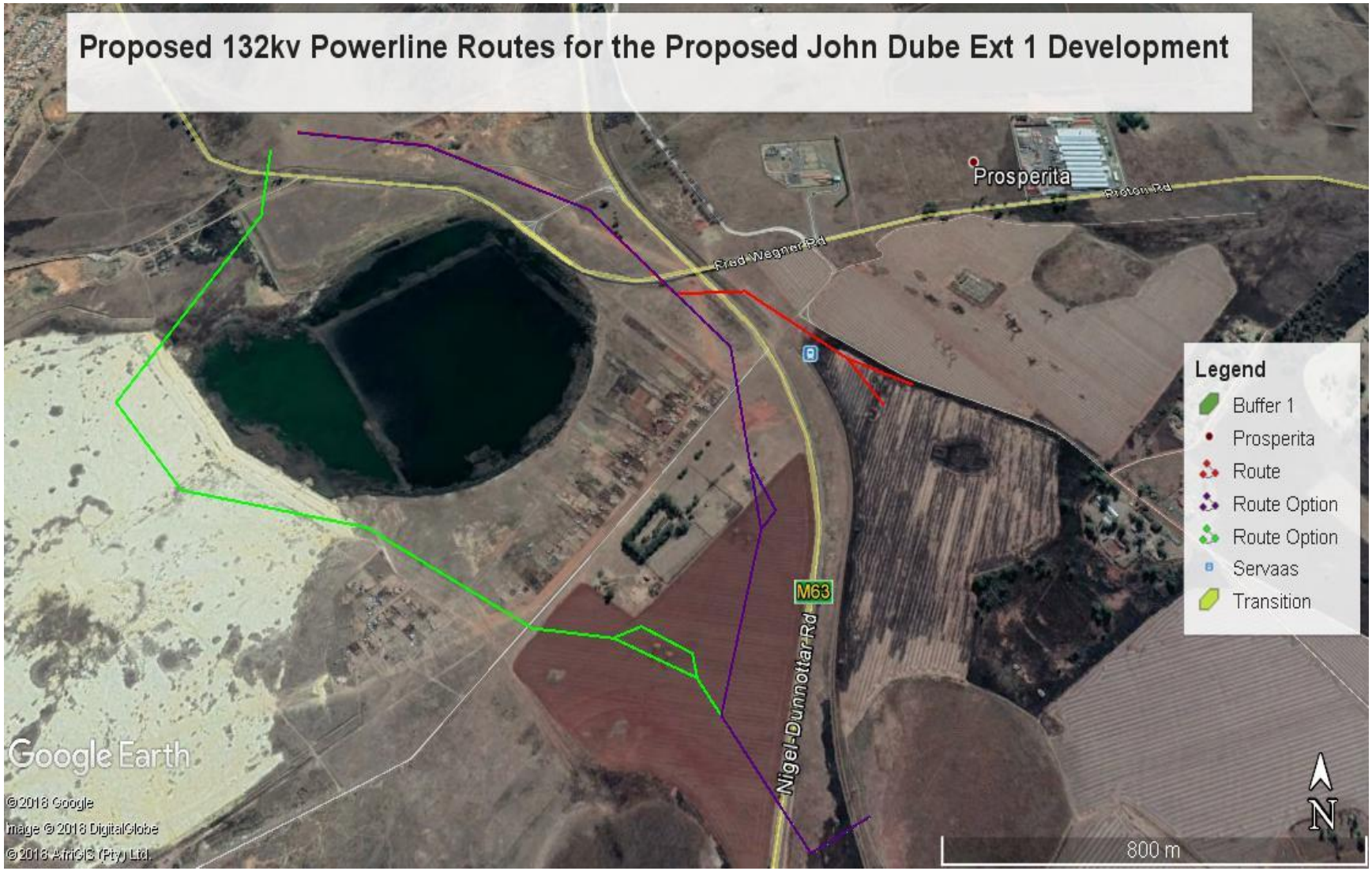

Figure 1: Location of the proposed project area (Mawenje Consulting Africa (Pty) Ltd 2018)

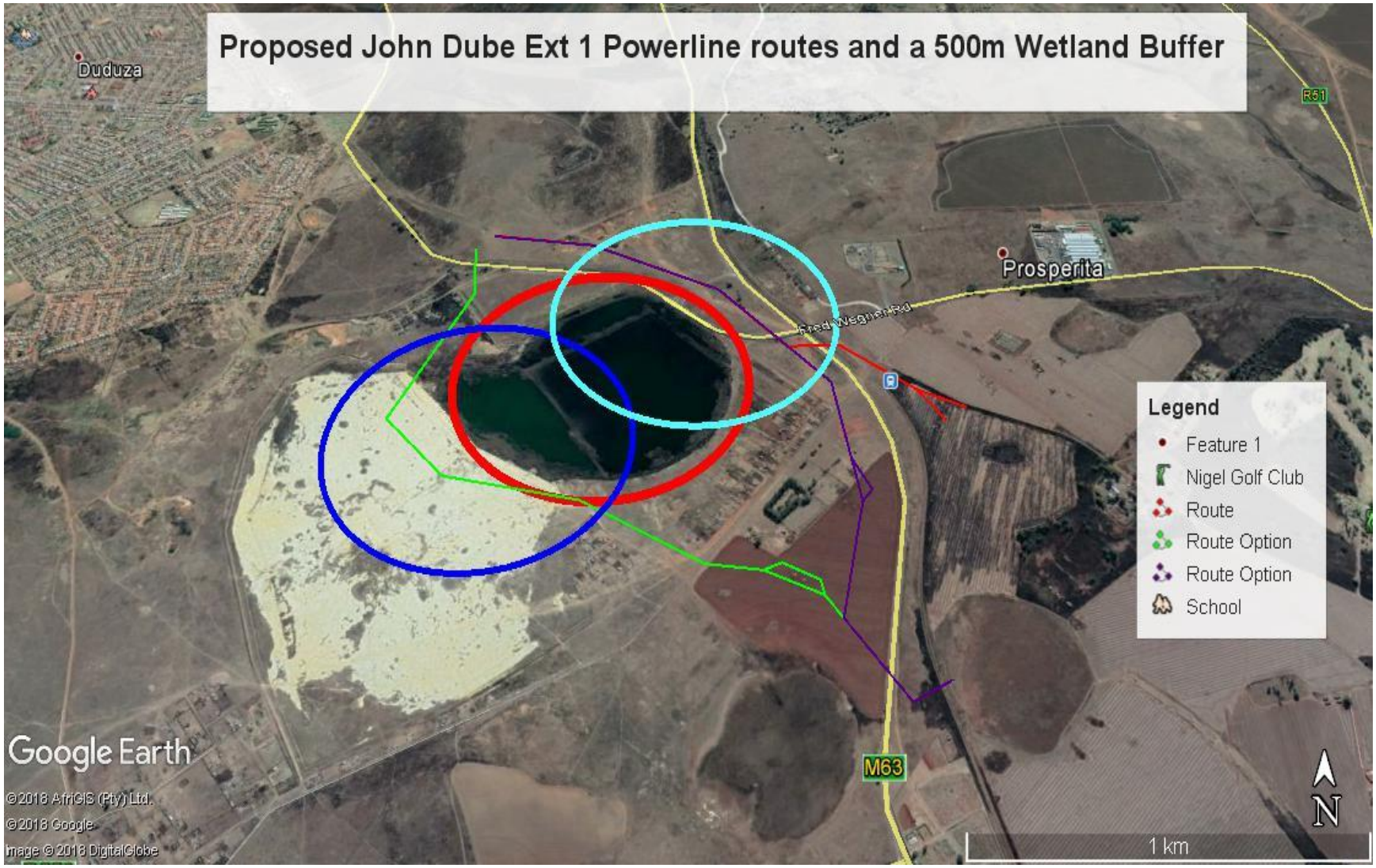

Figure 2 Location of the proposed project area (Mawenje Consulting Africa (Pty) Ltd 2018)

5.2 Project descriptions

The proposed John Dube Substation is a 3 X 40MVA 88/11kV substation that will form part of a Prosperita-Pretoriusstad 88kV ring main network. The substation will be situated within the John Dube Village boundary area within fenced premises, and will consist of three 40MVA 88/11kV transformers together with the necessary energy flow monitoring, control, and protection equipment, which will include indoor type 11kV switch gear equipment that will be supplying power to the John Dube Village development via 11kV underground network.

The proposed project will include the design, construction, installation, and commissioning of a dedicated 132kV dual circuit overhead bulk electricity line of approximately 4km in length from the proposed loop-in-loop-out connection at the existing Prosperita-to-Pretoruisstad substations' overhead line to the proposed 3 x 40MVA 88/11kV John Dube Substation. The proposed line will be supported by free standing monopole steel tower structures except at areas where the proposed line crosses the existing Eskom 275kV overhead lines, in which areas H poles will be used to cross underneath the Eskom lines.

The project will also include construction of the proposed John Dube Substation. The proposed station is a 3 X 40MVA 88/11kV substation that will form part of a Prosperita-Pretoruisstad 88kV ring main network. The substation will be situated within the John Dube Village boundary area within fenced premises, and will consist of three 40MVA 88/11kV transformers together with the necessary energy flow monitoring, control, and protection equipment, which will include indoor type 11kV switch gear equipment that will be supplying power to the John Dube Village development via 11kV underground network.

Alternatives Considered in this report

Three (3) technically powerline corridors (55m in width) have been identified for investigation within the EIA process. Through the EIA process, a preferred alternative powerline corridor and a substation site will be recommended to the DEA. Should the project be authorised by the DEA, the developer will then enter into a servitude negotiation process with each affected landowner. The process of negotiating a servitude is independent of the EIA process, and will be undertaken by the developer. The following section provides a detailed description of the proposed powerline routes and substation sites.

6 Legislative context

Two main pieces of legislations are relevant to the present study and there are presented here. Under the National Heritage Resources Act (Act 25 of 1999) (NHRA) and the National Environmental Management Act (NEMA), an AIA or HIA is required as a specialist sub-section of the EIA.

Heritage management and conservation in South Africa is governed by the NHRA and falls under the overall jurisdiction of the SAHRA and its PHRAs. There are different sections of the NHRA that are relevant to this study. The present proposed development is a listed activity in terms of Section 38 of the NHRA which stipulates that the following development categories require an HIA to be conducted by an independent heritage management consultant:

- Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length
- Construction of bridge or similar structure exceeding 50m in length
- Development or other activity that will change the character of a site -
  - ❖ Exceeding 5000 sq m
  - ❖ Involving three or more existing erven or subdivisions
  - ❖ Involving three or more erven or divisions that have been consolidated within past five years
  - ❖ Rezoning of site exceeding 10 000 sq m
  - ❖ The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority
- Any other development category, public open space, squares, parks, recreation grounds

Thus any person undertaking any development in the above categories, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development. Section 38 (2) (a) of the same act also requires the submission of a heritage impact assessment report for authorization purposes to the responsible heritage resources agencies (SAHRA/PHRAs). Because, the proposed development will change the character of a site exceeding 5000 sq m, then an HIA is required according to this section of act.

Related to Section 38 of the NHRA are Sections 34, 35, 36 and 37. Section 34 stipulates that no person may **alter damage, destroy and relocate any building or structure older than 60 years, without a permit issued by SAHRA or a provincial heritage resources authority**. This section may not apply to present

study since none were identified. Section 35 (4) of the NHRA stipulates that no person may, without a permit issued by SAHRA, destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object. This section may apply to any significant archaeological sites that may be discovered before or during construction. This means that any chance find must be reported to the heritage practitioner or SAHRA/PHRA-G, who will assist in investigating the extent and significance of the finds and inform about further actions. Such actions may entail the removal of material after documenting the find site or mapping of larger sections before destruction. Section 36 (3) of the NHRA also stipulates that no person may, without a permit issued by the South African Heritage Resources Agency (SAHRA), destroy, damage, alter, exhume or 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. This section may apply in case of the discovery of chance burials, which is unlikely. The procedure for reporting chance finds also applies to the unlikely discovery of burials or graves by the developer or his contractors. Section 37 of the NHRA deals with public monuments and memorials but this may not apply to this study because no protected monument will be physically affected by the proposed project.

In addition, the new EIA Regulations (04 December 2014) promulgated in terms of NEMA (Act 107 of 1998) determine that any environmental reports will include cultural (heritage) issues. The new regulations in terms of Chapter 5 of the NEMA provide for an assessment of development impacts on the cultural (heritage) and social environment and for Specialist Studies in this regard. The end purpose of such a report is to alert the developer (John Dube Development Company (Pty) Ltd), the environmental consultant (Mawenje Consulting Africa (Pty) Ltd), SAHRA/PHRA-G and interested and affected parties about existing heritage resources that may be affected by the proposed development, and to recommend mitigatory measures aimed at reducing the risks of any adverse impacts on these heritage resources.

Table 1: ***Evaluation of the proposed development as guided by the criteria in NHRA and NEMA***

ACT	Stipulation for developments	Requirement details
NHRA Section 38	Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	Yes

	Construction of bridge or similar structure exceeding 50m in length	
	Development exceeding 5000 sq m	
	Development involving three or more existing erven or subdivisions	
	Development involving three or more erven or divisions that have been consolidated within past five years	
	Rezoning of site exceeding 10 000 sq m	Not available
	Any other development category, public open space, squares, parks, recreation grounds	
NHRA Section 34	Impacts on buildings and structures older than 60 years	Subject to identification during Phase 1
NHRA Section 35	Impacts on archaeological and palaeontological heritage resources	Subject to identification during Phase 1
NHRA Section 36	Impacts on graves	Subject to identification during Phase 1
NHRA Section 37	Impacts on public monuments	Subject to identification during Phase 1
Chapter 5 (21/04/2006) NEMA	HIA is required as part of an EIA	Yes

Other relevant legislations

The Human Tissue Act

Human Tissue Act of 1983 and Ordinance on the Removal of Graves and Dead Bodies of 1925 Graves 60 years or older are heritage resources and fall under the jurisdiction of both the National Heritage Resources Act and the Human Tissues Act of 1983. However, graves younger than 60 years are specifically protected by the Human Tissues Act (Act 65 of 1983) and the Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925) as well as any local and regional provisions, laws and by-laws. Such burial places also fall under the jurisdiction of the National Department of Health and the Provincial Health Departments.

Approval for the exhumation and re-burial must be obtained from the relevant Provincial Member of the Executive Committee as well as the relevant Local Authorities.

7 Methodology

Relevant published and unpublished sources were consulted in generating desktop information for this report. This included online databases such as the UNESCO website, Google Earth, Google Scholar and SAHRIS. Previous HIAs in the project area were also consulted. A number of published works on the archaeology, history and palaeontology were also consulted. This included dedicated archaeological, paleontological and geological works by (Breutz 1956; 1968; 1987; Button 1971; Clarck 1971; Eriksson et al. 1975; Bertrand and Eriksson 1977; Humphreys 1978; Humphreys and Thackeray 1983; Beaumont and Vogel 1984; Beaumont and Morris 1990; Beaumont 1999; Holmgren et al. 1999; Johnson *et a*l. 1997; Peabody 1954; Shillington 1985; Wills 1992; Young 1934; 1940). Thus, the proposed powerline and substation by John Dube Development Company (Pty) Ltd was considered in relation to the broader landscape, with a key requirement of the ICOMOS Guidelines.

The proposed powerline and substation requires clearance and authorisation from government compliance agencies including the heritage authority of SAHRA. The objectives of this report are to:

- Fulfil the legislative requirements of the National Heritage Resources Act, Act 25 of 1999.
- Identify and describe, (in terms of their conservation and / or preservation importance) sites of cultural and archaeological importance that may be affected by the proposed development. This study searched for sites and features of traditional historical, social, scientific, cultural, and aesthetic significance within the affected study area; the identification of gravesites.
- Assess the significance of the resources where they are identified.
- Evaluate the impact thereon with respect to the socio-economic opportunities and benefits that would be derived from the proposed development.
- Provide guidelines for protection and management of identified heritage sites and places (including associated intangible heritage resources management that may apply).
- Consult with the affected and other interested parties, where applicable, in regard to the impact on the heritage resources in the project's receiving environment.
- Make recommendations on mitigation measures with the view to reduce specific adverse impacts and enhance specific positive impacts on the heritage resources.

- Take responsibility for communicating with the SAHRA and other authorities in order to obtain the relevant permits and authorization with reference to heritage aspects.

In order to meet the objectives of the AIA/HIA Phase 1 study, the following tasks were conducted: 1) site file search, 2) literature review, 3) consultations with the affected communities, 4) completion of a field survey and assessment and 5) analysis of the acquired data and report production. The following tasks were undertaken:

- Preparation of a predictive model for archaeological heritage resources in the study area.
- A review and gap analysis of archaeological, historical, and cultural background information, including possible previous heritage consultant reports specific to the affected project area, the context of the study area and previous land use history as well as a site search;
- Field survey of the proposed development site in order to test the predictive model regarding that heritage sites in the area;
- Physical cultural property recording of any identified sites or cultural heritage places;
- Identification of heritage significance; and
- Preparation of AIA/HIA report with recommendation, planning constraints and opportunities associated with the proposed development.

Walking surveys were conducted in order to identify and document archaeological and cultural sites along the proposed development route. Informal settlements, grazing lands; village roads and main road infrastructures, distribution & transmissions lines and other auxiliary infrastructures dominate the affected project area. The entire project area was accessible through a network of main roads and roads used to access the settlements. Although some sections of ground surface were covered with grass, this did not hinder identification of possible archaeological sites in surveyed areas. Geographic coordinates were obtained with a handheld Garmin GPS global positioning unit. Photographs were taken as part of the documentation process during field study.

7.2 Consultation

The study team consulted residents about any historical use of the proposed development area. They confirmed that other than bulk water supply infrastructure located within the proposed development route, there were no settlements or any other activities within the route. The EIA Public Participation Process invited and addressed comments from affected communities and any registered heritage bodies on any matter

related to the proposed project including heritage concerns that may arise as a result of the project. The issues raised by the public with respect to the proposed development will also be included in the Final Basic Assessment Report.

7.3 The fieldwork survey

The fieldwork survey was undertaken in November 2018. The main focus of the survey involved a pedestrian survey which was conducted across the project site. The pedestrian survey focussed on parts of the project area where it seemed as if disturbances may have occurred in the past, for example bald spots in the grass veld; stands of grass which are taller that the surrounding grass veld; the presence of exotic trees; evidence for building rubble, and ecological indicators such as invader weeds.

The literature survey suggests that prior to the 20th century modern residential and on-going industrial developments; the general area where the proposed development is located would have been a rewarding region to locate heritage resources related to Stone Age and particularly Iron Age and historical sites (Bergh 1999: 4). However, the situation today is completely different. The study area now lies on a clearly modified landscape that has previously been cleared of vegetation but is now dominated by a continuous sweep of tall grass and shrubs that limit ground visibility. Several agricultural, industrial and illegal dumping are also on-going on and around the development footprint (Plates 2A-I).

The following photographs illuminate the nature and character of the Project Area.

A

Plate 1: Photo **A**. showing the proposed powerline route.

B

Plate 2: Photo **B**. showing the proposed powerline route.

Plate 3: Photo **C**. showing the proposed powerline route.

Plate 4: Photo **D**. showing the proposed powerline route.

Plate 5: Photo **E**. showing a historical house in the vicinity of the proposed powerline route.

Plate 6: Photo **F**. showing a historical cottage in the vicinity of the proposed powerline route

Plate 7: Photo **G**. showing the proposed powerline route cutting through ploughed fields.

Plate 8: Photo **H**. showing the proposed powerline route.

I

Plate 9: Photo **I**. showing the proposed powerline route.

J

Plate 10: Photo **J**. showing sewer pipeline infrastructure within the proposed project area.

Plate 11: Photo **K**. showing the erosion control along proposed powerline route.

Plate 12: Photo **L**. showing proposed powerline route.

Plate 13: Photo **M**. showing the proposed powerline route.

Plate 14: Photo **N**. showing the proposed powerline route.

Plate 15: Photo **O**. showing the proposed powerline route.

Plate 16: Photo **P**. showing ruined structures and mine dumbs in the background.

Plate 17: Photo **Q**. showing proposed substation site

Plate 18: Photo **R** showing old sewer pipeline earmarked for replacement

Plate 19: Photo **S**. showing boundary fence line for the mine slimes dam..

Plate 20: Photo **T** showing remaining buildings of the abandoned mine compound

Plate 21: Photo **U**, showing abandoned mine compound near powerline route.

Plate 22: Photo **V**, showing proposed powerline route.

Plate 23: Photo **W**, showing powerline route near slimes dam.

8 Archaeological Context

Gauteng area has yielded evidence of human settlement extending into hundreds of thousands of years of prehistory that include the Stone Age, Iron Age, Historical period and contemporary communities. The palaeontological human-evolution record is reach in palaeoanthropological relics that were found in Stekfontein and Maropeng areas that are popularly known as the Cradle of Mankind that is also a World Heritage Site. Although there are no well-known Stone Age sites located in the Gauteng area there is evidence of the use of the larger area by Stone Age communities for example along the Kliprivier where ESA and MSA tools where recorded. LSA material is recorded along ridges to the south of the current study area (Huffman 2008). Petroglyphs occur at Redan as well as along the Vaal River (Berg 1999). Records indicate that stone tools dating to the Early and Middle Stone Age and especially the Later Stone Age occurred all over, for example in the Jukskei River area at Glenferness shelter, excavated by Professor. Revil Mason (1969).

Iron Age people started to settle in southern Africa c. AD 300, with one of the oldest known sites at Broederstroom south of Hartebeespoort Dam dating to AD 470. Having only had cereals (sorghum, millet) that need summer rainfall, Early Iron Age (EIA) people did not move outside this rainfall zone, and neither did they occupy the central interior highveld area. The occupation of the larger geographical area (including the study area) did not start much before the 1500s. By the 16th century things changed, with the climate becoming warmer and wetter, creating condition that allowed Late Iron Age (LIA) farmers to occupy areas previously unsuitable, for example the Witwatersrand in the region of Klipriviersberg and the Magaliesberg to the north (Horn 1996).

A distinction between the Iron Age and the LSA is drawn on the basis and on the fact that the Iron Age communities occupied the foot-hills and valley lands introducing sedentary life, domesticated livestock, crop production and the use of iron (Maggs 1984a; 1984b; Huffman 2007, van Schalkwyk, 2007). Stonewalls are one of the major characteristic of the Iron Age people. Cattle dung, both vetrified and unvetrified, is also one of the Iron Age traits (see Huffman (1982). He also includes pits and burials, with some located inside the cattle kraals. This would have varied from cultures to cultures and traditions to traditions. For example, alongside the Urewe Tradition is the second group called the Kalundu Tradition whose EIA archaeological sites have been recorded in most of South Africa's northern and central regions. These are therefore some of the important Iron Age traditions in the EIA. Iron Age sites associated with the ancestors of the modern Sotho-Tswana and Ndebele speaking communities are wide spread in the region. In recent colonial history,

the area played host to different competing local settler communities. The area was a scene of series of colonial wars. By the end of the 19th century, the region was placed under British rule and the local people displaced. Today most of the land is used for commercial, mining, agricultural activities and industrial activities. It is within this cultural landscape that the project area is located.

Archaeologically, the Gauteng is associated with Late Iron Age Sotho Tswana communities and has yielded four ceramic sequences of the Urehwe tradition: Ntsuanatsatsi (1450-1650), Olifantspoort (AD 1500 -1700) and Uitkomst (AD 1700-1850) and Buispoort (1700-1840) [Huffman 2007: 443). This area was historically occupied by predominantly Sotho Tswana -speaking groups before Mzilikazi's Ndebele briefly dominated it during the Mfecane. Around the 1830s, the region also witnessed the massive movements associated with the Mfecane ('wandering hordes'). The causes and consequences of the Mfecane are well documented elsewhere (e.g. Hamilton 1995; Cobbing 1988). The area was partitioned into commercial settler farms during the colonial period.

Melville Koppies is most well documented site in the project area. The site was excavated by Professor Mason from the Department of Archaeology of WITS in the 1980"s. Extensive Stone walled sites are also recorded at Klipriviers Berg Nature reserve belonging to the Late Iron Age period. A large body of research is available on this area. These sites (Taylor's Type N, Mason's Class 2 & 5) are now collectively referred to as Klipriviersberg (Huffman 2007). These settlements are complex in that aggregated settlements are common, the outer wall sometimes includes scallops to mark back courtyards, there are more small stock kraals, and straight walls separate households in the residential zone. These sites date to the 18th and 19th centuries and were built by people in the Fokeng cluster.

In this area the Klipriviersberg walling probably ended around AD 1823, when Mzilikazi entered the area (Rasmussen 1978). This settlement type may have lasted longer in other areas because of the positive interaction between Fokeng and Mzilikazi. Prior to the Gauteng region being incorporated into the colonial administration of the Transvaal, the region experienced several episodes of white settler migration and settler settlements as well as the associated colonial wars such as the Anglo-Boer War, which ended in 1902.

Historic Period

The Late Iron Age Nguni communities engaged in the Indian Ocean Trade exporting ivory and importing consumables such as cloth and glass beads. The exporting point was Delagoa. This brought the Nguni speaking community in touch with the Indo-Asian and first Europeans (Portuguese). It was the arrival of the

Dutch and the English traders that opened up Delagoa Bay to more trade did the Nguni engaged in extensive trade with the international traders (Huffman 2007). From the late 1700s, trade in supply of meat to passing ship had increased substantially to an extent that by 1800 meat trade is estimated to have surpassed ivory trade. At the same time population was booming following the increased food production that came with the introduction of maize that became the staple food. Naturally, there were signs that population groups had to compete for resources especially along the east coastal regions. The KwaZulu Natal coastal region has a special place in the history of the region and country at large. This relates to the most referenced Mfecane (wandering hordes) period of tremendous insecurity and military stress which eventually affected the entire Southern Africa including the modern day Gauteng area. Around the 1830s, the region also witnessed the massive movements associated with the Mfecane. The causes and consequences of the Mfecane are well documented elsewhere (e.g. Hamilton 1995; Cobbing 1988). In this context new African kingdoms emerged such as the Zulu Kingdom under Shaka in the second quarter of the 1800s AD. Military pressure from Zululand spilled onto the highveld by at least 1821. Various marauding groups of displaced Sotho-Tswana moved across the plateau in the 1820s. Mzilikazi raided the plateau extensively between 1825 and 1837. And throughout this time settled communities of Tswana people also attacked each other. As a result of this troubled period, Sotho-Tswana people concentrated into large towns for defensive purposes. Their settlements were built of stone because of the lack of trees in the project area. These stone-walled villages were almost always located near cultivatable soil and a source of water. Such sites are known to occur near Kriel (e.g. Pelser, *et a*l 2006).

White settlers moved into the Gauteng area during the first half of the 19th century. Within Gauteng Province and our study area the settlers are dated to 1840s. Palestrant (1986) places the date for the Voortrekker's in the Witwatersrand to 1830 and a date of 1842 for one of the earliest established farms which later became Johannesburg: "The part of the Highveld which was eventually to become Johannesburg had at the time few established farms. One of the earliest was situated at Klipriviersdale and belonged to the Meyer's family who had settled there in 1842. Their nearest white neighbours were miles away – the Marais, beyond Heidelburg and the Erasmus and Strydoms families, near Olifantsfontein (Palestrant, 1986: 8). European settlers of Dutch descent – the Afrikaans communities established earliest colonial settlements after they Trekked from the then Cape Colony to avoid British Administration in the 1930s and 19840s. They fall within what was then called the Transvaal -direct translation for "across the Vaal River". During the Great Trek these Afrikaans communities, commonly referred to as the Boers (farmers), who left the British Administration of the Cape Colony (i.e. a former Dutch colony in 1795 and again in 1806) established several republics north and north-

west of the British Colonies - these republics included the Boer Republics of the Orange Free State (1845) and the Transvaal across the Vaal River were the study area is located. The Transvaal which had different autonomous and separate states which were later united to form what became known as the Zuid Afrikaanse Republiek (South African Republic) the ZAR (Celliers, 2010).

During the historical period the availability of natural resources also played a pivotal role in the choice of settlement of people, based not only from a subsistence point of view but also driven by commerce or commercial gains resulting from the exploitation of available natural resources such as gold discovered within the Witwatersrand particularly after the discovery of gold in 1884. The founding of Johannesburg (the study area) is a direct consequence of the discovery of gold. The same is true for the establishment and the development of the railway industry within the Witwatersrand, Gauteng Province, South Africa. The settlers were largely self-sufficient, basing their survival on cattle/sheep farming and hunting. They established large farms which were later subdivided into a number 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 thirty years. Therefore most of the built fabric, date from this period. The result was that any historic farmsteads older than 60 years that may have existed have either disappeared or have been 'upgraded'. The oldest physical remains in these areas usually are planted vegetation such as lanes and tall trees in mature gardens, cemeteries, the remains of portions of farm and farmstead walling (dry stacked stone walls erected to demarcate the boundaries of a farmstead, an orchard or cattle kraal) farm roads, weirs (in the river) and water furrows.

8.2 Intangible Heritage

As defined in terms of the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (2003) intangible heritage includes oral traditions, knowledge and practices concerning nature, traditional craftsmanship and rituals and festive events, as well as the instruments, objects, artefacts and cultural spaces associated with group(s) of people. Thus intangible heritage is better defined and understood by the particular group of people that uphold it. In the present study area, very little intangible heritage remains because no historically known groups occupied the study area and most of the original settler descendants moved away from the area.

9 SAHRIS Data Base and Impact Assessment Reports in the project area

Several archaeological and heritage studies were conducted within the City of Ekurhuleni and its vicinity since 2005 and these presents the nature and heritage character of the area. The HIA conducted in the area also provide some predictive evidence regarding the types and ranges of heritage resources to be expected in the proposed project area: (see reference list for HIA reports). The studies include housing, infrastructure developments, water pipeline and powerline projects completed by Van Schalkwyk (2005, 2007, 2008, 2009, 2010, 2011, 2013, 2014), Kusel 2009, 2010, 2011, 2013, 2014), Tomose 2013, Jaco Van der Walt 2013, Van Der Ryst MM 2014 and Mlilo 2017,2018). No sites were recorded by these studies. Van Schalkwyk and Udo Kusel did extensive work in the project area mostly for infrastructure developments. The authors note that the entire region was subjected to urbanization and industrial activities, which would have destroyed any pre-colonial or early colonial heritage features that might have occurred in the past, and that the only heritage sites known from the region are a number of historical buildings older than 60 years, municipal cemeteries, which are all located well outside the area of the proposed development. No sites, features or objects of cultural heritage significance have been identified in the study area.

10 RESULTS OF THE FIELD SURVEY

ALTERNATIVE POWERLINE ROUTE 1

Archaeological and Heritage Site

The proposed Alternative powerline route 1 did not yield any verifiable archaeological sites or material. The affected landscape is heavily degraded from previous and previous land use such as agriculture, bulk water supply infrastructure, powerlines and from residential property developments. This limited the chances of encountering significant *in situ* archaeological sites. As such the proposed 132kv ±4km powerline for John Dube Ext 1 Development will be additional developments on the project area (Figure 1, also see Plates A to I). It is the considered opinion of the author that the chances of recovering significant archaeological materials were seriously compromised and limited due to infrastructural developments and other destructive land use patterns such as deep ploughing, bulk water pipe lines, access road works and residential areas that already exist on the project area.

Based on the field study results and field observations, the author concluded that the receiving environment for the proposed development is low to medium potential to yield previously unidentified archaeological sites during subsurface excavations and construction work associated with the proposed powerline This observation is supported by the fact that no Iron Age sites are indicated in a historical atlas around the area; however, this may be an indication of a lack of research. Literature review also revealed that no Stone Age sites are shown on a map contained in a historical atlas of this area. This however, should rather be seen as a lack of research in the area and not as an indication that such features do not occur.

Burial grounds and graves

Human remains and burials are commonly found close to archaeological sites; they may be found in abandoned and neglected burial sites, or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface. Archaeological and historical burials are usually identified when they are exposed through erosion and earth moving activities for infrastructure developments such as powerlines and roads. In some instances, packed stones or stones may indicate the presence of informal pre-colonial burials.

The field survey did not record any grave or burial ground along the proposed Alternative 1 powerline route. The possibility of encountering previously unidentified burial sites is very low on the proposed development

routes, should such sites be identified during construction, they are still protected by applicable legislations and they should be protected (also see Appendixes for more details). Burial sites older than 60 years are protected by the NHRA and those younger than 60 years are protected by the Human Tissue Act. Exhumation of graves must confirm to the standards set out in the ordinance on excavation (Ordinance no.12 of 1980 which replaced the old Transvaal Ordinance no.7 of 1925.

Buildings and Structures older than 60 years

There are several historical buildings and structures in the general project area. However, none will be affected by the proposed Alternative 1 powerline route.

Monuments and Plaques

None occur on the proposed development route.

ALTERNATIVE POWER LINE ROUTE 2

Archaeological and Heritage Site

The alternative route was assessed alongside Alternative 1 powerline route. No archaeological remains were recorded along the alternative power line route. It is the considered opinion of the author that the chances of recovering significant archaeological materials were seriously compromised and limited due to infrastructural developments and other destructive land use patterns such as deep ploughing, bulk water pipeline, road works and mining activities that already exist on the project area.

Burial grounds and graves

None were recorded along the alternative power line route.

Historical Monuments

There are several buildings and structures younger than 60 years, which are located within the proposed development site. The recorded contemporary buildings are less than 60 years of age and are therefore not protected by section 34 of NHRA.

1. ALTERNATIVE POWER LINE ROUTE 3

Archaeological and Heritage Site

None were recorded along the proposed alternative powerline route.

Burial grounds and graves

The field survey did not record any burial site in the vicinity of the proposed alternative power line route. It should however be noted that burial grounds and gravesites are accorded the highest social significance threshold (see Appendix 3). They have both historical and social significance and are considered sacred. Wherever they exist or not, they may not be tempered with or interfered with during any proposed development. It is important to note that the possibility of encountering human remains during subsurface earth moving works anywhere on the landscape is ever present. Although the possibility of encountering previously unidentified burial sites is low along the proposed powerline route, should such sites be identified during subsurface construction work, they are still protected by applicable legislations and they should be protected.

Historical Monuments

None were recorded along the proposed power line route.

THE PROPOSED SUBSTATION SITE

Archaeological and Heritage Site

The proposed substation development site was accessed alongside the powerline routes. The proposed substation site did not yield any verifiable archaeological sites or material. The affected landscape is heavily degraded from previous and current land use such as mining, bulk water pipelines, power lines, industrial infrastructure and from residential property developments. This limited the chances of encountering significant in *situ* archaeological sites. Based on the field study results and field observations, the author concluded that the receiving environment for the proposed development is low to medium potential to yield previously unidentified archaeological sites during subsurface excavations and construction work associated with the proposed substation development.

Burial grounds and graves

The field survey did not record any burial site in the vicinity of the proposed substation site.

Historical Monuments

None were recorded on the proposed substation site.

Cumulative Impacts

The European Union Guidelines define cumulative impacts as: “Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project. Therefore, the assessment of cumulative impacts for the proposed project considered the total impact associated with the proposed project when combined with other past, present, and reasonably foreseeable future developments projects. An examination of the potential for other projects to contribute cumulatively to the impacts on heritage resources from this proposed project was undertaken during the preparation of this report. The total impact arising from the proposed project (under the control of the developer), other activities (that may be under the control of others, including other developers, local communities, government) and other background pressures and trends which may be unregulated. The project’s impact is therefore one part of the total cumulative impact on the environment. The analysis of a project’s incremental impacts combined with the effects of other projects can often give a more accurate understanding of the likely results of the project’s presence than just considering its impacts in isolation. The impacts of the proposed project were assessed by comparing the post-project situation to a pre-existing baseline. Where projects can be considered in isolation this provides a good method of assessing a project’s impact. However, in this case there are several infrastructure developments including residential developments and bulk water supply infrastructure where baselines have already been affected, the proposed project will continue to add to the impacts in the area, it was deemed appropriate to consider the cumulative effects of proposed development. This section considers the cumulative impacts that would result from the combination of the proposed development project. There are existing infrastructure developments and massive residential developments in the project area. As such increased development in the project area will have a number of cumulative impacts on heritage resource whether known or covered in the ground. For example, during construction phase they will be increase in human activity and movement of heavy construction equipment and vehicles that could change, alter or destroy heritage resources that may be buried beneath the surface. Cumulative impacts that could result from a combination of the proposed project and other actual or proposed future developments in the broader study area include site clearance and the removal of topsoil could result in damage to or the destruction of heritage resources that have not previously been recorded for example abandoned and unmarked graves. Heritage resources such as burial grounds and graves and archaeological and historical sites are common occurrences within the greater study area. These sites are often not visible and as a result, can be easily affected or lost. In addition, increased human activity during construction phase allows increased access to nearby heritage resources. Furthermore, many heritage resource in the greater

study area are informal, unmarked and may not be visible, particularly during the wet season when grass cover is dense. As such, construction workers may not see these resources, which results in increased risk of resource damage and/or loss. Vibrations and earth moving activities associated with excavation for foundations has the potential to crack/damage graves marked by tombstones, which are known to occur in the greater study area. In addition, vibration from traffic has the potential to impact buildings and features of architectural and cultural significance. A potential interaction between archaeology, architectural and cultural heritage and landscape and visual during both the construction and operational phase of the proposed project is identified. Construction of the proposed powerline and substation will result in a visual impact and impact on features of architectural and cultural significance. Construction works associated with the provision of material assets such as gravel, in particular underground works have the potential to interact with archaeology, architectural and cultural heritage.

No specific paleontological resources were found in the project area during the time of this study; however, this does not preclude the fact that paleontological resources may exist within the greater study area. As such, the proposed development has the potential to impact on possible paleontological resources in the area. sites of archaeological, paleontological, or architectural significance were not specifically identified and cumulative effects are not applicable. the nature and severity of the possible cumulative effects may differ from site to site depending on the characteristics of the sites and variables.

Cumulative impacts that need attention are related to the impacts of access roads and impacts to buried heritage resources. Allowing the impact of the proposed development to go beyond the surveyed area would result in a significant negative cumulative impact on sites outside the surveyed area. Movement of heavy construction vehicles must be monitored to ensure that they do not drive beyond the approved site. No significant cumulative impacts, over and above those already considered in the impact assessment, are foreseen at this stage of the assessment process. Cumulative impacts can be significant, if construction vehicles are not monitored to avoid driving through undetected heritage resources.

Mitigation

From an archaeological and heritage perspective, mitigation is not required for the proposed reservoir and associated infrastructure development sites, however, chance find procedures apply.

Table 2: Summary of findings

Heritage resource	Status/Findings
Buildings, structures, places and equipment of cultural significance	Several historical buildings and structures , however none on the direct footprint of the proposed powerline.
Areas to which oral traditions are attached or which are associated with intangible heritage	None exists
Historical settlements and townscapes	Previous mining and colonial settlements in the general project area, but none on the direct footprint of the project.
Landscapes and natural features of cultural significance	None
Archaeological and palaeontological sites	None
Graves and burial grounds	None exists or are identifiable on the basis of a surface survey
Movable objects	None
Overall comment	The surveyed area has no identifiable heritage resources on the surface but sub-surface chance finds are still possible.

11 Assessing Heritage Significance

The Guidelines to the SAHRA Guidelines and the Burra Charter define the following criterion for the assessment of cultural significance:

Aesthetic Value

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and material of the fabric; sense of place, the smells and sounds associated with the place and its use.

Historic Value

Historic value encompasses the history of aesthetics, science and society, and therefore to a large extent underlies all of the terms set out in this section. A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.

Scientific value

The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality or representativeness, and on the degree to which the place may contribute further substantial information. Scientific value is also enshrined in natural resources that have significant social value. For example, pockets of forests and bushvelds have high ethnobotany value.

Social Value

Social value embraces the qualities for which a place has become a focus of spiritual, religious, political, local, national or other cultural sentiment to a majority or minority group. Social value also extend to natural resources such as bushes, trees and herbs that are collected and harvested from nature for herbal and medicinal purposes.

12 Recommendations

1. From a heritage perspective supported by the findings of this study, the proposed powerline and substation developments are feasible. The proposed development should be approved to proceed as planned under observation that the development dimensions do not extend beyond the proposed development. The foot print impact of the proposed development and associated infrastructure should be kept to minimal to limit the possibility of encountering chance finds.
2. None of the 3 presented alternative powerline routes has an advantage of the other. The three routes presented for this study are equally viable from a heritage perspective.
3. Should any unmarked burials be exposed during construction affected families must be trekked and consulted, relevant rescue/ relocation permits must be obtained from SAHRA before any grave relocation can take place. Furthermore a professional archaeologist must be retained to oversee the relocation process in accordance with the National Heritage Resources Act 25 of 1999.
4. Should chance archaeological materials or human remains be exposed during subsurface construction work on any section of the proposed development laydown sites, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimize disruption in construction scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the PHRA-G and NHRA regulations.
5. Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of the project EMP, there are no significant cultural heritage resources barriers to the proposed development. The Heritage authority may approve the proposed development to proceed as planned with special commendations to implement the recommendations herein made.

13 Chance finds procedures

It has already been highlighted that sub-surface materials may still be lying hidden from surface surveys. Therefore, absence (during surface survey) is not evidence of absence all together. The following monitoring and reporting procedures must be followed in the event of a chance find, in order to ensure compliance with heritage laws and policies for best-practice. This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. Accordingly, all construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds.

- If during the construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance, work must cease at the site of the find and this person must report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- The senior site Manager must then make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area before informing ISS.
- The developer will then contact a professional archaeologist for an assessment of the finds who will in turn inform SAHRA/PHRA-G.

14 Conclusion

In compliance with South African heritage legislation and other environmental legislation, Integrated Specialist Services (Pty) Ltd was appointed by Mawenje Consulting Africa (Pty) Ltd on behalf of John Dube Development Company (Pty) Ltd to carry out an HIA for the proposed powerline and substation site. The proposed development does not lie on pristine ground. Desktop research suggested that the general area is archaeologically rich but no known archaeological sites were reported on the development footprint. In terms of the archaeology and heritage in respect of the proposed powerline route and substation site, there are no obvious 'Fatal Flaws' or 'No-Go' areas. No archaeological sites were recorded along the proposed development route. The field survey established that the affected project area is degraded by previous land use activities. This report concludes that the proposed powerline and substation development may be approved by SAHRA/PHRA-G to proceed as planned subject to recommendations herein made (See Appendices 1, 2 &3). The measures are informed by the results of the study and principles of heritage management enshrined in the NHRA, Act 25 of 1999. However, the potential for chance finds, still remains and the developer and contractors are advised to be diligent and observant during excavation. The procedure

for reporting chance finds has clearly been laid out and if this report is adopted by SAHRA, then there are no archaeological reasons why the proposed development project cannot be allowed to proceed.

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16 APPENDIX 1: HERITAGE MANAGEMENT PLAN INPUT INTO THE PROPOSED POWERLINE AND SUBSTATION DEVELOPMENT PROJECT EMP

Objective	• Protection of archaeological sites and land considered to be of cultural value; • Protection of known physical cultural property sites against vandalism, destruction and theft; and • The preservation and appropriate management of new archaeological finds should these be discovered during construction.							
No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
Pre-Construction Phase								
1	Planning	Ensure all known sites of cultural, archaeological, and historical significance are demarcated on the site layout plan, and marked as no-go areas.	Throughout Project	Weekly Inspection	Contractor [C] CECO	SM	ECO	EA EM PM
Construction Phase								
1	Emergency Response	Should any archaeological or physical cultural property heritage resources be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped until heritage authority has cleared the development to continue.	N/A	Throughout	C CECO	SM	ECO	EA EM PM
		Should any archaeological, cultural property heritage resources be exposed during excavation or be found on development site, a registered heritage specialist or PHRA official must be called to site for inspection.		Throughout	C CECO	SM	ECO	EA EM PM
		Under no circumstances may any archaeological, historical or any physical cultural property heritage material be destroyed or removed form site;		Throughout	C CECO	SM	ECO	EA EM PM
		Should remains and/or artefacts be discovered on the development site during earthworks, all work will cease in the area affected and the Contractor will immediately inform the Construction Manager who in turn will inform PHRA-G.		When necessary	C CECO	SM	ECO	EA EM PM
		Should any remains be found on site that is potentially human remains, the PHRA-G and South African Police Service should be contacted.		When necessary	C CECO	SM	ECO	EA EM PM
Rehabilitation Phase								
		Same as construction phase.						
Operational Phase								
		Same as construction phase.						

17 Appendix 2: heritage mitigation measure table

SITE REF	HERITAGE ASPECT	POTENTIAL IMPACT	MITIGATION MEASURES	RESPONSIBLE PARTY	PENALTY	METHOD STATEMENT REQUIRED
Chance Archaeological and Burial Sites	General area where the proposed project is situated is a historic landscape, which may yield archaeological, cultural property, remains. There are possibilities of encountering unknown archaeological sites during subsurface construction work which may disturb previously unidentified chance finds.	Possible damage to previously unidentified archaeological and burial sites during construction phase. • Unanticipated impacts on archaeological sites where project actions inadvertently uncovered significant archaeological sites. • Loss of historic cultural landscape; • Destruction of burial sites and associated graves • Loss of aesthetic value due to construction work • Loss of sense of place Loss of intangible heritage value due to change in land use	In situations where unpredicted impacts occur construction activities must be stopped and the heritage authority should be notified immediately. Where remedial action is warranted, minimize disruption in construction scheduling while recovering archaeological data. Where necessary, implement emergency measures to mitigate. • Where burial sites are accidentally disturbed during construction, the affected area should be demarcated as no-go zone by use of fencing during construction, and access thereto by the construction team must be denied. • Accidentally discovered burials in development context should be salvaged and rescued to safe sites as may be directed by relevant heritage authority. The heritage officer responsible should secure relevant heritage and health authorities permits for possible relocation of affected graves accidentally encountered during construction work.	• Contractor / • Project Manager • Archaeologist • Project EO	Fine and or imprisonment under the PHRA-G Act & NHRA	Monitoring measures should be issued as instruction within the project EMP. PM/EO/Archaeologists Monitor construction work on sites where such development projects commences within the farm.

16 APPENDIX 3: LEGAL PRINCIPLES OF HERITAGE RESOURCES MANAGEMENT IN SOUTH AFRICA

Extracts relevant to this report from the National Heritage Resources Act No. 25 of 1999, (Sections 5, 36 and 47):

General principles for heritage resources management

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

(a) Heritage resources have lasting value in their own right and provide evidence of the origins of South African society and as they are valuable, finite, non-renewable and irreplaceable they must be carefully managed to ensure their survival;

(b) every generation has a moral responsibility to act as trustee of the national heritage for succeeding generations and the State has an obligation to manage heritage resources in the interests of all South Africans;

(c) heritage resources have the capacity to promote reconciliation, understanding and respect, and contribute to the development of a unifying South African identity; and

(d) heritage resources management must guard against the use of heritage for sectarian purposes or political gain.

(2) To ensure that heritage resources are effectively managed—

(a) the skills and capacities of persons and communities involved in heritage resources management must be developed; and

(b) provision must be made for the ongoing education and training of existing and new heritage resources management workers.

(3) Laws, procedures and administrative practices must—

(a) be clear and generally available to those affected thereby;

(b) in addition to serving as regulatory measures, also provide guidance and information to those affected thereby; and

(c) give further content to the fundamental rights set out in the Constitution.

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

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

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

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

(a) take account of all relevant cultural values and indigenous knowledge systems;

(b) take account of material or cultural heritage value and involve the least possible alteration or loss of it;

(c) promote the use and enjoyment of and access to heritage resources, in a way consistent with their cultural significance and conservation needs;

(d) contribute to social and economic development;

(e) safeguard the options of present and future generations; and

(f) be fully researched, documented and recorded.

Burial grounds and graves

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) (a) 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.

(5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection (3)(b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority—

(a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and

(b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.

(6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority—

(a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and

(b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant

to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

(7) (a) SAHRA must, over a period of five years from the commencement of this Act, submit to the Minister for his or her approval lists of graves and burial grounds of persons connected with the liberation struggle and who died in exile or as a result of the action of State security forces or agents provocateur and which, after a process of public consultation, it believes should be included among those protected under this section.

(b) The Minister must publish such lists as he or she approves in the Gazette.

(8) Subject to section 56(2), SAHRA has the power, with respect to the graves of victims of conflict outside the Republic, to perform any function of a provincial heritage resources authority in terms of this section.

(9) SAHRA must assist other State Departments in identifying graves in a foreign country of victims of conflict connected with the liberation struggle and, following negotiations with the next of kin, or relevant authorities, it may re-inter the remains of that person in a prominent place in the capital of the Republic.

General policy

47. (1) SAHRA and a provincial heritage resources authority—

(a) must, within three years after the commencement of this Act, adopt statements of general policy for the management of all heritage resources owned or controlled by it or vested in it; and

(b) may from time to time amend such statements so that they are adapted to changing circumstances or in accordance with increased knowledge; and

(c) must review any such statement within 10 years after its adoption.

(2) Each heritage resources authority must adopt for any place which is protected in terms of this Act and is owned or controlled by it or vested in it, a plan for the management of such place in accordance with the best environmental, heritage conservation, scientific and educational principles that can reasonably be applied taking into account the location, size and nature of the place and the resources of the authority concerned, and may from time to time review any such plan.

(3) A conservation management plan may at the discretion of the heritage resources authority concerned and for a period not exceeding 10 years, be operated either solely by the heritage resources authority or in conjunction with an environmental or tourism authority or under contractual arrangements, on such terms and conditions as the heritage resources authority may determine.

(4) Regulations by the heritage resources authority concerned must provide for a process whereby, prior to the adoption or amendment of any statement of general policy or any conservation management plan, the public and interested organisations are notified of the availability of a draft statement or plan for inspection, and comment is invited and considered by the heritage resources authority concerned.

(5) A heritage resources authority may not act in any manner inconsistent with any statement of general policy or conservation management plan.

(6) All current statements of general policy and conservation management plans adopted by a heritage resources authority must be available for public inspection on request.