

ESKOM CUPRUM BESS

ARCHAEOLOGICAL AND HERITAGE IMPACT ASSESSMENT

PHASE 1 ARCHAEOLOGICAL AND HERITAGE IMPACT ASSESSMENT REPORT
THE PROPOSED DEVELOPMENT OF A BATTERY ENERGY STORAGE SYSTEM
(BESS) AND ASSOCIATED INFRASTRUCTURE AT THE CUPRUM SUBSTATION
LOCATED WITHIN COPPERTON, NEAR THE TOWN OF PRIESKA, NORTHERN
CAPE PROVINCE

DATE: JUNE 2021



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AECOM

Waterside Place, South Gate, Tyger Waterfront
Carl Cronje Drive, Bellville
7535, South Africa
T +27-21-950-7500
aecom.com

To whom it may concern

**SUBJECT: THE PROPOSED ESKOM CUPRUM BATTERY ENERGY STORAGE SYSTEM
(BESS) PROJECT, ESKOM CUPRUM SUBSTATION, COPPERTON, NORTHERN CAPE
PROVINCE.**

The findings and recommendations as stipulated in the Archaeological and Heritage Impact Assessment report for the above mentioned project, dated 04th of June 2021, are still valid.

Regards,



Trust Mlilo, PhD Cand, MA. (Archaeology)

Archaeologist

Cell: 067 217 4511

E-Mail: heritage@sativatec.co.za

DOCUMENT INFORMATION

Item	Description
Proposed development and location	The proposed Eskom Cuprum Battery Energy Storage System Copperton, Siyathemba Local Municipality, Municipality Northern Cape Province.
Purpose of the study	To assess presence/absence of heritage resources on the project area.
Coordinates	29°57'37.63"S 22°18'0.76"E
Map Reference	2922 Prieska
Municipalities	Siyathemba Local Municipality, Pixley ka Seme District Municipality
Predominant land use of surrounding area	Mining, Distribution lines and Distribution substation
Applicant	Eskom
EAP	AECOM 263A West Ave Centurion, South Africa 0157 Tel: +27 12 421 3500 Email: dalian.govender@aecom.com
Consultant	Sativa Travel and Environmental Consultants (Pty) Ltd Constantia Park, Building 16-2, 546 16 th Road Midrand, 1685 Cell: 076 328 1558 Fax: 086 652 9774 Email: info@sativatec.co.za
Author	Trust Mlilo, PhD Cand, MA. (Archaeology)
Date of Report	04/06/ 2021

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, **PhD Cand**, MA. (Archaeology), BA Hons, PDGE and BA & (Univ. of Pretoria) ASAPA (Professional member) with 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 management work for government, parastatals (Eskom) and several private companies such as BHP Billiton (South32) 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 AECOM. The author has no business, personal, financial or other interest in the proposed development project 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. The author 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 Sativa Travel and Environmental Consultants (Pty) Ltd. 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).

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 the proposed substation extension being proposed by Eskom.

Signed by

A handwritten signature in black ink, appearing to read 'H. P. ...', is written over a light blue horizontal bar.

04/06/2021

ACKNOWLEDGEMENT

The author acknowledges AECOM for their assistance with project information and responding to technical queries related to the project.

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EXECUTIVE SUMMARY

The existing Eskom network in the Prieska area is not constrained, but the Eskom grid as a whole is and the Cuprum BESS (Battery Energy Storage System) will therefore be for business ancillary services and energy support. Generally, the BESS will be expected to charge during the low load period at night (23h00 to 4h59) and be available to provide ancillary and energy services during the day (5h00 to 22h59). The BESS shall have capability to be operated to provide capacity to meet the energy demand on the grid.

The project is located in Siyathemba Local Municipality in an area that is predominantly mining, game and stock farming as well as tourism (See Figure 1), This document serves to inform and guide the applicant (Eskom) and contractors about the possible impacts that the proposed project may have on heritage resources (if any) located in the study area. In the same light, the document must also inform South African Heritage Resources Agency (SAHRA) about the presence, absence and significance of heritage resources located in the study area. As required by South African heritage legislation, 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 proposed substation extension. In compliance with the National Environmental Management Act, 1998 (Act No.107 of 1998) (NEMA) and NHRA, AECOM tasked Sativa Travel and Environmental Consultants (Pty) Ltd (STEC) to conduct a Phase 1 Archaeological and Heritage Impact Assessment (AIA/HIA) of the proposed upgrades at the substation.

Desktop studies, drive-throughs and fieldwalking were conducted in order to identify heritage landmarks within the proposed development site. The study area is not an entirely pristine landscape, having seen significant transformations owing to construction activities at the substation and surrounding area. Thus, it is important to note that the project area has been heavily disturbed over the past years (see Plates 8, 9, 10 and 11). As such *in situ* archaeological remains might have been exposed and washed away by excessive erosion in the area. Although the area is known for Middle Stone Age (MSA) and Late Stone Age (LSA) occurrences, no archaeological resources were identifiable on the surface.

In terms of Section 36 of the National Heritage Resources Act, 1999 (Act No.25 of 1999), the study did not identify any grave or burial ground within the proposed development site. However, sub-surface archaeological material and unmarked graves may still exist and when encountered during clearance and construction at the substation site, work must be stopped forth-with and the finds must be reported to the South African Heritage Resource Agency (SAHRA) or the heritage practitioner (see appended Chance Finds Procedure). This report must also be submitted to the SAHRA for review.

Archaeological resources in the general project area stretches into deep time starting with australopithecines. These australopithecines were gradually displaced by early hominid (Homo Habilis) that was later replaced by the early crude stone tool using hominid (Homo erectus around 1.8 million years ago). This marked the beginning of the Stone Age (ESA), which is not very widespread in the study area. Nonetheless the area has isolated occurrences of the Middle Stone Age (MSA) industries associated with anatomically modern humans, Homo sapiens that replaced the ESA around 250000 years ago. The subsequent replacement of the MSA by Later Stone Age (LSA) occurred from about 20000 years ago and the new technology is also represented in isolated occurrences. The LSA is triggered a series of technological innovations and social transformations within these early hunter-gatherer societies that included the advent of rock art (paining and engravings), associated with the

Khoisan communities. This Archaeological and Heritage Impact Assessment (AIA/HIA) report has been prepared to address requirements of the National Heritage Resources Act, 1999 (Act No.25 of 1999), Section 38.

STEC was appointed by AECOM on behalf of Eskom to conduct this Archaeological and Heritage Impact Assessment (AIA/HIA) Study for the proposed Cuprum BESS (Battery Energy Storage System) and associated infrastructure. This report includes an impact study on potential archaeological and cultural heritage resources that may be associated with the proposed development site. This study was conducted as part of the specialist input for the Environmental authorisation process. The project information has been passed to Sativa research team by the project EAP. Analysis of the archaeological, cultural heritage, environmental and historic contexts of the study area predicted that archaeological sites, cultural heritage sites, burial grounds or isolated artefacts were likely to be present on the affected landscape. The field survey was conducted on the 23rd of April 2021 to test this proposition and verify this prediction within the proposed development site.

RECEIVING ENVIRONMENT

The proposed site is located within a disturbed landscape owing to previous and current land use activities such as mining, agriculture and infrastructure developments such as railway line, canals, powerline, solar and farming infrastructure.

RESTRICTIONS AND ASSUMPTIONS

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 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. STEC assumes no responsibility for compliance with conditions that may be required by SAHRA in terms of this report.

SITE-LOCATION MODEL

Archaeologists who do research in the region generally accept a site-location model proposed by Maggs (1980). The model suggests that inland sites will be found in locations which bear the following:

- Limited to below an altitude of 1000 m asl;
- Situated on riverside or streamside locations, on deep alkaline colluvial soils; and
- In areas appropriate for dry farming (with sufficient summer rainfall).

SURVEY FINDINGS

The Phase I Archaeological Impact Assessment for the proposed substation extension did not identify any confirmable archaeological remains. In terms of Section 36 the study did not identify any grave or burial ground within the proposed development site. The proposed development site does not trigger

Section 34 of the NHRA because there are no buildings or structures which are older than 60 years at the site.

IMPACT STATEMENT

The proposed substation extension has potential to disturb archaeological remains although limited. It is important to note that all categories of heritage resource, with the possible exception of movable objects, are generally known to occur in the wider area of the proposed development site. However, this is not addressed in this report in detail.

The report makes the following observations:

- The findings of this report have been informed by desktop data review, field survey and impact assessment reporting which include recommendations to guide heritage authorities in making decisions with regards to the proposed development.
- The proposed development site is very accessible through main road and farm tracks, and the field survey was effective enough to cover most sections of the project receiving environs. However, dense vegetation cover compromised visibility of surface remains.
- The immediate project area is predominantly distribution lines and a distribution substation (Cuprum).

This report concludes that the impacts of the proposed development on the cultural environmental values are not likely to be significant on the entire development site if the EMP includes recommended safeguard and mitigation measures identified in this report.

RECOMMENDATIONS

The proposed development may proceed as planned subject to the following recommendations:

1. It is also advised that the Archaeology, Palaeontology and SAHRA Meteorites Unit is alerted when site work begins.
2. Strict and clear reporting procedures for chance findings must be followed by applicant and contractors throughout the whole period of construction.

The applicant is reminded that should any archaeological material be unearthed accidentally during the course of construction, SAHRA **must** be alerted immediately, and construction activities be stopped within a radius of at least 25m of such indicator. The area should then be demarcated by a danger tape. Accordingly, a professional archaeologist should be contacted immediately. In the meantime, it is the responsibility of the Environmental officer and the contractor to protect the site from publicity (i.e., media) until a mutual agreement is reached. It is mandatory to report any incident of human remains encountered to the South African Police Services, SAHRA staff member and professional archaeologist. Any measure to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law under Section 35(4) and 36(3) of the National Heritage Resources Act, Act 25 of 1999. The applicant should induct field workers about archaeology, and steps that should be taken in the case of accidentally exposing archaeological materials (see appended Chance Find Procedure).

CONCLUSION

A thorough background study and survey of the proposed development site was conducted, and findings were recorded in line with SAHRA guidelines. In accordance with the recommendations above, there are

no major archaeological reasons why the proposed development should not be allowed to proceed. Thus, it is recommended that the proposed project proceed on condition that the recommendation indicated above are adhered to. Note that this report as well as its recommendations are inadequate without comments from SAHRA.

ABBREVIATIONS

AIA	Archaeological Impact Assessment
BESS	Battery Energy Storage System
ECO	Environmental Control Officer
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EM	Environmental Manager
EMP	Environmental Management Plan
HIA	Heritage Impact Assessment
LIA	Late Iron Age
NHRA	Nation Heritage Resources Act, 1999 (Act No.25 of 1999)
PM	Project Manager
PHRA	Provincial Heritage Agency
SM	Site Manager
SAHRA	South African Heritage Resources Agency

KEY CONCEPTS AND TERMS

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 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.

1 INTRODUCTION

1.1. BACKGROUND

Most heritage sites occur within communities, whose development should not be neglected in the name of heritage preservation but should be encouraged and embraced within legal and adaptive management frameworks (Carter and Grimwade 1997; Salafsky *et al* 2001). This case is true for the entire project area, which hosts palaeontological, archaeological, historical, natural and contemporary heritage resources. Previous heritage studies (Kusel *et al* 2009, Orton 2016, 2017, Kruger 2015, Mlilo 2019) recorded scatters of lithic tools and isolated burial site potsherds in the project area. The studies mention a range of heritage resources in the general project area. As such this current report must be read in conjunction with the previous HIA reports. This study focuses on the site ear marked for the proposed BESS project (see Figure 1).

The purpose of this Archaeology and Heritage Study is to assess presence/absence of heritage resources on the substation site and surrounding area. The study was designed to ensure that any significant archaeological or cultural physical property or sites are located and recorded, and site significance is evaluated to assess the nature and extent of expected impacts from the proposed development. The assessment includes recommendations to manage the expected impact of the proposed development. The report concludes with detailed recommendations to guide heritage authorities in making appropriate decision with regards to the environmental approval process for the proposed BESS project. Sativa Travel and Environmental Consultants (Pty) Ltd (STEC), an independent consulting firm, conducted an assessment; research and consultations required for the preparation of the archaeological and heritage impact report in accordance with its obligations set in the NHRA as well as the environmental management legislations.

In line with SAHRA guidelines, this report, not necessarily in that order, provides:

- 1) Management summary
- 2) Methodology
- 3) Information with reference to the desktop study
- 4) Map and relevant geodetic images and data
- 5) GPS co-ordinates
- 6) Directions to the site
- 7) Site description and interpretation of the cultural area where the project will take place
- 8) Management details, description of affected cultural environment, photographic records of the project area
- 9) Recommendations regarding the significance of the site and recommendations regarding further monitoring of the site.
- 10) Conclusions

1.2. DESCRIPTION OF THE PROPOSED PROJECT

The existing Eskom network in the Prieska area is not constraint, but the Eskom grid as a whole is and the Cuprum Battery Energy Storage System (BESS) uses will therefore be for business ancillary services and energy support. Generally, the BESS will be expected to charge during the low load period at night (23h00 to 4h59) and be available to provide ancillary and energy services during the day (5h00 to 22h59). The BESS shall have capability to be operated to provide capacity to meet the energy demand on the grid. The proposed Cuprum BESS size is

70MW/280MWh. Thus, this BESS capacity will be available to provide the required services on the System Operator's scheduling instruction.

Primary Plant Scope of Work:

- At Cuprum substation extend the substation footprint by 92x81m.
- Relocate existing lighting mast next to the busbar coupler.
- Extend the existing 132kV busbar using tubular bar.
- Install 5 x 21m lighting and lightning masts.
- Build oil holding dam that will cater for the future transformers.
- Install transformer bay consists of the following equipment.
 - ✓ 132kV Busbar 1 Isolator and Busbar 2 Isolator.
 - ✓ 132kV Breaker
 - ✓ 132kV Current Transformer.
 - ✓ 1 x 80MVA 132/22kV transformer
 - ✓ 1 x 22kV NECRT.
 - ✓ 1 x 22kV Combo Kiosk.
 - ✓ 1 x 22kV busbar Isolator
 - ✓ 22kV Busbar.
 - ✓ 22kV Busbar Isolator
 - ✓ 22kV Combo Kiosk
 - ✓ 22kV Line Isolator with Surge Arrestor.
 - ✓ Cable end support.
- Join new run-away road with the existing run-away.
- Install 2 x 5m slide gates and 1 x 1.5m gate.
- The Control room is enough to accommodate an additional future feeder bays.

Civil scope of work

- Deviate 185m of 32mm diameter water pipeline
- Build 170m of 32mm diameter water pipeline.
- Build the road length of 180m excluding runway inside the substation and width of 5m except the turning points at the corners.

HV line scope of work

- Deviate +-800m of 66kV Hare line, between CUKA01 and CUKA 04.

MV line scope of work

- MV Line Route
 - ✓ Reroute the 11kV 3Ph Mink conductor Cuprum Kronos Line outside Cuprum Substation as according to span plan

2 LEGAL REQUIREMENTS

Relevant pieces of legislations to the present study are presented here. Under the National Heritage Resources Act, 1999 (Act 25 of 1999) (NHRA), Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), and the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and 2014 Regulations, 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 proposed development is a listed activity in terms of Section 38 of the NHRA which stipulates that the following development categories require a HIA to be conducted by an independent heritage management consultant:

- Construction of a road, wall, **powerline**, 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 NHRA also requires the submission of a heritage impact assessment report for authorization purposes to the responsible heritage resources agencies (SAHRA/PHRAs).

Related to Section 38 of the NHRA are Sections 34, 35, 36 and 37. Section 34 stipulates that no person may alter, damage, destroy, relocate etc. any building or structure older than 60 years, without a permit issued by SAHRA or a provincial heritage resources authority. 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 SAHRA or PHRA (the relevant PHRA), 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 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 likely discovery of burials or graves by the developer or his contractors. Section 37 of the NHRA deals with public monuments and memorials which exist in the proposed project area.

In addition, the new EIA Regulations (4 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 the inclusion of specialist studies in this regard. The end purpose of such a report is to alert the applicant (Eskom) environmental consultant, SAHRA or PHRA 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.

2.1. ASSESSING THE SIGNIFICANCE OF HERITAGE RESOURCES

The appropriate management of cultural heritage resources is usually determined on the basis of their assessed significance as well as the likely impacts of any proposed developments. Cultural significance is defined in the Burra Charter as meaning aesthetic, historic, scientific, or social value for past, present, or future generations (Article 1.2). Social, religious, cultural, and public significance are currently identified as baseline elements of this assessment, and it is through the combination of these elements that the overall cultural heritage values of the site of interest, associated place or area are resolved.

Not all sites are equally significant and not all are worthy of equal consideration and management. The significance of a place is not fixed for all time, and what is considered of significance at the time of assessment may change as similar items are located, more research is undertaken, and community values change. This does not lessen the value of the heritage approach but enriches both the process and the long-term outcomes for future generations as the nature of what is conserved and why, also changes over time (Pearson and Sullivan 1995:7). This assessment of the Indigenous cultural heritage significance of the Site of Interest as its environments of the study area will be based on the views expressed by the traditional authority and community representatives, consulted documentary review and physical integrity.

African indigenous cultural heritage significance is not limited to items, places or landscapes associated with pre-European contact. Indigenous cultural heritage significance is understood to encompass more than ancient archaeological sites and deposits, broad landscapes, and environments. It also refers to sacred places and story sites, as well as historic sites, including mission sites, memorials, and contact sites. This can also refer to modern sites with resonance to the indigenous community. The site of interest considered in this project falls within this realm of broad significance.

Archaeological sites, as defined by the National Heritage Resources Act (Act 25 of 1999) are places in the landscape where people once lived in the past – generally more than 60 years ago – and have left traces of their presence behind. In South Africa, archaeological sites include hominid fossil sites, places where people of the Earlier, Middle and Later Stone Age lived in open sites, river gravels, rock shelters and caves, Iron Age sites, graves, and a variety of historical sites and structures in rural areas, towns and cities. Palaeontological sites are those with fossil remains of plants and animals where people were not involved in the accumulation of the deposits. The basic principle of cultural heritage conservation is that archaeological and other heritage sites are valuable, scarce and non-renewable. Many such sites are unfortunately lost daily through infrastructure developments such as powerlines, roads and other destructive economic activities such as mining and agriculture. This is also true for the proposed project area whose main economic activities are mining, solar, wind farms as well as stock and game farming. It should be noted that once archaeological sites are destroyed, they cannot be replaced as site integrity and authenticity is permanently lost. Archaeological heritage contributes to our understanding of the history of the

region and of our country and continent at large. By preserving links with our past, we may be able to appreciate the role past generations have played in the history of our country and the continent at large.

2.2. CATEGORIES OF SIGNIFICANCE

Rating the significance of archaeological sites, and consequently grading the potential impact on the resources is linked to the significance of the site itself. The significance of an archaeological site is based on the amount of deposit, the integrity of the context, the kind of deposit and the potential to help answer present research questions. Historical structures are defined by Section 34 of the National Heritage Resources Act, 1999, while other historical and cultural significant sites, places and features, are generally determined by community preferences. The guidelines as provided by the NHRA (Act No. 25 of 1999) in Section 3, with special reference to subsection 3 are used when determining the cultural significance or other special value of archaeological or historical sites. In addition, ICOMOS (the Australian Committee of the International Council on Monuments and Sites) highlights four cultural attributes, which are valuable to any given culture:

2.3. AESTHETIC VALUE

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria include consideration of the form, scale, colour, texture and material of the fabric, the general atmosphere associated with the place and its uses and the aesthetic values commonly assessed in the analysis of landscapes and townscape.

2.4. HISTORICAL VALUE

Historic value encompasses the history of aesthetics, science, and society and therefore to a large extent underlies all the attributes discussed here. Usually, a place has historical value because of some kind of influence by an event, person, phase or activity.

2.5. SCIENTIFIC VALUE

The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality and on the degree to which the place may contribute further substantial information.

2.6. SOCIAL VALUE

Social value includes the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a certain group. It is important for heritage specialist input in the EIA process to consider the heritage management structure set up by the NHR Act. It makes provision for a 3-tier system of management including the South Africa Heritage Resources Agency (SAHRA) at a national level, Provincial Heritage Resources Authorities (PHRAs) at a provincial and the local authority. The Act makes provision for two types or forms of protection of heritage resources, i.e., formally protected and generally protected sites:

2.7. FORMALLY PROTECTED SITES

- Grade 1 or national heritage sites, which are managed by SAHRA
- Grade 2 or provincial heritage sites, which are managed by the PHRA.
- Grade 3 or local heritage sites.

2.8. GENERAL PROTECTION

- Human burials older than 60 years.

- Archaeological and palaeontological sites.
- Shipwrecks and associated remains older than 70 years.
- Structures older than 60 years.

The certainty of prediction is definite, unless stated otherwise and if the significance of the site is rated high, the significance of the impact will also result in a high rating. The same rule applies if the significance rating of the site is low. The significance of archaeological sites is generally ranked into the following categories:

2.9. SIGNIFICANCE RATING ACTION

No significance: sites that do not require mitigation.

Low significance: sites, which may require mitigation.

2a. Recording and documentation (Phase 1) of site; no further action required

2b. Controlled sampling (shovel test pits, auguring), mapping and documentation (Phase 2 investigation); permit required for sampling and destruction

Medium significance: sites, which require mitigation.

3. Excavation of representative sample, C14 dating, mapping and documentation (Phase 2 investigation); permit required for sampling and destruction [including 2a & 2b]

High significance: sites, where disturbance should be avoided.

4a. Nomination for listing on Heritage Register (National, Provincial or Local) (Phase 2 & 3 investigation); site management plan; permit required if utilised for education or tourism

High significance: Graves and burial places

4b. Locate demonstrable descendants through social consulting; obtain permits from applicable legislation, ordinances, and regional by-laws; exhumation and reinternment [including 2a, 2b & 3]

Furthermore, the significance of archaeological sites was based on six main criteria:

- Site integrity (i.e., primary vs. secondary context),
- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Density of scatter (dispersed scatter),
- Social value,
- Uniqueness, and
- Potential to answer current and future research questions.

An important aspect in assessing the significance and protection status of a heritage resource is often whether the sustainable social and economic benefits of a proposed development outweigh the conservation issues at stake. When, for whatever reason the protection of a heritage site is not deemed necessary or practical, its research potential must be assessed and mitigated in order to gain data /information, which would otherwise be lost.

Table 1: Evaluation of the proposed development as guided by the criteria in NHRA, MPRDA 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	No
	Construction of bridge or similar structure exceeding 50m in length	No
	Development exceeding 5000 sq. m	Yes
	Development involving three or more existing erven or subdivisions	No
	Development involving three or more erven or divisions that have been consolidated within past five years	No
	Rezoning of site exceeding 10 000 sq. m	No
	Any other development category, public open space, squares, parks, recreation grounds	No
NHRA Section 34	Impacts on buildings and structures older than 60 years	No
NHRA Section 35	Impacts on archaeological and paleontological heritage resources	Subject to identification during Phase 1 walk down survey
NHRA Section 36	Impacts on graves	Subject to identification during Phase 1
NHRA Section 37	Impacts on public monuments	No
Chapter 5 (21/04/2006) NEMA	HIA is required as part of an EIA	Yes
Section 39(3)(b) (iii) of the MPRDA	AIA/HIA is required as part of an EIA	No

2.10. OTHER RELEVANT LEGISLATIONS

The Human Tissue Act

Human Tissue Act, 1983 (Act No.65 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, 1983 (Act No.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 (MEC) as well as the relevant Local Authorities.

2.11. TERMS OF REFERENCE

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

- Archaeological and heritage potential of the proposed development site including any known data on affected areas;
- Provide details on methods of study; potential and recommendations to guide the PHRA/ 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 in and around the proposed development site;
- 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 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;

PHOTOGRAPHIC PRESENTATION OF THE PROJECT SITE



Plate 1: Photo 1: View of Cuprum Substation and related infrastructure (Photograph © by Author 2021).



Plate 2: Photo 2: View of old demolished building 20m west of the substation (Photograph © by Author 2021).



Plate 3: Photo 3: View of proposed development site south of the substation (Photograph © by Author 2021).



Plate 4: Photo 4: View of proposed development site South East of the substation (Photograph © by Author 2021).



Plate 5: Photo 5: View of the general surrounding south of the substation (Photograph © by Author 2021).



Plate 6: Photo 6: View of existing powerlines in close proximity to the development (Photograph © by Author 2021)



Plate 7: Photo 7: View of proposed development site (Photograph © by Author 2021)



Plate 8: Photo 8: View of proposed development site south of the substation (Photograph © by Author 2021).



Plate 9: Photo 9: View of the general environment west of the development (Photograph © by Author 2021).



Plate 10: Photo 10: View of existing powerlines connecting to the substation earmarked for extension (Photograph © by Author 2021).



Plate 11: Photo 11: View of buildings at the Cuprum Substation (Photograph © by Author 2021).



Plate 12: Photo 12: View of proposed project site south of the substation (Photograph © by Author 2021).

3 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 HIA in the project area were also consulted (van Schalkwyk 2014, Miilo 2018, 2019). Several 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 al.* 1997; Peabody 1954; Shillington 1985; Wills 1992; Young 1934; 1940, Huffman 2007, Mason 1962). Thus, the proposed substation extension by Eskom was considered in relation to the broader landscape, which is a key requirement of the ICOMOS Guidelines.

This document falls under the basic assessment phase of the HIA and therefore aims at providing an informed heritage-related opinion about the proposed development. This is usually achieved through a combination of a review of any existing literature and a basic site inspection. As part of the desktop study, published literature and cartographic data, as well as archival data on heritage legislation, the history and archaeology of the area were studied. The desktop study was followed by field surveys. The field assessment was conducted according to generally accepted HIA practices and aimed at locating all possible heritage objects, sites and features of cultural significance on the proposed development site. Initially a drive-through was undertaken around the proposed development site as a way of acquiring the archaeological impression of the general area. This was then followed by a walk down survey in the study area, with a handheld Global Positioning System (GPS) for recording the location/position of each possible site. Detailed photographic recording was also undertaken where relevant. The findings were then analysed in view of the proposed development in order to suggest further action. The result of this investigation is a report indicating the presence/absence of heritage resources and how to manage them in the context of the proposed mining development. The field survey was undertaken in April of 2021 by an archaeologist, ecologist and the EAPs. The proposed development site was surveyed through tracks, footpaths which cut across the proposed development site. The focus of the survey involved a pedestrian survey which was conducted across the proposed 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 than 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 agriculture and associated infrastructure; the general project area would have been a rewarding region to locate heritage resources related to 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 mining activities. Several mining infrastructure developments such as access roads, dumping sites, high voltage and minor reticulation powerlines, pipelines and other infrastructure dominate the project area. In terms of the archaeology and heritage in respect of the proposed development site, there are no obvious 'Fatal Flaws' or 'No-Go' areas since study did not record any significant heritage resources within the proposed development site. However, the potential for chance finds remains and the applicant and contractors are advised to be diligent and observant during construction, should construction activities commence on the

3.1. ASSUMPTIONS AND LIMITATIONS

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 noted that archaeological deposits (including graves and traces of archaeological 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 must be notified 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 applicant 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. The author assumes no responsibility for compliance with conditions that may be required by SAHRA in terms of this report.

The field survey did not include any form of subsurface inspection beyond the inspection of burrows, road cut sections, and the sections exposed by erosion. Some assumptions were made as part of the study and therefore some limitations, uncertainties and gaps in information would apply. It should, however, be noted that these do not invalidate the findings of this study in any significant way:

- The proposed construction activities will be limited to specific right of site as detailed in the development layout (Figure 1).
- The construction team to provide link and access to the proposed site by making use and extending the existing access roads. and there will be no construction beyond the demarcated site.
- No excavations or sampling were undertaken since a permit from heritage authorities is required to disturb a heritage resource. As such the results herein discussed are based on superficially observed indicators. However, these surface observations concentrated on exposed sections such as road cuts and clear farmland.
- This study did not include any ethnographic and oral historical studies, nor did it investigate the settlement history of the area.

3.2. CONSULTATIONS

Public consultations are being conducted by the project EAP and issues raised by Interested and Affected parties will be presented during project specialist integration meetings. Issues relating to heritage will be forwarded to the heritage specialist.

4 CULTURE HISTORY BACKGROUND OF THE PROJECT AREA

Stone Age Archaeology

South Africa has one of the longest sequences of human development in the world. The prehistory and history of South Africa span the entire known life span of human on earth. It is thus difficult to determine exactly where to begin, a possible choice could be the development of genus *Homo* millions of years ago. South African scientists have been actively involved in the study of human origins since 1925 when Raymond Dart identified the Taung child as an infant halfway between apes and humans. Dart called the remains *Australopithecus africanus*, southern ape-man, and his work ultimately changed the focus of human evolution from Europe and Asia to Africa, and it is now widely accepted that humankind originated in Africa (Robbins *et al.* 1998). In many ways this discovery marked the birth of palaeoanthropology as a discipline. Nonetheless, the earliest form of culture known in South Africa is the Stone Age. This prehistoric period during which humans widely used stone for toolmaking, stone tools were made from a variety of different sorts of stone. For example, flint and chert were shaped for use as cutting tools and weapons, while basalt and sandstone were used for ground stone. Stone Age can be divided into Early, Middle and Late; it is argued that there are two transitional periods. Noteworthy that the time frame used for Stone Age period is an approximate and differ from researcher to researcher (see Korsman & Meyer 1999, Mitchell 2002, Robbins *et al.* 1998)

Stone Age

Although a long history of research on the Early Stone Age period of southern Africa has been conducted (Mason 1962, Sampson 1974, Klein 2000, Chazan 2003), it remains a period where little is known about. These may be due to many factors which includes, though not limited to retrieval techniques used, reliance on secondary, at times unknown sources and the fact that few faunal remains from this period have been analysed (Chazan 2003). According to Robbins *et al.* (1998) the Stone Age is the period in human history when stone was mainly used to produce tools. This period began approximately 2.5 million years ago and ended around 20 000 years ago. During this period, human beings became the creators of culture and was basically hunters and gatherers, this era is identified by large stone artefacts.

The Middle Stone Age possibly began around 100 000 to about 200 000 years ago and extends up to around 35 000 years ago. This period is marked by smaller tools than in ESA and characterized by the production of food and the introduction of domestication of animals. Many MSA sites have evidence for control of fire, prior to this, rock shelters and caves would have been dangerous for human habitation due to predators. MSA people made a wide range of stone tools from both coarse- and fine-grained rock types. Sometimes the rocks used for tools were transported considerable distances, presumably in bags or other containers; as such tool assemblages from some MSA sites tend to lack some of the preliminary cores and contain predominantly finished products like flakes and retouched pieces.

Microlithic Later Stone Age period began around 35 000 and extend to the later 1800 AD. According to Deacon (1984), LSA is a period when human being refined small blade tools, conversely abandoning the prepared-core technique. Thus, refined artefacts such as convex-edge scrapers, borers and segments are associated with this period. Moreover, large quantity of art and ornaments were made during this period. The practitioners of the Late Stone Age as with Rock Art are ancestors of the Khoisan. A number of rock engravings have been reported in the vicinity of Lime Acres and Danielskuil north of the Vaal River and at Wildebeest Kuil 16 km west of Kimberley.

Iron Age

The Iron Age is the name given to the period of human history when metal was mainly used to produce artefacts. Recently, there has been a debate about the use of the name. Other archaeologists have argued that the word “Iron Age” is problematic and does not precisely explain the event of what happened in southern Africa, as such, the word farming communities has been proposed (Segobye 1998). Nonetheless, in South Africa this period can be divided into two phases. Early (200 - 1000 A.D) and Late Iron Age (1000 - 1850 A.D). Huffman (2007) has indicated that a Middle Iron Age (900 - 1300 A.D) should be included. According to Huffman (2007:361), until the 1960s and 1970s most archaeologists had not yet recognised a Middle Iron age. Instead, they began the Late Iron Age at AD 1000. The Middle Iron Age (AD 900–1300) is characterised by extensive trade between the Limpopo Confluence and the East Coast of Africa. This has been debated, with other researchers, arguing that the period should be restricted to Shashe-Limpopo Confluence.

4.1. CONTEMPORARY HERITAGE

Southern Africa was networked with the literate world for several centuries, but the period of written history in the study area corresponds to the arrival of white travellers, hunters, missionaries and adventurers from the Cape in the 1800s. Notable amongst them include PJ Truter’s, William Somerville, Robert Moffat, Andrew Smith and John Campbell. The first arrivals into the study area may be PJ Truter’s and William Somerville who in 1801 reached Dithakong at Kuruman (Pelser 2012). Some of later travellers into this area kept diaries that today form part of invaluable history about indigenous communities whom they travellers interacted with (see Figure 4). European explorers such as Dr. Hinrich Lichtenstein (in 1805) and Dr. Andrew Smith (in 1835) reached Kuruman and met Tswana-speaking people (Bergh 1999). It should be noted that most of the early African-colonial interaction in this area centred around the nearly two-century old London Mission Society station at Kuruman, established by James Read in 1817 but popularized by Robert Moffat and his wife, three years later. Since the arrival of the Moffats in 1820, the mission has been known as The Moffat Mission Station (Figure 4, plate 14).

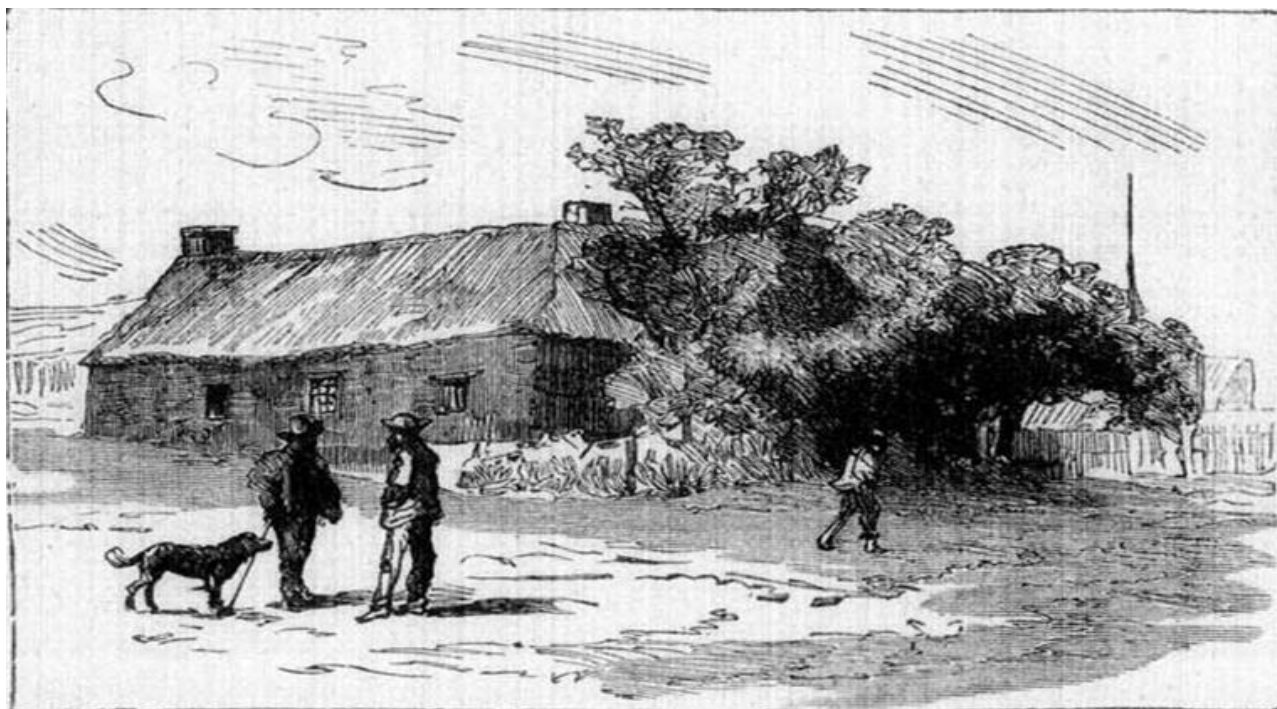


Plate 13: Photo 14: Photo A&B shows a drawing of the Old Mission House at Lattakoo which is now known as Kuruman (David J. Deane 2005. Robert Moffat: The Missionary Hero of Kuruman. March 16, 2005 [EBook #15379]<http://www.gutenberg.org/files/15379/15379->

Besides the isolated incursions by traders, hunters, and missionaries permanent and mass-movement of white settlers only took root in the late 1800s with the arrival of Dutch speaking farmers (Voortrekkers) who were protesting and escaping British rule in the Cape Colony (Ross 2002: 39). Yet even this incursion was not permanent yet because by 1897 most of them white settlers around the Kuruman River had moved away (Fourie 2013). It took the great drought of 1907 and 1908 for many farmers of the then Cape Colony to move into these areas along the edge of the Kalahari Desert in search of better grazing for their cattle (Smit 1966). Nonetheless, significant urban development in this area has been focused around the 'Eye' and the water course springing from it leading to the evolution of the town of Kuruman, from the late nineteenth century (Morris 2010). When in 1885 Britain declared a Protectorate over Bechuanaland and the Kalahari (on 23 March) and then divided the Protectorate was divided into two parts (on 30 September 1885), the area south of the Molopo (including the study area) became the Crown Colony of British Bechuanaland with its capital at Vryburg (Fourie 2013) (Tlou and Campbell 1997). Ten years later this area was included in the Cape Colony accordance to Act 31 of 1895 (Smit 1966) and the Lower Kuruman Native Reserves well as a few other so-called native reserves were established by virtue of Bechuanaland Proclamation No. 220 of 1895. The study area lies on the fringes of this Lower Kuruman Native Reserve.

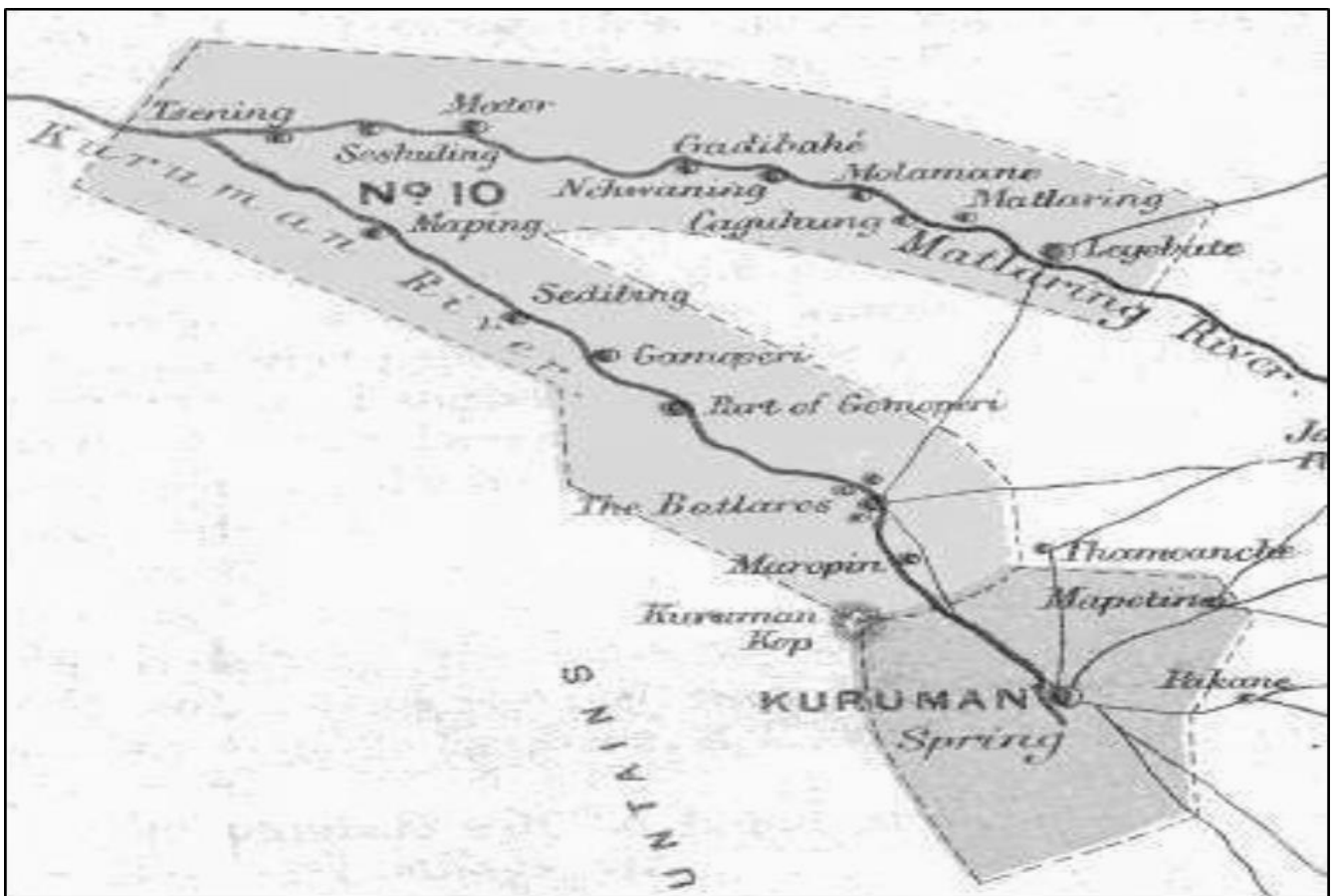


Figure 2: Map showing the original demarcation of the Lower Kuruman Native Reserve (Fourie 2013: 35)

Another impetus for the occupation of the Kuruman area was related to events that were ignited outside the African continent. Thus, when the First World War (1914-1918) broke out, and the South African Union Government joined the coalition forces and attacked German South West Africa (now Namibia). To sustain the Union troops along the way, a number of boreholes were sunk along the banks of the Kuruman River at places such as Eensaam, Kameelrus, Murray, Springputs and Van Zylsrus (Van der Merwe 1949; Smit 1966;). After the war, even more boreholes were sunk by the Department of Lands as opportunistic white farmers established themselves at these localities as borehole watchmen so that they could be allowed free grazing rights on the surrounding land (Smit 1966). All of this history produced heritage landmarks along the Kuruman River, but it is significant to note that none of these resources are located closer to the area of the proposed development. Parallel to the urban development is the history of manganese mining that the surrounding region is well known for today. Manganese is used in the manufacture of carbon steel and has been mined at such places as Hotazel and Black Rock (Fourie 2013). These mines are however, located out of the mining footprint and no mining heritage has been located within the proposed development site.

The town of Prieska developed from a place to which farmers migrated when the pans were full of water after rains. It attained municipal status in 1892. The name is derived from Korana and means “place of a lost she-goat”. The one industrial activity that is practised in the region on a commercial basis is the mining of copper at nearby Copperton. The history of the development of mining activities at Copperton is graphically described by Hocking (n.d.). Although the existence of copper on the farm Vogelstruisbult was known since the early 20th century, little was done to exploit it. It was only during the late 1960s that the potential importance of the deposit was realised, and a number of shafts were sunk: the Marais and Hutchings shafts. To house the workers at the mine a residential area was developed and named Copperton. The mine was closed down in 1991. An investigation of the Title Deeds of most of the farms under consideration indicated that they were surveyed during the latter part of the nineteenth century, implying that they would have been occupied since then. Kaffirskolk was first surveyed in 1891 and Platsjambok was surveyed and granted to G.F. Rens on 26 October 1882.

The archaeology of the Northern Cape is rich and varied covering long spans of human history. According to Morris (2010), the vicinity near Prieska includes well known Middle and Later Stone Age (LSA) sites along the Orange River, and a small shelter on Prieska Kop. Morris (2010) also documented surface scatters of mostly Later Stone Age and some Middle Stone Age tools during an assessment for a proposed new cemetery at Prieska. At Bundu near Copperton (about 60 west of Prieska), a series of dried-up deflated pans have been excavated by Kiberd (2002, 2006). Pans would have acted as focal points for grazing animals, but also a source of water. A complex series of sedimentary features and horizons in these pans may be broadly coeval with periods of climatic change in the region (Kiberd 2006). Archaeological material was recovered from throughout the sedimentary sequence. Large numbers of Later Stone Age tools occur on the surface of the pan and within the upper red sands and include micro-lithic tools, while below the red sands, Middle Stone Age (MSA) lithics mainly in quartzite, and preserved fauna were found. Early Stone Age (ESA) tools, preserved fauna and even the possible discovery of an ESA hearth, which may be older than 300 000 years, was also excavated. Kaplan (2010) also undertook an archaeological impact assessment of a proposed solar power farm near Copperton, where large numbers of Later and Middle Stone Age material were documented.

Mining History

Van Schalkwyk (2015a) refers briefly to the history of the development of mining activities at Copperton. Although the existence of copper on the farm Vogelstruisbult was known since the early 20th century, little was done to exploit

it. It was only during the late 1960s that the potential importance of the deposit was realised, and a number of shafts were sunk: the Marais and Hutchings shafts. To house the workers at the mine a residential area was developed and named Copperton. The mine was closed down in 1991 (Van Schalkwyk 2015a).

4.2. 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 is anticipated on the development footprint because most historical knowledge does not suggest a relationship with the study area per se, even though several other places in the general area such as Old Moffat Mission in Kuruman do have intangible heritage.

SAHRIS DATABASE AND IMPACT ASSESSMENT REPORTS IN THE PROPOSED PROJECT AREA

Previous heritage impact studies conducted in the general area identified artefacts associated with the Stone Age. The occurrences ranged from single artefact find spots (Dreyer 2004, Dreyer 2006, Rossouw 2015), to low or medium density artefact scatters (Van Schalkwyk 2015a, Van Schalkwyk 2015b). The occurrence of rock engravings on dolerite boulders was also identified in the CTS screening study for the SHA (2016). An engraving site along the road between Copperton and Van Wyksvlei was noted from a previous study. The rock art comprises scraped engravings of eland and ostrich as well as very recent (historical) images of horses with riders, a chariot and some writing (Van Schalkwyk 2015a). The occurrences ranged from single artefact find spots (Dreyer 2004, Dreyer 2006, Rossouw 2015), to low or medium density artefact scatters (Van Schalkwyk 2015a, Van Schalkwyk 2015b). The occurrence of rock engravings on dolerite boulders was also identified in the CTS screening study for the SHA (2016). An engraving site along the road between Copperton and Van Wyksvlei was noted from a previous study. The rock art comprises scraped engravings of eland and ostrich as well as very recent (historical) images of horses with riders, a chariot and some writing (Van Schalkwyk 2015a). Previous studies also identified a few isolated historical structures or farmsteads and graves or burial grounds that date to the historical period (Van Schalkwyk 2015a, Van Schalkwyk 2015b, CTS 2016). Mlilo (2018) identified sparse scatters of stone tools occurring as isolated finds mostly along streams which included cores, scrapers, flakes, and flake blades. Matenga (2017 d). During his Study on The Farm Viegulands Put 42 situated 25km to the west also straddling the R357 road from Douglas to Prieska identified MSA/LSA lithics were found to be widely distributed indicating general hunter-gatherer foraging activities. There was single occurrence of a hand axe which may date back to the Early Stone Age. There were buildings and a burial ground on the property both associated with the pioneer commercial farmers. De Cock, S & G Narainne. (2016) identified a spread of ESA and MSA stone artefacts across the study area for Humansrus Solar PV Facility 3 near Prieska.

Although Early Stone Age (ESA) artefacts have been recorded, these mainly consist of flakes and cores commonly based on quartzite cobbles, but formal ESA tools such as hand axes and cleavers are absent (Beaumont 2005, 2006 & 2007). An extensive surface scatter of small hand axes is supposed to occur approximately 10km upstream from Prieska (Beaumont 2007). It is possible that this is Fauresmith material, which is a transitional stone tool industry between the ESA and Middle Stone Age (MSA) (Nilsen 2012). The presence of stone artefacts representing this transitional Fauresmith industry and/or late phase of the Acheulian is frequently identified in the surrounding environment (Beaumont 2005 & 2008 and Rossouw 2007). Stone artefacts of MSA origin appear to be the most commonly occurring archaeological materials in the surrounding landscape (Beaumont 2005 & 2008, Dreyer 2005,

Morris 2009, 2010, 2011, 2012, Nilsen 2012, Rossouw 2007 and Van Ryneveld 2005 & 2006). Typically, the MSA material consists of isolated stone artefacts and low-density artefact scatters that include Levallois cores, flakes and blades with faceted or prepared platforms, and the dominant formal tools are irregular scrapers (Van Ryneveld 2006). Banded iron stone is the most commonly used raw material. Although stone artefacts of Later Stone Age (LSA) origins are reported to occur in the surrounding area, these seem to be less common than specimens of MSA age (Rossouw 2007 and Van Ryneveld 2005). Overall, Stone Age materials are scattered thinly over the modern land surface and to date, the Stone Age finds are considered to be of low to no archaeological significance (Morris 2009a, 2009b, 2010, 2011, 2012). This is due to the low frequencies of occurrences, temporally mixed assemblages, and the fact that artefacts are found in disturbed, derived and unstratified contexts. Kaplan 2011 identified scatters of MSA and LSA tools in the vicinity of Prieska.

5 RESULTS OF THE ARCHAEOLOGICAL/HERITAGE ASSESSMENT STUDY

The main cause of impacts to archaeological sites is direct, physical disturbance of the archaeological remains themselves and their contexts. It is important to note that the heritage and scientific potential of an archaeological site is highly dependent on its geological and spatial context. This means that even though, for example a deep excavation may expose buried archaeological sites and artefacts, the artefacts are relatively meaningless once removed from their original position. The severe impacts are likely to occur during clearance, and drilling, indirect impacts may occur during movement of construction equipment. Similarly, the clearing of access roads will impact material that lies buried in the surface sand. Since heritage sites, including archaeological sites, are non-renewable, it is important that they are identified, and their significance assessed prior to construction. It is important to note, that due to the localised nature of archaeological resources, that individual archaeological sites could be missed during the survey, although the probability of this is low within the proposed development site. Further, archaeological sites and unmarked graves may be buried beneath the surface and may only be exposed during construction. The purpose of this study is to assess the sensitivity of the area in terms of archaeology and to avoid or reduce the potential impacts of the proposed development by means of mitigation measures (see appended Chance Find Procedure). The study concludes that the impacts will be negligible since the proposed layout is spaced and smaller. The following section presents results of the archaeological and heritage survey conducted within the proposed development project site.

Table 2: Results of the archaeological and heritage survey

Heritage resource	Status/Findings
Buildings, structures, places and equipment of cultural significance	None recorded during the survey
Areas to which oral traditions are attached or which are associated with intangible heritage	None exists on the study area
Historical settlements and townscapes	None recorded on the study site
Landscapes and natural features of cultural significance	None
Archaeological sites	None recorded within the proposed development site
Graves and burial grounds	None recorded within the proposed development site must be protected/
Movable objects	None
Overall comment	Although no burial site was recorded within the proposed development site, there is potential to encounter unmarked graves.

5.1. ARCHAEOLOGICAL AND HERITAGE SITES

The proposed development site did not yield any confirmable archaeological sites or material. Previous studies such as Murimbika and Mlilo (2012) in the project area did not record any confirmable archaeological remains. Based on the field study results and field observations, it is the considered opinion of the author that the receiving environment for the proposed BESS site (including associated infrastructure) is medium to high potential to yield previously unidentified archaeological sites during construction.

5.2. BUILDINGS AND STRUCTURES OLDER THAN 60 YEARS

The study did not identify any buildings or structures which are more than 60 years old. As such proposed substation extension does not trigger Section 34 of the NHRA which protects buildings and structures that are older than 60 years.

5.3. 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 because 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 study did not identify any graves or burial sites within the proposed development site however, the possibility of encountering previously unidentified burial sites is low within the proposed development site, 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).

5.4. SIGNIFICANCE VALUATION FOR BURIAL GROUND, HISTORIC CEMETERIES, AND INDIVIDUAL GRAVES

The significance of burial grounds and gravesites is closely tied to their age and historical, cultural, and social context. Nonetheless, every burial should be considered as of high socio-cultural significance protected by practices, a series of legislations, and municipal ordinances.

5.5. PUBLIC MONUMENTS AND MEMORIALS

The survey did not identify any historical monument and public memorials within the proposed development site. There are no monuments or plaques within the proposed development site that are on the National Heritage or provincial List. The proposed BESS site (including associated infrastructure) will not impact on any listed monuments and memorials in the project area.

5.6. BATTLE FIELDS

No known battles or skirmishes associated with the Anglo-Boer war and the struggle against apartheid were fought on the proposed development site.

5.7. ARCHAEO-METALLURGY, PREHISTORIC MINING AND MINING HERITAGE

There are historical and current mining activities in the entire Northern Cape Province, however none are located on the proposed development site.

5.8. PALAEOLOGY

The study site is underlain by the sedimentary deposits of the Gordonia Formation of the Kalahari Group. These sediments have been deposited between the Late Cretaceous until Recent and is characterised by fluvial gravels, sands, lacustrine and pan mudrocks, diatomites and diatomaceous limestones, evaporites, consolidated to unconsolidated aeolian sands and pedocretes (especially calcrete) (Almond & Pether, 2009). The region is considered by SAHRA as having a Moderate Palaeontological Sensitivity (Fig. 3). The Gordonia Formation may contain fossil spores and pollen, root casts and burrows (such as termitaria), rare vertebrate remains (mammals, fish, ostrich eggshell etc.), diatoms, freshwater stromatolites, freshwater and terrestrial mollusc shells, ostracods and charophytes (Almond & Pether, 2009). None of these fossils have been reported from the study site.

5.9. MITIGATION

Mitigation is not required for this site. The proposed development may proceed without further studies and heritage mitigation. However, construction teams must be inducted on how to identify heritage resources during construction and the reporting procedure in accordance with the appended Chance find procedure.

6 CUMMULATIVE IMPACTS

Cumulative impacts are defined 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 development is considered the total impact associated with the proposed substation extension 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 development project was undertaken during the preparation of this report. The total impact arising from the proposed project (under the control of the applicant), 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 development 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 agricultural activities where baselines have already been affected, the proposed substation extension will contribute to already existing impacts in the region, 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. There are existing infrastructure developments and agriculture activities within the proposed development site. As such increased development in the project area will have 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 within and outside the proposed development site given that archaeological remains occur on the surface. Cumulative impacts that could result from a combination of the proposed development 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 as well as 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. As such, construction workers may not see these resources, which results in increased risk of resource damage and/or loss.

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. Sites of archaeological significance were identified, and cumulative effects are 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 surface archaeological remains. Allowing the impact of the proposed construction to go beyond the surveyed area would result in a significant negative cumulative impact on sites outside the surveyed area. A significant cumulative impact that needs attention is related to stamping by especially construction vehicles during construction. Movement of heavy construction equipment must be monitored to ensure they do not drive beyond the approved sites. 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/equipment are not monitored to avoid driving through undetected heritage resources.

7 ASSESSMENT OF SIGNIFICANCE

7.1. The significance of the impacts will be assessed considering the following descriptors:

Table 3: Criteria Used for Rating of Impacts

Nature of the impact (N)		
Positive	+	Impact will be beneficial to the environment (a benefit).
Negative	-	Impact will not be beneficial to the environment (a cost).
Neutral	0	Where a negative impact is offset by a positive impact, or mitigation measures, to have no overall effect.
Magnitude(M)		
Minor	2	Negligible effects on biophysical or social functions / processes. Includes areas / environmental aspects which have already been altered significantly and have little to no conservation importance (negligible sensitivity*).
Low	4	Minimal effects on biophysical or social functions / processes. Includes areas / environmental aspects which have been largely modified, and / or have a low conservation importance (low sensitivity*).
Moderate	6	Notable effects on biophysical or social functions / processes. Includes areas / environmental aspects which have already been moderately modified and have a medium conservation importance (medium sensitivity*).
High	8	Considerable effects on biophysical or social functions / processes. Includes areas / environmental aspects which have been slightly modified and have a high conservation importance (high sensitivity*).
Very high	10	Severe effects on biophysical or social functions / processes. Includes areas / environmental aspects which have not previously been impacted upon and are pristine, thus of very high conservation importance (very high sensitivity*).
Extent (E)		
Site only	1	Effect limited to the site and its immediate surroundings.
Local	2	Effect limited to within 3-5 km of the site.
Regional	3	Activity will have an impact on a regional scale.
National	4	Activity will have an impact on a national scale.
International	5	Activity will have an impact on an international scale.
Duration (D)		
Immediate	1	Effect occurs periodically throughout the life of the activity.
Short term	2	Effect lasts for a period 0 to 5 years.
Medium term	3	Effect continues for a period between 5 and 15 years.
Long term	4	Effect will cease after the operational life of the activity either because of natural process or by human intervention.
Permanent	5	Where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.
Probability of occurrence (P)		
Improbable	1	Less than 30% chance of occurrence.

Low	2	Between 30 and 50% chance of occurrence.
Medium	3	Between 50 and 70% chance of occurrence.
High	4	Greater than 70% chance of occurrence.
Definite	5	Will occur, or where applicable has occurred, regardless or in spite of any mitigation measures.

Once the impact criteria have been ranked for each impact, the significance of the impacts will be calculated using the following formula:

$$\text{Significance Points (SP)} = (\text{Magnitude} + \text{Duration} + \text{Extent}) \times \text{Probability}$$

The significance of the ecological impact is therefore calculated by multiplying the severity rating with the probability rating. The maximum value that can be reached through this impact evaluation process is 100 SP (points). The significance for each impact is rated as High (SP \geq 60), Medium (SP = 31-60) and Low (SP<30) significance as shown in the below.

Table 4: Criteria for Rating of Classified Impacts

Significance of predicted NEGATIVE impacts		
Low	0-30	Where the impact will have a relatively small effect on the environment and will require minimum or no mitigation and as such have a limited influence on the decision
Medium	31-60	Where the impact can have an influence on the environment and should be mitigated and as such could have an influence on the decision unless it is mitigated.
High	61-100	Where the impact will definitely have an influence on the environment and must be mitigated, where possible. This impact will influence the decision regardless of any possible mitigation.
Significance of predicted POSITIVE impacts		
Low	0-30	Where the impact will have a relatively small positive effect on the environment.
Medium	31-60	Where the positive impact will counteract an existing negative impact and result in an overall neutral effect on the environment.
High	61-100	Where the positive impact will improve the environment relative to baseline conditions.

Table 5: Operational Phase

Impacts and Mitigation measures relating to the proposed project during Operational Phase														
Activity/Aspect	Impact /	Aspect	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures	Magnitude	Extent	Duration	Probability	Significance after mitigation
Clearing and construction	Destruction of archaeological remains	Cultural heritage	-	4	2	4	2	20	<ul style="list-style-type: none"> Use chance find procedure to cater for accidental finds 	4	2	2	2	16
	Disturbance of graves	Cultural heritage	-	4	2	4	2	20	<ul style="list-style-type: none"> Mitigation not required 	6	2	4	3	4
	Disturbance of buildings and structures older than 60 years old	Operational	-	4	1	2	2	14	<ul style="list-style-type: none"> None required 	4	1	2	2	14
Movement of equipment	Destruction public monuments and plaques	Operational	-	2	1	1	1	4	<ul style="list-style-type: none"> Mitigation is not required because there are no public monuments within the mining right application site 	2	1	1	4	4

Based on the results of the Impact Assessment Matrix the proposed development site is viable from a heritage perspective.

8 STATEMENT OF SIGNIFICANCE

8.1. AESTHETIC VALUE

The aesthetic values of the AIA Study Area and the overall project area are contained in the valley bushveld environment and landscape typical of this part of the Northern Cape Province. The visual and physical relationship between AIA study area and the surrounding historical Cultural Landscape demonstrates the connection of place to the local and oral historical stories of the African communities who populated this region going back into prehistory.

The proposed development site will be situated within an environment and associated cultural landscape, which, although developed by existing settlements, remains representative of the original historical environment and cultural landscape of this part of Northern Cape. The local communities consider the project area a cultural landscape linked to their ancestors and history. However, the proposed substation extension will not alter this aesthetic value in any radical way since the site is small and located within the existing substation site.

8.2. HISTORIC VALUE

The Indigenous historic values of the Site of Interest and overall study area are contained in the claim of possible historic homesteads being located on the affected area. The history of generations of the KhoiSan clans is tied to this geographical region. Such history goes back to the pre-colonial period, through the colonial era, the colonial wars and subsequent colonial rule up to modern-day Northern Cape Province.

8.3. SCIENTIFIC VALUE

Past settlements and associated roads and other auxiliary infrastructure developments and disturbance within the HIA Study Area associated with the proposed development site has resulted in limited intact landscape with the potential to retain intact large scale or highly significant open archaeological site deposits.

8.4. SOCIAL VALUE

The project sites fall within a larger and an extensive cultural landscape that is integrated with the wider inland. The overall area has social value for the local community, as is the case with any populated landscape. Literature review suggests that social value of the overall project area is also demonstrated through local history which associates the area with the coming of European missionaries, explorers and colonialists and the African struggle against settler colonialism in the second half of the 1800s and at the end of the 1800s, the colonial wars of resistance, the century long struggle for democracy that followed colonial subjugation. Several generations of communities originate from the project area and continue to call it home. As such, they have ancestral ties to the area. The land also provides the canvas upon which daily socio-cultural activities are painted. All these factors put together confirms the social significance of the project area. However, this social significance is unlikely to be negatively impacted by the proposed development especially given the fact that the development will add value to the human settlements and activities already taking place. Some sections of development site are covered by thick bushes and vegetation retains social value as sources of important herbs and traditional medicines. As such, they must be considered as significant social value sites.

9 DISCUSSION

Several Phase 1 Heritage studies for various infrastructure developments and mining developments were conducted since 2006. Desktop research revealed that the project area is rich in LIA sites (Morris 2009, 2010, 2011, 2012, Ryneveld 2007, 2005 and Miilo 2018a, and 2018b). In terms of the archaeology and heritage in respect of the proposed development site, there are no obvious 'Fatal Flaws' or 'No-Go' areas. However, the potential for chance finds, remains and the applicant and contractors are advised to be diligent and observant during construction of the land site. The Stone Age record contains material spanning the Early, Middle and Later Stone Age periods and rock engravings are relatively common and were also recorded in the general project (Morris 2009a, 2009b, 2010, 2011 and Van Ryneveld 2007, 2008, 2009, Nilsen 2012). Acheulian and LSA collections from Douglas and Hopetown are housed in the Iziko and McGregor Museums (Beaumont 2006). Stone artefacts are made in a variety of raw materials including banded iron stone, andesite, quartzite, dolerite and hornfels, but banded ironstone is notably the most common (Beaumont 2005, 2006, 2007 & 2008 and Rossouw 2007).

Although Early Stone Age (ESA) artefacts have been recorded, these mainly consist of flakes and cores commonly based on quartzite cobbles, but formal ESA tools such as hand axes and cleavers are absent (Beaumont 2005, 2006 & 2007). An extensive surface scatter of small hand axes is supposed to occur approximately 10km upstream from Prieska (Beaumont 2007). It is possible that this is Fauresmith material, which is a transitional stone tool industry between the ESA and Middle Stone Age (MSA) (Nilsen 2012). The presence of stone artefacts representing this transitional Fauresmith industry and/or late phase of the Acheulian is frequently identified in the surrounding environment (Beaumont 2005 & 2008 and Rossouw 2007). Stone artefacts of MSA origin appear to be the most commonly occurring archaeological materials in the surrounding landscape (Beaumont 2005 & 2008, Dreyer 2005, Morris 2009, 2010, 2011, 2012, Nilsen 2012, Rossouw 2007 and Van Ryneveld 2005 & 2006). Typically, the MSA material consists of isolated stone artefacts and low-density artefact scatters that include Llevantian cores, flakes and blades with faceted or prepared platforms, and the dominant formal tools are irregular scrapers (Van Ryneveld 2006). Banded iron stone is the most commonly used raw material. Although stone artefacts of Later Stone Age (LSA) origin is reported to occur in the surrounding area, these seem to be less common than specimens of MSA age (Rossouw 2007 and Van Ryneveld 2005). Overall, Stone Age materials are scattered thinly over the modern land surface and to date, the Stone Age finds are of low to no archaeological significance (Morris 2009a, 2009b, 2010, 2011, 2012). This is due to the low frequencies of occurrences, temporally mixed assemblages, and the fact that artefacts are found in disturbed, derived and unstratified contexts.

10 RECOMMENDATIONS

The study did not find any permanent barriers to the proposed substation extension. It is the considered opinion of the author that the proposed development may proceed from a heritage resources management perspective, if mitigation measures are implemented if and when required. The following recommendations are based on the results of the AIA/HIA research, cultural heritage background review, site inspection and assessment of significance.

- The proposed development and associated infrastructure may be approved to proceed as planned under observation that project work does not extend beyond the surveyed site.
- Should any unmarked burials be exposed during construction, potential custodians must be trekked, consulted and relevant rescue/ relocation permits must be obtained from SAHRA and or Department of Health 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, 1999 (Act No.25 of 1999).
- Should chance archaeological materials or human burial 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 NHRA regulations.
- Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of the project EMP, there are no other 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 here in made.
- If during construction, operational or closure phases of this project, any person employed by the applicant, 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 site manager.
- The 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 Eskom environmental practitioner who will ensure that the right steps are being followed, i.e notifying SAHRA and an archaeologist contacted.
- If archaeological materials are unearthed, all construction activities within a radius of at least 20m of such indicator should cease and the area be demarcated by a danger tape. Accordingly, Eskom Environmental Practitioner should immediately contact a professional archaeologist and inform SAHRA.
- It is the responsibility of the applicant to protect the site from publicity (i.e., media) until a mutual agreement is reached.
- Noteworthy that any measures to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement by SAHRA
- The applicant is reminded that unavailability of archaeological materials (e.g., stone tools and graves, etc) and fossils does not mean they do not occur, archaeological material might be hidden underground, and as such the client is reminded to take precautions during construction.

- The footprint impact of the proposed construction activities should be kept to minimal to limit the possibility of encountering chance finds within the proposed development site.
- Overall, impacts to heritage resources are not considered to be significant for the project receiving environment. It is thus concluded that the project may be cleared to proceed as planned subject to the Heritage Authority ensuring that detailed heritage monitoring procedures are included in the project EMP for the construction phase, include chance archaeological finds mitigation procedure in the project EMP (See Appendix 1).
- The chance finds process will be implemented when necessary, especially when archaeological materials and burials are encountered during subsurface construction activities.
- The findings of this report, with approval of the SAHRA, may be classified as accessible to any interested and affected parties within the limits of the laws.

11 CONCLUDING REMARKS

The literature review and field surveys confirmed that the project area is situated within a contemporary cultural landscape dotted with settlements, stock and game farming as well mining establishments around Prieska town. The study did not record any significant heritage resources within the proposed development site. In terms of the archaeology and heritage in respect of the proposed development site, there are no obvious 'Fatal Flaws' or 'No-Go' areas. However, the potential for chance finds remains and the applicant and contractors are advised to be diligent and observant during construction, should construction activities commence on the site. The procedure for reporting chance finds has clearly been laid out (see Appendix 3). This report concludes that the proposed development may be approved by SAHRA to proceed as planned subject to recommendations herein made and heritage monitoring plan being incorporated into the EMP (also see Appendices). The mitigation measures are informed by the results of the AIA/HIA study and principles of heritage management enshrined in the NHRA, Act 25 of 1999.

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APPENDIX 1: CHANCE FIND PROCEDURE FOR THE PROPOSED SUBSTATION EXTENSION IN SIYATHEMBA LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE.

April 2021

ACRONYMS

BGG	Burial Grounds and Graves
CFPs	Chance Find Procedures
ECO	Environmental Control Officer
HIA	Heritage Impact Assessment
ICOMOS	International Council on Monuments and Sites
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
SAHRA	South African Heritage Resources Authority
SAPS	South African Police Service
UNESCO	United Nations Educational, Scientific and Cultural Organisation

CHANCE FIND PROCEDURE

Introduction

An Archaeological Chance Find Procedure (CFP) is a tool for the protection of previously unidentified cultural heritage resources during construction and mining. The main purpose of a CFP is to raise awareness of all construction, mine workers and management on site regarding the potential for accidental discovery of cultural heritage resources and establish a procedure for the protection of these resources. Chance Finds are defined as potential cultural heritage (or paleontological) objects, features, or sites that are identified outside of or after Heritage Impact studies, normally as a result of construction monitoring. Chance Finds may be made by any member of the project team who may not necessarily be an archaeologist or even visitors. Appropriate application of a CFP on development projects has led to discovery of cultural heritage resources that were not identified during archaeological and heritage impact assessments. As such, it is considered to be a valuable instrument when properly implemented. For the CFP to be effective, the site manager must ensure that all personnel on the proposed mining development site understand the CFP and the importance of adhering to it if cultural heritage resources are encountered. In addition, training or induction on cultural heritage resources that might potentially be found on site should be provided. In short, the Chance find procedure details the necessary steps to be taken if any culturally significant artefacts are found during construction.

Definitions

In short, the term 'heritage resource' includes structures, archaeology, meteors, and public monuments as defined in the South African National Heritage Resources Act (Act No. 25 of 1999) (NHRA) Sections 34, 35, and 37. Procedures specific to burial grounds and graves (BGG) as defined under NHRA Section 36 will be discussed separately as this require the implementation of separate criteria for CFPs.

Background

The proposed development site is located on the Remaining Extent of portion 2 of Farm East 270 within Siyathemba Local Municipality, Northern Cape Province the development site is subject to heritage survey and assessment at planning stage in accordance with the NHRA. These surveys are based on surface indications alone and it is therefore possible that sites or significant archaeological remains can be missed during surveys because they occur beneath the surface. These are often accidentally exposed during construction or any associated construction work and hence the need for a Chance Find Procedure to deal with accidental finds. In this case an extensive Archaeological Impact Assessment was completed by T. Mlilo (2021) on the proposed development site. The AIA/HIA conducted was very comprehensive covering the entire site.

Purpose

The purpose of this Chance Find Procedure is to ensure the protection of previously unrecorded heritage resources along the proposed project site. This Chance Find Procedure intends to provide the applicant and contractors with appropriate response in accordance with the NHRA and international best practice. The aim of this CFP is to avoid or reduce project risks that may occur as a result of accidental finds whilst considering international best practice. In addition, this document seeks to address the probability of archaeological remains finds and features becoming accidentally exposed during digging of foundations and movement of construction equipment. The proposed construction activities have the potential to cause severe impacts on significant tangible and intangible cultural heritage resources buried beneath the surface or concealed by tall grass cover. Integrated Specialist Services and Environmental Consultants developed this Chance Find Procedure to define the process which govern the management of Chance Finds during construction. This ensures that appropriate treatment of chance finds while also minimizing disruption of the construction schedule. It also enables compliance with the NHRA and all relevant regulations. Archaeological Chance Find Procedures are to promote preservation of archaeological remains while minimizing disruption of construction scheduling. It is recommended that due to the low to moderate archaeological potential of the project area, all site personnel and contractors be informed of the Archaeological Chance Find procedure and have access to a copy while on site. This document has been prepared to define the avoidance, minimization and mitigation measures necessary to ensure that negative impacts to known and unknown archaeological remains as a result of project activities and are prevented or where this is not possible, reduced to as low as reasonably practical during construction and mining.

Thus, this Chance Finds Procedure covers the actions to be taken from the discovering of a heritage site or item to its investigation and assessment by a professional archaeologist or other appropriately qualified person to its rescue or salvage.

CHANCE FIND PROCEDURE

General

The following procedure is to be executed in the event that archaeological material is discovered:

- All construction/clearance activities in the vicinity of the accidental find/feature/site must cease immediately to avoid further damage to the find site.
- Briefly note the type of archaeological materials you think you have encountered, and their location, including, if possible, the depth below surface of the find
- Report your discovery to your supervisor or if they are unavailable, report to Eskom Environmental Practitioner who will then inform the ECO and everyone else necessary for further instructions.

- If the supervisor is not available, notify the Eskom Environmental Practitioner immediately. The Environmental Control Officer will then report the find to the Site Manager who will promptly notify the project archaeologist and SAHRA.
- Delineate the discovered find/ feature/ site and provide 25m buffer zone from all sides of the find.
- Record the find GPS location, if able.
- All remains are to be stabilised *in situ*.
- Secure the area to prevent any damage or loss of removable objects.
- Photograph the exposed materials, preferably with a scale (a yellow plastic field binder will suffice).
- The project archaeologist will undertake the inspection process in accordance with all project health and safety protocols under direction of the Health and Safety Officer.
- **Finds rescue strategy:** All investigation of archaeological soils will be undertaken by hand, all finds, remains and samples will be kept and submitted to a Museum as required by the heritage legislation. If any artefacts need to be conserved, the relevant permit will be sought from the SAHRA.
- An on-site office and finds storage area will be provided, allowing storage of any artefacts or other archaeological material recovered during the monitoring process.
- In the case of human remains, in addition to the above, the SAHRA Burial Ground Unit will be contacted and the guidelines for the treatment of human remains will be adhered to. If skeletal remains are identified, an archaeological will be available to examine the remains.
- The project archaeologist will complete a report on the findings as part of the permit application process.
- Once authorisation has been given by SAHRA, the Applicant will be informed when construction activities can resume.

Management of chance finds

Should the Heritage specialist conclude that the find is a heritage resource protected in terms of the NRHA (1999) Sections 34, 36, 37 and NHRA (1999) Regulations (Regulation 38, 39, 40), ISS will notify SAHRA and/or PHRA on behalf of the applicant. SAHRA/PHRA may require that a search and rescue exercise be conducted in terms of NHRA Section 38, this may include rescue excavations, for which ISS will submit a rescue permit application having fulfilled all requirements of the permit application process.

In the event that human remains are accidentally exposed, SAHRA Burial Ground Unit or ISS Heritage Specialist must immediately be notified of the discovery in order to take the required further steps:

- a. Heritage Specialist to inspect, evaluate and document the exposed burial or skeletal remains and determine further action in consultation with the SAPS and Traditional authorities:

- b. Heritage specialist will investigate the age of the accidental exposure in order to determine whether the find is a burial older than 60 years under the jurisdiction of SAHRA or that the exposed burial is younger than 60 years under the jurisdiction of the Department of Health in terms of the Human Tissue Act.
- c. The local SAPS will be notified to inspect the accidental exposure in order to determine where the site is a scene of crime or not.
- d. Having inspected and evaluated the accidental exposure of human remains, the project Archaeologist will then track and consult the potential descendants or custodians of the affected burial.
- e. The project archaeologist will consult with the traditional authorities, local municipality, and SAPS to seek endorsement for the rescue of the remains. Consultation must be done in terms of NHRA (1999) Regulations 39, 40, 42.
- f. Having obtained consent from affected families and stakeholders, the project archaeologist will then compile a Rescue Permit application and submit to SAHRA Burial Ground and Graves Unit.
- g. As soon as the project archaeologist receives the rescue permit from SAHRA he will in collaboration with the company/contractor arrange for the relocation in terms of logistics and appointing of an experienced undertaker to conduct the relocation process.
- h. The rescue process will be done under the supervision of the archaeologist, the site representative and affected family members. Retrieval of the remains shall be undertaken in such a manner as to reveal the stratigraphic and spatial relationship of the human skeletal remains with other archaeological features in the excavation (e.g., grave goods, hearths, burial pits, etc.). A catalogue and bagging system shall be utilised that will allow ready reassembly and relational analysis of all elements in a laboratory. The remains will not be touched with the naked hand; all Contractor personnel working on the excavation must wear clean cotton or non-powdered latex gloves when handling remains in order to minimise contamination of the remains with modern human DNA. The project archaeologist will document the process from exhumation to reburial.
- i. Having fulfilled the requirements of the rescue/burial permit, the project archaeologist will compile a mitigation report which details the whole process from discovery to relocation. The report will be submitted to SAHRA and to the company.

Note that the relocation process will be informed by SAHRA Regulations and the wishes of the descendants of the affected burial.

Appendix 1: Heritage Management Plan Input into the Substation Construction EMP

Objective	<ul style="list-style-type: none"> • 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
Pre-Construction Phase								
1	Planning	No sites of cultural, archaeological, and historical significance were identified on site.	N/A	When necessary	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 from 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 the Eskom Environmental Practitioner who will take the right steps		When necessary	C CECO	SM	ECO	EA EM PM
		Should any remains be found on site that is potentially human remains, the PHRA 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.						

Appendix 2: Heritage mitigation measures 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.	<p>Possible damage to previously unidentified archaeological and burial sites during construction phase.</p> <ul style="list-style-type: none"> • 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 <p>Loss of intangible heritage value due to change in land use</p>	<p>In situations where unpredicted impacts occur construction activities must be stopped, and the heritage authority should be notified immediately.</p> <p>Where remedial action is warranted, minimize disruption in construction scheduling while recovering archaeological data. Where necessary, implement emergency measures to mitigate.</p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Contractor / • Project Manager • Archaeologist • Project EO 	Fine and or imprisonment under the NHRA	<p>Monitoring measures should be issued as instruction within the project EMP.</p> <p>PM/EO/Archaeologists Monitor construction work on sites where such development projects commence within the farm.</p>

Appendix 3: Legal background 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.