PHASE 1 HIA FOR THE PROPOSED INSTALLATION OF 19.5 MW GAS TURBINES AND A BATTERY ENERGY STORAGE SYSTEM (BESS) ON THE REMAINING EXTENT OF THE FARM VETLAAGTE 4 WITHIN EMTHANJENI LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE.

Trust Mlilo
Integrated Specialist Services (Pty) Ltd (ISS)

OCTOBER 2020

DOCUMENT SYNOPSIS (EXECUTIVE SUMMARY)

Item	Description
Proposed development and location	Proposed installation of 19.5 MW Gas Turbines and a Battery Energy Storage System (BESS) on the remaining extent of the Farm Vetlaagte 4 within Emthanjeni Local Municipality, Northern Cape Province.
Purpose of the study	The Phase 1 Heritage Impact Assessment is to determine the presence of cultural heritage sites and the impact of the proposed project on these resources within the area demarcated for development
1:50 000 Topographic Map	2723 CA
Municipalities	Emthanjeni Local Municipality.
Predominant land use of surrounding area	Power generation and reticulation infrastructure, Mining and agriculture
EAP	Sativa Travel and Environmental Consultants (Pty) Ltd Constantia Park, Building 16-2, 546, 16th Road, Midrand, 1685 Cell: 0716859247 Fax: 086 652 9774 E-mail: info@sativatec.co.za
Authors	Trust Mlilo
Date of Report	15 October 2020

This report serves to inform and guide the applicant and contractors about the possible impacts that the proposed power generation development may have on heritage resources (if any) located in the study area. In the same light, the document must also inform the 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, a development such as this requires pre-development archaeology and heritage assessment by a competent heritage practitioner to identify, record and if necessary, salvage the irreplaceable heritage resources that may be impacted upon by the proposed development. In compliance with these laws, Sativa Travel and Environmental Consultants (Pty) Ltd (STEC) retained Integrated Specialist Services (Pty) Ltd (ISS) to conduct a Phase 1 Archaeological and Heritage Impact Assessment (AIA/HIA) of the proposed power generation development. Desktop studies, drive-throughs, and fieldwalking were conducted to identity heritage landmarks within the proposed power generation sites. The study site is not on pristine ground, having seen significant transformations owing to previous agriculture activities and high voltage powerlines that Criss cross the project area (see Figure 1). The study identified isolated MSA lithic tools within the proposed development site. In terms of built environment, there is a farmhouse which is older than 60 years, however, the historical farmhouse is outside the sites considered for this study. There is also a historical grave associated with the farmhouse (Kruger 2014). Besides, sub-surface archaeological material and unmarked graves may still exist and when encountered during construction, work must be stopped forth-with and the finds must be reported to the South African Heritage Resource Agency (SAHRA) or the heritage practitioner. This report must also be submitted to the SAHRA for review.

The report makes the following observations:

- The findings of this report have been informed by desktop data review especially (Kruger 2014), field survey, and impact assessment reporting which include recommendations to guide heritage authorities in making decisions with regards to the proposed power generation development.
- Most sections of the project area are accessible, and the field survey was effective enough to cover significant sections of the development site.
- Some sections of the proposed development site are severely degraded due to stamping by domestic animals.

The report sets out the potential impacts of the proposed power generation development on heritage matters and recommends appropriate safeguard and mitigation measures that are designed to reduce the impacts where appropriate. The Report makes the following recommendations:

- Construction teams must be inducted on the possibility of encountering archaeological resources that may be accidentally exposed during construction before the commencement of work on the site to ensure appropriate mitigation measures and that course of action is afforded to any chance finds.
- If archaeological materials are uncovered, work must cease immediately and the SAHRA be notified and activity should not resume until appropriate management provisions are in place.
- 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 legislation.

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

NATIONAL LEGISLATION AND REGULATIONS GOVERNING THIS REPORT

This is a specialist report' 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 Applicant and their consultants and that all opinions expressed in this document are substantially my own, even though I have received fair remuneration from the client for preparation of this report.

Expertise:

Trust Mlilo, Ph.D. *cand* (Wits), MA. (Archaeology), BA Hons, PDGE and BA & (Univ. of Pretoria) ASAPA (Professional affiliation member), and more than 15 years of experience in archaeological and heritage

impact assessment and management. Mlilo is an accredited member of the Association for Southern African Professional Archaeologists (ASAPA), KwaZulu Natal Amafa and Research Institute, and Eastern Cape Heritage Resources Agency (ECPHRA). He has conducted more than a 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 the government, parastatals (Eskom), and several private companies such as BHP Billiton and Rhino Minerals.

Independence

The views expressed in this document are the objective, independent views of Mr Trust Mlilo and the survey was carried out under Sativa Travel and Environmental Consultants (Pty) Ltd (STEC), Integrated Specialists Services (Pty) Ltd (ISS) has no business, personal, financial, or other interest in the proposed development apart from fair remuneration for the work performed.

Conditions relating to this report

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

This report must not be altered or added to without the prior written consent of the author and STEC (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 the 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 South African Heritage Resources Agency (SAHRA)

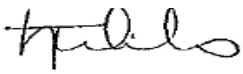
Geographic Co-ordinate Information**:** Geographic co-ordinates in this report were obtained using a hand-held Garmin Global Positioning System device. The manufacturer states that these devices are accurate to within +/- 5 m.

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

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

The Archaeological and Heritage Impact Assessment Study was carried out within the context of tangible and intangible cultural heritage resources as defined by the SAHRA Regulations and Guidelines as to the authorisation of proposed Gas Turbines and a Battery Energy Storage System (BESS) being proposed by the applicants.

Signed by



13/ 10/ 2020

ACKNOWLEDGEMENTS

The author acknowledges Sativa Travel and Environmental Consultants (Pty) Ltd for their assistance with project information, and the associated project Background Information Document (BID) as well as responding to technical queries related to the project.

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ABBREVIATIONS

AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
EIA	Environmental Impact Assessment
EIA	Early Iron Age *(EIA refers to both Environmental Impact Assessment and the Early Iron Age but, in both cases, the acronym is internationally accepted. This means that it must be read and interpreted within the context in which it is used.)*
EIAR	Environmental Impact Assessment Report
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
ICOMOS	International Council of Monuments and Sites
LIA	Late Iron Age
LSA	Late Stone Age
MIA	Middle Iron Age
MSA	Middle Stone Age
NEMA	National Environmental Management Act 107 of 1998
NHRA	National Heritage Resources Act 25 of 1999
SAHRA	South African Heritage Resources Agency
STEC	Sativa Travel and Environmental Consultancy
ToR	Terms of Reference

KEY CONCEPTS AND TERMS

Periodization

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

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

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

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

Early Iron Age (~ AD 200 to 1000)

Late Iron Age (~ AD1100-1840)

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

Definitions

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

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

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

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

Assumptions and disclaimer

The investigation has been influenced by the unpredictability of buried archaeological remains (absence of evidence does not mean evidence of absence) and the difficulty in establishing intangible heritage values. It should be remembered that archaeological deposits (including graves and traces of mining heritage) usually occur below the ground level. Should artefacts or skeletal material be revealed within the proposed Gas Turbines and a Battery Energy Storage System (BESS) site during construction, such activities should be halted immediately, and a competent heritage practitioner and 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. STEC assumes no responsibility for compliance with conditions that may be required by SAHRA in terms of this report.

1. INTRODUCTION

Integrated Specialist Services (Pty) Ltd was tasked by Sativa Travel and Environmental Consultants (Pty) Ltd. to carry out a Phase 1 AIA/ HIA for the proposed installation of 19.5 MW Gas Turbines and a Battery Energy Storage System (BESS) on each Portion (facility) of the remaining extent of the Farm Vetlaagte 4 within Emthanjeni Local Municipality, Northern Cape Province. Each site currently holds a positive Environmental authorization for the establishment of a Solar PV park. Portions A, B, C, & F are authorized to generate up to 75 MW electricity from Solar PV panels while Portion G is authorized for 30 MW. The proposed power generation development is gazetted in terms of section 38 (1) of the NHRA (See Figure 1). The overall purpose of this heritage report is to identify, assess any heritage resources that may be located in the study area, and evaluate the positive and negative impacts of the proposed power generation project on these resources to make recommendations for their appropriate management. To achieve this, we conducted background research of published literature, maps, and databases (desktop studies) which was then followed by ground-truthing by means of drive-through surveys and field walking. Desktop studies revealed that the general project area is rich in the Late Stone Age (LSA) and historical sites such as historical diamond mining sites and farmsteads. It should be noted that while heritage resources may have been located in the entire study area agriculture and transmission powerlines might have either obliterated these materials or reduced them to isolated finds that can only be identified as chance finds during construction. The power generation development may be permitted subject to adopting recommendations and mitigation measures proposed in this report. Based on the findings of the study, there is no archaeological and heritage reason why the development can be approved, taking full cognizance of clear procedures to follow in the event of chance findings.

1.1. Terms of Reference (ToR)

The author was requested by Sativa Travel and Environmental Consultants (Pty) Ltd to conduct an AIA/HIA study addressing the following issues:

- Archaeological and heritage potential of the development site including any known data on affected areas;
- Provide details on methods of study; potential and recommendations to guide the SAHRA to make an informed decision in respect of authorisation of the proposed power generation project
- Identify all objects, sites, occurrences, and structures of an archaeological or historical nature (cultural heritage sites) located within the 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 cultural resources; and
- Review applicable legislative requirements.

1.2. Project Location

The total project area covers an area of 958 ha and is situated approximately 6 km east of De Aar on the remaining extent of the farm Vetlaagte No. 4, next to Eskom's Hydra substation. The study area is accessible from De Aar via a secondary road from the N10 (which runs through De Aar to Hanover, where it crosses the N1). There is a gravel road running through the extreme southern part of the site in a north-easterly direction. There is another road running directly from De Aar through the northern part of the site. All parts of the site are therefore relatively accessible by means of existing roads. A railway line traverses the southern part of the farm; however, it is not affected by the proposed project layout.

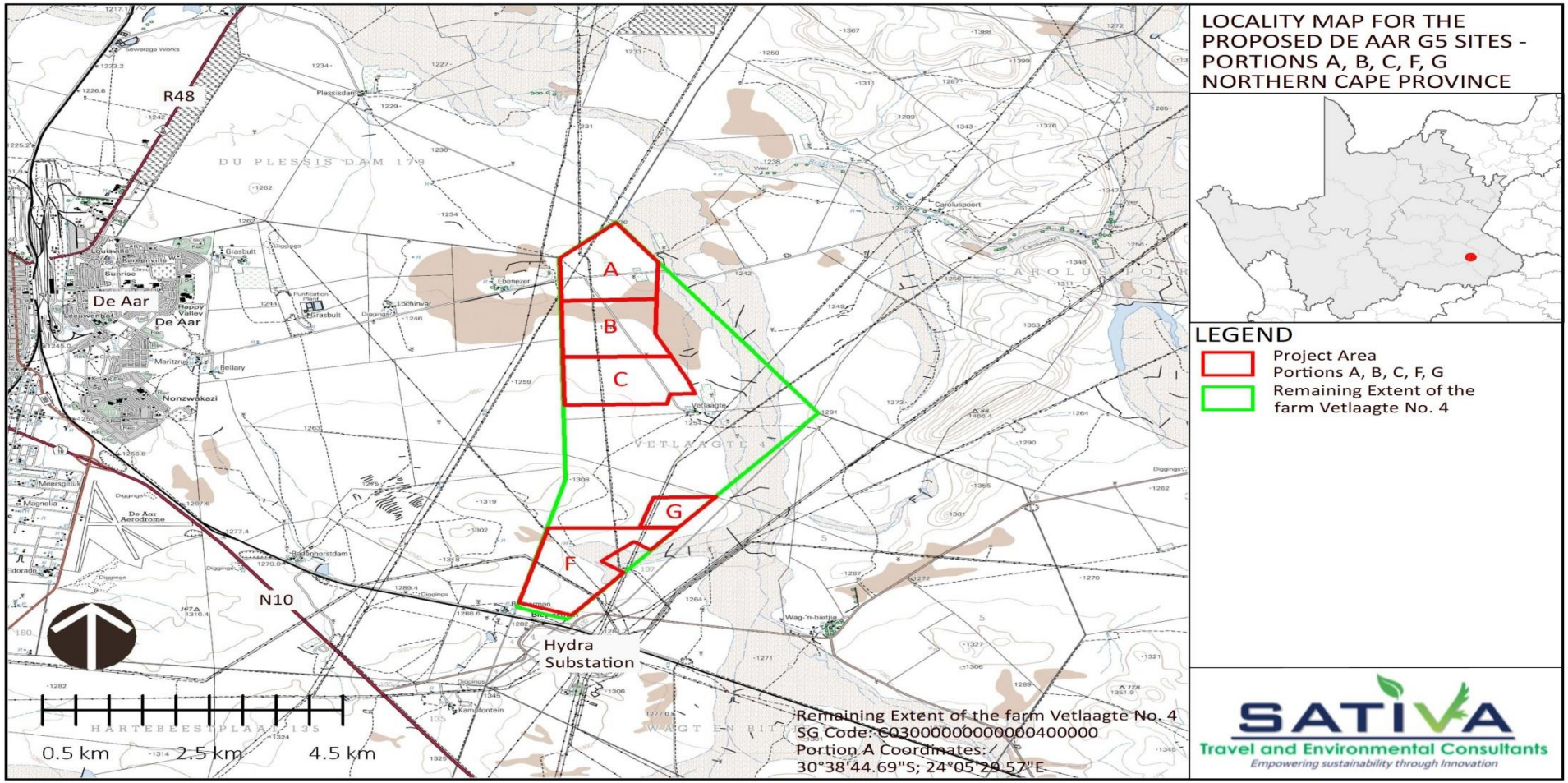

Figure 1: Location of the proposed project site (Sativa, 2020.)

1.3. Project Background and description

The Applicants intend to install 19.5 MW Gas Turbines and a Battery Energy Storage System (BESS) on each Portion (facility) on the remaining extent of the Farm Vetlaagte 4 within Emthanjeni Local Municipality, Northern Cape Province. Each site currently holds a positive Environmental authorization for the establishment of a Solar PV park. Portions A, B, C, & F are authorized to generated up to 75 MW electricity from Solar PV panels while Portion G is authorized for 30 MW (see Figure 1 for Locality Map).

The applicants wish to establish Gas Turbines with a maximum electrical output of 19.5 MW, with a BESS to create a hybrid electricity generation facility on each portion. This Hybrid power generation facility (on each portion) will have a higher dispatchability and allow for the generation of electricity for more hours of the day, as is desired in The Risk Mitigated Independent Power Producer Procurement Programme (RMIPPPP) currently underway by the Department of Mineral Resources and Energy (DMRE).

Table 1 Development footprint, capacity, technology and operating company of the different facilities

Portion	Ha	Mw	Technology	Operating Company
A	151	75	PV/TPV	Ennex Solar (Pty) Ltd
B	143	75	PV/PTV	Nexergy Solar (Pty) Ltd
C	142	75	PV/PTV	Ingwaba Energy (Pty) Ltd
D	148	75	PV/PTV and/or Dish Stirling	Khaliphile Energy
E	135	75	PV/PTV and/or Dish Stirling	Ukuqala Solar (Pty) Ltd
F	199	75	PV/PTV	Lehlasedi Energy (Pty) Ltd
G	34	30	PV/PTV and/or Dish Stirling	Ikusasa Energy (Pty) Ltd

2. LEGISLATIVE CONTEXT

Three main pieces of legislation are relevant to the present study and there are presented here. Under the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) and the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended (NEMA), an AIA or HIA is required as a specialist sub-section of the Environmental Authorisation process.

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

- Construction of a road, wall, power line, pipeline, canal or another 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 the past five years
  - ❖ Rezoning of site exceeding 10 000 sq m
  - ❖ The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority
- Any other development category, public open space, squares, parks, recreation grounds

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

Related to Section 38 of the NHRA are Sections 34, 35, 36, and 37. Section 34 stipulates that no person may **alter damage, destroy and relocate any building or structure older than 60 years, without a permit issued by SAHRA or a provincial heritage resources authority**. This section may not apply to the present study since none were identified. Section 35 (4) of the NHRA stipulates that no person may, without a permit issued by SAHRA, destroy, damage, excavate, alter, or remove from its original position, or collect, any archaeological material or object. This section may apply to any significant archaeological sites that may be discovered before or during construction. This means that any chance find must be reported to the heritage practitioner or SAHRA/PHRA, who will assist in investigating the extent and significance of the finds and inform the applicant about further actions. Such actions may entail the removal of material after documenting the find site or mapping of larger sections before destruction. Section 36 (3) of the NHRA also stipulates that no person may, without a permit issued by the South African Heritage Resources Agency (SAHRA), destroy, damage, alter, exhume or remove from its original position or otherwise disturb any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority. This section may apply in case of the discovery of chance burials, which is unlikely. The procedure for reporting chance finds also applies to the unlikely

discovery of burials or graves by the applicant or his contractors. Section 37 of the NHRA deals with public monuments and memorials but this may not apply to this study because no protected monument will be physically affected by the proposed solar power development.

Besides, the EIA Regulations of 2014 (as amended in 2017) promulgated in terms of NEMA (Act 107 of 1998) stated that environmental assessment 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 Specialist Studies in this regard. The end purpose of such a report is to alert the applicants, the environmental consultant (STEC), SAHRA/ 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.

Table 2:Evaluation of the proposed development as guided by the criteria in NHRA and NEMA

ACT	Stipulation for developments	Requirement details
NHRA Section 38	Construction of the road, wall, power line, pipeline, canal or another 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 the 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	Subject to identification during Phase 1
NHRA Section 35	Impacts on archaeological and palaeontological heritage resources	Subject to identification during Phase 1
NHRA Section 36	Impacts on graves	Subject to identification during Phase 1
NHRA Section 37	Impacts on public monuments	Subject to identification during Phase 1
Chapter 5 (21/04/2006) NEMA	HIA is required as part of an EIA	Yes
Section 39(3)(b) (iii) of the MPRDA	AIA/HIA is required as part of an EIA	No

3. METHODOLOGY

This document falls under the Environmental Authorisation process and EMPr of the proposed Gas turbines and a Battery Energy Storage System (BESS) development; therefore, this study aims at providing an informed heritage-related opinion about the proposed development in Northern Cape Province. 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 AIA/HIA practices and aimed at locating all possible objects, sites, and features of cultural significance on the development footprint. 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. The detailed photographic recording was also undertaken where relevant. The findings were then analysed in relation to proposed construction activities. The result of this investigation is a report indicating the presence/absence of heritage resources within the proposed Gas Turbines and a Battery Energy Storage System (BESS) site and how to manage them in the context of the proposed development.

3.1. The Fieldwork survey

The fieldwork survey was undertaken on the 11th of August 2020. The desktop studies were followed by intensive and extensive field walking to verify the situation on the ground and to identify the extent of the stone walled sites and burial sites. Based on the maps, it was noted that very few farmsteads and settlements occur in the general study area. A comprehensive survey of this area was conducted to identify the salient features as well as relationships between the different components of sites. The main focus of the survey involved a pedestrian survey which was conducted within the proposed development site. The pedestrian survey focused 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, existing buildings and ecological indicators such as invader weeds.

The literature survey suggests that before the 20th century modern residential and on-going infrastructure developments; the general area where the proposed development is located would have been a rewarding region to locate heritage resources related to the Stone Age and historical sites (Kruger 2014). However, the situation today is completely different. The study area now lies in a modified landscape that is dominated by stockpiled soil mounds within the riverbed.

3.2. Visibility and Constraints

Most sections of the site are visible and accessible. It is conceded that due to the subterranean nature of cultural remains this report should not be construed as a record of all archaeological and historic sites in the area. To mitigate this, a professional archaeologist must be retained to inspect the sites during clearance of the site.

3.3. Consultations

The Public Participation process is conducted by the EAP. The project archaeologist and heritage practitioner consulted the farm owner about any heritage resources located within the proposed site. This process helped in understanding the heritage character of the development site. We also took the opportunity to investigate the presence of historical buildings. The Public Participation Process will also invite and address comments from affected communities and any registered heritage bodies on any matter related to the proposed Gas Turbines and a Battery Energy Storage System (BESS) including heritage concerns that may arise as a result of the solar power generation project. The issues raised by the public concerning the proposed development will also be included in the Final Environmental Impact Assessment Report and EMPr.

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

Plate 1: Proposed Gas Turbines and a Battery Energy Storage System (BESS) site.

Plate 2: showing proposed development site.

Plate 3: showing proposed development site.

Plate 4: Showing proposed development site and powerlines in the background.

Plate 5: Showing Portion F of the proposed development site

Plate 6:showing an overgrazed section of the proposed development site where isolated lithic tools were identified..

Plate 7: showing proposed development site and high volatage powerline cutting across the site.

Plate 8: showing proposed development site and high volatage powerline cutting across the site.

Plate 9: showing proposed development site.

Plate 10: showing proposed development site .

Plate 11: showing proposed development site

Plate 12: showing proposed development site .

Plate 13: showing proposed development site, Note some sections of the proposed development site are overgrazed.

Plate 14: showing proposed development site.

Plate 15: showing access road curtting through Portion B of the proposed development site

Plate 16: showing proposed development site.

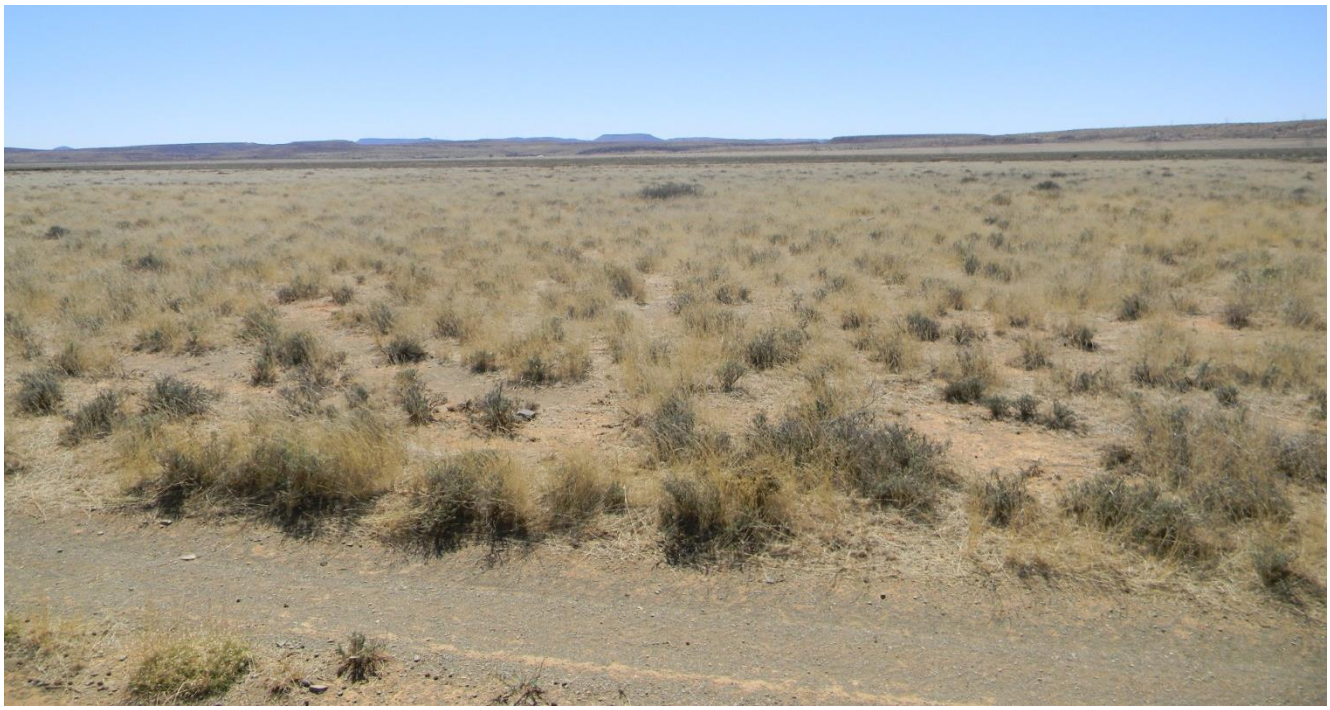

Plate 17: showing proposed development site.

Plate 18: showing proposed development site and high volatage powerline cutting across the site.

Plate 19: showing proposed development site.

Plate 20: showing proposed development site.

Plate 21: showing one of the several wind mills within the proposed development site.

Plate 22: showing Portion A of the proposed development site.

Plate 23: showing Portion A of the proposed development site.

Plate 24: showing proposed development site.

Plate 25: showing main road to the proposed development sites.

4. ARCHAEOLOGICAL CONTEXT

The Northern Cape Province is rich in archaeological materials which include Stone Age deposits and rock art mainly inform of engravings. The heritage dotted around this geographical region span from Early Stone Age (ESA), Middle Stone Age (MSA), Later Stone Age (LSA) as well as historical material which mainly covers the historical period mainly characterized by the colonial occupation of the area. As a result, such material is protected by the National Heritage Resources Act of South Africa (NAHRA Act of 1999).

Northern Cape Province is synonymous with alluvial diamond mining during and after colonial period. Early diamond miners in the province stumbled upon ESA artefacts in the Vaal River gravels at Klipdrift (Canteen Kopje) (Johnson and Young 1906). Since then the site of Canteen Kopje has received a lot of attention from researchers as it has yielded a lot of ESA deposits. Wonderwerck cave which is located on the eastern side of Kuruman Hills is one of the most well-known archaeological sites in the Northern Cape Province, in South Africa as a whole and even beyond. The artefacts assemblages recovered at Wonderwerck comprises of ESA, MSA, LSA materials and the remains include stone tools, faunal remains as well as botanical remains (Chazan and Horwitz 2015). This rich archaeological assemblage has been useful in reconstructing the lives of the past people or hominins who once occupied the cave as well as being able to provide datable material. The oldest deposits from Wonderwerck date to around 2 million years ago (Chazan and Horwitz 2015). Generally, ESA tools are

divided into Oldowan tools for example choppers and Acheulian industry characterized by tools like hand axes and cleavers. MSA tools are characterized by the lack of hand axes and cleavers, the use of prepared core techniques and the production of blades, triangular and convergent flakes, retouched flakes, end and side scrapers as well bone tools whereas LSA tools include small microlith tools, bladelets and bone tools as well. It is interesting to note that the Wonderwerck cave has yielded such artefacts from several excavations that have been carried out at the site.

Apart from Wonderwerck cave, some ESA material have been recovered from sites such as Kathu Pan 1 site which is an open-air site which was excavated by Beaumont. The site produced an assemblage characterized by Acheulean and Fauresmith lithics. Faunal remains were also recovered at Kathu Pan 1 site. (Beaumont 1990; Beaumont and Vogel 2006). It is estimated that an area of approximately 25ha of the site is littered with deposits that include cores, flakes and few hand axes (Beaumont 1990, 2004). Other ESA artefacts have been found closer to Kathu Townlands for example, Beaumont found ESA materials at a hilltop at Uitkoms Farm which is situated approximately 3km north-east of Kathu Townlands. The lithics are scattered over an area of about 30 ha. The rock types that were used to manufacture these tools include fine grained ironstone and quartzite (Chazan et al. 2012). Another locality with ESA material is the Bestwood Farm, in the Northern Cape which was documented by Jane Wilkins. She found some 3 localities full of archaeological materials, approximately 3km on the east of Kathu Townlands and she named them Bestwood 1, 2 and 3. These stone tools have been characterized as having well-made hand-axes, well retouched scrappers, blades and some cores (Chazan et al. 2012). Interestingly, Bestwood 3, is located on a hilltop which is most unlikely of ESA sites.

The other notable feature in the Northern Cape landscape is the existence of the pre-historic stone kraals and these have been mostly documented along the Seacow River Valley (Sampson 1984, 1985). Such features are usually found overlooking water sources. These are mainly associated with pastoralists' activities. Similar structures have also been reported around the De Aar area for instance by Fourie (2011) reported similar structures around the De Aar area. However, in this initial study non were found.

The Northern Cape also boasts of rich engravings that are doted around Province. These engravings are usually found on the face of some black iron stone boulders that are found in this region. Animals dominate such depictions and, in some cases, some geometrical motifs. For example, some known engravings are found at Klipbak 1 site in the Tswalu Kalahari Reserve in the Northern Cape (Rifkin 2009) and another known engraving site occur at Ga-Mohana. Around the De Aar area there are some engravings that are located at Nooitgedacht farms. However, no engravings were found in the current area ear marked for development.

De Aar is the third biggest town located in the dry to arid Northern Cape Province. This town was established in 1881 and is home to a well-known railway junction in South Africa that links the Northern Cape province with other provinces of South Africa that include the Free State, Eastern Cape and the Western Cape. Farms were also established around the locality of De Aar. De Aar attracted black people as they were working in the construction of the railway lines that linked with other towns during the colonial period. As a result, some black cultural groups that include for example, the Zulu and the Fengu were employed as the construction workers of the railway network and at some point, they were camping at De Aar. The rail network system played a major economic role by ferrying people as well as goods. Europeans set up some farms around De Aar area. Historically, the railway junction was busy during the Anglo Boer war as trains ferried soldiers and war artillery during the 1899 war (Meintjes, 1969).

The De Aar town is a host to several development projects. As a result, there are number of AIA or HIA that have been conducted around the town prior to some important development projects. Van Ryneveld (2008) conducted an archaeological scoping for an ammunition disposal plant next to Sinclair's dam 133 in De Aar. The scoping surveys recorded some low density LSA tools and two grave sites. All the archaeological sites were declared less significance except for the burials. Kaplan (2010) conducted an AIA for a proposed photovoltaic (PV) power generation facility along the Brak River which is situated north-west of the De Aar town and is close to the De Aar municipality substation. The surveys conducted on the north-west option located many weathered MSA tools which comprised of hornfels flakes, chunks, cores, retouched flakes and blades. Some historical materials were also found for example, a 19th century case bottle (Kaplan 2010). The author also recorded an activity area that had some stone tools, and a lower grinding stone. However, most of the artefacts were believed to be in their secondary contexts. The south-east option survey yielded some weathered MSA and LSA materials that were found in disturbed contexts.

Pelser (2011) undertook an Archaeological Impact Assessment as part of the Basic Heritage Impact Assessment (HIA) for a proposed Solar Energy Plant on the farm Konkoonsies 91, in the Pofadder District of the Northern Cape Province. During the assessment a few archaeological materials, features and objects were identified. The material that was recorded belong to the MSA and the LSA. Some stone tools which included some quartz flakes and ostrich eggshell beads were found but Pelser highlighted that these artefacts seemed to be out of context.

Fourie (2011) conducted a HIA for De Aar development on the north-east of De Aar town and documented 8 archaeological sites and only 1 site was outside the area that was earmarked for development. The artefacts that were recorded include a scatter of MSA cores and blades. These artefacts occurred on top of the hill next to the Brak River and they extended further to the fringes of the Brak River. Besides the stone artefacts, there are some circle stone enclosures that were recorded during the surveys. There were also about 3 stone cairn structures

which look like foundation structures were also recorded. A historical foundation of a purported old railway station was documented together with some metal artefacts (such as cans and wire) that were found lying around this old foundation and there are some Eucalyptus trees closer to the foundation.

An Archaeological Impact Assessment (AIA) study of surface portions of the farm Vetlaagte 4, on the east of De Aar was conducted by Kruger (2014). Thirteen portions that were ear marked for a solar farm project were surveyed and some 3 MSA tools scatters were documented in the process. Kruger (2014) thinks the stone tools were exposed by running water and through rains. The tools comprised of flakes and prepared cores made by the Levallois technique which is basically the removal of lithic flakes from a prepared core. Kruger (2014) also documented a dilapidated historical dam wall channel and a single grave of the former farm owner. However, some of the recorded MSA materials were found on the drainage line channels which make their context most likely to be secondary contexts.

4.1. 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 the group(s) of people. Thus, intangible heritage is better defined and understood by the particular group of people that uphold it. In the present study area, very little intangible heritage remains because no historically known groups occupied the study area and most of the original settler descendants moved away from the area.

5. RESULTS OF THE FIELD STUDY

5.1. RESULTS OF THE FIELD STUDY: PORTION A

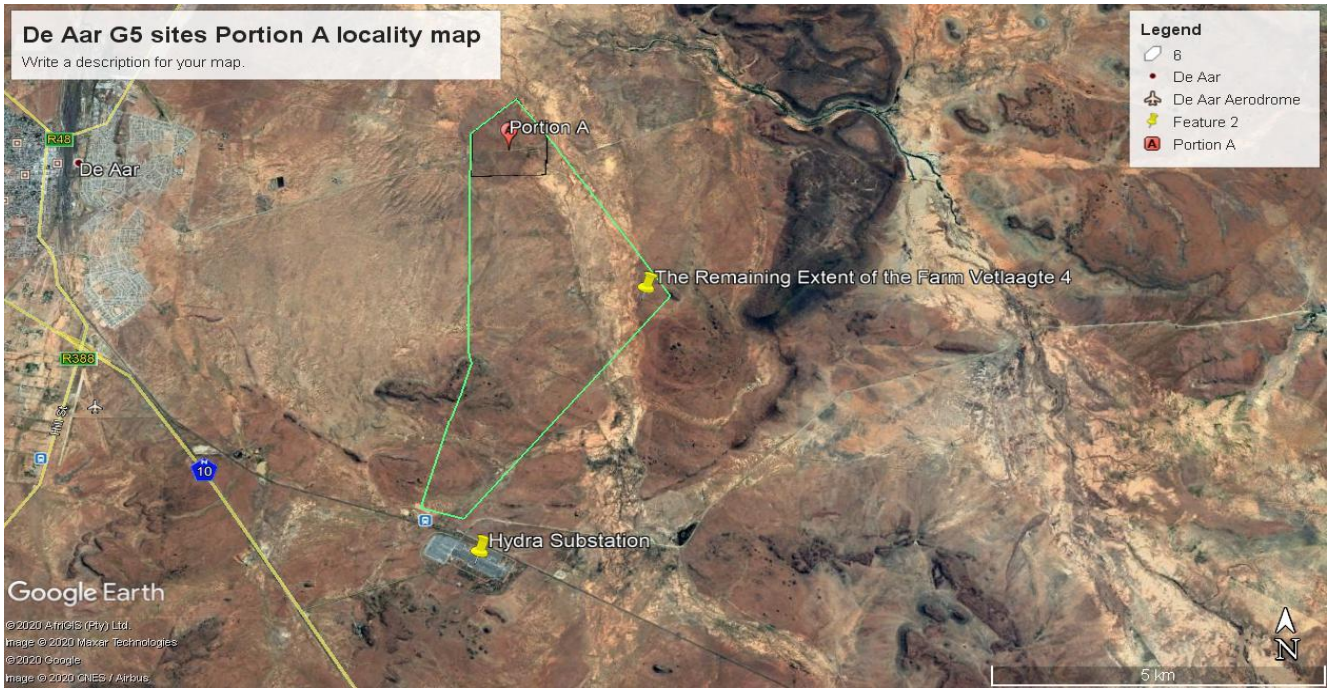

Figure 2: Showing portion A on the proposed project site

Archaeology

The field survey did not identify any archaeological remains within Portion A of the proposed development site.

5.1.1. Burial grounds and Graves

The field survey did not identify any graves within the proposed the site. It should be noted that burial grounds and grave sites are accorded the highest social significance threshold (see Appendix 3).

5.1.2. Public Monuments and Memorials

The study did not record any public memorials and monuments within the proposed site.

5.1.3. Buildings and Structures

There are no buildings and structures within the proposed site. The site does not trigger Section 34 of the NHRA which protects buildings, and structures older than 60 years.

5.1.4. Paleontology

The SAHRIS Palaeosensitivity map indicates that the development site is of moderate high sensitivity from the point of view of fossil heritage and that at least a desktop study should be conducted. Durand (2019) indicated that the Kalahari Sands and underlying calcretes are not sensitive from a palaeontological point of view because the types of fossils expected to be found are common and widespread within the region. These include invertebrate burrows and root and reed castes. These sorts of fossils are the only ones recorded by Almond in the project area (see Almond 2016). Almond (2016) observed that the site is underlain by sediments of the Kalahari Group. These include the Pleistocene-aged red sands of the Gordonia Formation as well as the underlying calcretes of the Mokolanen Formation. Fossils occur in both but are expected to be sporadic and widespread. Although mammalian bones, teeth and horn cores may occur in these sediments, their distribution is likely to be very sparse. Since the proposed site was surveyed previously, they may not be any need to conduct another survey.

5.2. RESULTS OF THE FIELD STUDY: PORTION B

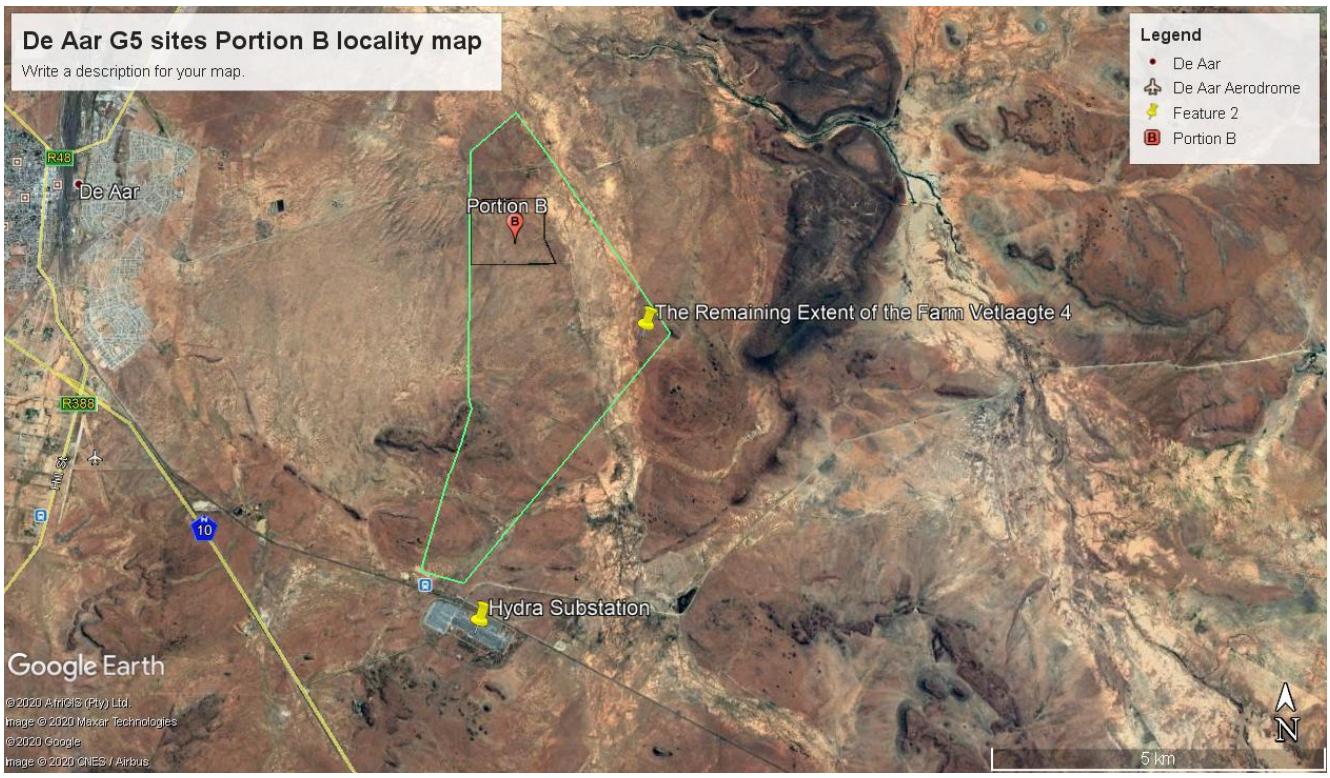

Figure 3: Showing portion B on the proposed project site

5.2.1. Archaeology

The field survey did not identify any archaeological remains within Portion B of the proposed development site.

5.2.2. Burial grounds and Graves

The field survey did not identify any graves within the proposed site. It should be noted that burial grounds and grave sites are accorded the highest social significance threshold (see Appendix 3). They have both historical and social significance and are considered sacred. Also, graves are important in providing evidence for communities seeking land restitution. Wherever they exist or not, they may not be tampered with or interfered with during any development without a permit from SAHRA. It is also borne in mind that the possibility of encountering human remains during subsurface earth moving works anywhere on the landscape is ever present. Although the possibility of encountering previously unidentified burial sites is low within the proposed development site, should such sites be identified during subsurface construction work, they are still protected by applicable legislation and they should be protected.

5.2.3. Public Monuments and Memorials

The study did not record any public memorials and monuments within the proposed site.

5.2.4. Buildings and Structures

There are no buildings and structures within the proposed site. The site does not trigger Section 34 of the NHRA which protects buildings, and structures older than 60 years.

5.2.5. Paleontology

The SAHRIS Palaeosensitivity map indicates that the development site is of moderate high sensitivity from the point of view of fossil heritage and that at least a desktop study should be conducted. Durand (2019) indicated that the Kalahari Sands and underlying calcretes are not sensitive from a palaeontological point of view because the types of fossils expected to be found are common and widespread within the region. These include invertebrate burrows and root and reed castes. These sorts of fossils are the only ones recorded by Almond in the project area (see Almond 2016). Almond (2016) observed that the site is underlain by sediments of the Kalahari Group. These include the Pleistocene-aged red sands of the Gordonia Formation as well as the underlying calcretes of the Mokolanen Formation. Fossils occur in both but are expected to be sporadic and widespread. Although mammalian bones, teeth and horn cores may occur in these sediments, their distribution is likely to be very sparse. Since the proposed site was surveyed previously, they may not be any need to conduct another survey.

5.3. RESULTS OF THE FIELD STUDY: PORTION C

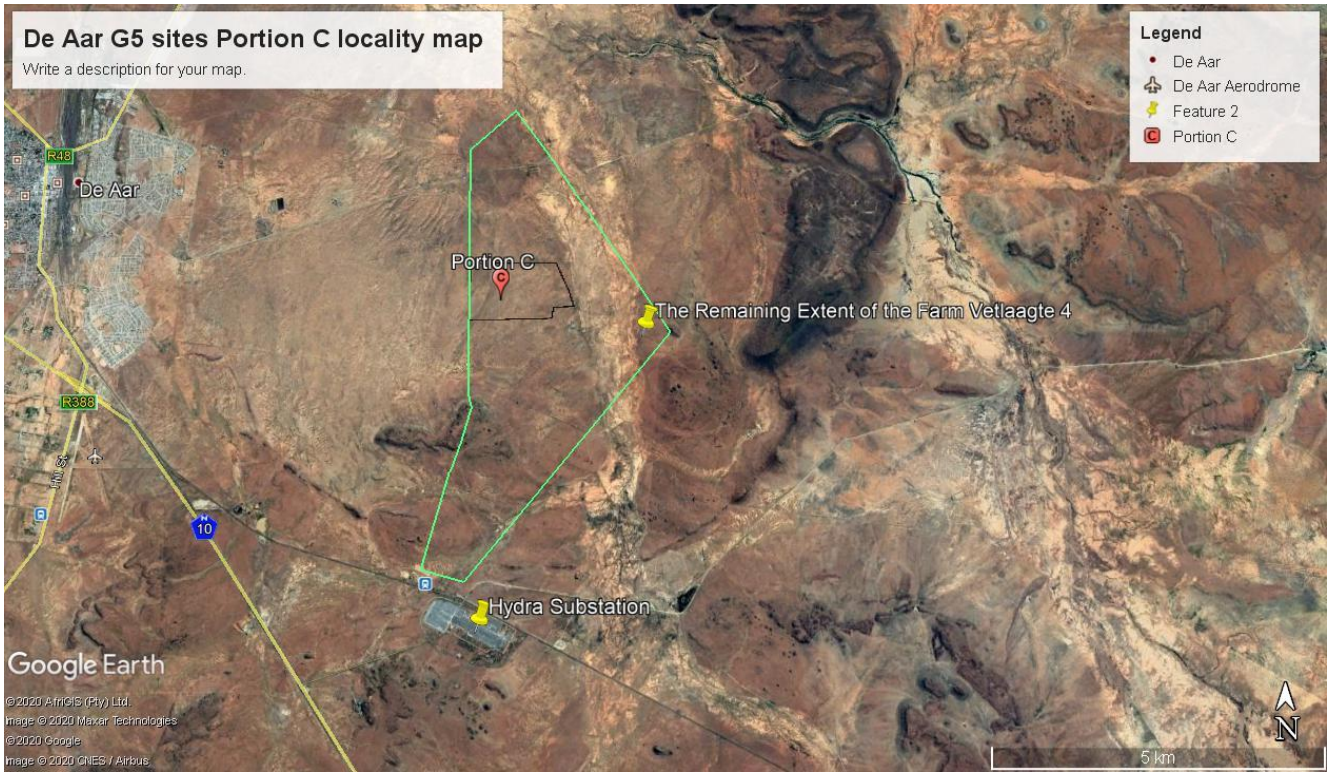

Figure 4: Showing portion C on the proposed project site

5.3.1. Archaeology

The field survey identified isolated MSA lithic tools on Portion C of the proposed development site. The flake scrapers were found in isolation on the different sections of Portion C of the proposed development site. However, the stone tools lake context and provenance and hence not much information can be reconstructed based on their disturbed context. The tools were similarly weathered which shows that they were exposed to natural weather conditions like rain and were washed around the landscape by running water. These MSA findings are not unique but they are generally synonymous with other MSA findings from other MSA sites around the area, for example, Wonderwerck Cave from the same province which has also yielded MSA deposits.

Plate 26: showing lithic tools found in Portion C of the proposed development site.

Plate 27: showing lithic tools found on Portion C of the proposed development site.

5.3.2. Burial grounds and Graves

The field survey did not identify any graves within Portion C of the proposed site. Although the possibility of encountering previously unidentified burial sites is low within the proposed development site, should such sites be identified during subsurface construction work, they are still protected by applicable legislation and they should be protected.

5.3.3. Public Monuments and Memorials

The study did not record any public memorials and monuments within the proposed site.

5.3.4. Buildings and Structures

There are no buildings and structures within the proposed site. The site does not trigger Section 34 of the NHRA which protects buildings, and structures older than 60 years.

5.3.5. Paleontology

The SAHRIS Palaeosensitivity map indicates that the development site is of moderate high sensitivity from the point of view of fossil heritage and that at least a desktop study should be conducted. Durand (2019) indicated that the Kalahari Sands and underlying calcretes are not sensitive from a palaeontological point of view because the types of fossils expected to be found are common and widespread within the region. These include invertebrate burrows and root and reed castes. These sorts of fossils are the only ones recorded by Almond in the project area (see Almond 2016). Almond (2016) observed that the site is underlain by sediments of the Kalahari Group. These include the Pleistocene-aged red sands of the Gordonia Formation as well as the underlying calcretes of the Mokolanen Formation. Fossils occur in both but are expected to be sporadic and widespread. Although mammalian bones, teeth and horn cores may occur in these sediments, their distribution is likely to be very sparse. Since the proposed development site was surveyed previously, they may not be any need to conduct another survey.

5.4. RESULTS OF THE FIELD STUDY: PORTION F

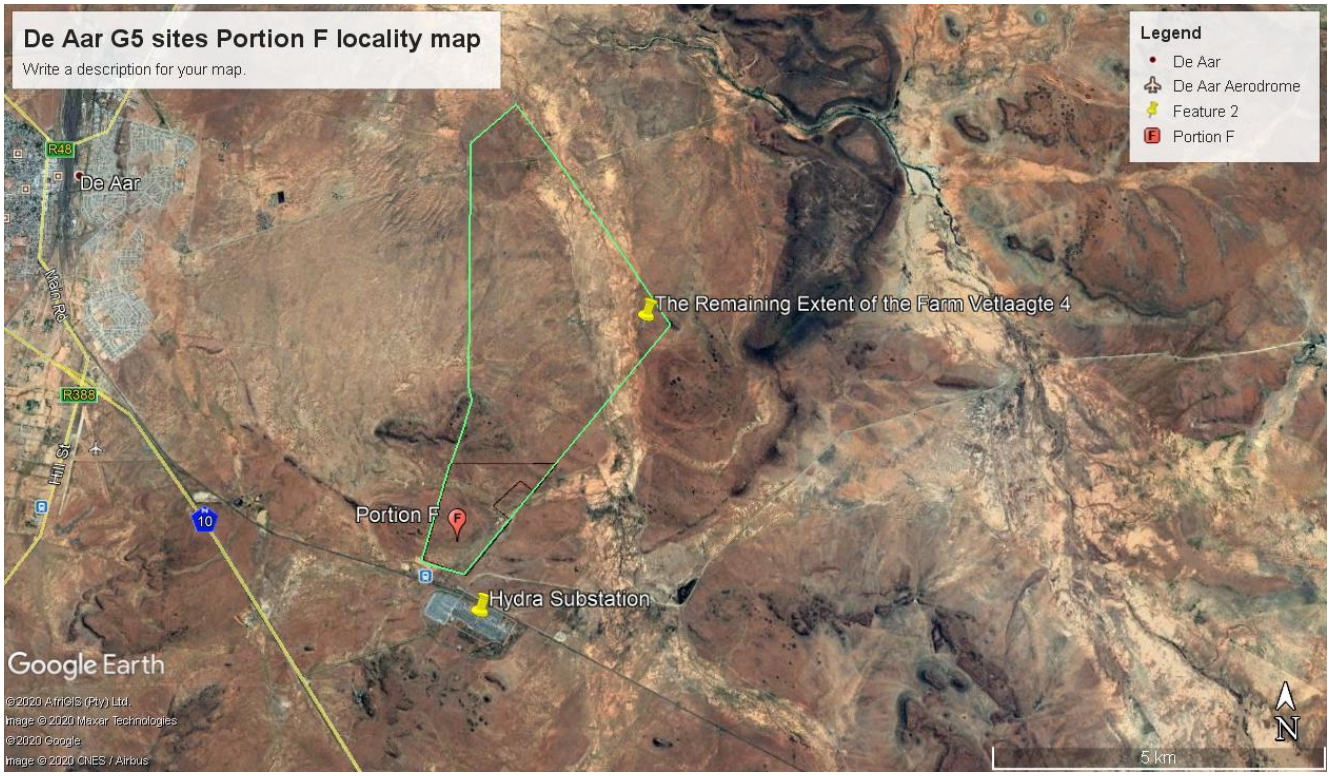

Figure 5: Showing Portion F on the proposed project site.

5.4.1. Archaeology

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 primary impacts are likely to occur during clearance and digging for foundations of infrastructure, indirect impacts that may occur during the movement of heavy construction equipment and vehicles. The drilling for fence line posts will result in the relocation or destruction of all existing surface heritage material (if any are present).

Similarly, the clearing of access road will impact material that lies buried in the topsoil although the chances are limited. Since heritage sites, including archaeological sites, are non-renewable, they must be identified, and their significance assessed before 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 very low within the proposed development site. Further, archaeological sites and unmarked graves may be buried beneath the surface and may only be exposed during surface clearance and construction. The purpose of

the AIA is to assess the sensitivity of the area in terms of archaeology and to avoid or reduce the potential impacts of the proposed development employing mitigation measures (see appended Chance Find Procedure). The following section presents the results of the archaeological and heritage survey conducted within the proposed development project site.

As a result of advances in technology, it is possible to survey large tracts of land on the desktop. A scoping survey was thus conducted for the entire proposed development site. The desktop scoping survey in Google Earth and Ortho-rectified satellite imagery identified heritage features and burial sites as well as farm steads and structures which may require protection under the NHRA. Sites known from written sources were marked pending verification during ground-truthing. During the scoping survey using Google Earth it became clear that most of the images were taken when there was little vegetation cover. It was thus easier to map the sites pending verification during ground-truthing. This mapping exercise also gave indications regarding the possible size of the settlements. Some areas were not visible enough to allow for the mapping of traditional graves. These were noted and the maps were verified during field walking.

Based on the field study results and field observations, the receiving environment for the proposed Gas turbine site low to medium potential to yield previously unidentified archaeological sites during subsurface excavations and work associated with the proposed development. Some MSA stone tools that include flakes and flake scrapers and triangular flakes were found in isolation on the different sections that are earmarked for development. However, the stone tools lake context and provenance and hence not much information can be reconstructed based on their disturbed context. The tools are partly weathered which shows that they were exposed to natural weather conditions like rain and were washed around the landscape by running water. These MSA findings are not unique but they are generally synonymous with other MSA findings from other MSA sites around the area, for example, Wonderwerck Cave from the same province which has also yielded MSA deposits.

Plate 28: showing MSA lithic tools found in isolated secondary location.

5.4.2. Burial grounds and Graves

Human remains and burials are commonly found close to archaeological sites and abandoned settlements; 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 burials on the landscape as these burials, in most cases, are not marked at the surface and concealed by thick vegetation cover. Human remains are usually identified when they are exposed through erosion, earth moving activities, and construction. In some instances, packed stones or bricks may indicate the presence of informal burials. If any human bones are found during clearance for construction then they should be reported to an archaeologist, and work in the immediate vicinity should cease until the appropriate actions have been carried out by the archaeologist. Where human remains are part of a burial, they would need to be exhumed under a permit from

either SAHRA (for pre-colonial burials as well as burials later than about AD 1500) or Department of Health for graves younger than 60 years.

The field survey did not identify any graves within the proposed development site. However, a historical grave occurs on one of the portions outside the current study site (Kruger 2014). It should be noted that burial grounds and grave sites are accorded the highest social significance threshold (see Appendix 3). They have both historical and social significance and are considered sacred. Also, graves are important in providing evidence for communities seeking land restitution. Wherever they exist or not, they may not be tampered with or interfered with during any development without a permit from SAHRA. It is also borne in mind that the possibility of encountering human remains during subsurface earth moving works anywhere on the landscape is ever present. Although the possibility of encountering previously unidentified burial sites is low within the proposed development site, should such sites be identified during subsurface construction work, they are still protected by applicable legislation and they should be protected.

5.4.3. Public Monuments and Memorials

The study did not record any public memorials and monuments within the proposed development site.

5.4.4. Buildings and Structures

There are no buildings and structures within the proposed development site. The site does not trigger Section 34 of the NHRA which protects buildings, and structures older than 60 years.

5.4.5. Paleontology

The SAHRIS Palaeosensitivity map indicates that the development site is of moderate high sensitivity from the point of view of fossil heritage and that at least a desktop study should be conducted. Durand (2019) indicated that the Kalahari Sands and underlying calcretes are not sensitive from a palaeontological point of view because the types of fossils expected to be found are common and widespread within the region. These include invertebrate burrows and root and reed castes. These sorts of fossils are the only ones recorded by Almond in the project area (see Almond 2016). Almond (2016) observed that the site is underlain by sediments of the Kalahari Group. These include the Pleistocene-aged red sands of the Gordonia Formation as well as the underlying calcretes of the Mokolanen Formation. Fossils occur in both but are expected to be sporadic and widespread. Although mammalian bones, teeth and horn cores may occur in these sediments, their distribution is likely to be

very sparse. Since the proposed development site was surveyed previously, they may not be any need to conduct another survey.

5.5. RESULTS OF THE FIELD STUDY: PORTION G

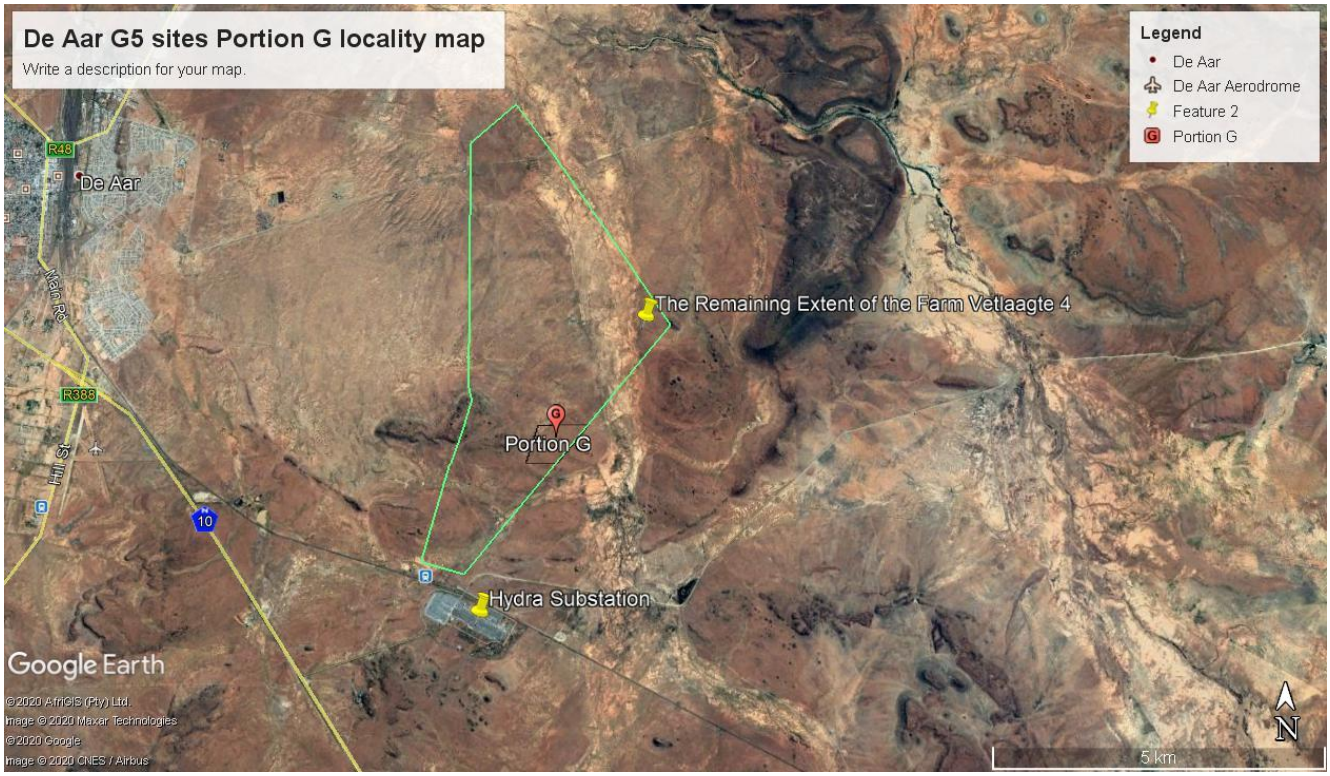

Figure 6 Showing portion G on the proposed project site

5.5.1. Archaeology

Based on the field study results and field observations, the receiving environment for the proposed Gas Turbine site will be low to medium potential to yield previously unidentified archaeological sites during subsurface excavations and work associated with the proposed development. Portion G yielded some MSA triangular flakes found in isolation. However, the stone tools lake context and provenance and hence not much information can be reconstructed based on their disturbed context. The tools are partly weathered which shows that they were exposed to natural weather conditions like rain and were washed around the landscape by running water. These findings are not unique but they are generally synonymous with other MSA findings from other MSA sites around the area, for example, Wonderwerck Cave from the same province which has also yielded MSA deposits.

Plate 29: showing MSA lithic tools found in Portion B of the proposed development site.

5.5.2. Burial grounds and Graves

The field survey did not identify any graves within Portion G of the proposed development site. It should be noted that burial grounds and grave sites are accorded the highest social significance threshold (see Appendix 3). They have both historical and social significance and are considered sacred.

5.5.3. Public Monuments and Memorials

The study did not record any public memorials and monuments within the proposed development site.

5.5.4. Buildings and Structures

There are no buildings and structures within the proposed development site. The site does not trigger Section 34 of the NHRA which protects buildings, and structures older than 60 years.

5.5.5. Paleontology

The SAHRIS Palaeosensitivity map indicates that the development site is of moderate high sensitivity from the point of view of fossil heritage and that at least a desktop study should be conducted. Durand (2019) indicated

that the Kalahari Sands and underlying calcretes are not sensitive from a palaeontological point of view because the types of fossils expected to be found are common and widespread within the region. These include invertebrate burrows and root and reed castes. These sorts of fossils are the only ones recorded by Almond in the project area (see Almond 2016). Almond (2016) observed that the site is underlain by sediments of the Kalahari Group. These include the Pleistocene-aged red sands of the Gordonia Formation as well as the underlying calcretes of the Mokolanen Formation. Fossils occur in both but are expected to be sporadic and widespread. Although mammalian bones, teeth and horn cores may occur in these sediments, their distribution is likely to be very sparse. Since the proposed development site was surveyed previously, they may not be any need to conduct another survey.

Table 3: Summary of Findings

Heritage resource	Status/Findings
Buildings, structures, places and equipment of cultural significance	None recorded.
Areas to which oral traditions are attached or which are associated with intangible heritage	None exist
Historical settlements and townscapes	None survives in the proposed area
Landscapes and natural features of cultural significance	None
Archaeological sites	None recorded within the proposed development site
Graves and burial grounds	None recorded
Movable objects	None
Overall comment	The surveyed area has no confirmable archaeological resources on the surface, but sub-surface chance finds are still possible.

5.6. Assessment of impacts

An impact can be defined as any change in the physical-chemical, biological, cultural, and/or socio-economic environmental system that can be attributed to human activities related to the project site under study for meeting a project need. The significance of the impacts of the process will be rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

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

Table 4: Criteria Used for Rating of Impacts

Nature of the impact (N)		
Positive	+	The impact will be beneficial to the environment (a benefit).
Negative	-	The 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 heritage 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 heritage 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 heritage 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 heritage or social functions/processes. Includes areas / environmental aspects which have been slightly modified and have high conservation importance (high sensitivity*).
Very high	10	Severe effects on heritage 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 of 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 a 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 such a period 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 of or despite 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:

Significance Points (SP) = (Magnitude + Duration + Extent) x Probability

The significance of the heritage 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≥60), Medium (SP = 31-60), and Low (SP<30) significance as shown below.

Table 5: 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 minimal 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 influence 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 6: Operational Phase

Impacts and Mitigation measures relating to the proposed project during the 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	-	2	1	1	2	8	Mitigation not required because the study did not record any archaeological sites, Chance find procedure applies.	2	1	1	1	4
	Disturbance of graves	Cultural heritage	-	2	1	1	2	8	Mitigation not required because the site did not yield any graves	4	1	1	1	4
	Disturbance of buildings and structures older than 60 years old	Operational	-	2	1	1	1	4	Mitigation not required because there are no buildings at the site	4	1	1	1	4
Operational Phase	Destruction of public monuments and plaques	Operational	-	2	1	1	1	4	• Mitigation is not required because there are no public monuments within the proposed development site	2	1	1	4	Low

5.7. Cumulative Impacts

The European Union Guidelines define cumulative impacts as "Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project. Therefore, the assessment of cumulative impacts for the proposed ppr is considered the total impact associated with the proposed development when combined with other past, present, and reasonably foreseeable future development projects. An examination of the potential for other projects to contribute cumulatively to the impacts on heritage resources from this proposed Development development was undertaken during the preparation of this report. The total impact arising from the proposed Development (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 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, the site has been previously disturbed by previous alluvial diamond mining activities which affected baselines, the proposed Development will contribute to the existing impacts in the project area. As such increased development in the project area will have several cumulative impacts on heritage resources whether known or covered in the ground. For example, during clearance they will be an increase in human activity and movement of heavy construction equipment and vehicles that could change, alter or destroy heritage resources within and outside the development sites given that archaeological remains occur on the surface. Cumulative impacts that could result from a combination of the proposed Development and other actual or 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.

Heritage resources such as burial grounds and graves, 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. Furthermore, many heritage resources in the greater study area are informal, unmarked, and may not be visible, particularly during the wet season when grass cover is dense. As such, the construction team may not see these resources, which results in an increased risk of resource damage

and/or loss. Earthmoving and extraction of gravel have the potential to interact with archaeology, architectural, and cultural heritage.

Palaeontological Impact Assessment is underway, the results will be incorporated into the heritage study as soon as they are available. Sites of archaeological significance were not specifically identified, and cumulative effects are not applicable. The nature and severity of the possible cumulative effects may differ from site to site depending on the characteristics of the sites and variables.

A significant cumulative impact that needs attention is related to stamping by especially construction vehicles during clearance and drilling within the site. No significant cumulative impacts, over and above those already considered in the impact assessment, are foreseen at this stage of the assessment process. Cumulative impacts can be significant if construction vehicles are not monitored to avoid driving through undetected heritage resources.

5.8. Mitigation

Mitigation is not required because they survey did not record any confirmable archaeological sites sites within the proposed development site. However, the Chance Find procedure is required to cater for any accidental finds during construction.

6. ASSESSING SIGNIFICANCE

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

6.1. Aesthetic Value

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

6.2. Historic Value

Historic value encompasses the history of aesthetics, science, and society, and therefore to a large extent underlies all the terms set out in this section. A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase, or activity. It may also have historic value as the

site of an important event. For any given place, the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.

6.3. Scientific value

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

6.4. Social Value

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

7. DISCUSSION

Several Phase 1 Heritage studies for various mining and infrastructure developments were conducted since 2000. The studies noted that significant Stone Age sites occur in and around project area and on adjacent farms. The current site did not yield any confirmed archaeological site except for isolated MSA lithic finds that were out of context and with no provenance. Kruger (2014) did an HIA in the proposed project and he reported some MSA lithics finds at various points which he considered to be sites, but he recorded them from their secondary context. Thus, the current study should be read in conjunction with previous Phase 1 Impact Studies conducted in the proposed project area. However, our study confirmed that indeed there are lithic tools mostly in their secondary deposition as a result of erosion, or animal trampling. Therefore, these were rated of low significance. It should be borne in mind that the existence of lithic tools although isolated is an indication that the project area is a Stone Age cultural landscape which has potential to yield low to medium significance remains (see appended chance finds procedure). The absence of confirmable and significant archaeological cultural heritage site is not evidence in itself that such sites did not exist in

the proposed development site (see appended Chance Find Procedure). Significance of the sites of Interest is not limited to presence or absence of physical archaeological sites.

8. RECOMMENDATIONS

1. From a heritage perspective supported by the findings of this study, the proposed development is feasible if appropriate measures are taken to deal with the recorded burial site
2. The footprint impact of the proposed development and associated infrastructure should be kept to a minimum to limit the possibility of encountering chance finds.
3. Construction teams must be inducted on the possibility of encountering archaeological resources that may be accidentally exposed during subsurface clearance before the commencement of work on the site to ensure appropriate mitigation measures and that course of action is afforded to any chance finds.
4. Should chance archaeological materials or human remains be exposed during subsurface construction work on any section of the proposed development 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.
5. Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of the project EMP, there are no significant cultural heritage resources barriers to the proposed development. SAHRA may approve the application to proceed as planned with special commendations to implement the recommendations herein made.

9. CONCLUSIONS

Integrated Specialist Services (Pty) Ltd (ISS) was tasked by Sativa Travel and Environmental Consultants (Pty) Ltd to carry out HIA for the proposed installation of 19.5 MW Gas Turbines and a Battery Energy Storage System (BESS) on the remaining extent of the farm Vetlaagte 4 within Emthanjeni Local Municipality, Northern Cape Province. Desktop research revealed that the Northern Cape Area is rich in MSA and LSA (Van Ryneveld 2008, Kaplan 2010, Fourie 2011, Pelser 2011 Kruger 2014). In terms of archaeology and heritage in respect of the proposed development, there are no obvious 'Fatal Flaws' or 'No-Go' areas. However, the potential for chance finds, remains and the developer and contractors are

advised to be diligent and observant during the construction. The procedure for reporting chance finds has been laid out and if this report is adopted by SAHRA, then there are no archaeological reasons why the proposed development cannot be approved.

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SAHRIS CASE REFERENCES

Researching the SAHRIS online database (http://www.sahra.org.za/sahris) further studies were identified in the vicinity of the study area:

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SAHRIS case number 1089. Consultation in terms of Section 40 of the Mineral and Petroleum Resources Development Act 2002, (Act 28 of 2002) for the approval of an Environmental Management Programme for a mining right in respect of manganese and iron ore on Erf

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SAHRIS case number 1332. Resources Development Act 2002, (Act 28 of 2002) for the approval of an amendment to the Environmental Management Programme for a mining right in respect of iron ore on Portion 2, 6 and the remainder of farm Parson Po. 564, Portions 1,2,3 and the remainder of farm King No.

561, Portion 3,4,5 and the remainder of Bruce No.544, Portion 1,2,3,4,5 remainder of Mokaning No.560 situated in the Magisterial District of Kuruman, Northern Cape.

SAHRIS case number 1402. Consultation in terms of Section 40 of the Mineral and Petroleum Resources Development Act of 2002, (Act 28 of 2002) for the approval of an Environmental Management Plan in respect of borrow pits 1,2,3,4,5,6,7,8 & 9 on Portion 19 of farm 543, remaining extent and Portion 1 of Gamagara 541, Portion 1 and Portion 2 of Fritz 540, remainder of Nooitgedacht 469 and remainder of Lylyveld 545, situated in the Magisterial District of Kuruman Northern Cape region.

SAHRIS case number 1411. Consultation of scoping report submitted in terms of Section 22 of the Mineral and Petroleum Resources Development Act 2002, (Act 28 of 2002) in respect of remaining extent of Portion 1 (Barnadene) of farm sims No.462, remaining extent of and remaining extent and remaining extent of Portion 2 (Rusoord) and remaining extent of Portion 3 (Portion of Portion 1) of Farm Sacha No.468, remaining extent of Portion 4 of the farm Gamagara No.541, remaining extent of Portion 1 (lot a) of the farm Sishen No. 543, situated in the Magisterial District of Kuruman.

SAHRIS case number 1505. Environmental Impact Assessment and Environmental Management Programme.

SAHRIS case number 2516. Consultation in terms of Section 40 of the Mineral and petroleum Resources Development Act 2002, (Act 28 of 2002) for the approval of an Environmental Management Plan for mining permit for aggregate gravel on the remainder of the farm Galway No.431, situated in the Magisterial District of Kuruman, Northern Cape region.

SAHRIS case number 2769. Proposed construction of 400kV transmission line from Ferrum substation (Kathu) to Garona substation (Groblershoop) in the Northern Cape.

SAHRIS case number 3029. Proposed Development of 3 500 Erven on 280 Ha of Vacant Land on a Portion of Remainder of Farm Sekgame 461, Kathu.

SAHRIS case number 3157. Consultation in terms of section 40 of the mineral and petroleum resources development act 2002, (act 28 of 2002) in respect of for manganese and iron ore on the farm Seldsden No.464 situated in the Magisterial District of Kuruman, Northern Cape Region.

SAHRIS case number 3615. Proposed borrow pits associated with the upgrade of the Kimberley – Hotazel Railway Line

SAHRIS case number 3698. Proposed relocation of the Vaal Gamagara water pipeline at the Sishen Iron Ore Mine.

SAHRIS case number 3701. Proposed relocation of Rail and Associated Infrastructure at Sishen Iron Ore Mine.

SAHRIS case number 4456. Proposed development of 380ha for residential uses, Kathu, Portion 175/1 and Portion 175/2, Joe Morolong Local Municipality, John Taolo District Municipality, Northern Cape Province.

SAHRIS case number 4785. SAHRA comments for the Heritage Impact Assessment Report for the Kalahari Solar Power Project located on Famr Kathu 465, near Kathu within the Northern Province.

SAHRIS case number 4460. Residential development on Remainder, and Portion 3 of Farm Bestwood 459 near the town of Kathu, Northern Cape.

SAHRIS case number 5323. EIA and EMPr for the Proposed Solar CSP Integration Project: Project 2 - 400kV Power Line from Ferrum to the Solar Substation.

SAHRIS case number 5648. The project will consist of the construction of an approximately 67km Double Circuit 400kV powerline from the Manganore Substation to the Ferrum Substation, including the construction of the new Manganore TX (Transmission) Substation adjacent to the existing Manganore DX (Distribution) Substation. The line runs in a northerly direction through areas of the Tsantsabane, Ga-Segonyana and Gamagara Local Municipalities in the Northern Cape Province.

APPENDIX 1: CHANCE FIND PROCEDURE FOR THE PROPOSED INSTALLATION OF 19.5 MW GAS TURBINES AND A BATTERY ENERGY STORAGE SYSTEM (BESS) ON THE REMAINING EXTENT OF THE FARM VETLAAGTE 4 WITHIN EMTHANJENI LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE

October 2020

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. The main purpose of a CFP is to raise awareness of all construction, workers, and management on site regarding the potential for the 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 the 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 development site understand the CFP and the importance of adhering to it if cultural heritage resources are encountered. Besides, training or induction on cultural heritage resources that might potentially be found on the site should be provided. In short, the Chance finds 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 requires the implementation of separate criteria for CFPs.

Background

The proposed development site is located near De Aar in the Northern Cape Province. The site is subject to heritage survey and assessment at the planning stage following 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 in the course of 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 (2020) on the proposed development site. The AIA/HIA conducted was very comprehensive covering the entire site. The current study (Mlilo 2020) did not record any significant archaeological or heritage resources within the proposed development site.

Purpose

The purpose of this Chance Find Procedure is to ensure the protection of previously unrecorded heritage resources along with the proposed project site. This Chance Find Procedure intends to provide the applicant and contractors with an appropriate response in accordance with the NHRA and international best practices. This CFP aims to avoid or reduce project risks that may occur as a result of accidental finds whilst considering international best practices. Besides, this document seeks to address the probability of archaeological remains finds and features becoming accidentally exposed during the 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 (Pty) Ltd 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 the preservation of archaeological remains while minimizing disruption of the construction schedule. 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 clearance and construction.

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 another appropriately qualified person to its rescue or salvage.

CHANCE FIND PROCEDURE

General

The following procedure is to be executed if 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 the surface of the find
- Report your discovery to your supervisor or if they are unavailable, report to the project ECO who will provide further instructions.
- If the supervisor is not available, notify the Environmental Control Officer 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 a 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 the 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.

If human remains are accidentally exposed, SAHRA Burial Ground Unit or ISS Specialist must immediately be notified of the discovery 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 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 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 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 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 the company.

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

APPENDIX 2: HERITAGE MANAGEMENT PLAN INPUT INTO THE PROPOSED DEVELOPMENT EMP

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

		human remains, the PHRA and South African Police Service should be contacted.			CECO			EM PM
Rehabilitation Phase								
		Same as the Construction phase.						
Operational Phase								
		Same as the Construction phase.						

APPENDIX 3: 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 in a historic landscape, which may yield archaeological, cultural property, remains. There are possibilities of encountering unknown archaeological sites during subsurface construction work which may disturb previously unidentified chance finds.	Possible damage to previously unidentified archaeological and burial sites during the construction phase. • Unanticipated impacts on archaeological sites where project actions inadvertently uncovered significant archaeological sites. • Loss of historic cultural landscape. • Destruction of burial sites and associated graves • Loss of aesthetic value due to construction work • Loss of sense of place Loss of intangible heritage value due to	In situations where unpredicted impacts occur construction activities must be stopped, and the heritage authority should be notified immediately. Where remedial action is warranted, minimize disruption in construction scheduling while recovering archaeological data. Where necessary, implement emergency measures to mitigate. • Where burial sites are accidentally disturbed during construction, the affected area should be demarcated as a no-go zone by the 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	• Contractor / • Project Manager • Archaeologist • Project EO	Fine and or imprisonment under the PHRA Act & NHRA	Monitoring measures should be issued as instruction within the project EMP. PM/EO/Archaeologists Monitor construction work on sites where such development projects commence within the farm.

		change in land use	heritage and health authorities permit for possible relocation of affected graves accidentally encountered during construction work.			

APPENDIX 4: LEGAL PRINCIPLES OF HERITAGE RESOURCES MANAGEMENT IN SOUTH AFRICA

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

General principles for heritage resources management

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

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

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

(c) heritage resources can 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 the 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 accordance with regulations of the responsible heritage resources authority

(a) investigate 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 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, concerning 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-enter 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, before 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