# HERITAGE IMPACT ASSESSMENT

**(REQUIRED UNDER SECTION 38(8) OF THE NHRA (No. 25 OF 1999)**

**FOR THE PROPOSED HEUNINGSPRUIT 50 MW PV SOLAR FACILITY, FREE STATE**

**Type of development:**

Renewable Energy Development

**Client:**

CRRENEWABLES
Greener Tomorrow

**Report prepared by:**

Cultural Resource Consultants
Beyond Heritage


**Beyond Heritage**
Private Bag X 1049
Suite 34
Modimolle
0510
Tel: 082 373 8491
Fax: 086 691 6461
E-Mail: jaco@heritageconsultants.co.za



Report Author:
Mr. J. van der Walt


Project Reference:
Project number 23023

Report date:
March 2023

## APPROVAL PAGE

| | |
|---|---|
| **Project Name** | Proposed Heuningspruit 50 Mw PV Solar Facility, Free State |
| **Report Title** | Heritage Impact Assessment for the proposed Heuningspruit 50 Mw PV Solar Facility, Free State. |
| **Authority Reference Number** | TBC |
| **Report Status** | Draft Report |
| **Applicant Name** | Ms Cate Rapudi |

| Responsibility | Name | Qualifications and Certifications | Date |
|---|---|---|---|
| **Fieldwork and reporting** | Jaco van der Walt - Archaeologist | MA Archaeology<br>ASAPA #159<br>APHP #114 | February 2023 |

## DOCUMENT PROGRESS

### Distribution List

| Date | Report Reference Number | Document Distribution | Number of Copies |
|---|---|---|---|
| 1 March 2023 | 23023 | CR Renewables | Electronic Copy |
| | | | |
| | | I | |

### Amendments on Document

| Date | Report Reference Number | Description of Amendment |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

## INDEMNITY AND CONDITIONS RELATING TO THIS REPORT

The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information. The report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken. Beyond Heritage reserves the right to modify aspects of the report including the recommendations if and when new information becomes available from ongoing research or further work in this field or pertaining to this investigation.

Although Beyond Heritage exercises due care and diligence in rendering services and preparing documents Beyond Heritage accepts no liability, and the client, by receiving this document, indemnifies Beyond Heritage against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by Beyond Heritage and by the use of the information contained in this document.

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

## COPYRIGHT

Copyright on all documents, drawings and records, whether manually or electronically produced, which form part of the submission and any subsequent report or project document, shall vest in Beyond Heritage.

The client, on acceptance of any submission by Beyond Heritage and on condition that the client pays to Beyond Heritage the full price for the work as agreed, shall be entitled to use for its own benefit:

- The results of the project;
- The technology described in any report; and
- Recommendations delivered to the client.

Should the applicant wish to utilise any part of, or the entire report, for a project other than the subject project, permission must be obtained from Beyond Heritage to do so. This will ensure validation of the suitability and relevance of this report on an alternative project.

## REPORT OUTLINE

Appendix 6 of the GNR 326 Environmental Impact Assessment (EIA) Regulations published on 7 April 2017 provides the requirements for specialist reports undertaken as part of the environmental authorisation process. In line with this, Table 1 provides an overview of Appendix 6 together with information on how these requirements have been met.

**Table 1. Specialist Report Requirements.**

| Requirement from Appendix 6 of GN 326 EIA Regulation 2017 | Chapter |
|---|---|
| (a) Details of -<br>(i) the specialist who prepared the report; and<br>(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae | Section a<br>Section 12 |
| (b) Declaration that the specialist is independent in a form as may be specified by the competent authority | *Declaration of Independence* |
| (c) Indication of the scope of, and the purpose for which, the report was prepared | Section 1 |
| (cA)an indication of the quality and age of base data used for the specialist report | Section 3.4, 7and 8. |
| (cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change; | 9 |
| (d) Duration, Date and season of the site investigation and the relevance of the season to the outcome of the assessment | Section 3.4 |
| (e) Description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used | Section 3 |
| (f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of site plan identifying site alternatives; | Section 8 and 9 |
| (g) Identification of any areas to be avoided, including buffers | Section 8 and 9 |
| (h) Map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers | Section 8 |
| (I) Description of any assumptions made and any uncertainties or gaps in knowledge | Section 3.7 |
| (j) a description of the findings and potential implications of such findings on the impact of the proposed activity including identified alternatives on the environment or activities; | Section 1.3 |
| (k) Mitigation measures for inclusion in the EMPr | Section 10.1 |
| (l) Conditions for inclusion in the environmental authorisation | Section 10. 1. |
| (m) Monitoring requirements for inclusion in the EMPr or environmental authorisation | Section 10. 5. |
| (n) Reasoned opinion -<br>(i) as to whether the proposed activity, activities or portions thereof should be authorised;<br>(iA) regarding the acceptability of the proposed activity or activities; and<br>(ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan | Section 10.3 |
| (o) Description of any consultation process that was undertaken during the course of preparing the specialist report | Section 5 |
| (p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and | Refer to EIA report |
| (q) Any other information requested by the competent authority | N.A |

## Executive Summary

Contrarians Capital Holdings (the Applicant) has proposed the development of a new Heuningspruit 50MW Photovoltaic (PV) Solar Facility, near the town of Koppies, in the Free State Province. The proposed PV facility is located on the farm Voorspoed 1508 and Verdun No 1511. Beyond Heritage was appointed to conduct a Heritage Impact Assessment (HIA) for the Project based on the field survey and archaeological assessment of the previously approved Environmental Assessment that was issued in 2014 that has since lapsed. Key findings of the assessment include:

- The study area has been altered by agricultural activities that would have impacted on surface indicators of heritage resources if any ever existed in these areas. Furthermore, the study area is flat without any focal points (such as pans or shelters) that would have attracted human occupation in antiquity and is considered to be of low heritage potential;
- This was confirmed during the previous site visit and heritage finds were limited to a burial site (**Site 1**) located **outside** of the current impact areas;
- The layout of the Project changed from the areas assessed during the field assessment and 2014 Environmental authorisation, resulting in some areas not being physically surveyed. This is not regarded as major limitation due to the low heritage potential of the area;
- The palaeontological sensitivity of the study area is high, and an independent study was conducted for this aspect (Bamford 2023). The study concluded that no further palaeontological studies are required. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr.

No adverse impact to heritage resources is expected by the project and it is recommended that the project can commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA.

**Recommendations:**

- Regular monitoring of the development footprint by the ECO to implement the Chance Find Procedure for heritage and palaeontology resources (outlined in Section 10.2) in case heritage resources are uncovered during the course of construction;
- The recorded burial site should be indicated on development plans and avoided with a 30 m buffer;
- The final development layout should be subjected to a heritage walk down prior to construction with enough lead time to facilitate heritage mitigation if needed.

**Declaration of Independence**

| | |
|---|---|
| **Specialist Name** | Jaco van der Walt |
| **Declaration of Independence** | I declare, as a specialist appointed in terms of the National Environmental Management Act (NEMA) (Act No 107 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations (as amended), that I:<br>• I act as an independent specialist in this application;<br>• I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;<br>• I declare that there are no circumstances that may compromise my objectivity in performing such work;<br>• I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;<br>• I will comply with the Act, Regulations, and all other applicable legislation;<br>• I have no, and will not engage in, conflicting interests in the undertaking of the activity;<br>• I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;<br>• All the particulars furnished by me in this form are true and correct; and<br>• I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 49 A of the Act.of regulation 48 and is punishable in terms of section 24F of the Act. |
| **Signature** |  |
| **Date** | 17/02/2023 |

**a) Expertise of the specialist**

Jaco van der Walt has been practising as a Cultural Resource Management (CRM) archaeologist for 23 years. Jaco is an accredited member of the Association of South African Professional Archaeologists (ASAPA) (#159) and APHP #114 and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, Kwa Zulu Natal (KZN) as well as the Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, Democratic Republic of the Congo (DRC) Zambia, Guinea, Afghanistan, Nigeria and Tanzania. Through this, he has a sound understanding of the International Finance Corporations (IFC) Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage

TABLE OF CONTENTS

## LIST OF FIGURES

## LIST OF TABLES

## ABBREVIATIONS

| |
|---|
| ASAPA: Association of South African Professional Archaeologists |
| BGG Burial Ground and Graves |
| CFPs: Chance Find Procedures |
| CMP: Conservation Management Plan |
| CRR: Comments and Response Report |
| CRM: Cultural Resource Management |
| DFFE: Department of Fisheries, Forestry and Environment, |
| EA: Environmental Authorisation |
| EAP: Environmental Assessment Practitioner |
| ECO: Environmental Control Officer |
| EIA: Environmental Impact Assessment* |
| EIA: Early Iron Age* |
| EAP Environmental Assessment Practitioner |
| EMPr: Environmental Management Programme |
| ESA: Early Stone Age |
| ESIA: Environmental and Social Impact Assessment |
| GIS Geographical Information System |
| GPS: Global Positioning System |
| GRP Grave Relocation Plan |
| HIA: Heritage Impact Assessment |
| LIA: Late Iron Age |
| LSA: Late Stone Age |
| MEC: Member of the Executive Council |
| MIA: Middle Iron Age |
| MPRDA: Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) |
| MSA: Middle Stone Age |
| NEMA National Environmental Management Act, 1998 (Act No. 107 of 1998) |
| NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999) |
| NID Notification of Intent to Develop |
| NoK Next-of-Kin |
| PRHA: Provincial Heritage Resource Agency |
| SADC: Southern African Development Community |
| SAHRA: South African Heritage Resources Agency |

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

## GLOSSARY

Archaeological site (remains of human activity over 100 years old)
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)
The Iron Age (~ AD 400 to 1840)
Historic (~ AD 1840 to 1950)
Historic building (over 60 years old)

# 1 Introduction and Terms of Reference:

Beyond Heritage was appointed to conduct a HIA for the proposed Heuningspruit 50 MW PV Solar Facility, Free State Province (Figure 1.1 to 1.3). The report forms part of the Environmental Impact Assessment (EIA) and Environmental Management Programme Report (EMPr) for the development.

The aim of the study is to survey the proposed development footprint to identify cultural heritage sites, document, and assess their importance within local, provincial, and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999). The report outlines the approach and methodology utilized before and during the survey, which includes Phase 1, review of relevant literature; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey, finds included an informal cemetery. General site conditions and features on sites were recorded by means of photographs, GPS locations and site descriptions. Possible impacts were identified and mitigation measures are proposed in the following report. SAHRA as a commenting authority under section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) require all environmental documents, compiled in support of an Environmental Authorisation application as defined by NEMA EIA Regulations section 40 (1) and (2), to be submitted to SAHRA for commenting. Upon submission to SAHRA the project will be automatically given a case number as reference. As such the EIA report and its appendices must be submitted to the case as well as the EMPr, once it's completed by the Environmental Assessment Practitioner (EAP).

## 1.1 Terms of Reference

**Field study**

Conduct a field study to: (a) locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of sites/areas identified as significant areas; c) determine the levels of significance of the various types of heritage resources affected by the proposed development.

**Reporting**

Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with the relevant legislation, SAHRA minimum standards and the code of ethics and guidelines of ASAPA.

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act No 25 of 1999).

## 1.2 Project Description

Project components and the location of the proposed project are outlined under Table 2 and 3.

**Table 2: Project Description**

| | |
|---|---|
| **Project area** | Voorspoed 1508 and Verdun No 1511 |
| **Magisterial District** | Ngwathe Local Municipality |
| **Central co-ordinate of the development** | 27° 27.282'S<br>27° 24.887'E |
| **Topographic Map Number** | 2727AD |

**Table 3: Infrastructure and project activities**

| | |
|---|---|
| **Type of development** | PV Development |
| **Project Details** | Apart from the PV facility the associated infrastructure will include but are not limited to the following: on-site substation and buildings, access roads, overhead power line, and associated structures. The power generated by the proposed Project will feed into the existing Eskom Distribution System. The applicant anticipates to bid for Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) bid windows and any other possible renewable energy opportunities in South Africa. |

## 1.3 Alternatives

No alternatives were provided for assessment.

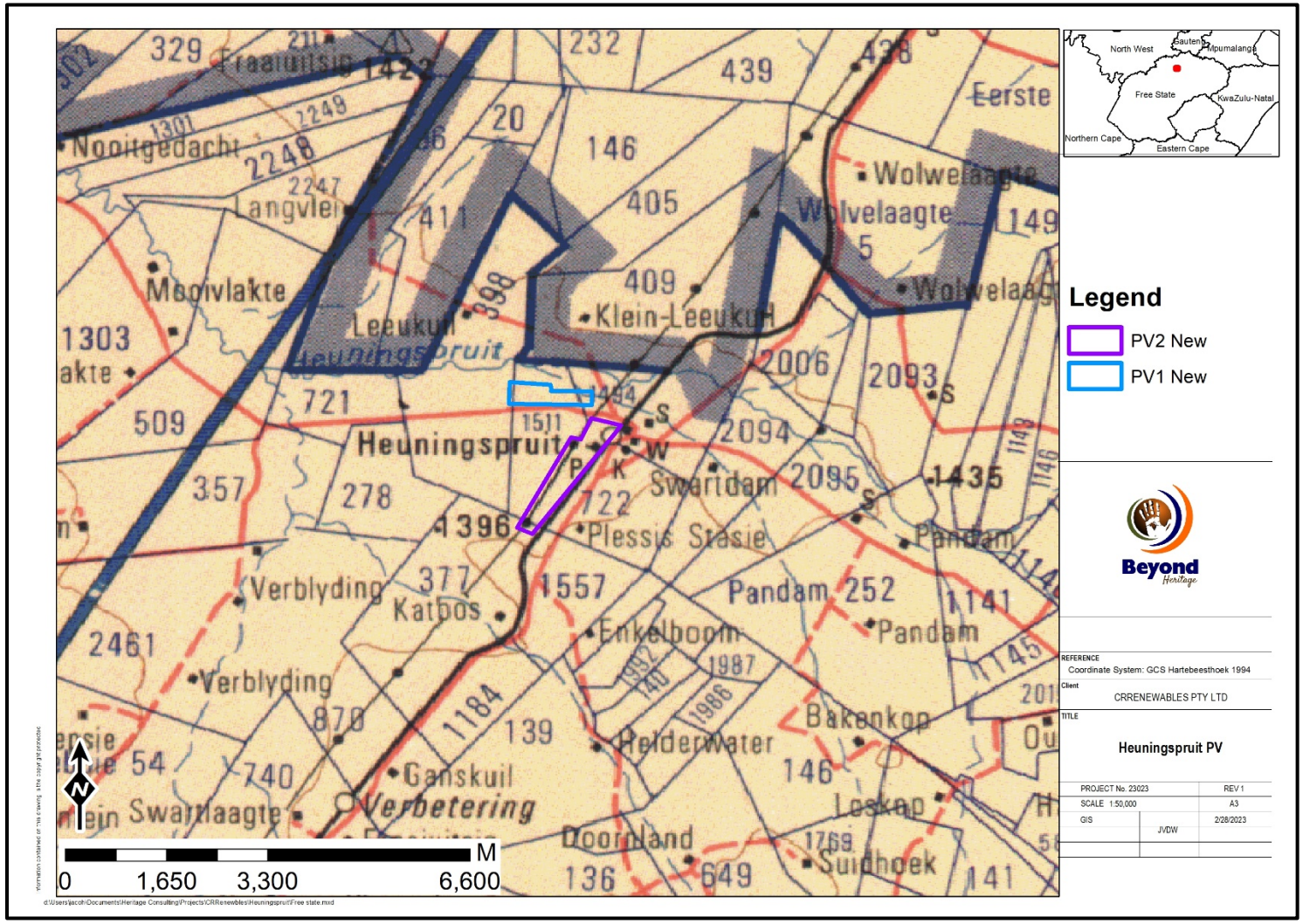



Figure 1.1. Regional setting of the project (1: 250 000 topographical map) showing the new PV footprints.

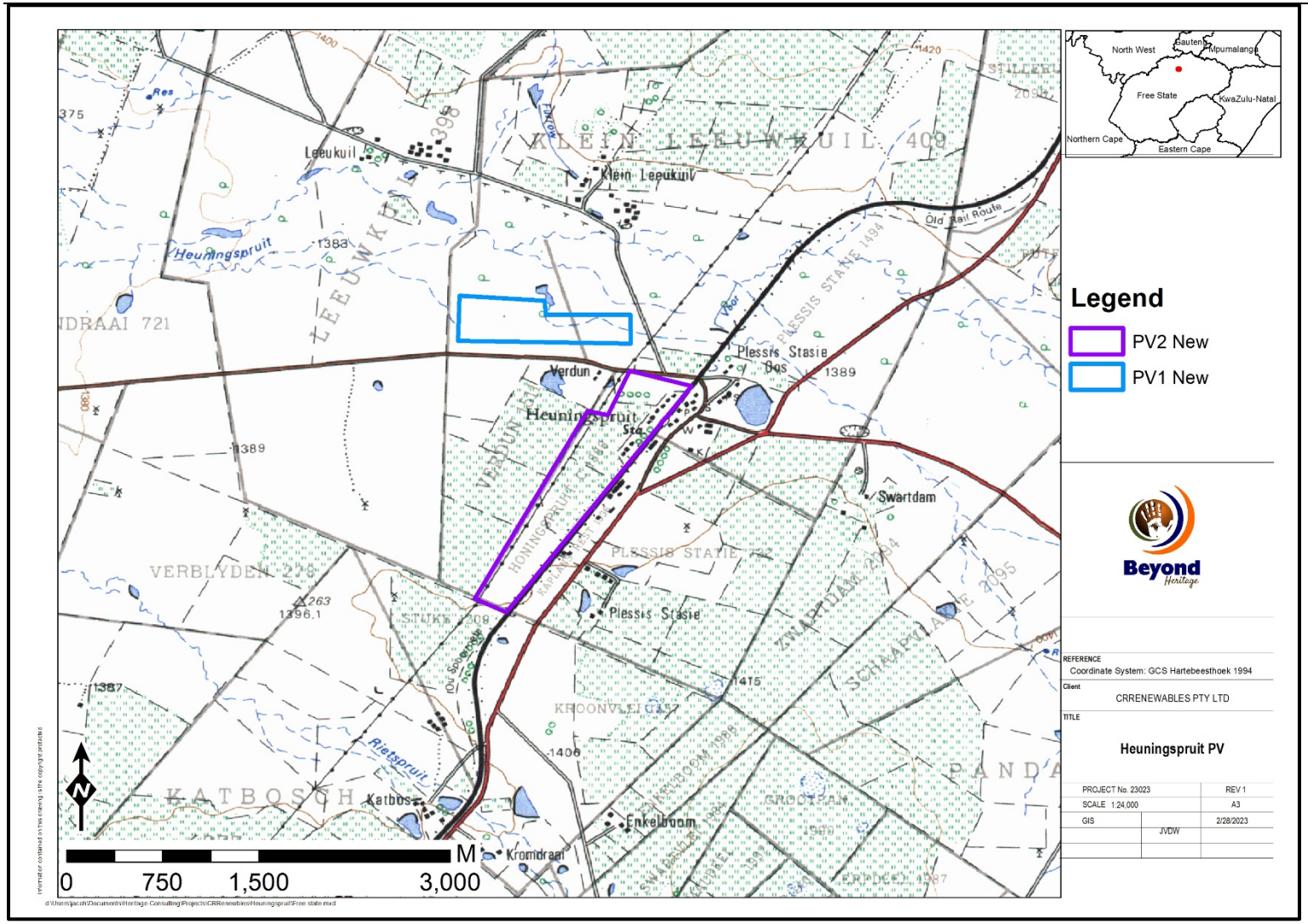



Figure 1.2. Local setting of the project (1: 50 000 topographical map) showing the new PV footprints.

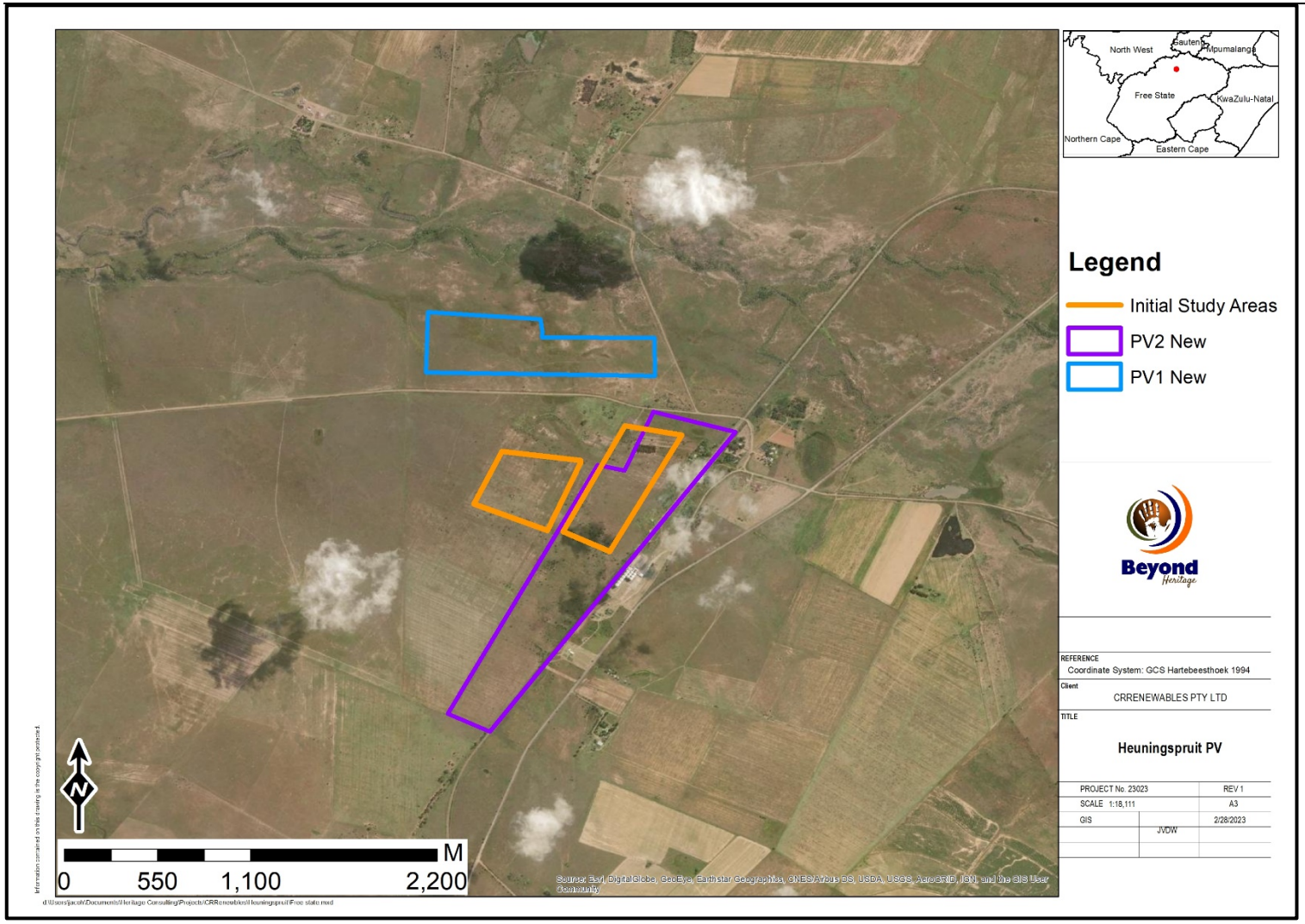



Figure 1.3. Aerial image of the study area. The image indicates the areas that were previously assessed (orange polygon) as well as the new layouts.

## 2 Legislative Requirements

The HIA, as a specialist sub-section of the EIA, is required under the following legislation:

- National Heritage Resources Act (NHRA), Act No. 25 of 1999)
- National Environmental Management Act (NEMA), (Act No. 107 of 1998 - Section 23(2)(b))

A Phase 1 HIA is a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of heritage specialist input is to:

- Identify any heritage resources, which may be affected;
- Assess the nature and degree of significance of such resources;
- Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- Assess the negative and positive impact of the development on these resources; and
- Make recommendations for the appropriate heritage management (or avoidance) of these impacts.

The HIA should be submitted, as part of the impact assessment report or EMPr, to the Provincial Heritage Resource Agency (PHRA) or to SAHRA. SAHRA will ultimately be responsible for the evaluation of Phase 1 HIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 HIA reports and additional development information, as per the impact assessment report and/or EMPr, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 HIA reports authored by professional archaeologists, accredited with ASAPA or with a proven ability to do archaeological work.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level). Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is based in South Africa, representing professional archaeology in the Southern African Development Community (SADC) region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 HIA's are primarily concerned with the location and identification of heritage sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase 2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision-making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and include (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation of a site, a destruction permit must be applied for with SAHRA by the applicant before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36 and GNR 548 as well as the SAHRA BGG Policy 2020. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (NHRA), as well as the National Health Act of 2003 and are under the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in this age category, located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws, set by the cemetery authority, must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925) re-instituted by Proclamation 109 of 17 June 1994 and implemented by CoGHSTA as well as the National Health Act of 2003 and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. . Authorisation for exhumation and reinternment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. To handle and transport human remains, the institution conducting the relocation should be authorised under the National Health Act of 2003.

# 3 METHODOLOGY

## 3.1 Literature Review

A brief survey of available literature was conducted to extract data and information on the area in question to provide general heritage context into which the development would be set. This literature search included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).

## 3.2 Genealogical Society and Google Earth Monuments

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located; these locations were marked and visited during the fieldwork phase. The database of the Genealogical Society was consulted to collect data on any known graves in the area.

### 3.3 Public Consultation and Stakeholder Engagement:

Stakeholder engagement is a key component of any EA process, it involves stakeholders interested in, or affected by the proposed development. Stakeholders are provided with an opportunity to raise issues of concern (for the purposes of this report only heritage related issues will be included). The aim of the public consultation (conducted by the EAP) process was to capture and address any issues raised by community members and other stakeholders during key stakeholder and public meetings.

### 3.4 Site Investigation

The aim of the site visit was to:

a) understand the heritage character of the development footprint;

b) record GPS points of sites/areas identified as significant areas;

c) determine the levels of significance of the various types of heritage resources recorded in the project area.

**Table 4: Site Investigation Details**

| | **Site Investigation** |
|---|---|
| Date | October 2013 |
| Season | Summer – After the initial study the layout of the development was changed resulting in some of the areas not being subjected to a field survey (Figure 3.1). |

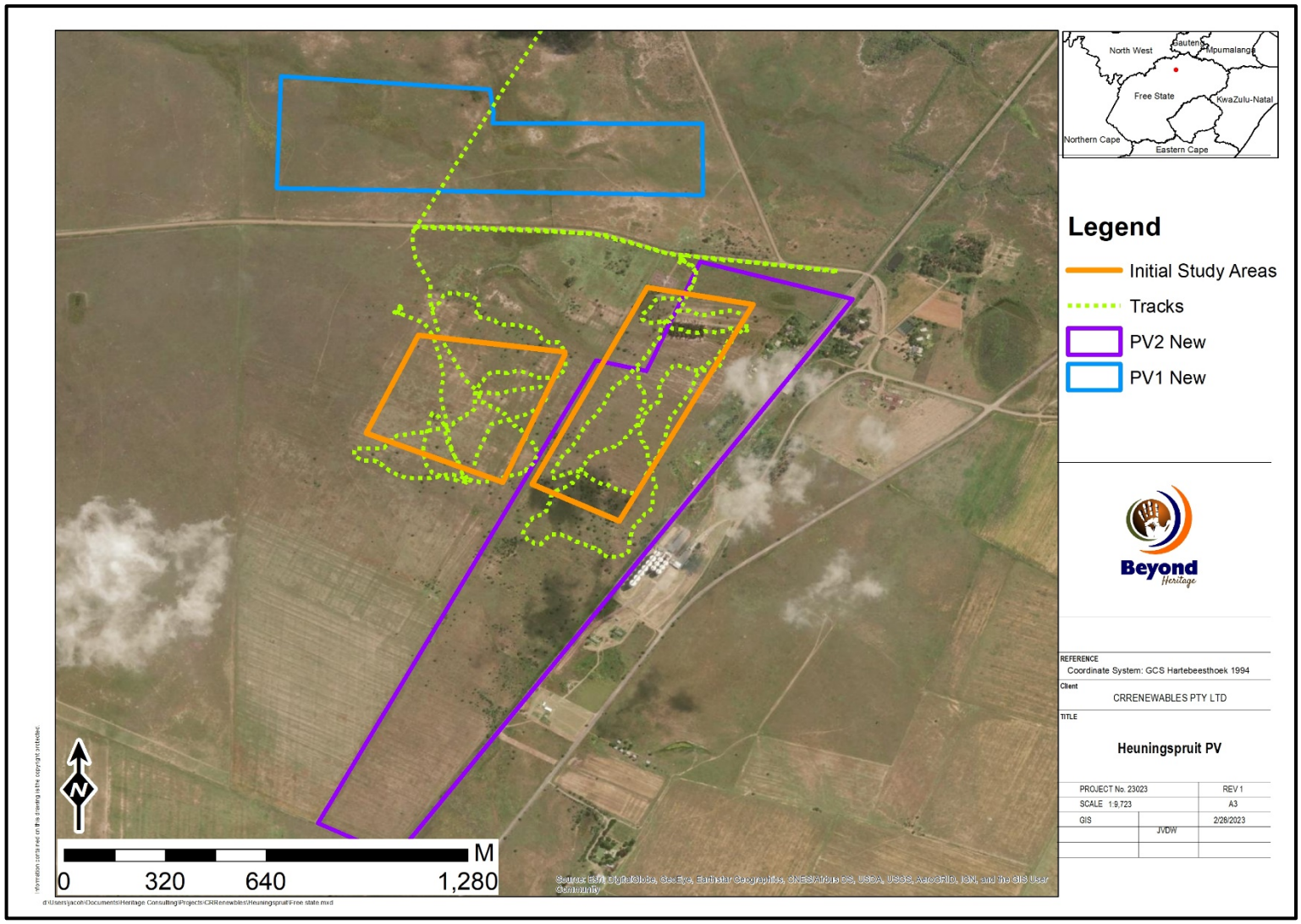



Figure 3.1. Tracklog of the survey path in green showing the areas covered that focussed on the initial layout.

### 3.5 Site Significance and Field Rating

Section 3 of the NHRA distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

- Its importance in/to the community, or pattern of South Africa's history;
- Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;
- Sites of significance relating to the history of slavery in South Africa.

The presence and distribution of heritage resources define a 'heritage landscape'. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed project the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface. This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance with cognisance of Section 3 of the NHRA:

- The unique nature of a site;
- The integrity of the archaeological/cultural heritage deposits;
- The wider historic, archaeological and geographic context of the site;
- The location of the site in relation to other similar sites or features;
- The depth of the archaeological deposit (when it can be determined/is known);
- The preservation condition of the sites; and
- Potential to answer present research questions.

In addition to this criteria field ratings prescribed by SAHRA (2007), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 10 of this report.

**Table 5: Heritage significance and field ratings**

| ***FIELD RATING*** | ***GRADE*** | ***SIGNIFICANCE*** | ***RECOMMENDED MITIGATION*** |
|---|---|---|---|
| National Significance (NS) | Grade 1 | - | Conservation; national site nomination |
| Provincial Significance (PS) | Grade 2 | - | Conservation; provincial site nomination |
| Local Significance (LS) | Grade 3A | High significance | Conservation; mitigation not advised |
| Local Significance (LS) | Grade 3B | High significance | Mitigation (part of site should be retained) |
| Generally Protected A (GP. A) | - | High/medium significance | Mitigation before destruction |
| Generally Protected B (GP. B) | - | Medium significance | Recording before destruction |
| Generally Protected C (GP.C) | - | Low significance | Destruction |

### 3.6 Impact Assessment Methodology

The criteria below are used to establish the impact rating on sites:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- The **duration**, wherein it will be indicated whether:
    - the lifetime of the impact will be of a very short duration (0-1 years), assigned a score of 1;
    - the lifetime of the impact will be of a short duration (2-5 years), assigned a score of 2;
    - medium-term (5-15 years), assigned a score of 3;
    - long term (> 15 years), assigned a score of 4; or
    - permanent, assigned a score of 5;
    - The **magnitude**, quantified on a scale from 0-10 where; 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
    - The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5 where; 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
    - The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
    - the **status**, which will be described as either positive, negative or neutral.
    - the degree to which the impact can be reversed.
    - the degree to which the impact may cause irreplaceable loss of resources.
    - the *degree* to which the impact can be mitigated.

The **significance** is calculated by combining the criteria in the following formula:
S=(E+D+M) P
S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

### 3.7 Limitations and Constraints of the study

The authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the subsurface nature of heritage resources, the possibility of discovery of heritage resources during the construction phase cannot be excluded. This limitation is successfully mitigated with the implementation of a chance find procedure and monitoring of the study area by the ECO. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. It should be noted that the layout of the approved facility was changed after the survey and subsequently all areas were not subjected to a field survey. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

.

## 4 Description of Socio-Economic Environment

According to Census 2011,Ngwathe Local Municipality has a total population of 120520 people, of which 86,5% are black African, 10,3% are white people and with the other population groups making up the remaining 3,2%. Of those aged 20 years and older, 5,4% have completed primary school, 34,7% have some secondary education, 25,9% have completed matric and 6,4% have some form of higher education.

There are 39 555 economically active (employed or unemployed but looking for work) people, and of these 35,2% are unemployed. Of the 20 204economically active youth (15–35 years) in the area, 45,1% are unemployed.

## 5 Results of Public Consultation and Stakeholder Engagement:

### 5.1.1 Stakeholder Identification

Adjacent landowners and the public at large were informed of the proposed activity as part of the EIA process by the EAP. Site notices and advertisements notifying interested and affected parties were placed at strategic points and in local newspapers as part of the process. No heritage concerns have been raised thus far.

## 6 Literature / Background Study:

### 6.1 Literature Review (SAHRIS)

Few sites are known for the greater region and consist of scattered Stone Age finds, Later Iron Age stone-wall settlements, graves, and historic structures. The following Cultural Resource Management (CRM) assessments (Table 6) were conducted in the area and consulted for this report:

**Table 6. CRM reports consulted for the study.**

| Author | Year | Project | Findings |
|---|---|---|---|
| Dreyer, C. | 2006 | First Phase Archaeological and Cultural Heritage Assessment of The Proposed Animal Breeding Station at The Farms Rietkuil 110, Dampoort 327, Winkelhaakdam 455, Mt Sinai 292, Gibson 294 & Van Vuurenskop 457, Vredefort, Free State | No sites were identified. |
| Dreyer, C. | 2006 | First Phase Archaeological and Cultural Heritage Investigation of The Proposed Residential Developments on The Farms Denoon 808, Maara 618, Aasvogelrand 249, Bergplaats 240 & Union 440, Vredefort, Free State | Structures and historical finds including mining remains and also stone packed walls. |
| Dreyer, C. | 2008 | First Phase Archaeological and Cultural Heritage Assessment of The Proposed Residential Developments at The Farm Buffelskloof 511 IQ, Vredefort Dome, Potchefstroom, North-West Province | Iron Age Sites |
| Van der Walt, J. | 2013 | Archaeological Impact Assessment For the proposed Jumanji Estate Development, Parys, Free State Province | Structures and MSA artefacts |
| Van der Walt, J. | 2018 | Heritage Impact Assessment Aasvogelrand Tented Camp, Vredefort, Free State Province, | No Sites |
| Van der Walt, J. | 2021 | Heritage Desktop Report Lengana Health SA (Pty) Ltd, Ngwathe District Municipality. Koppies | Structures |

### 6.1.1 Google Earth and The Genealogical Society of South Africa (Graves and burial sites)

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where archaeological and historical sites might be located. The database of the Genealogical Society of South Africa indicated no known grave sites within the study area.

## 6.2 Archaeological Background

The archaeological record for the greater study area consists of the Stone Age, Iron Age and Historical Period.

### 6.2.1 The Stone Age

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For Cultural Resources Management (CRM) purposes it is often only expected/ possible to identify the presence of the three main phases.

The three main phases can be divided as follows:

•Later Stone Age (LSA): associated with Khoi and San societies and their immediate predecessors. Recently to ~30 thousand years ago

•Middle Stone Age (MSA): associated with Homo sapiens and archaic modern humans. 30-300 thousand years ago.

•Earlier Stone Age (ESA): associated with early Homo groups such as Homo habilis and Homo erectus. 400 000-> 2 million years ago.

The Vaal Gravels are known to contain Early and Middle Stone Age Artefacts (van Riet Lowe 1937, 1952; Butzer et al. 1973; Helgren 1978; Gibbon, et al. 2009). Some important ESA sites providing background to the larger study area are included below (These are all located well away from the study area):

Table 7. Known ESA sites

| Site Name | Period | Source |
|---|---|---|
| Pneil | Acheulean | Beaumont & Morris 1990 |
| Power's Site | Acheulean | Power 1955; Beaumont & Morris 1990 |
| Riverview Estate | Acheulean | van Riet Lowe 1945; Helgren 1978 |

Some Rock Engraving sites are also on record around the greater study area especially the rock engraving site of Leeuwkuil. Hollmann (1999) described the sites as being located on a small island in the Vaal River. Engravings are concentrated on the south-eastern part of the peninsula also located well away from the Project area.

The images are dominated by Eland and other antelope, which appeared to be in the San hunter-gatherer engraving tradition (Hollmann, 1999). Pistorius (2007) discusses the Redan rock engraving site which contains up to 244 rock engravings. These engravings depict animals, geometric designs as well as San weapons (Du Piesani 2014).

### 6.2.2 The Iron Age

The Iron Age as a whole represents the spread of Bantu speaking people and includes both the pre-Historic and Historic periods. It can be divided into three distinct periods:

- The Early Iron Age: Most of the first millennium AD.
- The Middle Iron Age: 10th to 13th centuries AD
- The Late Iron Age: 14th century to colonial period.

The Iron Age is characterised by the ability of these early people to manipulate and work Iron ore into implements that assisted them in creating a favourable environment to make a better living.

Almost no Iron Age Sites are on record close to the study area. The closest sites are towards the southeast at Heilbron where Type N walling led to Type V named after Vegkop near Heilbron (Maggs,1976). Type V consists of the standard core of cattle enclosures surrounded by beehive houses and grain bins, but outer walls are usually absent. Corbelled huts have been associated with this type. These low huts were originally occupied by herd boys but in some areas of the Free State they may have served as houses for adults.

### 6.3 Historical Overview

The first Europeans arrived in the Cape in 1652, and expansion to the north only started in the late 1820s. In 1836 on 16 October the Battle of Vechtkop (Vegkop), near present day Heilbron, FS, between the Voortrekkers and the Ndebele takes place. Kalipi attacks the laager with 6 000 warriors. 430 Ndebele and two Voortrekkers are killed. There is difference of opinion about the exact date of the attack, but it is certain that news of the campaign reached the Ndebele king at Kapain, Marico district, on 25 October.
The Great Trek of 1837, as this northern movement of white people from the Cape Colony was called, resulted in a mass migration of white people into the northern areas of South Africa. (Ross 2002:39) The discovery of diamonds and gold in the northern provinces between 1867 and 1886 had very important consequences for South Africa. After the discovery of these resources, the British, who at the time had colonised the Cape and Natal, had intensions of expanding their territory into the northern Boer republics. This eventually led to the Anglo-Boer War, which took place between 1899 and 1902, and which was one of the most turbulent times in South Africa's history. Even before the outbreak of war in October 1899 British politicians, including Sir Alfred Milner and Mr. Chamberlain, had declared that should Britain's differences with the Z.A.R. result in violence, it would mean the end of republican independence. This decision was not immediately publicised, and as a consequence republican leaders based their assessment of British intentions on the more moderate public utterances of British leaders. Consequently, in March 1900, they asked Lord Salisbury to agree to peace on the basis of the status quo ante bellum. Salisbury's reply was, however, a clear statement of British war aims. (Du Preez 1977).

Based on information obtained from Mr Herbst, the owner of Goudlaagte 238, the farm was previously owned by the Kirsch family, and home to South African Poet Olga Kirsch. She was born in the Koppies area in 1924 and holds a unique place in Afrikaans literature. As an English-speaking Jewess who chose to write and publish poetry in Afrikaans (Roth 2017)

#### 6.3.1 Battles and Battlefield sites in relation to the study area

##### 6.3.1.1 Historical Battles

The only historical battle on record for the area is the battle of Vechtkop (1836) 49 km east of the study area.

The northern Free State is located within the area where some of the main operations of the Boer General, Christiaan De Wet, took place between 1899 and May 1900 when the war ended. De Wet, among the other Boer generals, realized that they could not win the war by conventional means, and spread out into small hit-and-run groups that inflicted serious casualties on the British armies. This is known as Guerrilla warfare. The British Commander-In-Chief, Lord Kitchener, consequently turned to the destruction of Boer crops and built concentration camps where the wives and children of the Boer soldiers were interned. This "scorched earth" policy of the British finally resulted in the demoralisation of the Boers. (Readers Digest 1984: 33)
Some skirmishes took place on towns in the vicinity of Koppies. Kroonstad was one of these towns. On 12 March 1900, on the eve of the occupation of Bloemfontein by Lord Roberts, President M. T. Steyn declared Kroonstad the new capital of the Free State government. It simultaneously became the organising centre for retreating Boer commandos and a depot for stores of all kinds. It was also at Kroonstad that it was decided in March 1900 to abolish wagon laagers and to employ mounted commandos instead. This heralded a new method of warfare with increased mobility, which later became known as guerrilla warfare.

Kroonstad remained the Free State capital until 11 May 1900, when the British were victorious at Zand River. Kroonstad remained in British hands for the rest of the war, and housed concentration camps for both Boer civilians and black people. (Pretorius 2010: 225-226)
Lindley is another town located close to where some of the very few successful Boer sieges during the war took place here. Spagge's Battalion of 500 men reached Lindley from Kroonstad on 27 May 1900. The battalion had covered 90 miles in three days and only had rations for two days. As they approached Lindley, the battalion came under heavy rifle fire from a group of Boers. During five days of fighting the British casualties came to 468. The British finally gave in when they realized they were completely surrounded, and became the prisoners of war of General Piet de Wet. (Pretorius 2010: 244-245).

A central figure in the establishment of the town Koppies was Emily Hobhouse. Concerned about the economic and personal losses of the Boer people, throughout the Anglo Boer war, she promoted the idea of home-industry among the inhabitants of the town. Her vision and courage was manifested in the Lace school at Phillipolis. Peace talks between the Boers and the British had started around April 1902, and culminated in the Peace of Vereeniging treaty on 31 May 1902. This event signalled the end of the Anglo-Boer War, as well as the temporary end of the Boer Republics' independence. (Geskiedenisatlas van Suid-Afrika 1999: 251)

In 1904, General C.R. de Wet established a settlement on the banks of the Renoster River for underprivileged whites. He donated his Farm "Rooipoort" in order to relieve the poverty caused by the war in the form of a few morgen irrigation land, and then a few morgen "dry" land for cultivating maize. Inhabitants were supplied with a few eggs and a paraffin lamp/hatcher for the eggs. In 1926 this settlement achieved municipal rights and became the town of Koppies.
By demand/pressure of General De Wet, the "Koppies Dam" was constructed to supply water for irrigation, and work to the local people who needed it badly. The Vredefort Concentration camp is indicated more than 4,5 km to the east of the study area and no impact is expected to this site.

#### 6.3.1.2 World War I

At the start of the 1914-Rebellion (or "Armed protest" as it was called), it is decided in Koppies, OFS, that Gen. C.R. de Wet is to lead the rebels in the Free state (7 000 men), while Gen. C.F. Beyers (after whom "Oom Bey" was later named), is to lead the 3 000 rebels in the Transvaal (SA History 2013). About 2 000 would take up arms in the Cape Province. This decision was made in the old NG-church, the Minister was C.R Ferreira. After the war, he returned to minister in Koppies. He passed away in 1932 and was buried in the church grounds.

## 7 Description of the Physical Environment

The project site is located approximately 35km south west of Koppies in the Free State Province Heuningspruit PV 1 Solar Energy Facility is proposed on Voorspoed 1508 and Heuningspruit PV 2 Solar Energy Facility is proposed on Verdun RE/1511. The sites are currently used for livestock grazing with sheep and cattle but large areas were used for crop farming in the past. These properties fall within the Ngwathe Local Municipality of the Free State Province.

The study area falls within a Dry Highveld Grassland Bioregion as described by Mucina *et al* (2006) with the vegetation described as Central Free State Grassland. Land use in the general area is characterized by agriculture, dominated by crops and cattle farming. The study area is characterised by deep sandy to loam soil. General site conditions are illustrated in Figure 7.1 and 7.2.

Figure 7.1. General site conditions in the study area.

Figure 7.2. General site conditions showing typical vegetation cover in the project area.

# 8 Findings of the Survey

## 8.1 Heritage Resources

The study area is flat without focal points like natural pans or rocky outcrops that would have attracted human occupation in antiquity. The project area consists of open veld used for grazing with large areas that have been ploughed and cultivated. Previous disturbances relating to cultivation of the study area is evident throughout the area and during the site visit heritage finds were limited to an informal cemetery.

General site conditions and site distribution of the recorded observations are illustrated in Figure 8.1 and briefly described in Table 8. Recorded features are illustrated in Figure 8.2 to 8.7.

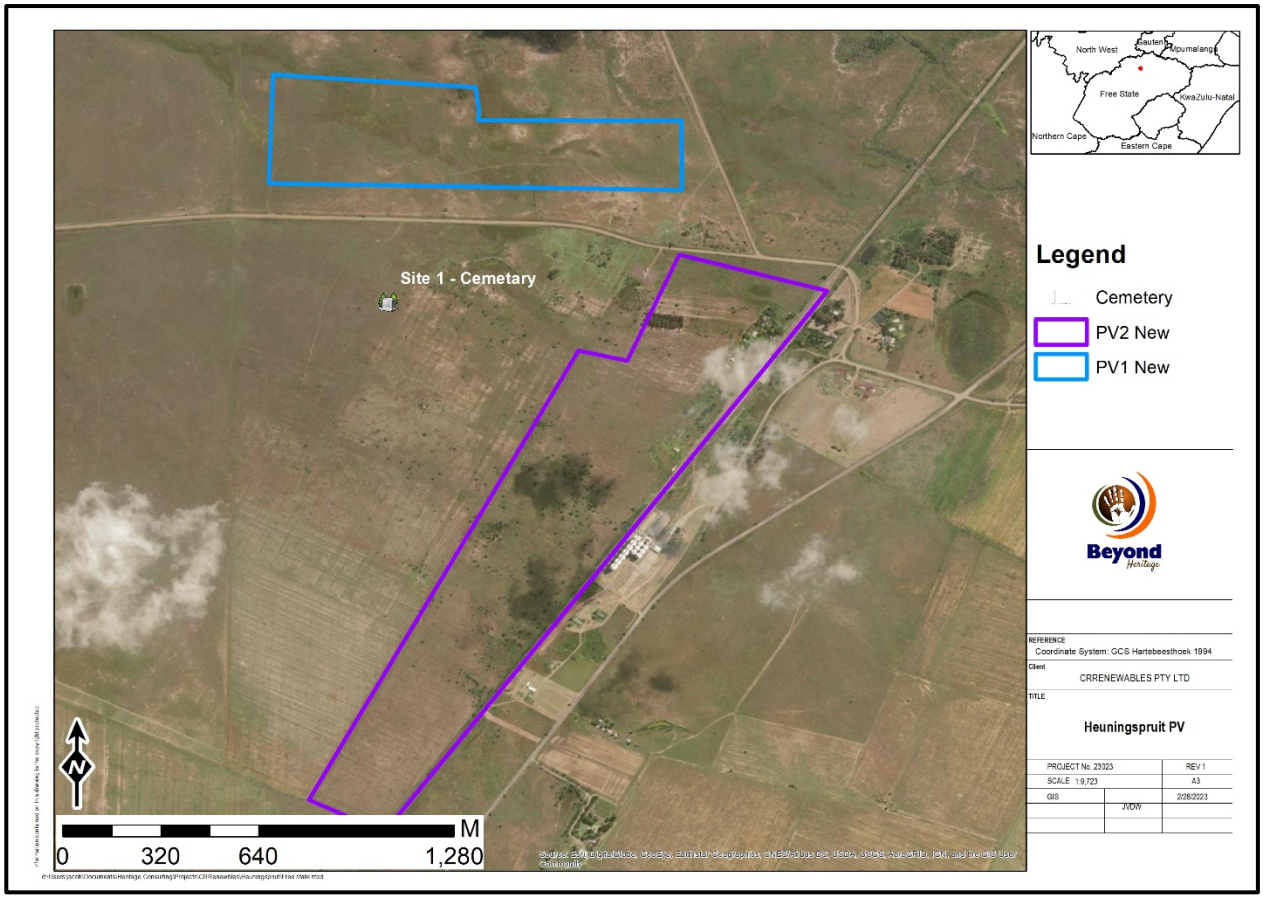



Figure 8.1. Site distribution map.

**Table 8. Heritage observations in the study area.**

| Site Number | Description | Cultural Markers | Co ordinate |
|---|---|---|---|
| **Site 1** | Site 1 consists of approximately 4 demarcated graves. The graves are aligned east to west and are located just outside of the development footprint. The graves are much neglected with the headstones fallen over and broken and borrowing animals digging through the graves causing them to collapse. The site is not located within any of the proposed alternatives and no impact is foreseen on the site. | Headstones, informal grave dressings (bricks) and one of the inscription dates to 1975. | S27 26 51.6<br>E27 24 29.8 |

Figure 8.2. Grave in informal cemetery.

Figure 8.3. Grave in informal cemetery.

Figure 8.4. Broken headstone on grave at Site 1.

Figure 8.5. Headstone with inscription indicating that the cemetery dates to at least 1975.

## 8.2 Cultural Landscape

The cultural landscape of the area consisted of areas of cultivation and low scale developments such as railway lines and powerlines (Figure 8.6 to 8.7). The study area itself seems to have been fallow for a number of years.

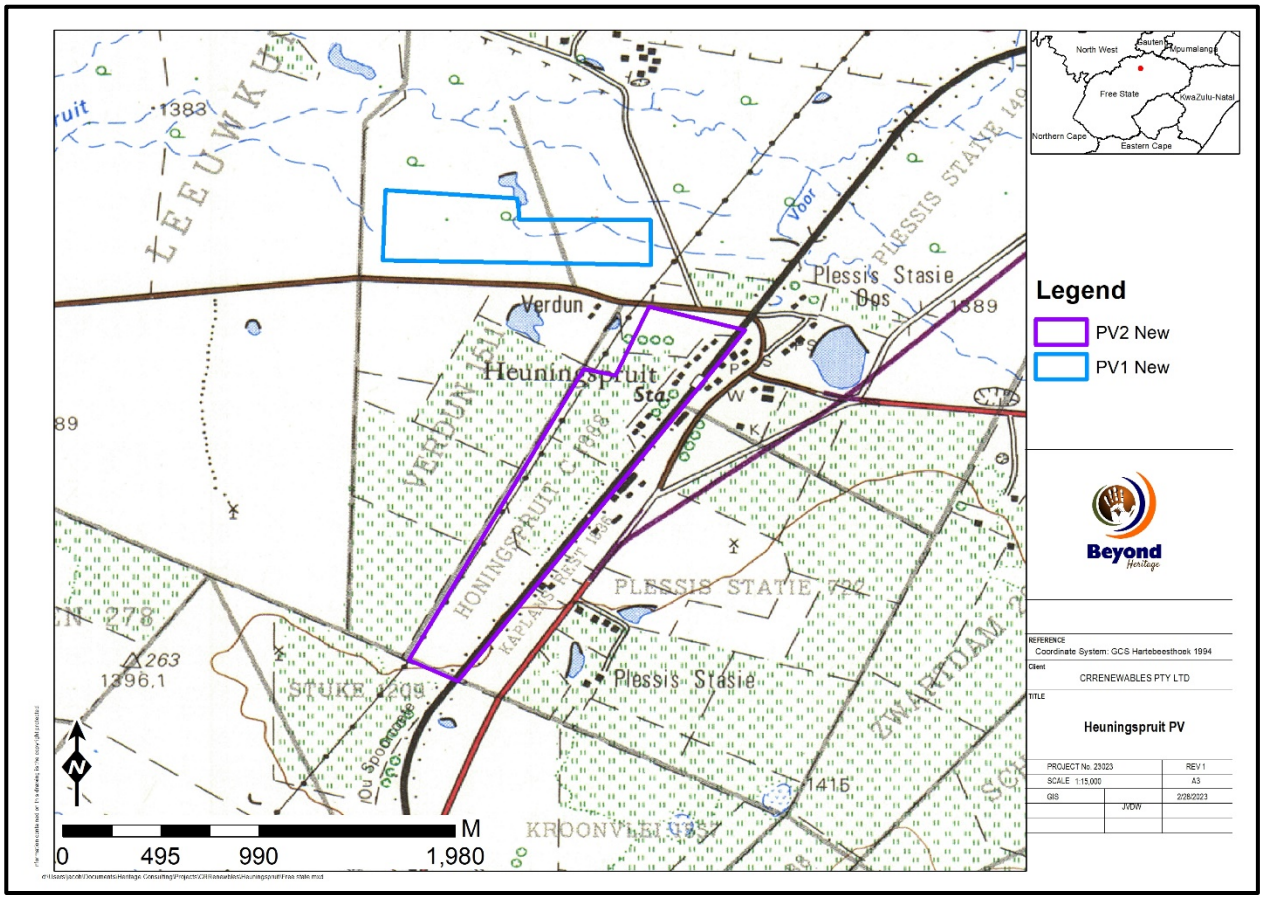



Figure 8.6. 1991 Topographic map of the project area indicating no developments in the study area.

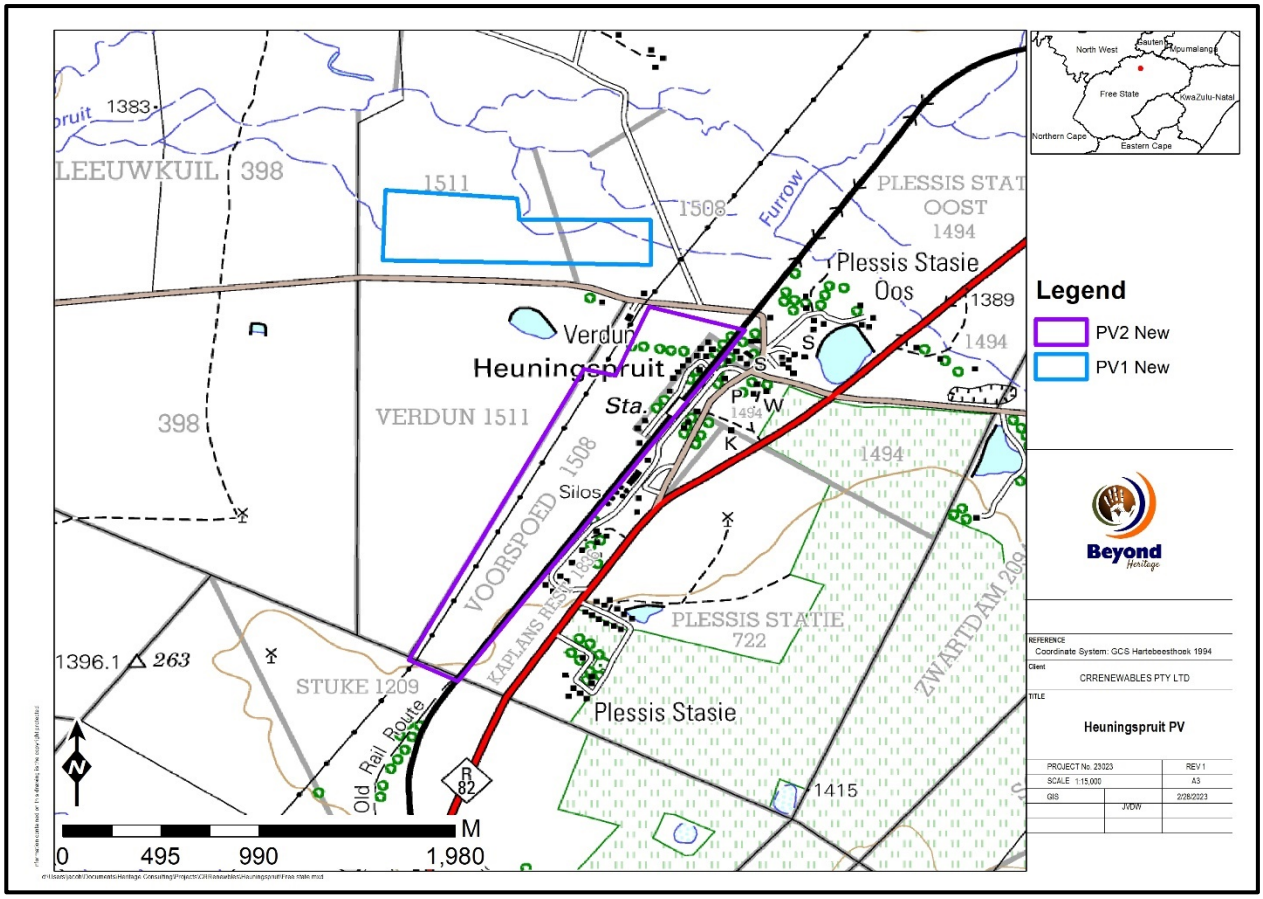
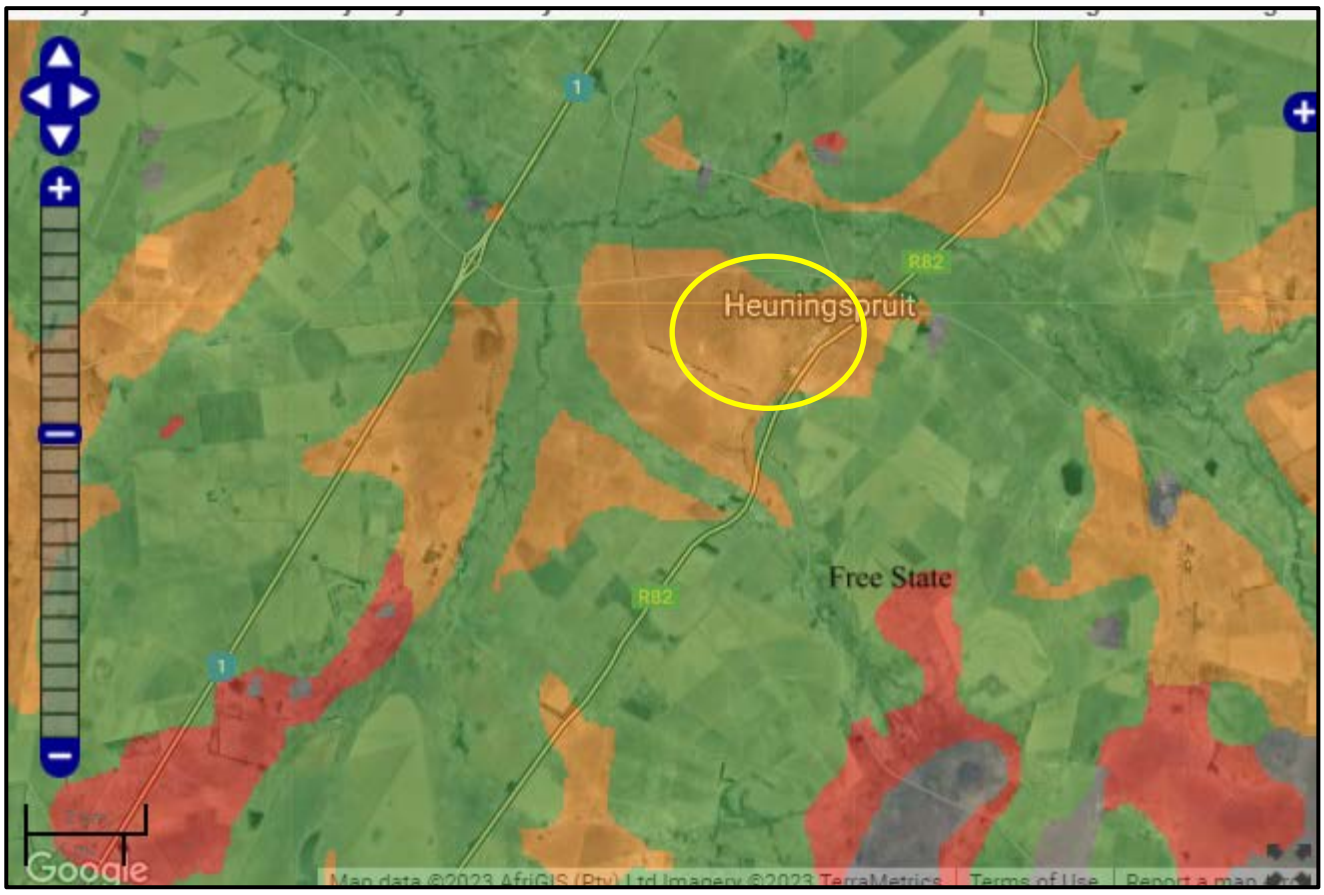



Figure 8.7. 1997 Topographic map of the project area indicating cultivation in the study area.

### 8.3 Paleontological Heritage

The study area is indicated as of high paleontological significance on the SAHRA Paleontological map (Figure 8.8) and an independent study (Bamford 2023) was commissioned for this aspect.




| Colour | Sensitivity | Required Action |
|---|---|---|
| RED | VERY HIGH | Field assessment and protocol for finds is required |
| ORANGE/YELLOW | HIGH | Desktop study is required and based on the outcome of the desktop study, a field assessment is likely |
| GREEN | MODERATE | Desktop study is required |
| BLUE | LOW | No palaeontological studies are required however a protocol for finds is required |
| GREY | INSIGNIFICANT/ZERO | No palaeontological studies are required |
| WHITE/CLEAR | UNKNOWN | These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map |

Figure 8.8. Paleontological sensitivity of the approximate study area (yellow polygon) as indicated on the SAHRA Palaeontological sensitivity map.

## 9 Potential Impact

The main cause of impacts to heritage resources is physical disturbance of the material itself and its context during removal of topsoil and vegetation as well as the excavations associated with the establishment of infrastructure. In terms of this project the main source of impacts will happen during the following activities.

- Establishment of new roads and upgrade of existing roads;
- Earthworks for temporary infrastructure including laydown areas;
- Visual impact of the PV Facility on the landscape and sense of place;
- Excavation and levelling of the PV facility footprint;
- Trenches for cables and erection of powerlines;
- Influx of people into the area that could impact on the burial site;
- Excavations during construction of the sub stations.

The only recorded heritage resource consists of a burial site (**Site 1**) that was documented outside of the proposed PV footprints and no direct impact is foreseen on the site. However, some recommendations are made to protect the site from accidental damage during the construction phase of the project.

Any additional effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure. Mitigation measures as recommended in this report should be implemented during all phases of the project. Impacts of the project on heritage resources is expected to be low during all phases of the development (Table 9).

### 9.1.1 Impact Assessment Table

**Table 9. Potential impact of the project.**

| ***Nature:*** During the operation of the project an indirect visual impact is expected for the site. | | |
|---|---|---|
| | **Without mitigation** | **With mitigation** |
| ***Extent*** | Local (2) | Local (1) |
| ***Duration*** | Permanent (5) | Permanent (5) |
| ***Magnitude*** | High (8) | Low (2) |
| ***Probability*** | Not Probable (2) | Not Probable (1) |
| ***Significance*** | **30 (Low)** | **8 (Low)** |
| ***Status (positive or negative)*** | Negative | Negative |
| ***Reversibility*** | Not reversible | Not reversible |
| ***Irreplaceable loss of resources?*** | Yes | Yes |
| ***Can impacts be mitigated?*** | Yes | |
| ***Mitigation:***<br>• Regular monitoring of the development footprint by the ECO to implement the Chance Find Procedure for heritage and palaeontology resources (outlined in Section 10.2) in case heritage resources are uncovered during the course of construction;<br>• The recorded burial site should be indicated on development plans and avoided with a 30 m buffer;<br>• The final development layout should be subjected to a heritage walk down prior to construction with enough lead time to facilitate heritage mitigation if needed. | | |
| ***Residual Impacts:***<br>Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on, but this cannot be quantified. | | |
| ***Cumulative impacts:***<br>The proposed project will have a low cumulative impact as no significant heritage resources will be adversely affected. | | |

## 10 Conclusion and recommendations

The topography of the study area is undulating with no major topographic features (such as pans or shelters) that would have been focal points for human activity in antiquity and heritage finds were limited to a burial (Site 1). The cemetery at Site 1 is of high social significance and should be preserved *in situ*. This should easily be achievable as the site is located **outside** of the study area.

The palaeontological sensitivity of the study area is moderate to high, and an independent study was conducted by Marion Bamford (2023) for this aspect. The palaeontological site visit found no fossils present within the proposed project area. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr. As far as the palaeontology is concerned, the project may be authorised. The impact to heritage resources is medium and the project can commence provided that the recommendations in this report are adhered to, based on the South African Heritage Resource Authority (SAHRA) 's approval.

The layout of the Project changed from the areas assessed during the field assessment and 2014 Environmental authorisation, resulting in some areas not being physically surveyed. This is not regarded as major limitation due to the low heritage potential of the area but should be verified through a pre-construction heritage walk down.

Impacts to heritage resources can be mitigated to an acceptable level and it is recommended that the project can commence on the condition that the following recommendations (Section 10) are implemented as part of the EMPr and based on approval from SAHRA.

### 10.1 Recommendations for condition of authorisation

The following recommendations for Environmental Authorisation apply and the project may only proceed based on approval from SAHRA:

**Recommendations:**

- Regular monitoring of the development footprint by the ECO to implement the Chance Find Procedure for heritage and palaeontology resources (outlined in Section 10.2) in case heritage resources are uncovered during the course of construction;
- The recorded burial site should be indicated on development plans and avoided with a 30 m buffer;
- The final development layout should be subjected to a heritage walk down prior to construction with enough lead time to facilitate heritage mitigation if needed.

### 10.2 Chance Find Procedures

#### 10.2.1 Heritage Resources

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped, and a qualified archaeologist must be contacted for an assessment of the find and therefor chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below and monitoring guidelines applicable to the Chance Find procedure is discussed below and monitoring guidelines for this procedure are provided in Section 10.5.

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

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

#### 10.2.2 Monitoring Programme for Palaeontology – to commence once the excavations / drilling activities begin.

1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.
2. When excavations begin the rocks and discard must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone or trace fossils) should be put aside in a suitably protected place. This way the project activities will not be interrupted.

3. Photographs of similar fossils must be provided to the developer to assist in recognizing the trace fossils such as stromatolites in the dolomites or the Quaternary bones, rhizoliths, traces. This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the developer/environmental officer then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
7. If no good fossil material is recovered, then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
8. If no fossils are found and the excavations have finished, then no further monitoring is required.

### 10.3 Reasoned Opinion

The overall impact of the project is considered to be low and residual impacts can be managed to an acceptable level through implementation of the recommendations made in this report. The socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project.

### 10.4 Potential risk

Potential risks to the proposed project are the occurrence of intangible features, sub surface cultural material and unrecorded heritage sites. This can cause delays during construction, as well as additional costs involved in mitigation, as well as possible layout changes.

### 10.5 Monitoring Requirements

Day to day monitoring can be conducted by the Environmental Control Officers (ECO). The ECO or other responsible persons should be trained along the following lines:

- *Induction training:* Responsible staff identified by the developer should attend a short course on heritage management and identification of heritage resources.
- *Site monitoring and watching brief*: As most heritage resources occur below surface, all earth-moving activities need to be routinely monitored in case of accidental discoveries. The greatest potential impacts are from pre-construction and construction activities. The ECO should monitor all such activities daily. If any heritage resources are found, the chance finds procedure must be followed as outlined above.

Table 10. Monitoring requirements for the project

| Heritage Monitoring | | | | | |
|---|---|---|---|---|---|
| **Aspect** | **Area** | **Responsible for monitoring and measuring** | **Frequency** | **Proactive or reactive measurement** | **Method** |
| Cultural Resources Chance Finds | Entire project area | ECO | Weekly (Pre construction and construction phase) | Proactively | • If risks are manifested (accidental discovery of heritage resources) the chance find procedure should be implemented:<br>1. Cease all works immediately;<br>2. Report incident to the Sustainability Manager;<br>3. Contact an archaeologist/ palaeontologist to inspect the site;<br>4. Report incident to the competent authority; and<br>5. Employ reasonable mitigation measures in accordance with the requirements of the relevant authorities. |

| Heritage Monitoring | | | | | |
|---|---|---|---|---|---|
| **Aspect** | **Area** | **Responsible for monitoring and measuring** | **Frequency** | **Proactive or reactive measurement** | **Method** |
| | | | | | • Only recommence operations once impacts have been mitigated. |

## 10.6 Management Measures for inclusion in the EMPr

Table 11. Heritage Management Plan for EMPr implementation

| Area | Mitigation measures | Phase | Timeframe | Responsible party for implementation | Target | Performance indicators (Monitoring tool) |
|---|---|---|---|---|---|---|
| General project area | Regular monitoring of the development footprint by the ECO to implement the Chance Find Procedure for heritage and palaeontology resources (outlined in Section 10.2) in case heritage resources are uncovered during the course of construction. | Construction | Throughout the project | Applicant EAP | Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA | ECO Checklist/Report |
| Site 1 | Burial sites should be avoided with at least a 30m buffer zone and access to the site for family members should not be impeded on by the development. | Pre construction and Construction | Throughout the project | Applicant EAP | Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA | ECO Checklist/Report |
| Project Area | Recorded heritage features should be indicated on development plans and construction crews should be made aware of expected resources and applicable mitigation measures; | Pre construction and Construction | Throughout the project | Applicant EAP | Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA | ECO Checklist/Report |
| Final Layout | The final layout should be subjected to a heritage walkdown prior to development. | Pre construction | Throughout the project | Applicant EAP | Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA | ECO Checklist/Report |

## 11 References

*Du Preez, S. J. 1977. Peace attempts during the Anglo Boer War until March 1901. Magister Artium thesis in History. Pretoria: University of Pretoria*

*Geskiedenisatlas van Suid-Afrika. Die vier noordelike provinsies.*Edited by J. S. Bergh. 1999. Pretoria: J. L. van Schaik Uitgewers.

Huffman, T.N. 2007. Handbook to the Iron Age. The archaeology of pre-colonial farming societies in Southern Africa. Pietermaritzburg: University of KwaZulu-Natal Press.

Hutten, M. 2012. Heritage Impact Assessment of Lichtenburg Solar Park. An unpublished report.

Mucina, L. & Rutherford,M.C. 2006. The vegetation map of South Africa, Lesotho and Swaziland. SANBI, Pretoria.

National Heritage Resources Act NHRA of 1999 (Act 25 of 1999)

Pretorius, F. 2010. The *A to Z of the Anglo-Boer War.* Lanham, Md: Scarecrow Press. Readers Digest. 1984. *Atlas of Southern Africa*. Cape Town: Readers Digest Association.

Readers Digest. 1992. *Illustrated history of South Africa. The Real Story. Expanded second edition: completely updated*. Cape Town: Readers Digest Association.

Ross, R. 2002. *A concise history of South Africa*. Cambridge: Cambridge University Press.

SAHRA Report Mapping Project Version 1.0, 2009

Van der Walt, J. 2013. Archaeological Impact Assessment For the proposed Watershed Solar Energy Facility, Lichtenburg, North West Province. An unpublished report.

Wallis, F. (2000). Nuusdagboek: feite en fratse oor 1000 jaar, Kaapstad: Human & Rousseau