

# HERITAGE IMPACT ASSESSMENT

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

## FOR THE PROPOSED ERGO MINING SOLAR (PV) ENERGY: PHASE 1 PROJECT, GAUTENG PROVINCE

**Type of development:**

Renewable Energy

**Client:**

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## APPROVAL PAGE

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10 May 2021	2107b	Technical revision
15 July 2021	2107c	Lay out changes

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## REPORT OUTLINE

Appendix 6 of the GNR 326 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 - (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae	Section a Section 12
(b) Declaration that the specialist is independent in a form as may be specified by the competent authority	<i>Declaration of Independence</i>
(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 and 7.1.
(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 <b>including identified alternatives on the environment</b> or activities;	Section 9
(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 - (i) as to whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and (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 6
(p) A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer to BAR report
(q) Any other information requested by the competent authority	Section 13

## Executive Summary

Tshedza 1 Pre Project Development (Pty) Ltd, appointed Environmental Management Assistance (Pty) Ltd as the Environmental Assessment Practitioner (EAP) to obtain Environmental Authorisation (EA) for the proposed Ergo Mining Solar (PV) Phase 1 Energy project. The project is located on Ergo Mining owned land adjacent to the Withok Estates Agricultural Holdings and Witpoort Estates Agricultural Holdings areas of Brakpan within the City of Ekurhuleni Metropolitan Municipality, Gauteng Province.


The project consists of two components, a PV facility (a preferred and alternative layout) of up to 19.9 MW, with battery energy storage, and a 22 KV overhead power line. HCAC was appointed to conduct a Heritage Impact Assessment (HIA) for the project and the study area was assessed on desktop level and by a non-intrusive pedestrian field survey. Key findings of the assessment include:

- In the area marked for the preferred PV layout, Stone Age artefacts (Feature 6) were recorded. Historically this area was first used for agriculture (1940's), then as a slimes dam (1976) and later as a reclaimed mine dump (during the 1990's) and the level of disturbance to the Stone Age site is difficult to ascertain. The use of the area as a slimes dam could have capped and preserved the subsurface material *in situ* until the dump was reclaimed and earthworks exposed the lithics.
- Along the proposed power line route, the remains of 5 structures were recorded. Some of these features are older than 60 years and therefore protected by the NHRA. The features are located outside of the direct area of impact;
- In terms of the palaeontological component, the area is indicated as of moderate to high paleontological sensitivity and an independent palaeontological study was commissioned for the project and found the impact on paleontological resources to be low;
- From a heritage point of view the alternative layout is preferred but with the correct mitigation measures both layouts are acceptable.
- The project can commence based on the implementation of the recommendations in this report and the approval of SAHRA.

## Recommendations:

- Indication of Feature 1 – 5 on development plans and avoidance of these features.
- Surface sampling and test excavation at Feature 6 to determine the depth and integrity of the deposit.
- The development of the PV plant (Preferred and Alternative layout) should be monitored during construction to record and mitigate subsurface Stone Age finds.
- Implementation of a chance find procedure and a Fossil Chance Find Protocol should be added to the EMPr.

**Declaration of Independence**

<b>Specialist Name</b>	Jaco van der Walt
<b>Declaration of Independence</b>	<p>I declare, as a specialist appointed in terms of the National Environmental Management Act (Act No 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I:</p> <ul style="list-style-type: none"> <li>• I act as the independent specialist in this application;</li> <li>• 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;</li> <li>• I declare that there are no circumstances that may compromise my objectivity in performing such work;</li> <li>• 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;</li> <li>• I will comply with the Act, Regulations and all other applicable legislation;</li> <li>• I have no, and will not engage in, conflicting interests in the undertaking of the activity;</li> <li>• 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;</li> <li>• All the particulars furnished by me in this form are true and correct; and</li> <li>• I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.</li> </ul>
<b>Signature</b>	
<b>Date</b>	02/23/2021

**a) Expertise of the specialist**

Jaco van der Walt has been practising as a CRM archaeologist for 15 years. He obtained an MA degree in Archaeology from the University of the Witwatersrand focussing on the Iron Age in 2012 and is a PhD candidate at the University of Johannesburg focussing on Stone Age Archaeology with specific interest in the Middle Stone Age (MSA) and Later Stone Age (LSA). Jaco is an accredited member of ASAPA (#159) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, KZN as well as he Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, DRC Zambia and Tanzania. Through this, he has a sound understanding of the IFC Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage.

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**ABBREVIATIONS**

ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
BIA: Basic Impact Assessment
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DEFF: Department of Environment, Forestry and Fisheries
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact 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:

HCAC was appointed to conduct a Heritage Impact Assessment (HIA) for the proposed Ergo Mining Solar PV Energy Phase 1 project situated on Ergo Mining owned land. The project is located adjacent to the Withok Estates Agricultural Holdings and Witpoort Estates Agricultural Holdings areas of Brakpan within the City of Ekurhuleni Metropolitan Municipality, Gauteng Province (Figure 1.1 to 1.4). The report forms part of the Basic Assessment Report (BAR) 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, the remains of 5 structures and a scatter of Stone Age material were recorded. 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 and activities

The proposed PV project location and components are outlined in Table 2 and 3.

**Table 2: Project Description**

<b>Farm and portions</b>	PV facility - Farm Witpoortje 117 portion 183 Power line - Farms Witpoortje 117, Witpoort Estates AH and Withok Estate AH
<b>Magisterial District</b>	Ekurhuleni Metropolitan Municipality
<b>Central co-ordinate of the development</b>	26°17'26.10"S 28°21'56.12"E

**Table 3: Infrastructure and project activities**

<b>Type of development</b>	Renewable Energy
<b>Size of development</b>	Linear development – Power line of approximately 11 km PV facility – Approximately 17 hectares
<b>Project Components</b>	<p>The proposed development entails a PV facility up to 19.9MW, with battery energy storage, including ~11 km of 22 KV Overhead Power Line (OHL) which mainly follows an existing slurry pipe servitude/corridor. The OHL will link the PV facility to two (2) existing substations. The PV development will include up to 100 MWh containerized battery storage. The vacant land earmarked for the PV facility itself, which was previously mined and subsequently rehabilitated to its current naturally vegetated condition, is owned by Ergo Mining and falls within the existing approved Mining Right Area. The two mining facilities i.e., Ergo Mining Brakpan Plant and the Brakpan/Withok Tailings Dam facility, are currently supplied with electricity by Eskom via an existing grid infrastructure. The proposed PV facility will generate electricity with battery storage, to interface with the Eskom grid to supply the ERGO Mining Brakpan Plant and the Brakpan/Withok Tailings Facility. The generated electricity will be used when there is an interruption to Eskom's supply in energy.</p> <p>The project will also include:</p> <ul style="list-style-type: none"> <li>• 1 x Substation (approximately 40m x 30m)</li> <li>• 1 x Battery Storage area (approximately 60m x 40m) <ul style="list-style-type: none"> <li>○ Each battery will be contained in a 12m x 2,4m container (x20) with some ancillary equipment</li> </ul> </li> <li>• 3m roads to be constructed in between and around battery storage containers.</li> </ul>

## 1.3 Alternatives

A preferred and alternative location for the PV facility were provided for assessment (Figure 1.2). From a heritage point of view the alternative layout is preferred, but with the implementation of the recommendations in this report and based on approval from SAHRA both layouts are acceptable from a heritage point of view.

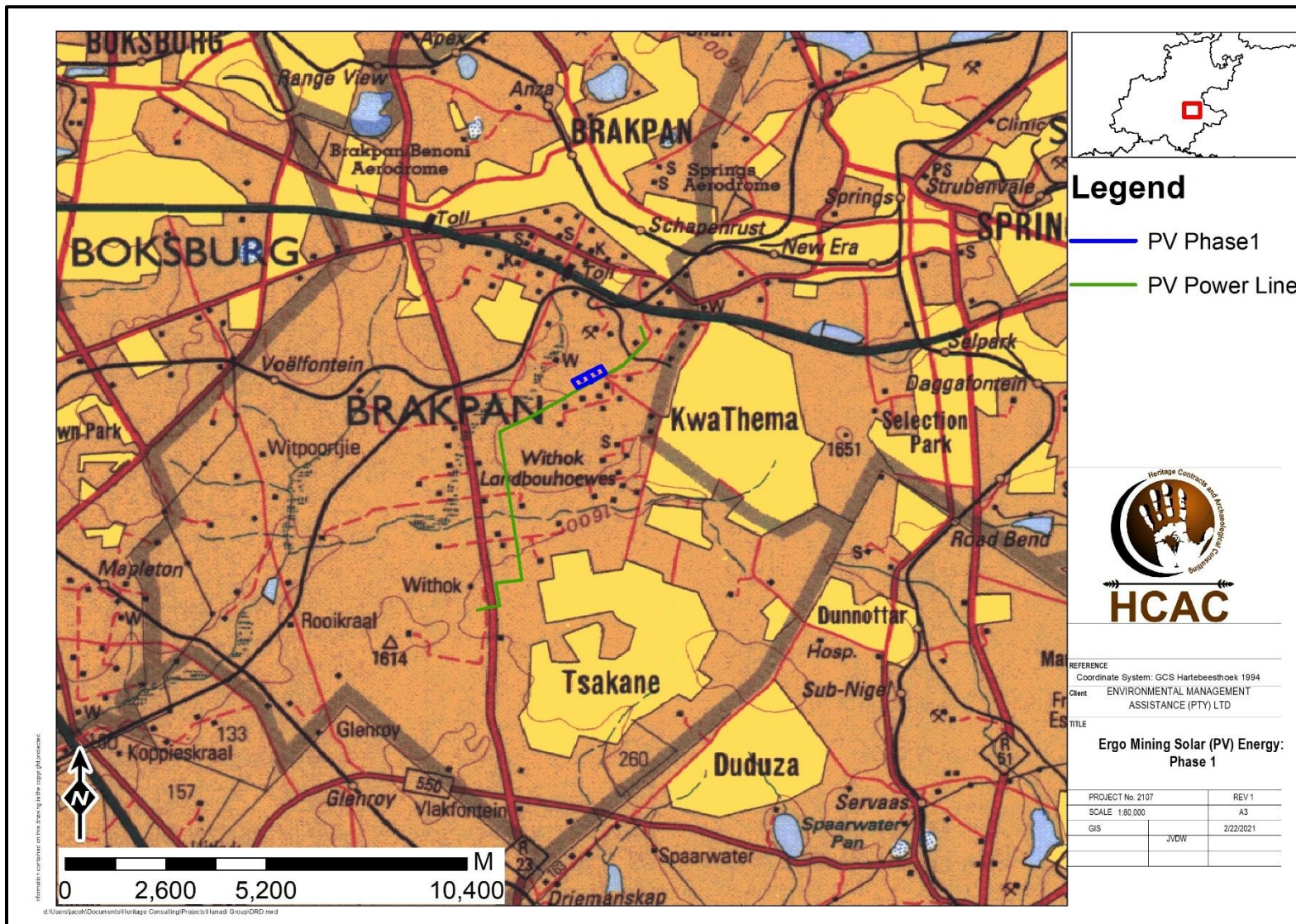


Figure 1.1. Regional setting of the project (1: 250 000 topographical map).

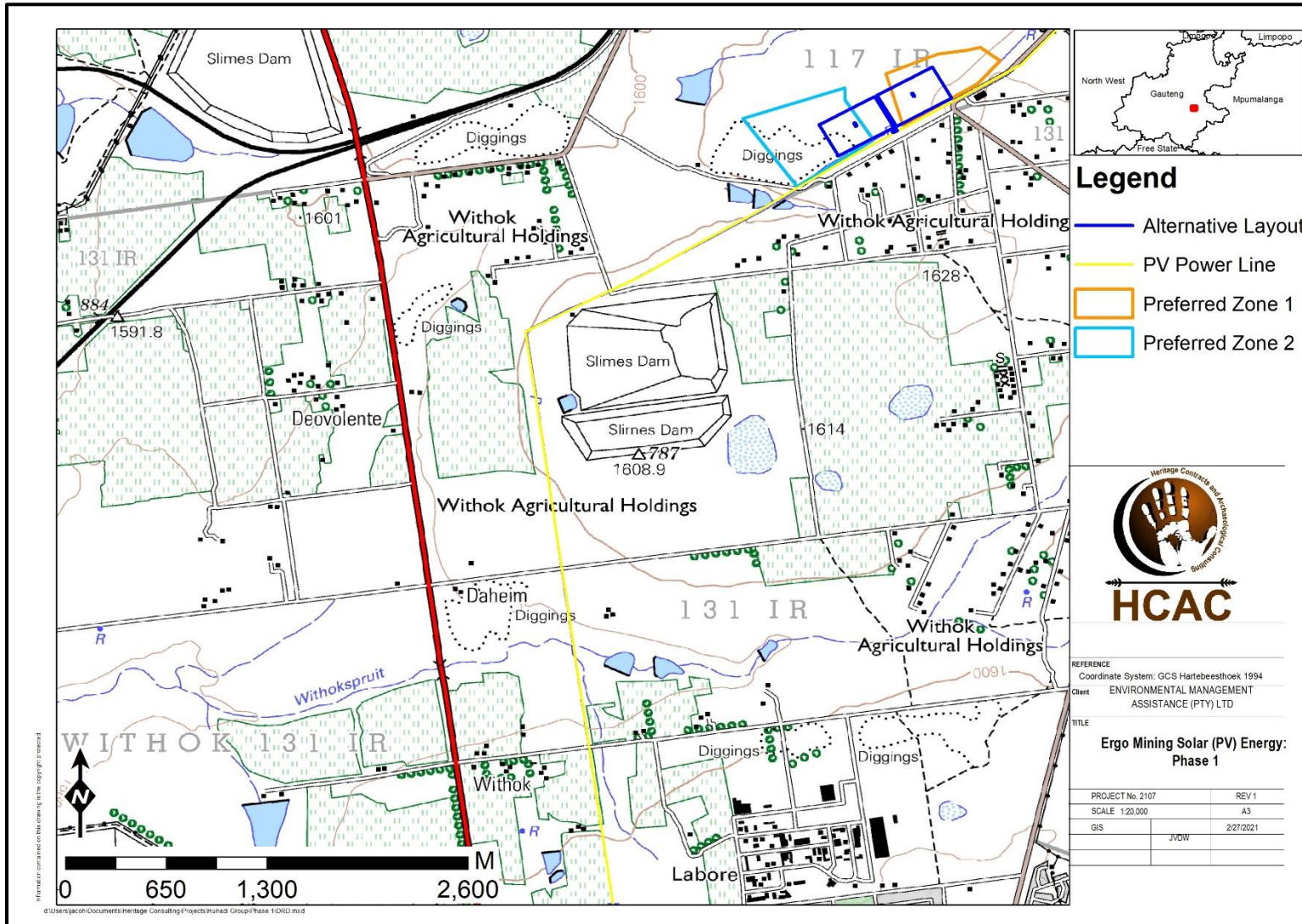


Figure 1.2: Local setting of the project (1:50 000 topographical map).



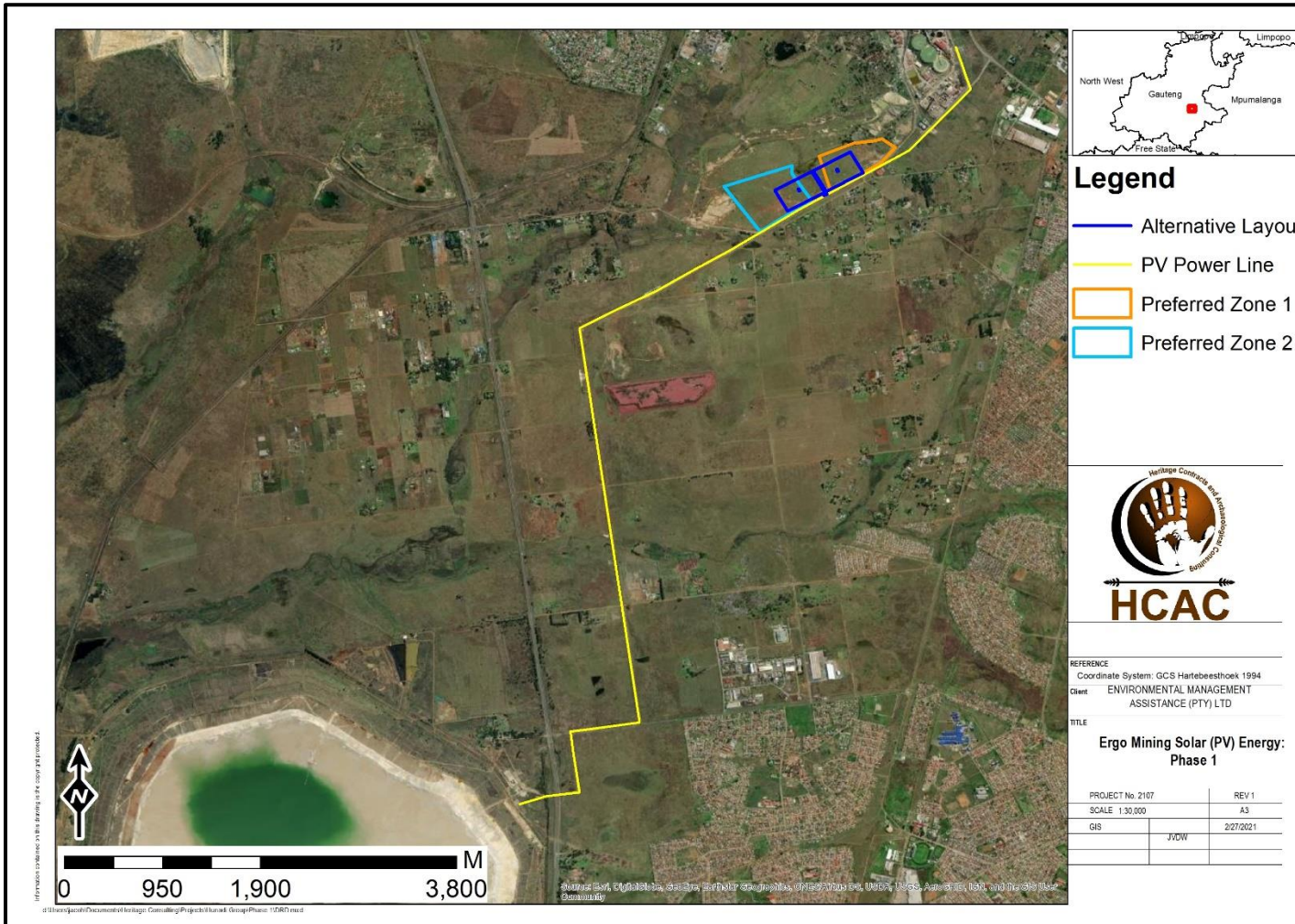


Figure 1.3. Aerial image of the development footprint.

## 2 Legislative Requirements

The HIA, as a specialist sub-section of the BAR 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 of these impacts.

The HIA should be submitted, as part of the impact assessment report or EMPr, to the PHRA if established in the province 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 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 includes (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. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983) and are 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), as well as the Human Tissues Act (Act 65 of 1983) 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. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare. 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 Section 24 of Act 65 of 1983 (Human Tissues Act).

### 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 EIA 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 process was to capture and address any issues raised by community members and other stakeholders during key stakeholder and public meetings. The process involved:

- Placement of advertisements and site notices
- Stakeholder notification (through the dissemination of information and meeting invitations);
- Stakeholder meetings undertaken with I&APs;
- Authority Consultation
- The compilation of Basic Assessment Report (BAR).

### 3.4 Site Investigation

The aim of the site survey was to:

- a) survey the proposed project area to 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 recorded in the project area.

**Table 4: Site Investigation Details**

	Site Investigation
Date	17 February 2021 The site was revisited to assess the preferred alternative on 23 June 2021
Season	<p><u>First Site visit</u> Summer- Archaeological visibility was low due to the high vegetation cover in the study area. The area was however sufficiently covered to adequately record the heritage character of the study area (Figure 3.1).</p> <p><u>Second Site Visit</u> Ground visibility was generally low due to dense grass cover across the study area. Some areas show exposed soil where Stone Age artefacts are visible.</p>

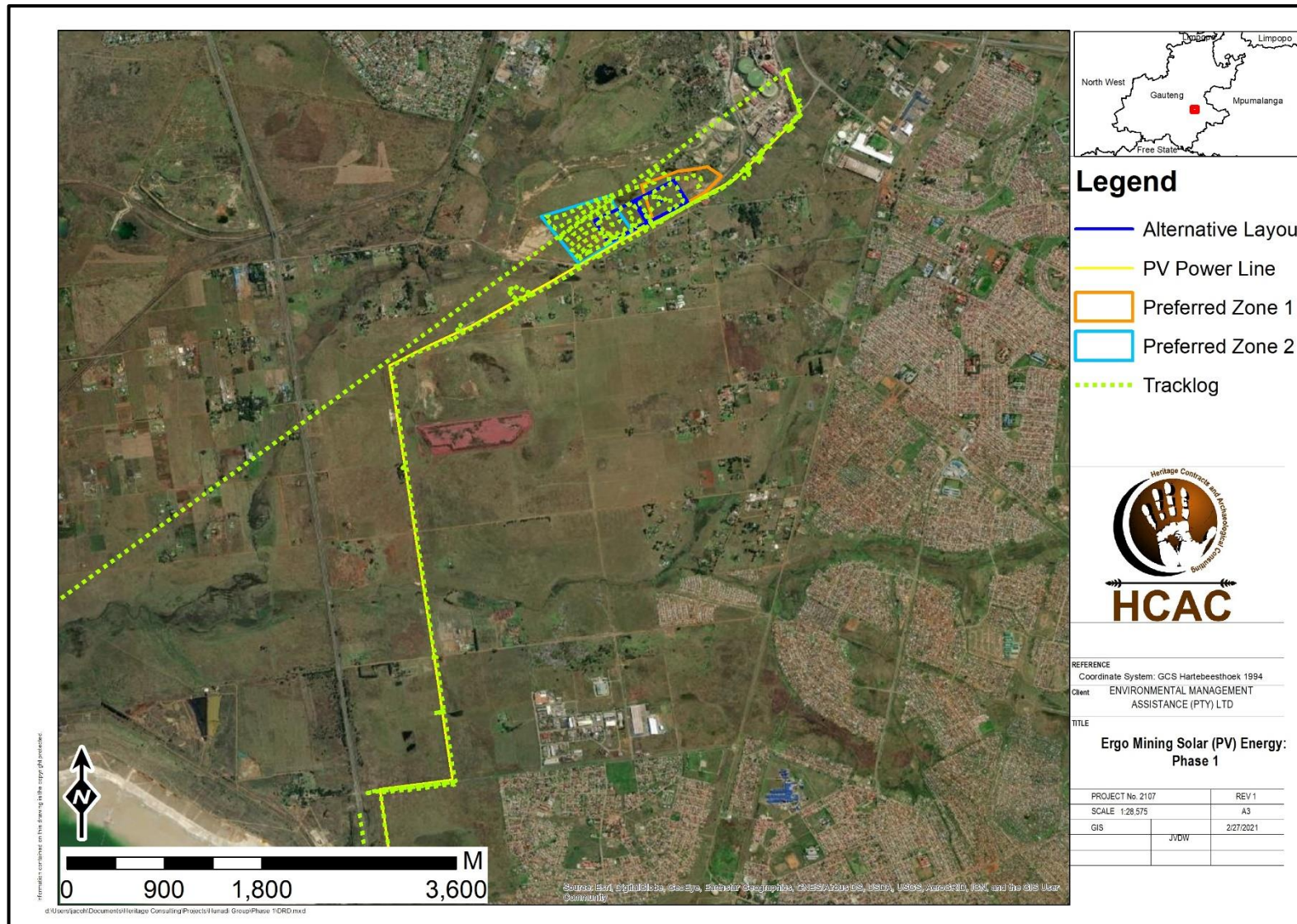


Figure 3.1: Tracklog of the survey in green.

### 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 (2006), 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**

<b>FIELD RATING</b>	<b>GRADE</b>	<b>SIGNIFICANCE</b>	<b>RECOMMENDED MITIGATION</b>
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 nature of heritage resources and pedestrian surveys, the possibility exists that some features or artefacts may not have been discovered/recorded and the possible occurrence of graves and other cultural material cannot be excluded. Similarly, the depth of cultural deposits and the extent of heritage sites cannot be accurately determined due its subsurface nature. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. 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, the Ekurhuleni municipality has a total population of just under 3,2 million individuals, 78,7% of whom are black African. Whites make up 15,8%, and other race groups comprise the remaining 5,5%. Of those aged 20 years and older, 3,3% have completed primary school, 35,3% have some secondary education, 35,5% have completed matric and 14,6% have some form of higher education. Due to the presence of OR Tambo International airport, a number of airline company headquarters are located within the municipality, such as South African Airways, Comair and Kulula.com.

In terms of employment, there are about 1,6 million economically active individuals (i.e. those who are employed or unemployed but looking for work) residing within the municipality. Of these, 28,8% are unemployed. When the youth (15–34 years) are considered, there are about 840 000 economically active individuals, 36,9% of whom are unemployed (www.statssa.gov.za).

## 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 BA process. Site notices and advertisements notifying interested and affected parties were placed at strategic points and in local newspapers as part of the process.



## 6 Literature / Background Study:

### 6.1 Literature Review (SAHRIS)

The following CRM studies (Table 6) were conducted in the immediate area and were consulted for this report:

**Table 6. Heritage Reports conducted close to the study area.**

Author	Year	Project	Findings
Van Schalkwyk, J.	1995	A Survey Of Cultural Resources Along The Proposed Pwv 16 Road Corridor, Brakpan District	No Sites were identified
Huffman, TN and Van der Merwe, HD.	1995	Archaeological Survey of Withoekspruit, Brakpan	Stone Age finds and historical sites
Gaigher, S.	2013	Heritage Impact Assessment for the Proposed Vulcania Cemetery Development	No heritage sites
Gaigher, S.	2014	Heritage Impact Assessment for the Proposed Ergo Road Residential Development	Historical structure.
Gaigher, S.	2018	Heritage Impact Assessment for the Proposed New Mixed-Use Residential Development and Related Infrastructure: Minnebron Extension 1 on Portions 64 - 65, 165 and the Remainder of Portion 3 of the Farm Witpoortjie 117 I.R., in the Ekurhuleni Metropolitan Municipality, Gauteng Province	Mining related features, no heritage sites
Kitto, J.	2019	The proposed Valley Silts Project, City of Johannesburg Metropolitan Municipality, Gauteng Province – HIA	Stone structure and a cemetery

#### 6.1.1 Genealogical Society and Google Earth Monuments

No known grave sites are indicated in the study area. The Withok cemetery is indicated 970 m north of the proposed power line.

## 6.2 Background to the general area

### 6.2.1 Archaeology of the area

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

#### 6.2.1.1 Stone Age

The Stone Age can be divided in three main phases as follows;

- Later Stone Age; associated with Khoi and San societies and their immediate predecessors. Recently to ~30 thousand years ago
- Middle Stone Age; associated with Homo sapiens and archaic modern humans. 30-300 thousand years ago.
- Earlier Stone Age; associated with early Homo groups such as Homo habilis and Homo erectus. 400 000-> 2 million years ago.

Although there are no well-known Stone Age sites located on or around the study area there is evidence of the use of the larger area by Stone Age communities for example along the Kliprivier where ESA and MSA tools were recorded. LSA material is recorded along ridges to the south of the current study area (Huffman 2008). Petroglyphs occur at Redan as well as along the Vaal River (Berg 1999).

#### 6.2.1.2 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. Extensive Stone walled sites are recorded at Klipriviers Berg Nature reserve belonging to the Late Iron Age period. A large body of research is available on this area. These sites (Taylor's Type N, Mason's Class 2 & 5) are now collectively referred to as Klipriviersberg (Huffman 2007).

These settlements are complex in that aggregated settlements are common, the outer wall sometimes includes scallops to mark back courtyards, there are more small stock kraals, and straight walls separate households in the residential zone. These sites date to the 18th and 19th centuries and was built by people in the Fokeng cluster. In this area the Klipriviersberg walling would have ended at about AD 1823, when Mzilikazi entered the area (Rasmussen 1978). This settlement type may have lasted longer in other areas because of the positive interaction between Fokeng and Mzilikazi.

## 6.3 Historical Information

Brakpan was first named in 1886 and grew rapidly after the discovery of coal (in 1888) and gold (in 1905). Brakpan officially became a town in 1919.

### 6.3.1 Anglo-Boer War

The Anglo-Boer War was the greatest conflict that had taken place in South Africa up to date. One Skirmish is listed for the Brakpan area on the Farm Hartebeesfontein on 18th February 1901 (<http://www.boerenbrit.com/archives/9658>)

#### 6.4 Cultural Landscape

The study area is situated on Ergo Mining owned land adjacent to the Withok Estates Agricultural Holdings and Witpoort Estates Agricultural Holdings areas of Brakpan within the City of Ekurhuleni Metropolitan Municipality, Gauteng Province. The vacant land earmarked for the PV facility itself, used to be cultivated, and had a slimes dam by 1976, and rehabilitated by 1995 to its current naturally vegetated condition (Figure 6.1 to 6.9). This area is owned by Ergo Mining and falls within the existing approved Mining Right Area. The focus area of the historical maps and aerial images are focussed on the PV footprint (preferred and alternative layouts).

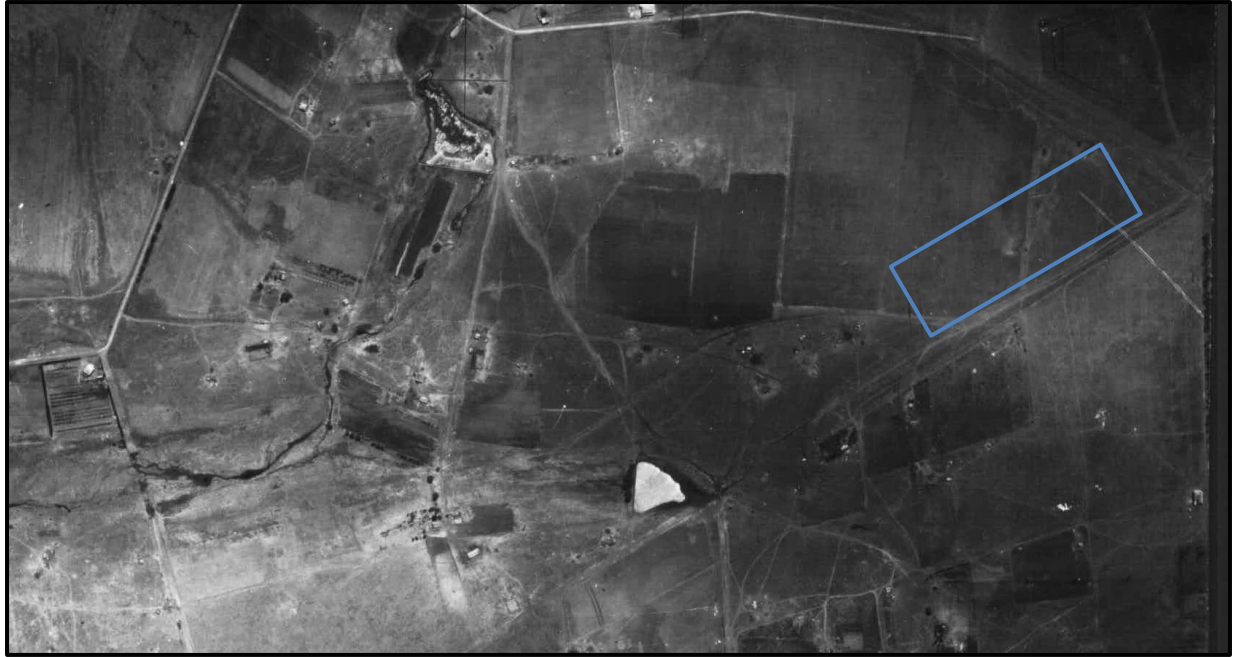


Figure 6.1. 1938 Aerial image of the PV area indicating vacant land.

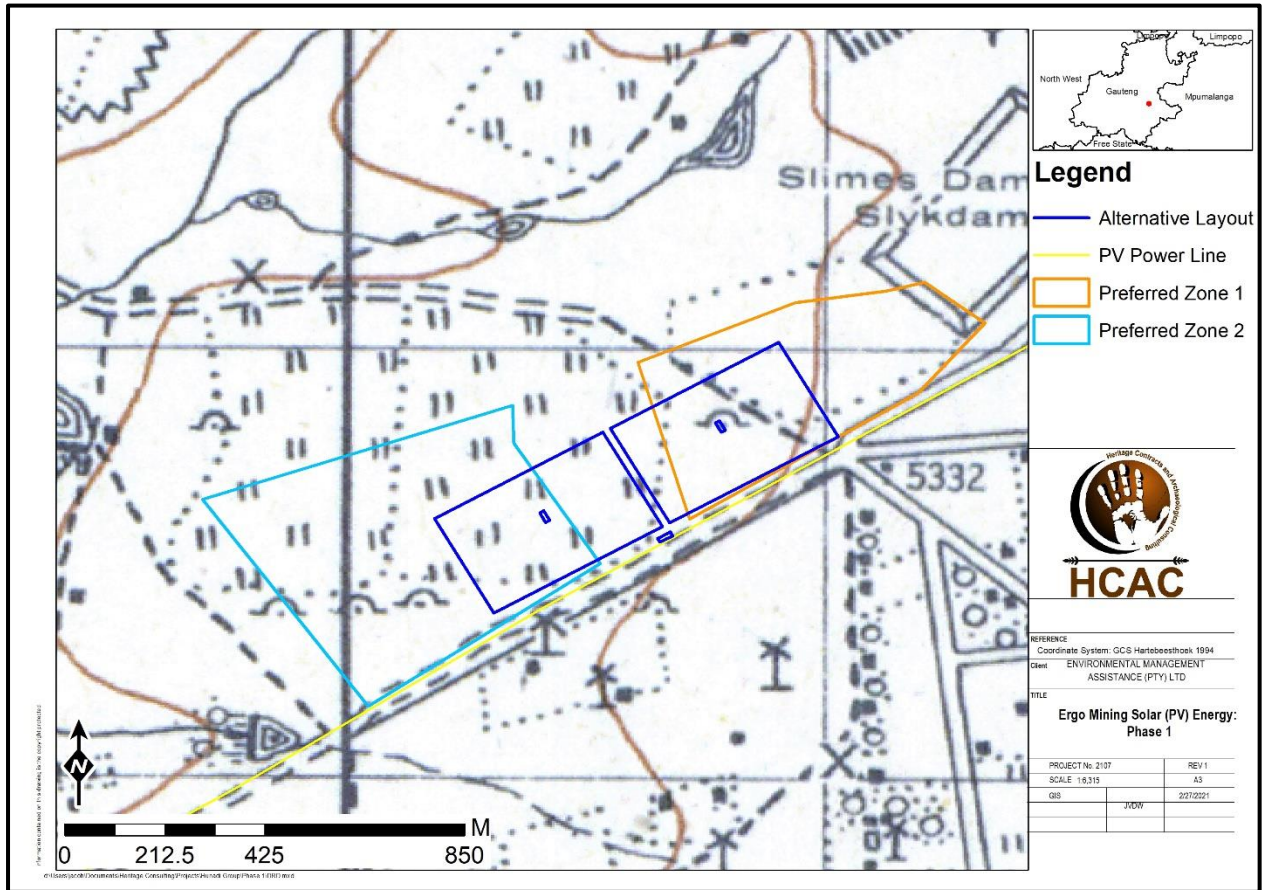


Figure 6.2. 1944 Topographical map of the study area. The western portion was cultivated and the eastern section subject to mining activities. A road traverses the north-eastern corner of the alternative layout, a hut is also located in this area.

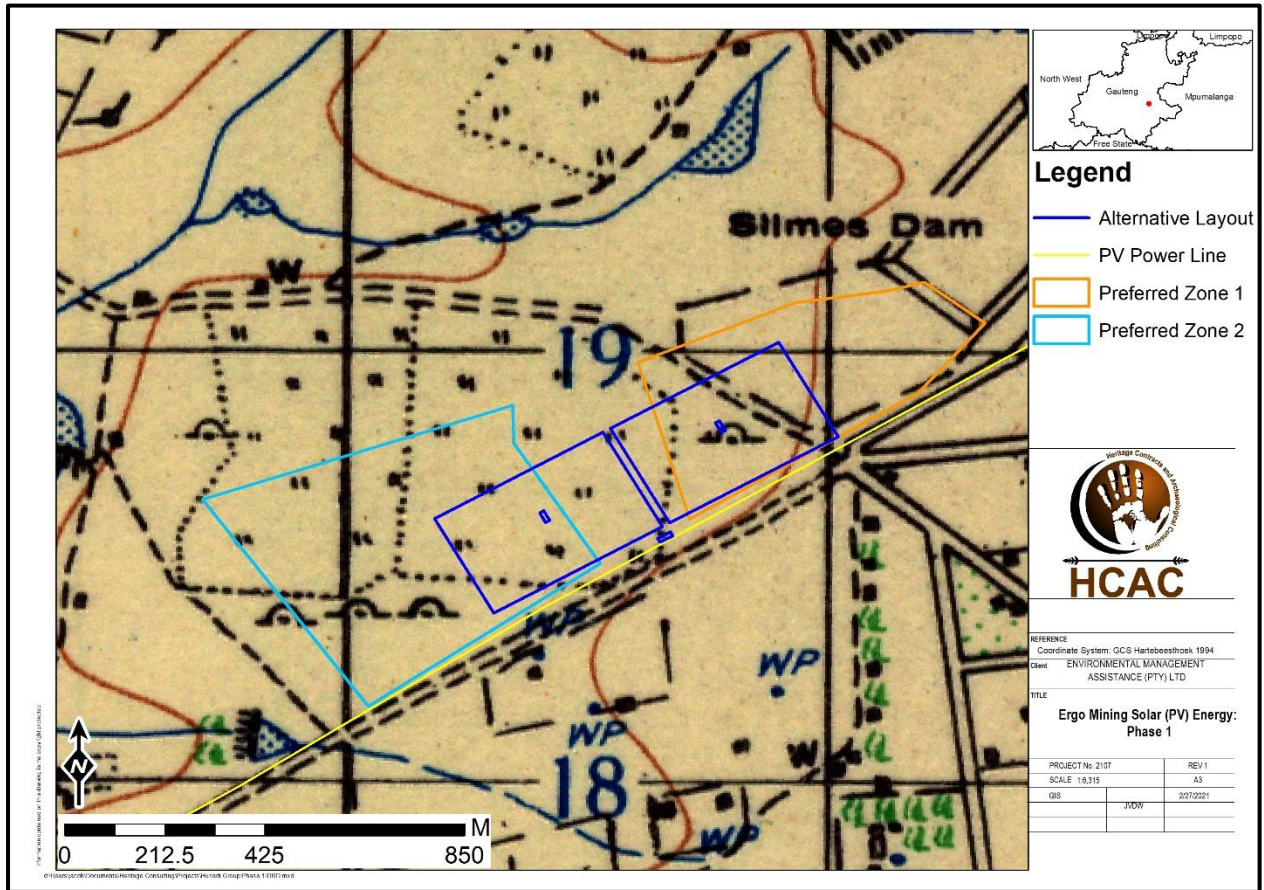


Figure 6.3. 1946 Topographical map of the study area. The western portion was cultivated and the eastern section subject to mining activities. A road traverses the north eastern corner of the alternative layout, a hut is also located in this area. Huts are indicated in the western part of the preferred layout.

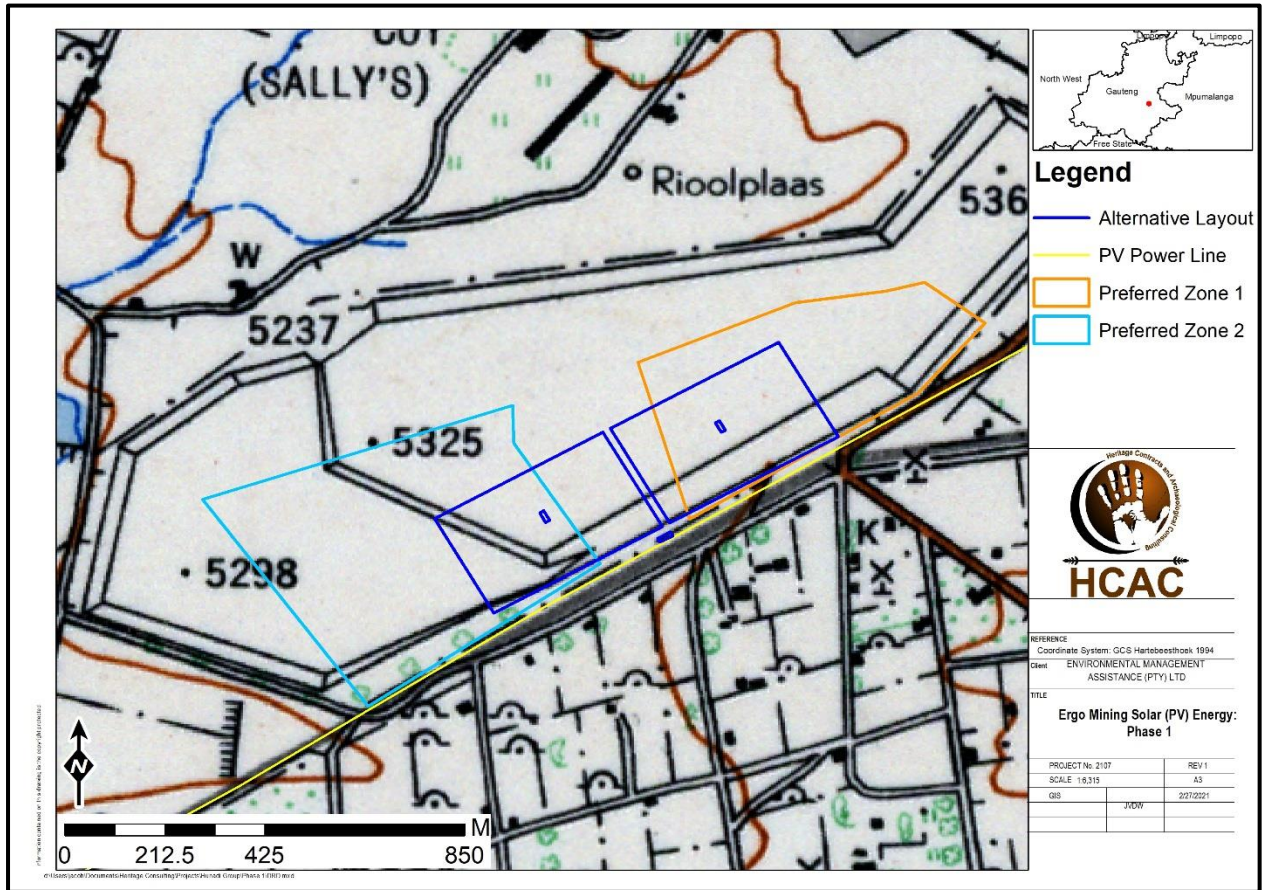


Figure 6.4. 1960 Topographic map of the study area. The entire PV facility area is covered by a slimes dam.

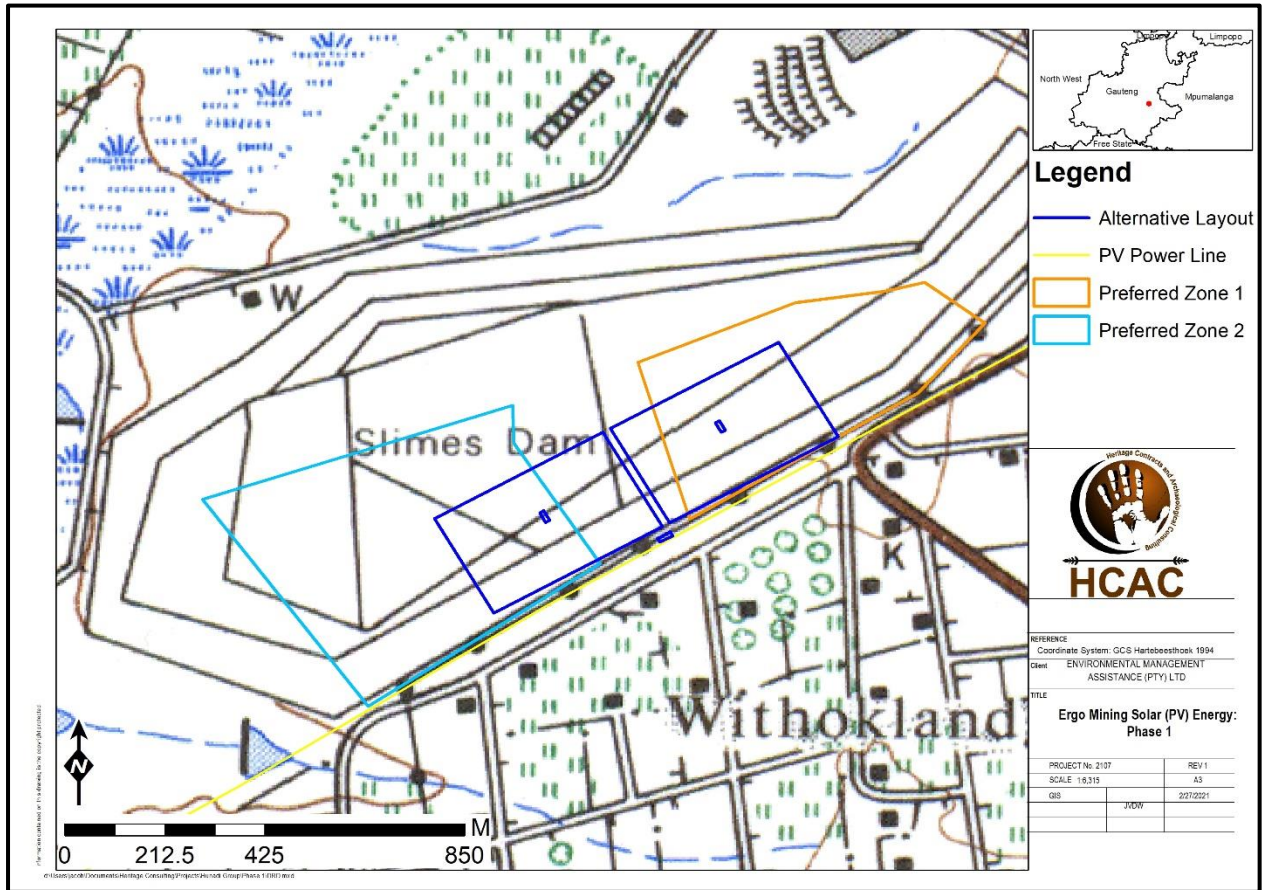


Figure 6.5. 1976 Topographic Map of the area, the area is utilised as a slimes dam.

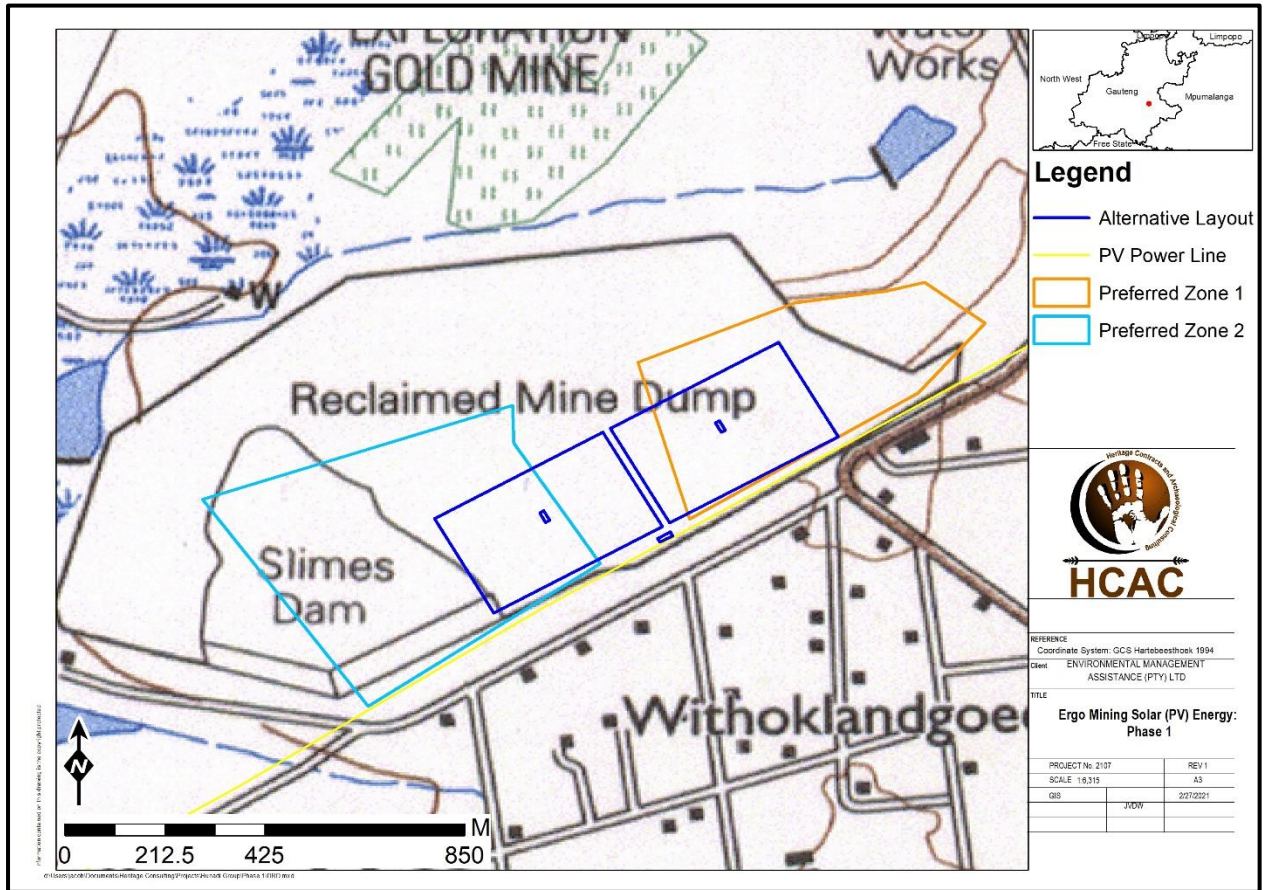


Figure 6.6. 1995 Topographic map of the study area. The area is indicated as a reclaimed mine dump and slimes dam.



Figure 6.7. 1996 Aerial image of the area under investigation showing the extensive reclamation of the mine dump



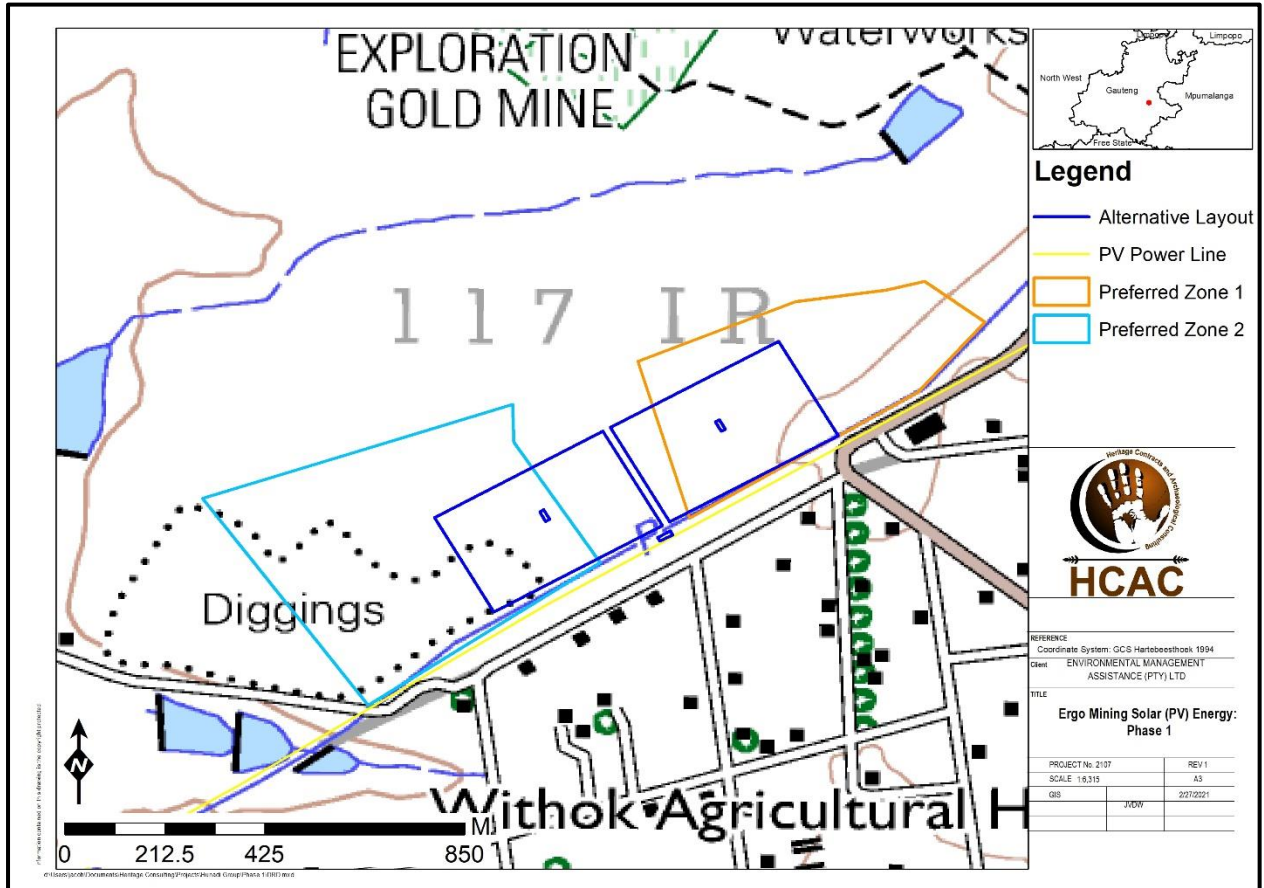


Figure 6.8. 2002 Topographic map of the study area. Diggings are indicated in the western section of the preferred layout.



Figure 6.9. 2012 Aerial image of the PV area after reclamation of the mine dump.

### 6.5 Graves and Burial Sites

Graves and cemeteries are widely distributed across the landscape and can be expected anywhere.

## 7 Description of the Physical Environment

### 7.1 Power line

The proposed power line and associating infrastructure start at a substation situated on 7<sup>th</sup> road next to the Ergo Mine just south of Brakpan and follows an existing pipeline servitude that is part of the gold mining infrastructure of the larger area.

The proposed power line follows the existing pipeline from the Ergo mine and continues through various areas that has been disturbed by mining activity (Figure 7.1 and 7.2). A series of small dams or reservoirs are situated along the existing pipelines and along the proposed power line route (Figure 7.3 and 7.4).



Figure 7.1. The power line follows the existing pipeline.



Figure 7.2. The power line follows the existing pipeline servitude.



Figure 7.3. Marsh area along the proposed power line route.



Figure 7.4. Reclaimed area close to the pipeline.

## 7.2 PV Area

### 7.2.1 Preferred Layout

The study area is an open field situated directly southwest of the Ergo mine about 3km southwest of the N17. The study area is an open field that is currently mainly used as grazing area for the local community (Figure 7.5 and 7.6). Past and present Mining activities are evident around this entire area with features such as old mine dumps, large series of pipelines and the large plant complex to the northeast.

A large series of pipelines is located along the southern border of the study area. This is a combination of historical and modern pipelines all running parallel to one another (Figure 7.7). A large corridor seems to have been originally cleared for the construction of the pipeline area (Figure 7.8)

The rest of the study area is covered in a thick layer of grass cover making visibility extremely low in terms of identifying lithic artefacts. A large soil dump is situated on the western border of the study area as well as a large, disturbed area with dumping piles on the eastern border (Figure 7.9 and 7.10). The northern border of the study area sits within an open field extending further north.

### 7.2.2 Layout Alternative

The proposed PV plant layout alternative is situated southwest of Ergo Mine and is characterised by an open field that used to be a rehabilitated mine dump with a waterlogged area (Figure 7.11 to 7.12). The ground is highly disturbed with multiple levels of previous developments and mining activities still visible. The area is overgrown with a thick ground cover making visibility low.



Figure 7.5. General site conditions in the Preferred layout area



Figure 7.6. Areas where soil is exposed.



Figure 7.7. Existing pipeline.



Figure 7.8. Cleared area as a result of the reclamation of the mine dump.



Figure 7.9. Disturbed area.



Figure 7.10. Area characterised by dumping



Figure 7.11. Proposed PV Plant area



Figure 7.12. Proposed PV Plant area.

### 8 Findings of the Survey

The surveys for the powerline, the preferred layout out and the layout alternative recorded 6 heritage Features consisting of ruins along the proposed power line (Feature 1 -5) and an Early Stone Age site within the proposed PV area (Feature 6) illustrated in Figure 8.1. These features are briefly described in the following section.

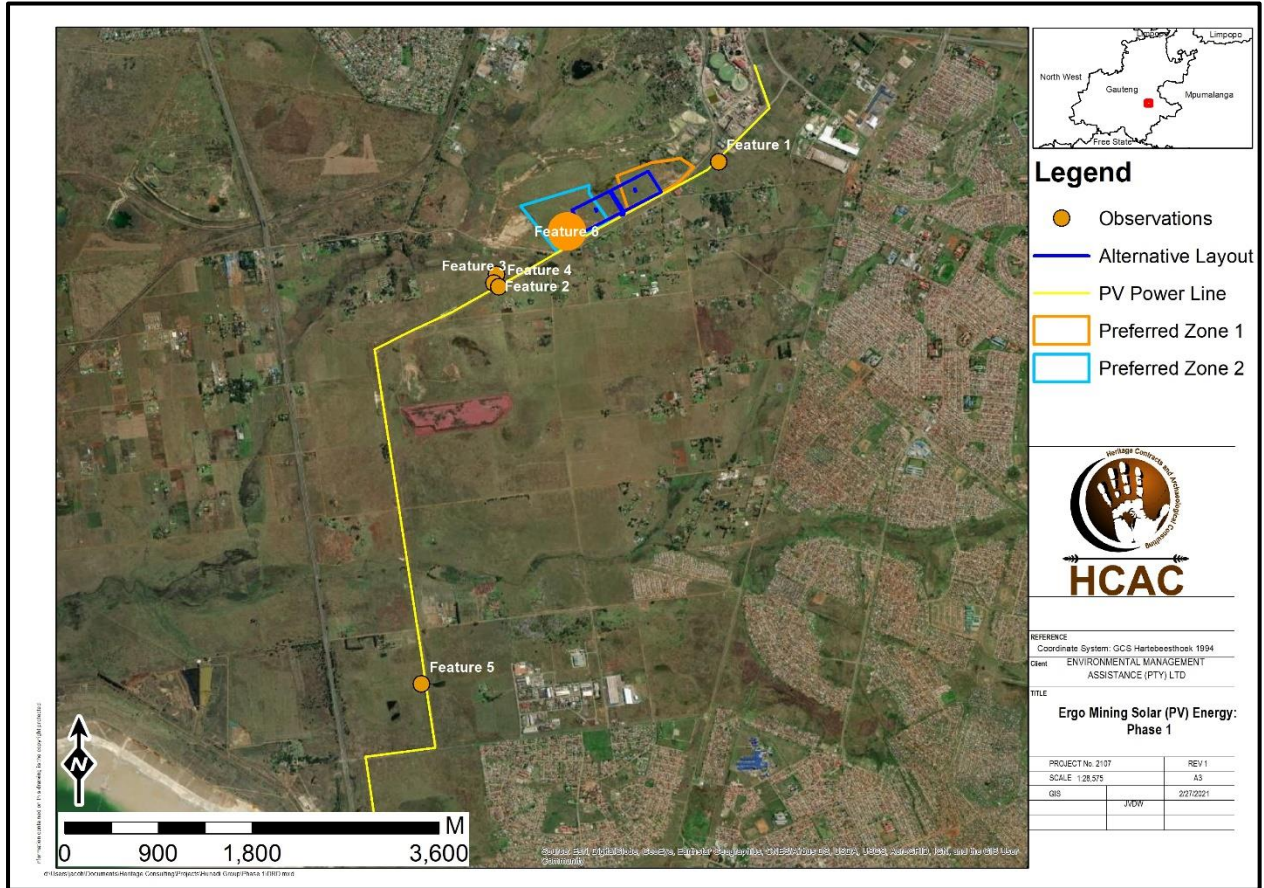


Figure 8.1. Distribution of heritage features.

## 8.1 Power line

The proposed power line follows the existing pipeline from the Ergo mine, along a gravel road all the way to the slimes dam facility next to Heidelberg Road. The proposed power line will cross various areas that has been disturbed by mining activity. A series of waterlogged areas are situated along the existing pipelines. In some areas the proposed power line will traverse these areas. These features characterise the power line route all the way to the Slimes dam.

### 8.1.1 Heritage resources

It is important to note that the survey only focused on the impact area as indicated in Figure 1.1 to 1.4. The greater area has been extensively disturbed by previous mining and industrial developments and subsequent rehabilitation of vegetation.

The survey identified structural remains in proximity to the power line and 5 features are recorded and described (Figure 8.1 and Table 7). Features 1 – 5 range from more recent infrastructure to stone-built remnants of historic structures. Based on an analysis of historical Topographic Maps it was concluded that Feature 1 was constructed prior to 1961 (Figure 8.2) and is therefore protected by the NHRA as it is older than 60 years. Feature 2 is also indicated as a hut on the 1960 Topographic Map (Figure 8.3) and is therefore older than 60 years. Features 3 and 4 are not indicated and it is assumed that both Features post-date the 1961 cut-off date for structures older than 60 years (Figure 8.3). Feature 5 is indicated for the first time on the 1995 Topographic Map (Figure 8.4) and is therefore not protected by the NHRA. The structures have all been partly destroyed and comprise either foundations or dilapidated walls (Figure 8. 5 to 8.14) and the features' potential to contribute to aesthetic, historic, scientific, and social aspects are non-existent, and they are all of low heritage significance. Only features 1 and 2 are protected in terms of the NHRA based on their age.

Table 7. Features recorded during the survey

Label	Description	Longitude	Latitude	Heritage Significance
Feature 1	The demolished remains of multiple structures. Only foundations are visible in the tall grass and the purpose of these structures is unknown.	28° 22' 23.8081" E	26° 17' 15.7417" S	Low significance
Feature 2	The ruins of two square stone-built structures. The first structure seems like the remains of a small single roomed dwelling with packed stone walls. The second structure seems like the remains of a large kraal with animal feed troughs built into the walls. This structure was also built using large stones from the area. These ruins seem historical in age.	28° 21' 14.6989" E	26° 17' 50.8308" S	Low significance
Feature 3	A stone foundation that seems of the same architectural style as the structures at Feature 2. The foundation is square and partially buried in the grass.	28° 21' 13.8528" E	26° 17' 53.4264" S	Low significance
Feature 4	Several brick and cement features that are partially buried in the ground. The features could be related to mining or agricultural infrastructure and are of a recent nature.	28° 21' 15.4153" E	26° 17' 54.6540" S	No significance
Feature 5	The remains of a small dwelling constructed of modern material. The area contains multiple structures of low significance. These structures do not seem historical in age.	28° 20' 51.2917" E	26° 19' 58.2456" S	No significance

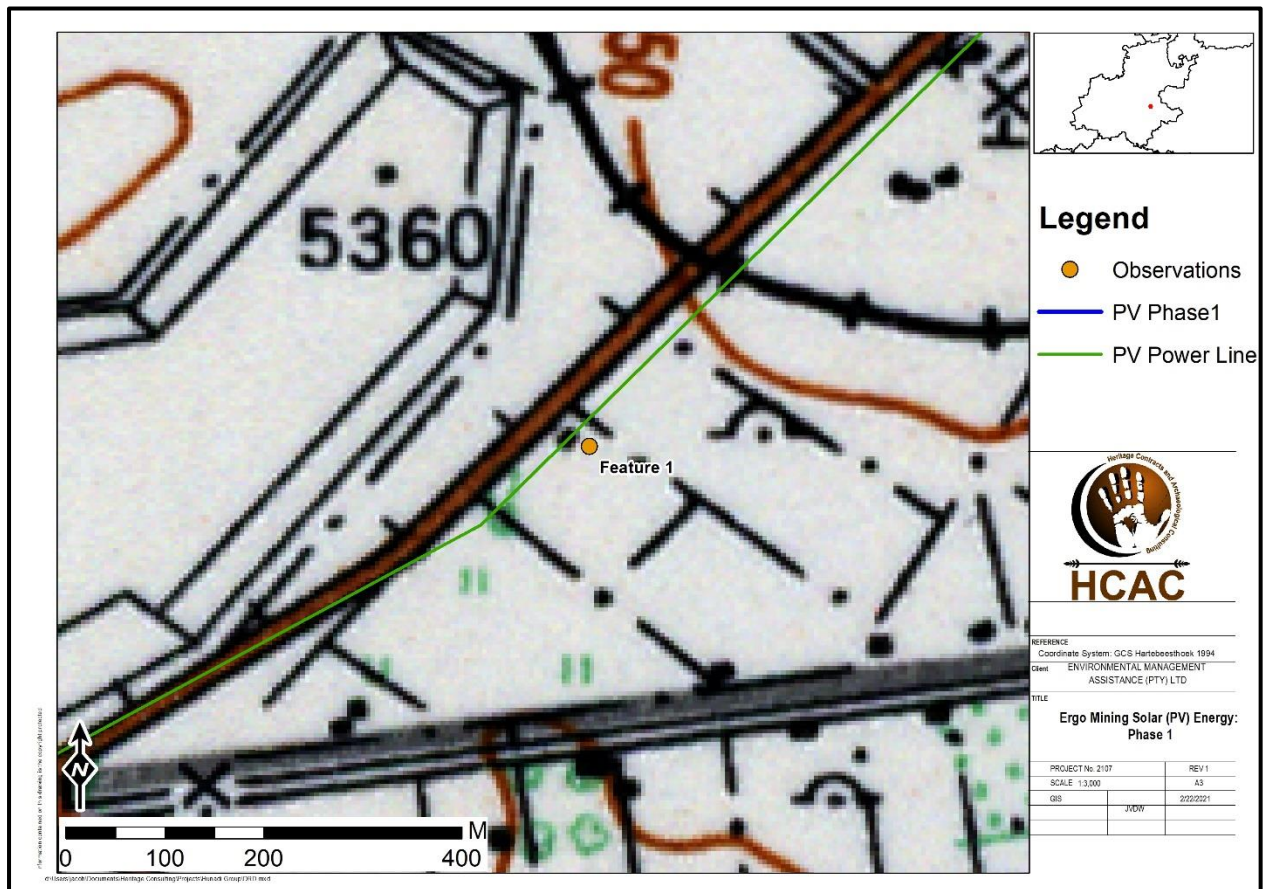


Figure 8.2. Feature 1 indicated on a map dating to 1960.



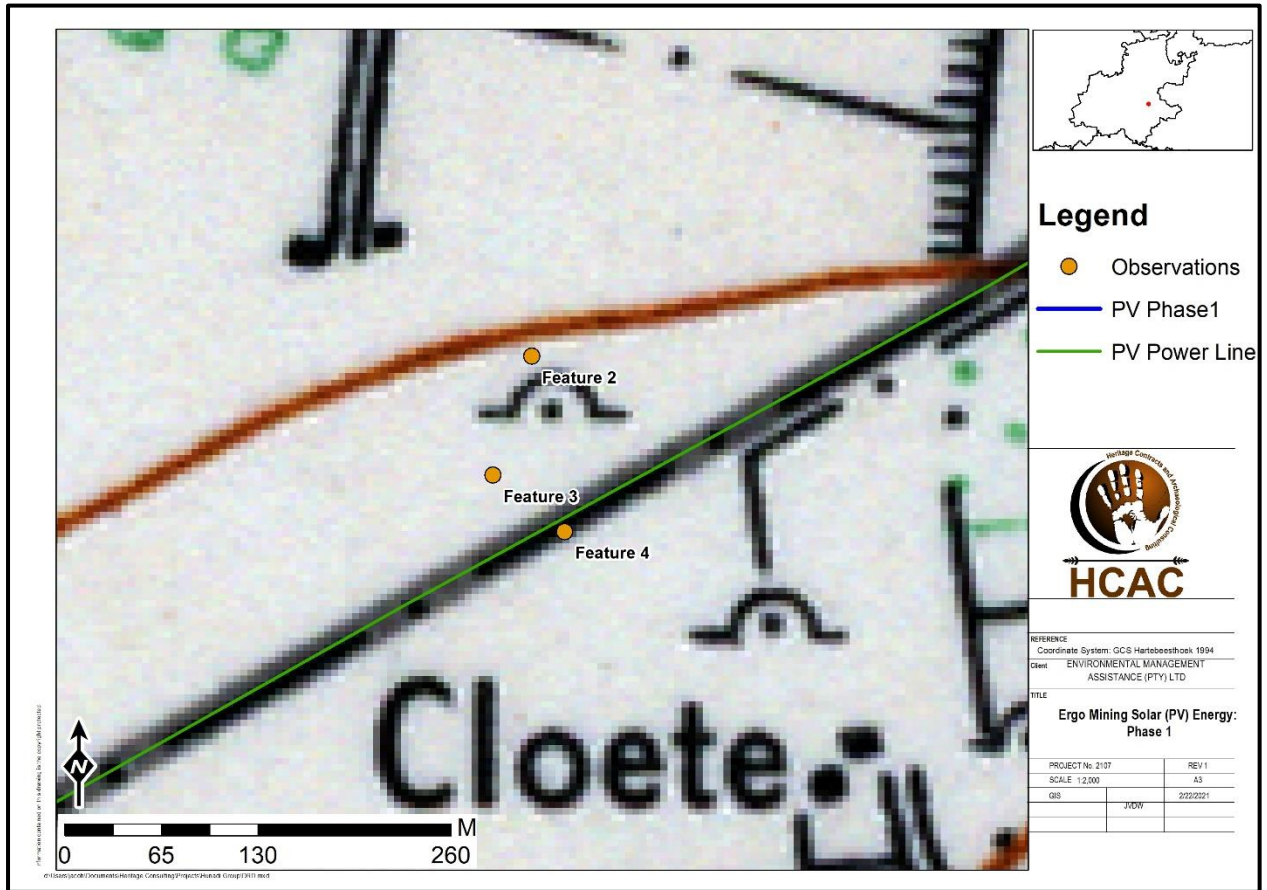


Figure 8.3. Feature 2,3 and 4 as indicated in relation to the proposed power line in 1960.

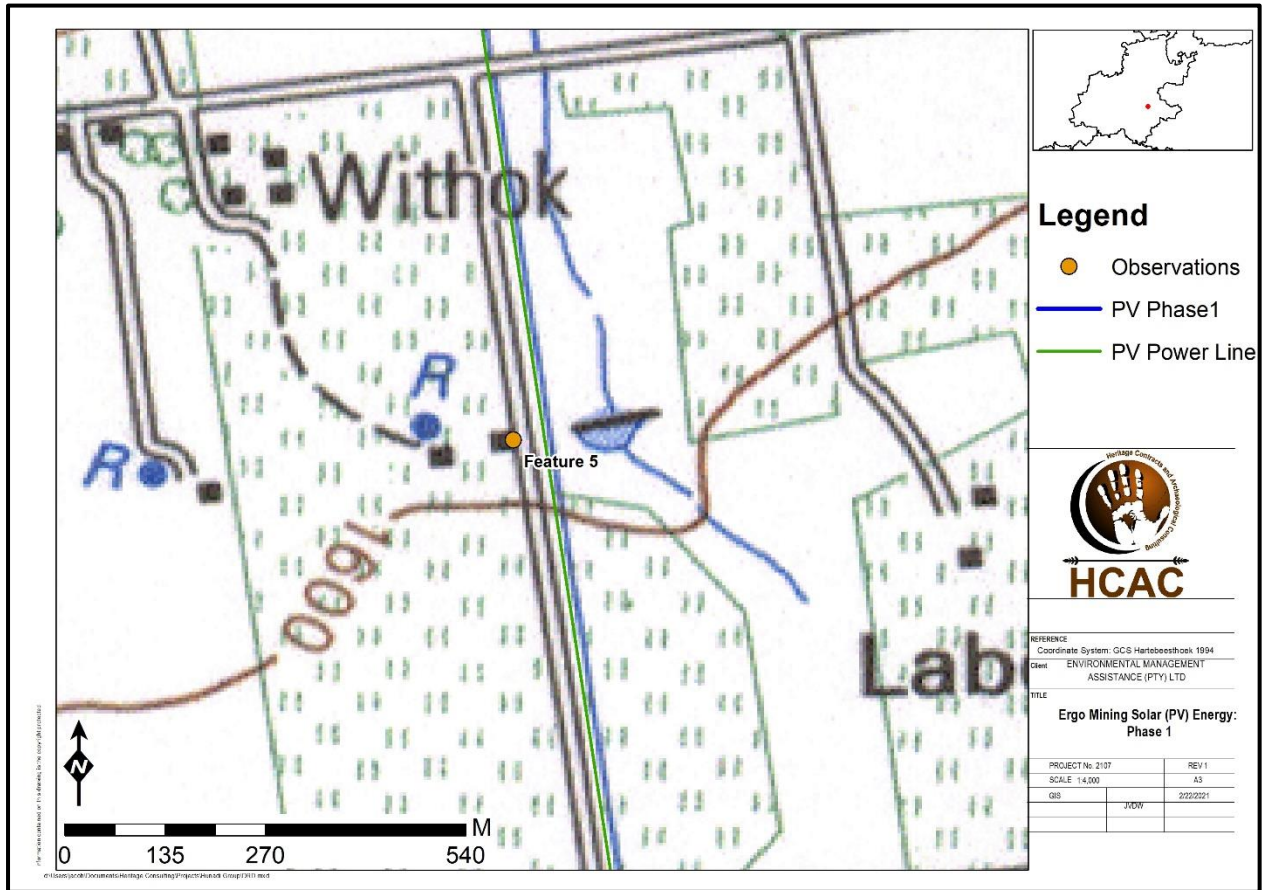


Figure 8.4. Feature 5 indicated on a Topographic map dating to 1995.



Figure 8.5. Foundations of Feature 1.



Figure 8.6. Foundations of Feature 1.



Figure 8.7. Ruin at Feature 2.



Figure 8.8. Ruin at Feature 2.



Figure 8.9. Stone packed foundations at Feature 3.



Figure 8.10. Stone packed foundations at Feature 3.



Figure 8.11. Modern infrastructure at Feature 4.



Figure 8.12. Infrastructure at Feature 4.



Figure 8.13. Small dwelling at Feature 5.



Figure 8.14. Modern brick and mortar dwelling at Feature 5.

## 8.2 PV Plant

### 8.2.1 Preferred Lay out

The Preferred Layout area is characterised by dense grass cover, dumping and large disturbed areas attributed to the reclamation of the mine dumps and an existing pipeline.

#### 8.2.1.1 Heritage Resources

The area along the pipeline towards the southwest exposed an area in which a scatter of various densities of Stone Age artefacts was identified (Figure 8.15 to 8.19). These artefacts are typologically classified as Earlier Stone Age marked by an Acheulean hand axe dating to 300ka – 1.5 MA (Lombard *et al* 2012) with a transitional (ESA to MSA) or MSA component with large flakes, chunks and prepared cores. All the artefacts are made from Chert and Quartzite (Figure 8.15 to 8.18).

This area was recorded as Feature 6, and a marked decline in artefact ratio is evident towards the north, the highest recorded density is approximately 5-7 artefacts per m<sup>2</sup>. Due to historical usage of this area, first for agriculture (1940's), then as a slimes dam (1976) and later as a reclaimed mine dump (during the 1990's) the level of disturbance to the material is difficult to ascertain. The use of the area as a slimes dam could have capped and preserved the subsurface material *in situ* until the dump was reclaimed and earthworks exposed the subsurface stratified lithics. Historical material was also identified in small ash dumps that are scattered across the study area, the material was disturbed and is of no significance apart from mentioning its presence in this report.



Figure 8.15. ESA Acheulean Hand Axe.



Figure 8.16. Flakes and chunks mostly made from Chert.



Figure 8.17. Scatter of flakes and a hammerstone.



Figure 8.18. Chert cores.

## 8.2.2 Lay out Alternative.

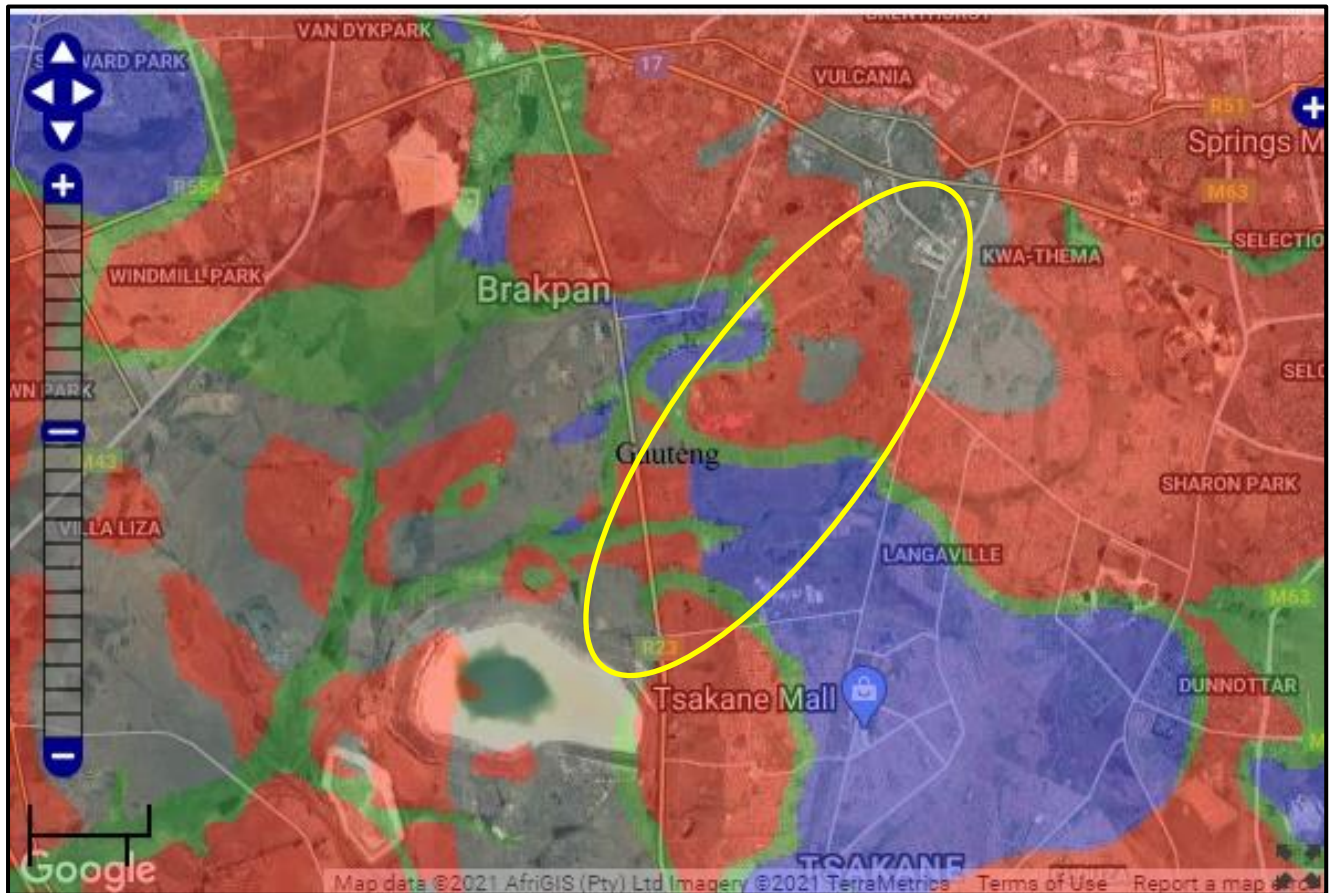
The proposed PV facility alternative is situated southwest of Ergo Mine and is characterised by a large, waterlogged area in the central section of the proposed footprint. The ground is highly disturbed with multiple levels of previous developments and mining activities still visible. The area is marked by dense vegetation limiting archaeological visibility.

### 8.2.2.1 Heritage resources

No heritage features were recorded in this area although stone Age material could be covered by the dense vegetation or occurring sub surface.

### 8.3 Paleontological resources

Based on the SAHRA Paleontological map the powerline impact area ranges from insignificant paleontological sensitivity to very high sensitivity and the PV plant is located in an area of very high sensitivity (Fig 8-20). Therefore, an independent Palaeontological desktop study was conducted by Prof Marion Bamford.



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 paleontological 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 8.19. Paleontological Sensitivity of the general project area ranging from insignificant to very high.

The study concluded the palaeontological significance is low as outlined below:

1. The proposed Photovoltaic Plant (both the preferred and alternative layout) site lies on the reclaimed mine dump which is material transported from far below the surface and is too old and too weathered to preserve fossils. The SAHRIS palaeosensitivity map indicates the site is very highly sensitive (red) but this applies to the Vryheid Formation that overlies the Witwatersrand Group mined material and underlies the dumped material that been mostly removed. There is no chance of fossils being affected.
2. The proposed power line to the northeast lies on the cleared mine dump and Jurassic dolerite so there is no chance of fossils being affected.
3. The proposed power line to the southwest lies on a variety of rocks along the route. The Klipriviersberg Group andesite and tuff, and the Jurassic dolerite are non-fossiliferous. Fossil plants of the *Glossopteris* flora might occur in the Dwyka Group and Vryheid Formations but they are rare and the sites have been disturbed. Trace fossils (stromatolites) might occur in the Malmani Subgroup dolomites. Therefore, a Fossil Chance Find Protocol should be added to the EMP. Based on this information it is recommended that no palaeontological site visit is required unless fossils are found once excavations have commenced.



## 9 Potential Impact

The power line will not impact directly on any heritage resources, although some structures possibly older than 60 years were recorded in the vicinity. Potential indirect impacts are limited and can be mitigated to an acceptable level. The only feature located close to the power line is Feature 4 (Table 8) and this is a modern feature of no heritage significance. The recorded features are spatially illustrated in relation to the development in Figure 9.1 – 9.3. The preferred PV layout will impact directly on Feature 6 with a possible impact on the extent of the site by the alternative layout, especially considering the subsurface nature of heritage resources (Figure 9.4).

### 9.1.1 Pre-Construction phase

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure needed for the construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

### 9.1.2 Construction Phase

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

### 9.1.3 Operation Phase:

Both direct and indirect impacts to heritage features can occur during the operation phase.

Table 8. Features that will be impacted on by the development and proposed mitigation measures.

Label	Description	Heritage Significance	Impact	Mitigation
Feature 1	Foundations of structures of unknown purpose.	Low	Possible Indirect impact by the power line (18 m away)	Indicate on development plans and avoid. Implementation of chance find procedure.
Feature 2	Stone packed remains of two structures	Low	Possible Indirect impact by the power line (103 m away from the power line)	Indicate on development plans and avoid. Implementation of chance find procedure.
Feature 3	A square stone packed foundation	Low	Possible Indirect impact by the power line (46 m away from the power line)	Indicate on development plans and avoid. Implementation of chance find procedure.
Feature 4	Several brick and cement features that are partially buried in the ground. The features could be related to mining or agricultural infrastructure and are of a recent nature.	No heritage significance	Possible Indirect impact by the power line (8 m away from the power line)	No preconstruction mitigation needed. Implementation of chance find procedure.
Feature 5	The remains of a modern brick and mortar dwelling.	Low	Possible Indirect impact by the power line (38 m away from the power line)	Indicate on development plans and avoid. Implementation of chance find procedure.
Feature 6	Stone Age lithics	Medium to high	Possible direct impact (preferred layout)	Surface sampling. Excavations to determine the extent of deposit.

Table 9. Impact assessment Feature 1 – 5 by the powerline and the alternative layout.

<b>Activity:</b>	Construction and Operation of PV Plant (Alternative layout) and Power Line				
<b>Impact:</b>	During the construction and operation phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects				
<b>Significance rating:</b>	<b>Duration</b>	<b>Extent</b>	<b>Magnitude</b>	<b>Probability</b>	<b>Significance</b>
<b>Pre-Mitigation</b>	5	2	4	2	<b>22</b>
<b>Post-Mitigation</b>	5	1	2	2	<b>16</b>
<b>Is the Impact Reversible?</b>	<ul style="list-style-type: none"> <li>Impacts to heritage resources are irreversible.</li> </ul>				
<b>Mitigation Measures:</b>	<ul style="list-style-type: none"> <li>Implementation of a chance find procedure.</li> <li>Indicate recorded features on development plans and avoid.</li> <li>The development of the PV plant (Preferred and Alternative layout) should be monitored during construction to record and mitigate subsurface Stone Age finds.</li> <li></li> </ul>				
<b>Cumulative impacts:</b>	<ul style="list-style-type: none"> <li>The greater study area has been impacted on by various mining developments and the current lay out will not impact on significant heritage resources and therefore the cumulative impact is low.</li> </ul>				
<b>Residual impacts:</b>	<ul style="list-style-type: none"> <li>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.</li> </ul>				
<b>Climate Change:</b>	<ul style="list-style-type: none"> <li>NA</li> </ul>				

Table 10. Impact on Feature 6 by the preferred PV layout.

<b>Activity:</b>	Construction and Operation of PV Plant (preferred layout)				
<b>Impact:</b>	During the construction and operation phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects				
<b>Significance rating:</b>	<b>Duration</b>	<b>Extent</b>	<b>Magnitude</b>	<b>Probability</b>	<b>Significance</b>
<b>Pre-Mitigation</b>	5	2	6	4	<b>52</b>
<b>Post-Mitigation</b>	5	1	4	4	<b>40</b>
<b>Is the Impact Reversible?</b>	<ul style="list-style-type: none"> <li>Impacts to heritage resources are irreversible.</li> </ul>				
<b>Mitigation Measures:</b>	<ul style="list-style-type: none"> <li>Surface sampling and test excavation at Feature 6 to determine the possibility and integrity of subsurface deposits.</li> <li>The development of the PV plant (Preferred and Alternative layout) should be monitored during construction to record and mitigate subsurface Stone Age finds.</li> </ul>				
<b>Cumulative impacts:</b>	<ul style="list-style-type: none"> <li>The greater study area has been transformed by various mining developments and the impact by these activities on heritage resources is unknown, the preferred PV layout will directly impact on a Stone Age site and the cumulative impact is low to medium.</li> </ul>				
<b>Residual impacts:</b>	<ul style="list-style-type: none"> <li>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.</li> </ul>				
<b>Climate Change:</b>	<ul style="list-style-type: none"> <li>NA</li> </ul>				

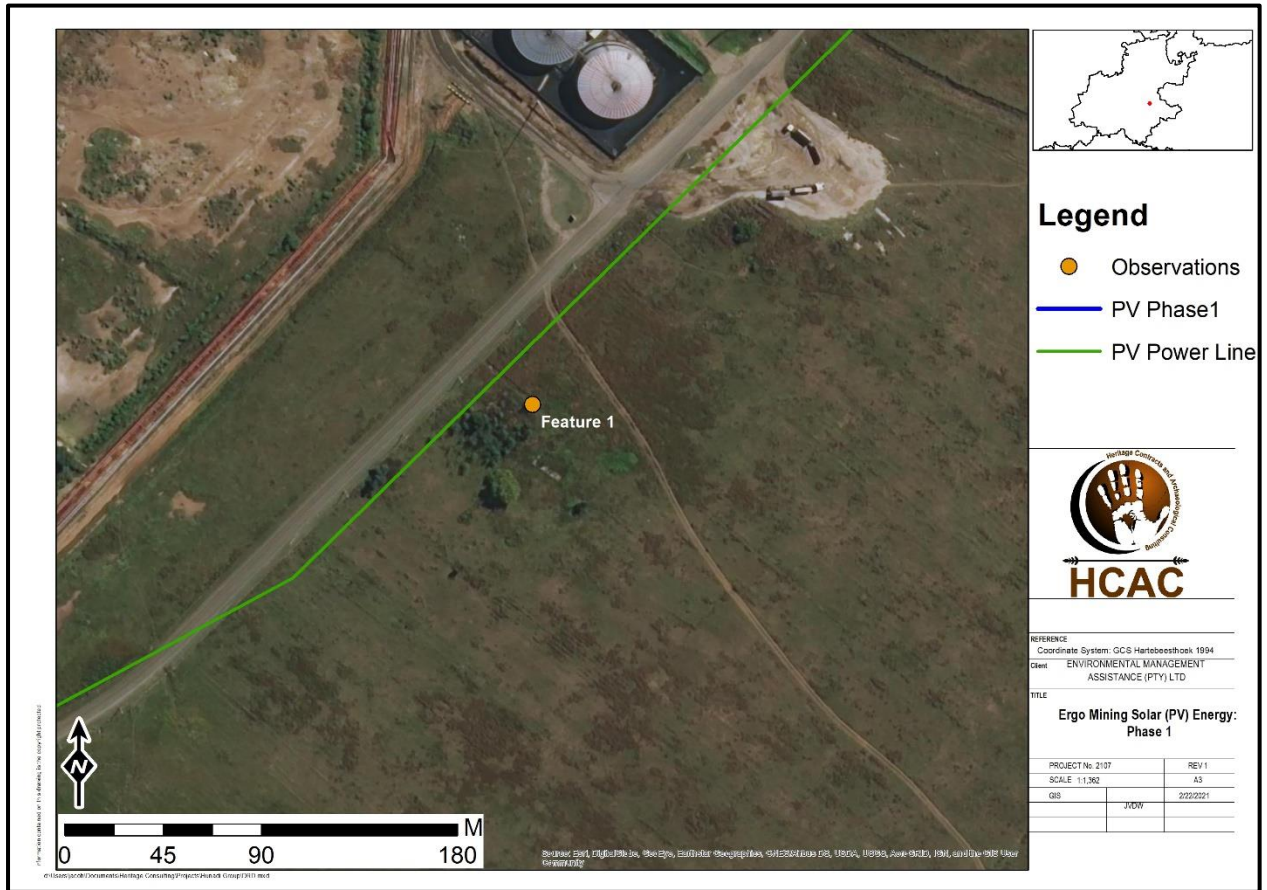


Figure 9.1. Feature 1 in relation to the proposed powerline.

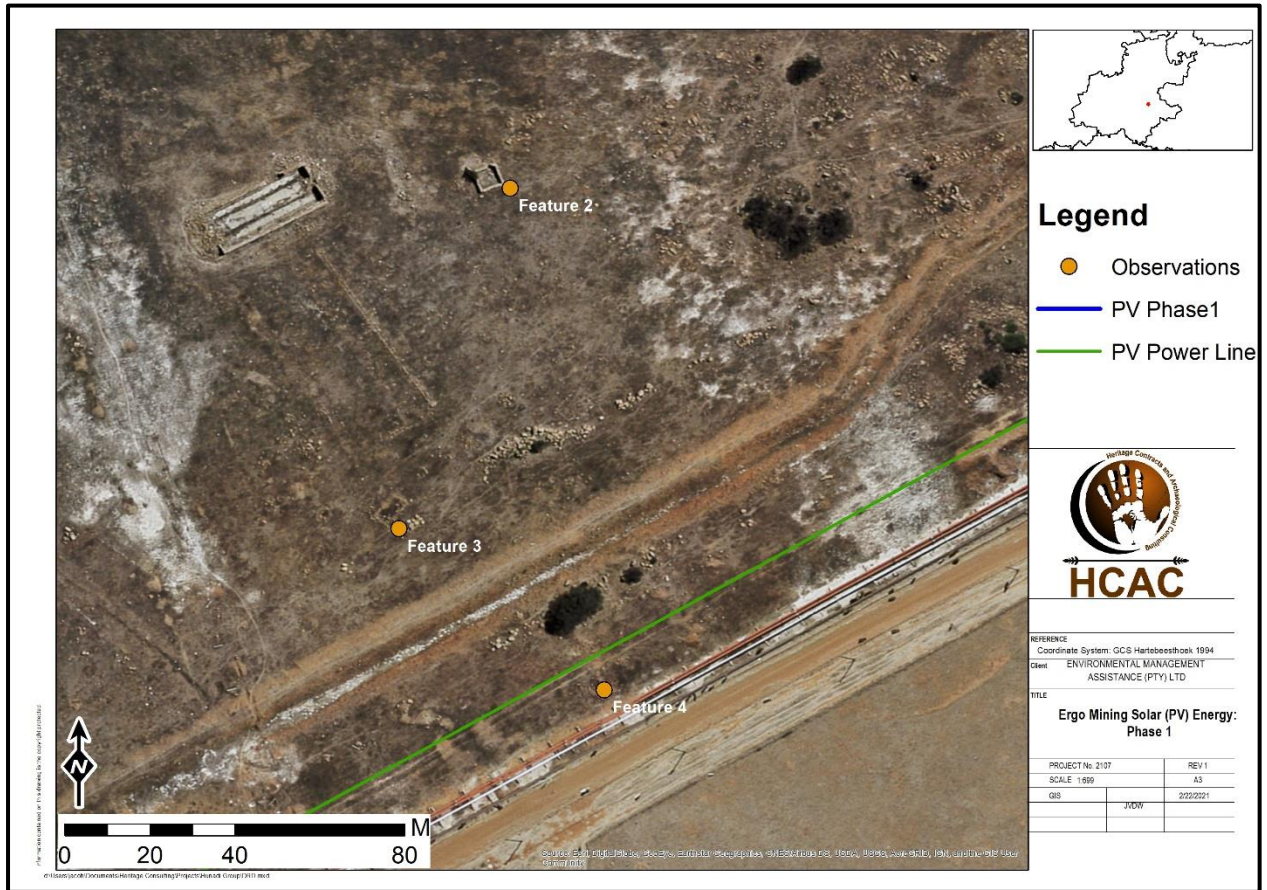


Figure 9.2. Feature 2,3 and 4 in relation to the proposed powerline.

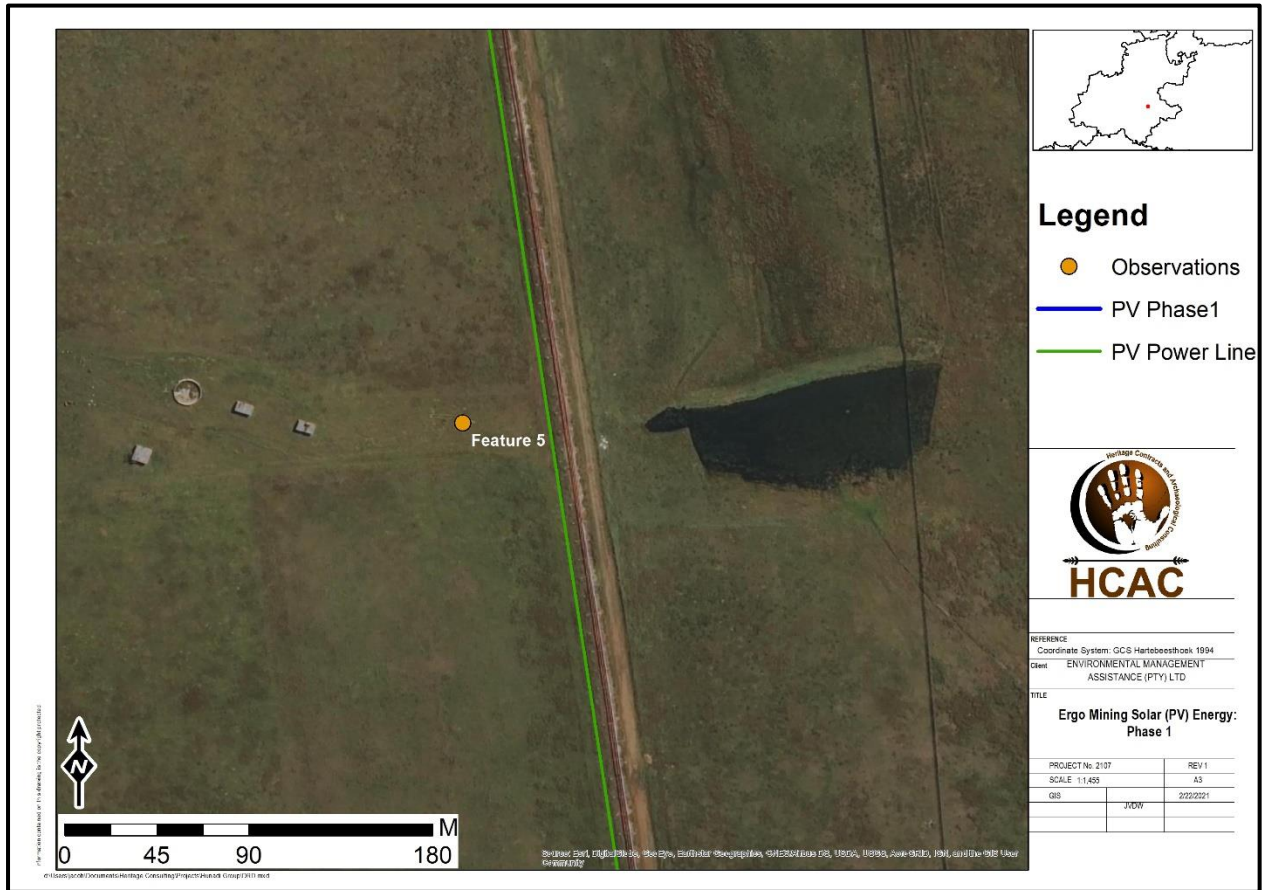


Figure 9.3. Feature 5 in relation to the powerline.

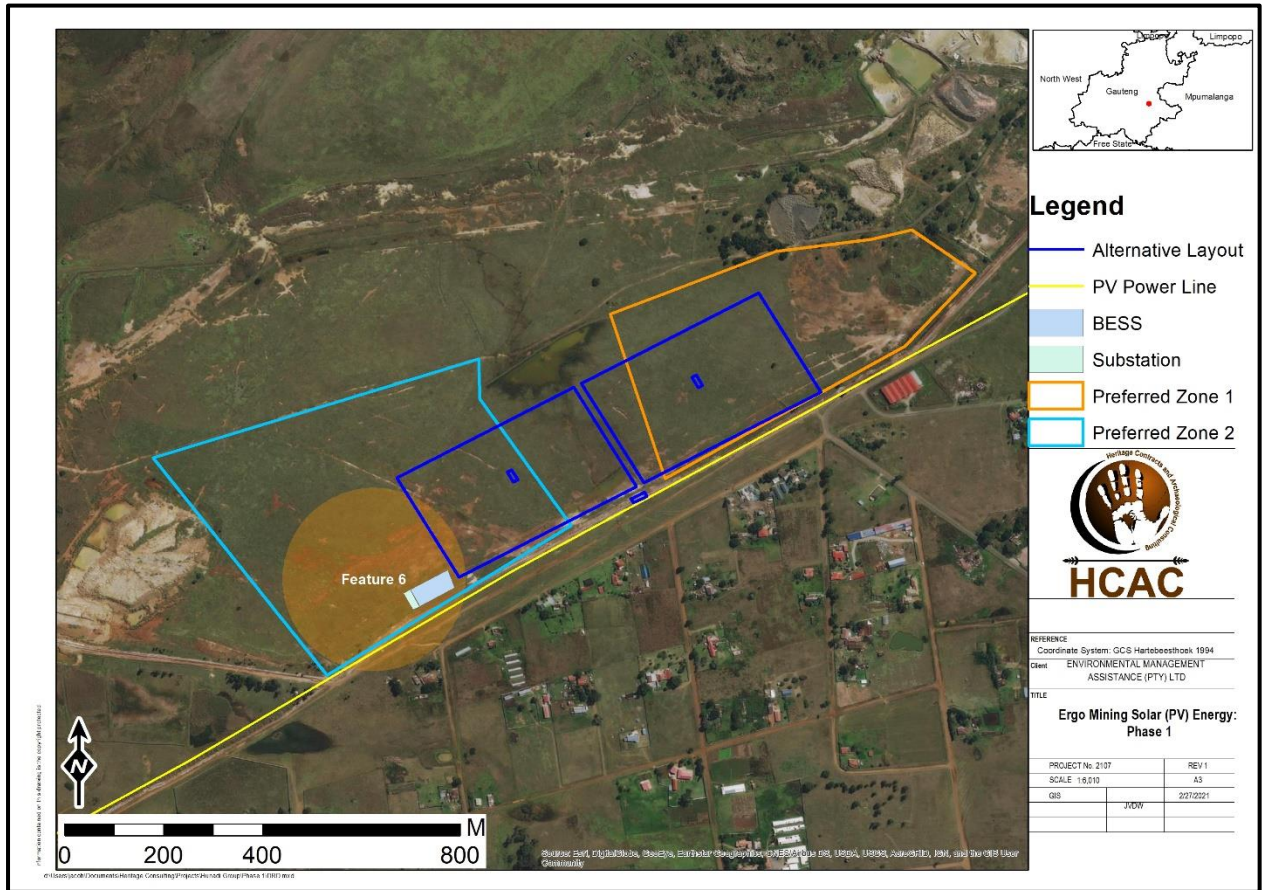


Figure 9.4. Impact of the project on Feature 6.

## 10 Conclusion and recommendations

The surveys for the powerline, the preferred PV layout out and alternative layout recorded 6 heritage Features consisting of ruins along the proposed power line (Feature 1 -5) and an Early Stone Age site within the proposed PV area.

Feature 1 -5 all relates to the built environment where structural remains were noted in proximity to the power line. Features 1 – 5 range from more recent infrastructure to stone-built remnants of historic structures. Based on an analysis of historical Topographic Maps it was concluded that Feature 1 was constructed prior to 1961 (Figure 8.2) and is therefore protected by the NHRA as it is older than 60 years. Feature 2 is also indicated as a hut on the 1960 Topographic Map (Figure 8.3) and is therefore older than 60 years. Features 3 and 4 are not indicated and it is assumed that both Features post-date the 1961 cut-off date for structures older than 60 years (Figure 8.3). Feature 5 is indicated for the first time on the 1995 Topographic Map (Figure 8.4) and is therefore not protected by the NHRA. The structures have all been partly destroyed and comprise either foundations or dilapidated walls and the features' potential to contribute to aesthetic, historic, scientific, and social aspects are non-existent, and they are all of low heritage significance. Only features 1 and 2 are protected in terms of the NHRA based on their age. The only feature located close to the power line that could potentially be impacted on is Feature 4, this is a modern feature of no heritage significance, and no further action is required.

Within the proposed PV area a scatter of various densities of Stone Age artefacts was recorded (Feature 6). These artefacts are typologically classified as Earlier Stone Age marked by an Acheulean hand axe dating to 300ka – 1.5 MA (Lombard *et al* 2012) with a transitional (ESA to MSA) or MSA component with large flakes, chunks and prepared cores all made from Chert and Quartzite. Due to historical usage of this area, first for agriculture (1940's), then as a slimes dam (1976) and later as a reclaimed mine dump (during the 1990's) the level of disturbance to the material is difficult to ascertain on surface observations alone. The use of the area as a slimes dam could have capped and preserved the subsurface material *in situ* until the dump was reclaimed and earthworks exposed the subsurface stratified lithics.

Based on historical topographic maps Feature 1 and Feature 2 are older than 60 years and therefore protected by the NHRA. Considering the limited impact footprint of a 22 KV power line no direct impact is expected on the identified features and from a heritage point of view the project is acceptable based on adherence to the recommendations in this report and the approval of SAHRA. A preferred and alternative lay out were assessed for the PV plant infrastructure and from a heritage point of view the alternative layout is preferred but with the correct mitigation measures both layouts are acceptable. The project can commence based on the implementation of the recommendations in this report and the approval of 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:

- Indication of Feature 1 – 5 on development maps and avoidance of these features.
- Surface sampling and excavation at Feature 6 to analyse the artefacts and determine the depth of deposit.
- The development of the PV plant (Preferred and Alternative layout) should be monitored during construction to record and mitigate subsurface Stone Age finds.
- Implementation of a chance find procedure for the project and a Fossil Chance Find Protocol should be added to the EMPr (as outlined below).



## 10.2. Chance Find Procedures

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 therefore chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below.

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.

**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 must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (stromatolites, plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
3. Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones (for example see Figure 8 - 10). 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 material removed by excavations 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 impact of the proposed project on heritage resources is low and any impact to accidental finds can be mitigated to an acceptable level and no further pre-construction mitigation is required based on approval from SAHRA. Furthermore, the socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures (i.e. chance find procedure) are implemented for the project.

**10.4 Potential risk**

Potential risks to the proposed project are the occurrence of subterranean archaeological deposit and unrecorded or unmarked graves. These risks can be mitigated to an acceptable level with the implementation of a chance find procedure as outlined in Section 10.1.

## 10.5 Monitoring Requirements

Day to day monitoring can be conducted by the Environmental Officers (EO). The EO 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 the initial soil removal and subsequent earthworks during construction. The EO should monitor all such activities daily. If any heritage resources are found, the chance finds procedure must be followed as outlined above.

Table 11. Monitoring requirements for the Ergo Mining Solar PV Phase 1 project

Heritage Monitoring					
Aspect	Area	Responsible for monitoring and measuring	Frequency	Proactive or reactive measurement	Method
Clearing activities and Excavations	PV Plant and Power line	EO	Weekly – during construction phase	Proactively	<ul style="list-style-type: none"> <li>• If risks are manifested (accidental discovery of heritage resources) the chance find procedure should be implemented:               <ol style="list-style-type: none"> <li>1. Cease all works immediately;</li> <li>2. Report incident to the Sustainability Manager;</li> <li>3. Contact an archaeologist to inspect the site;</li> <li>4. Report incident to the competent authority; and</li> <li>5. Employ reasonable mitigation measures in accordance with the requirements of the relevant authorities.</li> </ol> </li> <li>• Only recommence operations once impacts have been mitigated.</li> </ul>
Feature 1, 2,3 and 5	Power line area	EO	Monthly – During Construction	Proactively	<ul style="list-style-type: none"> <li>• Measure levels of subsidence and compare with recorded baseline conditions;</li> <li>• Status quo will be recorded through photographs;</li> <li>• Results will be maintained; and</li> <li>• Results will be reported in the progress reporting.</li> </ul>

Heritage Monitoring					
Aspect	Area	Responsible for monitoring and measuring	Frequency	Proactive or reactive measurement	Method
Feature 6	PV Plant	Project archaeologist	Weekly – During Pre construction and Construction	Proactively	<ul style="list-style-type: none"> <li>Measure levels of subsidence and compare with recorded baseline conditions;</li> <li>Status quo will be recorded through photographs;</li> <li>Results will be maintained; and</li> <li>Results will be reported in the progress reporting.</li> </ul>

### 10.6 Management Measures for inclusion in the EMPr

Table 12. Heritage Management Plan for EMPr implementation

Area	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Target	Performance indicators (monitoring tool)
<b>General project area</b>	Implement chance find procedures in case possible heritage finds are uncovered	Ground clearance, excavations as well as construction and operation	Throughout the project	Applicant EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	EO Checklist/Report
<b>Structures Feature 1 -5</b>	Retain sites <i>in situ</i> by indicating the recorded features on development plans and avoiding recorded features.	All	Throughout the construction phase	Applicant and EO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35 and 38 of NHRA	EO Checklist/ Report
<b>Feature 6</b>	Surface sampling and excavation at Feature 6 to analyse the artefacts and determine the depth of deposit	Prior to construction	Prior to construction	Applicant Project archaeologist	Mitigate the impact to an acceptable level.	Approved permit report.

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Area	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Target	Performance indicators (monitoring tool)
					Add to the archaeological record of the area.	

## 10. References

Archaeological database, University of the Witwatersrand.

Bergh, J.S. (red.). 1999. Geskiedenisatlas van Suid-Afrika. Die vier noordelike provinsies. Pretoria: J.L. van Schaik.

Gaigher, S. 2018 . Heritage Impact Assessment for the Proposed New Mixed-Use Residential Development and Related Infrastructure: Minnebron Extension 1 on Portions 64 - 65, 165 and the Remainder of Portion 3 of the Farm Witpoortjie 117 I.R., in the Ekurhuleni Metropolitan Municipality, Gauteng Province

Gaigher, S. 2014. Heritage Impact Assessment for the Proposed Ergo Road Residential Development

Gaigher, S. 2013 Heritage Impact Assessment for the Proposed Vulcania Cemetery Development

Huffman, TN and Van der Merwe, HD. 1995. Archaeological Survey of Withoekspruit, Brakpan

Huffman, T.N. 2007. Handbook to the Iron Age: The Archaeology of Pre-Colonial Farming Societies in Southern Africa. Scottsville: University of KwaZulu-Natal Press.

Kitto, J. 2019. The proposed Valley Silts Project, City of Johannesburg Metropolitan Municipality, Gauteng Province – HIA

Lombard, M., L. Wadley, J. Deacon, S. Wurz, I. Parsons, M. Mohapi, J. Swart & P. Mitchell. 2012. South African and Lesotho Stone Age Sequence Updated (I). South African Archaeological Bulletin 67 (195): 120–144, 2012.

National Heritage Resources Act (No 25 of 1999). Pretoria: the Government Printer. Republic of South Africa. 1998.

National Environmental Management Act (no 107 of 25 1998). Pretoria: The Government Printer.

Van Schalkwyk, J. 1995. A Survey Of Cultural Resources Along The Proposed Pwv 16 Road Corridor, Brakpan District

**11. Appendices:****Appendix A  
Curriculum Vitae of Specialist**

Jaco van der Walt  
Archaeologist

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**Education:****Particulars of degrees/diplomas and/or other qualifications:**

<b>Name of University or Institution:</b>	University of Pretoria
<b>Degree obtained</b> :	BA Heritage Tourism & Archaeology
<b>Year of graduation</b> :	2001
<b>Name of University or Institution:</b>	University of the Witwatersrand
<b>Degree obtained</b> :	BA Hons Archaeology
<b>Year of graduation</b> :	2002
<b>Name of University or Institution</b> :	University of the Witwatersrand
<b>Degree Obtained</b> :	MA (Archaeology)
<b>Year of Graduation</b> :	2012
<b>Name of University or Institution</b> :	University of Johannesburg
<b>Degree</b> :	PhD
<b>Year</b> :	Currently Enrolled

**EMPLOYMENT HISTORY:**

2011 – Present:	<b>Owner – HCAC (Heritage Contracts and Archaeological Consulting CC).</b>
2007 – 2010 :	<b>CRM Archaeologist</b> , Managed the Heritage Contracts Unit at the University of the Witwatersrand.
2005 - 2007:	<b>CRM Archaeologist</b> , Director of Matakoma Heritage Consultants
2004:	<b>Technical Assistant</b> , Department of Anatomy University of Pretoria
2003:	<b>Archaeologist</b> , Mapungubwe World Heritage Site
2001 - 2002:	<b>CRM Archaeologists</b> , For R & R Cultural Resource Consultants, Polokwane
2000:	<b>Museum Assistant</b> , Fort Klapperkop.

**Countries of work experience include:**

Republic of South Africa, Botswana, Zimbabwe, Mozambique, Tanzania, The Democratic Republic of the Congo, Lesotho and Zambia.

**SELECTED PROJECTS INCLUDE:****Archaeological Impact Assessments (Phase 1)**

Heritage Impact Assessment Proposed Discharge Of Treated Mine Water Via The Wonderfontein Spruit Receiving Water Body Specialist as part of team conducting an Archaeological Assessment for the Mmamabula mining project and power supply, Botswana

Archaeological Impact Assessment Mmamethlake Landfill

Archaeological Impact Assessment Libangeni Landfill

**Linear Developments**

Archaeological Impact Assessment Link Northern Waterline Project At The Suikerbosrand Nature Reserve

Archaeological Impact Assessment Medupi – Spitskop Power Line,

Archaeological Impact Assessment Nelspruit Road Development

**Renewable Energy developments**

Archaeological Impact Assessment Karoshoek Solar Project

**Grave Relocation Projects**

Relocation of graves and site monitoring at Chlookop as well as permit application and liaison with local authorities and social processes with local stakeholders, Gauteng Province.

Relocation of the grave of Rifle Man Maritz as well as permit application and liaison with local authorities and social processes with local stakeholders, Ndumo, Kwa Zulu Natal.

Relocation of the Magolwane graves for the office of the premier, Kwa Zulu Natal

Relocation of the OSuthu Royal Graves office of the premier, Kwa Zulu Natal

**Phase 2 Mitigation Projects**

Field Director for the Archaeological Mitigation For Booyesdal Platinum Mine, Steelpoort, Limpopo Province. Principle investigator Prof. T. Huffman

Monitoring of heritage sites affected by the ARUP Transnet Multipurpose Pipeline under directorship of Gavin Anderson.

Field Director for the Phase 2 mapping of a late Iron Age site located on the farm Kameelbult, Zeerust, North West Province. Under directorship of Prof T. Huffman.

Field Director for the Phase 2 surface sampling of Stone Age sites effected by the Medupi – Spitskop Power Line, Limpopo Province

**Heritage management projects**

Platreef Mitigation project – mitigation of heritage sites and compilation of conservation management plan.



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**MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:**


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- Association of Southern African Professional Archaeologists. Member number 159  
Accreditation:
  - Field Director                      Iron Age Archaeology
  - Field Supervisor                  Colonial Period Archaeology, Stone Age  
Archaeology and Grave Relocation
- Accredited CRM Archaeologist with SAHRA
- Accredited CRM Archaeologist with AMAFA
- Co-opted council member for the CRM Section of the Association of Southern African Association Professional Archaeologists (2011 – 2012)

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**PUBLICATIONS AND PRESENTATIONS**


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- A Culture Historical Interpretation, Aimed at Site Visitors, of the Exposed Eastern Profile of K8 on the Southern terrace at Mapungubwe.
  - J van der Walt, A Meyer, WC Nienaber
  - Poster presented at Faculty day, Faculty of Medicine University of Pretoria 2003
- 'n Reddingsondersoek na Anglo-Boereoorlog-ammunisie, gevind by Ifafi, Noordwes-Provinsie. South-African Journal for Cultural History 16(1) June 2002, with A. van Vollenhoven as co-writer.
- Fieldwork Report: Mapungubwe Stabilization Project.
  - WC Nienaber, M Hutten, S Gaigher, J van der Walt
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2004
- A War Uncovered: Human Remains from Thabantšho Hill (South Africa), 10 May 1864.
  - M. Steyn, WS Boshoff, WC Nienaber, J van der Walt
  - Paper read at the 12<sup>th</sup> Congress of the Pan-African Archaeological Association for Prehistory and Related Studies 2005
- Field Report on the mitigation measures conducted on the farm Bokfontein, Brits, North West Province .
  - J van der Walt, P Birkholtz, W. Fourie
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2007
- Field report on the mitigation measures employed at Early Farmer sites threatened by development in the Greater Sekhukhune area, Limpopo Province. J van der Walt
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2008
- Ceramic
- J'jnanalysis of an Early Iron Age Site with vitrified dung, Limpopo Province South Africa.
  - J van der Walt. Poster presented at SAFA, Frankfurt Germany 2008

- Bantu Speaker Rock Engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga (*In Prep*)
  - J van der Walt and J.P Celliers
- Sterkspruit: Micro-layout of late Iron Age stone walling, Lydenburg, Mpumalanga. W. Fourie and J van der Walt. A Poster presented at the Southern African Association of Archaeologists Biennial Conference 2011
- Detailed mapping of LIA stone-walled settlements' in Lydenburg, Mpumalanga. J van der Walt and J.P Celliers
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Bantu-Speaker Rock engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga. J.P Celliers and J van der Walt
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Pleistocene hominin land use on the western trans-Vaal Highveld ecoregion, South Africa, Jaco van der Walt.
  - J van der Walt. Poster presented at SAFA, Toulouse, France. Biennial Conference 2016

---

**REFERENCES:**


---

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3. Alex Schoeman      University of the Witwatersrand  
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