HERITAGE IMPACT ASSESSMENT

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

FOR THE PROPOSED SCAFELL CLUSTER PROJECT, FREE STATE PROVINCE

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Date	Report Reference Number	Description of Amendment

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REPORT OUTLINE

Appendix 6 of the Environmental Impact Assessment (EIA) Regulations 2014 (as amended by GNR 326 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 the EIA Regulations 2014	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	*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 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 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 - (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 EIA report
(q) Any other information requested by the competent authority	Section 13

Executive Summary

SLR Consulting (South Africa) (Pty) Ltd (SLR) was appointed as the Environmental Assessment Practitioner (EAP) by South Africa Mainstream Renewable Power Developments (Pty) Ltd to undertake the required Environmental Authorisation Process for the Scafell Cluster Project comprising of four separate solar PV facilities and grid connections. 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. Table 2 below lists the properties affected by each of the proposed projects.

Table 2: List of properties affected by the Scafell Cluster Project

Project	Affected Property
Damlaagte Solar PV Facility	Remaining Extent of the Farm Damlaagte 229
Damlaagte Solar PV Facility Grid Connection	Remaining Extent of the Farm Damlaagte 229 Portion 3 of the Farm Willow Grange 246 Portion 5 of the Farm Proceederfontein 100 Remaining Extent of the Farm Scafell 400
Scafell Solar PV Facility	Portion 3 of the Farm Willow Grange 246
Scafell Solar PV Facility Grid Connection	Portion 3 of the Farm Willow Grange 246 Portion 5 of the Farm Proceederfontein 100 Remaining Extent of the Farm Scafell 400
Vlakfontein Solar PV Facility	Portion 6 of the Farm Vlakfontein 161
Vlakfontein Solar PV Facility Grid Connection	Portion 6 of the Farm Vlakfontein 161 Portion 3 of the Farm Willow Grange 246 Portion 5 of the Farm Proceederfontein 100 Remaining Extent of the Farm Scafell 400

Key findings of the assessment include:

- The study area is characterised by previous cultivation and these activities would have impacted on surface indicators of heritage sites;
- No significant resources were noted in the Damlaagte project area,
- In the area earmarked for the Scafell PV Facility a cemetery as well as a stone packed feature of unknown purpose and farming infrastructure was recorded. Burial sites are always of high social significance,
- No significant resources were noted in the Vlakfontein project area, or within the grid connection corridor alternatives. The stone packed feature (S2) identified on Portion 3 of the Farm Willow Grange 246 is located at least 80 m north of the Grid Connection Corridor Alternative 1 and 78 m east of the Grid Connection Corridor Alternative 2.
- In the area earmarked for the Ilikwa PV Facility a cemetery as well as an extensive area characterised by stone packed features of unknown purpose were recorded. A cemetery is located within the footprint of the solar PV facility, however outside of the two alternatives assessed for the placement of the grid connection infrastructure.
- In terms of the palaeontological component a separate study was conducted for this aspect (Bamford 2021). Bamford (2021) concluded that most of the area has no potential fossils (no action required). However, a portion of the study area has moderate sensitivity, thus a Fossil Chance Find Protocol (FCFP) has been included in this report. Another section of the study area, namely the the northernmost portions of farms Scafell/Willow Grange and Vlakfontein, is very highly sensitive. For this area, A site visit is required to survey for and collect, if necessary, if fossil plants are seen **once excavations have commenced**.

The impact of the proposed project on heritage resources prior to mitigation is deemed to be high, however, this can be mitigated to an acceptable level by adherence to the recommendations in this report and based on the South African Heritage Resource Authority (SAHRA) 's approval.

Recommendations:

The following general recommendations apply to all of the proposed projects:

- Implementation of a chance find procedure for the project.
- A Heritage Walkdown should be conducted of the final pylon positions for the grid connection prior to construction;
- Once excavations for constructions have commenced, undertake a site visit of the northernmost portions of farms Scafell/Willow Grange and Vlakfontein to survey for and collect any observed fossil plants.
- Confirm the presence of unmarked graves in the study area during public consultation.

The following recommendations apply to each individual project based on the findings in each project area:

- **Damlaagte**
  Any adverse effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure.

- **Scafell**
  The recorded cemetery (S1) can be mitigated preferably by avoidance (the sites should be demarcated and avoided with an access gate for family members and a 30 m buffer) and as a last resort by relocation of the graves adhering to all legal requirements. The stone packed feature (S2) is located in an area marked by a ruin on the 1945 topographical map and is considered to be older than 60 years. The stone packed feature is located within the proposed footprint of the Switching Station. No additional heritage sites were identified within either of the grid connection corridor alternatives assessed in this Report. Thus, the site should be cleared of vegetation and mapped after which a destruction permit can be applied for.

- **Vlakfontein**
  Any adverse effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure. The area where labourers resided (VF 1) which is located within the footprint of the solar PV facility should be monitored during construction as sites such as these are known to contain the graves of stillborn babies. It is also recommended that the presence of graves should be confirmed during the social consultation process prior to construction. If graves are indeed present, the relevant permits should be sought from SAHRA for their relocation adhering to all legal requirements.

- **Ilikwa**
  Burial sites are always of high social significance thus the recorded cemetery (I6) can be mitigated preferably by avoidance (the site should be demarcated and avoided with an access gate for family members and a 30 m buffer). As a last resort, the graves should be relocated to a suitable area whilst adhering to all relevant legal requirements. The area with various stone packed features (I12) is indicated on the 1945 topographic map of the area and is older than 60 years. The site should be subjected to phase 2 mitigation (subject to a mitigation permit) including clearing and mapping after which a destruction permit can be applied for.

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 (Act No 108 of 1998) and the associated 2014 Environmental Impact Assessment (EIA) Regulations, that I: • I act as the independent specialist in this application; • 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; • I declare that there are no circumstances that may compromise my objectivity in performing such work; • 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; • I will comply with the Act, Regulations and all other applicable legislation; • I have no, and will not engage in, conflicting interests in the undertaking of the activity; • 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; • All the particulars furnished by me in this form are true and correct; and • 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.
Signature	
Date	27/07/2021

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, Guinea 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
DFFE: Department of Forestry, Fisheries and the Environment
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 HIA for the proposed Scafell Cluster Project (comprising of solar PV facilities and associated grid connection infrastructure) located on a site west of Sasolburg in Ward 7 of the Ngwathe Local Municipality, Free State Province. The report forms part of the Environmental Impact Assessment (EIA), Basic Assessment (BA) 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 undertaken from 25 to 30 January 2021, heritage finds were limited to cemeteries and structures older than 60 years. General site conditions and features on site 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, each of the projects associated with the Scafell Cluster Project will automatically be given a case number as reference[1]. As such the EIA and BA reports and the relevant appendices must be submitted to the case by the Environmental Assessment Practitioner (EAP) as well as the EMPrs, once it's completed.

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.

[1] It should be noted that the solar PV facilities, i.e., Damlaagte, Scafell, Vlakfontein and Ilikwa solar PV facilities require the undertaking of a full Scoping and EIA process in line with the EIA Regulations 2014 (as amended). Thus, the Scoping Reports for each of the solar PV facilities were made available for a 30-day comment and review period from 23 June to 22 July 2021 where the reports were submitted to SAHRA for comment. The projects were each provided with the case numbers / references, 16675, 16676, 16677, and 16678.

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).

1.1.1 Location

The proposed Scafell Cluster Project consists of four PV projects and grid connections with associated infrastructure, located on adjacent properties 19 km west of the town Sasolburg in Ward 7 of the Ngwathe Local Municipality of the Free State Province (Figure 1 -3). The study area is located outside of a Renewable Energy Development Zone (REDZ), but within the Central Strategic Transmission Corridor – a node for the development and expansion of large-scale electricity / grid connection infrastructure, i.e., power lines and substations, etc. The study area located 2 km from the existing Scafell Main Transmission Substation (MTS). Existing grid connection infrastructure present within the vicinity of the substation and the study are for the proposed project include the following:

- Mercury – Zeus 765 1 kV Power Line;
- Olympus – Scafell 1 275 kV Power Line,
- Scafell – Snowdon 1 275 kV Power Line; and
- Makalu – Scafell 1 275 kV Power Line.

The grid connection infrastructure associated with the Scafell Cluster Project will be connected to the Scafell MTS via overhead power lines of up to 132 kV from each of the solar PV facilities.

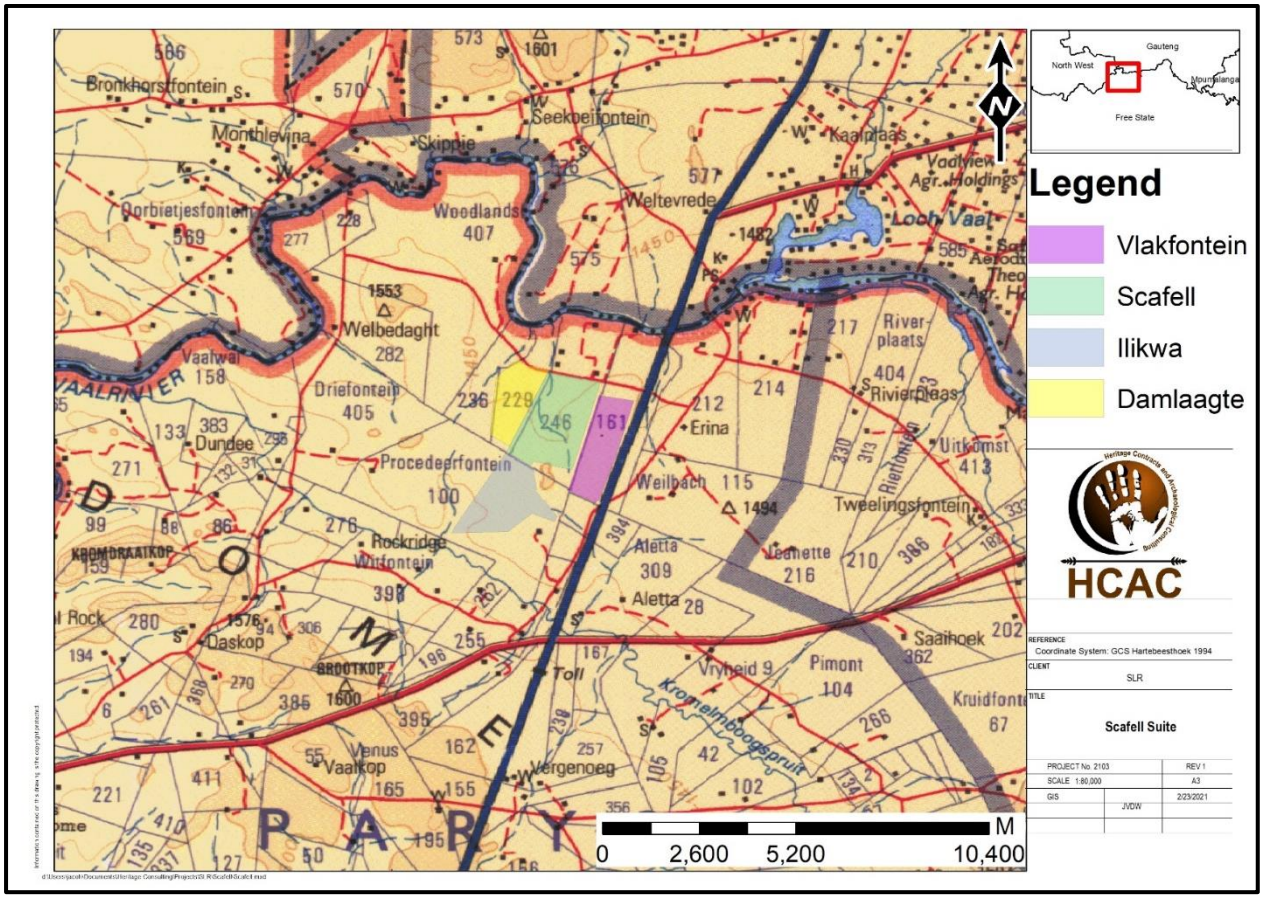


Figure 1. Regional setting of the project (1: 250 000 topographical map).

1.1.2 Project Components

Table 2 and Table 3 below provide technical details of the project components for the Scafell Cluster Project and the details of existing grid connection infrastructure within the vicinity of the project site.

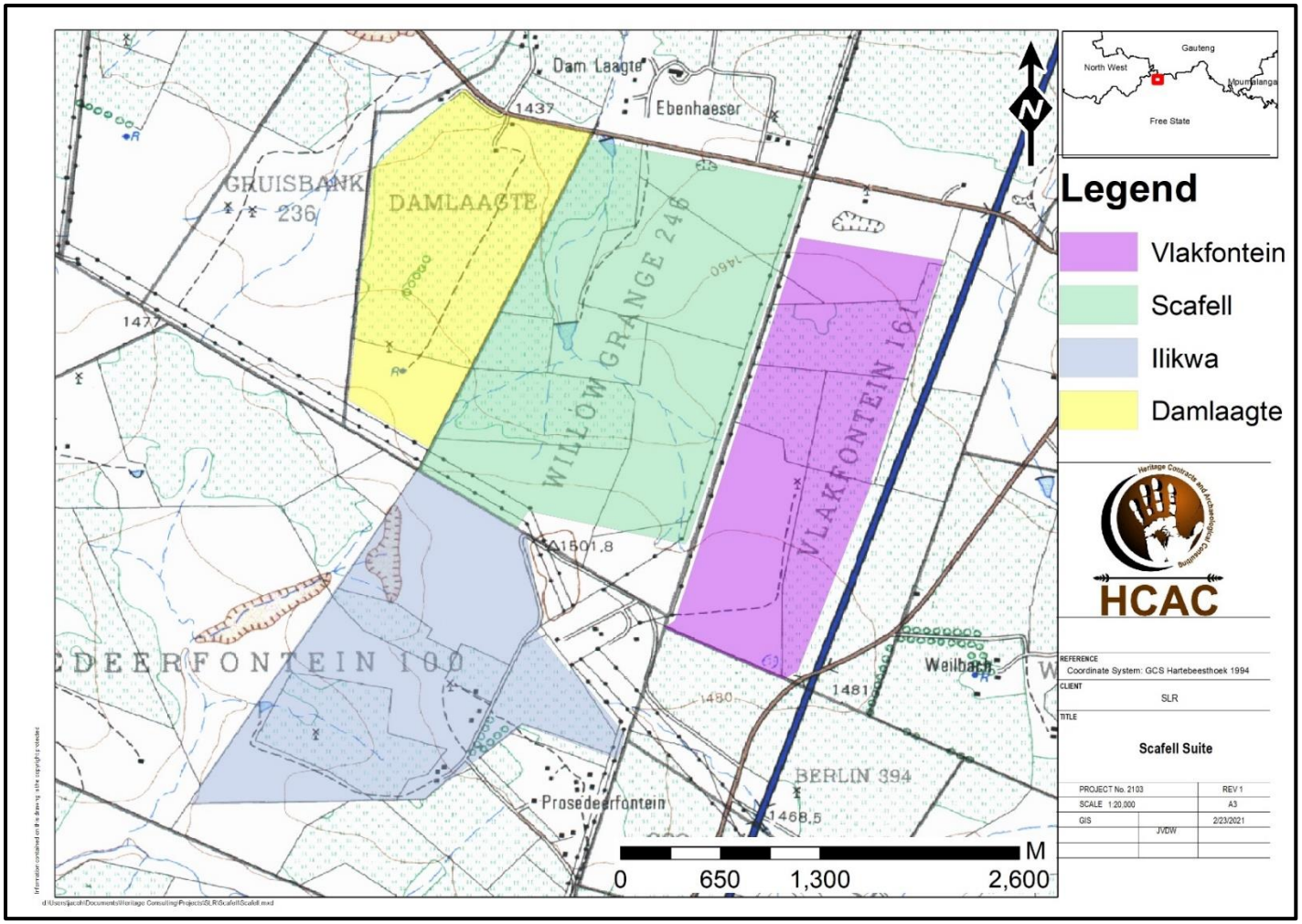


Figure 2: Local setting of the project (1:50 000 topographical map).

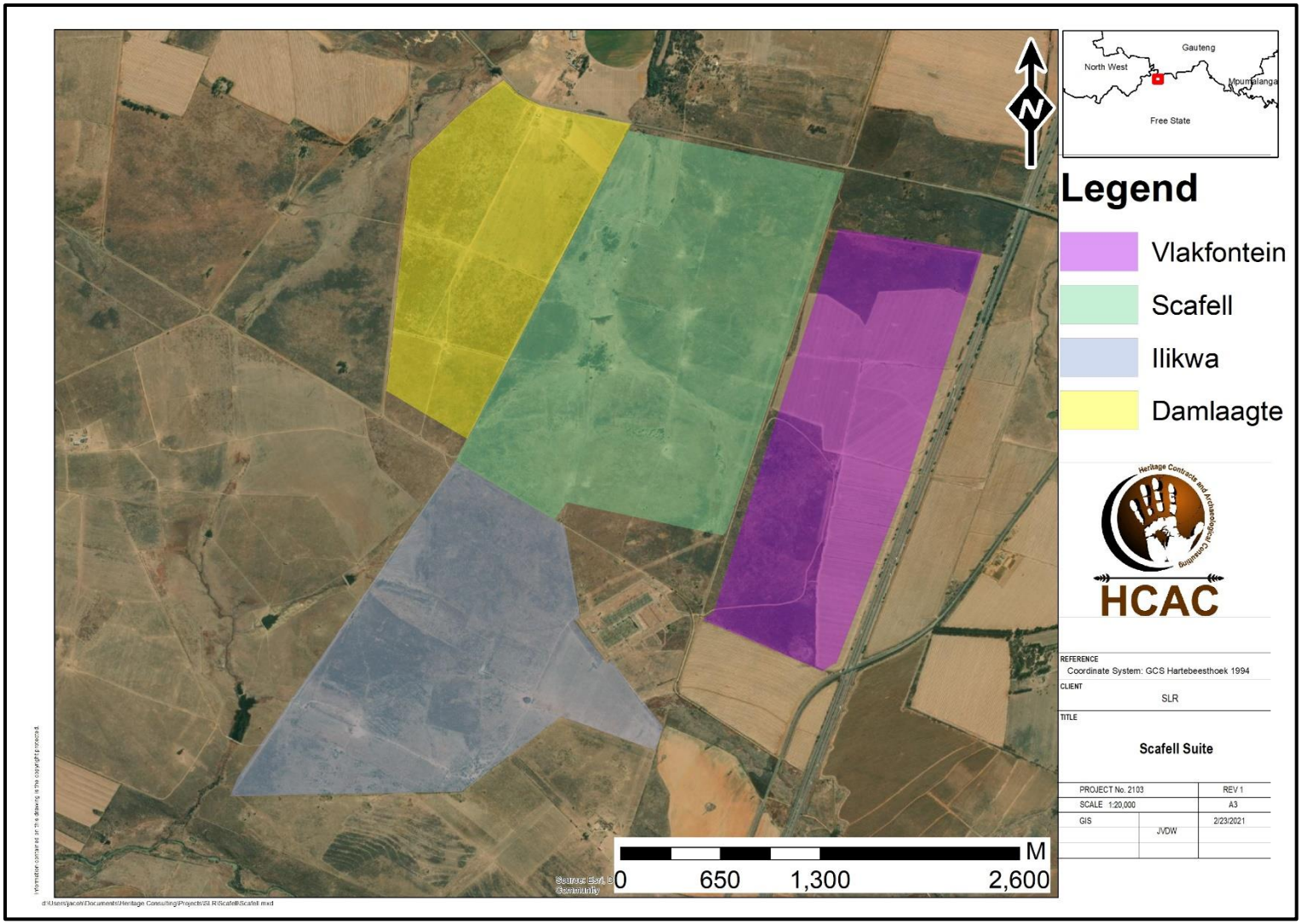


Figure 3. Aerial image of the development footprint.

Table 3: Scafell Cluster Project technical details for the solar PV facilities

Component	Damlaagte Solar PV Facility	Scafell Solar PV Facility	Vlakfontein Solar PV Facility	Ilikwa Solar PV Facility
Farm name & portion number:	Damlaagte 229 Remaining Extent	Willow Grange 246 Portion 3	Vlakfontein 161 Portion 6	Procedeerfontein 100 Portion 5
Property size:	282.22 ha	521.05 ha	299.95 ha	276.86 ha
Project Site size:	173 ha	361 ha	255 ha	195 ha
Development footprint size:	166 ha	257 ha	169 ha	132 ha
Centre coordinates of site:	26°47'29.47"S 27°37'43.58"E	26°47'46.97"S 27°38'20.00"E	26°48'10.41"S 27°39'0.92"E	26°48'55.45"S 27°37'35.52"E
Capacity	Up to 150 MW_{ac}	Up to 150 MW_{ac}	Up to 150 MW_{ac}	Up to 100 MW_{ac}
Installed PV panel height	Up to 3 m			
Number of PV panels	Up to 304 452	Up to 304 252	Up to 304 252	Up to 154 440
IPP Substation capacity	Up to 33 kV / 132 kV			
Substation footprint	Up to 2.5 ha			
Grid Connection	132 kV power line from the 33 kV / 132 kV from the on-site substation to the Scafell MTS 132 kV power line from the 33 kV / 132 kV on-site substation via Loop-in / Loop-out connection into the existing Bernina – Leeudoring Shaft / Scafell 132 kV power lines.	132 kV power line from the 33 kV / 132 kV from the on-site substation to the Scafell MTS 132 kV power line from the 33 kV / 132 kV on-site substation via Loop-in / Loop-out connection into the existing Scafell – West Wits 2 132 kV power lines.	132 kV power line from the 33 kV / 132 kV from the on-site substation to the Scafell MTS 132 kV power line from the 33 kV / 132 kV on-site substation via Loop-in / Loop-out connection into the existing Scafell / Tahiti 132 kV power lines or the Lochvaal Rural / Scafell 132 kV	132 kV power line from the 33 kV / 132 kV from the on-site substation to the Scafell MTS 132 kV power line from the 33 kV / 132 kV on-site substation via Loop-in / Loop-out connection into the existing Scafell / Tahiti 132 kV power lines or the Lochvaal Rural / Scafell 132 kV
Grid Connection Corridor Length & Width	Up to 2 km long and 150 m			
BESS footprint	Up to 1 ha			
BESS technology	Lithium-ion or Redox Flow Batteries			
Size of laydown area	Up to 3 ha			
Operation and maintenance buildings	Offices Operations and Control Centre Operation and Maintenance Area / Warehouse / Workshop Ablution Facilities Security and Guard House			

Internal access road	Gravel,12 km long and 5 m wide	Gravel,12 km long and 5 m wide	Gravel,12 km long and 5 m wide	Gravel,12 km long and 5 m wide

Table 4: Scafell Cluster Project technical details of the grid connection infrastructure

Component	**Damlaagte Solar PV Facility Grid Connection**	**Scafell Solar PV Facility Grid Connection**	**Vlakfontein Solar PV Facility Grid Connection**	**Ilikwa Solar PV Facility Grid Connection**
Property details:	Damlaagte 229 Remaining Extent Willow Grange 246 Portion 3 Proceederfontein 100 Portion 5 Scafell 448 Remaining Extent	Willow Grange 246 Portion 3 Damlaagte 229 Remaining Extent Proceederfontein 100 Portion 5 Scafell 448 Remaining Extent	Vlakfontein 161 Portion 6 Willow Grange 246 Portion 3 Proceederfontein 100 Portion 5 Scafell 448 Remaining Extent	Proceederfontein 100 Portion 5 Willow Grange 246 Portion 3 Scafell 448 Remaining Extent
Grid connection corridor length and width:	**Alternative 1:** 150 m wide and up to 5 km long **Alternative 2:** 150 m wide and up to 5 km long	**Alternative 1:** 150 m wide and up to 5 km long **Alternative 2:** 150 m wide and up to 5 km long	**Alternative 1:** 150 m wide and up to 5 km long **Alternative 2:** 150 m wide and up to 5 km long	**Alternative 1:** 150 m wide and up to 5 km long **Alternative 2:** 150 m wide and up to 5 km long
Servitude width:	Up to 31 m			
Switching Station capacity:	33 / 132 kV			
Transmission Line capacity:	Up to 132 kV			
Transmission Line length:	Up to 2 km			
Transmission Line pylons:	Monopole or Lattice pylons, or a combination of both where required.			
Transmission line pylon height:	Up to 40 m			
Access to transmission servitude:	A 2 km long jeep track will be required and constructed during the construction phase of the proposed project. Existing roads and jeep tracks within existing servitudes in the study area will be used as far as possible to gain access to the grid connection corridor during the construction and operation phase of the proposed project.			

1.2 Alternatives

Alternatives have been identified and assessed for the grid connection corridors (for each of the solar PV facilities), battery energy storage systems, monofacial and bifacial PV panel modules and PV panel mounting technologies. Each of the alternatives being considered and assessed in this HIA are described in detail in the following sections.

1.2.1 Damlaagte Solar PV Facility Grid Connection Corridor Alternatives

Two grid connection corridors have been identified and assessed in this Report for the placement of grid connection infrastructure for the Damlaagte Solar PV Facility (refer to Figure 4). These corridors are described as follows:

- **Grid Connection Corridor Alternative 1**
  This corridor is 150 m wide and is approximately 2.0 km in length. The proposed grid connection is from the on-site substation (Switching Station) of the proposed Damlaagte Solar Facility located on Damlaagte RE/229 and extends for about 1 km in an easterly direction across Willow Grange 3/246 before turning about 90° south for 0.6km across Scafell RE/448, then turning slightly southeast for 0.3km before terminating at the Scafell Eskom MTS. This is the shortest most direct route to connect to the Scafell Eskom MTS.

- **Grid Connection Corridor Alternative 2:**
  This corridor is 150 m wide and is also approximately 2.5 km in length. This proposed grid connection starts at the on-site substation (Switching Station) of the proposed Damlaagte Solar Facility located on Damlaagte RE/229 and extends for about 0.6 km in an easterly direction across Willow Grange 3/246, then turns about 90° southwest for 0.7km and then southeast for 0.9km onto Procedeerfontein 5/100, and then turns northeast for 0.2km before terminating at the Scafell Eskom MTS located on Scafell RE/448.

1.2.2 Scafell Solar PV Facility Grid Connection Corridor Alternatives

Two grid connection corridors have been identified and assessed in this Report for the placement of grid connection infrastructure for the Scafell Solar PV Facility (refer to Figure 5). These corridors are described as follows:

- **Grid Connection Corridor Alternative 1**
  This corridor is 150 m wide and is approximately 0.9 km in length. The proposed grid connection is from the on-site substation (Switching Station) of the proposed Scafell Solar Facility located on Willow Grange 3/246 and extends for about 0.6 km south across Scafell RE/448, then turning slightly southeast for 0.3 km, terminating at the Scafell Eskom MTS. This is the shortest most direct route to connect to the Scafell Eskom MTS.

- **Grid Connection Corridor Alternative 2:**
  This corridor is 150 m wide and is also approximately 2.2 km in length. This proposed grid connection starts at the on-site substation (Switching Station) of the proposed Scafell Solar Facility located on Willow Grange 3/246 and extends for about 0.4 km in a westerly direction across Willow Grange 3/246, then turns southwest for 0.7 km and then southeast for 0.9 km onto Procedeerfontein 5/100, and then turns northeast for 0.2 km before terminating at the Scafell Eskom MTS located on Scafell RE/448.

1.2.3 Vlakfontein Solar PV Facility Grid Connection Corridor Alternatives

Two grid connection corridors have been identified and assessed in this Report for the placement of grid connection infrastructure for the Vlakfontein Solar PV Facility (refer to Figure 6). These corridors are described as follows:

- **Grid Connection Corridor Alternative 1**
  This corridor is 150 m wide and is approximately 2.0 km in length. The proposed grid connection is from the on-site substation (Switching Station) of the proposed Vlakfontein Solar Facility located on Vlakfontein 6/161 and extends for about 0.8 km in a westerly direction across Willow Grange 3/246 before turning about 90° south for 0.6 km across Scafell RE/448, then turning slightly southeast for 0.3 km, terminating at the Scafell Eskom MTS. This is the shortest most direct route to connect to the Scafell Eskom MTS.

- **Grid Connection Corridor Alternative 2**
  This corridor is 150 m wide and is approximately 3.0 km in length. The proposed grid connection is from the on-site substation (Switching Station) of the proposed Vlakfontein Solar Facility located on Vlakfontein 6/161 and extends for about 1.2 km in a westerly direction across Willow Grange 3/246, then 0.7 km in a south-westerly direction across Procedeerfontein 5/100, a further 0.9 km in a south-easterly direction and then turns northeast for 0.2 km before terminating at the Scafell Eskom MTS located on Scafell RE/448.

1.2.4 Ilikwa Solar PV Facility Grid Connection Corridor Alternatives

Two grid connection corridors have been identified and assessed in this Report for the placement of grid connection infrastructure for the Vlakfontein Solar PV Facility (refer to Figure 7). These corridors are described as follows:

- **Grid Connection Corridor Alternative 1**
  This corridor is 150 m wide and is approximately 2.3 km in length. The proposed grid connection is from the on-site substation (Switching Station) of the proposed Ilikwa Solar Facility located on Procedeerfontein 5/100 and extends for about 0.3 km in a south-easterly direction before moving north-easterly for 0.7 km across Willow Grange 3/246, then turning east for 0.4 km then directly south for 0.6 km crossing Scafell RE/448, then a further 0.3 km in a south easterly direction, before terminating at the Scafell Eskom MTS.

- **Grid Connection Corridor Alternative 2**

  This corridor is 150 m wide and is approximately 1.4 km in length. The proposed grid connection is from the on-site substation (Switching Station) of the proposed Ilikwa Solar Facility located on Procedeerfontein 5/100 and extends for about 1.2 km in a south-easterly direction before at 90° northeast for 0.2 km into the Scafell Eskom MTS located on Scafell RE/448.

1.2.5 Solar PV Panel Module Alternatives

Mainstream is considering the use of Monofacial and Bifacial PV panel modules for the proposed solar PV facilities. Monofacial PV panel modules generate electricity from one side of the module, whereas bifacial PV panel modules generate electricity from the front and rear side of the module thus providing more output. Bifacial PV panel modules are regarded as having a higher energy yield in comparison to monofacial PV panel modules. Thus, the utilisation of bifacial PV panel modules will require the placement of reflective material beneath the PV panel module such as concrete to enhance the albedo effect from the rear surface of the module.

1.2.6 Solar PV Panel Mounting Structures Alternatives

Mainstream is considering the use of either fixed tilt or dual tracking (single or dual axis) mounting structures for the proposed solar PV facilities. Fixed-tilt mounting structures for PV modules are typically aligned on a North – South path, are cheaper, reliable and have longer lifespan in comparison to Tracking mounting structures. Fixed-tilt mounting structures are however associated with a low energy output, whereas the Tracking mounting structures provide flexibility in the orientation and motion of the PV panel modules which leads to a high energy output. The tracking mounting structures work on a primary and secondary axis which enables the structures to point PV panel modules to specific points in the sky for greater energy output.

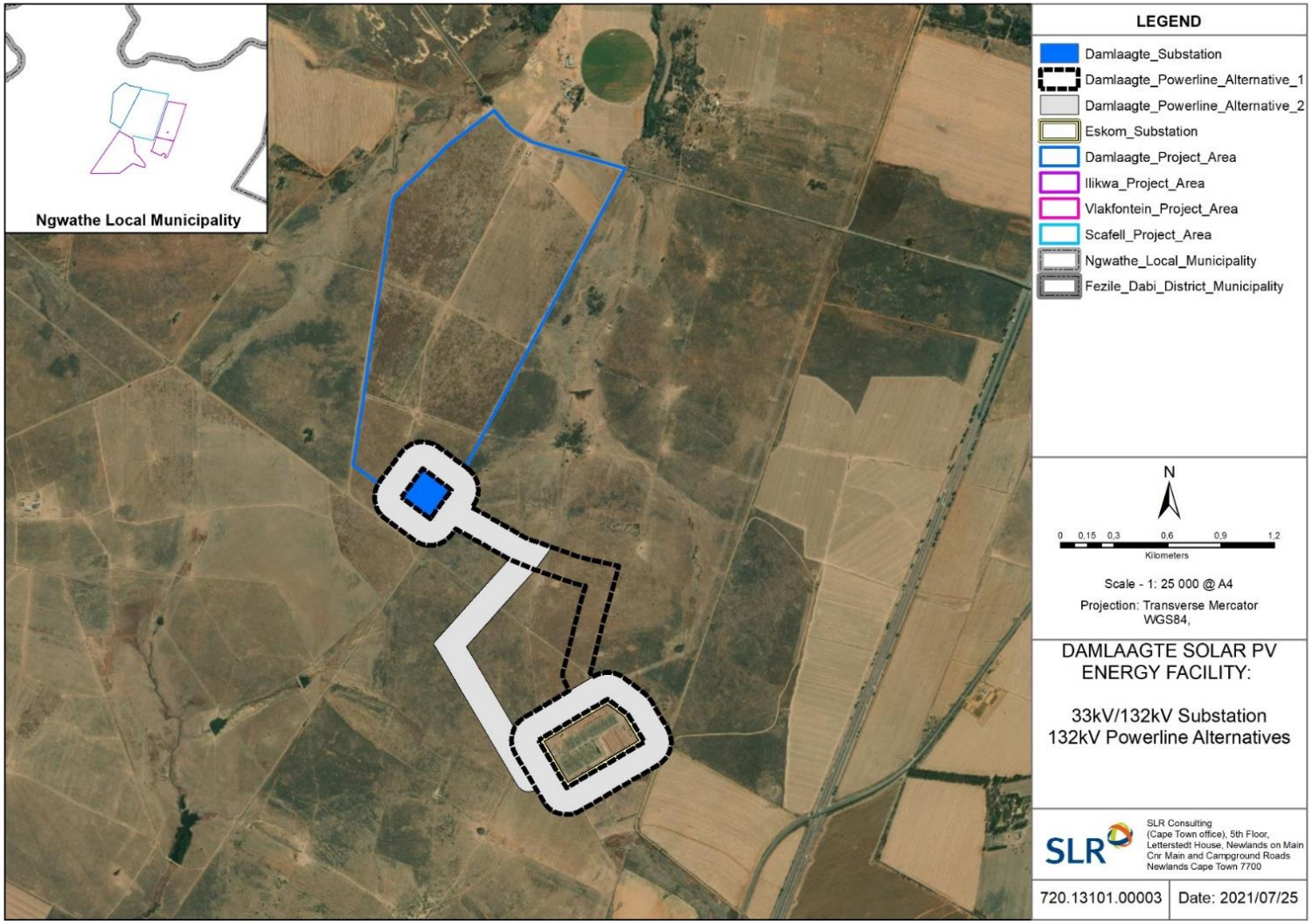


Figure 4: Grid Connection Corridor Alternatives identified and assessed for the Damlaagte Solar PV Facility Grid Connection

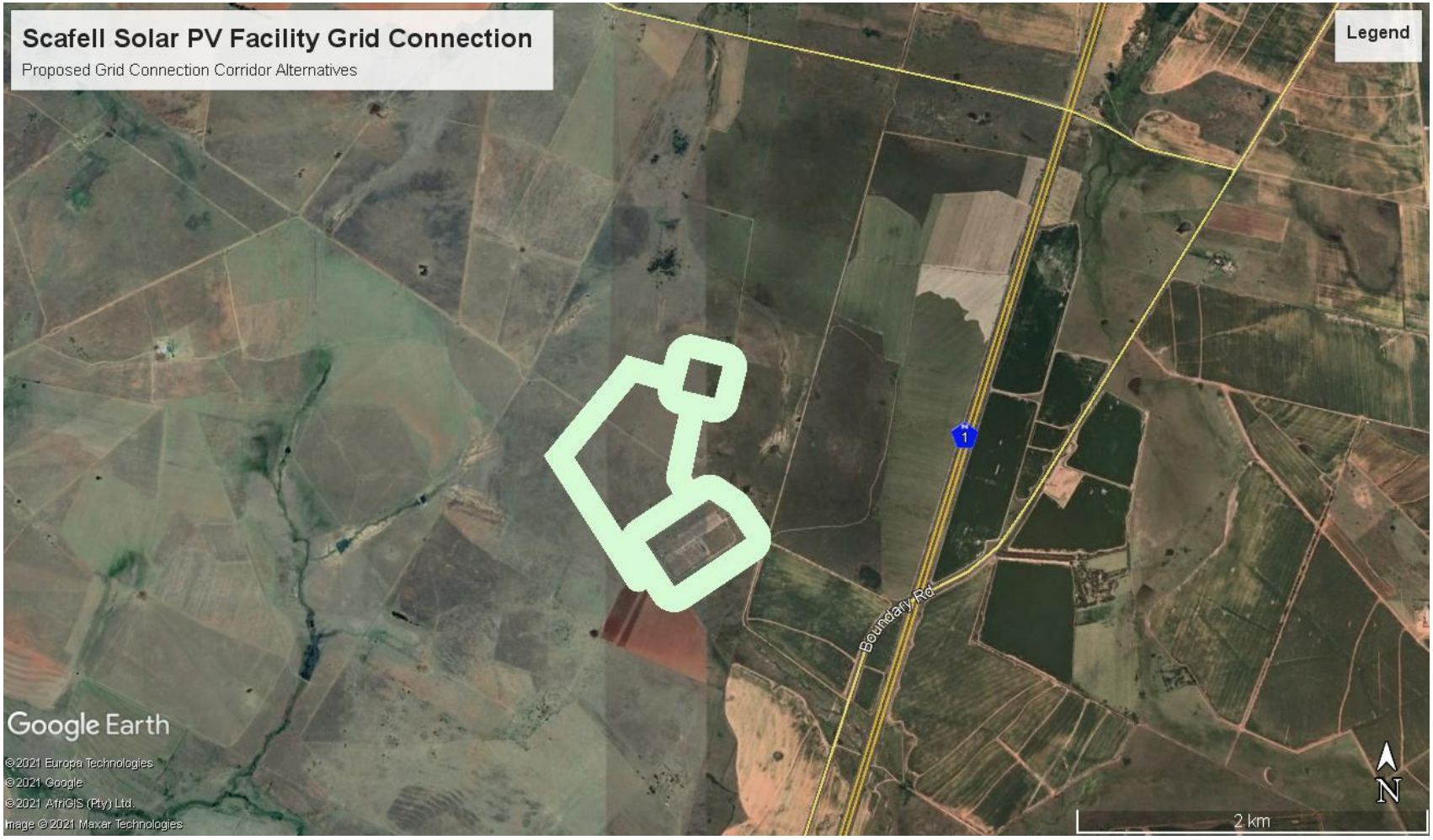


Figure 5: Grid Connection Corridor Alternatives identified and assessed for the Scafell Solar PV Facility Grid Connection

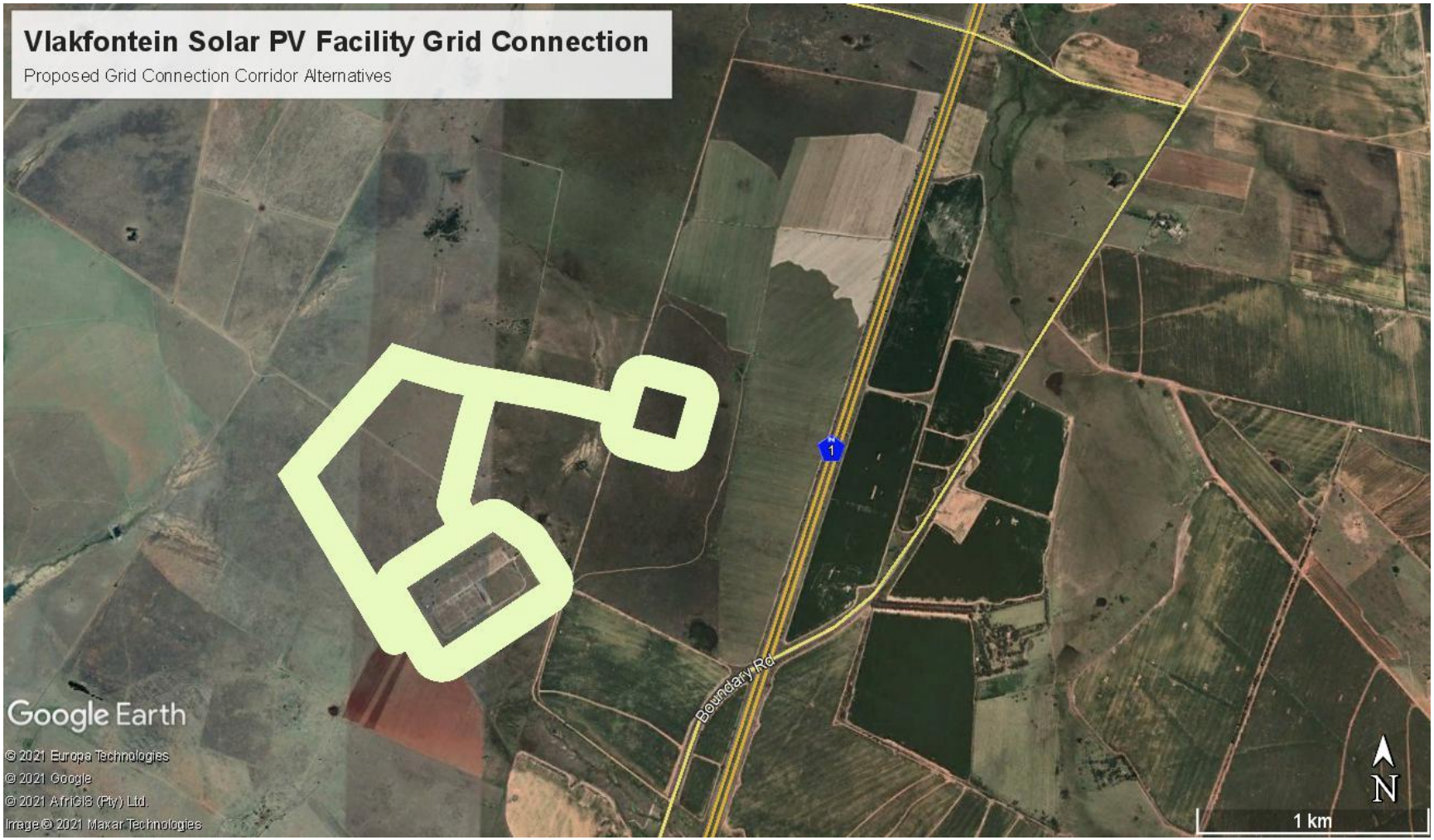


Figure 6: Grid Connection Corridor Alternatives identified and assessed for the Vlakfontein Solar PV Facility Grid Connection

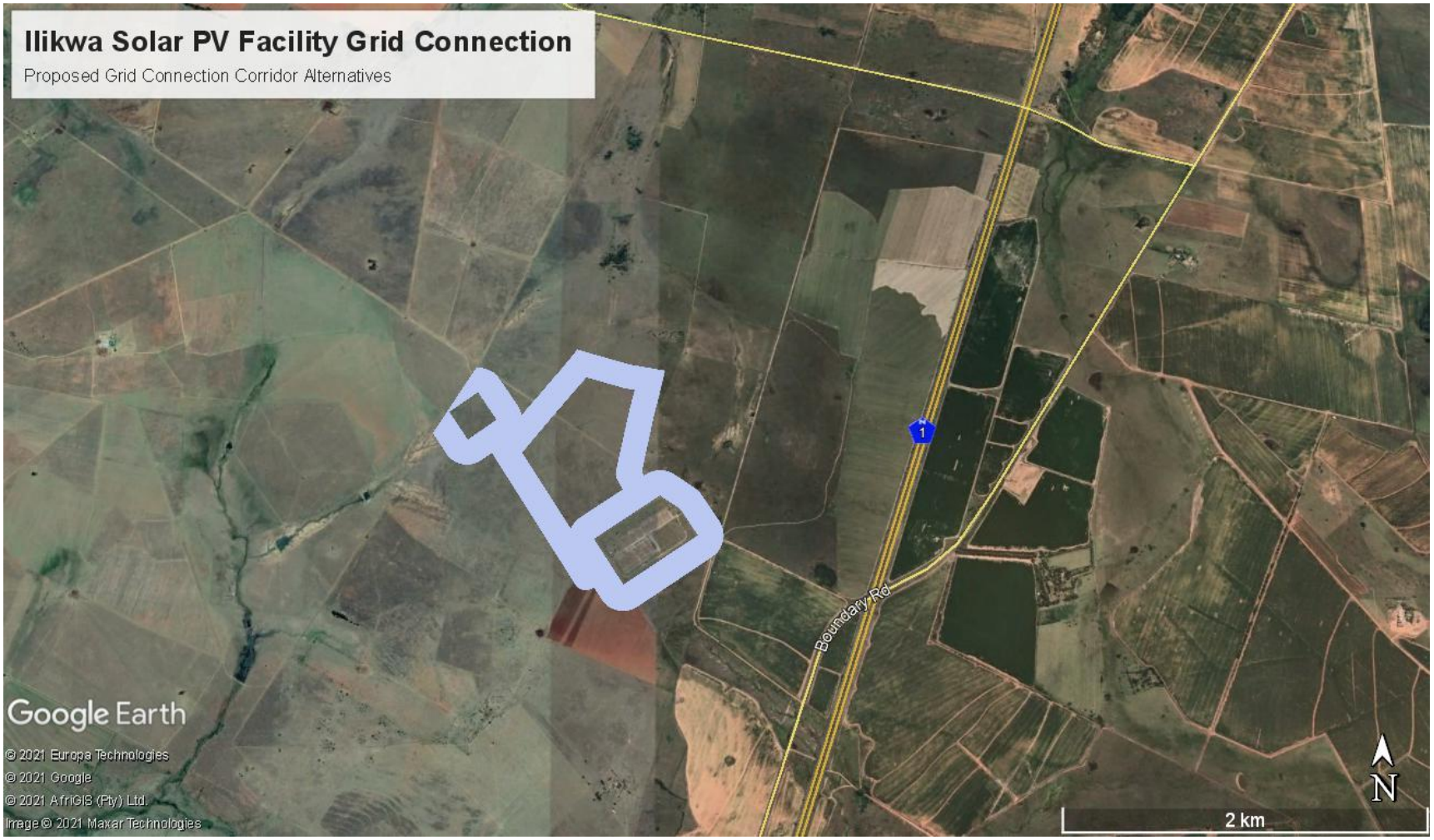


Figure 7: Grid Connection Corridor Alternatives identified and assessed for the Ilikwa Solar PV Facility Grid Connection

1.2.7 Battery Energy Storage System Alternatives

Mainstream is considering the use of either Solid State or Redox Flow Batteries for the Battery Energy Storage Systems (BESS) for each of the solar PV facilities. Each of the BESS-type technologies are described in detail below:

- **Solid State Batteries**

Solid State Batteries are energy storage units that are associated with a range of containerised systems ranging from 500 kWh to 4 MWh. For a 150 MW_{ac} renewable energy facility, a total footprint area of up to 1 ha will be required for the placement of containerised solid-state batteries within each footprint of the proposed solar PV facilities. In general, solid-state batteries consist of numerous battery cells that collectively form modules. Each cell contains an anode, cathode, and an electrolyte. The modules will be assembled and packed inside shipping-size containers (i.e., 17 m long, 3.5 m wide and 4 m high) and delivered to the study area for placement within each of the solar PV facilities proposed for the Scafell Cluster Project. Each container will be placed on a raised concrete plinth of up to 30 cm and may be stacked on top of each other to a maximum height of approximately 15 m. Additional infrastructure associated with the modules include inverters and temperature control equipment which will be positioned inside the containers.

- **Redox Flow Batteries**

Redox Flow Batteries (RFB) are also being considered as an alternative for the proposed solar PV facilities. For this technology, energy is stored as an electrolyte in the flow cells. Specific options include Sodium polysulfide / bromine (PSB) flow batteries, Vanadium Redox (VRB) flow batteries, and Zinc-Bromine (ZNBR) flow batteries which would be contained in small bunded areas. RFBs generally consist of two half-cells containing liquid electrolyte systems. Once supplied with electrical energy a reduction - oxidation (redox) reaction between ions of the two electrolytes, separated by a membrane, charge the electrodes (i.e., cathode and anode) with energy. Energy discharge from an RFB is achieved by a reversed redox reaction between ions resulting in the potential for electrical energy to be drawn from the electrodes. The footprint of a RFB system is approximately 150 x 100 m, with a height of 15 m. The system consists of two electrolyte storage tanks that are contained within a 2.5 m high berm wall which prevents leakage of the electrolyte chemical into the surrounding environment.

An assessment of the potential impacts anticipated from the alternatives considered for the Scafell Cluster Project is included in Chapter 9 of this Heritage Impact Assessment Report.

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)
- Mineral and Petroleum Resources Development Act (MPRDA), Act No. 28 of 2002 - Section 39(3)(b)(iii)

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 conducted by the EAP 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; and
- The compilation of Environmental Impact Assessment Report (EIAR).

3.4 Site Investigation

The aim of the site visit 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 5: Site Investigation Details

	Site Investigation
Date	25 to 30 January 2021
Season	Summer- Archaeological visibility was low due to dense grass cover and waterlogged areas that was difficult to access. The site was however sufficiently covered to understand the heritage character of the area (Figure 4).

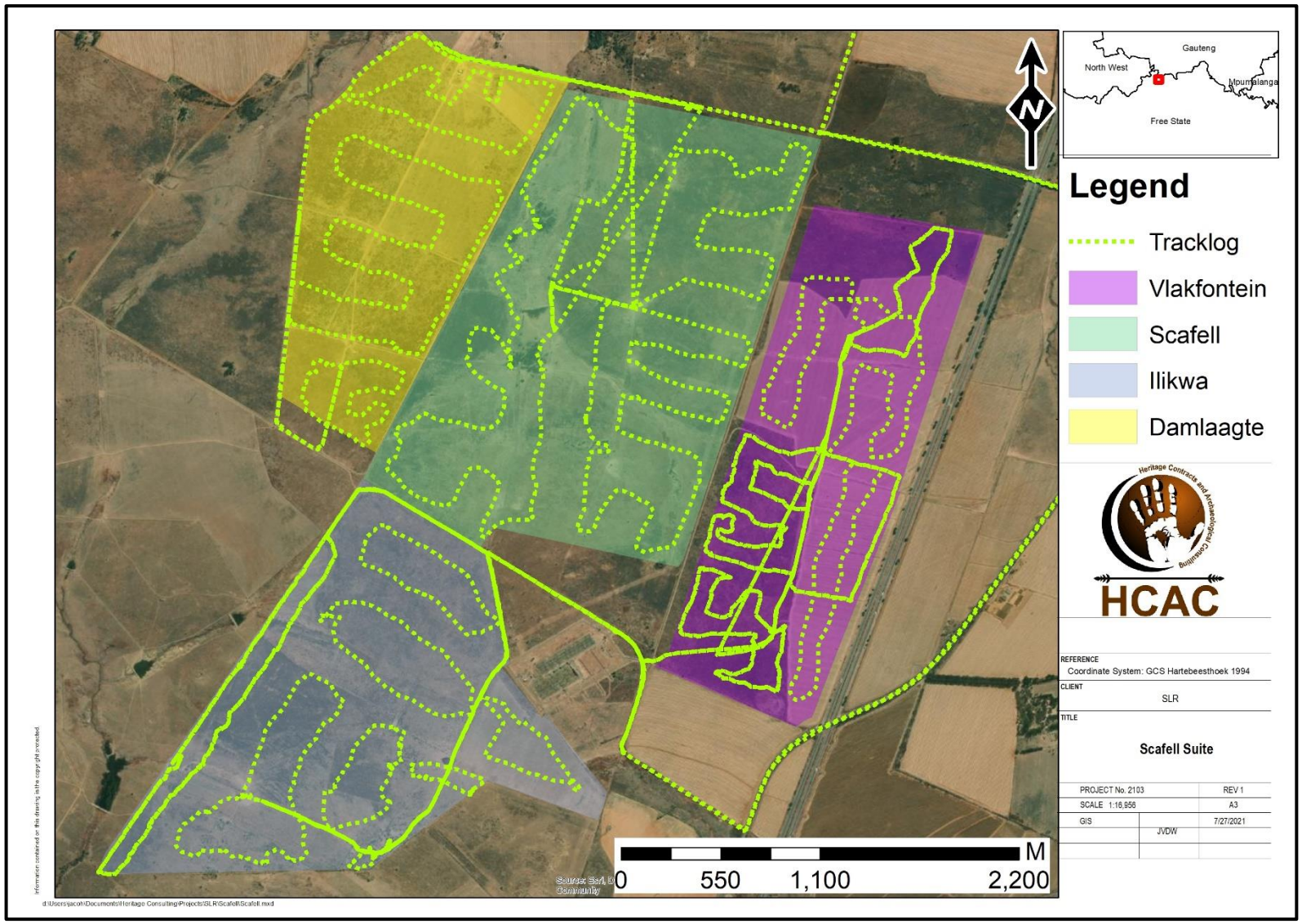


Figure 8: Tracklog of the survey in green.

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 6. 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 following impact assessment methodology was provided by the client:

The identification and assessment of environmental impacts is a multi-faceted process, using a combination of quantitative and qualitative descriptions and evaluations. It involves applying scientific measurements and professional judgement to determine the significance of environmental impacts associated with the proposed project. The process involves consideration of, *inter alia*: the purpose and need for the project; views and concerns of interested and affected parties (I&APs); social and political norms, and general public interest.

3.6.1 Identification and Description of Impacts

Identified impacts are described in terms of the nature of the impact, compliance with legislation and accepted standards, receptor sensitivity and the significance of the predicted environmental change (before and after mitigation). Mitigation measures may be existing measures or additional measures that were identified through the impact assessment and associated specialist input. The impact rating system considers the confidence level that can be placed on the successful implementation of mitigation.

3.6.2 Evaluation of Impacts and Mitigation Measures

3.6.2.1 Introduction

Impacts are assessed using SLR's standard convention for assessing the significance of impacts, a summary of which is provided below.

In assigning significance ratings to potential impacts before and after mitigation the approach presented below is to be followed.

1. **Determine the impact consequence rating:** This is a function of the "intensity", "duration" and "extent" of the impact. The consequence ratings for combinations of these three criteria are given below.
2. **Determine impact significance rating:** The significance of an impact is a function of the consequence of the impact occurring and the probability of occurrence. Significance is determined using the table below.
3. **Modify significance rating (if necessary):** Significance ratings are based on largely professional judgement and transparent defined criteria. In some instances, therefore, whilst the significance

rating of potential impacts might be “low”, the importance of these impacts to local communities or individuals might be extremely high. The importance/value which interested and affected parties attach to impacts will be highlighted, and recommendations should be made as to ways of avoiding or minimising these perceived negative impacts through project design, selection of appropriate alternatives and / or management.

4. **Determine degree of confidence of the significance assessment:** Once the significance of the impact has been determined, the degree of confidence in the assessment will be qualified. Confidence in the prediction is associated with any uncertainties, for example, where information is insufficient to assess the impact.

3.6.3 Criteria for Impact Assessment

The criteria for impact assessment are provided below.

Criteria	Rating	Description
Criteria for ranking of the INTENSITY (SEVERITY) of environmental impacts	**ZERO TO VERY LOW**	Negligible change, disturbance or nuisance. The impac the environment in such a way that natural functions an processes are not affected. People / communities are a adapt with relative ease and maintain pre-impact livelih
	LOW	Minor (Slight) change, disturbance or nuisance. The im the environment is not detectable or there is no percepti change to people’s livelihood.
	MEDIUM	Moderate change, disturbance or discomfort. Where th affected environment is altered, but natural functions an processes continue, albeit in a modified way. People/communities are able to adapt with some difficul maintain pre-impact livelihoods but only with a degree o support.
	HIGH	Prominent change, disturbance or degradation. Where r functions or processes are altered to the extent that they temporarily or permanently cease. Affected people/com will not be able to adapt to changes or continue to maint impact livelihoods.
Criteria for ranking the DURATION of impacts	**SHORT TERM**	< 5 years.
	MEDIUM TERM	5 to < 15 years.
	LONG TERM	> 15 years, but where the impact will eventually cease e because of natural processes or by human intervention.
	PERMANENT	Where mitigation either by natural processes or by huma intervention will not occur in such a way or in such time that the impact can be considered transient.
Criteria for ranking the EXTENT / SPATIAL SCALE of impacts	**LOCAL**	Impact is confined to project or study area or part theree limited to the area of interest and its immediate surrounc
	REGIONAL	Impact is confined to the region, e.g. catchment, municip region, etc.
	NATIONAL	Impact is confined to the country as a whole, e.g. South etc.
	INTERNATIONAL	Impact extends beyond the national scale.
Criteria for determining the	**IMPROBABLE**	Where the possibility of the impact to materialise is very either because of design or historic experience, i.e. ≤ 30 chance of occurring.

PROBABILITY of impacts	**POSSIBLE**	Where there is a distinct possibility that the impact would c i.e. > 30 to ≤ 60% chance of occurring.
	PROBABLE	Where it is most likely that the impact would occur, i.e. > 6 80% chance of occurring.
	DEFINITE	Where the impact would occur regardless of any preventic measures, i.e. > 80% chance of occurring.
Criteria for determining the DEGREE OF CONFIDENCE of the assessment	**LOW**	≤ 35% sure of impact prediction.
	MEDIUM	> 35% and ≤ 70% sure of impact prediction.
	HIGH	> 70% sure of impact prediction.
Criteria for the DEGREE TO WHICH IMPACT CAN BE MITIGATED - the degree to which an impact can be reduced / enhanced	**NONE**	No change in impact after mitigation.
	VERY LOW	Where the significance rating stays the same, but where mitigation will reduce the intensity of the impact.
	LOW	Where the significance rating drops by one level, after miti
	MEDIUM	Where the significance rating drops by two to three levels, mitigation.
	HIGH	Where the significance rating drops by more than three lev after mitigation.
Criteria for LOSS OF RESOURCES - the degree to which a resource is permanently affected by the activity, i.e. the degree to which a resource is irreplaceable	**LOW**	Where the activity results in a loss of a particular resource where the natural, cultural and social functions and proces are not affected.
	MEDIUM	Where the loss of a resource occurs, but natural, cultural a social functions and processes continue, albeit in a modifi way.
	HIGH	Where the activity results in an irreplaceable loss of a resc
Criteria for REVERSIBILITY - the degree to which an impact can be reversed	**IRREVERSIBLE**	Where the impact is permanent.
	PARTIALLY REVERSIBLE	Where the impact can be partially reversed.
	FULLY REVERSIBLE	Where the impact can be completely reversed.

3.6.4 Determining Consequence

Consequence attempts to evaluate the importance of a particular impact, and in doing so incorporates extent, duration and intensity. The ratings and description for determining consequence are provided below.

Rating	Description *
VERY HIGH	Impacts could be EITHER: of ***high intensity*** at a ***regional level*** and endure in the ***long term***; OR of ***high intensity*** at a ***national level*** in the ***medium term***; OR of ***medium intensity*** at a ***national level*** in the ***long term.***
HIGH	Impacts could be EITHER: of ***high intensity*** at a ***regional level*** and endure in the ***medium term***; OR of ***high intensity*** at a ***national level*** in the ***short term***; OR of ***medium intensity*** at a ***national level*** in the ***medium term;***

	OR of ***low intensity*** at a ***national level*** in the ***long term***; OR of ***high intensity*** at a ***local level*** in the ***long term***; OR of ***medium intensity*** at a ***regional level*** in the ***long term.***
MEDIUM	Impacts could be EITHER: of ***high intensity*** at a ***local level*** and endure in the ***medium term***; OR of ***medium intensity*** at a ***regional level*** in the ***medium term***; OR of ***high intensity*** at a ***regional level*** in the ***short term***; OR of ***medium intensity*** at a ***national level*** in the ***short term***; OR of ***medium intensity*** at a ***local level*** in the ***long term***; OR of ***low intensity*** at a ***national level*** in the ***medium term;*** OR of ***low intensity*** at a ***regional level*** in the ***long term.***
LOW	Impacts could be EITHER of ***low intensity*** at a ***regional level*** and endure in the ***medium term***; OR of ***low intensity*** at a ***national level*** in the ***short term***; OR of ***high intensity*** at a ***local level*** and endure in the ***short term***; OR of ***medium intensity*** at a ***regional level*** in the ***short term***; OR of ***low intensity*** at a ***local level*** in the ***long term***; OR of ***medium intensity*** at a ***local level*** and endure in the ***medium term.***
VERY LOW	Impacts could be EITHER of ***low intensity*** at a ***local level*** and endure in the ***medium term***; OR of ***low intensity*** at a ***regional level*** and endure in the ***short term***; OR of ***low to medium intensity*** at a ***local level*** and endure in the ***short term*** OR **Zero to very low intensity** with any combination of extent and duration.

* Note: For any impact that is considered to be “Permanent” or “International” apply the “Long-Term” and “National” ratings, respectively.

3.6.5 Determining Significance

The consequence rating is considered together with the probability of occurrence in order to determine the overall significance using the table below.

		PROBABILITY			
		IMPROBABLE	**POSSIBLE**	**PROBABLE**	**DEFINITE**
CONSEQUENCE	**VERY LOW**	**INSIGNIFICANT**	**INSIGNIFICANT**	**VERY LOW**	**VERY LOW**
	LOW	**VERY LOW**	**VERY LOW**	**LOW**	**LOW**
	MEDIUM	**LOW**	**LOW**	**MEDIUM**	**MEDIUM**
	HIGH	**MEDIUM**	**MEDIUM**	**HIGH**	**HIGH**
	VERY HIGH	**HIGH**	**HIGH**	**VERY HIGH**	**VERY HIGH**

In certain cases, it may not be possible to determine the significance of an impact. In these instances, the significance is **UNKNOWN**.

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

StatsSA provide the following information: "*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. Site notices and advertisements notifying interested and affected parties were placed at strategic points within the study area and in a local newspaper as part of the process.

6 Literature / Background Study:

6.1 Literature Review (SAHRIS)

Several assessments were conducted in the general area, studies listed in Table 7 were consulted for this report.

Table 7. The following studies were conducted in the surrounding area and were consulted for this report.

Author	Year	Project	Findings
Van Schalkwyk, J.A.	1996	Survey of cultural resources in the Proposed Sigma Colliery Northwest Strip Mine, Sasolburg District, Free State Province	Stone Age features, Iron Age sites and cemeteries
Dreyer, C.	2005	First Phase Archaeological and Heritage Impact Assessment for The Proposed Development Of The Heron Banks Golf And River Estate, Sasolburg, Free State	Cemetery.
Dreyer, C	2005	First phase archaeological and historical investigation of the proposed developments on	No sites

		the farm Geluk 196 & Ladiesfontein 255 , Parys, Free State	
Van Schalkwyk, J. A.	2006	HIA For the proposed Waterford Golf Estate, Parys Free State Province.	Cemetery and ruins.
Coetzee, F, P	2008	Cultural Heritage Survey of the Proposed Goosebay Eco Estate situated on Portions 1 and 3 and a Remainder of the Farm Woodlands 407RD, Free State Province	Cemetery and historical entrenchment
Van der Walt, J.	2008a	Archaeological Impact Assessment. Subdivision 6 of the farm Erina 121, Sasolburg, Free State Province, Sasolburg: Unpublished report	No Heritage sites
Van der Walt, J.	2008b	Archaeological Impact Assessment. Subdivision 10 of the farm Erina 121, Sasolburg, Free State Province, Sasolburg: Unpublished report	No Heritage Sites
Van der Walt, J	2009	Archaeological Impact Assessment. On Portion 3 Of Portion 2 Of the Farm Wonderfontein 350, Sasolburg, Free-State Province	No heritage features.
Van der Walt, J.	2009	Archaeological Impact Assessment on a portion of the farm Boschbank 12, Sasolburg, South Africa, Sasolburg: Unpublished report.	Cemetery
Van der Walt	2011	Archaeological Impact Assessment. Proposed Vaal River Casino on part of Portion 9 of the farm Rietfontein 251, Sasolburg, Free State Province, Sasolburg: Unpublished report.	Cemetery
Nel J	2013	Letter of Recommendation For Exemption: Heritage Impact Assessment For The Sasol Sigma Colliery Ash Backfilling Project, Sasolburg, Free State Province	No heritage features.
Gaigher, S	2015	Heritage Impact Assessment for the Mining rights Application for the Farm De Pont 228	No sites
Van der Walt, J	2016	Letter of Recommendation For Exemption of HIA for a Calcination Plant, Sasolburg, Free State, South Africa	No heritage features
Hardwick, S.	2019	Sasol Sigma Defunct Colliery Surface Mitigation Project: Proposed River Diversion and Flood Protection Berms NID	Four burial grounds and one historical structure were identified

6.1.1 Genealogical Society and Google Earth Monuments

No known grave sites are indicated in the study area.

6.2. Background to the general area

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

6.2.1. 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 (LSA), the Middle Stone Age (MSA) and the Earlier Stone Age (ESA). 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. Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable (Lombard 2012). The three main phases can be divided 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.

The Vaal Gravels are known to contain Early and Middle Stone Age Artefacts and some Rock Engraving sites are on record in the greater study area. To the north west of the study area, the rock engraving site of Leeuwkuil is located. 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.

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.

6.2.2. Iron Age (general)

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.

Little is published on the Iron Age of the study area. The closest sites are towards the south east 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. History of the greater area

Since the farms under investigation are in proximity to Sasolburg, the history of this urban center will be briefly discussed.

By the 1930's, an international Depression left a great proportion of South Africa's population destitute. The Second World War commenced in 1939, and ironically helped to kick-start the South African economy. This eventually spurred the development of towns such as Vereeniging, Vanderbijlpark and Sasolburg. (Iscor Limited 1952: 10-11)

Sasolburg is located near the Vaal River, about 80 kilometers from Johannesburg. This city forms part of the Vaal Industrial Triangle, together with the townships of Vereeniging and Vanderbijlpark. The latter is located only 13 kilometers from Sasolburg. In the late 1860s, diamonds were discovered near the confluence of the Orange and the Vaal Rivers. Subsequently, thousands of hopeful diamond excavators flooded to the banks of the Vaal during the early 1870s. (Meintjes 1975: 1-4)

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 colonized the Cape and Natal, had intentions 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 publicized, and 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 based on the status quo ante bellum. Salisbury's reply was, however, a clear statement of British war aims. (Du Preez 1977)

By the time that Sasolburg was established, Vereeniging was already a large town. This urban center was established partly on the farm Leeuwkuil, which had belonged to Jan Hendrik Venter. An important coal reef was discovered on this farm in 1879 by George William Stow, who was also instrumental in the establishment of Sasolburg. With the help of the mine magnate Sammy Marks, Stow created the company De Zuid-Afrikaansche en Oranje Vrijstaatche Kolen en Mineralen Vereeniging, from which the town of Vereeniging later took its name. Stow was an interesting character, and in his lifetime worked as a medical practitioner, wine merchant, ethnologist and artist, among other things. He is however best known for the discoveries that he made in the field of geology. He started his geological fieldwork in South Africa in 1877, and some of his earliest discoveries of important coal deposits were at the wall of the Taaiboschspruit and at Leeuwspruit, where a Sasol Pump Station was later built. Sammy Marks joined with Stow and bought land on both sides of the Vaal River to mine these coal reefs. In the 1880s, coal was transported by ox wagon to Kimberley. There was an increased demand for coal in the following years, and by 1895, the Cornelia Coal Mine at Vereeniging was established. The Anglo Boer War inhibited the full-scale mining of coal between 1899 and 1902. (Meintjes 1975: 5, 7-11)

Construction of the Sasol factory started in 1952, and the town of Sasolburg would be built around this development. When the development of this township started in the same year, Sasolburg was in the magisterial district of Parys. The properties Grootfontein, Zevenfontein, Herewarde, Willowgrove, Antrim, Kleinfontein, Geduld, Roseberry Plain and Saltberry Plain were bought for the purposes of township development. Prior to the development of Sasolburg, farmhouses and maize fields was all that stretched between that area and the banks of the Vaal River. At first it was considered that the town could be built on the banks of the river, some distance from the Sasol factory, but misty conditions in the winter and mosquitoes in summer led to the dismissal of this idea. It was decided that the Vaal River would rather serve as a recreational destination, and the farm Abrahams Rust was bought for this purpose. From the outset, Sasolburg was planned as a 'garden town', with many trees along its streets. The town was originally

developed to house 12 000 inhabitants in four living extensions which would each have amenities such as shops, schools, churches, and parks. One of the first developments on Abrahams Rust was a Garden Nursery. Park trees were grown at nurseries on Abrahams Rust and Zevenfontein from the beginning and were later planted along the provincial road between the town and the Vaal River. The first inhabitants of Sasolburg had to manage without electricity, and water was still rather scarce. It was also necessary to take a ferry to the northern bank of the Vaal River if one wanted to visit Vanderbijlpark, which was the closest town at the time. By 1953, 1 468 white and 3 251 black individuals were already living at Sasolburg. (Meintjes 1975: 49-59)

Sasolburg expanded quickly in the years that followed. In February 1961, the Provincial Secretary of the Orange Free State wrote an urgent letter to the Secretary of Bantu Administration and Development, asking for permission to develop Extension 9 of the town Sasolburg, which would be the industrial section of the town. In the letter, the Provincial Secretary notes that the development of Sasolburg was the direct result of the establishment of the large parastatal Sasol Factory. He also noted that the factory produced a wide variety of valuable by-products which would have to be processed by private industrial companies. The factory's expanded productivity therefore necessitated the establishment of new chemical industries. Most of these companies were built by foreign industrial enterprises. The town of Sasolburg further expanded around these new enterprises. (National Archives of South Africa SAB, BAO: 1433 A17/1603).

6.3.1. Anglo Boer War

During the time of the Anglo-Boer War, an important event occurred at Vereeniging, which is today located some 19 kilometers to the east of Vanderbijlpark. 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 signaled the end of the Anglo-Boer War, as well as the end of the Boer Republics' independence. (Bergh 1999: 251).

6.3.2. Cultural Landscape

The larger study area is characterized by agricultural activities character although some mining activities used to occur on Portion 3 of the Farm Willow Grange 246 - the project site for the Scafell Solar PV Facility. The study area is void of landmarks that would have attracted human occupation in antiquity.

6.4. Graves and Burial Sites

No known graves are indicated on databases consulted but graves and cemeteries are widely distributed across the landscape and can be expected anywhere.

7. Description of the Physical Environment

The study area is divided into four project areas namely:

- Damlaagte Solar PV Facility located on the farm Damlaagte 229 (Remaining Extent),
- Scafell Solar PV Facility located on the farm Willow Grange 246 Portion 3,
- Vlakfontein Solar PV Facility located on the farm Vlakfontein 161 Portion 6 and,
- Ilikwa Solar PV Facility located on the farm Proceederfontein 100 Portion 5

Each of the proposed solar PV facilities will have grid connection infrastructure to facilitate the connection between each facility and the Scafell MTS. The proposed PV facilities and grid connection corridors are in a rural setting mostly used for grazing although mining activities used to occur on Portion 3 of the Farm Willow Grange 246. The study areas are flat without major topographical features like pans or hills and infrastructure are limited to small gravel roads, cattle fences, powerlines, and the remains of derelict irrigation pipelines (Figure 9 to 18).

Figure 9. Damlaagte access road.

Figure 10. General site conditions at Damlaagte.

Figure 11. General site conditions Damlaagte.

Figure 12. Vegetation and irrigation infrastructure at Damlaagte.

Figure 13. General Scafell site conditions

Figure 14. Excavated area Scafell.

Figure 15. Excavated area Scafell.

Figure 16. General site conditions at Scafell.

Figure 17. Vlakfontein General site conditions.

Figure 18. Vlakfontein General site conditions.

8. Findings of the Survey

It is important to note that only the development footprint of the project was surveyed over one week by two professional archaeologists. The study area does not contain major topographical features that would have been focal points for human settlement in antiquity like rocky outcrops or large water bodies. Furthermore, no raw material suitable for stone tool manufacture occurs in the area.

During the survey numerous historical stone walled enclosures were identified in the Ilikwa Project area and these features will require mitigation measures prior to construction if impacted on. Recorded heritage features were labelled numerically with the Prefix S for Scafell, VF for Vlakfontein and I for Ilikwa. No heritage sites were recorded within the Damlaagte Project area. Each project is discussed individually below. First is an overview of historical maps of the area providing context to how the site evolved over time and to features that could occur in the area, followed by the results of the field survey.

8.1. Damlaagte Solar PV Facility and associated grid connection

8.1.1. Damlaagte Cultural Landscape

The Damlaagte study area is mainly used as grazing for cattle with the only structures being the modern workers houses close to the entrance of the study area. A dug-out trench is situated near the workers houses that could have been a disposal site for refuse and has filled up with rainwater. The farm seems to have been cultivated in the past and evidence of large-scale irrigation systems can be seen across the study area but is now covered with shrubs and grass. These are underground metal pipes and spouts that can be seen at different points across the study area.

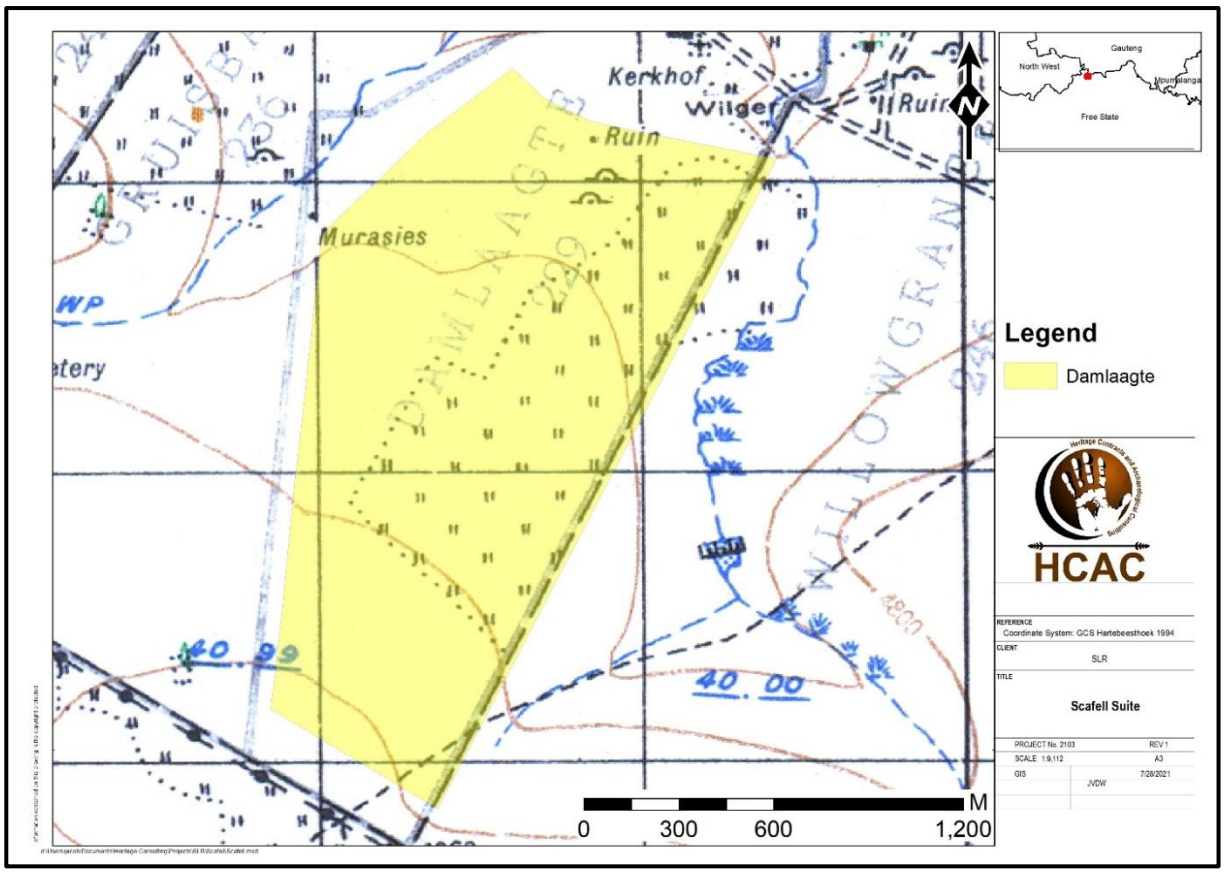


Figure 19. 1945 Topographic map of Damlaagte indicating a cemetery to the north and outside of the study area with cultivation, ruins and huts in the study area.

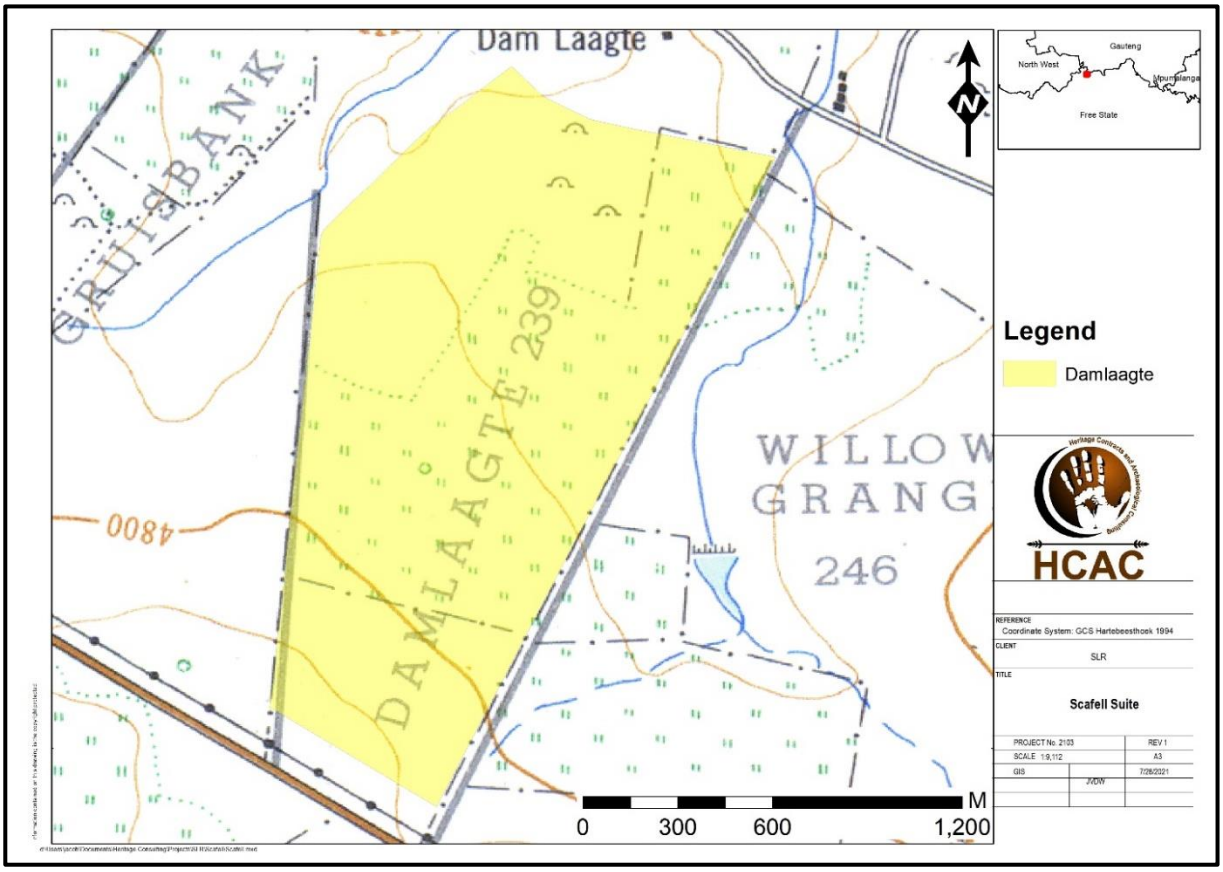


Figure 20. 1966 Topographic map of Damlaagte. Huts are indicating in the northern part of the study area and a large portion of the area is cultivated.

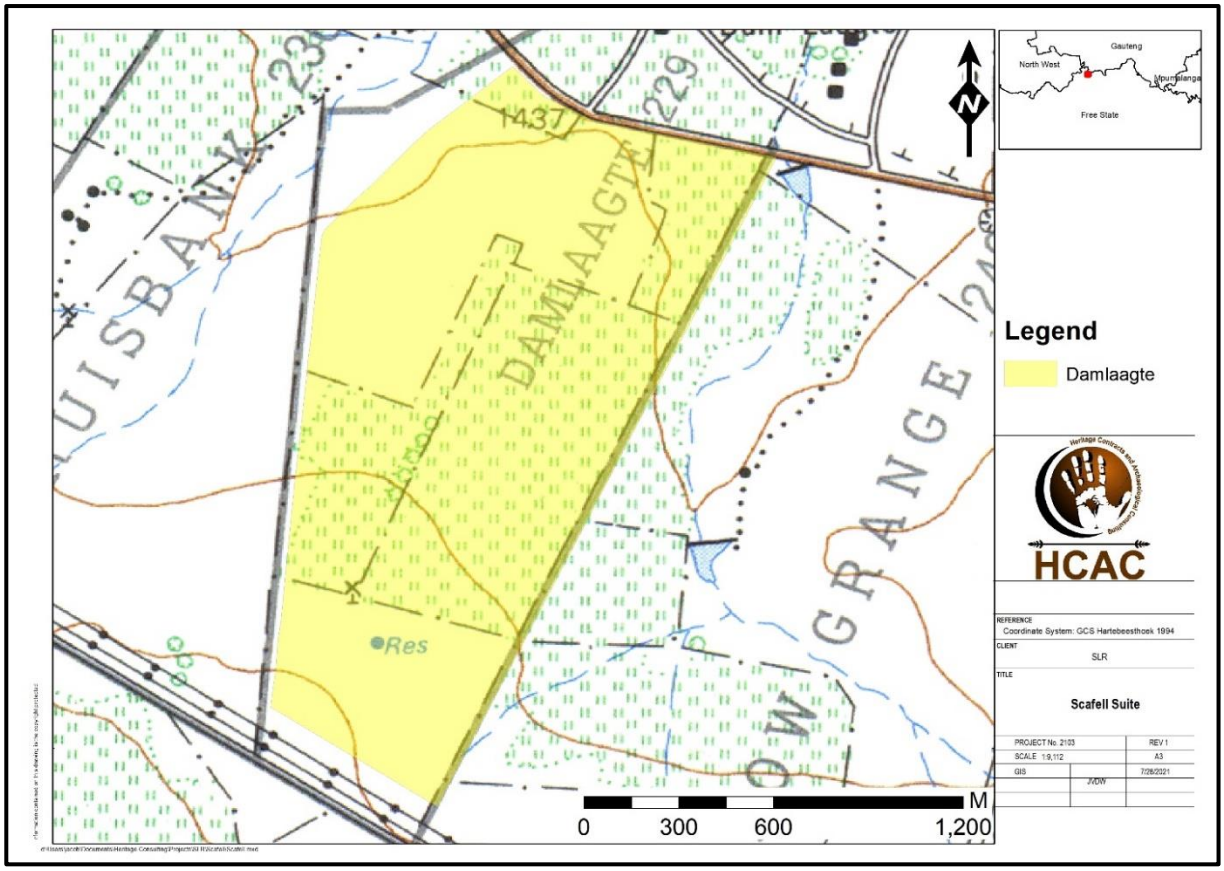


Figure 21. 1976 Topographic map of the impact area. Cultivation increased in the area.

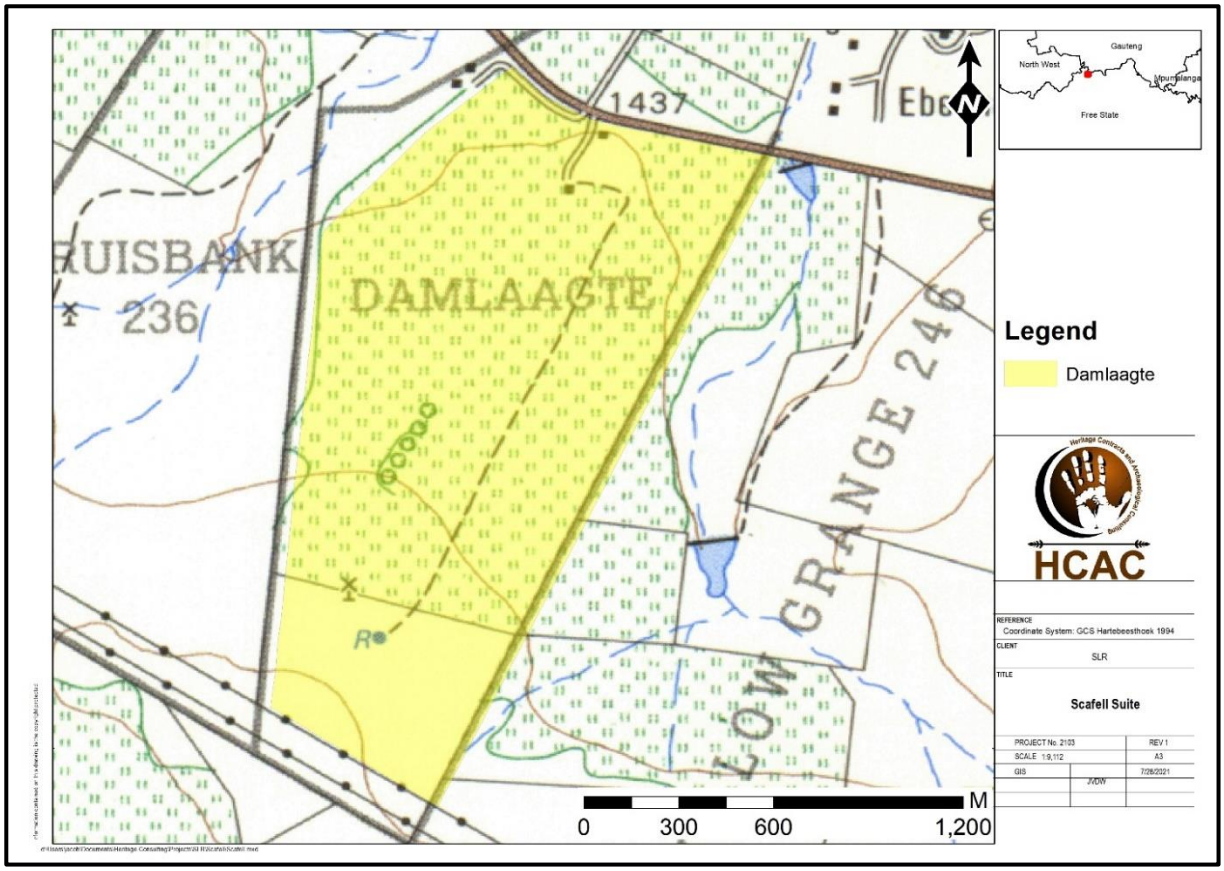


Figure 22. 1991 Topographic map of the study area indicating cultivation in most of the study area and an access road and two structures in the northern part of the study area.

No structures or archaeological sites of significance were identified in this area, or within the grid connection corridor alternatives considered for the placement of grid connection infrastructure. Based on historical maps of the area, the study area has been sparsely occupied from the 1940's and cultivated with huts and a ruin indicated in the northern portion of the study area (Figure 19 to 22). From the 1990's most of the area is cultivated and no traces of the earlier structures were noted during the survey.

8.2. Scafell Solar PV Facility and associated grid connection

8.2.1. Scafell Cultural Landscape

The Scafell study area is characterised by open fields with high grass cover that was probably cultivated in the past. Multiple thickets of thorn trees occur within the study area and are situated near a natural drainage line that traverses the study area. The scattered thickets along the small stream contain areas that were waterlogged due to the high rainfall experienced just before the survey, limiting access in these areas. The drainage line cuts through to the northern corner of the study area into a small dam near the north-western border of the study area.

The study area has been sparsely developed from the 1940's onwards with ruins indicated in the southern portion. In the 1960's cultivation began with a large excavation in the south-eastern corner. In the 1970's cultivation of the area began that continued into the 1990's (Figure 23 – 26).

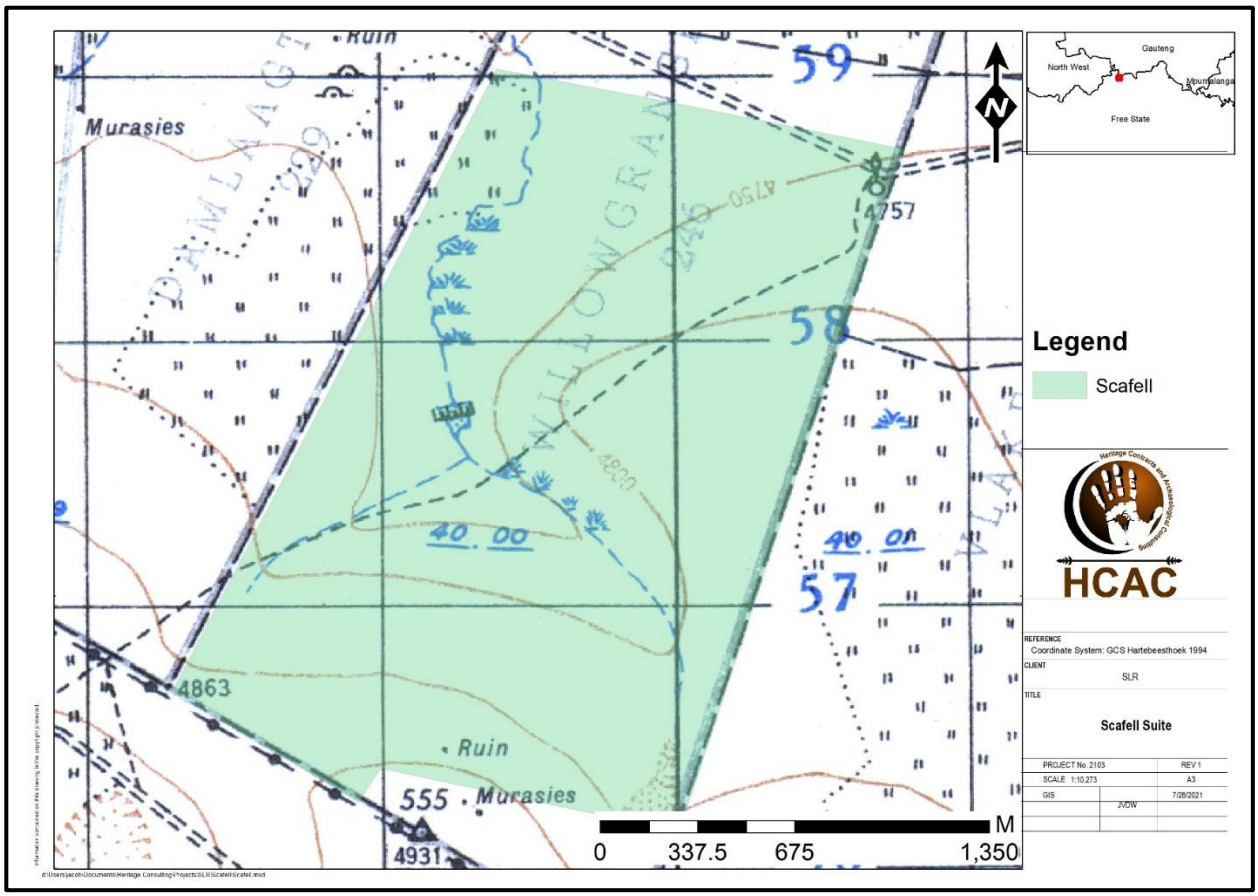


Figure 23.1945 Topographic map indicating ruins in the southern part of the study area.

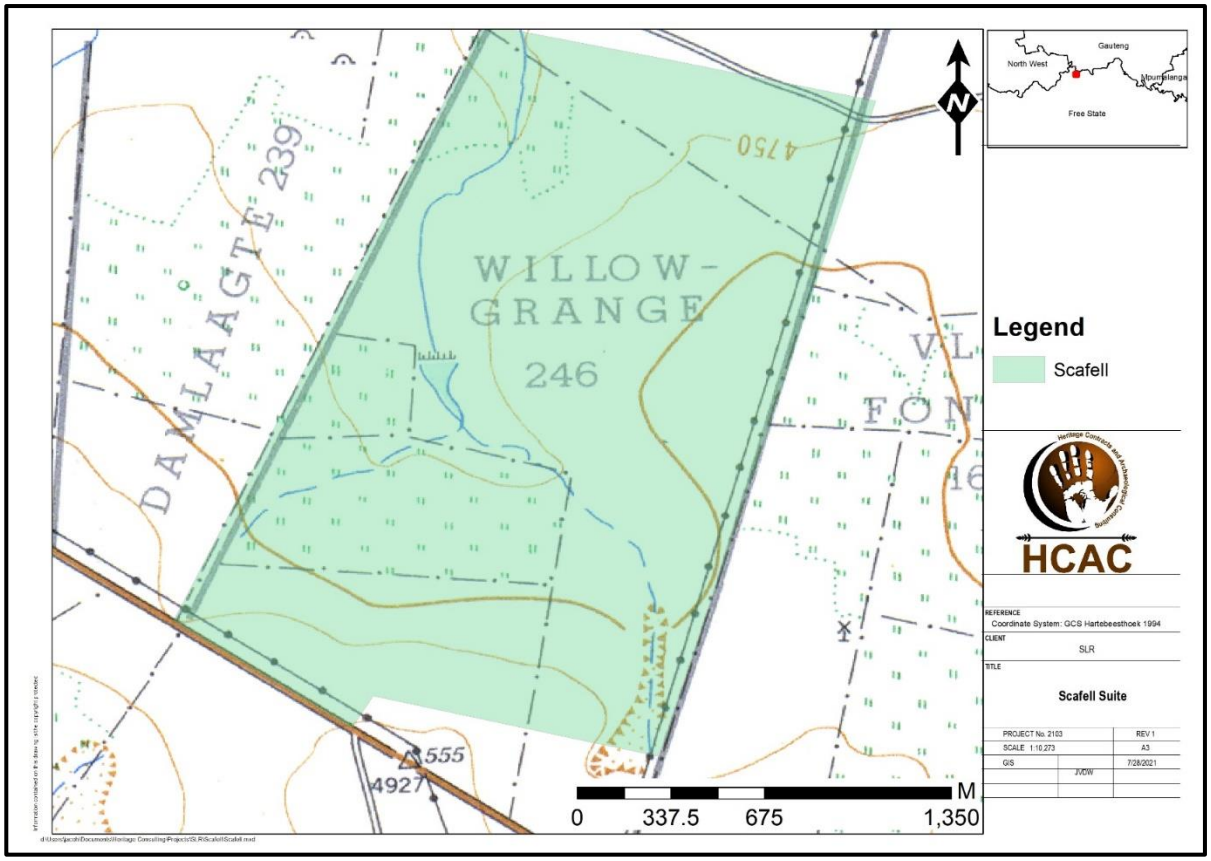


Figure 24. 1966 Topographic map of the study area. No major features are indicated.

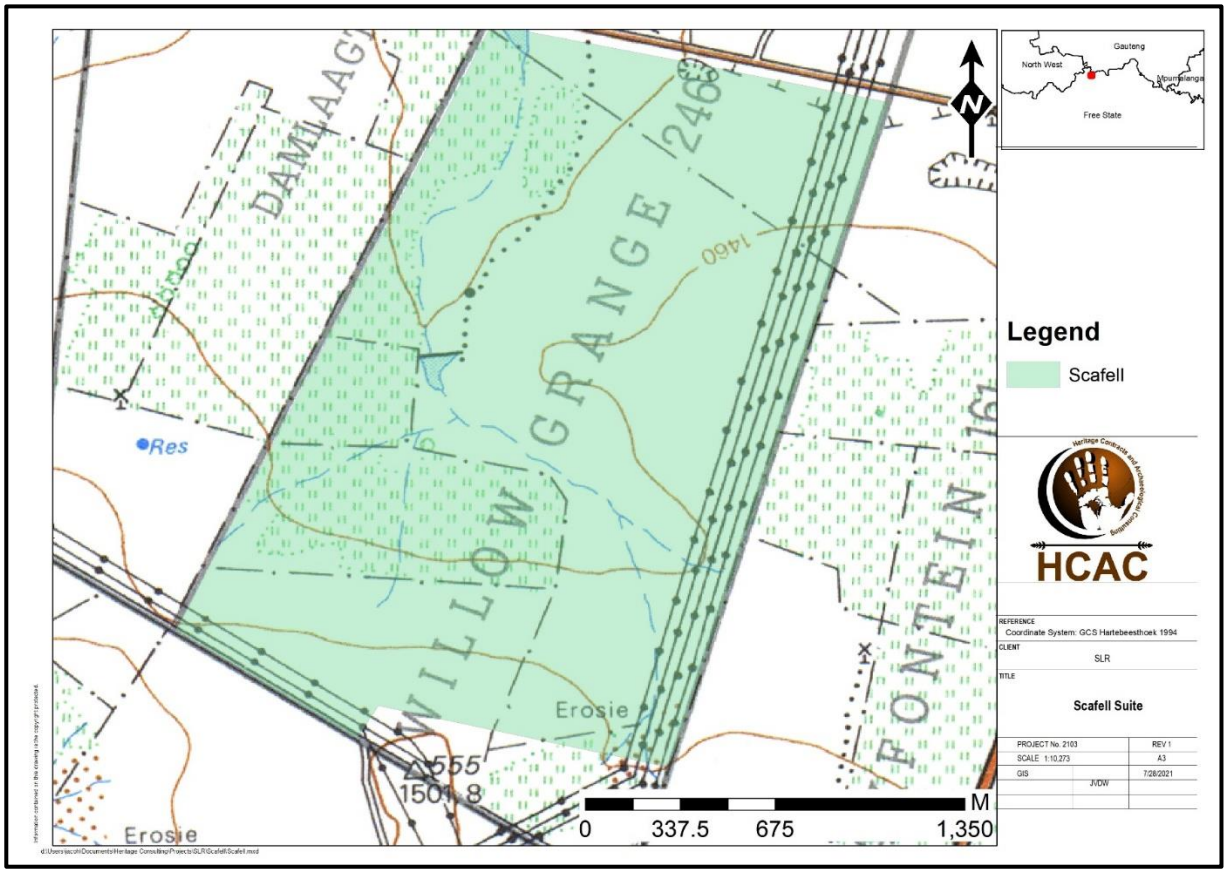


Figure 25. 1977 Topographic map of the Scafell PV area. A road is indicated towards the dam as well as some cultivation.

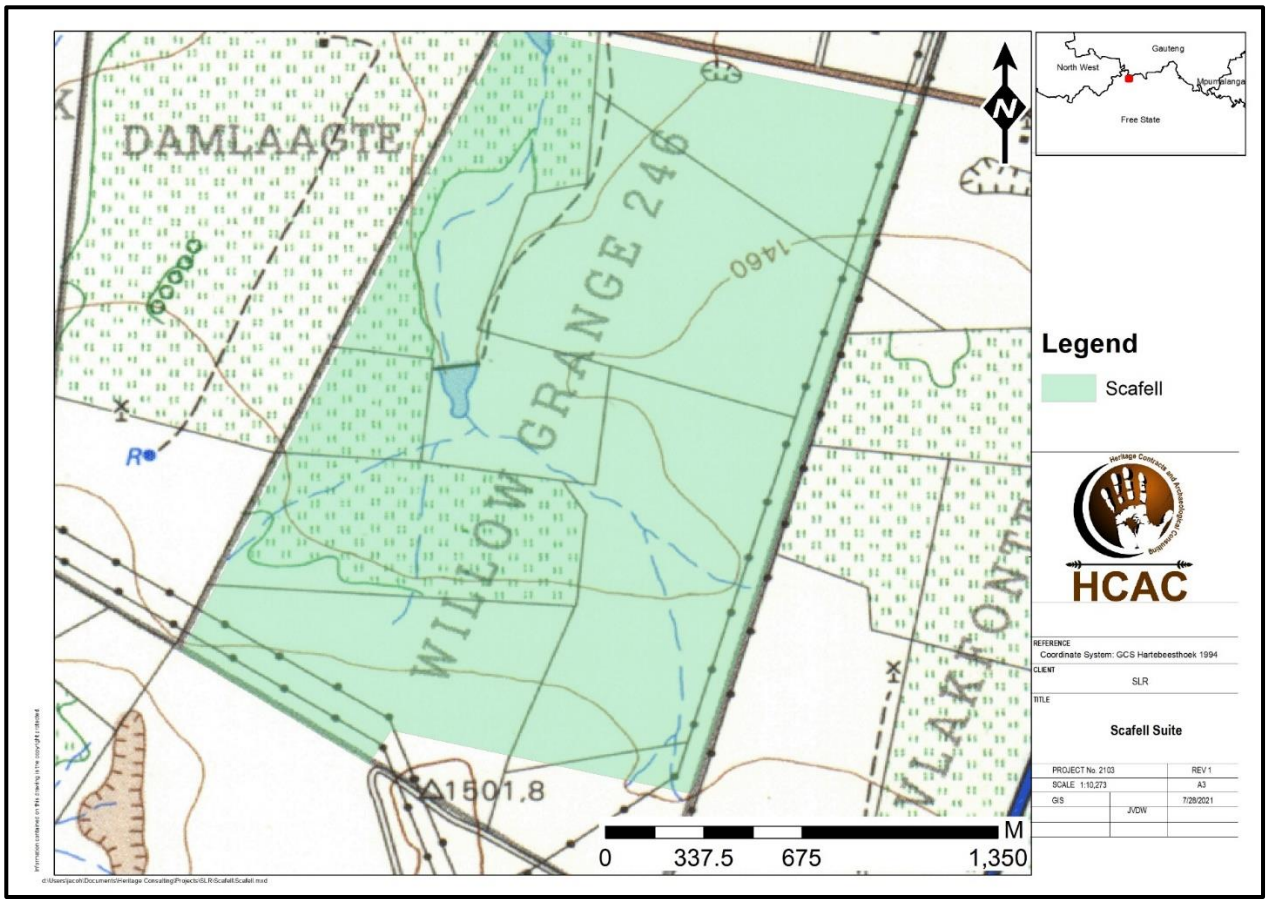


Figure 26. 1991 Topographic map of the study area, a small excavation is indicated in the north.

8.2.2. Recorded Features – Scafell Solar PV Facility and associated grid connection

The north-eastern section of the study area is situated on the incline of an elevated area in the topography. This area has been mined for gravel in the past. A small graveyard recorded as S1 is situated right next to the fence close to this area, within the footprint of the solar PV facility. The graveyard is extremely overgrown with many of the graves almost completely covered in grass and used to be fenced. 10-15 graves could be identified with only some having cement gravestones and grave borders. Most of the graves are marked by packed stone.

S2 marks a packed stone feature/ section of ephemeral walling within the footprint of the solar PV facility and the switching station for the grid connection infrastructure. This feature could be historical since a ruin is indicated in this area on the 1945 topographical map and is almost completely covered by grass and difficult to define. S3 is situated within one of the larger thickets of trees. This is a small, fenced area with a water pump and does not seem to demarcate a cemetery and is of no heritage significance. Recorded features are spatially illustrated in Figure 27 with the coordinates in Table 8. Figure 28 to 35 indicate general site conditions at S1 – S3.

Table 8. Recorded features - Scafell

Site number	Longitude	Latitude	Description	Field Rating/ Significance
S1	27° 38' 37.8383" E	26° 47' 04.4519" S	Cemetery	GP A High
S2	27° 38' 10.0249" E	26° 48' 17.4060" S	Packed stone feature/ section of ephemeral walling	GP C Low
S3	27° 38' 06.0503" E	26° 47' 50.2728" S	Small fenced off area with a water pump	No significance

Figure 27. Site distribution Scafell.

Figure 28. General site conditions at S1

Figure 29. Grave in cemetery S1.

Figure 30. Grave in cemetery S1.

Figure 31. Grave in cemetery S1.

Figure 32. General site conditions at S2

Figure 33. Stone packed feature at S2.

Figure 34. Site conditions at S3.

Figure 35. Site conditions at S3.

8.3. Vlakfontein Solar PV Facility and associated grid connection

8.3.1. Cultural Landscape

Vlakfontein is characterised by fields that are mostly being used for the growing of *Eragrostis* grass for animal feed. These fields cover a large portion of the study area. During the survey some of these fields had already been baled. These areas are extremely flat with no features visible probably due to the continuous use of the area for agriculture. Based on historical maps the area has been cultivated from the 1940's onwards (Figure 36 to 39). Apart from farming infrastructure like windpumps no other features are indicated on the historical topographic maps.

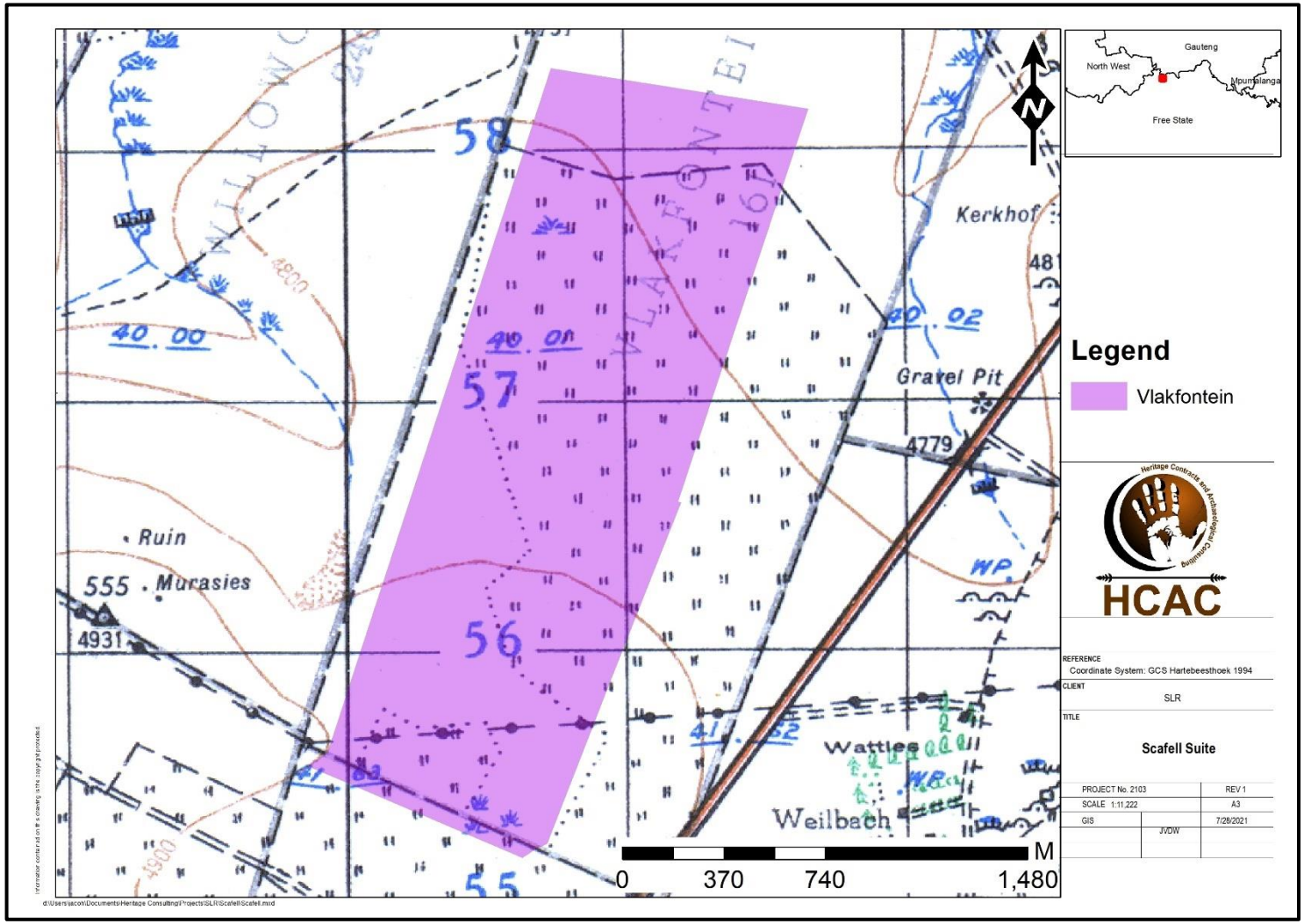


Figure 36. 1945 Topographic map of the Vlakfontein PV impact area. Large parts of the area are cultivated.

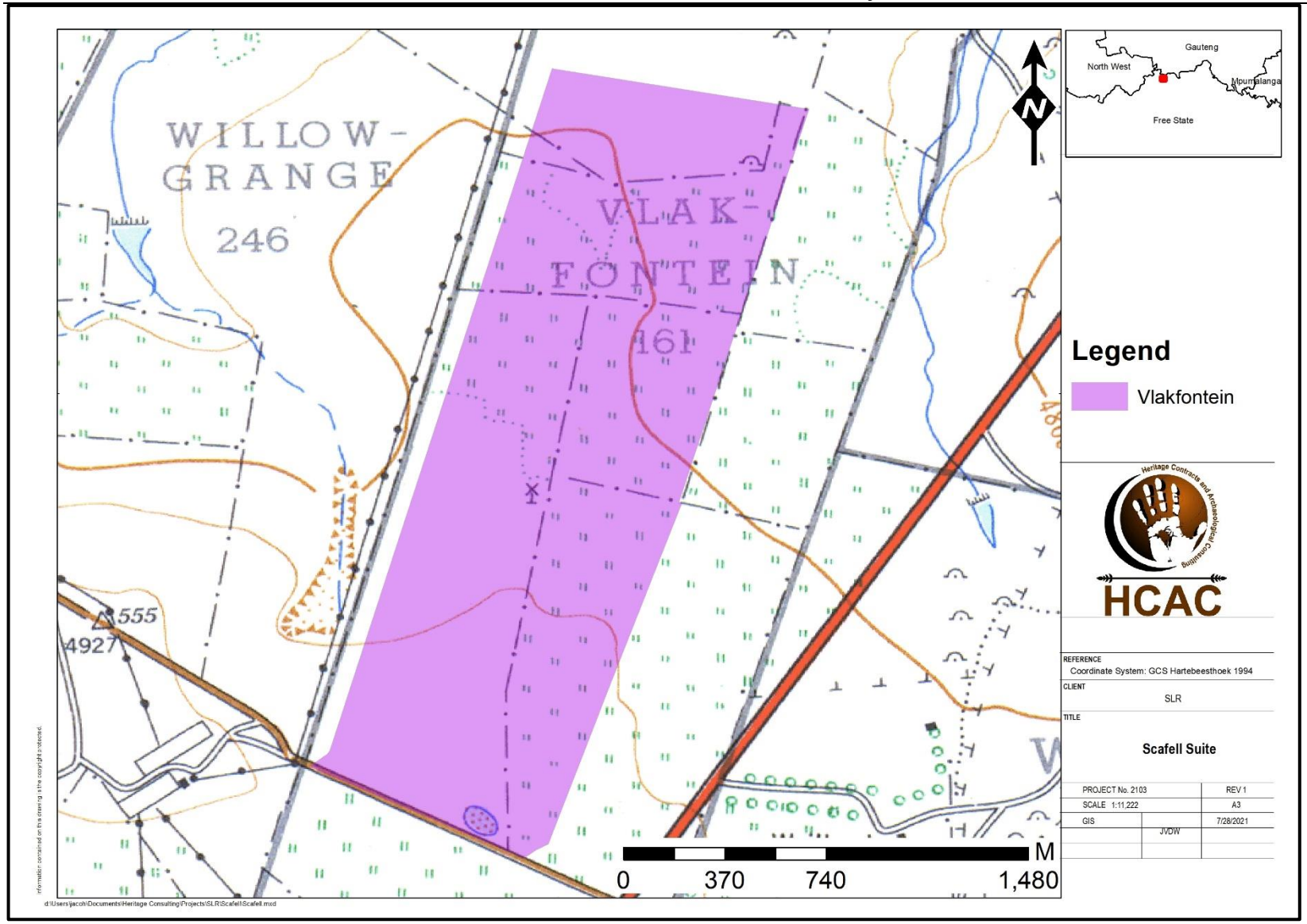


Figure 37. 1966 Topographic map of the Vlakfontein PV area. Roads are indicated as well as a hut in the northern section.

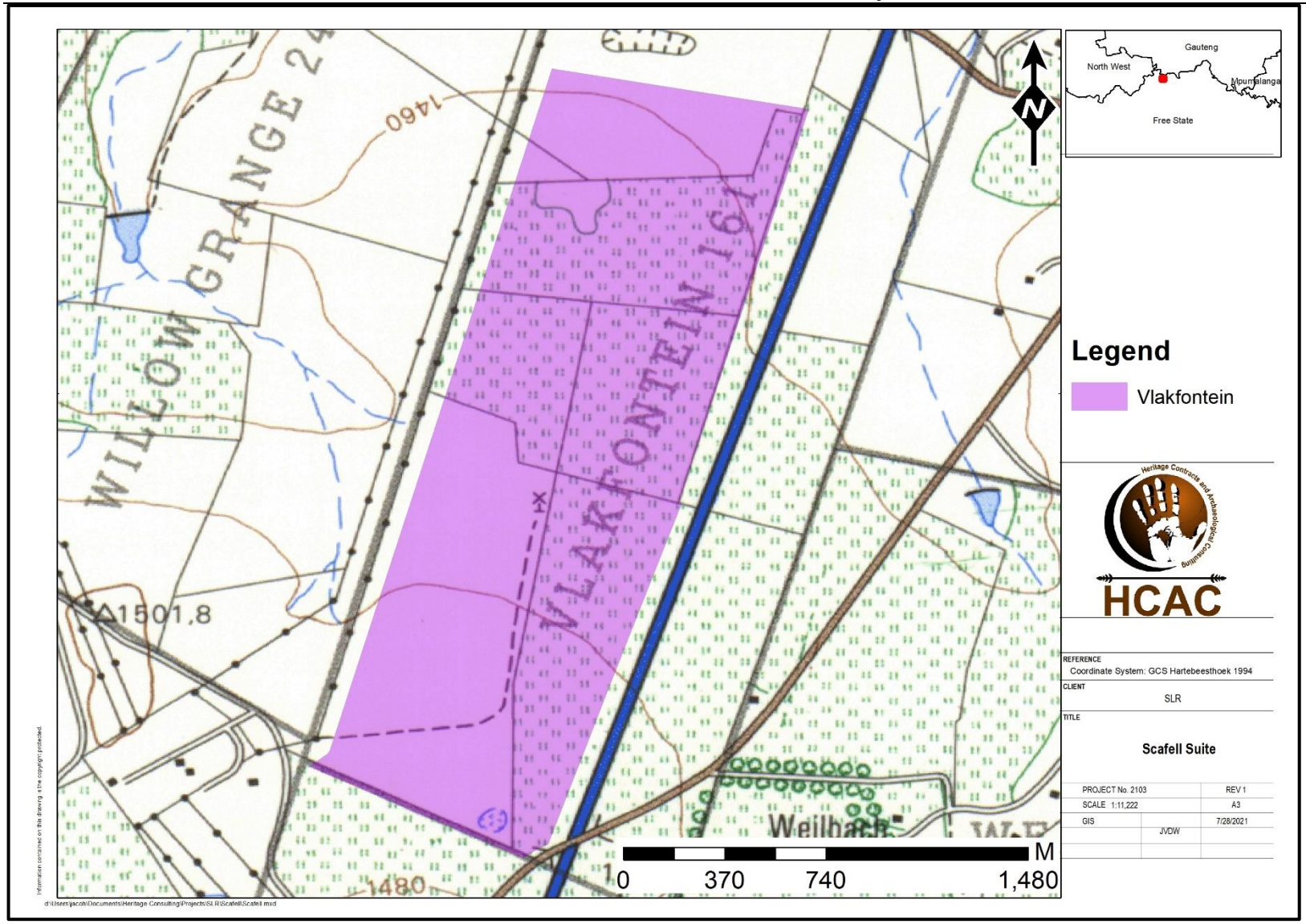


Figure 38. 1977 Topographic map of the study area. Large portions of the study area are cultivated.

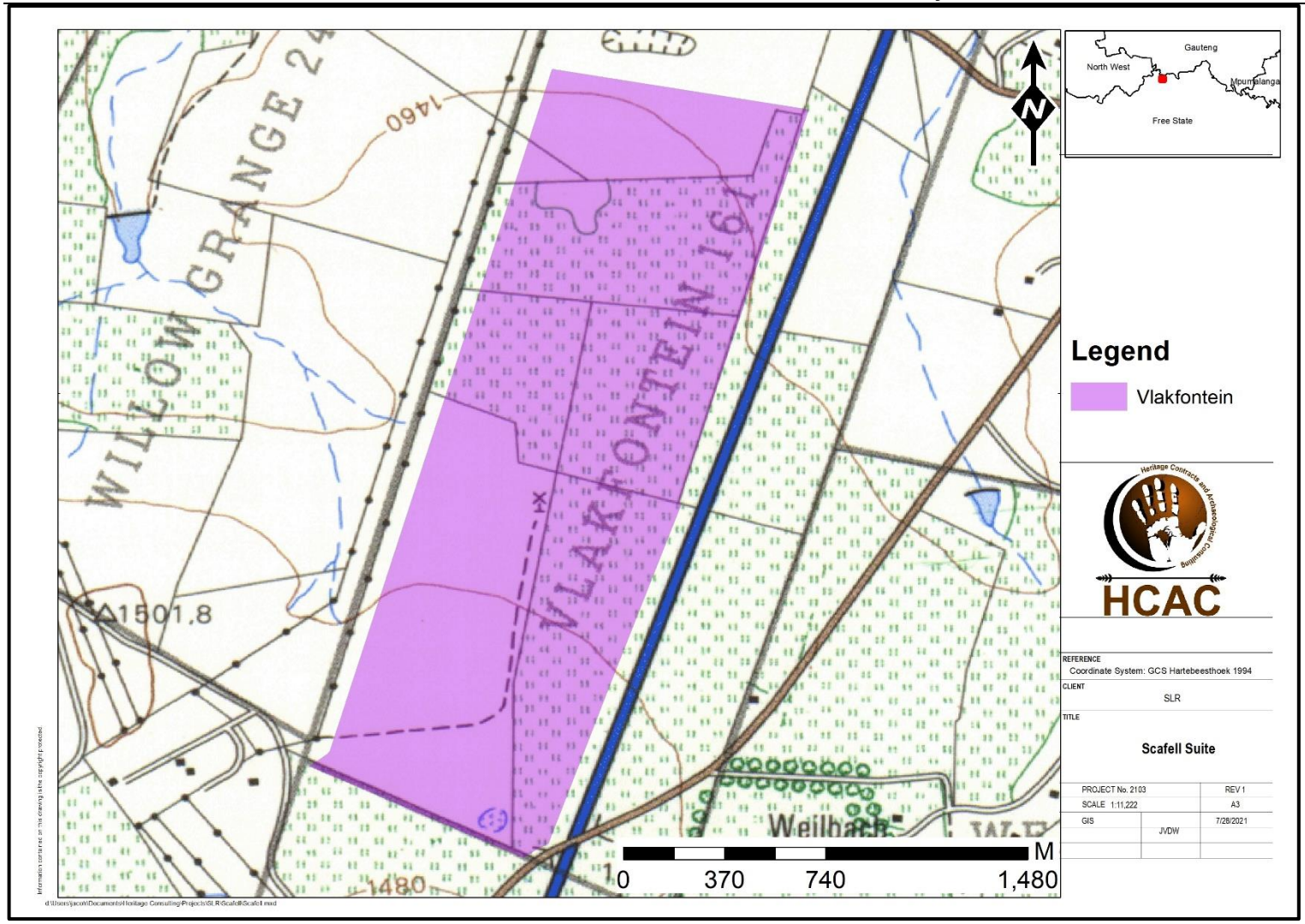


Figure 39. 1991 Topographic map of the study area. Large portions of the area are cultivated.

8.3.2. Recorded Features – Vlakfontein Solar PV Facility and associated grid connection

Within the sections where the planted grass has not been baled, archaeological visibility was extremely low due to the high grass cover, also limiting access in these areas. The survey methodology had to be adjusted to compensate for these areas. Areas within Vlakfontein that have not been used for planting grass is characterised by dense grass cover. No archaeological material was identified within these areas although an area where labourers resided was recorded within the footprint of the solar PV facility. No features were recorded within the footprint of the grid connection corridors; however a packed stone feature was identified within the grid connection corridors at the footprint of the switching station within Portion 3 of the Farm Willow Grange 246. Recorded features are spatially illustrated in Figure 40 and site conditions are indicated in Figure 41 with the coordinates in Table 9.

Table 9. Recorded features Vlakfontein

Site number	Longitude	Latitude	Description	Field Rating/ Significance
VF1	27° 38' 55.2229" E	26° 48' 37.0800" S	According to the landowner, a labourer used to live close to this location in the 80s and was then moved to a different location	GP C Low

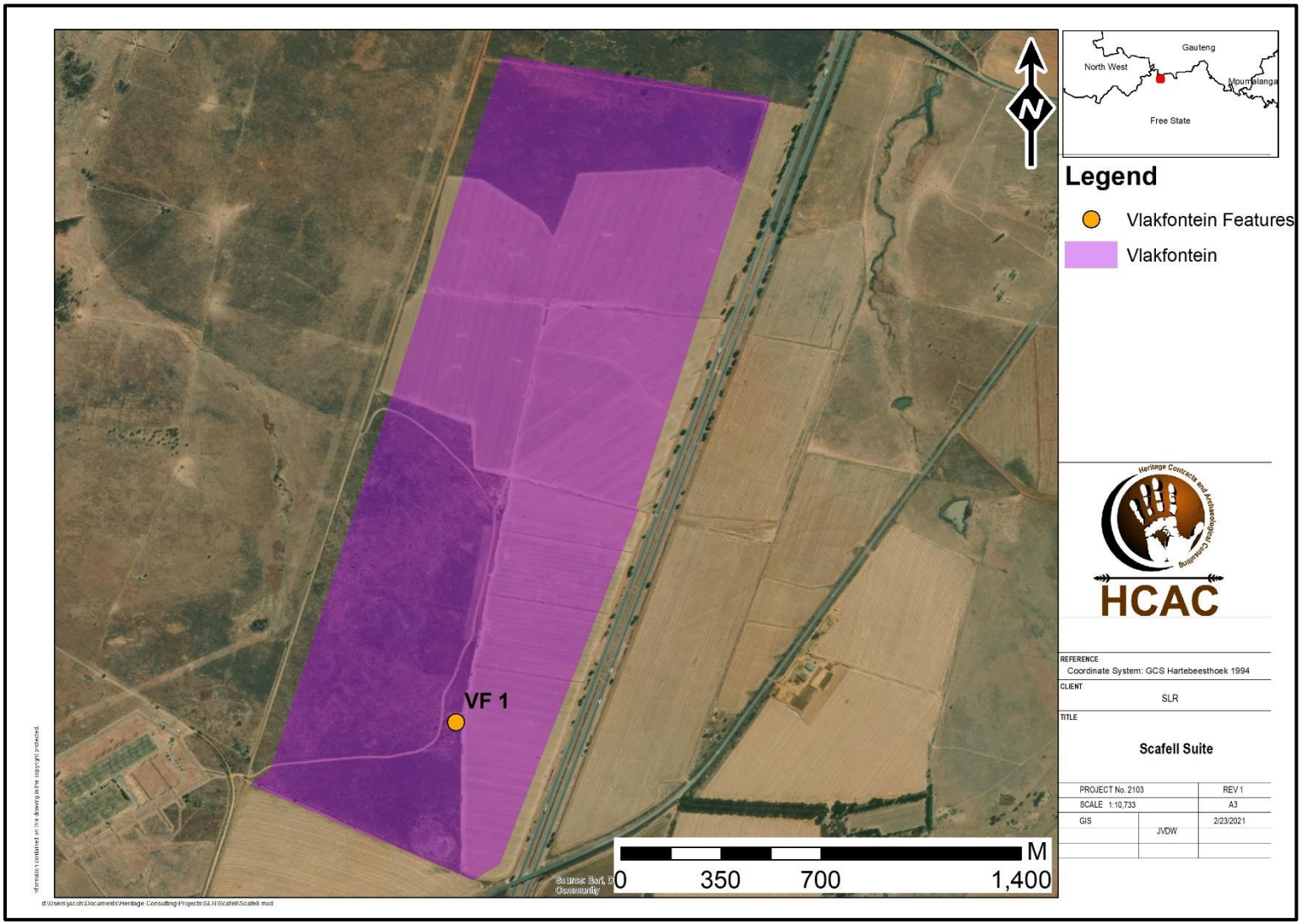


Figure 40. Site distribution Vlakfontein.

Figure 41. General site conditions at VF1.

8.4. Ilikwa Solar PV Facility and associated grid connection

8.4.1. Cultural Landscape – Ilikwa

The Ilikwa facility and the associated grid connection is located around the existing Scafell MTS, dominated by a dense ground cover of grass and small shrubs with some areas showing signs of previous disturbance. These disturbed areas are covered in tall weeds.

The area is mainly used as grazing for cattle. Some sections of the study area were waterlogged due to heavy rainfall experienced just before the survey. A small dam is situated on the northeastern section of the area close to a row of large trees. These trees seem to have been part of a wind break next to an agricultural field. Several ruins and the remains of mining activities are indicated from as early as the 1940's especially in the south-eastern portion of the study area as well as the north-western section. Cultivation and use of the mining area are indicated up to the 1990's onwards (Figure 42 to 45).

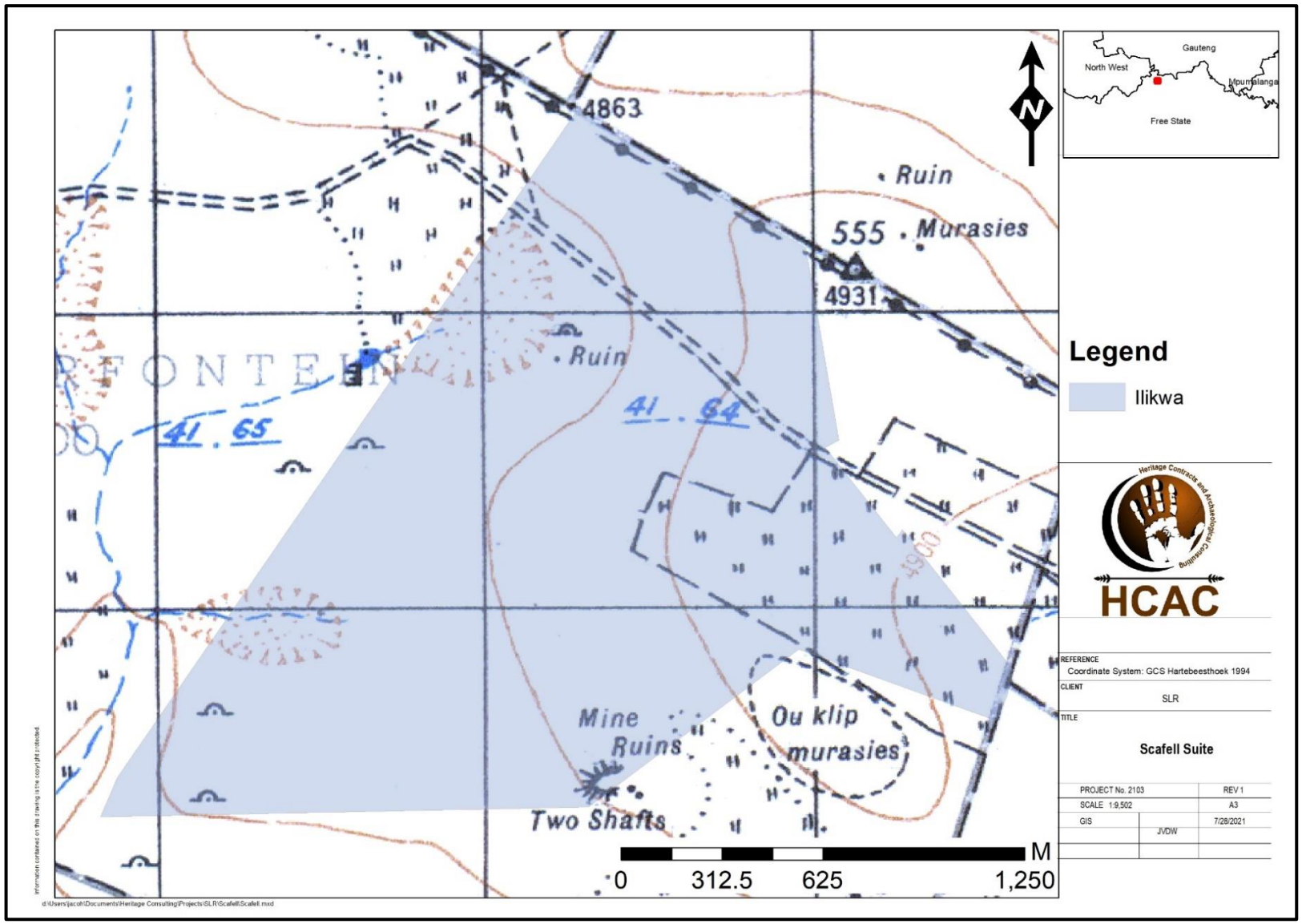


Figure 42. 1945 Topographic map of the study area, indicating ruins as well as mining infrastructure.

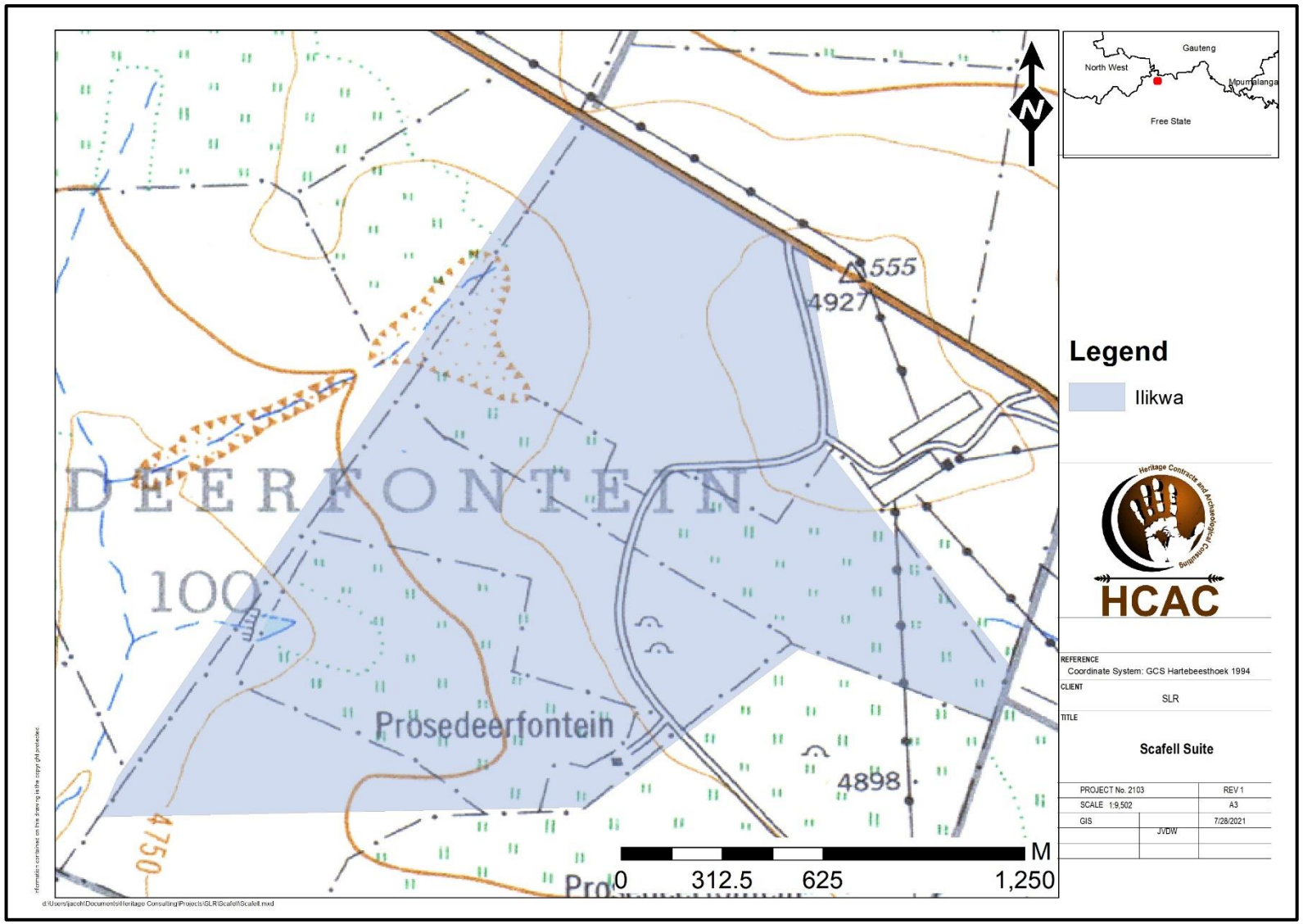


Figure 43. 1977 Topographic map of the Ilikwa area. One structure is indicated in the south-eastern portion and excavations in the northern portion.

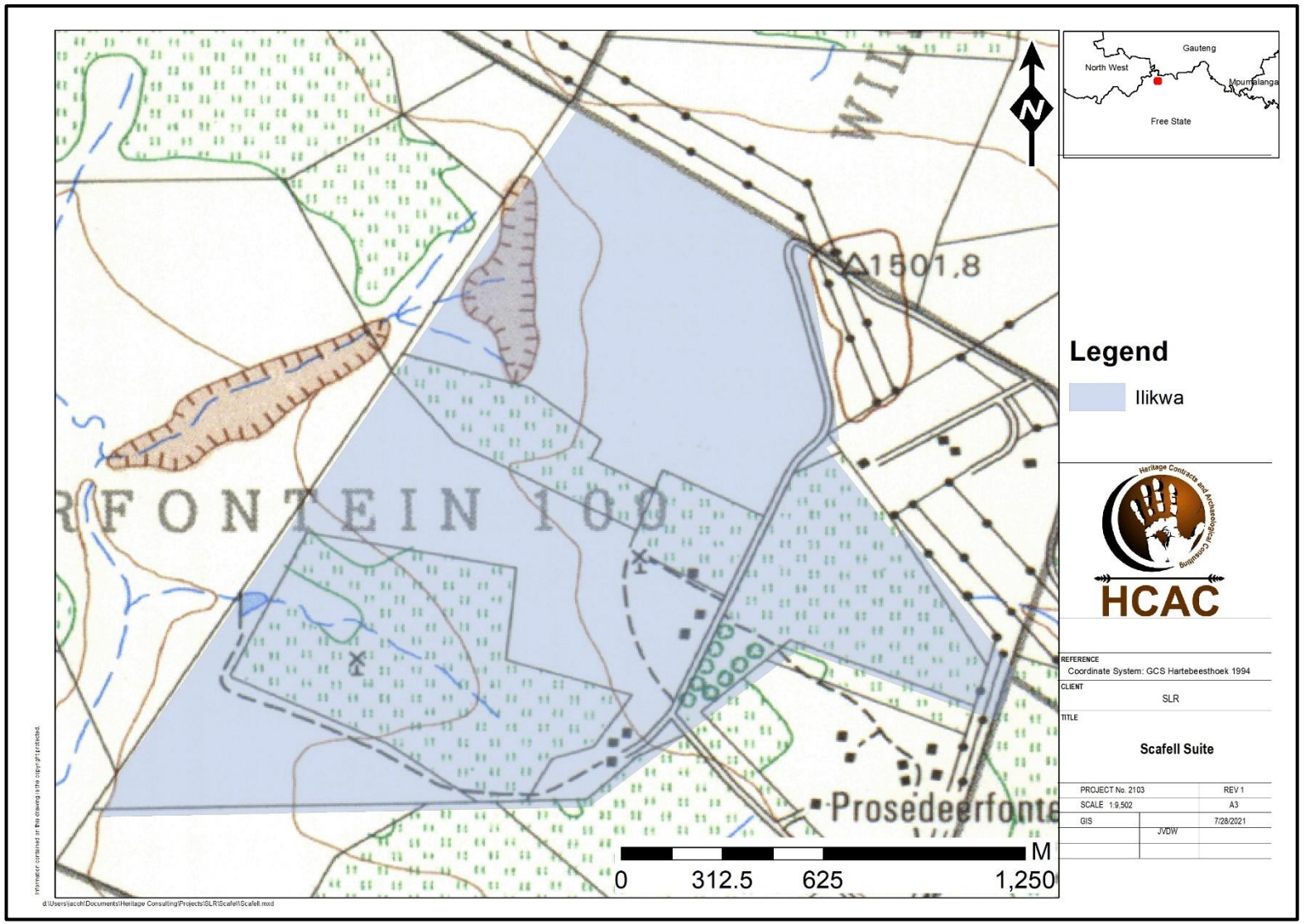


Figure 44. 1991 Topographic map of the study area. Various structures and cultivated areas are indicated.

8.4.2. Recorded Features – Ilikwa Solar PV Facility and associated grid connection

Several heritage features were recorded in the study area corresponding to the locations indicated in the topographical maps of the area. No heritage features were recorded within the grid connection corridors. These features consist of stone walled features, historic structures, and a cemetery. Recorded features are spatially illustrated in Figure 45 with the coordinates in Table 8. Thirteen features were recorded with two sites of higher significance, and these are briefly discussed below. General site conditions at the recorded features are indicated in Figure 46 to 52.

Along the southern boundary of Ilikwa a large area, characterized by clusters of stone walled sites were recorded as I 12. These stone packed walls contain square as well as circular walled features. The area containing these walled sites cover an area of about 2000 m x 500 m. The stone walled features along the southern most edge of the study area is the best defined with some of the enclosures towards the interior being disturbed. A large maize lower grindstone was identified among the multiple stone walled sites and recorded as I 7.

I 6 marks a small graveyard situated toward the southwestern edge of the study area within the footprint of the solar PV facility. The graveyard extends through the fence onto the next property, the Remaining Extent of the Farm Proceederfontein 100. The graves are extremely overgrown with some graves being almost entirely covered with grass. There are between 15-20 graves present however the exact number could not be counted. Most of these graves were only marked by packed stones with few headstones. These graves were found close to the small gravel road leading to a dilapidated farmstead.

Table 10. Recorded features Ilikwa

Site number	Longitude	Latitude	Description	Field Rating/ Significance
I1	27° 37' 19.5563" E	26° 48' 41.0471" S	Possible packed stone foundation next to fence line	GP C Low
I2	27° 37' 17.5225" E	26° 48' 44.1756" S	Stone packed feature of unknown purpose	GP C Low
I3	27° 37' 01.5060" E	26° 49' 12.8640" S	Stone Cairn. Possible packed stone feature under small tree	GP C Low
I4	27° 37' 44.6159" E	26° 49' 16.0140" S	Farming infrastructure and remnants of a dwelling. Multiple broken-down structures/ metal structures	GP C Low
I5	27° 37' 41.9017" E	26° 49' 18.2892" S	Cement and brick platform possibly associated with historical mining activities.	GP C Low
I6	27° 37' 59.0700" E	26° 49' 06.7657" S	Cemetery Small Graveyard. 15-20 Graves.	GP A High
I7	27° 37' 41.2861" E	26° 49' 19.0055" S	Stone packed feature of unknown purpose	GP C Low
I8	27° 37' 40.1844" E	26° 49' 17.4503" S	Ephemeral linear stone walling	GP C Low
I9	27° 37' 40.8721" E	26° 49' 16.7089" S	Cement, concrete and stone foundations. Platforms for machinery	GP C Low
I10	27° 37' 44.2559" E	26° 49' 01.6321" S	Circular packed stone enclosure.	GP C Low
I11	27° 37' 46.3153" E	26° 48' 59.1589" S	Rectangular packed stone feature under a tree.	GP C Low
I12	27° 37' 11.9281" E	26° 49' 10.2289" S	Small section of ephemeral walling.	GP C Low
	27° 37' 09.8113" E	26° 49' 18.1489" S	Large cluster/concentration of stone walled enclosures.	GP C Low
	27° 37' 14.5415" E	26° 49' 16.9681" S	Large cluster/concentration of stone walled enclosures.	GP C Low
	27° 37' 21.6697" E	26° 49' 19.0991" S	Large cluster/concentration of stone walled enclosures.	GP C Low
	27° 37' 22.4724" E	26° 49' 19.2035" S	Large cluster/concentration of stone walled enclosures.	GP C Low
	27° 37' 22.8900" E	26° 49' 17.4431" S	Large cluster/concentration of stone walled enclosures.	GP C Low
I13	27° 37' 26.2092" E	26° 49' 18.3577" S	Large cluster/concentration of stone walled enclosures.	GP C Low

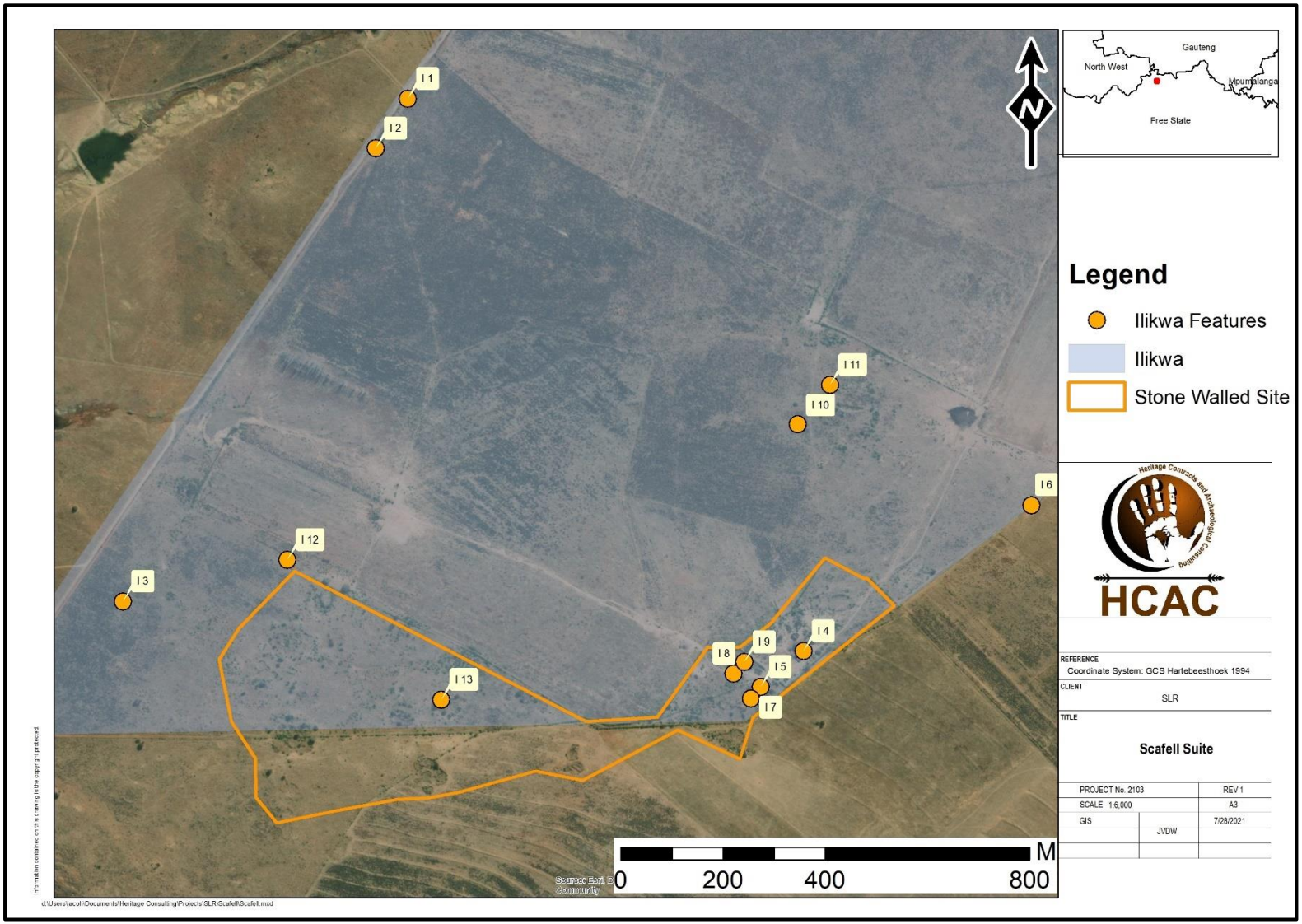


Figure 45. Site distribution map Ilikwa.

Figure 46. Stone packed feature.

Figure 47. General site conditions at I4.

Figure 48. Extensive stone walling occurs at I12

Figure 49. Extensive stone walling occurs at I12

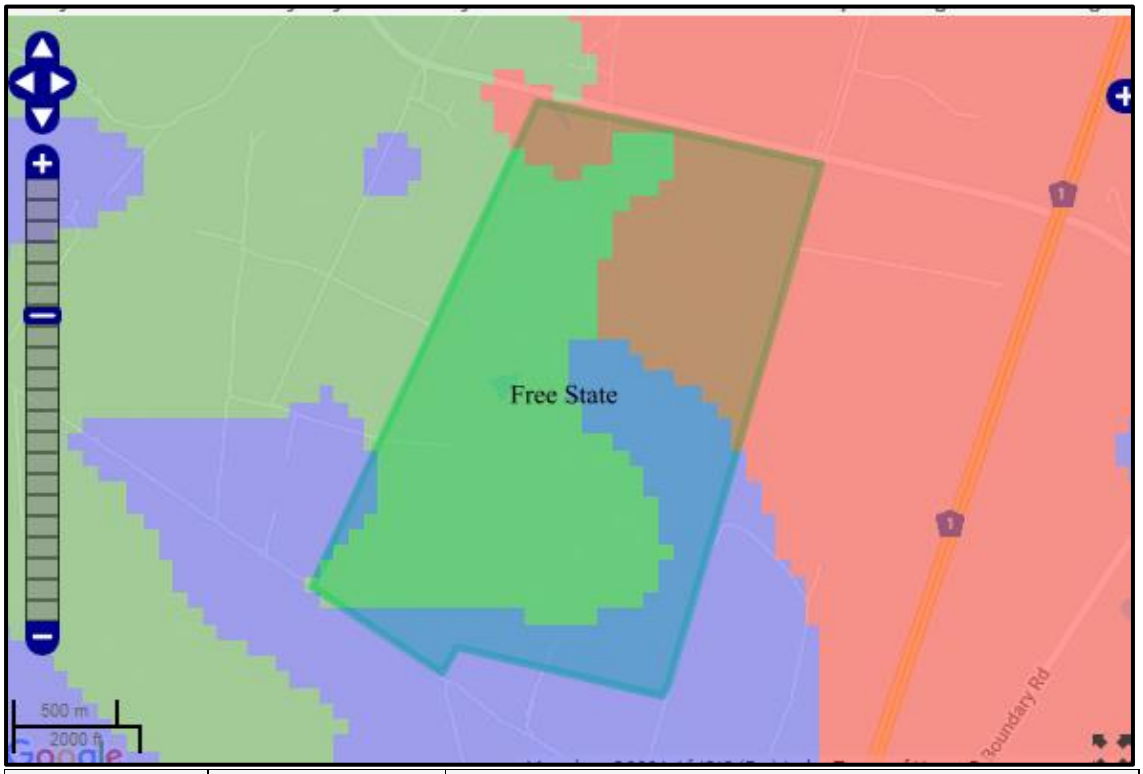
Figure 50. Graves at I6

Figure 51. Graves at I6

Figure 52. Graves at I6.

8.5. Paleontological Heritage

Based on the SAHRA Paleontological map the area (Figure 8.35) is of low to moderate to very high paleontological sensitivity and a separate study was conducted for this aspect (Bamford 2021). This study found that the proposed site lies on four different groups of rocks. The non-fossiliferous rocks are from the Archaean Ventersdorp and Witwatersrand Supergroup, and the Quaternary alluvium and sands. Ancient dolomites and limestones of the Malmani Subgroup (Chuniespoort Group, Transvaal Supergroup) may have stromatolites. These are trace fossils of ancient algal colonies and only extremely rarely are the algae preserved. Since they are common trace fossils there will be no significant impact on the palaeontological heritage of South Africa. Shales, mudstones and sandstones of the Dwyka Group and the Vryheid Formation (Ecca Group, Karoo Supergroup may preserve fossil plants of the *Glossopteris* flora). Bamford (2021) concluded that most of the area has no potential fossils (no action required); a section has moderate sensitivity, so a Fossil Chance Find Protocol (FCFP) has been added to this report, but a section is very highly sensitive. A site visit is required to survey for and collect, if necessary, if fossil plants are seen **once excavations have commenced**, from the northernmost portions of farms Scafell/Willow Grange and Vlakfontein.



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 53. Paleontological sensitivity for the approximate study area as indicated by SAHRA.

9. Potential Impact

Based on the current assessment area the project will impact on burial sites as well as an extensive stone walled site and numerous stone packed features of unknown purpose. These features will be directly impacted by the project (Table 11 to 18) and are of medium to high significance with burial sites being of high social significance, resulting in a high impact. Impacts are highest during the pre-construction and construction phase with very limited impacts to heritage resources expected to occur in the operation. With the implementation of the correct mitigation and management measures (including avoidance of the recorded features) the impact of the project can be reduced to an acceptable level. No impacts are expected to heritage resources during the operation or decommissioning phases of the project.

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 features in the study area. 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. Potential impacts include destruction or partial destruction of non-renewable heritage resources.

9.1.3. Impact Assessment for the Project

9.1.3.1. Damlaagte Solar PV Facility

No significant resources were noted in the Damlaagte project area and no adverse impact to heritage resources is expected. Impact to heritage resources is very low prior to mitigation and insignificant post mitigation (Table 11). Any effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure.

Table 11. Impact assessment of the proposed Damlaagte PV Project.

Category	Pre – mitigation	Post mitigation
Intensity	Low	Zero – very low
Duration	Long Term	Short term
Extent	Local	Local
Probability	Possible	Improbable
Degree of mitigation	Low to Medium	Low to Medium
Degree of Confidence	High	High
Loss of Resources	Medium	Low
Reversibility	Permanent	Permanent
Consequence	Low	Very low
Significance	Very low	Insignificant

9.1.3.2. Assessment of Alternatives

It is understood that Mainstream will consider the use of various technology alternatives for the PV panel modules, mounting structures and the BESS. From a heritage perspective, the technically preferred alternatives for the PV panel modules, mounting structures and the BESS are acceptable for the proposed Damlaagte Solar PV Facility. The selection of the technically preferred alternatives will not pose additional and significant impacts on heritage resources as a result of the proposed project.

9.1.3.3. Damlaagte Solar PV Facility Grid Connection

No significant resources were noted within the grid connection corridor alternatives identified and assessed for the proposed Damlaagte Solar PV Facility and no adverse impact to heritage resources is expected as a result of the proposed project. Impact to heritage resources is of low significance (due to the possible occurrence of subsurface heritage resources) prior to mitigation and would be insignificant with the implementation of mitigation. Any effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure.

Table 12: Impact assessment of the proposed Damlaagte Solar PV Facility Grid Connection

Category	Alternative 1		Alternative 2	
	Pre – mitigation	Post mitigation	Pre – mitigation	Post mitigation
Intensity	Low	Zero – very low	Low	Zero – very low
Duration	Long Term	Short term	Long Term	Short term
Extent	Local	Local	Local	Local
Probability	Possible	Improbable	Possible	Improbable
Degree of mitigation	Low to Medium	Low to Medium	Low to Medium	Low to Medium
Degree of Confidence	High	High	High	High
Loss of Resources	Medium	Low	Medium	Low
Reversibility	Permanent	Permanent	Permanent	Permanent
Consequence	Low	Very low	Low	Very low
Significance	Very low	Insignificant	Very low	Insignificant

9.1.3.4. Assessment of Grid Connection Corridor Alternatives

There were no identified significant heritage resources located within the grid connection corridor alternatives assessed for the proposed Damlaagte Solar PV Facility Grid Connection. Thus, both grid connection corridor alternatives are considered to be acceptable from a heritage perspective as the anticipated impacts as a result of the implementation of the proposed project are of a very low significance. Therefore, taking the above into consideration, the technically preferred corridor is selected as the preferred grid connection corridor from a heritage perspective for the Damlaagte Solar PV Facility Grid Connection.

9.1.3.5. Scafell Solar PV Facility

In the area earmarked for the Scafell PV Facility a cemetery as well as a stone packed feature of unknown purpose and farming infrastructure was recorded. Burial sites are always of high social significance. Impact to heritage resources is high prior to mitigation and very low post mitigation which includes avoidance of the sites (Table 13).

Table 13. Impact assessment of the proposed Scafell PV project.

Category	Pre – mitigation	Post mitigation
Intensity	High	High
Duration	Long Term	Short term
Extent	Local	Local
Probability	Probable	Improbable
Degree of mitigation	Medium	Medium
Degree of Confidence	High	High
Loss of Resources	High	Low
Reversibility	Permanent	Permanent
Consequence	High	Low
Significance	High	Very Low

9.1.3.6. Assessment of Alternatives

It is understood that Mainstream will consider the use of various technology alternatives for the PV panel modules, mounting structures and the BESS. From a heritage perspective, the technically preferred alternatives for the PV panel modules, mounting structures and the BESS are acceptable for the proposed Scafell Solar PV Facility from a heritage perspective. The selection of the technically preferred technology alternatives will not pose additional and significant impacts on heritage resources as a result of the proposed project.

9.1.3.7. Scafell Solar PV Facility Grid Connection

Although a cemetery as well as a packed stone feature where identified within the footprint of the Scafell PV Facility, no heritage resources of high conservation significance were recorded within the grid connection corridor alternatives assessed for the Scafell Solar PV Facility Grid Connection. A packed stone feature is located adjacent to the proposed footprint of the Switching Station for the Scafell Solar PV Facility Grid Connection and is deemed to be of low heritage significance (refer to Table 14). Thus, impacts on heritage resources as a result of the grid connection will be of very low significance following the implementation of the recommended mitigation measures.

Table 14: Impact assessment of the Scafell Solar PV Facility Grid Connection

Category	**Alternative 1**		**Alternative 2**	
	Pre – mitigation	**Post mitigation**	**Pre – mitigation**	**Post mitigation**
Intensity	Low	Zero – very low	Low	Zero – very low
Duration	Long Term	Short term	Long Term	Short term
Extent	Local	Local	Local	Local
Probability	Possible	Improbable	Possible	Improbable
Degree of mitigation	Low to Medium	Low to Medium	Low to Medium	Low to Medium
Degree of Confidence	High	High	High	High
Loss of Resources	Medium	Low	Medium	Low
Reversibility	Permanent	Permanent	Permanent	Permanent
Consequence	Low	Very low	Low	Very low
Significance	Very low	Insignificant	Very low	Insignificant

9.1.3.8. Assessment of Grid Connection Corridor Alternatives

There were no identified significant heritage resources located within the grid connection corridor alternatives assessed for the proposed Scafell Solar PV Facility Grid Connection. Thus, both grid connection corridor alternatives are considered to be acceptable from a heritage perspective as the anticipated impacts as a result of the implementation of the proposed project are of very low significance. Therefore, taking the above into consideration, the technically preferred corridor is selected as the preferred grid connection corridor from a heritage perspective for the Scafell Solar PV Facility Grid Connection.

9.1.3.9. Vlakfontein PV Facility

No significant resources were noted in the Vlakfontein project area and any adverse effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure. Impact to heritage resources is of very low significance prior to mitigation and insignificant post mitigation (Table 15).

Table 15. Impact assessment of the proposed Vlakfontein PV Project.

Category	Pre – mitigation	Post mitigation
Intensity	Low	Zero – very low
Duration	Long Term	Short term
Extent	Local	Local
Probability	Possible	Improbable
Degree of mitigation	Low to Medium	Low to Medium
Degree of Confidence	High	High
Loss of Resources	Medium	Low
Reversibility	Permanent	Permanent
Consequence	Low	Very low
Significance	Very low	Insignificant

9.1.3.10. Assessment of Alternatives

It is understood that Mainstream will consider the use of various technology alternatives for the PV panel modules, mounting structures and the BESS. From a heritage perspective, the technically preferred alternatives for the PV panel modules, mounting structures and the BESS are acceptable for the proposed Vlakfontein Solar PV Facility from a heritage perspective. The selection of the technically preferred technology alternatives will not pose additional and significant impacts on heritage resources as a result of the proposed project.

9.1.3.11. Vlakfontein Solar PV Facility Grid Connection

No significant heritage resources were identified within the grid connection alternatives assessed for the Vlakfontein Solar PV Facility Grid Connection. Thus, impacts on heritage resources will be insignificant following the implementation of the recommended mitigation measures.

Table 16: Impact assessment for the proposed Vlakfontein Grid Connection

Category	Alternative 1		Alternative 2	
	Pre – mitigation	Post mitigation	Pre – mitigation	Post mitigation
Intensity	Low	Zero – very low	Low	Zero – very low
Duration	Long Term	Short term	Long Term	Short term
Extent	Local	Local	Local	Local
Probability	Possible	Improbable	Possible	Improbable
Degree of mitigation	Low to Medium	Low to Medium	Low to Medium	Low to Medium
Degree of Confidence	High	High	High	High
Loss of Resources	Medium	Low	Medium	Low
Reversibility	Permanent	Permanent	Permanent	Permanent
Consequence	Low	Very low	Low	Very low
Significance	Very low	Insignificant	Very low	Insignificant

9.1.3.12. Assessment of Grid Connection Corridor Alternatives

There were no identified significant heritage resources located within the grid connection corridor alternatives assessed for the proposed Vlakfontein Solar PV Facility Grid Connection. Thus, both grid connection corridor alternatives are considered to be acceptable from a heritage perspective as the anticipated impacts will be insignificant following the implementation of the recommended mitigation measures. Therefore, taking the above into consideration, the technically preferred corridor is selected as the preferred grid connection corridor from a heritage perspective for the Vlakfontein Solar PV Facility Grid Connection.

6.2.1.1. Ilikwa Solar PV Facility

In the area earmarked for the Ilikwa PV Facility a cemetery as well as an extensive area characterised by stone packed features of unknown purpose were recorded. Burial sites are always of high social significance. Impact to heritage resources is high prior to mitigation and very low post mitigation. Mitigation in this case is avoidance of the site ensuring that the features are preserved *in situ* with an appropriate buffer zone (Table 17).

Table 17. Impact assessment of the proposed Ilikwa PV project.

Category	Pre – mitigation	Post mitigation
Intensity	High	High
Duration	Long Term	Short term
Extent	Local	Local
Probability	Probable	Improbable
Degree of mitigation	Medium	Medium
Degree of Confidence	High	High
Loss of Resources	High	Low
Reversibility	Permanent	Permanent
Consequence	High	Low
Significance	High	Very Low

9.1.3.13. Assessment of Alternatives

It is understood that Mainstream will consider the use of various technology alternatives for the PV panel modules, mounting structures and the BESS. From a heritage perspective, the technically preferred technology alternatives for the PV panel modules, mounting structures and the BESS are acceptable for the proposed Ilikwa Solar PV Facility from a heritage perspective. The selection of the technically preferred technology alternatives will not pose additional and significant impacts on heritage resources as a result of the proposed project.

9.1.3.14. Ilikwa Solar PV Facility Grid Connection

Although the area earmarked for the placement of the Ilikwa Solar PV Facility is characterised by numerous heritage resources, these are located outside of the footprint of the assessed grid connection corridor alternatives, as well as outside of the footprint of the proposed Switching Station.

Table 18: Impact assessment of the proposed Ilikwa Solar PV Facility Grid Connection

Category	Alternative 1		Alternative 2	
	Pre – mitigation	Post mitigation	Pre – mitigation	Post mitigation
Intensity	Low	Zero – very low	Low	Zero – very low
Duration	Long Term	Short term	Long Term	Short term
Extent	Local	Local	Local	Local
Probability	Possible	Improbable	Possible	Improbable
Degree of mitigation	Low to Medium	Low to Medium	Low to Medium	Low to Medium
Degree of Confidence	High	High	High	High
Loss of Resources	Medium	Low	Medium	Low
Reversibility	Permanent	Permanent	Permanent	Permanent
Consequence	Low	Very low	Low	Very low
Significance	Very low	Insignificant	Very low	Insignificant

9.1.3.15. Assessment of Grid Connection Corridor Alternatives

There were no identified significant heritage resources located within the grid connection corridor alternatives assessed for the proposed Vlakfontein Solar PV Facility Grid Connection. Thus, both grid connection corridor alternatives are considered to be acceptable from a heritage perspective as the anticipated impacts will be very low following the implementation of the recommended mitigation measures. Therefore, taking the above into consideration, the technically preferred corridor is selected as the preferred grid connection corridor from a heritage perspective for the Ilikwa Solar PV Facility Grid Connection.

10. Conclusion and recommendations

The study area is flat without focal points like natural pans or rocky outcrops that would have attracted human occupation. The disturbed character of the study area (due to previous and ongoing agricultural activities) and high vegetation cover in the study area could have masked isolated finds, despite this limitation two cemeteries were recorded as well as historical stone packed settlements associated with mining activities.

The potential impact of the proposed project on heritage resources prior to mitigation is deemed to be of high significance due to the presentence of above-mentioned heritage resources within the proposed project footprints. However, these impacts can be mitigated to an acceptable level by adherence to the recommendations in this report 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:

- Implementation of a chance find procedure for the project.
- A Heritage Walkdown should be conducted of the final pylon positions for the grid connection prior to construction.
- A site visit is required to survey for and collect, if necessary, if fossil plants **are seen once excavations have commenced**, from the northernmost portions of farms Scafell/Willow Grange and Vlakfontein.
- The presence of unmarked graves in the study area should be confirmed during social consultation.
- The following recommendations based on the findings of the HIA apply to each study area:
    - **Damlaagte solar PV facility and grid connection**
      No significant resources were noted in the Damlaagte project area, and within the grid connection corridor alternatives. Thus, any adverse effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure.

    - **Scafell solar PV facility and grid connection**
      In the area earmarked for the Scafell PV Facility a cemetery as well as a stone packed feature of unknown purpose and farming infrastructure was recorded. Burial sites are always of high social significance. However, no heritage resources of a high conservation significance were recorded within the grid connection corridor alternatives. The recorded cemetery (S1) can be mitigated preferably by avoidance (the sites should be demarcated and avoided with an access gate for family members and a 30 m buffer) and as a last resort by relocation of the graves adhering to all legal requirements. The stone packed feature (S2) is located in an area marked by a ruin on the 1945 topographical map and is considered to be older than 60 years. The site should be cleared and mapped after which a destruction permit can be applied for.

    - **Vlakfontein solar PV facility and grid connection**
      No significant resources were noted in the Vlakfontein project area, or within the grid connection corridor alternatives and any adverse effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure. The area where labourers resided (VF 1) should be monitored during construction as sites such as these are known to contain the graves of stillborn babies. It is also recommended that the presence of graves should be confirmed during the social consultation process.

- **Ilikwa solar PV facility and grid connection**
  In the area earmarked for the Ilikwa PV Facility a cemetery as well as an extensive area characterised by stone packed features of unknown purpose were recorded. These heritage resources are located outside of the grid connection alternatives.

  Burial sites are always of high social significance. The recorded cemetery (I6) can be mitigated preferably by avoidance (the sites should be demarcated and avoided with an access gate for family members and a 30 m buffer) and as a last resort by relocation of the graves adhering to all legal requirements. I 12 the area with various stone packed features is indicated on the 1945 topographic map of the area and is older than 60 years. The site should be subjected to phase 2 mitigation including clearing and mapping after which a destruction permit can be applied for.

10.2. Chance Find Procedures

10.2.1. Chance Find procedures for Heritage Features

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 EMPr. 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 Environmental Control Officer (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. Chance finds procedure for paleontology–

The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence:

1. When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
2. Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones. This information will be built into the EMPr's training and awareness plan and procedures.
3. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.

4. 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.
5. 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.
6. 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.
7. 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 high but can be mitigated to an acceptable level through implementation of the recommendations made in this report. Therefore, the proposed project is acceptable from a heritage perspective and should be authorised by the relevant authority subject to the implementation of the recommended mitigation measures. 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 and unrecorded cultural resources (of which graves are the highest risk). This can cause delays during construction, as well as additional costs involved in mitigation, as well as require additional layout changes.

10.5. Monitoring Requirements

Ideally, site monitoring should be conducted by an experienced archaeologist or heritage specialist. 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 the initial soil removal and subsequent earthworks during construction. 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 19. Monitoring requirements for the project

Heritage Monitoring					
Aspect	**Area**	**Responsible for monitoring and measuring**	**Frequency**	**Proactive or reactive measurement**	**Method**
Clearing activities and construction	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: 1. Cease all works immediately; 2. Report incident to the Sustainability Manager; 3. Contact an archaeologist/ palaeontologist to inspect the site; 4. Report incident to the competent authority; and 5. Employ reasonable mitigation measures in accordance with the requirements of the relevant authorities. • Only recommence operations once impacts have been mitigated.

Heritage Monitoring					
Aspect	**Area**	**Responsible for monitoring and measuring**	**Frequency**	**Proactive or reactive measurement**	**Method**
Clearing and Excavations	Entire Project Area	ECO	Pre construction and construction phase – Daily	Pro Active	• When excavations begin the rocks must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted. • Photographs of similar fossils must be provided to the developer to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures. • Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment. • If there is any possible fossil material found by the developer/environmental officer, then a qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible. • 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.

10.6. Management Measures for inclusion in the EMPr

The management measures in Table 20 should be included together with the recommendations in section 10.1.

Table 20. Heritage Management Plan for EMPr implementation

Area	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Target	Performance indicators (monitoring tool)
General project area	Implement chance find procedures in case possible heritage finds are uncovered	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
Grid Connection corridors	A Heritage Walkdown should be conducted of the final pylon positions for the grid connection prior to construction	Pre Construction	Pre Construction	Applicant EAP Project archaeologist	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	ECO Checklist/Report
Scafell/Willow Grange and Vlakfontein.	A site visit is required to survey for and collect if necessary, if fossil plants **are seen once excavations have commenced**, from the northernmost portions of farms Scafell/Willow Grange and Vlakfontein.	Construction	Construction	Applicant EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35 and 38 of NHRA	ECO Checklist/Report
Entire project area	The presence of unmarked graves in the study area should be confirmed during social consultation	Pre Construction	Pre Construction	Applicant EAP Social consultation team	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Checklist/Report

Area	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Target	Performance indicators (monitoring tool)
Scafell	The recorded cemetery (S1) can be mitigated preferably by avoidance (the sites should be demarcated and avoided with an access gate for family members and a 30 m buffer) and as a last resort by relocation of the graves adhering to all legal requirements. The stone packed feature (S2) is located in an area marked by a ruin on the 1945 topographical map and is considered to be older than 60 years. The stone packed feature is located within the proposed footprint of the Switching Station. Thus, the site should be cleared of vegetation and mapped after which a destruction permit can be applied for.	Pre Construction	Through out the project Pre construction	Applicant EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	ECO Checklist/Report
Vlakfontein	The area where labourers resided (VF 1) which is located within the footprint of the solar PV facility should be monitored during construction as sites such as these are known to contain the graves of stillborn babies. It is also recommended that the presence of graves should be confirmed during the social	Pre Construction	Pre construction	Applicant EAP	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 35, 36 and 38 of NHRA	ECO Checklist/Report

Area	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Target	Performance indicators (monitoring tool)
	consultation process prior to construction. If graves are indeed present, the relevant permits should be sought from SAHRA for their relocation adhering to all legal requirements.					
Ilikwa	Burial sites are always of high social significance thus the recorded cemetery (I6) can be mitigated preferably by avoidance (the site should be demarcated and avoided with an access gate for family members and a 30 m buffer). As a last resort, the graves should be relocated to a suitable area whilst adhering to all relevant legal requirements. The area with various stone packed features (I12) is indicated on the 1945 topographic map of the area and is older than 60 years. The site should be subjected to phase 2 mitigation (subject to a mitigation permit) including clearing and mapping after which a destruction permit can be applied for	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

10.7. Knowledge Gaps

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. High grass cover limited visibility and access was restricted in some areas.

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