

# FINAL HERITAGE IMPACT ASSESSMENT

In terms of Section 38(8) of the NHRA for the

## **PROPOSED SOLAR PHOTOVOLTAIC FACILITIES, RHINO ON REMAINDER OF FARM RHENOSTERKOP 155 AND SUNNYSIDE ON FARM 400, BEAUFORT WEST**

**Prepared by CTS Heritage**



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Jenna Lavin

**For**

**SiVEST SA (Pty) Ltd**

**March 2024**



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## EXECUTIVE SUMMARY

### 1. Site Name

Solar Photovoltaic Facility, “Rhino PV” on Remainder of Farm Rhenosterkop 155 and “Sunnyside PV” on Farm 400  
Solar Energy Facilities

### 2. Location

Near Beaufort West, east of the N1 within the Western Cape Province.

### 3. Locality Plan

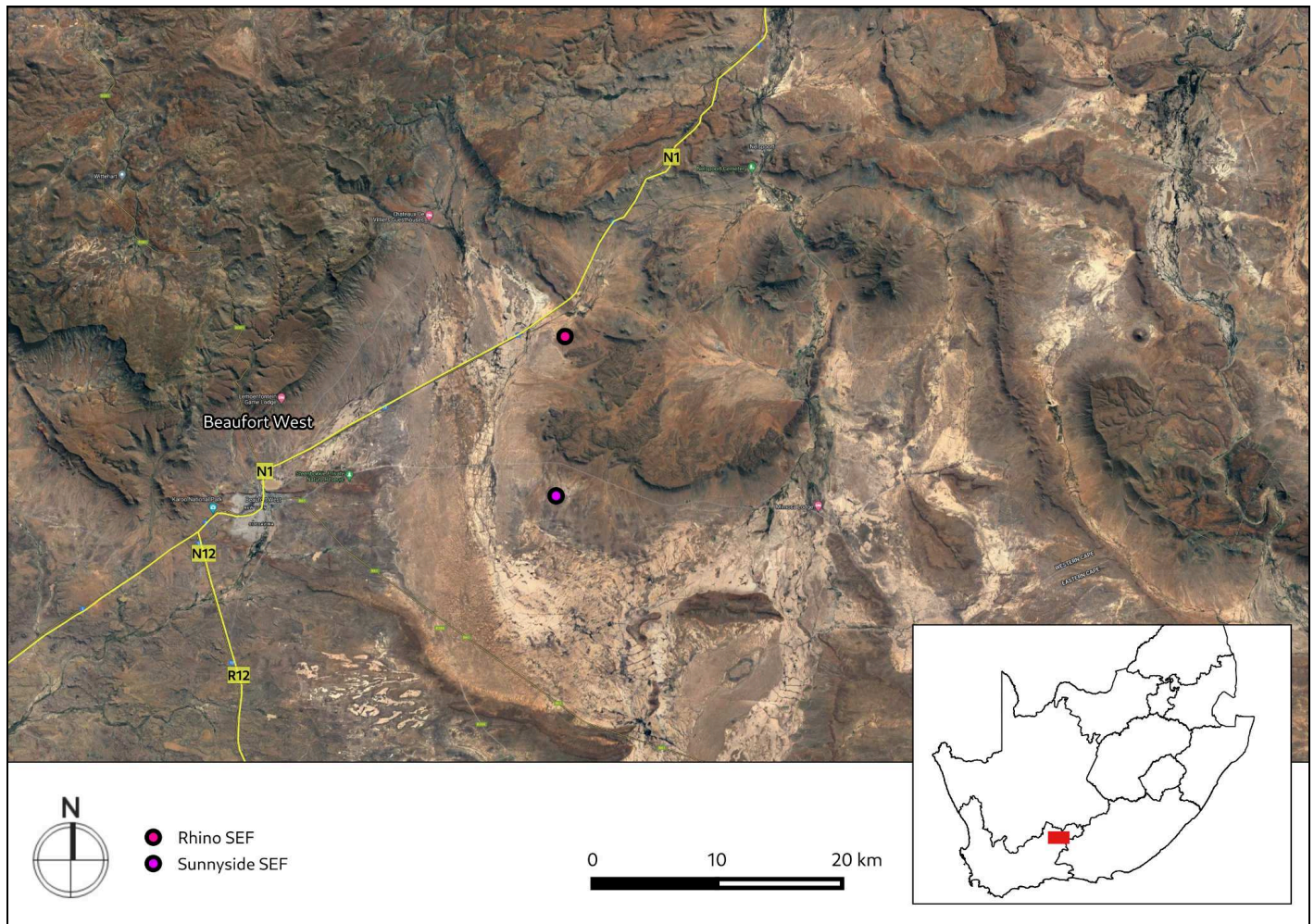


Figure A: Location of the proposed development area

### 4. Description of Proposed Development

K2022578692 South Africa (Pty) Ltd, has appointed SiVEST SA (Pty) Ltd (SiVEST) to undertake the required Basic Assessment (BA) process for the proposed development of the 500 megawatt alternating current (MWac) solar





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photovoltaic (PV) facility and associated infrastructure, to be located approximately 20 kilometres (km) to the east and north-east of Beaufort West in the Western Cape Province. The project is being developed either to supply the national grid under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or similar procurement programme.

## **5. Anticipated Potential Impacts on Heritage Resources**

The site forms part of a low significance cultural landscape representative of the Central Plateau of the Great Karoo possessing heritage value for historical, aesthetic, architectural, social and scientific reasons. The site possesses some landscape elements contributing to a composite cultural landscape, however, this particular area is already dominated by existing infrastructure. The addition of the proposed PV facility is therefore unlikely to negatively impact on any significant cultural landscape elements within this immediate context, or the broader context. The proposed development is located sufficiently far from the N1 scenic route, existing railway infrastructure and the Rhenosterkop farmstead that the anticipated impact to the heritage significance of these resources is considered to be negligible.

Although the broader area has archaeological significance in terms of the sensitive dolerite outcrops in the area and associated rock art sites, no archaeological resources of significance were identified within the area proposed for the Rhino Solar Energy Facility (SEF). No further mitigation is recommended. A number of ruins of farm structures were identified within the development footprint for the Sunnyside SEF. These ruins are associated with the historic farming practices in this area and as such, have been determined to have contextual cultural value. These resources are Graded IIIC. A no development buffer of 50 metres (m) is recommended around these sites.

Due to the age of these ruins, and their historic nature, excavations that take place in close proximity to these ruins are more likely to negatively impact associated buried archaeological heritage. As such, an area of higher archaeological sensitivity has been identified in figures 4.3b and 4.3c. It is recommended that this area be avoided by development activities.

No observations of palaeontological significance were noted within the area proposed for development. However, the geology underlying the development area remains sensitive for impacts to significant palaeontological heritage. There are limited impacts anticipated to archaeological and palaeontological heritage from this proposed development and as such, the principle of a renewable energy (RE) facility in this location is supported from a heritage perspective as the infrastructure is to be located in an area able to tolerate the impact of the proposed PV infrastructure.



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## 6. Recommendations

Based on the outcomes of this report, it is not anticipated that the proposed development will negatively impact on significant heritage resources on condition that:

- The buffers recommended in **Table 4**, and illustrated in Figures 4.3a, 4.3b and 4.3c are implemented.
- The Heritage Western Cape (HWC) Chance Fossil Finds Procedure is implemented for the duration of construction activities.
- The recommendations of the Visual Impact Assessment (VIA) are implemented.
- Although all possible care has been taken to identify sites of cultural importance during the investigation of the study area, it is always possible that hidden or subsurface sites could be overlooked during the assessment. If any evidence of archaeological sites or remains (e.g., remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials or other categories of heritage resources are found during the proposed development, work must cease in the vicinity of the find and South African Heritage Resources Agency (SAHRA) must be alerted immediately to determine an appropriate way forward.



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### **Details of Specialist who prepared the HIA**

**Jenna Lavin**, an archaeologist with an MSc in Archaeology and Palaeoenvironments, and since 2016 heads up the heritage division of the organisation. She has a wealth of experience in the heritage management sector. Jenna's previous position as the Assistant Director for Policy, Research and Planning at Heritage Western Cape has provided her with an in-depth understanding of national and international heritage legislation. Prior to joining CTS Heritage, her 8 years of experience at various heritage authorities in South Africa means that she has dealt extensively with permitting, policy formulation, compliance and heritage management at national and provincial level and has also been heavily involved in rolling out training on South African Heritage Resources Information System (SAHRIS) to the Provincial Heritage Resources Authorities and local authorities.

Jenna is a member of the Association of Professional Heritage Practitioners (APHP), and is also an active member of the International Committee on Monuments and Sites (ICOMOS) as well as the International Committee on Archaeological Heritage Management (ICAHM). In addition, Jenna has been a member of the Association of Southern African Professional Archaeologists (ASAPA) since 2009. Since 2016, Jenna has drafted over 250 Screening and Heritage Impact Assessments (HIAs) throughout South Africa.





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## 1. INTRODUCTION

### 1.1 Background Information on Project

K2022578692 South Africa (PTY) LTD, has appointed SiVEST SA (Pty) Ltd (SiVEST to undertake the required Basic Assessment (BA) process for the proposed development of the 500 megawatt alternating current (MWac) solar PV facility and associated infrastructure, to be located approximately 20 kilometres (km) to the east of and north-east of Beaufort West in the Western Cape Province. The project is being developed either to supply the national grid under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or similar procurement programme.

The applicant intends to develop a SEF and associated infrastructure on Remainder of farm Rhenosterkop 155 and Farm 400. A total development footprint of approximately 489.09 ha is envisaged for the project.

The term PV describes a solid-state electronic cell that produces direct current electrical energy from the radiant energy of the sun through a process known as the PV Effect. This refers to light energy placing electrons into a higher state of energy to create electricity. Each PV cell is made of silicon (i.e., semiconductors), which is positively and negatively charged on either side, with electrical conductors attached to both sides to form a circuit. This circuit captures the released electrons in the form of an electric current (direct current). The key components of the proposed project are described in the table below.

**Table 1: Technical details of the proposed project**

Component	Description/ Dimensions on Rhino Site	Description/ Dimensions on Sunnyside Site
Location of site (centre point)	32°14'9.254"S; 22°50'26"E	22°49'59.587"S; 32°21'4.729"E
Application site area	Remainder of farm Rhenosterkop 155: 4 247 ha, only 563 ha available for development	Farm 400: 4 035 ha, only 525.2 ha available for development
Solar PV development area	533.94 ha	494.93 ha
SG codes	Remainder of farm Rhenosterkop 155: C00900000000015500000	Farm 400: C00900000000040000000
Export capacity	Up to 250 MW	Up to 250 MW
PV Panels	Mono- or bifacial panels will be used, not thin film Panel width and height (to be confirmed during detailed design phase) Expected panel dimensions: Width: 1 – 1.3 m Height: 2 – 2.4 m	Mono- or bifacial panels will be used, not thin film Panel width and height (to be confirmed during detailed design phase) Expected panel dimensions: Width: 1 – 1.3 m Height: 2 – 2.4 m
On-site Substation	One 132 kV 21 m height 1 ha	One 132 kV 21 m height 1 ha



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	<p>Substation will step up voltage from 33 to 132 kV Various transformers will be located within the PV area. These will combine the power from multiple inverters and step up the supply voltage from 800 V to 33 kV. The expected capacity of these transformers are in the range of 2.5 megavolt ampere each Note that the voltage levels are estimates and subject to confirmation/change during the detail design phase of the project</p>	<p>Substation will step up voltage from 33 to 132 kV Various transformers will be located within the PV area. These will combine the power from multiple inverters and step up the supply voltage from 800 V to 33 kV. The expected capacity of these transformers are in the range of 2.5 megavolt ampere each Note that the voltage levels are estimates and subject to confirmation/change during the detail design phase of the project</p>
BESS	<p>5 to 5.8 ha The final BESS capacity is subject input by DMRE, NERSA and Eskom regarding the dispatchability and ancillary services to be provided by the hybrid Solar PV and BESS facility. This may range between 77 MW/ 308 MWh, in line with the latest ESIPPPP bidding round 2, and 240 MW/ 960 MWh, in line with 4 hours of rated capacity. These stated capacities are also subject to the charging, discharging and augmentation regime established during the subsequent design phases of the project.</p>	<p>5 to 5.8 ha The final BESS capacity is subject input by DMRE, NERSA and Eskom regarding the dispatchability and ancillary services to be provided by the hybrid Solar PV and BESS facility. This may range between 77 MW/ 308 MWh, in line with the latest ESIPPPP bidding round 2, and 240 MW/ 960 MWh, in line with 4 hours of rated capacity. These stated capacities are also subject to the charging, discharging and augmentation regime established during the subsequent design phases of the project.</p>
Proximity to grid connection	<p>The facility is planned to connect to a new Main Transmission Substation (MTS) which will be established near the project site. The new MTS will tie in via loop-in-loop-out connection to the existing Droërivier/Hydra 400 kV lines. Alternatively, the project can tie into the existing Droërivier MTS via a 132 kV connection. It should be noted that this does not form part of this application</p>	<p>The facility is planned to connect to a new MTS which will be established near the project site. The new MTS will tie in via loop-in-loop-out connection to the existing Droërivier/Hydra 400 kV lines. Alternatively, the project can tie into the existing Droërivier MTS via a 132 kV connection. It should be noted that this does not form part of this application</p>
O&M buildings	<p>The 1 ha construction camps will become the operational site camp offices, workshop areas, O&amp;M building, permanent parking area, storage area</p>	<p>The 1 ha construction camps will become the operational site camp offices, workshop areas, O&amp;M building, permanent parking area, storage area</p>
Access roads	<p>6 – 8 m access roads +/-15% 4 m internal roads</p>	<p>6 – 8 m access roads +/-15% 4 m internal roads</p>
Site Access	<p>Turn southward off from N1, 30 km outside Beaufort-West, between Beaufort-West and Three Sisters. This will lead to a Transnet service road used by the local population for access to farms and smallholdings. The site will be located immediately to the right at the T-junction of the road that connects the service road and the N1</p>	<p>Approximately 3.2 km outside Beaufort-West on the R61, turn onto the Hopewell Road in an Eastern direction. After 24.1 km, turn right onto Farm 400 through the gate to the farm. This will be the main access point to the site</p>
Construction camp	<p>One 1 ha temporary containers</p>	<p>One 1 ha temporary containers</p>
Temporary construction laydown/ staging area	<p>2 ha within the development area – laydown (x 2)</p>	<p>2 ha within the development area – laydown (x 1)</p>
Fence/ security	<p>Triple wire fence, electrical fencing: Maximum height 3 m Length – 11 076 m</p>	<p>Triple wire fence, electrical fencing: Maximum height 3 m Length – Sunnyside PV west at 11 408.45 m and east 3 959 m</p>





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## 1.2 Description of Property and Affected Environment

The proposal includes a solar PV installation on Remainder of Farm Rhenosterkop 155, Rhino SEF, and on Farm 400, Sunnyside SEF, located further southeast (of the Rhino SEF). A series of dolerite koppies lie east and north of these two PV facilities, respectively, and range from low to medium height, overlooking the level plains further southwest towards Beaufort West, about 40 km distant. The dolerite ridges and koppies fall mainly on the farms Elandsfontein 150, Sunnyside 400 and Klipkopjes Leegte 132. The terrain around the proposed solar PV areas is level and gently sloping upwards towards the Farm Rhenosterkop along the eastern end while sloping down gently towards the floodplain of the Renosterspruit. The N1 lies prominently along the western boundary connecting Nelspoort and Three Sisters to Beaufort West. An abandoned railway station hosts a few late 19<sup>th</sup> / early 20<sup>th</sup> century houses at Rhenosterkop farm and the main Rhenosterkop werf is nearby.

The vegetation consists of grassland and succulent karoo covering much of the area and acacia thorn trees in the floodplains. There has been some significant recovery of the vegetation following the break of the prolonged seven-year drought. Small-scale wild game farming is taking place with springbuck and other small antelope species, but sheep farming is the main activity in the area. Plots of ground within reach of irrigation systems surround the immediate areas around the werfs to grow feed for the stock farming businesses. Besides the Rhenosterkop werf, other notable settlement landmarks are located at Bleakhouse, Sunnyside and Elandsfontein farms. A few large national grid powerlines run southwest to northeast through the Remainder of Farm Rhenosterkop 155 (both 765 kV and 400 kV).

In a Visual Impact Assessment (VIA) completed for an adjacent project, it is noted that, in general, the landscape character of the greater study area and the site itself presents as undeveloped and largely natural in character. The visual quality of the region is generally high by virtue of the vast and undeveloped nature of the environment. This lends a distinct sense of place to the area, but the landscape is not unique. As such, the entire study area is considered sensitive to visual impacts due to its generally low levels of transformation.

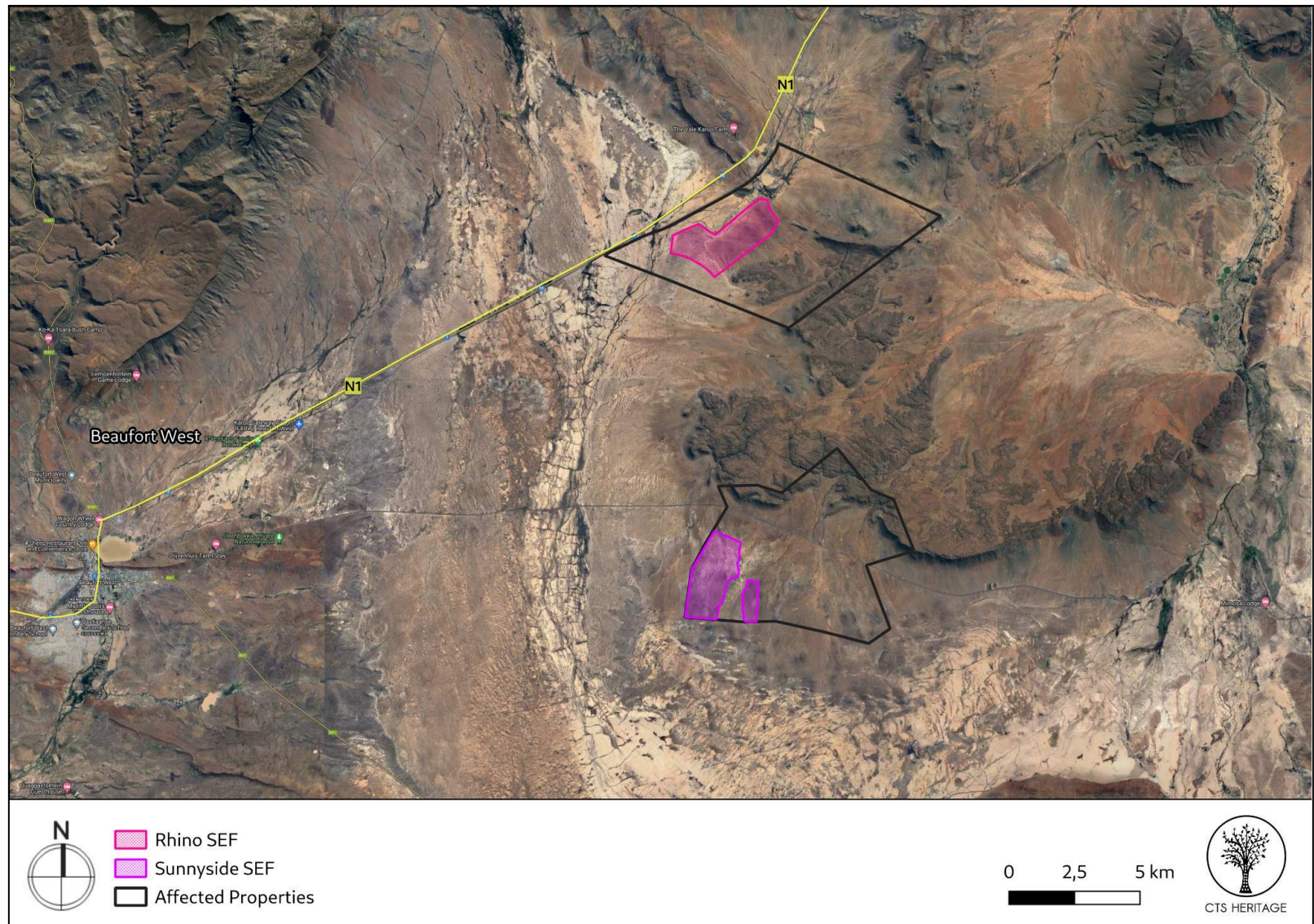
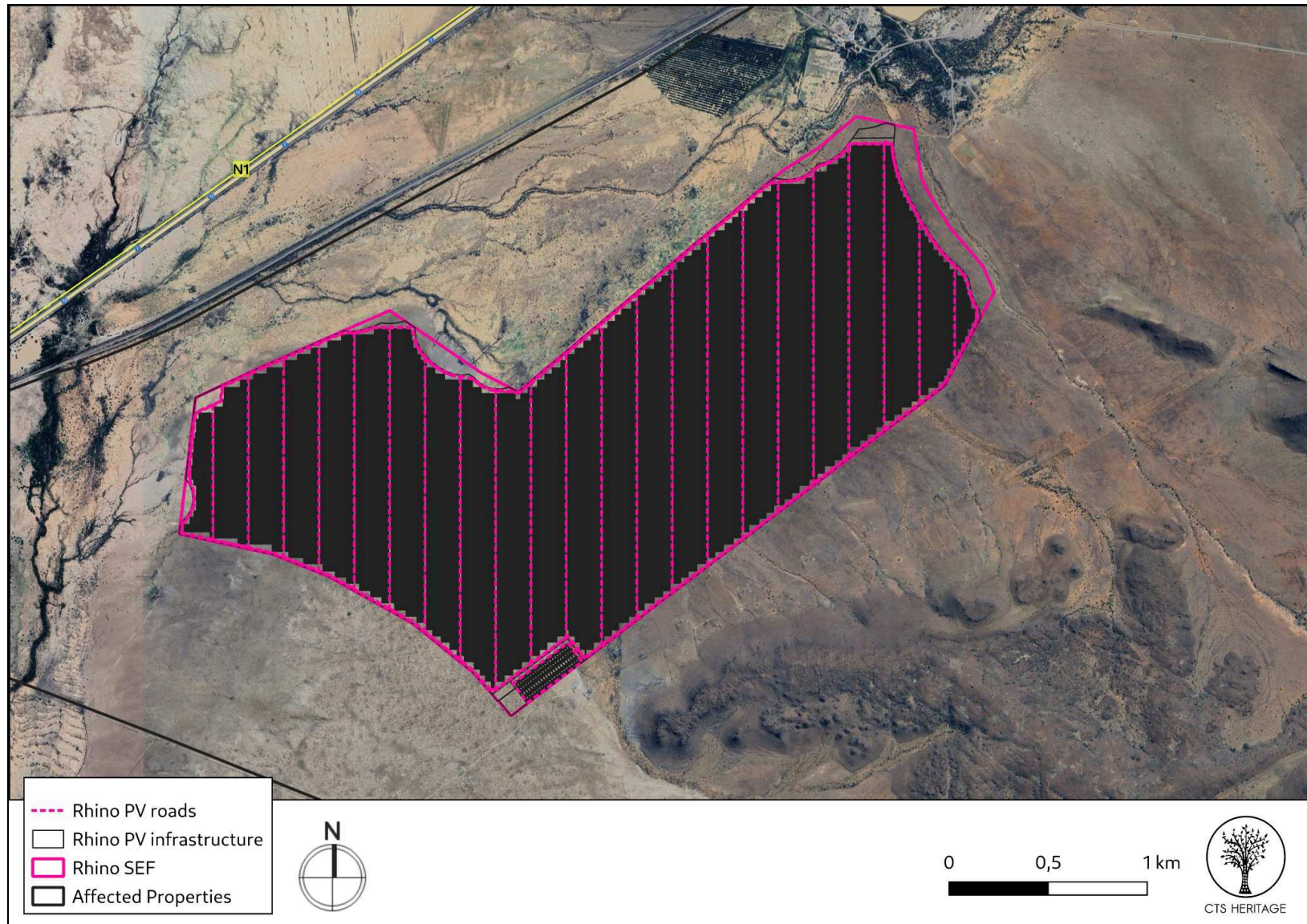


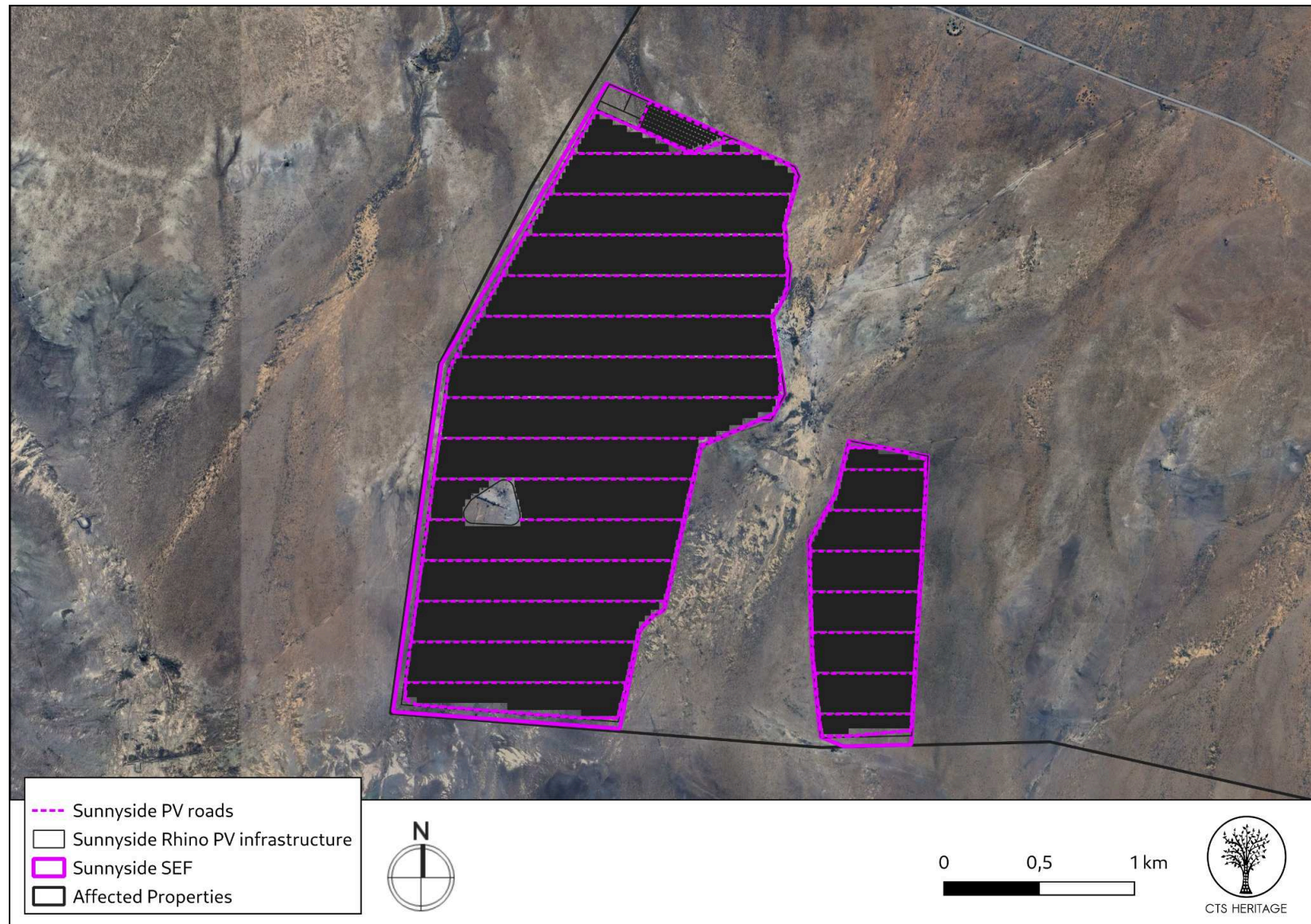
Figure 1.1: Proposed development relative to Beaufort West





**Figure 1.2: The proposed development at Rhino SEF**





**Figure 1.3: The proposed development at Sunnyside SEF**





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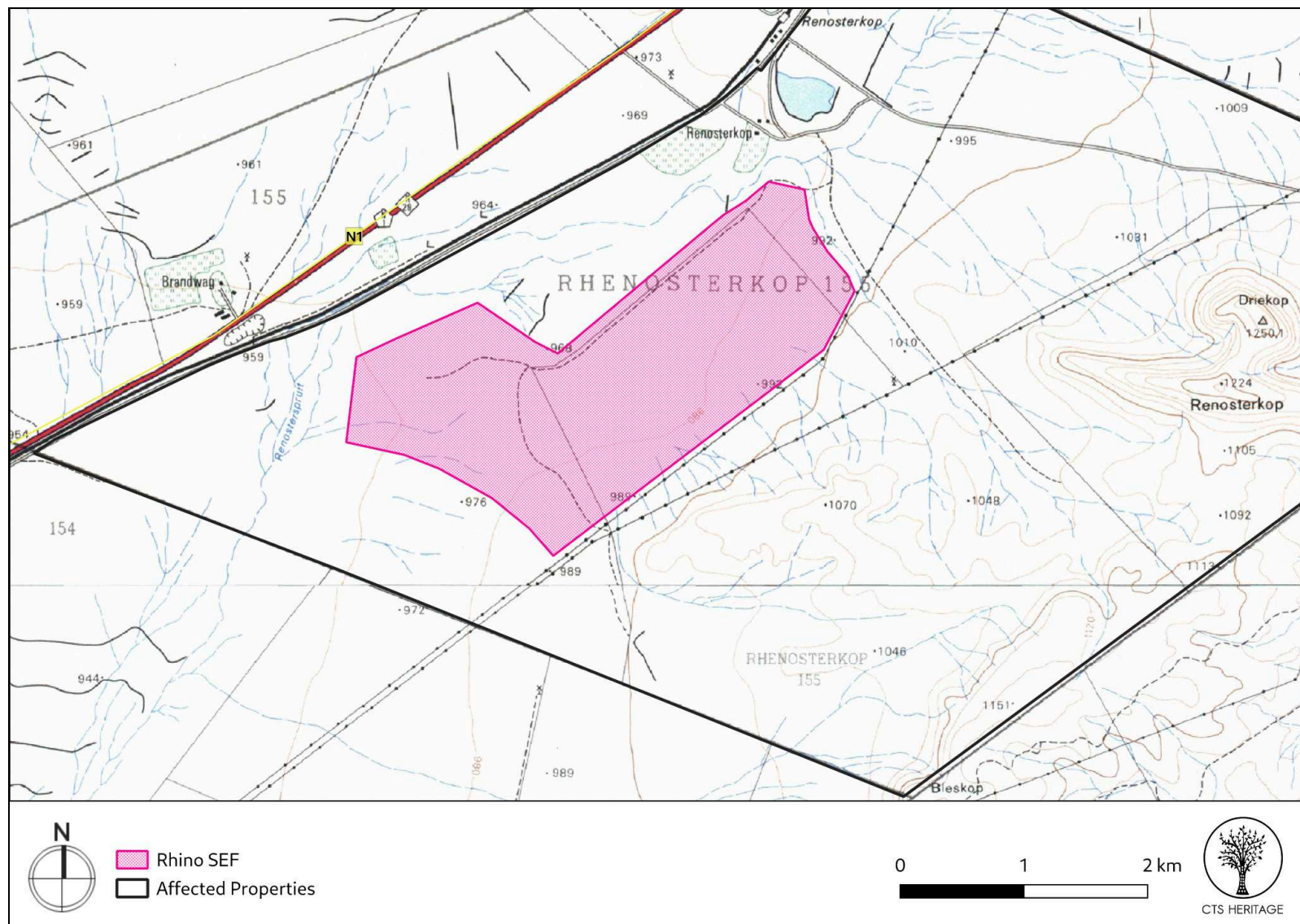
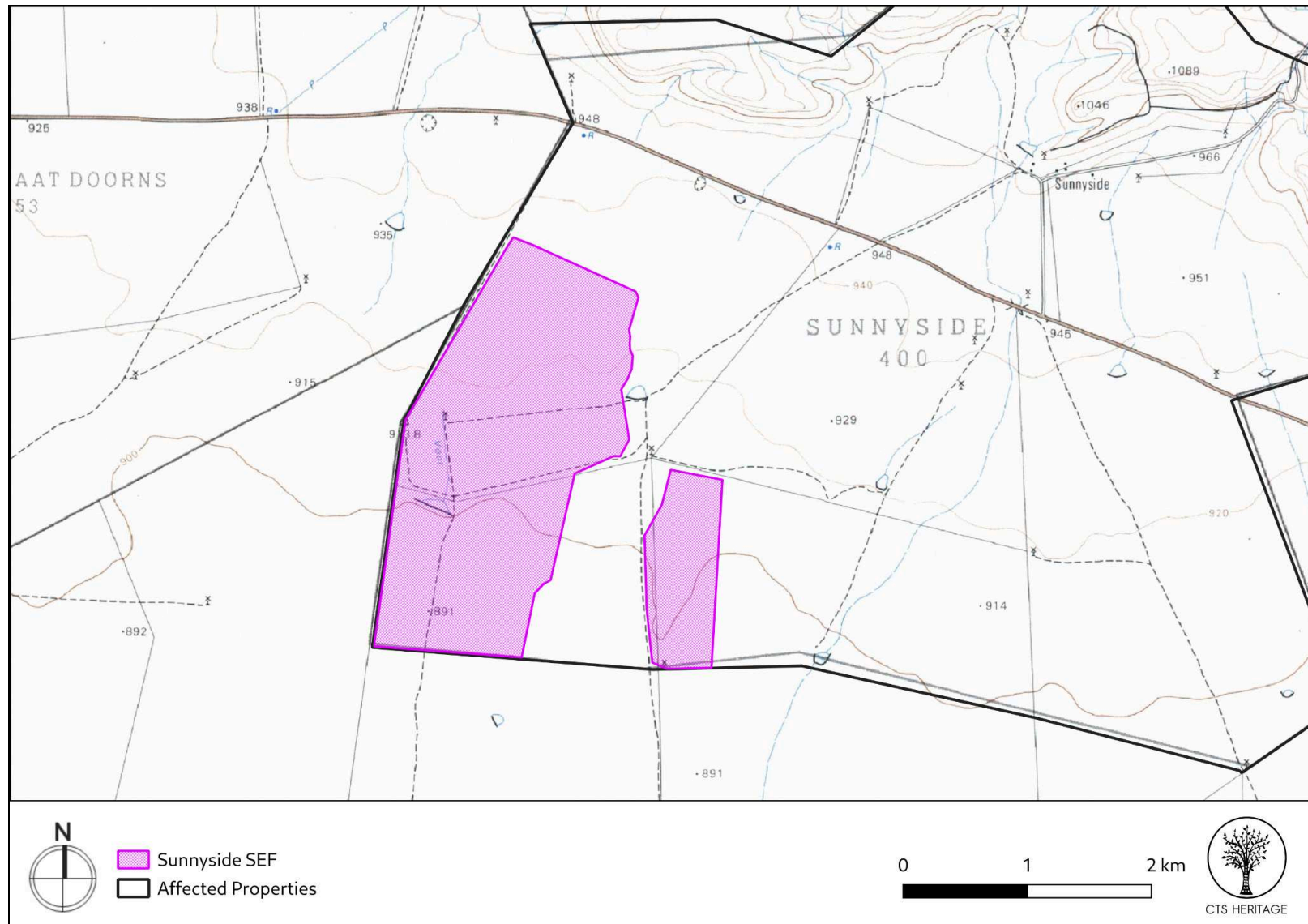


Figure 1.4: Extract from the 1:50 000 Topo Map

Cedar Tower Services (Pty) Ltd t/a CTS Heritage  
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### **1.3. Legislative Framework**

#### **1.3.1 Relevant Acts, Ordinances and By-laws (National, Provincial and Municipal)**

National Heritage Resources Act 25 of 1999

- to introduce an integrated and interactive system for the management of the national heritage resources;
- to promote good government at all levels, and empower civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations;
- to lay down general principles for governing heritage resources management throughout the Republic;
- to introduce an integrated system for the identification, assessment and management of the heritage resources of South Africa;
- to establish the South African Heritage Resources Agency together with its Council to coordinate and promote the management of heritage resources at national level;
- to set norms and maintain essential national standards for the management of heritage resources in the Republic and to protect heritage resources of national significance;
- to control the export of nationally significant heritage objects and the import into the Republic of cultural property illegally exported from foreign countries;
- to enable the provinces to establish heritage authorities which must adopt powers to protect and manage certain categories of heritage resources;
- to provide for the protection and management of conservation-worthy places and areas by local authorities;
- Section 7 provides a system for evaluating cultural significance - the grading system

National Environmental Management Act 107 of 1998

- Management of all environmental resources including heritage through the linking clause of S. 38(8) of the NHRA
- There is no specialist specific protocol - so the general protocol is used for impacts to heritage resources



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**Table 2: National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and Environmental Impact Assessment (EIA) Regulations, 2014 (as amended) - Requirements for Specialist Reports (Appendix 6).**

	<b>A specialist report prepared in terms of the Environmental Impact Regulations of 2017 must contain:</b>	<b>Relevant section in report</b>
ai	Details of the specialist who prepared the report,	Page 3
a ii	The expertise of that person to compile a specialist report including a curriculum vitae	Page 3
b	A declaration that the person is independent in a form as may be specified by the competent authority	Attached by EAP
c	An indication of the scope of, and the purpose for which, the report was prepared	Section 2.1
ci	An indication of the quality and age of the base data used for the specialist report: SAHRIS palaeosensitivity map accessed – date of this report	Section 2.1 and Section 9
c ii	A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change	Section 5.1
d	The date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 2.2
e	A description of the methodology adopted in preparing the report or carrying out the specialised process	Section 2
f	The specific identified sensitivity of the site related to the activity and its associated structures and infrastructure	Section 5
g	An identification of any areas to be avoided, including buffers	Section 5
h	A 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 5
i	A description of any assumptions made and any uncertainties or gaps in knowledge;	Section 2.3
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	Section 5



	<b>A specialist report prepared in terms of the Environmental Impact Regulations of 2017 must contain:</b>	<b>Relevant section in report</b>
k	Any mitigation measures for inclusion in the EMPr	Section 8
l	Any conditions for inclusion in the environmental authorisation	Section 8
m	Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 8
ni	A reasoned opinion as to whether the proposed activity or portions thereof should be authorised	Section 7
nii	If the opinion is that the proposed activity 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 8
o	A description of any consultation process that was undertaken during the course of carrying out the study	Section 6
p	A summary and copies of any comments that were received during any consultation process	N/A
q	Any other information requested by the competent authority.	N/A
2	Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	N/A

#### NEMA: Protected Areas Act 57 of 2003

- Management of declared World Heritage Sites and buffer areas within South Africa
- The purpose of the National Environmental Management: Protected Areas Act (Act 57 of 2003) (NEMPAA) is to, inter alia, provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. To this end, it provides for the declaration and management of various types of protected areas.
- Section 39 of NEM:PAA requires the preparation and submission of a management plan for a protected area declared in terms of the Act. The objective of a management plan, as stated in Section 41 of



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NEM:PAA, is to ensure the protection, conservation and management of the protected area concerned in a manner that is consistent with the objectives of NEMPAA and for the purpose it was declared.

- Section 50(5) of NEM:PAA states that “*no development, construction or farming may be permitted in a nature reserve or world heritage site without the prior written approval of the management authority.*”
- The management authority for a WHS is established through a NEM:PAA process. The MA is located within and funded by the DFFE.
- The MA is tasked with ensuring that activities within the WHS and its buffer area comply with the approved Conservation Management Plan developed for the WHS.

#### World Heritage Convention Act 49 of 1999

- Provides for the incorporation of the World Heritage Convention into South African law;
- Provides for the enforcement and implementation of the World Heritage Convention in South Africa;
- Provides for the recognition and establishment of World Heritage Sites;
- Provides for the establishment of Authorities and the granting of additional powers to existing organs of state;
- Provides for the powers and duties of such Authorities, especially those safeguarding the integrity of World Heritage Sites;
- Provides for where appropriate, the establishment of Boards and Executive Staff Components of the Authorities;
- Provides for integrated management plans over World Heritage Sites;
- Provides for land matters in relation to World Heritage Sites;
- Provides for financial, auditing and reporting controls over the Authorities;
- Provides for the establishment of the World Heritage Convention Committee of South Africa which is responsible for liaison with the World Heritage Convention Committee of UNESCO
- Declared WHS within this assessment area - Richtersveld Cultural Landscape WHS

#### 1.3.2 Relevant International Treaties and Conventions

##### Unesco Convention on the Protection of World Cultural and Natural Heritage, 1972

- Provides a system for the protection of natural and cultural heritage sites which demonstrate importance for all the peoples of the world
- Provides a system for the identification of Outstanding Universal Value (OUV)



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#### Burra Charter or the Australia ICOMOS Charter for the Conservation of Places of Cultural Significance (1979)

- Defines the basic principles and procedures to be followed in the conservation of Australian heritage places but is widely used across the world and very much in South Africa today.
- Accepts the philosophy and concepts of the ICOMOS Venice Charter, but wrote them in a form which would be practical and useful in Australia. The Charter is periodically revised and updated (most recent, 2013)
- Recognised as having pioneered the understanding of cultural heritage as going beyond the mere preservation of the built environment.

#### NARA Document on Authenticity (1994)

- Addresses the need for a broader understanding of cultural diversity and cultural heritage in relation to conservation in order to evaluate the value and authenticity of cultural property more objectively.
- "authenticity is an essential element in defining, assessing, and monitoring cultural heritage."
- "authenticity" varies from culture to culture - when authenticity is being assessed for a particular cultural heritage, its underlying cultural context should be considered

#### Convention for the Safeguarding of Intangible Cultural Heritage (2003)

- Intangible Cultural Heritage means the practices, representations, expressions, knowledge, and skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage.
- This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity.
- For the purposes of this Convention, consideration will be given solely to such intangible cultural heritage as is compatible with existing international human rights instruments, as well as with the requirements of mutual respect among communities, groups and individuals, and of sustainable development

### **1.3.3 Relevant Guidelines (promulgated and proposed)**

#### HWC Grading: Purpose and Management Implications (2016)

- Although emanating from the Western Cape, this document provides clarity on the grading system outlined in Sections 7 and 8 of the NHRA
- Provides the basis for grading recommendations for heritage resources and the outcomes thereof



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SAHRA Minimum Standards: Archaeological And Palaeontological Components Of Impact Assessment Reports, 2007

- Outlines the minimum requirements for impact assessments submitted to SAHRA in terms of section 38 of the NHRA

SAHRA Minimum Standards: Palaeontological Component of Heritage Impact Assessment Reports, 2012

- Outlines the minimum requirements for palaeontological impact assessments submitted to SAHRA in terms of section 38 of the NHRA

#### **1.3.4 Any discipline specific permitting requirements**

The NHRA describes a number of general protections that apply to heritage resources including:

- Section 34 permit for impacts to structures older than 60 years
- Section 35 permit for impacts to archaeological heritage, palaeontological heritage and meteorites
- Section 36 permit for impacts to burial grounds and graves that fall outside of a municipal cemetery
- Section 38 HIA process for impacts resulting from developments

The NHRA also describes a number of formal protections that apply to heritage resources that have been protected through the placement of a notice in a National or Provincial gazette

- Section 27 permit for impacts to National and Provincial Heritage Sites
- Section 28 permit for impacts to a site that is provisionally protected
- Section 29 permit for impacts to a buffer area around a National or Provincial Heritage Site
- Section 30 and 31 permits for impacts to sites placed on the heritage register or heritage areas

#### **1.3.5 Any relevant IFC, Equator Principles or World Bank requirements**

##### ***IFC Performance Standard 7: Indigenous Peoples***

Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalised and vulnerable segments of the population. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development. Indigenous Peoples are particularly vulnerable if their lands and resources are transformed, encroached upon, or significantly degraded.

Their languages, cultures, religions, spiritual beliefs, and institutions may also come under threat. As a consequence, Indigenous Peoples may be more vulnerable to the adverse impacts associated with project





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development than non-indigenous communities. This vulnerability may include loss of identity, culture, and natural resource-based livelihoods, as well as exposure to impoverishment and diseases. Private sector projects can create opportunities for Indigenous Peoples to participate in, and benefit from project-related activities that may help them fulfil their aspiration for economic and social development. Furthermore, Indigenous Peoples may play a role in sustainable development by promoting and managing activities and enterprises as partners in development. Government often plays a central role in the management of Indigenous Peoples' issues, and clients should collaborate with the responsible authorities in managing the risks and impacts of their activities.

The primary objectives of Performance Standard 7 are:

- To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples;
- To anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts;
- To promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner;
- To establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life cycle.
- To ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of Indigenous Peoples when the circumstances described in this Performance Standard are present;
- To respect and preserve the culture, knowledge, and practices of Indigenous Peoples; and
- There is no universally accepted definition of "Indigenous Peoples." Indigenous Peoples may be referred to in different countries by such terms as "Indigenous ethnic minorities," "aboriginals," "hill tribes," "minority nationalities," "scheduled tribes," "first nations," or "tribal groups."

The term "Indigenous Peoples" is used in a generic sense to refer to a distinct social and cultural group possessing the following characteristics in varying degrees:

- Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;
- Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;
- Customary cultural, economic, social, or political institutions that are separate from those of the mainstream society or culture; or
- A distinct language or dialect, often different from the official language or languages of the country or region in which they reside.

Projects shall seek input from competent professionals to ascertain whether a particular group is considered as Indigenous Peoples.

### ***IFC Performance Standard 8 - Cultural Heritage (2012)***

This principle recognizes the importance of cultural heritage for current and future generations. Consistent with the Convention Concerning the Protection of the World Cultural and Natural Heritage, this Performance Standard aims to ensure that clients protect cultural heritage in the course of their project activities. In addition, the requirements of this Performance Standard on a project's use of cultural heritage are based in part on standards set by the Convention on Biological Diversity.

The primary objectives of Performance Standard 8 are:

- To protect cultural heritage from the adverse impacts of project activities and support its preservation; and
- To promote the equitable sharing of benefits from the use of cultural heritage. Cultural heritage refers to:
  - Tangible forms of cultural heritage, such as tangible moveable or immovable objects, property, sites, structures, or groups of structures, having archaeological (prehistoric), paleontological, historical, cultural, artistic, and religious values;
  - Unique natural features or tangible objects that embody cultural values, such as sacred groves, rocks, lakes, and waterfalls; and
  - Certain instances of intangible forms of culture that are proposed to be used for commercial purposes, such as cultural knowledge, innovations, and practices of communities embodying traditional lifestyles.

### **1.3.6 Discussion**

#### **NATIONAL HERITAGE RESOURCES ACT (1999)**

Heritage resources significant enough to be considered part of the national "estate" in Section 3(2) of the NHRA, and may include *inter alia*:

- Places, buildings, structures and equipment of cultural significance;
- Places to which oral traditions are attached or which are associated with living heritage;
- Historical settlements and townscapes;
- Landscapes and natural features of cultural significance;
- Geological sites of scientific or cultural importance;
- Archaeological sites and objects;



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- Graves and burial grounds;
- Sites of significance relating to the history of slavery in South Africa;
- Moveable objects including military objects, fine art, books records, documents, archaeological and paleontological objects, and materials.

Cultural heritage significance means aesthetic, historical, scientific, architectural, spiritual, technological or/and social significance. The process of deciding why a place is of heritage significance is called heritage assessment. Understanding heritage significance is essential to making sound decisions about the future of the heritage resource, to assess development proposals and to ensure the appropriate level of heritage management.

A culturally significant resource or site is considered part of the national estate if it has cultural significance or any other special values due to:

- Its importance in the community, or pattern of South Africa's history;
- Its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural history;
- Its potential to yield information that will contribute to an understanding of South Africa 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 association with a particular community or cultural group for social, cultural or spiritual reasons;
- Its strong and special association with the life or work of a person, group or organisation of importance in the history of south Africa;
- Sites of significance in relations to the history of slavery (Section 3[3] NHRA).

The National Heritage Resources Act (Act 25 of 1999) provides a mechanism for the management of heritage resources of cultural significance. The NHRA envisages a three tier system of management of heritage resources, namely National, Provincial and Local.

Specific management tools are available to Local Authorities for heritage resource management. In terms of section 8(4) of the National Heritage Resources Act, "A local authority is responsible for the identification and management of Grade III heritage resources and heritage resources which are deemed to fall within their competence in terms of this Act".





Registered Conservation Bodies play an extremely important role in assisting with the identification of heritage resources which are important to the community, and can provide local knowledge in determining their significance. The benefits to Local Authorities in implementing heritage management in terms of the NHRA include the protection of local resources, giving certainty to local property owners as to what is and is not protected, and enabling them to have their applications dealt with at a local level. The specific management tools provided for in the NHRA include:

- Grading (Sections 7 and 8 of the NHRA)
- Surveys (Section 30 of the NHRA)
- Heritage Registers (Section 30 of the NHRA)
- Heritage Areas (Section 31 of the NHRA)

### ***Grading***

The NHRA requires that all heritage resources be graded in order to assign the appropriate level of management responsibility (i.e. Local, Provincial or National spheres of governance) to a heritage resource and to indicate its significance. Significance is key to assessing grading and is the primary tool in defining heritage management.

The identification of significant heritage resources is a requirement of the National Heritage Resources Act, No 25 of 1999 (NHRA). NHRA Section 7 (1) makes provision for the establishment of a system of grading places and objects which form part of the national estate, and which distinguishes between at least the following categories:

- Grade 1: Heritage resources with qualities so exceptional that they are of special national significance and thus should be declared national heritage sites;
- Grade II: Heritage resources which although forming part of the national estate can be considered to have special qualities which make them significant within the context of a province or a region and thus should be declared provincial heritage sites; and
- Grade III: Other conservation-worthy heritage resources, which should be entered on the provincial heritage register and protected in terms of the local planning system.

This system needs to prescribe certain assessment criteria, consistent with the criteria set out in section 3(3) of the NHRA. These must be used to assess the intrinsic, comparative and contextual significance of a heritage resource and the relative benefits and cost of its protection so that the appropriate level of grading of the resource and the consequent responsibility for its management may be allocated.

Grading is an important step in the process towards (but not necessarily leading to) the formal protection of a heritage resource, such as declaration as a National Heritage Site, Provincial Heritage Site, or, in the case of Grade III heritage resources, the placing of a heritage resource on the Heritage Register. It is not an end in itself, but a means of establishing an appropriate level of management to proceed with future formal protection.



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In terms of grading, we will be following the recommended grading system included in the HWC Grading Policy document (2016).

### ***Legislative Mandate***

The National Heritage Resources Act (NHRA, Act 25 of 1999) primarily employs two mechanisms to ensure the effective conservation and management of significant heritage resources. These mechanisms are the Formal Protections detailed in Part I of Chapter II of the NHRA and the General Protections detailed in Part II of Chapter II of the NHRA. Formal Protections include the declaration of National and Provincial Heritage Sites, Heritage Areas as well as the establishment of the Heritage Register. The General Protections include permitting requirements for alterations to structures that are older than 60 years (Section 34) and permit requirements for impacts to archaeological and palaeontological heritage resources (Section 35), amongst others.

Applications for renewable energy developments, in general, fall under section 38 of the NHRA, a section that falls within Part II of Chapter II - the General Protections. This section of the heritage legislation is triggered by developments of a certain scale, size or nature such as the change of character to a site exceeding 5000m<sup>2</sup>. Section 38(8) of the NHRA specifically deals with such developments that also trigger other legislation that requires an assessment of impacts, for example, in terms of NEMA.

Section 38(8) of the NHRA requires that any assessment of impacts from such developments also include an assessment of impacts to heritage resources that satisfies certain criteria detailed in section 38(3) of the NHRA. Section 38(8) also requires heritage authorities to comment on such heritage impact assessments, and that the relevant decision-making authorities (such as the DFFE) take this comment into consideration prior to issuing the authorisation (such as the Environmental Authorisation or equivalent). This is to ensure that any significant heritage resources that may be impacted by the proposed development are identified and appropriately managed or mitigated against impacts prior to authorisation.



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In terms of section 38(3) of the NHRA, it is required that impacts to all heritage resources be assessed in an HIA. “All heritage resources” includes archaeological heritage, palaeontological heritage, the built environment as well as the cultural landscape more broadly. This HIA is drafted to satisfy this requirement.

## **2. METHODOLOGY**

### **2.1 Purpose of HIA**

A Notice of Intent to Develop (NID) was submitted to HWC and was reviewed by HWC in a meeting held on 30 October 2023. HWC determined that a HIA must be drafted that has specific reference to:

- Palaeontological Impact Assessment (PIA);
- Archaeological Impact Assessment (AIA); and
- Visual impact on the Cultural Landscape Assessment

The purpose of this HIA is to satisfy the requirements of HWC, above, in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act 25 of 1999) (NHRA), and Section 38(3) of the NHRA, as well as Government Notice (GN) No. 320 of 2020 and Appendix 6 of the Environmental Impact Assessment Regulations, 2014 as amended (EIA Regulations), both enacted under the National Environmental Management Act, 1998 (Act 107 of 1998) as amended (NEMA).

### **2.2 Summary of Steps Followed**

- A Desktop Study was conducted of relevant reports previously written (see the reference list for the age and nature of the reports used)
- An archaeologist conducted an assessment of archaeological resources likely to be disturbed by the proposed development. The archaeologist conducted their site visit from 26 to 28 September 2022 and again on 11 and 12 October 2023.
- A palaeontologist conducted an assessment of palaeontological resources likely to be disturbed by the proposed development. The palaeontologist conducted their site visit from 25 to 26 October 2023. The palaeontology report refers to the Rhino PV area as North SEF and the Sunnyside PV area as South SEF as the report was drafted prior to the finalisation of the project names. However, the findings and data remain applicable and valid.
- The identified resources were assessed to evaluate their heritage significance and potential impacts to these resources were assessed.
- Alternatives and mitigation options were discussed with the Environmental Assessment Practitioner (EAP).





### 2.3 Assumptions and Uncertainties

- The *significance* of the sites and artefacts is determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.
- It should be noted that archaeological and palaeontological deposits often occur below ground level. Should artefacts or skeletal material be revealed at the site during construction, such activities should be halted, and it would be required that the heritage consultants are notified for an investigation and evaluation of the find(s) to take place.

However, despite this, sufficient time and expertise were allocated to provide an accurate assessment of the heritage sensitivity of the area.

### 2.4 Constraints & Limitations

The sparse vegetation and relatively level ground encountered when surveying the areas proposed for the solar PV facility facilitated a very high level of survey coverage of the heritage resources found in these areas. We therefore feel confident that we have obtained a reliable and sufficient level of coverage of heritage sensitivities in the solar PV areas.

### 2.5 SiVEST Impact Assessment Methodology

The Environmental Impact Assessment (EIA) Methodology assists in evaluating the overall effect of a proposed activity on the environment. Determining the significance of an environmental impact on an environmental parameter is determined through a systematic analysis.

#### **Determination of Significance of Impacts**

Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale (i.e., site, local, national or global), whereas intensity is defined by the severity of the impact, e.g., the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in **Table 2**.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

### **Impact Rating System**

The impact assessment must take account of the nature, scale and duration of effects on the environment and whether such effects are positive (beneficial) or negative (detrimental). Each issue/ impact is also assessed according to the various project stages, as follows:

- Planning;
- Construction;
- Operation; and
- Decommissioning.

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance has also been included.

### *Rating System Used to Classify Impacts*

The rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the possible mitigation of the impact. Impacts have been consolidated into one (1) rating. In assessing the significance of each issue the following criteria (including an allocated point system) is used.

**Table 3: Rating of impacts criteria**

ENVIRONMENTAL PARAMETER		
A brief description of the environmental aspect likely to be affected by the proposed activity.		
ISSUE / IMPACT / ENVIRONMENTAL EFFECT / NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity (e.g. oil spill in surface water).		
EXTENT (E)		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined		
1	Site	The impact will only affect the site
2	Local/district	Will affect the local area or district
3	Province/region	Will affect the entire province or region
4	International and National	Will affect the entire country
PROBABILITY (P)		
This describes the chance of occurrence of an impact		



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1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
<b>REVERSIBILITY (R)</b>		
This describes the degree to which an impact on an environmental parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
<b>IRREPLACEABLE LOSS OF RESOURCES (L)</b>		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact results in a complete loss of all resources.
<b>DURATION (D)</b>		
This describes the duration of the impacts on the environmental parameter. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
<b>INTENSITY / MAGNITUDE (I / M)</b>		
Describes the severity of an impact (i.e. whether the impact has the ability to alter the functionality or quality of a system permanently or temporarily).		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely



		perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.

#### SIGNIFICANCE (S)

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the environmental parameter. The calculation of the significance of an impact uses the following formula:

**Significance = (Extent + probability + reversibility + irreplaceability + duration) x magnitude/intensity.**

The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.

Points	Impact Significance Rating	Description
5 to 23	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
5 to 23	Positive Low impact	The anticipated impact will have minor positive effects.
24 to 42	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
24 to 42	Positive Medium impact	The anticipated impact will have moderate positive effects.
43 to 61	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
43 to 61	Positive High impact	The anticipated impact will have significant positive effects.
62 to 80	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
62 to 80	Positive Very high impact	The anticipated impact will have highly significant positive effects.





### 3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT

The area proposed for the proposed Rhino and Sunnyside SEF project is located between Beaufort West and Nelspoort in the Western Cape within the identified Beaufort West Renewable Energy Development Zones (REDZ). The town of Nelspoort lies at the foot of the Nuweveld Mountains on an old section of the N1 highway. The Rhino SEF site is positioned near a watercourse, the Platdoring River, which flows after rains, originating from the Nuweveld mountains to further south of both the Rhino and Sunnyside SEF sites.

#### 3.1 Cultural Landscape

The name 'Karoo' has its roots in the Khoisan word meaning 'place of great dryness'. It once supported large grassy flatlands, and the San and Khoekhoen people migrated across the region for hunting and grazing purposes. Less than two hundred years ago large herds of antelope still roamed the grass plains. With the occupation of the area by stock farmers, the sheep gradually replaced the game and the grass receded along with changing grazing and weather patterns (Winter et al 2009; Winter & Oberholzer 2013). By the late 17<sup>th</sup> century, the Khoenhoen had moved from the region into the more water-rich southern Karoo and the coastal plains. During the early colonial period, the harshness of the Karoo region formed an almost impenetrable barrier from the Cape to the interior for colonial explorers, hunters and travellers. The 18<sup>th</sup> century was characterised by a marked increase in the rate of expansion of the boundaries of the settlement at the Cape. This was associated with the emergence of the migrant stock farmer (trekboer) (Guelke 1982 In Winter *et al* 2009). Early routes into the interior largely followed the tracks initially used by migrating herds of game or the cattle herds and sheep flocks of the Khoekhoen on their seasonal route between coastal and inland grazing grounds. These routes were later reinforced by generations of trek farmers moving between the markets at the Cape and their farms (Winter *et al* 2009).

Permanent settlement of the region only really occurred in the 19<sup>th</sup> century with towns being established near permanent water sources. It was during this period that Beaufort West was established as a drostdy in 1818 on the farm Hooyvlakte. In the same year, a mission station was established at Kookfontein, just outside Beaufort West (Winter *et al* 2009). Beaufort West became the first municipality in South Africa on 03 February 1837 and had the country's first town hall. When the railroad reached the town in 1880 it became a marshalling yard and locomotive depot and today it is the largest town in the Karoo.

The area proposed for development is located near to Nelspoort, a detailed history for which is provided for online<sup>1</sup>. Nelspoort became a hub for the treatment of Tuberculosis. As far back as 1850, the famous explorer David Livingstone extolled the climate of the Karoo and noted it was "suitable for all patients with pulmonary

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<sup>1</sup> <https://www.beaufortwest.net/explore/central-karoo/nelspoort/>



complaints". By 1925, the Nelspoort Sanatorium opened its doors, with the official opening performed by the Prince of Wales, later Edward VIII and then Duke of Windsor in July, 1925. As part of this ceremony, a small grove of blue gums were planted. This species has subsequently established itself as an integral part of the cultural landscape of this area.

Nelspoort also has links with the Anglo-Boer War. In 1901, in an effort to prevent the northbound rail link from being destroyed, the British built hundreds of blockhouses. Two were erected to guard the bridges over the Krom River, near Nelspoort. In 1980, however, one was totally destroyed in a flash flood. The other still stands in the shade of pepper trees on the farm Smokey Grove. Guard posts and schantzes were also built on the Nelspoort koppies and soldiers were garrisoned nearby to man the lookouts and blockhouses. Their water source was a perennial fountain, to this day, called Kitchener's Well after Lord Kitchener, British Commander-in-Chief.

According to Winter and Wilson (2022), the area possesses a number of cultural landscape qualities and elements which are outlined below:

- The location of the site on the south Central Plateau of the Great Karoo, separated from the Karoo vlakte by the Great Escarpment, characterised by a combination of flat open plains punctuated by mountains and koppies. Parallel valley-ridge systems.
- The folded quality of the landscape - open plains interrupted by ridges and koppies - a function of its geology, semi-arid conditions and low vegetation cover; a relatively ephemeral pattern of human intervention on the landscape resulting in a sense of remoteness and stillness, known also for its night sky.
- Generally, a widespread archaeological signature dating to the Earlier Stone Ages (ESA) and Middle Stone Ages (MSA) is described as a low frequency ancient scatter across the landscape, as well as an archaeological signature dating to the Later Stone Age (LSA). In this case, dense archaeology around the dolerite koppies.
- Historical associations with colonial expansion of the northern frontier zone in the late 18<sup>th</sup> / early 19<sup>th</sup> century resulting in the further displacement of transhumant pastoralism<sup>2</sup> by settled agriculture and the emergence of extensive sheep farming in the early to mid-19<sup>th</sup> century; the farms Kruidfontein (pre-1890), Poortjie and Louws Baken (pre-1829), being first surveyed during this period.
- A distinctive pattern of settlement informed by access to limited water resources with small, isolated farmsteads forming green oases in the semi-arid landscape, sheltered from the heat by exotic trees and associated with springs, streams, dams and windpumps. The manner in which homesteads are positioned at the base of hills and koppies forming distinctive topographical settings. The dry-packed stone walls historically used for kraals, are a characteristic feature of the landscape.

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<sup>2</sup> Transhumant pastoralism is a type of seasonal movement of livestock between fixed summer and winter pastures.



- The N1 corridor following the alignment of the late 18<sup>th</sup> century route to the interior and its role as a structuring element in the landscape along which dispersed settlement has occurred like “beads on a string”.
- Nelspoort, significant for its wealth of tangible remains demonstrating a continuous history of occupation from pre-history, through to its mid-19<sup>th</sup> century role in the local wool farming boom, and development as a 20<sup>th</sup> century medical sanctuary.
- Poortjie Wes, significant as an identified place on an early linkage route between Beaufort West and Graaf Reinet.



Figure 2.1. Historic Image. The area proposed for development is located between Nelspoort and Beaufort West in the Great Karoo. Map from 1911. By Encyclopedia Britannica. - 1911. Encyclopedia Britannica., Public Domain, <https://commons.wikimedia.org/w/index.php?curid=>



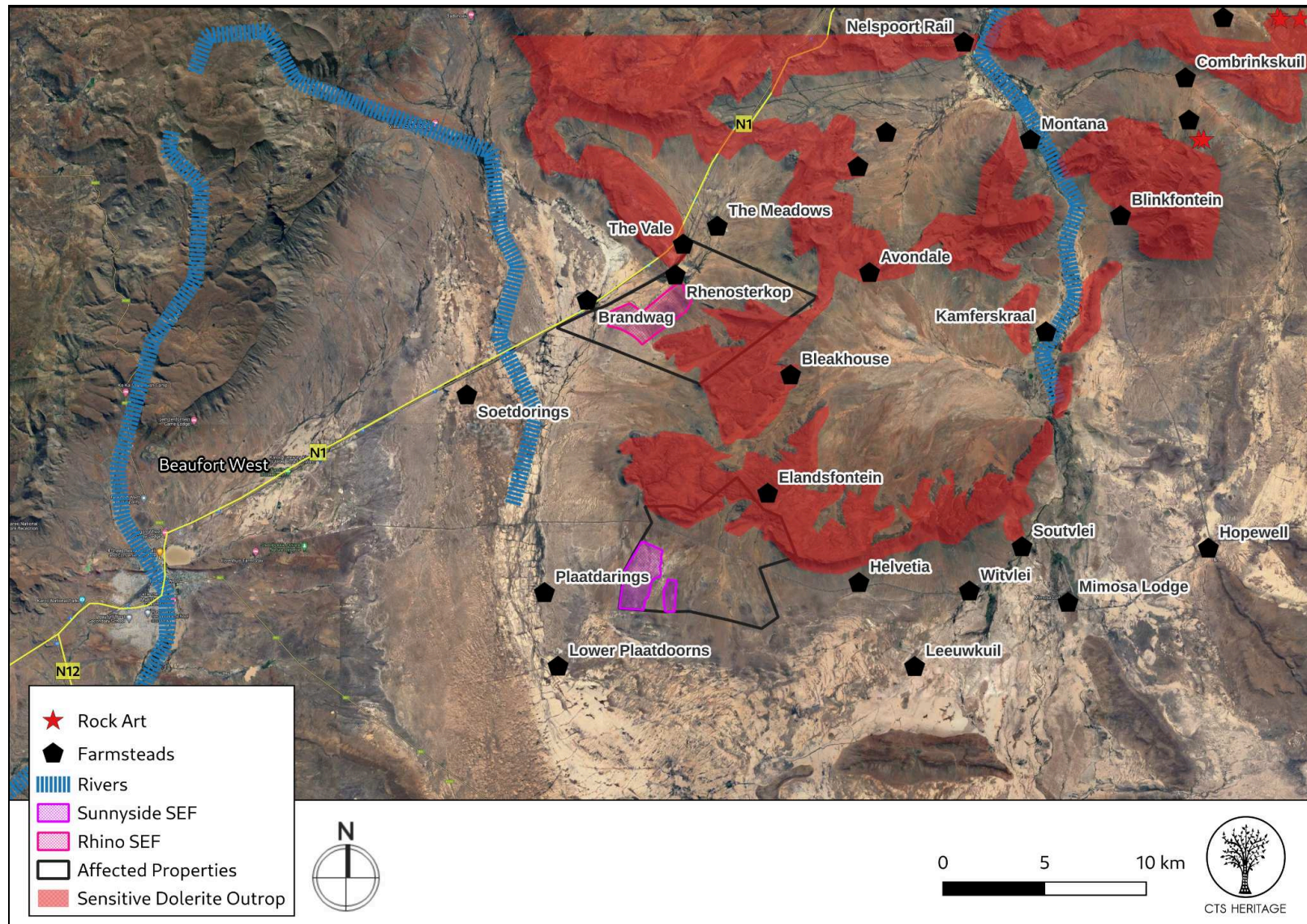


Figure 2.2. Heritage Resources Map. Cultural Landscape Elements



### 3.2 Archaeology

Recently, a number of heritage assessments have been completed within close proximity to the area proposed for development (Figure 3.1). According to Nilssen (2014, SAHRIS NID 504763), “The Karoo houses a long and rich archaeological record dating from the earliest stages of Stone Age technology that are over a million years old, to the historic period that consists of the last few hundred years of human occupation (see Nilssen 2011 and references therein). Archaeological sites include caves and rock shelters, open air artefact scatters, rock engravings and historic structures with their associated cultural materials.” According to ACO (2013, SAHRIS NID 503074), “Because of the scarcity of caves and shelters, more than 90% of Karoo archaeological sites are open sites of stone artefacts, ostrich eggshell fragments and occasionally, pottery. Bone remains are rarely preserved. Artefacts of both the ESA and MSA are widespread, and may generally be described as an ancient litter that occurs at a low frequency across the landscape. Where definable scatters of ESA and MSA material occur, they are considered to be significant heritage sites.

More intensive occupation of the Karoo started around 13 000 years ago during the LSA, which is essentially the heritage of Khoisan groups who lived throughout the region. The legacy of the San includes numerous open sites while traces of their presence can also be found in most large rock shelters, often in the form of rock art. They frequently settled a short distance from permanent water sources (springs or waterholes) and made use of natural shelters such as rock outcrops or large boulders or even large bushes. In the Great Karoo, natural elevated features such as dolerite dykes and ridges played a significant role in San settlement patterns” and as such, this broader area is renowned for its well-preserved rock art and other artefacts from this time, including rock engravings and rock gongs. It is likely that similar archaeological heritage exists within the areas proposed for development and as such, impact to these resources must be assessed.

There are currently 14 identified sites of archaeological interest with over 400 examples of rock engravings (petroglyphs) in the immediate Nelspoort area. All engravings are made on the flat surfaces of the dolerite rocks, with the dark outer layer scraped away leaving the image expressed in the lighter sub layer of the rock. While the precise authorship of rock art is debated (Smith, Ouzman 2004), engravings fall broadly into three types described as follows:

- !xam San hunter-gatherer rock engravings: representations include elephant, giraffe, hartebeest, jackal, zebra and rhinoceros. Images also of human figures, bird-human figures and spirit world representations.
- Khoe herder geometric engravings: patterns such as lines radiating sun-like from a centre point, zig-zag patterns and concentric circles.
- Settler engravings: these include text, symbols and direction markers such as arrows and images including a windpump and animals.





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In many sites these different types of rock art co-exist, along with other evidence of habitation over an extended period of time, such as stone tools, grinding patches on stones, arranged stones, and rock gongs (Ouzman 2003). Nelspoort is the site of several rock gong complexes. The rock gong, or lithophone percussion instrument, is formed by dolerite boulders, some cracked as a result of lightning strike or extreme temperature fluctuation, balanced on each other so that they resonate with a deep ringing sound when struck in a specific way. They are believed to have been intrinsic to spiritual practices of the !xam San people. Two rock gong groupings are located on small rises across the shallow Nelspoort valley, suggesting that the gong's sound may have been used for communication purposes (Rusch 2016).

A recent field assessment completed by CTS Heritage for a renewable energy project located immediately north of the development area recorded 111 Observations. The bulk of these were open site scatters of MSA cores, flakes and debitage. Local siltstones and hornfels rock cores had been used in the production of the flakes with very little introduction of exotic stone sourced in other regions. While only a handful of flakes were found dispersed across a very wide area, they form a constant backdrop to the landscape rather than being concentrated particularly in any one area. The MSA materials tended to be heavily patinated and weathered by water and mud runoff after storms with a high clay content. Typologically diagnostic artefacts included some radial cores and a fairly common spread of retouched blades and blade blanks. Earlier MSA material was also found such as bifacial points and larger flakes but we would deduce that most of this layer of occupation is buried on the floodplains. A cluster of conservation-worthy sites were found including LSA engravings on dolerite boulders and an historic ruined kraal. The engravings show a range of well-preserved imagery linking the ethnographic records of the San in the Bleek and Lloyd collection to these sites such as the scene depicted showing a cloudburst of rain, finely engraved eland and elephant. A large number of LSA and historical artefacts were found in association with these sites. Most of the scatters recorded were graded as not conservation-worthy due to the ubiquity of these artefacts across the landscape and the lack of a particular focal point of landscape use.

Fieldwork in this area has identified a correlation between the dolerite outcrops in the area and higher levels of LSA archaeology, rock engravings and rock gongs. It is likely that this pattern is also applicable for the area under consideration in this assessment. As such, the dolerite outcrop located here must be considered to have high levels of archaeological sensitivity.

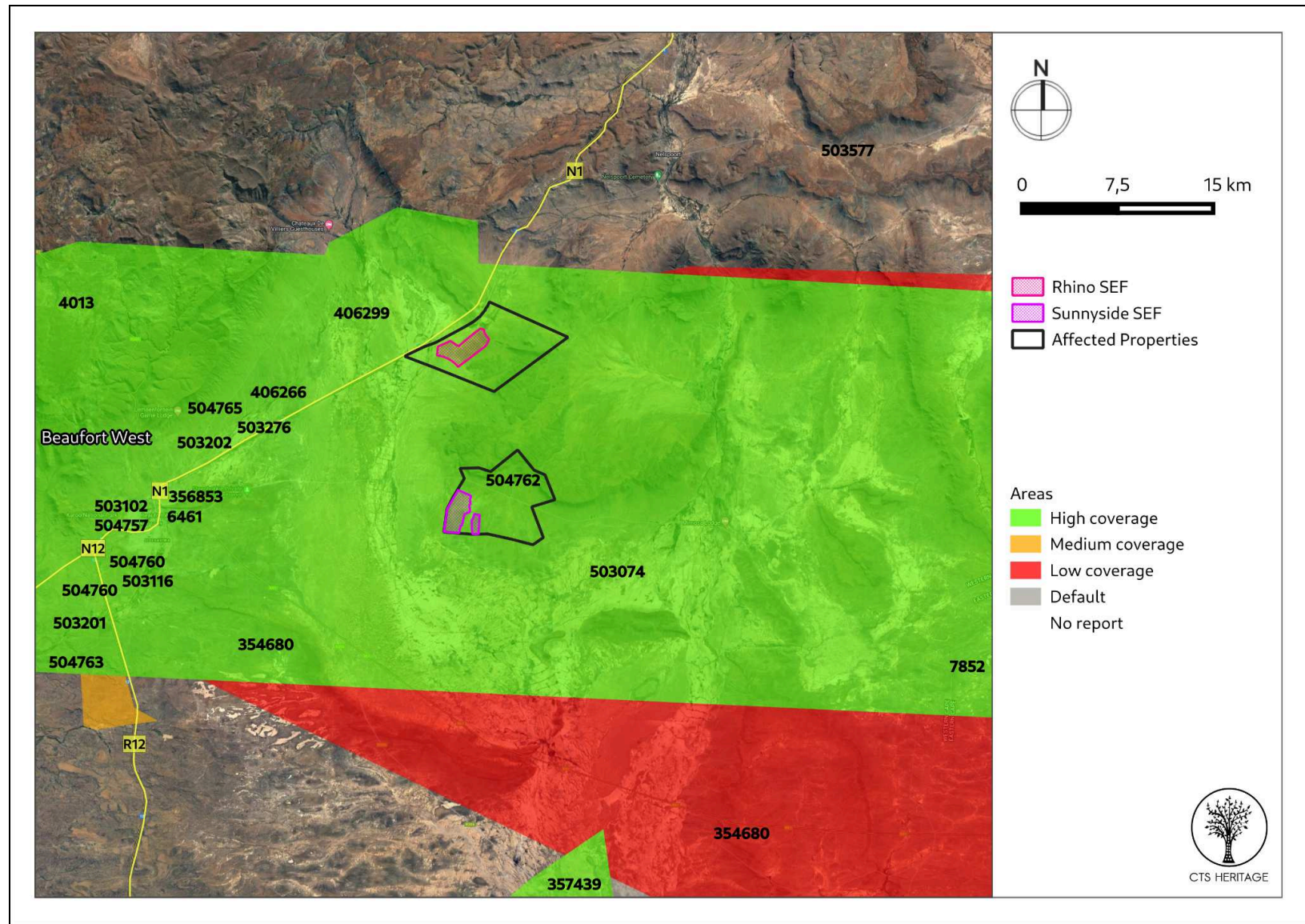
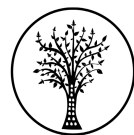


Figure 3.1: Spatialisation of heritage assessments conducted in proximity to the proposed development





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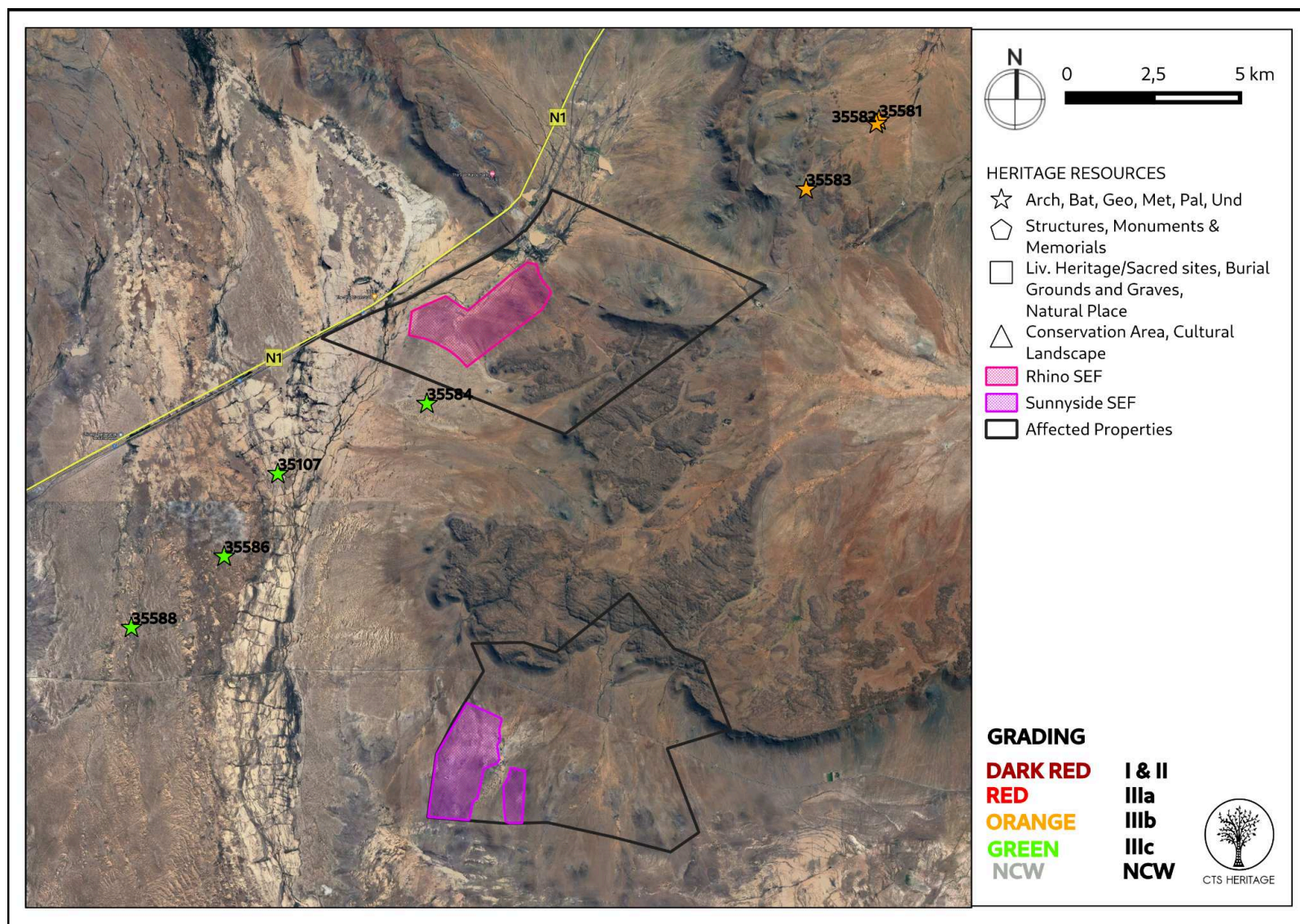


Figure 3.2. Heritage Resources Map. Heritage Resources previously identified within the study area, with SAHRIS Site IDs indicated in the insets below. Please See Appendix 4 for full description of heritage resource types.



### 3.3 Palaeontology

According to the SAHRIS Palaeosensitivity Map (Figure 4.1), the area proposed for development is underlain by very few sediments of very high paleontological sensitivity (red), some of high sensitivity (orange) and most of low sensitivity (blue). According to the extract from the Council for GeoSciences Map 3222 for Beaufort West, the development area is underlain by the Poortjie Member of the Teekloof Formations, both of the Adelaide Subgroup of the Beaufort Group of sediments. According to the SAHRIS Fossil Heritage Browser and the Palaeotechnic Report for the Western Cape (Almond and Pether, 2008), the Beaufort Group sediments are known to preserve diverse terrestrial and freshwater tetrapods of *Tapinocephalus* to *Lystrosaurus* Biozones (amphibians, true reptiles, synapsids – especially therapsids), palaeoniscoid fish, freshwater bivalves, trace fossils (including tetrapod trackways) and sparse vascular plants (*Glossopteris* Flora, including petrified wood).

A recent field assessment of an adjacent site completed by Almond (2022) noted that “The great majority of the project areas is mantled by thick superficial deposits (alluvium, colluvium/ eluvium, calcrete, soils) of low palaeosensitivity. Apart from occasional invertebrate trace fossils of limited scientific interest, the small number of tetrapod fossils recorded from Lower Beaufort Group bedrocks here comprise reworked, fragmentary bones preserved within channel basal breccias or weathered-out into surface gravels. No well-preserved, articulated postcrania or identifiable skull material of high scientific or conservation significance were recorded, although there is still potential for such material occurring at or beneath the surface within the sites. It is concluded that all three solar site are in practice of Low Palaeosensitivity overall. The preliminary Low to Very High palaeosensitivity sensitivity mapped by the Screening Tool is therefore *contested*. Given the low overall palaeosensitivity of all three of the solar project areas, the proposed RE development is all of Low impact significance in terms of palaeontological heritage resources.” It is likely that a similar finding will result from palaeontological fieldwork conducted in the area under consideration in this assessment.



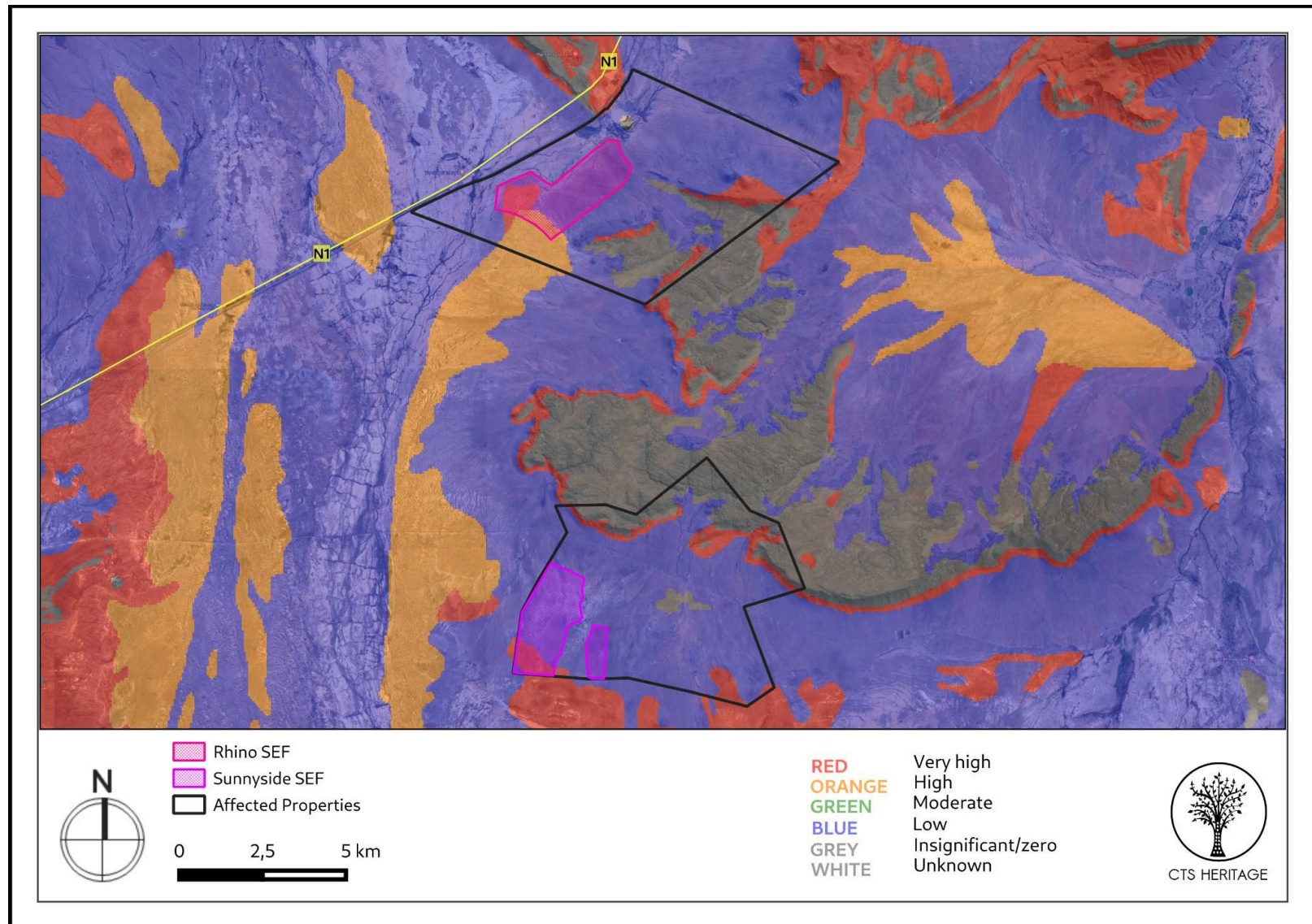


Figure 4.1: Palaeontological sensitivity of the proposed development area





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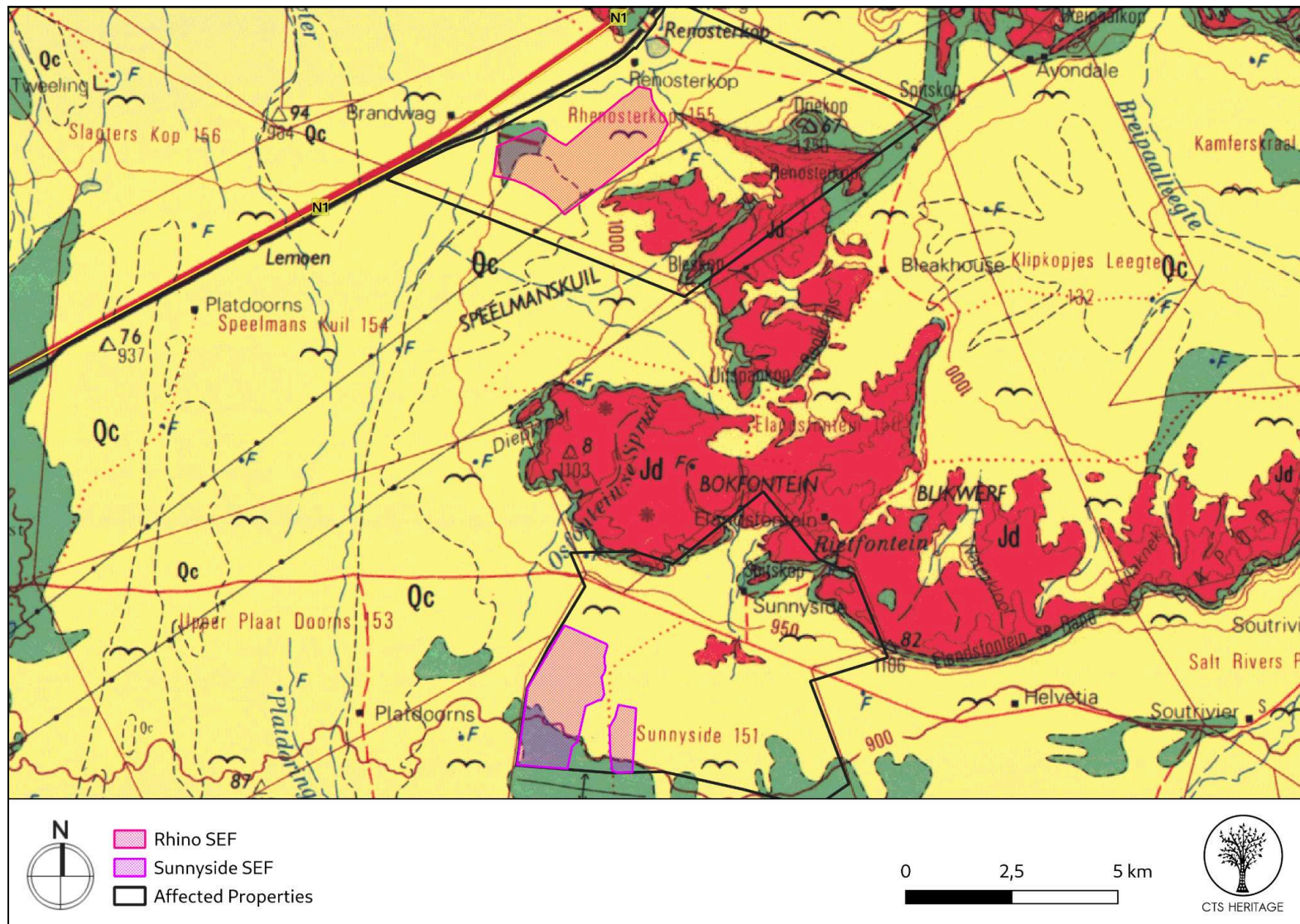


Figure 4.2: Geology Map. Extract from the CGS 2628 East Rand Map and CGS 2630 Mbabane Map indicating that the development area for the REF development is underlain by sediments of Jd: Jurassic Dolerite, Pv: Vryheid sandstone, shale and coal beds, as well as Quaternary Sands

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## **4. IDENTIFICATION OF HERITAGE RESOURCES**

### **4.1 Summary of findings of Specialist Reports**

#### **4.1.1 Cultural Landscape**

As noted by Winter and Wilson (2022), the area possesses a number of cultural landscape qualities and elements which are outlined below:

- The location of the site on the south Central Plateau of the Great Karoo, separated from the Karoo vlakte by the Great Escarpment, characterised by a combination of flat open plains punctuated by mountains and koppies. Parallel valley-ridge systems.
- The folded quality of the landscape - open plains interrupted by ridges and koppies - a function of its geology, semi-arid conditions and low vegetation cover; a relatively ephemeral pattern of human intervention on the landscape resulting in a sense of remoteness and stillness, known also for its night sky.
- Generally a widespread archaeological signature dating to the ESA and MSA described as a low frequency ancient scatter across the landscape, as well as an archaeological signature dating to the LSA. In this case, dense archaeology around the dolerite koppies.
- Historical associations with colonial expansion of the northern frontier zone in the late 18<sup>th</sup> / early 19<sup>th</sup> century resulting in the further displacement of transhumant pastoralism by settled agriculture and the emergence of extensive sheep farming in the early to mid-19<sup>th</sup> century; the farms Kruidfontein (pre-1890), Poortjie and Louws Baken (pre-1829), being first surveyed during this period.
- A distinctive pattern of settlement informed by access to limited water resources with small, isolated farmsteads forming green oases in the semi-arid landscape, sheltered from the heat by exotic trees and associated with springs, streams, dams and windpumps. The manner in which homesteads are positioned at the base of hills and koppies forming distinctive topographical settings. The dry-packed stone walls historically used for kraals, are a characteristic feature of the landscape.
- The N1 corridor following the alignment of the late 18<sup>th</sup> century route to the interior and its role as a structuring element in the landscape along which dispersed settlement has occurred like “beads on a string”.
- Nelspoort, significant for its wealth of tangible remains demonstrating a continuous history of occupation from pre-history, through to its mid-19<sup>th</sup> century role in the local wool farming boom, and development as a 20<sup>th</sup> century medical sanctuary.
- Poortjie Wes, significant as an identified place on an early linkage route between Beaufort West and Graaf Reinet.



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#### **4.1.2 Archaeology (Appendix 1)**

The Archaeological Report was compiled by CTS Heritage to satisfy the requirements of the HWC comment and in accordance with Section 38(3) of the NHRA. The Archaeological Report is attached to this HIA as Appendix 1.

A total of 75 observations were made and these were concentrated in the Rhino solar PV area. The clusters of railway historic buildings and the Rhenosterkop werf lie to the north and west of the proposed Rhino PV and Sunnyside PV areas. One area of slightly elevated ground on a platform near the slopes of the dolerite ridges held a higher number of *in situ* archaeological material consisting of chert and hornfels flakes that should be avoided during the development of the final layouts for access roads and placement of solar PV panels. The tail end of the dolerite outcrop holding sites 045-050 is also of interest as there are round historic stock kraals built using a single level of dolerite boulders, historic and LSA engravings and lithic materials spanning the MSA and LSA. This area falls outside the Rhino and Sunnyside solar PV areas and can easily be avoided. This area was surveyed more intensely to establish a baseline of other areas that potentially hold similar outcrops of engravings and traces of early stock farming in the area.

Much of the archaeological material consists of low density MSA material made from locally abundant stone such as siltstone, hornfels and chert. This was evident from the large number of flake blanks and cores found during the survey. Excellent views were obtained from the top of Driekop over the surrounding area and it was clear that the types of rock suitable for engravings on dolerite boulders are not found in equal densities spread across the SEF area. Sampling of other locations yielded more historic engravings near Bleakhouse whilst other areas with promising dolerite boulders did not yield engravings. The location and extent of the historic farm werfs at Bleakhouse, Sunnyside and Elandsfontein were fairly easily determined and a very extensive series of stone walling boundary features interlink these farms in various states of preservation.

#### **4.1.3 Palaeontology (Appendix 2)**

The Palaeontological Report was compiled by Natura Viva CC to satisfy the requirements of the HWC comment and in accordance with Section 38(3) of the NHRA. The PIA is attached to this HIA as Appendix 2.

The bedrocks of the Hoedemaker Member (Teekloof Formation) which are provisionally taken to underlie the Rhino PV and Sunnyside PV project areas near Beaufort West at depth were originally assigned to the *Tropidostoma* Assemblage Zone (AZ) (Smith & Keyser 1995, Smith *et al.* 2012). They are now largely referred to the upper part of the newly defined **Endothiodon AZ** (Day & Smith 2020), viz. the *Tropidostoma* – *Gorgonops* Subzone (Figures 34 and 35 of the Palaeontology Report – Appendix 2 of this HIA). This diverse continental fossil biota of earliest Late Permian age is characterised by several medium to large-sized, dicynodonts such as



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*Tropidostoma*, *Rachiocephalus* and *Endothiodon* with its highly-specialized herbivorous dentition (the first large-bodied herbivore to appear after the end-Capitanian extinction event) as well as a range of small-bodied dicynodonts with or without post-canine teeth, palaeoniscoid bony fish, rhinesuchid temnospondyl amphibians, large herbivorous pareiasaur reptiles, the small, lizard-like reptile *Youngina* as well as several carnivorous gorgonopsian, therocephalian and cynodont therapsids. Non-vertebrate fossils include non-marine bivalve molluscs, a limited range of trace fossils (e.g., vertebrate tracks, tetrapod burrows, invertebrate burrows and trackways) as well as plant remains of the Gondwanan *Glossopteris* Flora.

No historical fossil sites are shown in the wider solar project area near Beaufort West on the 1: 250 000 geology sheet 3222 Beaufort West (Figure 4.2) or on the early Karoo vertebrate fossil site map of Kitching (1977). A couple of recorded vertebrate fossil sites are shown in the region in the more recent fossil site map of Nicolas (2007) however.

No fossil remains of any sort, including bones, teeth, trace fossils and petrified wood, were recorded within the proposed Rhino PV and Sunnyside PV project areas during the recent two-day site visit. This is probably due to (1) the very poor exposure levels of the Lower Beaufort Group bedrocks as well as (2) the weathered and calcretised condition of the mudrock facies immediately underlying the extensive calcrete hardpan in low-lying areas. In addition, the bedrocks are locally baked by dolerite dykes. The Late Caenozoic superficial sediments – calcretes, alluvium, eluvial and alluvial surface gravels – are generally of low palaeosensitivity in the Great Karoo region. With few exceptions, similar results were obtained in recent palaeontological heritage surveys of low-relief, calcrete- and alluvial-dominated terrain east of Beaufort West (including the Aberdeen *Vlaktes*) by Almond (2022a, 2022b, 2023). The potential for scientifically valuable fossil remains (bones, teeth, trace fossils) within the Lower Beaufort Group bedrocks cannot be excluded however.





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## 4.2 Heritage Resources identified

The following elements of cultural significance fall within the broader area affected by the proposed development, and their spatial relationship with the proposed development is significant:

- Farmsteads including Bleakhouse (Grade IIIB), Elandsfontein, Rhenosterkop and The Vale;
- Rivers, dams and water furrows including Platdoringsrivier, Renosterspruit and Rhenosterkop Dam;
- Mountain ridges and peaks which contribute to the cultural landscape including Magielskop, Renosterkop, Bleskop, Uitspankop and Elandsfontein se Rant;
- Movement routes and views experienced from the routes including the Nelspoort road extension from the N1;
- 20<sup>th</sup> century communications and electrical infrastructure; and
- Railway infrastructure along the N1.

**Table 4: Artefacts identified during the field assessment development area (Figure 4.2)**

Table 1: Artifacts identified during the field assessment of development area (Figure 4.2)								
POINT ID	Description	Type	Period	Co-ordinates		Grading	Density	Mitigation
Rhino SEF								
001	Rhenosterkop train station late Victorian buildings	Structure	Historic	-32.209414	22.854199	IIIC	n/a	No impact anticipated
002	Rhenosterkop train station late Victorian buildings	Structure	Historic	-32.210161	22.853453	IIIC	n/a	No impact anticipated
003	Rhenosterkop train station late Victorian buildings	Structure	Historic	-32.21064	22.853032	IIIC	n/a	No impact anticipated
005	Rhenosterkop train station late Victorian buildings	Structure	Historic	-32.210981	22.852806	IIIC	n/a	No impact anticipated
006	Rhenosterkop werf and graveyard. Victorian farmhouse, altered with Cape Dutch. Revival gables	Structure, Graves	Historic	-32.217916	22.852824	IIIA	n/a	400m Buffer
016	Extensive scatter of hornfels, chert, siltstone flakes on slightly raised platform with good views of surrounds. Points, retouched flakes, cores. Mix of MSA and LSA	Artefacts	MSA, LSA	-32.238563	22.85194	IIIB	30+	50m Buffer
045	Stock kraals with single level stone wall circles, at least 3 here, one very clear; Kraals likely historic as associated with broken glass and metal items. Also here MSA and LSA stone tools in the general area and some OES. could be non-archaeological OES	Ruin, Artefacts	Historic, MSA, LSA	-32.248934	22.840968	IIIA	30+	No Go Area 100m Buffer
046	Scratched engraving near kraals	RockArt	LSA	-32.249019	22.841232	IIIC	0 to 5	No Go Area 50m Buffer
047	Engraving on boulder higher up	RockArt	Historic	-32.248338	22.843057	IIIC	n/a	No Go Area





	ridge, possible 'R' letter and long horizontal lined drawing							50m Buffer
048	Historical graffiti: 'MG 1918'	RockArt	Historic	-32.248259	22.84274	IIIC	n/a	No Go Area 50m Buffer
049	Engraving, elephant facing right with cloud like spots above	RockArt, Artefacts	LSA	-32.248065	22.842898	IIIB	0 to 5	No Go Area 50m Buffer
050	Isolated boulder on lower slope with scraped engraving and likely more recent scratched lines. Scraped engraving not decipherable	Artefacts	LSA	-32.247175	22.843037	IIIC	n/a	No Go Area 50m Buffer
<b>Sunnyside SEF</b>								
019	Well built stone ruined kraal and old dam next to earthen dam	Ruin	Historic	-32.354327	22.828732	IIIC	n/a	No Go Area 50m Buffer
020	Ruined stone built dwelling, larger ephemeral kraal next to it, also near dam with stone edging. Metal items and glass	Ruin, Artefacts	Historic	-32.35556	22.829092	IIIC	30+	No Go Area 50m Buffer
021	Larger ruined stone dwelling, probably the main werf next to the dam. These buildings probably precede the earthen dam or are perhaps contemporaneous.	Ruin, Artefacts	Historic	-32.355149	22.827259	IIIC	30+	No Go Area 50m Buffer
022	Stone Age and historical artefacts near the werf. Metal cans marked with Cooper, Imperial Gallon etc	Artefacts	MSA, LSA, Historic	-32.35547773	22.82699579	IIIC	30+	No Go Area 50m Buffer

The proposed SEF project areas are underlain at depth by Permian continental sediments of the Lower Beaufort Group (Karoo Supergroup) assigned to the Teekloof Formation which are locally baked by dolerite dykes. Based on desktop studies, including several previous palaeontological heritage reports for the low-lying Beaufort West – Aberdeen region of the Great Karoo, as well as the recent two-day site visit, all of the Rhino and Sunnyside SEF project areas are in practice of low palaeosensitivity. No fossils were recorded from either the very poorly-exposed, weathered bedrocks nor from the overlying Late Caenozoic superficial sediments (calcrete, alluvium, surface gravels, etc.).

### 4.3 Mapping and spatialisation of heritage resources

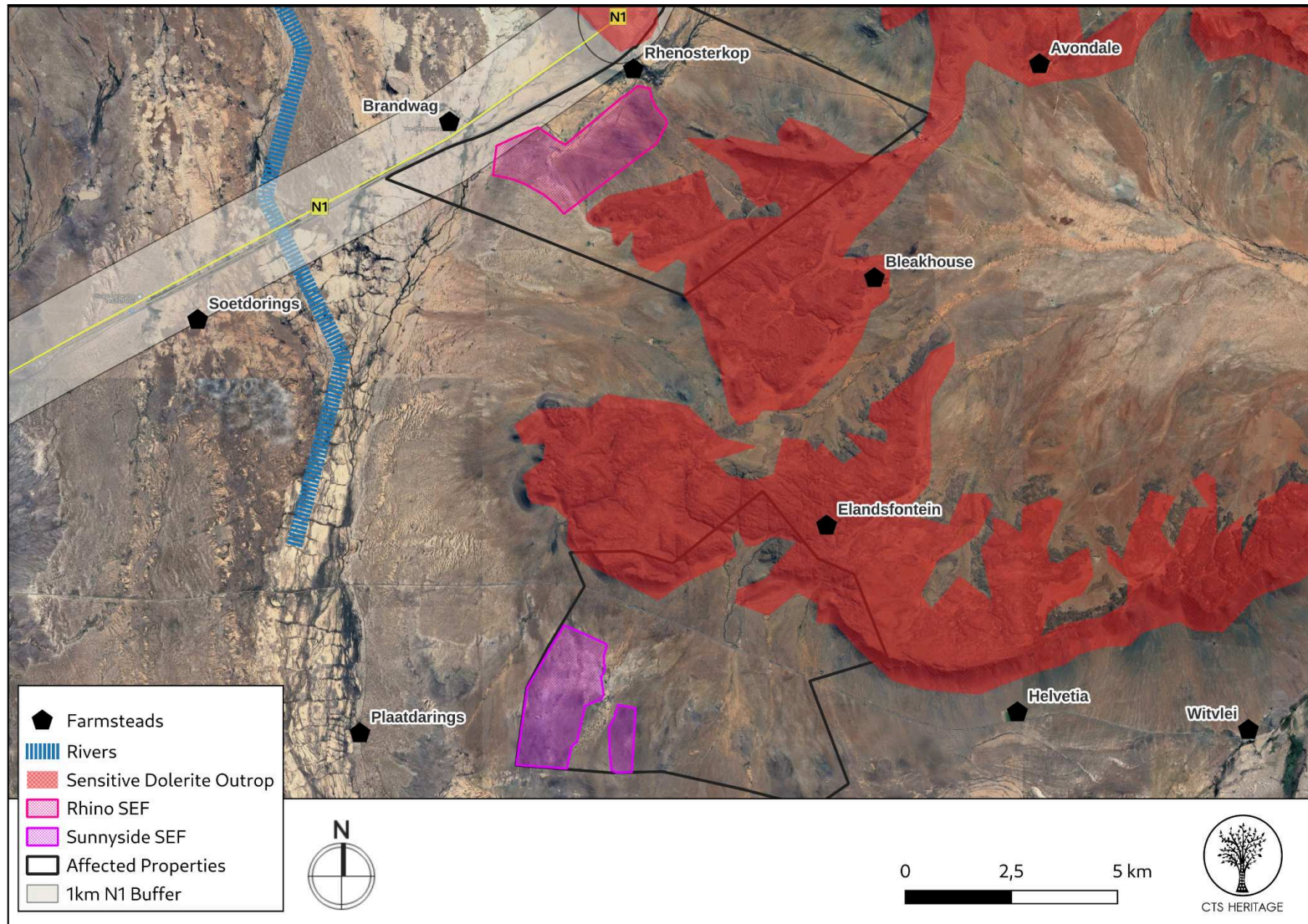


Figure 4.1: Map of sensitive receptors within the proposed development area extracted from the 1:50 000 Topo Map



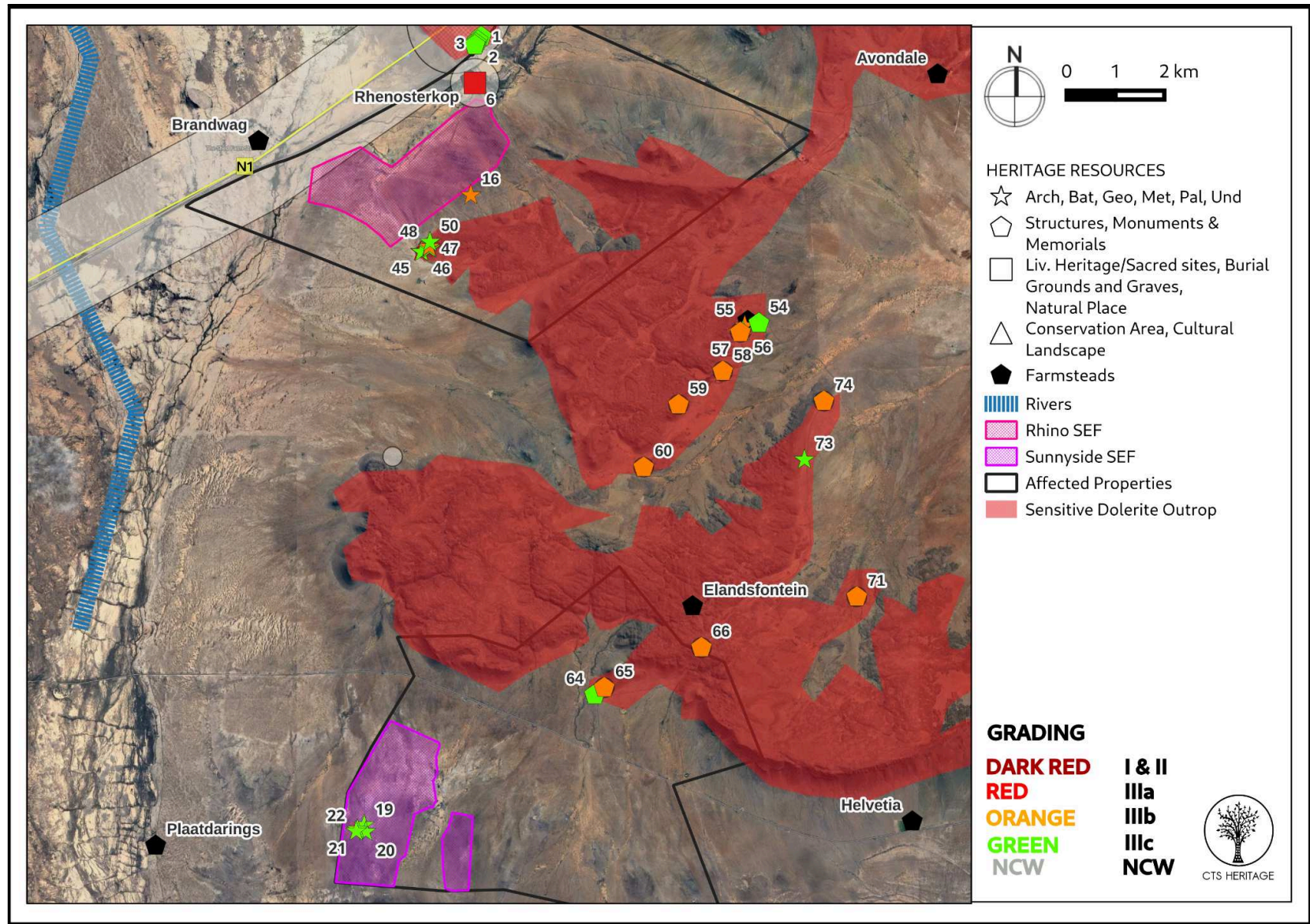


Figure 4.2: Map of archaeological heritage resources within the proposed development area



## 5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

### 5.1 Assessment of impact to Heritage Resources

#### 5.1.1 Cultural Landscape and Visual Impacts

According to the VIA completed for this project, the project is “located within a rural area comprising large, undeveloped farms with natural vegetation predominantly used for grazing. The vast, undeveloped expanse of arid landscape can be experienced by receptors as desolate. The PV array infrastructure is not consistent with the type, scale and size of the existing infrastructure in the landscape. Grid infrastructure such as substations and powerlines are and will become increasingly more common in the area around the proposed project, with existing small and large powerlines traversing the landscape throughout the project area. As such, the proposed powerline infrastructure is consistent with type, scale and size of the existing infrastructure in the landscape. The project is deemed to have moderate integrity with the surrounding landscape.”

While the site has been found to have the capacity to accommodate development of this nature, the broader landscape is regarded as having a high degree of sensitivity. The landscape comprises heritage receptors of varying degrees of sensitivity to this type of development.

**Table 5: Landscape Elements**

Landscape Element	Impact	Notes and Mitigation
Farmsteads including Bleakhouse (Grade IIIB), Elandsfontein, Rhenosterkop and The Vale	None anticipated	The proposed development is located more than 400m from any identified farm werf
Rivers, dams and water furrows including Platdoringsrivier, Renosterspruit and Rhenosterkop Dam	None anticipated	No impact to any river systems is anticipated. The development is located well away from any river and water systems
Mountain ridges and peaks which contribute to the cultural landscape including Magielskop, Renosterkop, Driekop, Bleskop, Uitspankop and Elandsfontein se Rant	None anticipated	No PV infrastructure is located on any slopes or on any of the ridges and peaks identified. The Rhino SEF falls between the scenic route of the N1 and Driekop, Rhenosterkop and Bleskop however the PV facility is located more than 800m from the N1 at its closest point and as such, this impact on the views from the N1 towards the koppies is considered negligible.
Linear elements within the landscape including movement routes and views experienced from the routes including the Nelspoort road extension from the N1, 20th century communications and electrical infrastructure and Railway infrastructure along the N1	None anticipated	The PV facility is located more than 800m from the N1 scenic route, and more than 300m from the railway line, at its closest point and as such, this impact on the views from the N1 towards the koppies is considered negligible.  The maps below reflect a 1km buffer along the N1.



### 5.1.2 Archaeology

Much of the archaeological material identified within the development area consists of low density MSA material made from locally abundant stone such as siltstone, hornfels and chert. This archaeological signature consists largely of low-density surface scatters. These low-density scatters have been determined to be Not Conservation-Worthy and as such, do not require mitigation and are not considered further here. Areas of higher density and higher significance can be avoided through the implementation of no development buffers.

#### *Rhino SEF*

While no archaeological resources of significance were identified within the area proposed for the development of the Rhino SEF, some were identified in close proximity to the development area, but outside its borders. These sites include Observation 16 which is a high-density scatter of MSA and LSA artefacts. This site is graded IIIB due to its scientific significance. While no direct impact to this site is anticipated due to its position outside of the development, a no go buffer area of 50 m is recommended around this site to ensure its conservation.

Sites 45, 46, 47, 48, 49 and 50 form a cluster of archaeological resources of high significance. Site 45 is graded IIIA due to the high local significance ascribed to rock art of this nature in this area, and Site 49 is graded IIIB due to its scientific value. The remaining archaeological sites located here are graded IIIC due to their contextual scientific significance relative to sites 45 and 49. This cluster of sites is located within the dolerite outcrops mapped in the area. No direct impact to these sites is anticipated, and the existing grid alignment runs between this cluster and the area proposed for development. While no direct impact to this cluster is anticipated due to its position outside of the development, various no-go buffer areas are recommended around this cluster to ensure its conservation.

Important to note are the high numbers of rock engravings and rock gongs associated with the dolerite outcrops in the area. No direct impact to these dolerite outcrops is anticipated, however, their archaeological sensitivity cannot be overstated and due concern in this regard must be noted.

Observation 006 reflects the position of the Rhenosterkop werf and graveyard. This werf includes a Victorian farmhouse, somewhat altered with Cape Dutch. Revival gables. Due to the high local social and spiritual significance of burial grounds, this site is determined to be Grade IIIA. No direct or indirect impact is anticipated for the burial ground. A no development buffer of 400 m is recommended around the Rhenosterkop farm werf in order to ensure that the sense of place associated with this historic farm is retained. It is also noted that a river runs between the proposed development and the werf and burial ground which assists in creating a natural hard edge to retain the sense of place.



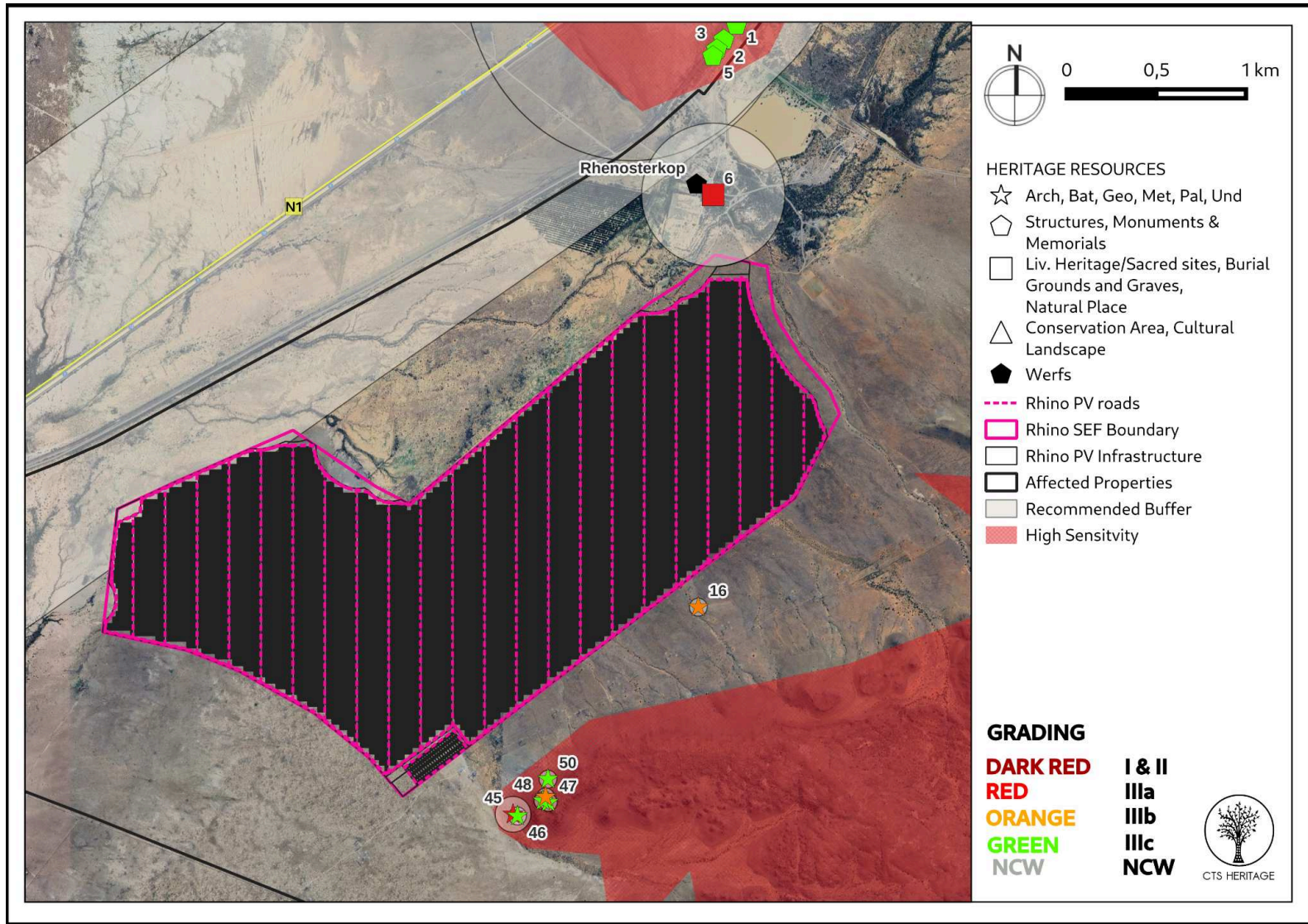


Figure 4.3a: Inset A of archaeological heritage resources within the proposed Rhino SEF development area



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### *Sunnyside SEF*

No stone age archaeological resources of significance were identified within this proposed development footprint, and the proposed development area is located well-away from the identified archaeologically sensitive dolerite outcrops.

A number of ruins of farm structures were identified within the development footprint, i.e., - Observations 19, 20, 21 and 22. These ruins are associated with the historic farming practices in this area and as such, have been determined to have contextual cultural value. These resources are Graded IIIC. A no development buffer of 50 m is recommended around these sites.

Due to the age of these ruins, and their historic nature, excavations that take place in close proximity to these ruins are more likely to negatively impact associated buried archaeological heritage. As such, an area of higher archaeological sensitivity has been identified in figures 4.3b and 4.3c below. It is recommended that this area be avoided by development activities.



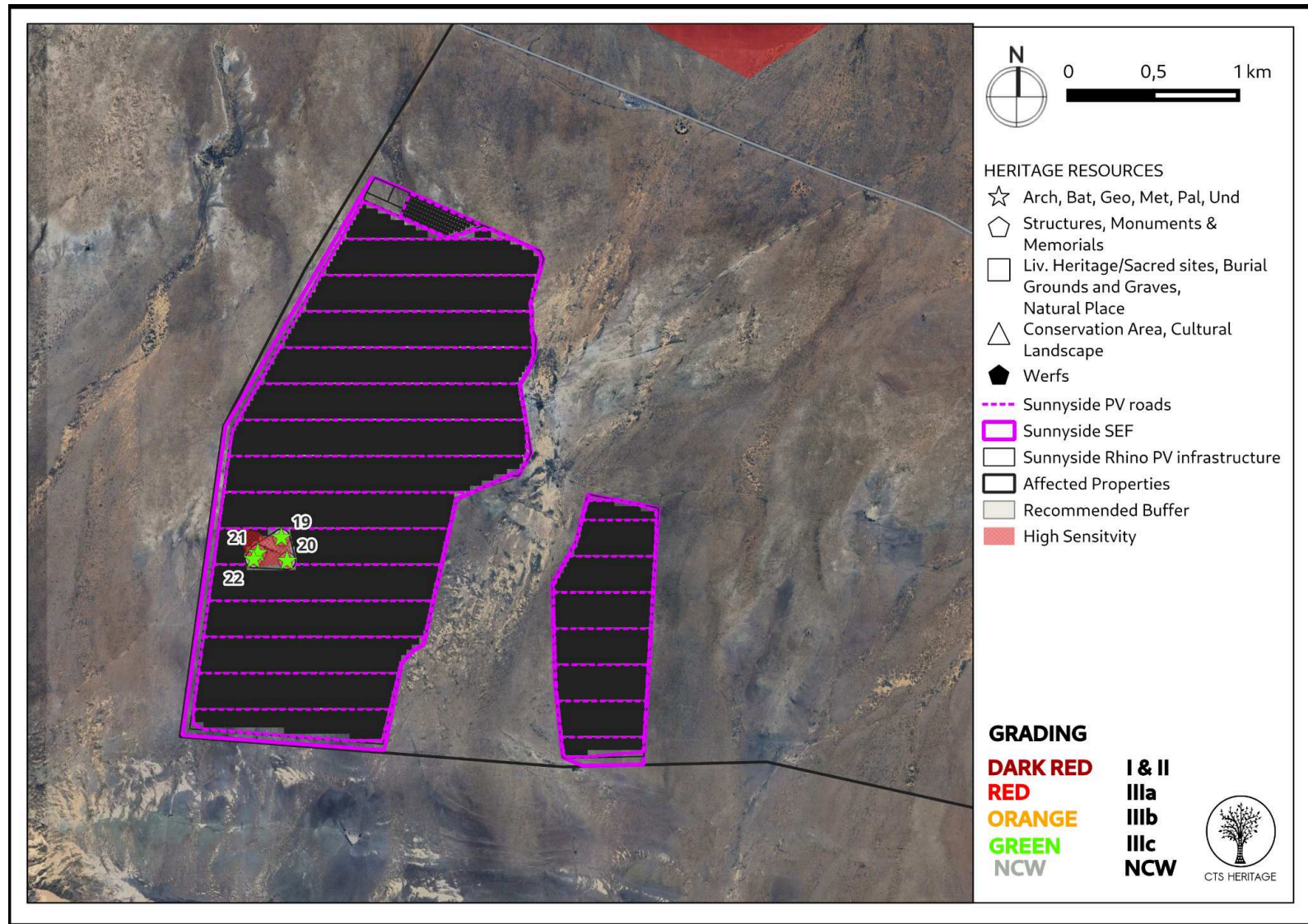


Figure 4.3b: Inset B of archaeological heritage resources within the proposed Sunnyside SEF development area





Figure 4.3c: Inset C of archaeological heritage resources within the proposed Sunnyside SEF development area



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### 5.1.3 Palaeontology

The SEF project areas are underlain at depth by Permian continental sediments of the Lower Beaufort Group (Karoo Supergroup) assigned to the Teekloof Formation which are locally baked by dolerite dykes. Based on desktop studies, including several previous palaeontological heritage reports for the low-lying Beaufort West – Aberdeen region of the Great Karoo, as well as the recent two-day site visit, all of the Rhino and Sunnyside SEF project areas are in practice of low palaeosensitivity. No fossils were recorded, from either the very poorly-exposed, weathered bedrocks nor from the overlying Late Caenozoic superficial sediments (calcrete, alluvium, surface gravels, *etc.*).

Impacts on local palaeontological heritage resources due to the proposed Rhino and Sunnyside SEF are anticipated to be of LOW significance. There are therefore no objections on palaeontological grounds to authorization of this RE project. Pending the discovery of significant new fossil remains before or during construction, no further palaeontological studies, monitoring or mitigation are recommended for this development.

Given the potential (albeit small) for the exposure or recognition of scientifically valuable fossil occurrences within the bedrocks underlying the SEF project footprints, a Chance Fossil Finds Protocol, as outlined below and tabulated in Appendix 1, must be included within the Environmental Management Programme and fully implemented throughout the construction phase of the solar project.



Table 6.1: Impacts Table

Rhino SEF																				
ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Construction Phase																				
Impacts to archaeological heritage resources	Construction activities that take place near to archaeological resources may result in their destruction	1	1	4	4	4	1	14	(-)	Negative Low	Should any previously unknown archaeological resources be impacted during construction, work must cese in the vicinity of the find and the relevant heritage authority must be contacted	1	1	4	4	4	1	14	(-)	Negative Low
Impacts to palaeontological resources	Construction activities that take place near to palaeontological resources may result in their destruction	1	2	4	4	4	1	15	(-)	Negative Low	Implementation of the Chance Fossil Finds Protocol	1	2	4	4	4	1	15	(-)	Negative Low
Operational Phase																				
Impacts to archaeological heritage resources	Operational activities that take place near to archaeological resources may result in their destruction	1	1	4	1	4	1	11	(-)	Negative Low	Should any previously unknown archaeological resources be impacted during construction, work must cese in the vicinity of the find and the relevant heritage authority must be contacted	1	1	4	1	4	1	11	(-)	Negative Low
Impacts to palaeontological resources	Operational activities that take place near to palaeontological resources may result in their destruction	1	1	4	1	4	3	33	(-)	Negative Medium	Implementation of the Chance Fossil Finds Protocol	1	1	4	1	4	1	11	(-)	Negative Low
Decommissioning Phase																				
Impacts to archaeological heritage resources	Decommissioning activities that take place near to archaeological resources may result in their destruction	1	1	4	4	4	1	14	(-)	Negative Low	Should any previously unknown archaeological resources be impacted during construction, work must cese in the vicinity of the find and the relevant heritage authority must be contacted	1	1	4	4	4	1	14	(-)	Negative Low
Impacts to palaeontological resources	Decommissioning activities that take place near to palaeontological resources may result in their destruction	1	2	4	4	4	1	15	(-)	Negative Low	Implementation of the Chance Fossil Finds Protocol	1	2	4	4	4	1	15	(-)	Negative Low
Cumulative																				
Impacts to archaeological heritage resources	Cumulative destruction of significant archaeological heritage	1	1	4	1	4	1	11	(-)	Negative Low	Should any previously unknown archaeological resources be impacted during construction, work must cese in the vicinity of the find and the relevant heritage authority must be contacted	1	1	4	1	4	1	11	(-)	Negative Low

Impacts to palaeontological resources	Cumulative destruction of significant palaeontological heritage	1	2	4	3	4	3	42	(-)	Negative Medium	Implementation of the Chance Fossil Finds Protocol	1	1	4	1	4	1	11	(-)	Negative Low
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Table 6.2: Impacts Table

Sunnyside WEF																				
ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S		E	P	R	L	D	I / M	TOTAL	STATUS (+ OR -)	S
Construction Phase																				
Impacts to archaeological heritage resources	Construction activities that take place near to archaeological resources may result in their destruction	1	1	4	4	4	1	14	(-)	Negative Low	No development activities within the high archaeological sensitivity area identified Should any previously unknown archaeological resources be impacted during construction, work must cease in the vicinity of the find and the relevant heritage authority must be contacted	1	1	4	4	4	1	14	(-)	Negative Low
Impacts to palaeontological resources	Construction activities that take place near to palaeontological resources may result in their destruction	1	2	4	4	4	1	15	(-)	Negative Low	Implementation of the Chance Fossil Finds Protocol	1	2	4	4	4	1	15	(-)	Negative Low
Operational Phase																				
Impacts to archaeological heritage resources	Operational activities that take place near to archaeological resources may result in their destruction	1	1	4	1	4	1	11	(-)	Negative Low	No development activities within the high archaeological sensitivity area identified Should any previously unknown archaeological resources be impacted during construction, work must cease in the vicinity of the find and the relevant heritage authority must be contacted	1	1	4	1	4	1	11	(-)	Negative Low
Impacts to palaeontological resources	Operational activities that take place near to palaeontological resources may result in their destruction	1	1	4	1	4	3	33	(-)	Negative Medium	Implementation of the Chance Fossil Finds Protocol	1	1	4	1	4	1	11	(-)	Negative Low
Decommissioning Phase																				
Impacts to archaeological heritage resources	Decommissioning activities that take place near to archaeological resources may result in their destruction	1	1	4	4	4	1	14	(-)	Negative Low	No development activities within the high archaeological sensitivity area identified Should any previously unknown archaeological resources be impacted during construction, work must cease in the vicinity of the find and the relevant heritage authority must be contacted	1	1	4	4	4	1	14	(-)	Negative Low
Impacts to palaeontological resources	Decommissioning activities that take place near to palaeontological resources may result in their destruction	1	2	4	4	4	1	15	(-)	Negative Low	Implementation of the Chance Fossil Finds Protocol	1	2	4	4	4	1	15	(-)	Negative Low
Cumulative																				
Impacts to archaeological heritage resources	Cumulative destruction of significant archaeological heritage	1	1	4	1	4	1	11	(-)	Negative Low	No development activities within the high archaeological sensitivity area identified Should any previously unknown archaeological resources be impacted during construction, work must cease in the vicinity of the find and the relevant heritage authority must be contacted	1	1	4	1	4	1	11	(-)	Negative Low

Impacts to palaeontological resources	Cumulative destruction of significant palaeontological heritage	1	2	4	3	4	3	42	(-)	Negative Medium	Implementation of the Chance Fossil Finds Protocol	1	1	4	1	4	1	11	(-)	Negative Low
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## 5.2 Sustainable Social and Economic Benefit

According to information received from the EAP, the following socio-economic benefits are anticipated to be derived from this project:

### - CONSTRUCTION PHASE

The construction period is expected to be approximately eighteen (18) months. Different construction teams will be utilised for the duration of the construction period. During the peak of the construction phase, it is estimated that two-hundred and fifty (250) workers would be on site. The construction related opportunities would require unskilled, semi-skilled and highly skilled individuals. The low skilled positions would make up the bulk of the staff component (220 individuals), with twenty (20) medium skilled and ten (10) highly skilled individuals.

### - OPERATION PHASE

The PV facility will employ approximately 2 sixty (60) individuals as part of the permanent employees during the operational phase. High skilled workers would constitute less than 10% (approximately 4 individuals), with the medium skilled workers comprising approximately 20% of the workforce (approximately 12 individuals) and the low or unskilled workers 76% (approximately 46 individuals).

The above employment opportunities in addition to the anticipated benefits in terms of renewable energy generation outweigh the anticipated negative impacts to heritage resources on condition that the recommendations below are implemented.

## 5.3 Proposed development alternatives

The proposed solar PV facilities form part of a larger proposed RE development which includes both solar and wind energy facilities (WEFs). Currently, there are two SEF clusters proposed, Rhino and Sunnyside. The WEF is referred to as “Rhino WEF” of which a small portion extends into Farm Rhenosterkop 155 and Farm 400. The two solar PV sites and the WEF are owned by two different companies whose development is being managed by the applicant.

An Environmental Site Establishment (ESE) process was undertaken from September 2022 to January 2023 to screen the greater project site from an environmental and social perspective. The ESE process included both desktop studies as well as on-site surveys by avifauna, bat, ecology and heritage specialists. The aim of the ESE was to define the scope of the BA phase of the project.

Originally, for the solar PV facility, the farm Rhenosterkop 155 was identified as most suitable from a topographic, local, and environmental perspective. However, due to an avifauna (Martial Eagle) perspective no-development





buffer, the development area was reduced significantly. Furthermore, the landowner did not support solar PV facility development on some sections of the property due to (a) agriculture preference, and (b) the development's potential visual impact as the development would be within direct view of the guest house existing in the farm. To ensure that the project remains feasible, alternative sites were identified to compensate for the 'lost' capacity. The landowners were consulted, and due to the discussions undertaken, agreed to the solar PV development under certain conditions.

Development proposed on Farm 400 needed to be located to the southwest of the property so that it is not visible from the farmstead. A layout was then developed and discussed with the landowner which was agreed upon (Figure 2). Presented with the proposed development area, the landowner noted their support of the development, and that development would be within an area that is not preferred by sheep for grazing that always migrate back to the preferred areas (green polygon) as shown in Figure 5.1.

For Farm Rhenosterkop 155, the development footprint was reduced to what is shown in Figure 5.2 below. The layouts consider the ESE results, and the landowner's comments and recommendations. Other alternative locations were identified and assessed from a development perspective. The alternative locations, including surrounding farms, are less desirable to develop due to increased distance from the cluster. From a financial and environmental perspective, the development of other properties would also require additional servitudes that may not be feasible.

The specialist constraints were considered in developing the proposed design and layout. This exercise also fed into the constraints mapping to identify the most suitable areas for the development of a solar PV facility which is envisaged to result in the least environmental and social impact. In considering the specialist limitations identified in the screening phase, three no-go areas have been identified and excluded from the proposed development as restricted areas are not suitable for the installation of PV modules. The final available land area covers 498.09 ha.

This site is preferred due to the suitable climate, conditions and topography including close proximity to the national grid. Based on the above site-specific attributes, the study area is considered highly preferred in terms of the development of solar and WEFs. As such, no further property/ location alternatives have been considered.

Considering the above, no further alternatives have been considered for the proposed solar PV facility.

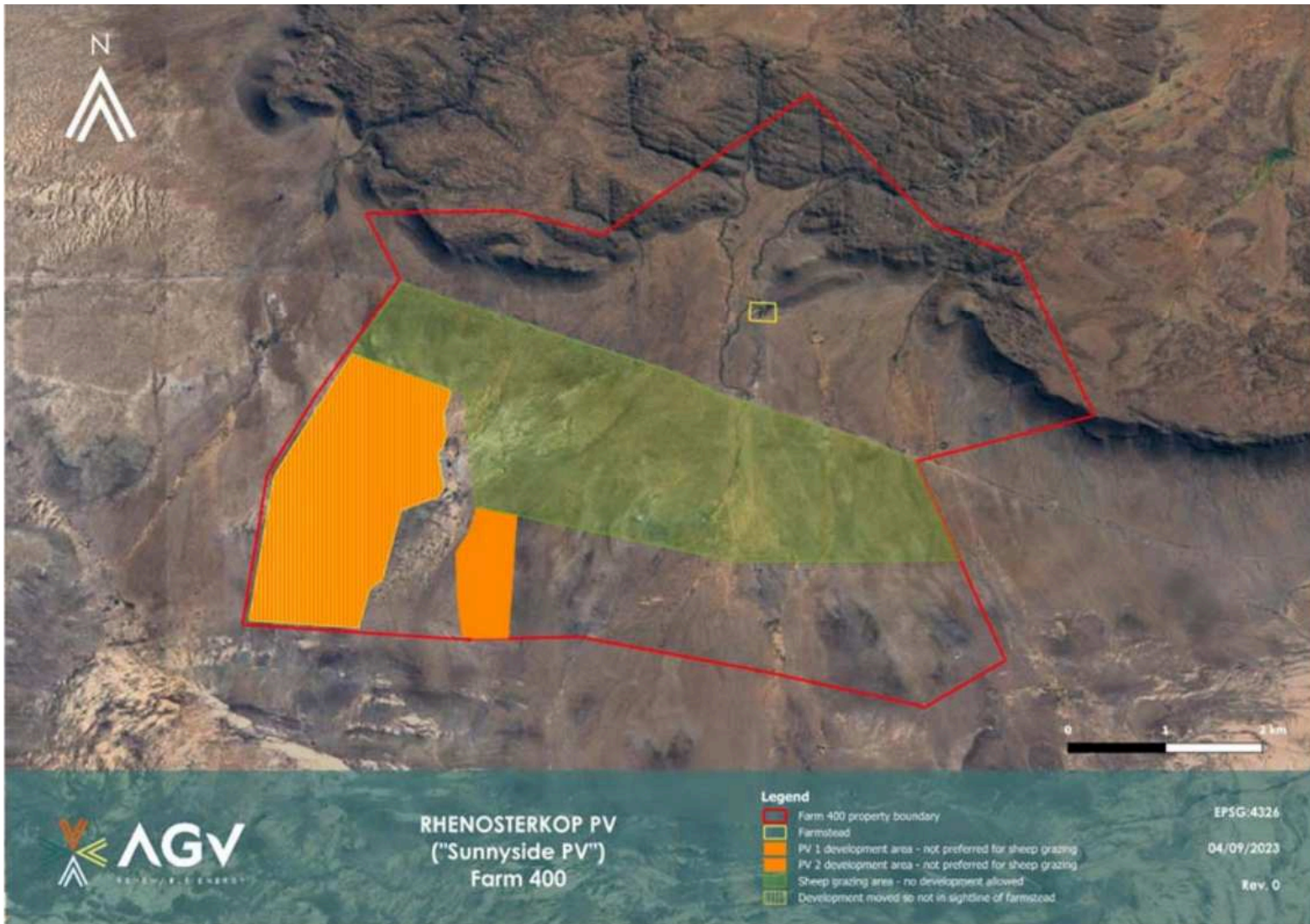


Figure 5.1: Sunnyside, original development area (green) versus agreed upon development area (orange)



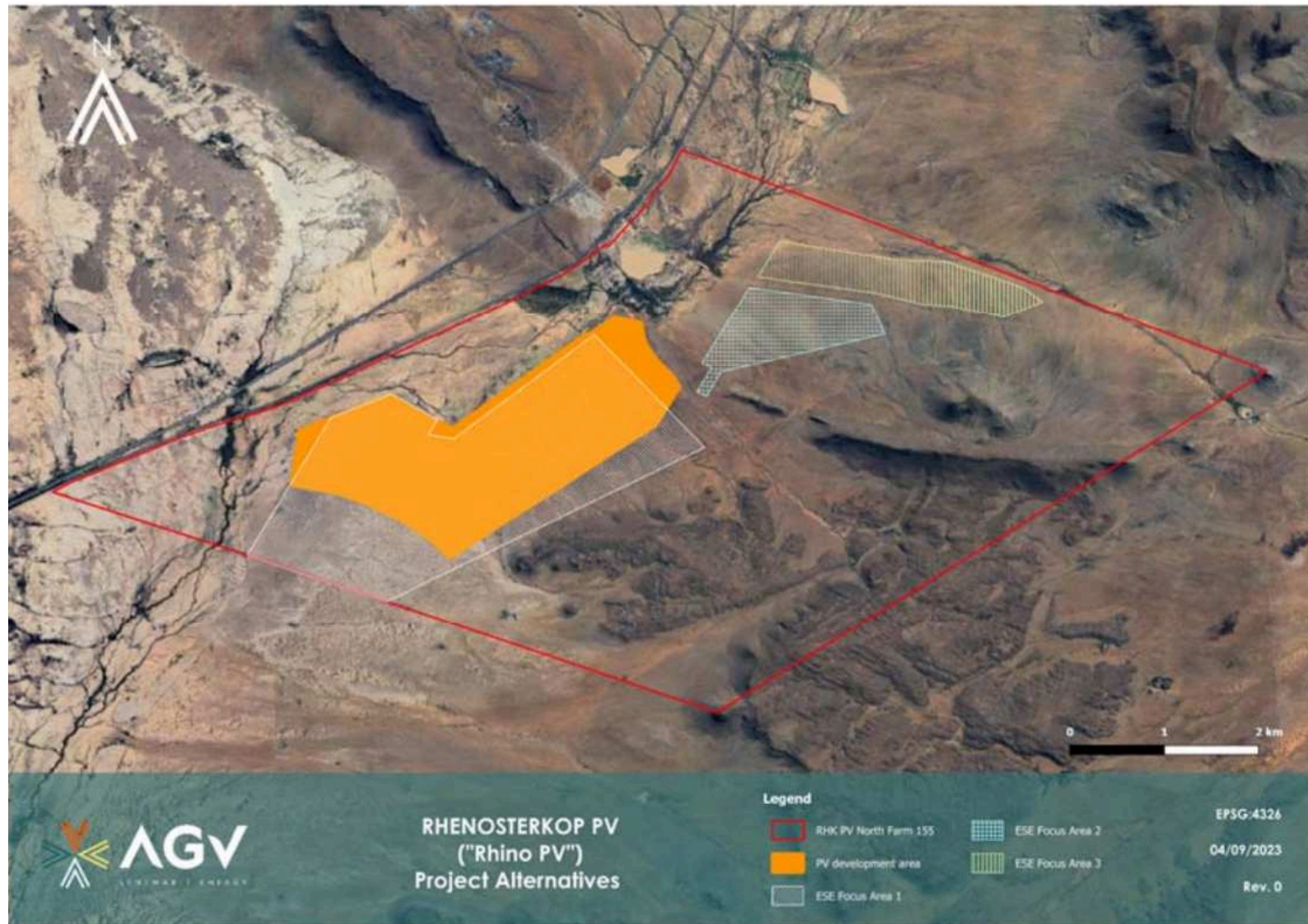


Figure 5.2: Rhino, original development area (white, blue and green) versus agreed upon development area (orange)



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### ***Technology Alternatives***

No other activity alternatives are being considered. RE development in South Africa is highly desirable from a social, environmental and development point of view and a solar energy installation is more suitable for the site due to the high solar resource.

### ***Layout Alternatives***

Refer to “Location Alternatives” above. Additionally, layout alternatives were further refined upon availability of all specialist sensitivities.

### ***No-Go Alternative***

The ‘no-go’ alternative is the option of not undertaking the proposed SEF project. Hence, if the ‘no-go’ option is implemented, there would be no development. This alternative would result in no environmental impacts from the proposed project on the site or surrounding local area. It provides the baseline against which other alternatives are compared and will be considered throughout the report.

## **5.4 Site Verification**

### ***Rhino SEF***

According to the National Web-Based Environmental Screening Tool (Screening Tool) analysis, the development area has VERY HIGH levels of sensitivity for palaeontological heritage and LOW levels of sensitivity for archaeological and cultural heritage resources. The results of this assessment in terms of site sensitivity verification (SSV) are summarised below:

- The cultural value of the broader area has significance in terms of its wilderness qualities and frontier history (MODERATE)
- Significant archaeological resources have been identified within the broader area, however, only low significance resources have been found within this footprint (MODERATE)
- No highly significant palaeontological resources were identified within the development footprint, and the geology underlying the development area is not very sensitive for impacts to significant fossils (LOW)

As per the findings of this assessment, and its supporting documentation, the outcome of the SSV disputes the results of the Screening Tool for Palaeontology, this should be considered to be LOW, and disputes the results of the Screening Tool for archaeology and cultural heritage, this should be considered to be MODERATE. This evidence is provided in the body of the HIA report and in its appendices.





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### ***Sunnyside SEF***

According to the Screening Tool analysis, the development area has VERY HIGH (larger site to the west) and LOW (smaller site to the east) levels of sensitivity for palaeontological heritage and LOW (both sites) levels of sensitivity for archaeological and cultural heritage resources. The results of this assessment in terms of SSV are summarised below:

- The cultural value of the broader area has significance in terms of its wilderness qualities and frontier history (MODERATE)
- Significant archaeological resources have been identified within the broader area, however, only low significance resources have been found within this footprint (MODERATE)
- No highly significant palaeontological resources were identified within the development footprint, and the geology underlying the development area is not very sensitive for impacts to significant fossils (LOW)

As per the findings of this assessment, and its supporting documentation, the outcome of the SSV disputes the results of the Screening Tool for Palaeontology, this should be considered to be LOW, and disputes the results of the Screening Tool for archaeology and cultural heritage, this should be considered to be MODERATE. This evidence is provided in the body of the HIA report and in its appendices.

## **5.5 Cumulative Impacts**

The cumulative impact of a development is the impact that development will have when its impact is added to the incremental impacts of other past, present or reasonably foreseeable future activities that will affect the same environment. It is important to note that the cumulative impact assessment for a particular project, like what is being done here, is not the same as an assessment of the impact of all surrounding projects. The cumulative assessment for this project is an assessment only of the impacts associated with this project, but seen in the context of all surrounding impacts. It is concerned with this project's contribution to the overall impact, within the context of the overall impact. But it is not simply the overall impact itself.

The most important concept related to a cumulative impact is that of an acceptable level of change to an environment. A cumulative impact only becomes relevant when the impact of the proposed development will lead directly to the sum of impacts of all developments causing an acceptable level of change to be exceeded in the surrounding area. If the impact of the development being assessed does not cause that level to be exceeded, then the cumulative impact associated with that development is not significant.

In REDZ areas, there is a reasonable expectation that the cultural landscape of an area will be changed to be dominated, or at least heavily altered, by RE development. In fact, this is the intention of the REDZ areas.



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In terms of cumulative impacts to heritage resources, impacts to archaeological and palaeontological resources are sufficiently dealt with on a case-by-case basis. The primary concern from a cumulative impact perspective would be to the cultural landscape. The cultural landscape is defined as the interaction between people and the places that they have occupied and impacted. In some places in South Africa, the cultural landscape can be more than 1 million years old where we find evidence of ESA archaeology (up to 2 million years old), MSA archaeology (up to 200 000 years old), LSA archaeology (up to 20 000 years old), evidence of indigenous herder populations (up to 2 000 years old) as well as evidence of colonial frontier settlement (up to 300 years old) and more recent agricultural layers.

Modern interventions into such landscapes, such as RE development, constitute an additional layer onto the cultural landscape which must be acceptable in REDZ areas. The primary risk in terms of negative impact to the cultural landscape resulting from RE development lies in the eradication of older layers that make up the cultural landscape. There are various ways that such impact can be mitigated.

In terms of impacts to heritage resources, it is preferred that this kind of infrastructure development is concentrated in one location and is not sprawled across an otherwise agricultural landscape. The proposed development is, therefore, unlikely to result in unacceptable risk or loss, nor will the proposed development result in a complete change to the sense of place of the area or result in an unacceptable increase in impact due to its location as one of many RE facilities in this area. Furthermore, this development is located within the Beaufort West REDZ, an area that has been pre-identified as suitable for RE development and as such, cumulative impact is expected in this area.

The landscape within which the proposed project areas are located, is not worthy of formal protection as a heritage resource and has the capacity to accommodate such development from a heritage perspective.

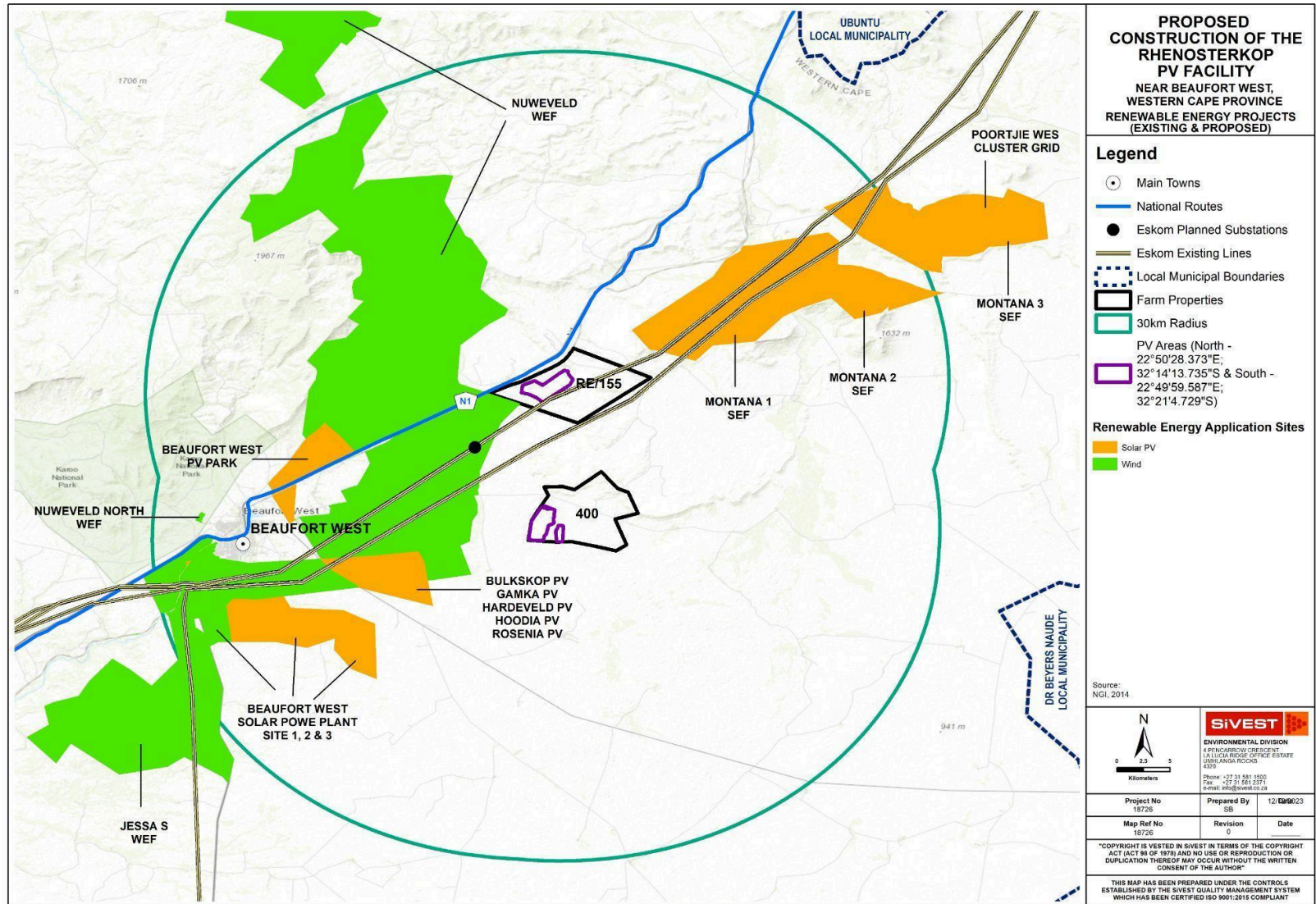


Figure 6: Cumulative Impact Map



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## 6. RESULTS OF PUBLIC CONSULTATION

No Heritage Conservation Bodies are registered on the HWC database for the area proposed for development - the proposed development falls just outside of the area identified by the Simon van der Stel Foundation, Southern Cape. As such, in terms of the HWC Guidelines for HIAs which apply to this application, the relevant Local Authorities - Beaufort West in the Western Cape - and the Simon van der Stel Foundation are provided with 30 days in which to comment on the DRAFT HIA. Evidence of this consultation is provided in Appendix 6.

As this application is made in terms of NEMA, the public consultation on the HIA will take place with the broader public consultation process required for the BA process and will be managed by the lead environmental consultants on the project.

## 7. CONCLUSION

The site forms part of a low significance cultural landscape representative of the Central Plateau of the Great Karoo possessing heritage value for historical, aesthetic, architectural, social and scientific reasons. The site possesses some landscape elements contributing to a composite cultural landscape, however, this particular area is already dominated by existing infrastructure. The addition of the proposed PV facility is, therefore, unlikely to negatively impact on any significant cultural landscape elements within this immediate context, or the broader context. The proposed development is located sufficiently far from the N1 scenic route, existing railway infrastructure and the Rhenosterkop farmstead that the anticipated impact to the heritage significance of these resources is considered to be negligible.

Although the broader area has archaeological significance in terms of the sensitive dolerite outcrops in the area and associated rock art sites, no archaeological resources of significance were identified within the area proposed for the Rhino SEF. No further mitigation is recommended. A number of ruins of farm structures were identified within the development footprint for the Sunnyside SEF. These ruins are associated with the historic farming practices in this area and as such, have been determined to have contextual cultural value. These resources are Graded IIIC. A no development buffer of 50 m is recommended around these sites.

Due to the age of these ruins, and their historic nature, excavations that take place in close proximity to these ruins are more likely to negatively impact associated buried archaeological heritage. As such, an area of higher archaeological sensitivity has been identified in figures 4.3b and 4.3c. It is recommended that this area be avoided by development activities.

No observations of palaeontological significance were noted within the area proposed for development. However,





the geology underlying the development area remains sensitive for impacts to significant palaeontological heritage. There are limited impacts anticipated to archaeological and palaeontological heritage from this proposed development and as such, the principle of a RE facility in this location is supported from a heritage perspective as the infrastructure is located in an area able to tolerate the impact of the proposed PV infrastructure.

## 8. RECOMMENDATIONS

Based on the outcomes of this report, it is not anticipated that the proposed development will negatively impact on significant heritage resources on condition that:

- The buffers recommended in **Table 4**, and illustrated in Figures 4.3a, 4.3b and 4.3c are implemented.
- The HWC Chance Fossil Finds Procedure is implemented for the duration of construction activities.
- The recommendations of the VIA are implemented.
- Although all possible care has been taken to identify sites of cultural importance during the investigation of the study area, it is always possible that hidden or subsurface sites could be overlooked during the assessment. If any evidence of archaeological sites or remains (e.g., remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials or other categories of heritage resources are found during the proposed development, work must cease in the vicinity of the find and SAHRA must be alerted immediately to determine an appropriate way forward.



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**Table 7: Input to the EMPr for the Construction Phase**

Impact/Aspect	Mitigation/Management Actions	Responsibility	Methodology	Mitigation/Management Objectives and Outcomes	Frequency
Impact to significant archaeology	If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials or other categories of heritage resources are found during the proposed development, work must cease in the vicinity of the find and SAHRA must be alerted immediately to determine an appropriate way forward.	ECO	NA	Conservation of significant resources	Daily
Impact to significant palaeontology	If Palaeontological Heritage is uncovered during surface clearing and excavations ECO should be informed immediately. Fossil discoveries ought to be protected and the ECO/site manager must report to South African Heritage Resources Agency (SAHRA) so that mitigation (recording and collection) can be carried out.	ECO	NA	Conservation of significant resources	Daily



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## 9. REFERENCES

Heritage Impact Assessments				
Nid	Report Type	Author/s	Date	Title
5014	AIA Phase 1	Julius CC Pistorius	01/06/2007	A Phase 1 Heritage Impact Assessment Study for the Proposed New 88 kV Power Line Running from the Majuba Power Station near Amersfoort to the Camden Power Station near Ermelo in the Mpumalanga Province
5749	AIA Phase 1	Julius CC Pistorius	01/05/2003	Heritage Impact Assessment Study for Eskom's Proposed New Power Line on the Farms Driefontein 114 IT and Lettieskeus 105 IT near Chrissiesmeer, Mpumalanga
5829	HIA Phase 1	Polke Birkholtz	02/04/2008	Phase 1 Heritage Impact Assessment for the Lothier Siding for Golfview Mining (Pty) Ltd. on the Farm Leliefontein 136 IT Portion 6 in the Vicinity of Ermelo, Mpumalanga Province, South Africa
6382	AIA Phase 1	Wouter Fourie	28/11/2008	Archaeological Impact Assessment: Camden Power Station Rail Expansion Project on Portions of the Farm Mooiplaats 290 IT and the Farm Camden Power Station 329 IT, District Ermelo, Mpumalanga
7957	AIA Phase 1	Wouter Fourie	23/05/2008	Archaeological Impact Assessment Proposed Mining Development for Xstrata Group - Spitzkop Mine, Breyten - Ermelo Region, Mpumalanga Province Version 2.0
8200	AIA Phase 1	Polke Birkholtz	07/11/2008	Voorslag Siding for SA Coal Mining Holdings on the Farm Voorslag 274 IS Portion 10 of Ptn of Ptn of Ptn 5
16357	AIA Phase 1	Anton van Vollenhoven	01/06/2012	A Report on a Heritage Impact Assessment for a proposed opencast Coal Mine on the farms Joubertsvele 260IT and Meppel 264It close to Ermelo, Mpumalanga Province.
108270	AIA Phase 1	Tobias Coetzee		ARCHAEOLOGICAL IMPACT ASSESSMENT: Vunene Mining
110581	AIA Phase 1	Tobias Coetzee	15/02/2013	Phase 1 AIA for the proposed relocation of the Umlabu Colliery processing plant between Ermelo and Breyten, Mpumalanga
114858	HIA Phase 1	Stephan Gaigher	13/12/2011	First Phase Heritage Impact Assessment for the Proposed Extension to the Camden Ash Disposal Facilities
116756	AIA Phase 1	Jean-Pierre Celliers	22/01/2013	Report on Phase 1 Archaeological Impact Assessment on Portion 22 of the farm Witpunt 267 IT, Ermelo, Mpumalanga Province.
133732	HIA Phase 1	Johnny Van Schalkwyk	29/01/2014	Cultural Heritage Impact Assessment Report for the development of the proposed Ermelo Ring Road, Mpumalanga Province
145653	AIA Phase 1	Munyadziwa Magoma	30/05/2011	PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT SPECIALIST STUDY REPORT FOR THE PROPOSED TOWNSHIP ESTABLISHMENT OF 5760 STANDS ON PORTION 6 OF FARM RIETSPRUIT 437-IS IN ERMELO REGION



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				WITHIN MSUKALIGWA LOCAL MUNICIPALITY OF GERT SIBANDE DISTRICT, MPUMALANGA PROVINCE.
152426	PIA Desktop	John E Almond	31/10/2013	RECOMMENDED EXEMPTION FROM FURTHER PALAEONTOLOGICAL STUDIES: PROPOSED AGGREGATE MINE ON PORTION 7 OF FARM ROODEPOORT 435 NEAR ERMELO, MPUMALANGA
152427	AIA Phase 1	Jaco van der Walt	31/10/2013	Archaeological Impact Assessment For the proposed Mine on De Roodepoort 435, IS, Mpumalanga Province
162098	HIA Phase 1	Johnny Van Schalkwyk	01/09/2013	Cultural heritage impact assessment for THE PROPOSED SWAZILAND RAIL LINK, WESTERN SECTION, MPUMALANGA REGION
163823	HIA Phase 1	Udo Kusel	24/02/2014	CULTURAL HERITAGE RESOURCES IMPACT ASSESSMENT FOR THE REMAINDER OF PORTION 89 OF THE FARM NOOITGEDACHT 268 IT ERMELO MPUMALANGA PROVINCE
164257	Palaeontological Specialist Reports	Gideon Groenewald	15/02/2014	Paleontological desktop assessment for the proposed upgrade of the Davel to Nerston Rail Line in the Mpumalanga Province
164316	Palaeontological Specialist Reports	Gideon Groenewald	16/02/2014	Palaeontological Desktop Assessment for the proposed upgrade of the Golela to Nsezi Line in KwaZulu - Natal Province.
182088	PIA Phase 1	Heidi Fourie	23/09/2014	Phase 1 Palaeontological Impact Assessment for the Proposed Relocation of the Umlabu Coal Handling and Preparation Plant and Tailings Storage Facility to Portions 5 and 10 of the Farm Voorslag 274 IS.
182097	AIA Phase 1	Tobias Coetzee	10/10/2014	Phase 1 Archaeological Impact Assessment for the Proposed Relocation of the Coal Handling and Preparation Plant and Tailings Storage Facility to Portions 5 and 10 of the Farm Voorslag 274 IS
182469	AIA Phase 1	Christine Van Wyk Rowe	21/11/2014	Phase 1 Archaeological and Heritage impact assessment for the proposed Bahlangene residential township establishment on portion 2 of the farm Langverwacht 293, Ermelo, Mpumalanga province
183145	Heritage Impact Assessment Specialist Reports	Wouter Fourie, Jennifer Kitto	31/10/2013	Heritage Impact Assessment (HIA) for expansion of mining activities on Portion 25 of the farm Witbank No 262 IT, Ferreirás Extension of Penumbra Mine, near Ermelo, Gert Sibande District Municipality, Mpumalanga Province.
342931	PIA Desktop	Barry Millstead	22/02/2014	Desktop Palaeontological Heritage Impact Assessment Report on the site of four alternative road locations (Alternatives 1-4) for a proposed ring road around Ermelo, Mpumalanga Province
374698	BGG Phase 3	Henk Steyn	17/10/2016	Msobo Coal (Spitzkop Colliery) Test Excavation on portion 15 of the Farm Waterval 244 IS





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## APPENDICES



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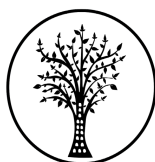
## **APPENDIX 1: Archaeological Assessment (2023)**

# ARCHAEOLOGICAL SPECIALIST STUDY

In terms of Section 38(8) of the NHRA for the

## **PROPOSED SOLAR PHOTOVOLTAIC FACILITY, “RHINO PV” ON REMAINDER OF FARM RHENOSTERKOP 155 AND “SUNNYSIDE PV” ON FARM 400, BEAUFORT WEST**

Prepared by



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**Jenna Lavin**

**Nic Wiltshire**

In Association with

**SiVEST SA (Pty) Ltd**

January 2024



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## EXECUTIVE SUMMARY

K2022578692 South Africa (Pty) Ltd, has appointed SiVEST SA (Pty) Ltd (SiVEST) to undertake the required Basic Assessment process for the proposed development of the 500 megawatt alternating current (MWac) solar PV facility and associated infrastructure, to be located approximately 20 kilometres (km) to the east of and north-east of Beaufort West in the Western Cape Province. The project is being developed either to supply the national grid under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or similar procurement programme.

Much of the archaeological material identified within the development area consists of low density MSA material made from locally abundant stone such as siltstone, hornfels and chert. This archaeological signature consists largely of low density surface scatters. Areas of higher density and higher significance can be avoided through the implementation of no development buffers. These buffers are noted in Tables 2.1 and 2.2 and in Figures 7.1, 7.2 and 7.3.

Important to note are the high numbers of rock engravings and rock gongs associated with the dolerite outcrops in the area. No direct impact to these dolerite outcrops is anticipated, however, their archaeological sensitivity cannot be overstated and due concern in this regard must be noted.

### ***Recommendations***

Based on the outcomes of this report, it is not anticipated that the proposed development will negatively impact on significant archaeological heritage on condition that:

- The buffers recommended in Tables 2.1 and 2.2, and illustrated in Figures 7.1, 7.2 and 7.3 are implemented.
- Although all possible care has been taken to identify sites of cultural importance during the investigation of the study area, it is always possible that hidden or subsurface sites could be overlooked during the assessment. If any evidence of archaeological sites or remains (e.g., remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials or other categories of heritage resources are found during the proposed development, work must cease in the vicinity of the find and HWC must be alerted immediately to determine an appropriate way forward.





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## 1. INTRODUCTION

### 1.1 Background Information on Project

K2022578692 South Africa (Pty) Ltd, has appointed SiVEST SA (Pty) Ltd (SiVEST) to undertake the required Basic Assessment (BA) process for the proposed development of the 500 megawatt alternating current (MWac) solar photovoltaic (PV) facility and associated infrastructure, to be located approximately 20 kilometres (km) to the east and north-east of Beaufort West in the Western Cape Province. The project is being developed either to supply the national grid under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or similar procurement programme.

The applicant intends to develop a solar energy facility (SEF) and associated infrastructure on Remainder of farm Rhenosterkop 155 and Farm 400, Western Cape Province.

The term PV describes a solid-state electronic cell that produces direct current electrical energy from the radiant energy of the sun through a process known as the PV Effect. This refers to light energy placing electrons into a higher state of energy to create electricity. Each PV cell is made of silicon (i.e., semiconductors), which is positively and negatively charged on either side, with electrical conductors attached to both sides to form a circuit. This circuit captures the released electrons in the form of an electric current (direct current). The key components of the proposed project are described in the table below:

**Table 1: Technical Details of the proposed Project**

TECHNICAL DETAILS	
PV panels	<ul style="list-style-type: none"> <li>· Mono- or bifacial panels will be used, not thin film.</li> <li>· Panel width and height (TBC during detail design phase).</li> <li>· Expected panel dimensions: <ul style="list-style-type: none"> <li>o Width: 1 – 1.3 metres (m)</li> <li>o Height: 2 – 2.4 m</li> </ul> </li> </ul>
Access roads	<ul style="list-style-type: none"> <li>· 6 – 8 m access roads +15%</li> <li>· 4 m internal roads</li> </ul>
On-site Substation	<ul style="list-style-type: none"> <li>· One 132 kilovolt (kV)</li> <li>· 21 m height</li> <li>· Substation will step up voltage from 33 to 132 kV</li> <li>· Various transformers will be located within the PV area. These will combine the power from multiple inverters and step up the supply voltage from 800 volts to 33 kV. The expected capacity of these transformers are in the range of 2.5 megavolt ampere each</li> <li>· Note that the voltage levels are estimates and subject to confirmation/change during the detail design phase of the project</li> </ul>
Construction camp	<ul style="list-style-type: none"> <li>· 1 per site</li> <li>· Temporary containers: 1 ha per site</li> </ul>



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Temporary construction laydown / staging area	· 2 ha within the development area – laydown
Operation and Maintenance (O&M) buildings	· 1 ha construction camps will become the operational site camp offices, workshop areas, O&M building, permanent parking area, storage area
On-site Independent Power Producer Electrical infrastructure	<ul style="list-style-type: none"> <li>· Medium voltage cabling will link the PV installation with the grid connection infrastructure at 33 kV</li> <li>· The grid connection infrastructure will step up the voltage to 132 kV, high voltage</li> </ul>
Fencing	<ul style="list-style-type: none"> <li>· Triple wire fence, electrical fencing: <ul style="list-style-type: none"> <li>o Length – 11.5 km</li> <li>o Maximum height 3 m</li> </ul> </li> </ul>
Proximity to grid connection	<ul style="list-style-type: none"> <li>· The facility is planned to connect to a new Main Transmission Substation (MTS) which will be established near the project site. The new MTS will tie in via loop-in-loop-out connection to the existing Droërvier/Hydra 400 kV lines</li> <li>· Alternatively, the project can tie into the existing Droërvier MTS via a 132 kV connection</li> </ul>
Site Access	<ul style="list-style-type: none"> <li>· Rhino PV: Turn southward off from N1, 30 km outside Beaufort-West, between Beaufort-West and Three Sisters. This will lead to a Transnet service road used by the local population for access to farms and smallholdings. The site will be located immediately to the right at the T junction of the road that connects the service road and the N1</li> <li>· Sunnyside PV: Approximately 3.2 km outside Beaufort-West on the R61, turn onto the Hopewell Road in an Eastern direction. After 24.1 km, turn right onto Farm 400 through the gate to the farm. This will be the main access point to the site</li> </ul>
Boreholes and storage tanks (if applicable)	<ul style="list-style-type: none"> <li>· Existing boreholes will be tested. If no potential boreholes (existing), new boreholes will be required.</li> <li>· Water will be stored on site using jojo tanks storing borehole or municipal water.</li> </ul>
BESS	<ul style="list-style-type: none"> <li>· Up to 5 ha</li> <li>· The technology and capacity are still to be determined.</li> </ul>

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## 1.2 Description of Property and Affected Environment

The proposal includes a solar PV installation on Remainder of Farm Rhenosterkop 155, Rhino SEF, and on Farm 400, Sunnyside SEF, located further southeast (of the Rhino SEF). A series of dolerite koppies lie east and north of these two PV facilities, respectively, and range from low to medium height, overlooking the level plains further southwest towards Beaufort West, about 40 km distant. The dolerite ridges and koppies fall mainly on the farms Elandsfontein 150, Sunnyside 400 and Klipkopjes Leegte 132. The terrain around the proposed solar PV areas is level and gently sloping upwards towards the Rhenosterkop farm along the eastern end while sloping down gently towards the floodplain of the Renosterspruit. The N1 lies prominently along the western boundary connecting Nelspoort and Three Sisters to Beaufort West. An abandoned railway station hosts a few late 19<sup>th</sup> / early 20<sup>th</sup> century houses at Rhenosterkop farm and the main Rhenosterkop werf is nearby.

The vegetation consists of grassland and succulent karoo covering much of the area and acacia thorn trees in the floodplains. There has been some significant recovery of the vegetation following the break of the prolonged seven-year drought. Small-scale wild game farming is taking place with springbuck and other small antelope species, but sheep farming is the main activity in the area. Plots of ground within reach of irrigation systems surround the immediate areas around the werfs to grow feed for the stock farming businesses. Besides the Rhenosterkop werf, other notable settlement landmarks are located at Bleakhouse, Sunnyside and Elandsfontein farms. A few large national grid powerlines run southwest to northeast through the Remainder of Farm Rhenosterkop 155 (both 765 kV and 400 kV).

In a Visual Impact Assessment (VIA) completed for an adjacent project, it is noted that, in general, the landscape character of the greater study area and the site itself presents as undeveloped and largely natural in character. The visual quality of the region is generally high by virtue of the vast and undeveloped nature of the environment. This lends a distinct sense of place to the area, but the landscape is not unique. As such, the entire study area is considered sensitive to visual impacts due to its generally low levels of transformation.



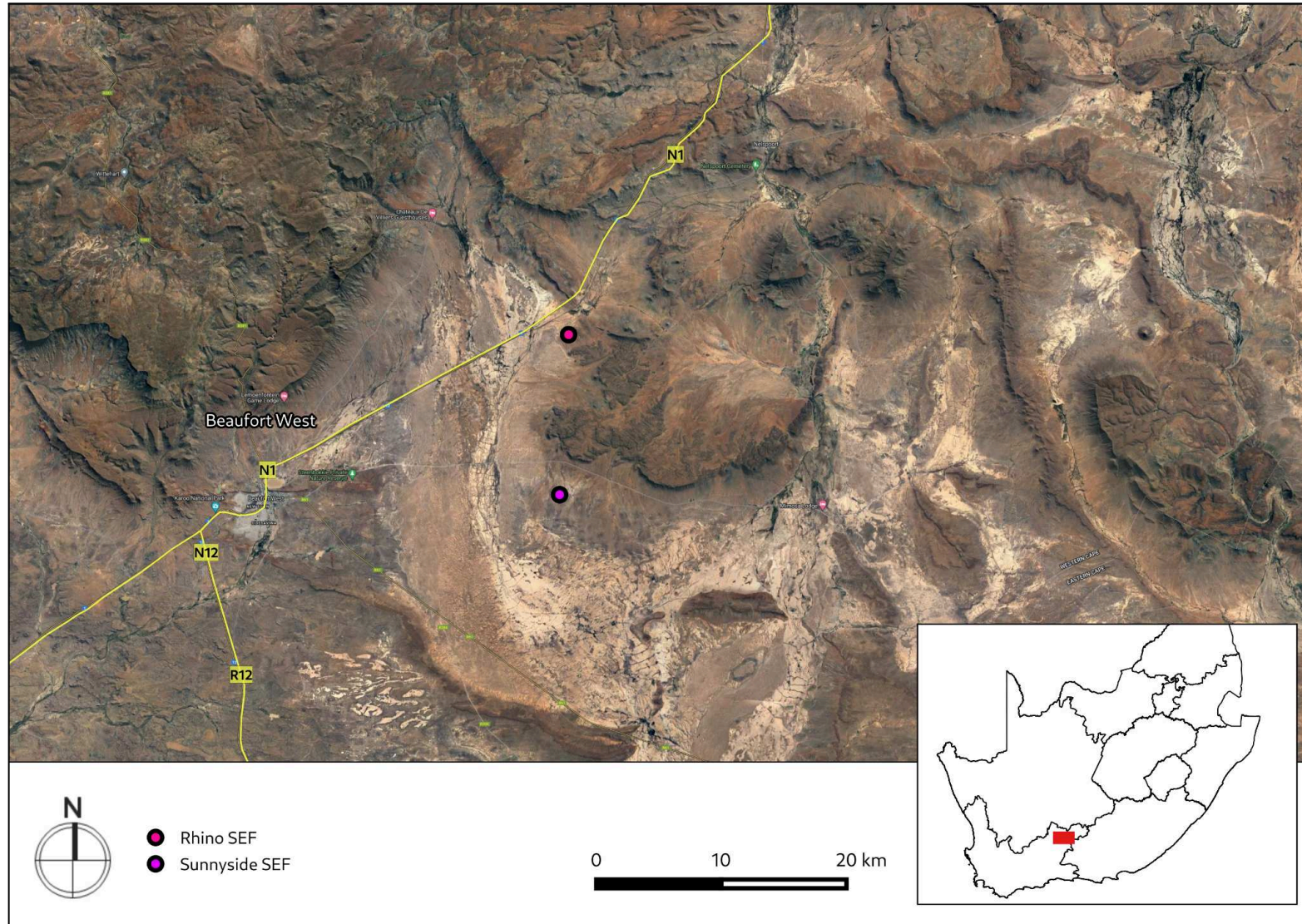


Figure 1.1: Satellite image indicating proposed location of development



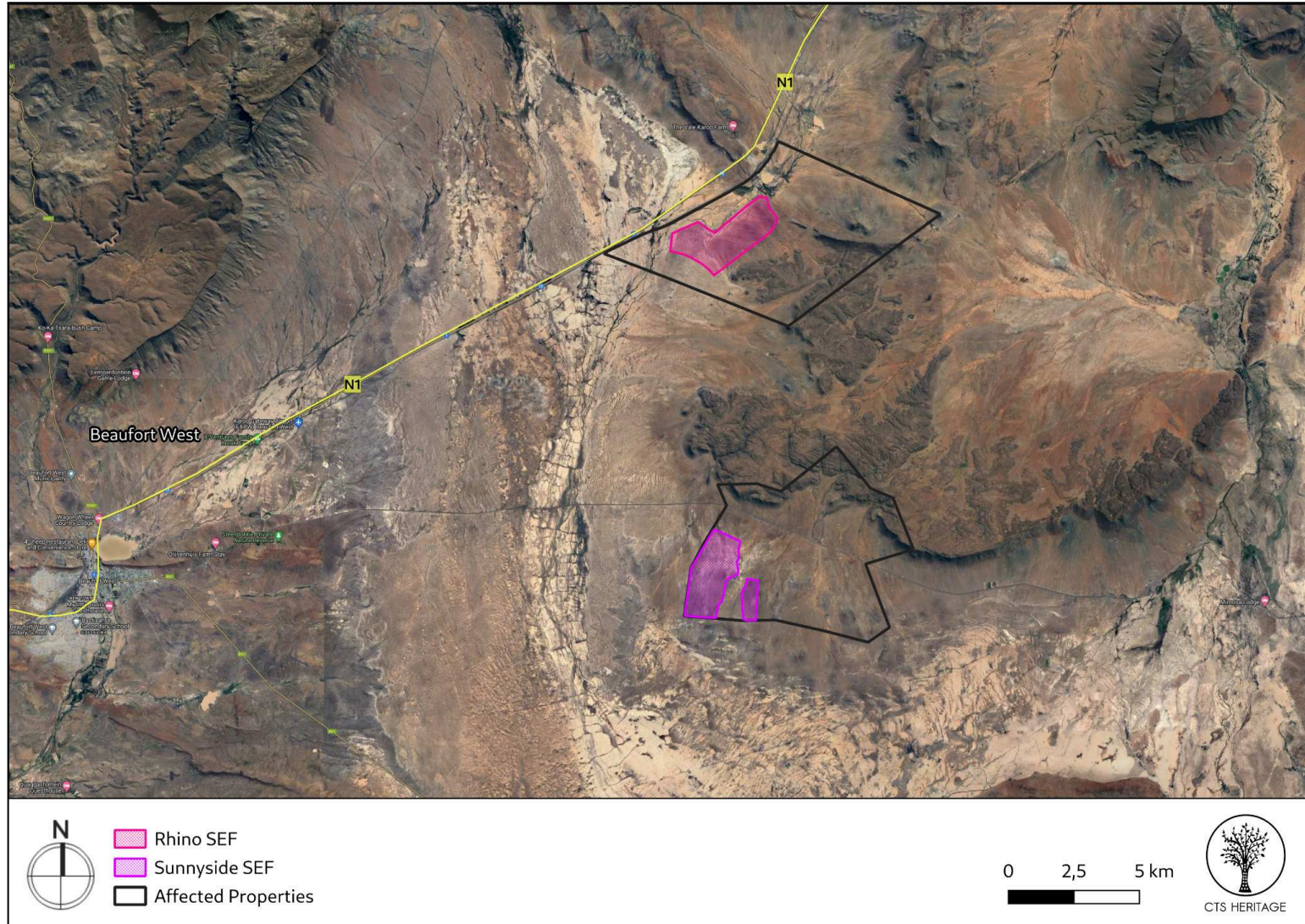
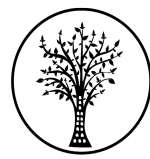


Figure 1.2: Project boundary with proposed layout





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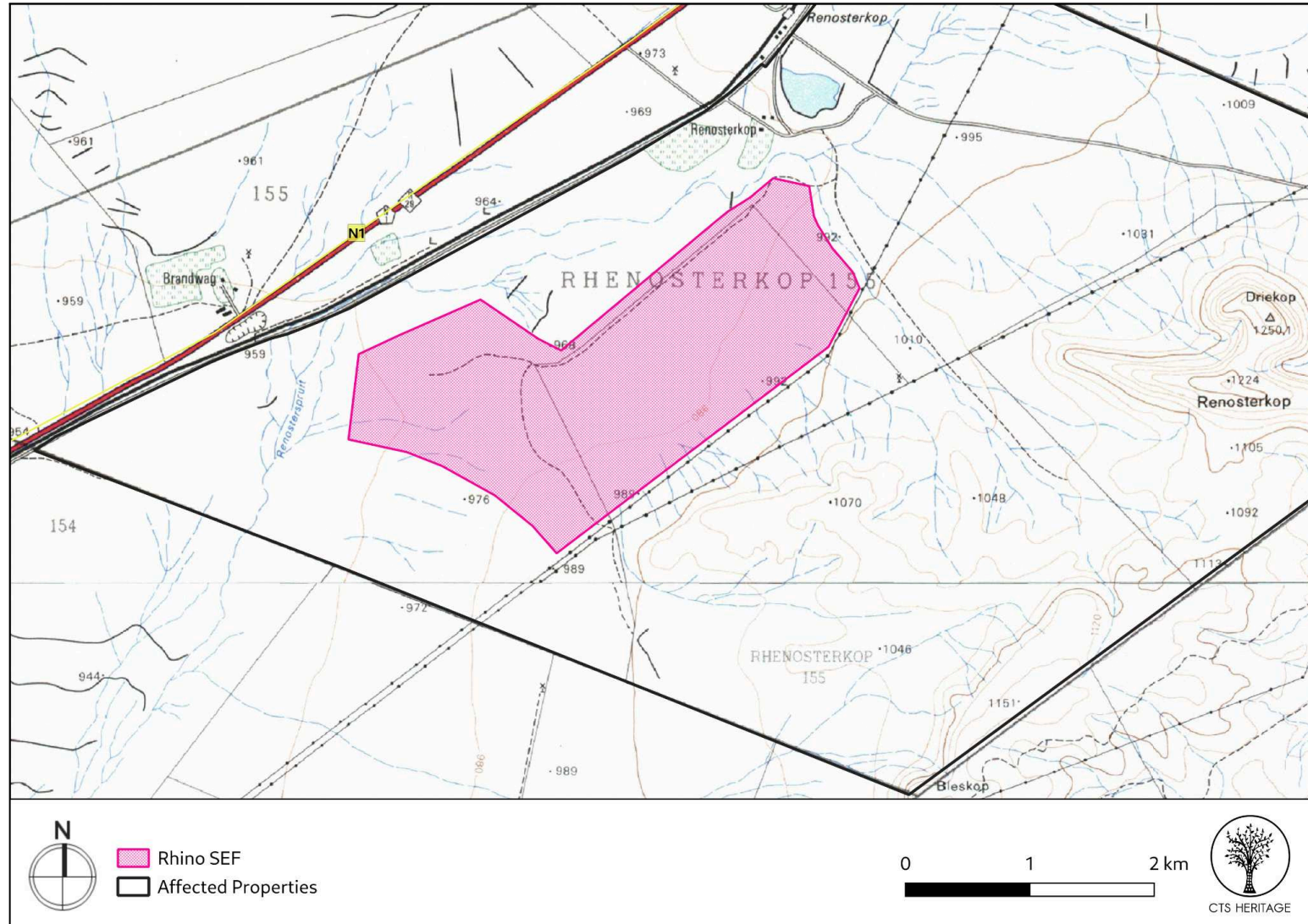


Figure 1.3: Project boundary on the 1:50 000 Topo Map

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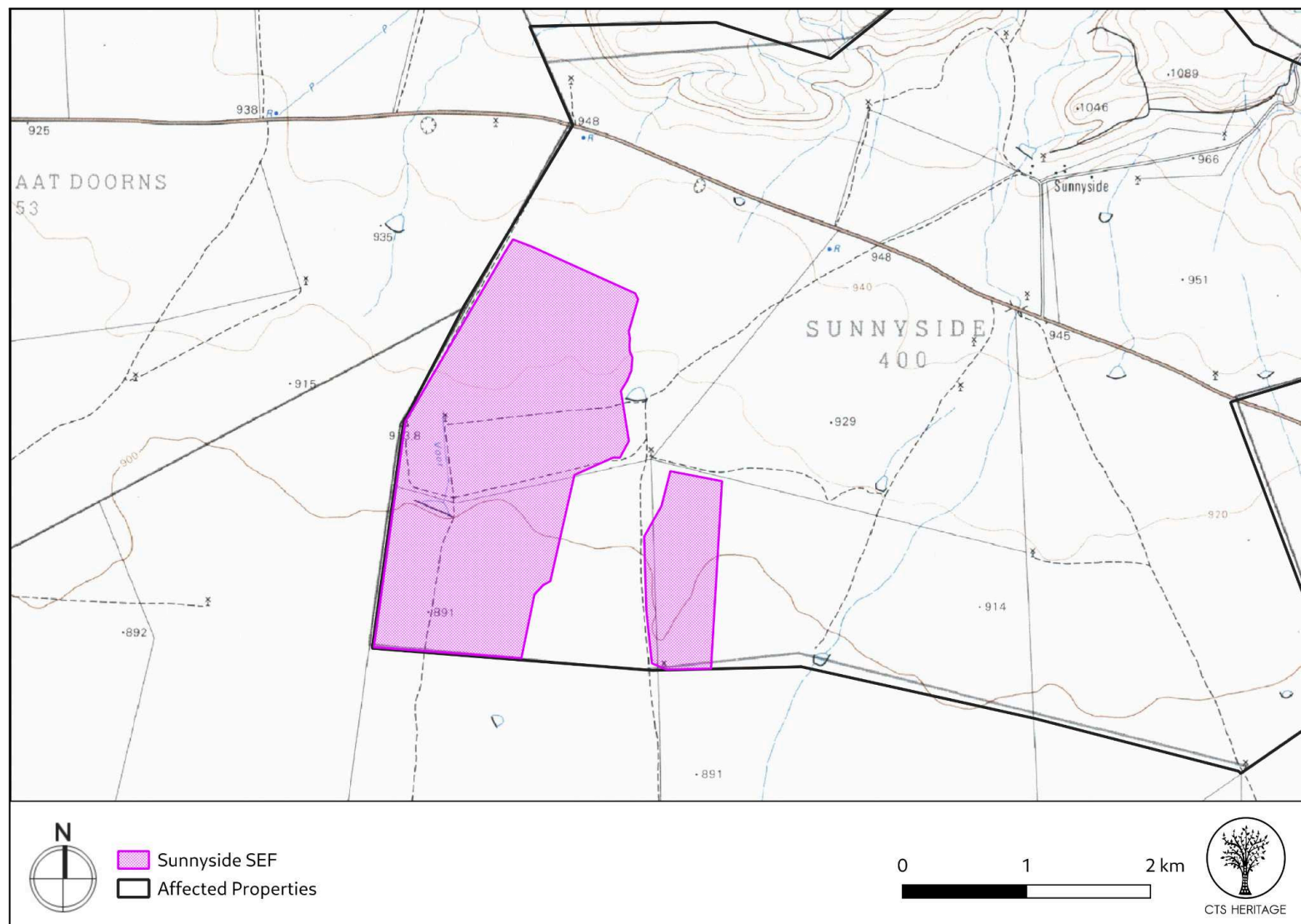


Figure 1.5: Extract from the 1:50 000 Topo Map

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## **2. METHODOLOGY**

### **2.1 Purpose of Archaeological Study**

A Notice of Intent to Develop (NID) was submitted to HWC and was reviewed by HWC in a meeting held on 30 October 2023. HWC determined that a HIA must be drafted that has specific reference to:

- Palaeontological Impact Assessment (PIA);
- Archaeological Impact Assessment (AIA); and
- Visual impact on the Cultural Landscape Assessment

The purpose of this archaeological study is to satisfy the requirements of HWC with regard to the specialist archaeology requirement noted above in terms of section 38(8), and therefore section 38(3) of the National Heritage Resources Act (Act 25 of 1999).

### **2.2 Summary of steps followed**

- An archaeologist conducted an assessment of archaeological resources likely to be disturbed by the proposed development. The archaeologist conducted their site visit from 26 to 28 September 2022 and again on 11 and 12 October 2023.
- The area proposed for development was assessed on foot, photographs of the context and finds were taken, and tracks were recorded using a GPS.
- The identified resources were assessed to evaluate their heritage significance in terms of the grading system outlined in Section 3 of the NHRA (Act 25 of 1999).
- Alternatives and mitigation options were discussed with the Environmental Assessment Practitioner.

### **2.3 Constraints and Limitations**

The patchy, generally sparse vegetation typical of this area and relatively level ground encountered when surveying the areas proposed for the solar PV facility facilitated a very high level of survey coverage of the heritage resources found in these areas. We, therefore, feel confident that we have obtained a reliable and sufficient level of coverage of heritage sensitivities in the proposed solar PV areas.

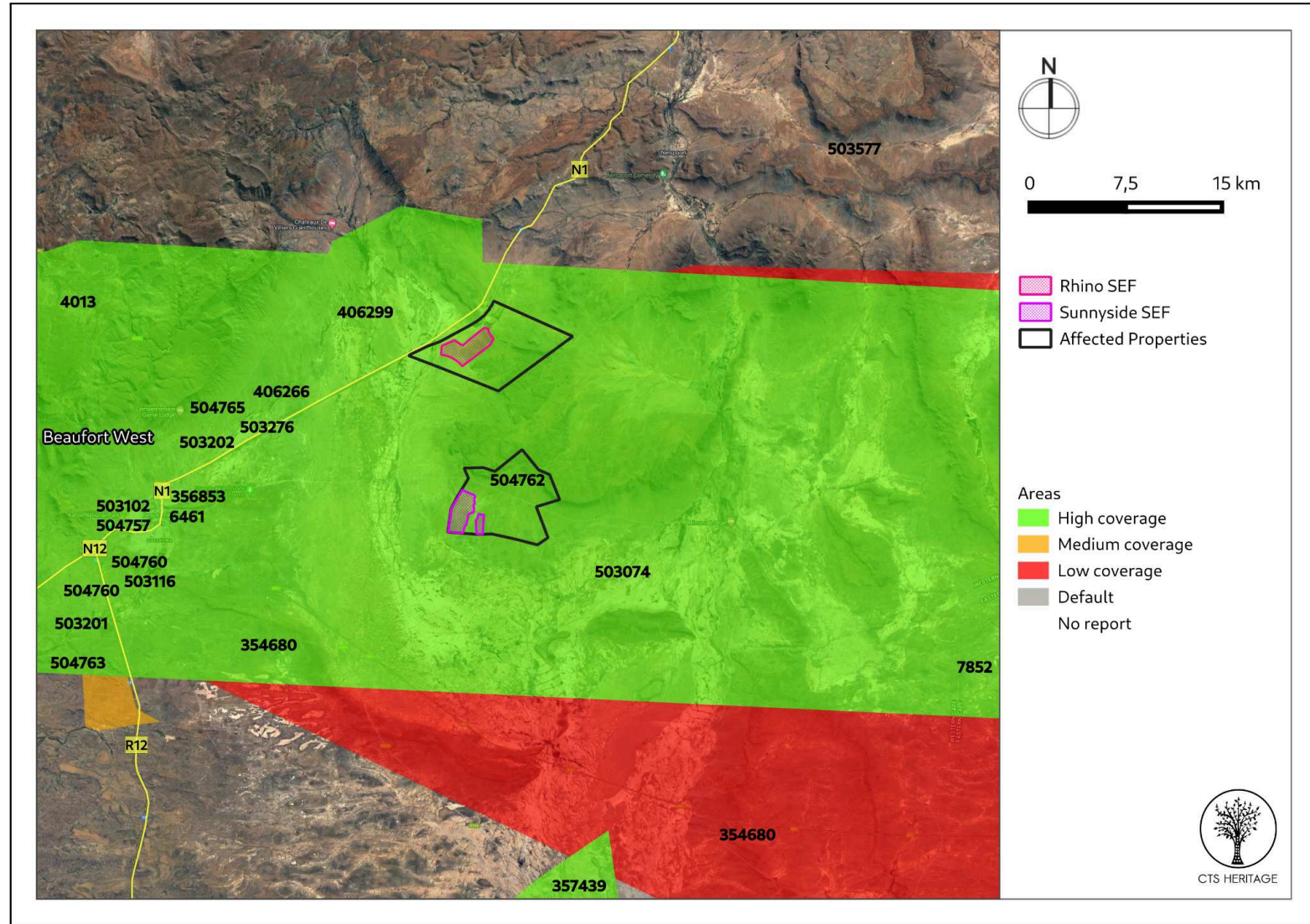


Figure 2: Close up satellite image indicating proposed location of development in relation to heritage studies previously conducted



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### 3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT

Recently, a number of heritage assessments have been completed within close proximity to the area proposed for development (Figure 3.1). According to Nilssen (2014, SAHRIS NID 504763), “The Karoo houses a long and rich archaeological record dating from the earliest stages of Stone Age technology that are over a million years old, to the historic period that consists of the last few hundred years of human occupation (see Nilssen 2011 and references therein). Archaeological sites include caves and rock shelters, open air artefact scatters, rock engravings and historic structures with their associated cultural materials.” According to ACO (2013, SAHRIS NID 503074), “Because of the scarcity of caves and shelters, more than 90% of Karoo archaeological sites are open sites of stone artefacts, ostrich eggshell fragments and occasionally, pottery. Bone remains are rarely preserved. Artefacts of both the ESA and MSA are widespread, and may generally be described as an ancient litter that occurs at a low frequency across the landscape. Where definable scatters of ESA and MSA material occur, they are considered to be significant heritage sites.

More intensive occupation of the Karoo started around 13 000 years ago during the LSA, which is essentially the heritage of Khoisan groups who lived throughout the region. The legacy of the San includes numerous open sites while traces of their presence can also be found in most large rock shelters, often in the form of rock art. They frequently settled a short distance from permanent water sources (springs or waterholes) and made use of natural shelters such as rock outcrops or large boulders or even large bushes. In the Great Karoo, natural elevated features such as dolerite dykes and ridges played a significant role in San settlement patterns” and as such, this broader area is renowned for its well-preserved rock art and other artefacts from this time, including rock engravings and rock gongs. It is likely that similar archaeological heritage exists within the areas proposed for development and as such, impact to these resources must be assessed.

There are currently 14 identified sites of archaeological interest with over 400 examples of rock engravings (petroglyphs) in the immediate Nelspoort area. All engravings are made on the flat surfaces of the dolerite rocks, with the dark outer layer scraped away leaving the image expressed in the lighter sub layer of the rock. While the precise authorship of rock art is debated (Smith, Ouzman 2004), engravings fall broadly into three types described as follows:

- !xam San hunter-gatherer rock engravings: representations include elephant, giraffe, hartebeest, jackal, zebra and rhinoceros. Images also of human figures, bird-human figures and spirit world representations.
- Khoe herder geometric engravings: patterns such as lines radiating sun-like from a centre point, zig-zag patterns and concentric circles.
- Settler engravings: these include text, symbols and direction markers such as arrows and images including a windpump and animals.

In many sites these different types of rock art co-exist, along with other evidence of habitation over an extended period of time, such as stone tools, grinding patches on stones, arranged stones, and rock gongs (Ouzman 2003). Nelspoort is the site of several rock gong complexes. The rock gong, or lithophone percussion instrument, is formed by dolerite



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boulders, some cracked as a result of lightning strike or extreme temperature fluctuation, balanced on each other so that they resonate with a deep ringing sound when struck in a specific way. They are believed to have been intrinsic to spiritual practices of the !xam San people. Two rock gong groupings are located on small rises across the shallow Nelspoort valley, suggesting that the gong's sound may have been used for communication purposes (Rusch 2016).

A recent field assessment completed by CTS Heritage for a renewable energy project located immediately north of the development area recorded 111 Observations. The bulk of these were open site scatters of MSA cores, flakes and debitage. Local siltstones and hornfels rock cores had been used in the production of the flakes with very little introduction of exotic stone sourced in other regions. While only a handful of flakes were found dispersed across a very wide area, they form a constant backdrop to the landscape rather than being concentrated particularly in any one area. The MSA materials tended to be heavily patinated and weathered by water and mud runoff after storms with a high clay content. Typologically diagnostic artefacts included some radial cores and a fairly common spread of retouched blades and blade blanks. Earlier MSA material was also found such as bifacial points and larger flakes but we would deduce that most of this layer of occupation is buried on the floodplains. A cluster of conservation-worthy sites were found including LSA engravings on dolerite boulders and an historic ruined kraal. The engravings show a range of well-preserved imagery linking the ethnographic records of the San in the Bleek and Lloyd collection to these sites such as the scene depicted showing a cloudburst of rain, finely engraved eland and elephant. A large number of LSA and historical artefacts were found in association with these sites. Most of the scatters recorded were graded as not conservation-worthy due to the ubiquity of these artefacts across the landscape and the lack of a particular focal point of landscape use.

Fieldwork in this area has identified a correlation between the dolerite outcrops in the area and higher levels of LSA archaeology, rock engravings and rock gongs. It is likely that this pattern is also applicable for the area under consideration in this assessment. As such, the dolerite outcrop located here must be considered to have high levels of archaeological sensitivity.



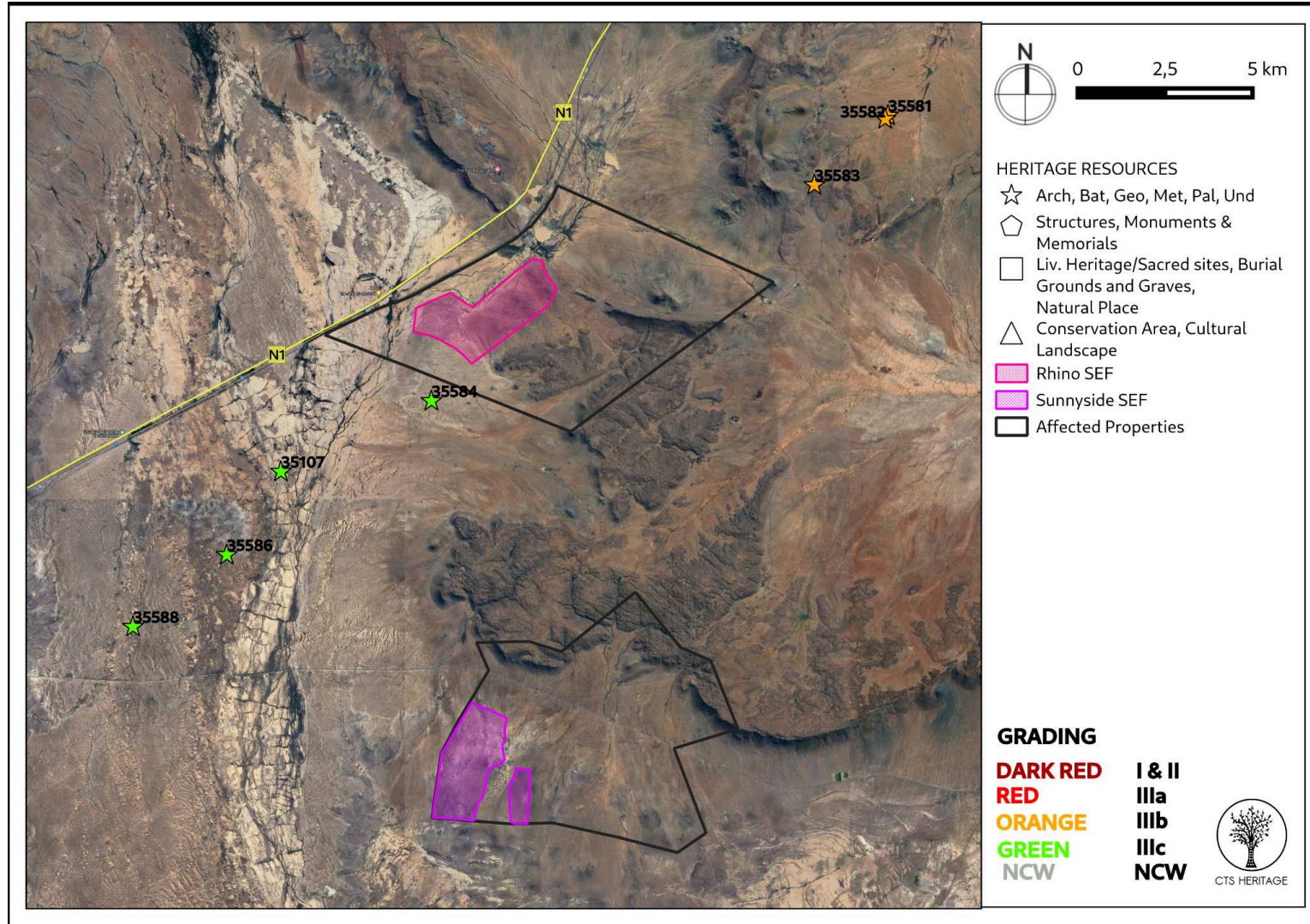


Figure 3. Heritage Resources Map. Heritage Resources previously identified in and near the study area, with SahrIs Site IDs indicated

#### **4. IDENTIFICATION OF HERITAGE RESOURCES**

##### **4.1 Field Assessment**

A total of 75 observations were made and these were concentrated in the Rhino solar PV area. The clusters of railway historic buildings and the Rhenosterkop werf lie to the north and west of the proposed Rhino PV and Sunnyside PV areas. One area of slightly elevated ground on a platform near the slopes of the dolerite ridges held a higher number of *in situ* archaeological material consisting of chert and hornfels flakes that should be avoided during the development of the final layouts for access roads and placement of solar PV panels. The tail end of the dolerite outcrop holding sites 045-050 is also of interest as there are round historic stock kraals built using a single level of dolerite boulders, historic and LSA engravings and lithic materials spanning the MSA and LSA. This area falls outside the Rhino and Sunnyside solar PV areas and can easily be avoided. This area was surveyed more intensely to establish a baseline of other areas that potentially hold similar outcrops of engravings and traces of early stock farming in the area.

Much of the archaeological material consists of low density MSA material made from locally abundant stone such as siltstone, hornfels and chert. This was evident from the large number of flake blanks and cores found during the survey. Excellent views were obtained from the top of Driekop over the surrounding area and it was clear that the types of rock suitable for engravings on dolerite boulders are not found in equal densities spread across the SEF area. Sampling of other locations yielded more historic engravings near Bleakhouse whilst other areas with promising dolerite boulders did not yield engravings. The location and extent of the historic farm werfs at Bleakhouse, Sunnyside and Elandsfontein were fairly easily determined and a very extensive series of stone walling boundary features interlink these farms in various states of preservation.





Figure 4.1: Existing grid infrastructure lying to the east of the proposed solar PV area.



Figure 4.2: Existing grid infrastructure lying to the east of the proposed solar PV area with views of koppies near Rhenosterkop.





**Figure 4.3: View of flat ground at option B studded with succulent scrubland and grasses recovering from the drought. Low ridgeline in the background which holds the sensitive engravings.**



**Figure 4.4: View looking north towards Nelspoort of connecting powerline route from the proposed solar PV area.**





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**Figure 4.5: Flat topography of the area proposed for the PV development.**



**Figure 4.6: Contextual Images of landscape showing the koppies sloping down onto the solar PV plain.**





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Figure 4.7: Contextual Images of landscape showing the national grid alongside the level plain of the solar PV area.



Figure 4.8: Contextual Images of landscape showing the national grid alongside the level plain of the solar PV area.





Figure 4.9: Contextual Images of landscape showing the tailend of the dolerite ridge holding engravings and old kraals.



Figure 4.10: Contextual Images of landscape showing the national grid alongside the level plain of the solar PV area.





Figure 4.11: Contextual Images of landscape from the top of Driekop down onto the plains north of Bleakhouse.



Figure 4.12: Contextual Images of the flat landscape south of the dolerite ridges onto Beaufort West in the distance.





Figure 4.13: Contextual Images of landscape of the dolerite ridges and level plains.



Figure 4.14: Contextual Images of landscape of the dolerite ridges and level plains.



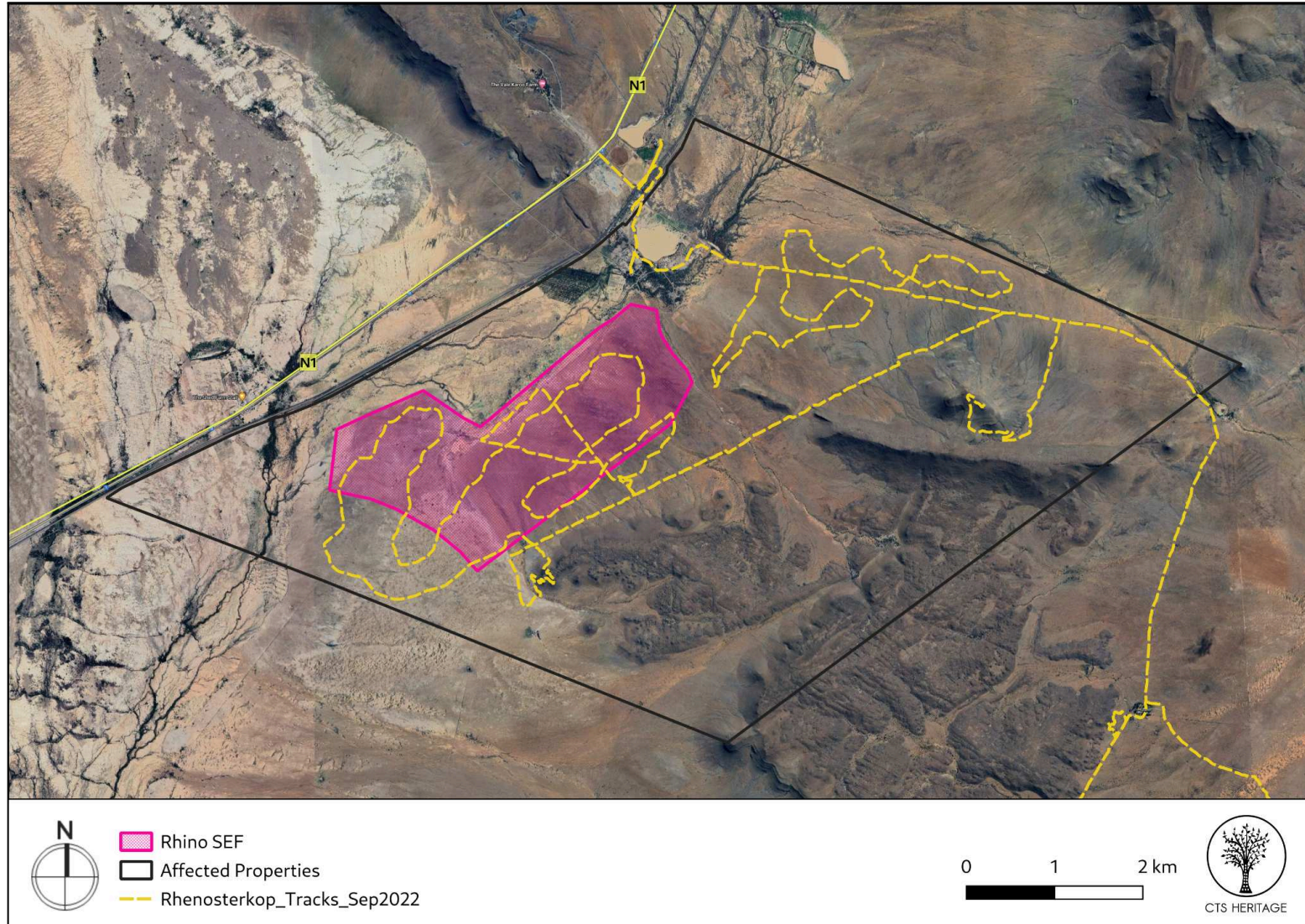
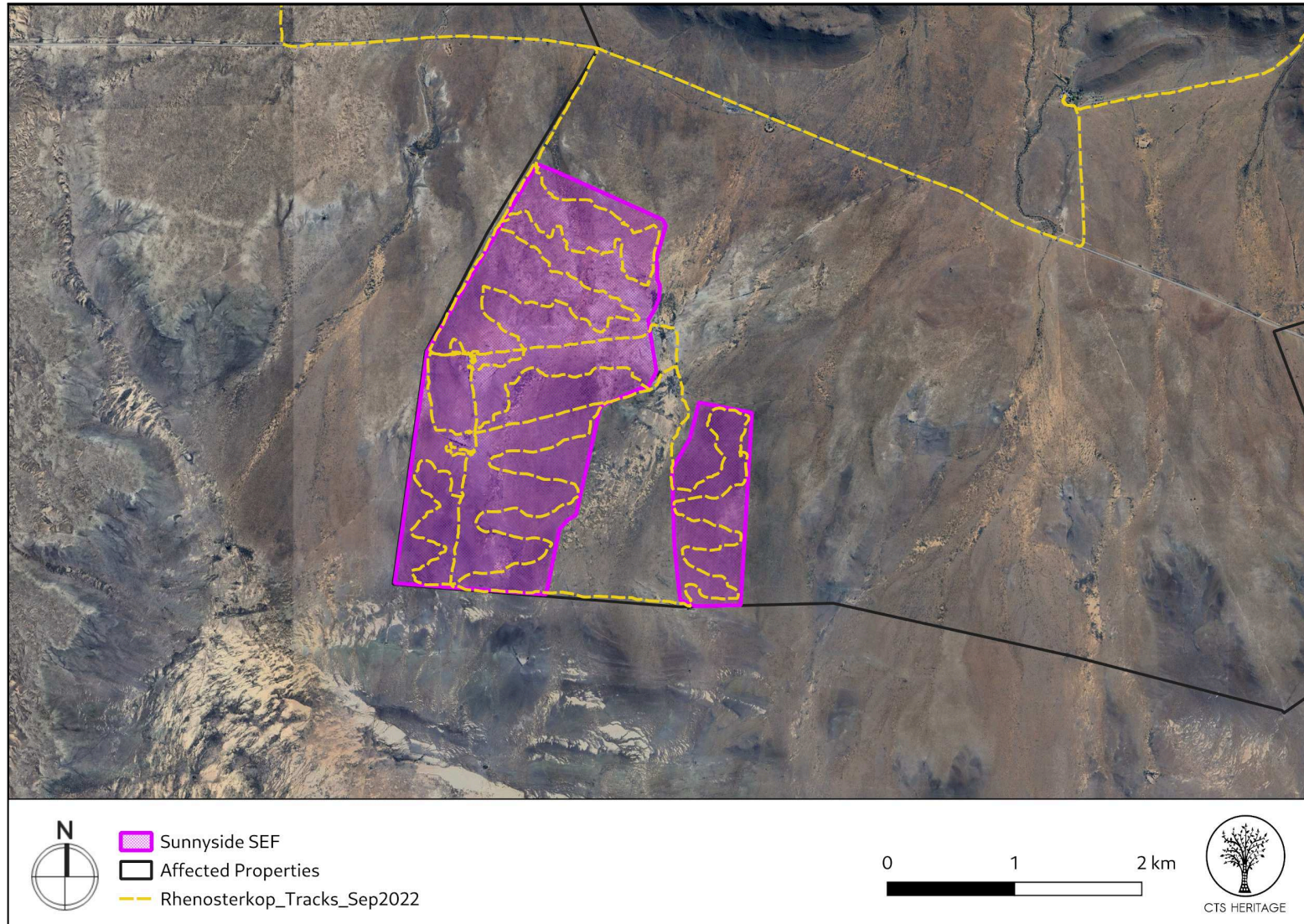


Figure 5.1: Overall track paths of foot survey for the proposed development of Rhino PV Area





**Figure 5.2: Overall track paths of foot survey for the proposed development of Sunnyside PV Area**





## 4.2 Archaeological Resources identified

Table 2.1 below reflects the observations made during the field assessments completed for Rhino and Table 2.2 below reflects the observations made during the field assessments completed for Sunnyside.

**Table 2.1: Artefacts identified during the field assessment of the Rhino PV development area**

POINT ID	Description	Type	Period	Co-ordinates		Grading	Density	Mitigation
001	Rhenosterkop train station late Victorian buildings	Structure	Historic	-32.209414	22.854199	IIIC	n/a	No impact anticipated
002	Rhenosterkop train station late Victorian buildings	Structure	Historic	-32.210161	22.853453	IIIC	n/a	No impact anticipated
003	Rhenosterkop train station late Victorian buildings	Structure	Historic	-32.21064	22.853032	IIIC	n/a	No impact anticipated
004	The Vale farmhouse werf. Heavily altered and mostly modern additions	Structure	Historic	-32.204149	22.855673	NCW	n/a	NA
005	Rhenosterkop train station late Victorian buildings	Structure	Historic	-32.210981	22.852806	IIIC	n/a	No impact anticipated
006	Rhenosterkop werf and graveyard. Victorian farmhouse, altered with Cape Dutch. Revival gables	Structure, Graves	Historic	-32.217916	22.852824	IIIA	n/a	400m Buffer
007	Siltstone flake blanks	Artefacts	MSA	-32.22477417	22.86508097	NCW	0 to 5	NA
008	Siltstone cores and flakes	Artefacts	MSA	-32.22376253	22.87391449	NCW	0 to 5	NA
009	Siltstone cores and flakes	Artefacts	MSA	-32.22005985	22.87786105	NCW	5 to 10	NA
010	Siltstone core	Artefacts	MSA	-32.21551706	22.87501606	NCW	0 to 5	NA
011	Siltstone flakes	Artefacts	MSA	-32.21592484	22.88318229	NCW	0 to 5	NA
012	Hornfels core and flake	Artefacts	MSA	-32.217032	22.88368462	NCW	0 to 5	NA
013	Siltstone flakes	Artefacts	MSA	-32.21892593	22.88790521	NCW	0 to 5	NA
014	Siltstone flake with hafting	Artefacts	MSA	-32.22025146	22.89620458	NCW	0 to 5	NA
015	Very patinated hornfels and chert core, flake	Artefacts	MSA	-32.21711364	22.89387675	NCW	0 to 5	NA
016	Extensive scatter of hornfels, chert, siltstone flakes on slightly raised platform with good views of surrounds. Points, retouched flakes, cores. Mix of MSA and LSA	Artefacts	MSA, LSA	-32.238563	22.85194	IIIB	30+	50m Buffer
017	Early MSA siltstone flakes	Artefacts	MSA	-32.23247011	22.85803451	NCW	0 to 5	NA
018	Notched siltstone point and flake	Artefacts	MSA	-32.2339931	22.85475087	NCW	0 to 5	NA
019	Long siltstone blade form	Artefacts	MSA	-32.23661062	22.85081577	NCW	0 to 5	NA
020	Siltstone flakes	Artefacts	MSA	-32.24134057	22.84498111	NCW	0 to 5	NA
021	Siltstone cores and hornfels microliths	Artefacts	LSA	-32.2400494	22.8408094	NCW	5 to 10	NA
022	Siltstone flakes	Artefacts	MSA	-32.23617365	22.84689445	NCW	0 to 5	NA
023	Hornfels core	Artefacts	LSA	-32.23339155	22.85143909	NCW	0 to 5	NA
024	Weathered siltstone flake blank	Artefacts	MSA	-32.22788326	22.85441416	NCW	0 to 5	NA
025	Siltstone flakes and core	Artefacts	MSA	-32.22674674	22.85401968	NCW	0 to 5	NA
026	Hornfels and siltstone cores	Artefacts	MSA	-32.22588749	22.85052778	NCW	0 to 5	NA
027	Very patinated hornfels point, flake	Artefacts	MSA	-32.22966276	22.84497601	NCW	5 to 10	NA



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028	Hornfels core, flake, debitage	Artefacts	LSA	-32.23145757	22.84327362	NCW	5 to 10	NA
029	Siltstone flakes	Artefacts	MSA	-32.23272381	22.84046959	NCW	0 to 5	NA
030	Siltstone cores	Artefacts	MSA	-32.235186	22.838324	NCW	0 to 5	NA
031	Patinated hornfels flakes and points	Artefacts	MSA	-32.23842015	22.8349217	NCW	0 to 5	NA
032	Patinated hornfels flakes and points	Artefacts	MSA	-32.24158334	22.8319489	NCW	5 to 10	NA
033	Siltstone flakes prom. Bulb of percussion	Artefacts	MSA	-32.24734136	22.82514126	NCW	0 to 5	NA
034	Weathered siltstone flakes	Artefacts	MSA	-32.23979755	22.82614452	NCW	0 to 5	NA
035	Siltstone flake blanks and flakes	Artefacts	MSA	-32.23509945	22.82931561	NCW	0 to 5	NA
036	Siltstone cores, flakes, debitage	Artefacts	MSA	-32.23193012	22.82589388	NCW	5 to 10	NA
037	Weathered siltstone flakes	Artefacts	MSA	-32.23623088	22.82204397	NCW	0 to 5	NA
038	Hornfels and quartzite flakes, dorsal scarring	Artefacts	MSA	-32.2421551	22.81819148	NCW	0 to 5	NA
039	Siltstone long point, core	Artefacts	MSA	-32.24844909	22.81913147	NCW	0 to 5	NA
040	Siltstone core flake and flakes	Artefacts	MSA	-32.25010039	22.82195335	NCW	0 to 5	NA
041	Early MSA siltstone blade forms and cores	Artefacts	MSA	-32.25025321	22.8279223	NCW	5 to 10	NA
042	Weather siltstone flakes and cores	Artefacts	MSA	-32.24815817	22.83270208	NCW	0 to 5	NA
043	Hornfels flakes and siltstone cores	Artefacts	MSA	-32.24653801	22.83601642	NCW	0 to 5	NA
044	Siltstone flakes and cores	Artefacts	MSA	-32.24429033	22.83981115	NCW	0 to 5	NA
045	Stock kraals with single level stone wall circles, at least 3 here, one very clear; Kraals likely historic as associated with broken glass and metal items. Also here MSA and LSA stone tools in the general area and some OES. could be non-archaeological OES	Ruin, Artefacts	Historic, MSA, LSA	-32.248934	22.840968	IIIA	30+	No Go Area 100m Buffer
046	Scratched engraving near kraals	RockArt	LSA	-32.249019	22.841232	IIIC	0 to 5	No Go Area 50m Buffer
047	Engraving on boulder higher up ridge, possible 'R' letter and long horizontal lined drawing	RockArt	Historic	-32.248338	22.843057	IIIC	n/a	No Go Area 50m Buffer
048	Historical graffiti: 'MG 1918'	RockArt	Historic	-32.248259	22.84274	IIIC	n/a	No Go Area 50m Buffer
049	Engraving, elephant facing right with cloud like spots above	RockArt, Artefacts	LSA	-32.248065	22.842898	IIIB	0 to 5	No Go Area 50m Buffer
050	Isolated boulder on lower slope with scraped engraving and likely more recent scratched lines. Scraped engraving not decipherable	Artefacts	LSA	-32.247175	22.843037	IIIC	n/a	No Go Area 50m Buffer
051	Siltstone core and flake	Artefacts	MSA	-32.232173	22.900587	NCW	0 to 5	NA
052	Siltstone flakes, large bulb of percussion	Artefacts	MSA	-32.228729	22.919746	NCW	0 to 5	NA
053	Siltstone core flake	Artefacts	MSA	-32.240976	22.919641	NCW	0 to 5	NA

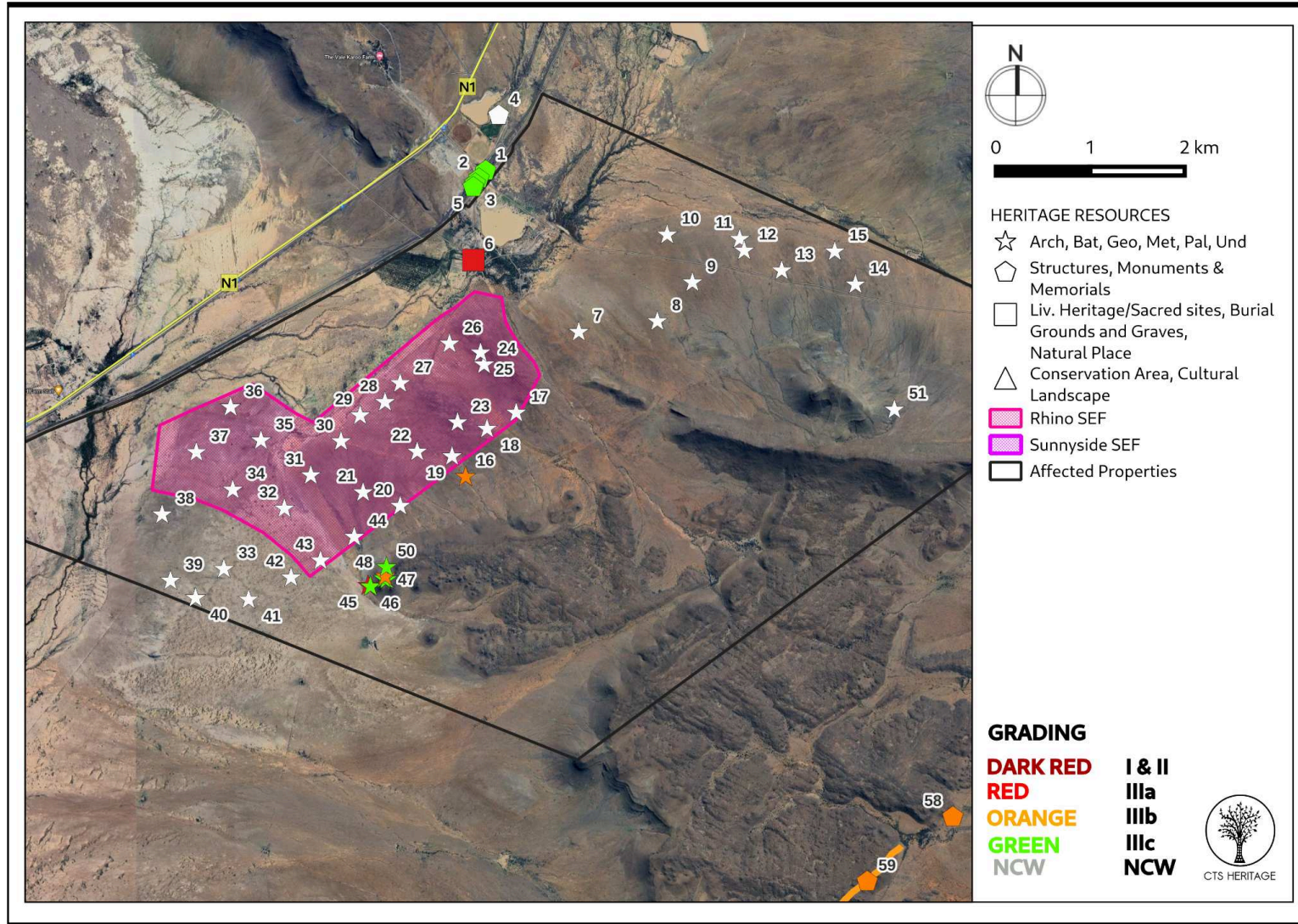


Figure 6.1: Map of all sites and observations noted within the PV North development area





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**Table 2.2: Artefacts identified during the field assessment of the Sunnyside PV development area**

POINT ID	Description	Type	Period	Co-ordinates		Grading	Density	Mitigation
001	Hornfels point and retouched flake, patinated	Artefacts	MSA	-32.335421	22.834222	NCW	0 to 5	NA
002	Hornfels point	Artefacts	MSA	-32.33745513	22.83561079	NCW	0 to 5	NA
003	Patinated hornfels flake with edge retouch	Artefacts	MSA	-32.3393606	22.84149582	NCW	0 to 5	NA
004	Blade flake, some retouch and other hornfels flakes	Artefacts	MSA	-32.3431419	22.84195408	NCW	5 to 10	NA
005	Points and flakes, hornfels	Artefacts	MSA	-32.34156395	22.83973383	NCW	5 to 10	NA
006	Demineralised siltstone blade	Artefacts	MSA	-32.34037301	22.83525832	NCW	0 to 5	NA
007	Hornfels chunks, debitage and flakes	Artefacts	MSA	-32.34108756	22.83413062	NCW	5 to 10	NA
008	Siltstone point	Artefacts	MSA	-32.3438861	22.82993681	NCW	0 to 5	NA
009	Blade flakes and points, hornfels	Artefacts	MSA	-32.345107	22.83423619	NCW	5 to 10	NA
010	Siltstone and hornfels flakes	Artefacts	MSA	-32.34605976	22.84075596	NCW	0 to 5	NA
011	Chert core, still looks 'fresh' and hornfels flakes	Artefacts	MSA, LSA	-32.34966238	22.84209541	NCW	5 to 10	NA
012	Siltstone radial core, hornfels	Artefacts	MSA	-32.35025789	22.83730221	NCW	0 to 5	NA
013	Very patinated hornfels and siltstone flakes	Artefacts	MSA	-32.34894777	22.83303778	NCW	5 to 10	NA
014	Hornfels microliths	Artefacts	LSA	-32.34763736	22.82746945	NCW	5 to 10	NA
015	Hornfels cores, flakes, debitage	Artefacts	MSA	-32.35091275	22.83176896	NCW	10 to 30	NA
016	Hornfels core, large siltstone point, early MSA	Artefacts	MSA	-32.35442616	22.83818338	NCW	0 to 5	NA
017	Siltstone point	Artefacts	MSA	-32.35776084	22.83719651	NCW	0 to 5	NA
018	Hornfels flakes and points, some retouch, quite patinated	Artefacts	MSA	-32.35707595	22.83289644	NCW	5 to 10	NA
019	Well built stone ruined kraal and old dam next to earthen dam	Ruin	Historic	-32.354327	22.828732	IIIC	n/a	No Go Area 50m Buffer
020	Ruined stone built dwelling, larger ephemeral kraal next to it, also near dam with stone edging. Metal items and glass	Ruin, Artefacts	Historic	-32.35556	22.829092	IIIC	30+	No Go Area 50m Buffer
021	Larger ruined stone dwelling, probably the main werf next to the dam. These buildings probably precede the earthen dam or are perhaps contemporaneous.	Ruin, Artefacts	Historic	-32.355149	22.827259	IIIC	30+	No Go Area 50m Buffer
022	Stone Age and historical artefacts near the werf. Metal cans marked with Cooper, Imperial Gallon etc	Artefacts	MSA, LSA, Historic	-32.35547773	22.82699579	IIIC	30+	No Go Area 50m Buffer
023	Very patinated and weathered hornfels flakes	Artefacts	MSA	-32.35826634	22.82485983	NCW	0 to 5	NA
024	Hornfels core and flake	Artefacts	MSA	-32.3588917	22.82577623	NCW	0 to 5	NA
025	Siltstone and hornfels flakes	Artefacts	MSA	-32.36219674	22.82651614	NCW	0 to 5	NA
026	Very patinated hornfels blade, flakes	Artefacts	MSA	-32.36020233	22.83423565	NCW	5 to 10	NA
027	Various hornfels flakes and points	Artefacts	MSA	-32.36347616	22.83302749	NCW	5 to 10	NA
028	Siltstone and hornfels cores, flakes	Artefacts	MSA, LSA	-32.36490974	22.8468322	NCW	10 to 30	NA



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029	Hornfels blades, flakes, some retouched	Artefacts	MSA	-32.36592609	22.85106493	NCW	5 to 10	NA
030	Hornfels radial core, flakes	Artefacts	MSA	-32.36205585	22.85118086	NCW	0 to 5	NA
031	Hornfels flakes	Artefacts	MSA	-32.36002277	22.84652109	NCW	0 to 5	NA
032	Triangular hornfels and siltstone flakes, patinated	Artefacts	MSA	-32.3573987	22.84896697	NCW	5 to 10	NA
033	Stone walling lining earthen dam wall	Structure	Historic	-32.346756	22.845731	NCW	n/a	NA
034	Hornfels core and debitage	Artefacts	MSA	-32.35343003	22.84873345	NCW	0 to 5	NA
035	Hornfels flake	Artefacts	MSA	-32.35579133	22.85141285	NCW	0 to 5	NA

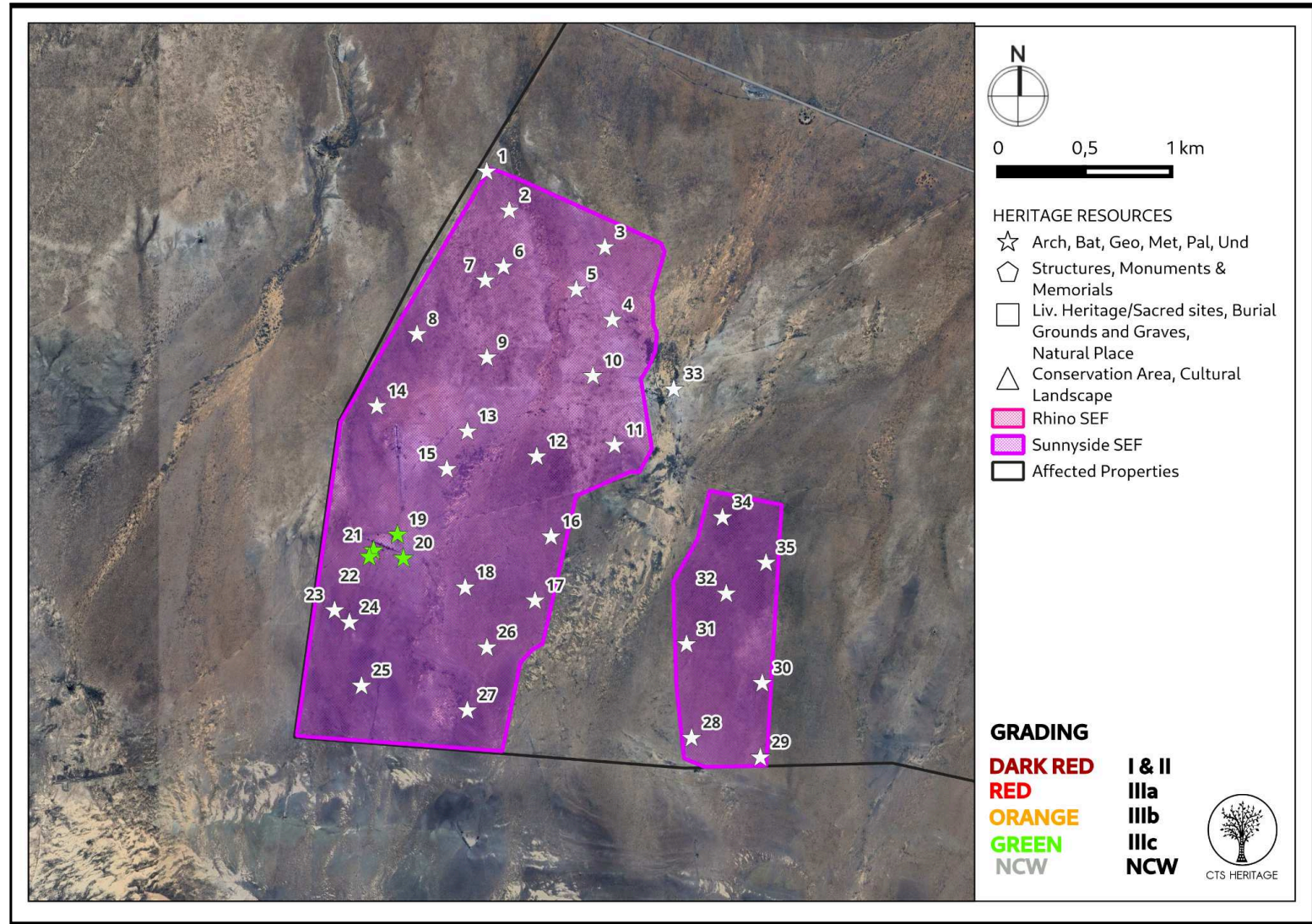


Figure 6.2: Map of all sites and observations noted within the PV South development area



### 4.3 Selected photographic record

(a full photographic record is available upon request)



Figure 7.1: Observations Rhino PV 001 and 002

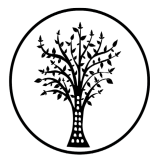


Figure 7.2: Observation Rhino PV 003



Figure 7.3: Observation Rhino PV 005





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Figure 7.4: Observation Rhino PV 006



Figure 7.5 Observation Rhino PV 016



Figure 7.6 Observation Rhino PV 045





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Figure 7.7 Observation Rhino PV 046



Figure 7.8 Observation Rhino PV 047



Figure 7.9: Observation Rhino PV 048



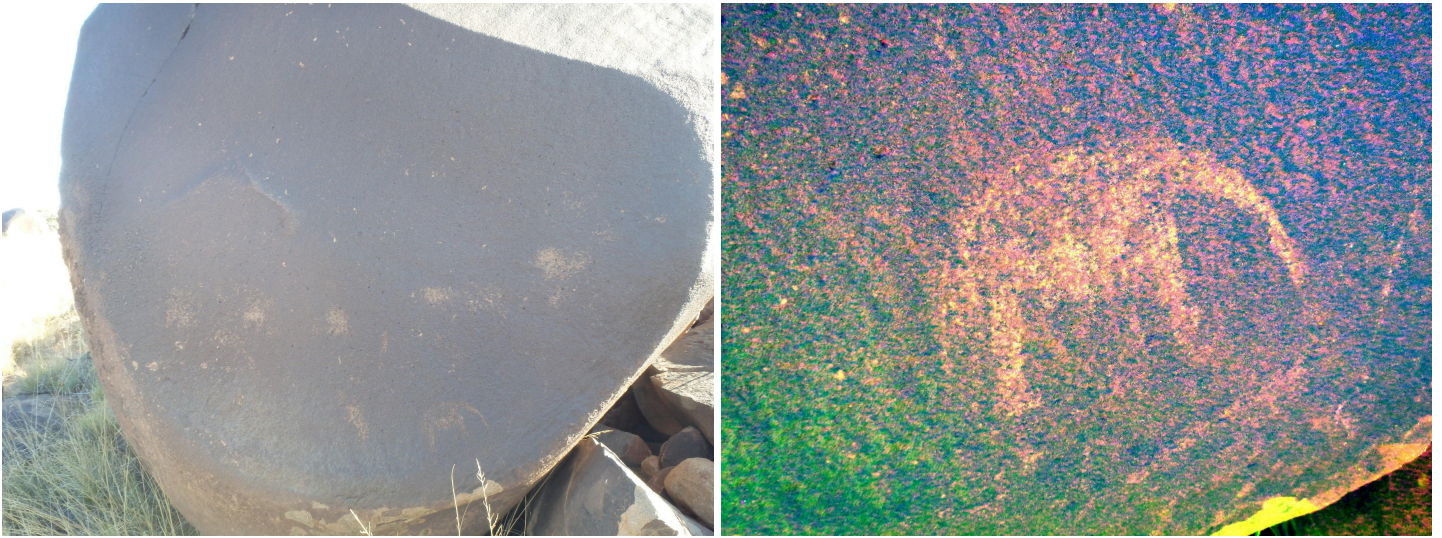


Figure 7.10: Observation Rhino PV 049



Figure 7.11: Observation Rhino PV 050



Figure 7.12: Observations Sunnyside PV 019





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Figure 7.13: Observations Sunnyside PV 020



Figure 7.14: Observations Sunnyside PV 021



Figure 7.15: Observations Sunnyside PV 022





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## 5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

### 5.1 Assessment of impact to Archaeological Resources

Much of the archaeological material identified within the development area consists of low density MSA material made from locally abundant stone such as siltstone, hornfels and chert. This archaeological signature consists largely of low density surface scatters. These low-density scatters have been determined to be Not Conservation-Worthy and as such, do not require mitigation and are not considered further here. Areas of higher density and higher significance can be avoided through the implementation of no development buffers.

#### ***Rhino SEF***

While no archaeological resources of significance were identified within the area proposed for the development of the Rhino facility, some were identified in close proximity to the development area, but outside its borders. These sites include Observation 16 which is a high-density scatter of MSA and LSA artefacts. This site is graded IIIB due to its scientific significance. While no direct impact to this site is anticipated due to its position outside of the development, a no go buffer area of 50m is recommended around this site to ensure its conservation.

Sites 45, 46, 47, 48, 49 and 50 form a cluster of archaeological resources of high significance. Site 45 is graded IIIA due to the high local significance ascribed to rock art of this nature in this area, and Site 49 is graded IIIB due to its scientific value. The remaining archaeological sites located here are graded IIIC due to their contextual scientific significance relative to sites 45 and 49. This cluster of sites is located within the dolerite outcrops mapped in the area. No direct impact to these sites is anticipated, and the existing grid alignment runs between this cluster and the area proposed for development. While no direct impact to this cluster is anticipated due to its position outside of the development, various no go buffer areas are recommended around this cluster to ensure its conservation.

Important to note are the high numbers of rock engravings and rock gongs associated with the dolerite outcrops in the area. No direct impact to these dolerite outcrops is anticipated however their archaeological sensitivity cannot be overstated and due concern in this regard must be noted.

Observation 006 reflects the position of the Rhenosterkop werf and graveyard. This werf includes a Victorian farmhouse, somewhat altered with Cape Dutch. Revival gables. Due to the high local social and spiritual significance of burial grounds, this site is determined to be Grade IIIA. No direct or indirect impact is anticipated for the burial ground. A no development buffer of 400 m is recommended around the Rhenosterkop farm werf in order to ensure that the sense of place associated with this historic farm is retained. It is also noted that a river runs between the proposed development and the werf and burial ground which assists in creating a natural hard edge to retain the sense of place.



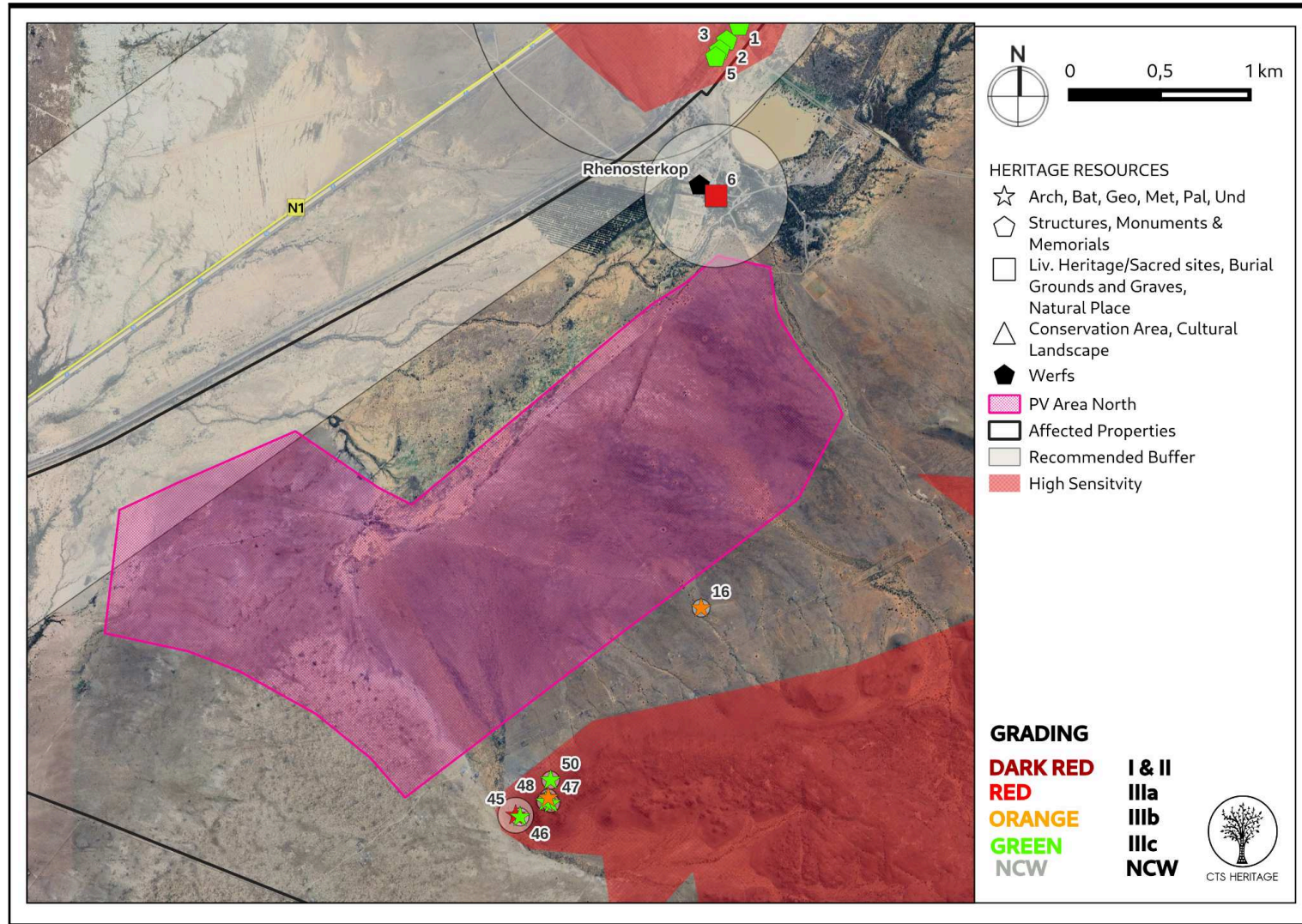


Figure 7.1: Map of all sites and observations noted within the PV North development area with recommended mitigation measures



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### ***Sunnyside***

No stone age archaeological resources of significance were identified within this proposed development footprint, and the proposed development area is located well-away from the identified archaeologically sensitive dolerite outcrops.

A number of ruins of farm structures were identified within the development footprint, i.e., - Observations 19, 20, 21 and 22. These ruins are associated with the historic farming practices in this area and as such, have been determined to have contextual cultural value. These resources are Graded IIIC. A no development buffer of 50 m is recommended around these sites.

Due to the age of these ruins, and their historic nature, excavations that take place in close proximity to these ruins are more likely to negatively impact associated buried archaeological heritage. As such, an area of higher archaeological sensitivity has been identified in figures 7.2 and 7.3 below. It is recommended that this area be avoided by development activities.



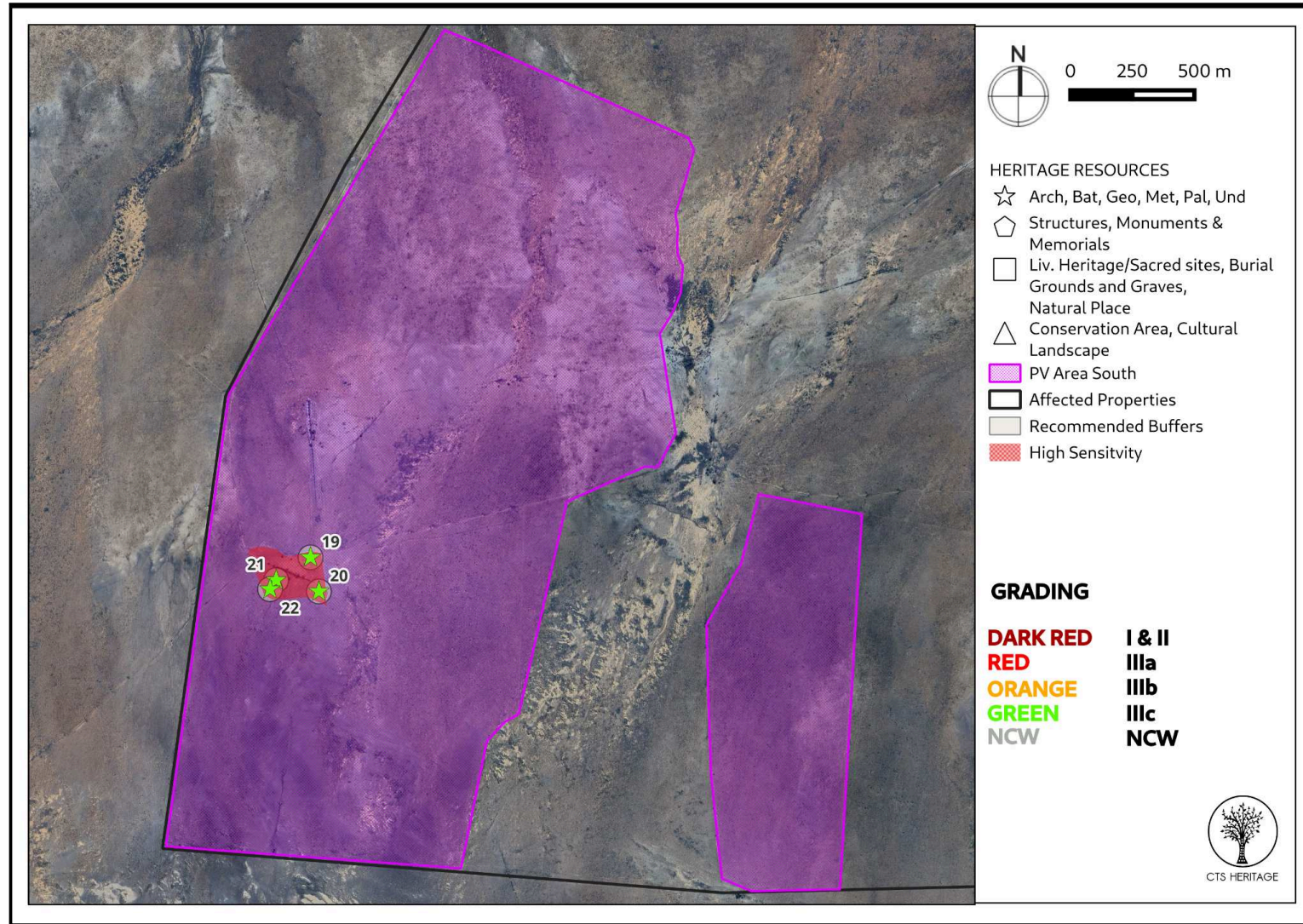


Figure 7.2: Map of all sites and observations noted within the PV South development area with recommended mitigation measures



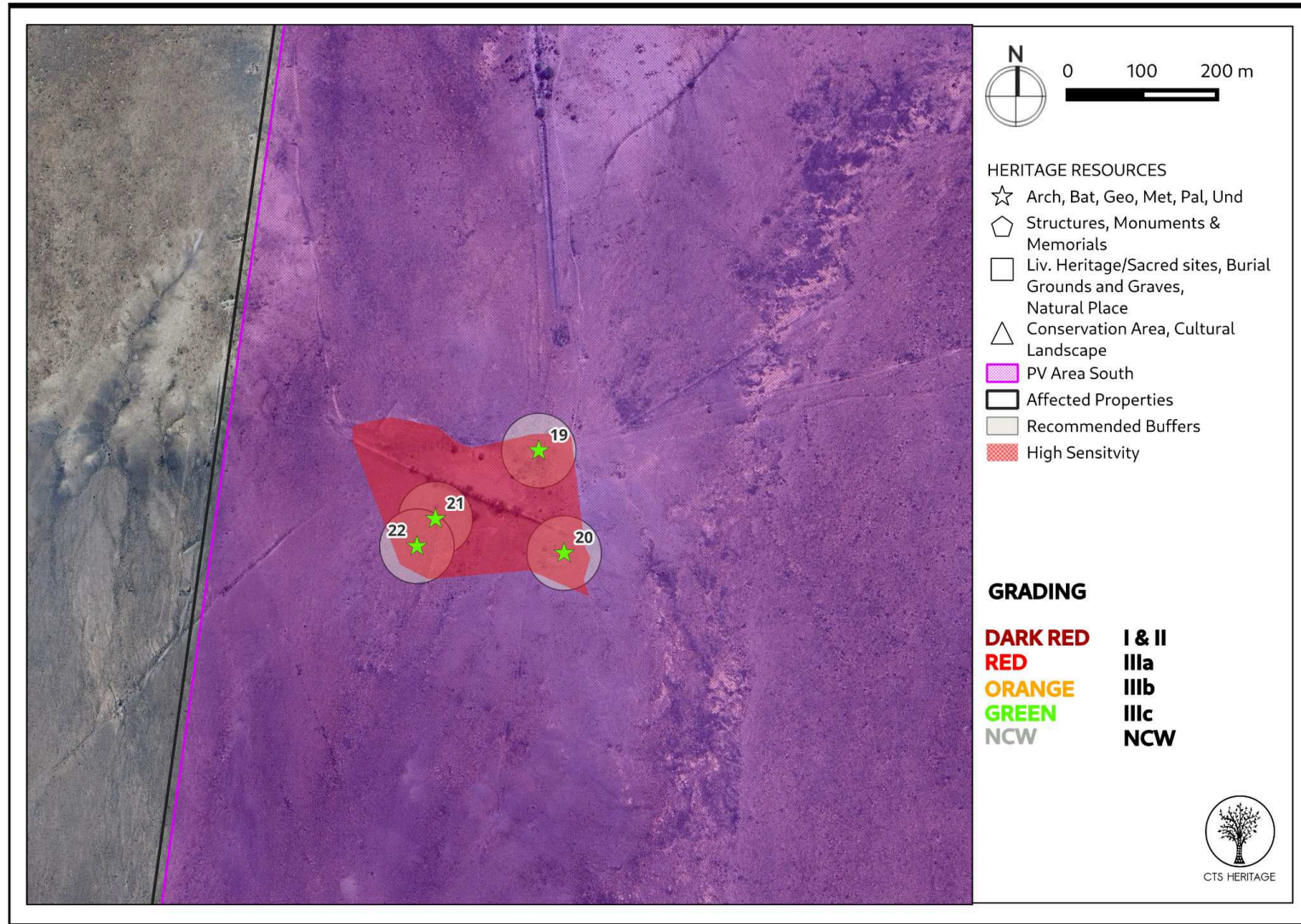


Figure 7.3: Map of all sites and observations noted within the PV South development area with recommended mitigation measures



## 6. CONCLUSION AND RECOMMENDATIONS

Much of the archaeological material identified within the development area consists of low density MSA material made from locally abundant stone such as siltstone, hornfels and chert. This archaeological signature consists largely of low density surface scatters. Areas of higher density and higher significance can be avoided through the implementation of no development buffers. These buffers are noted in Tables 2.1 and 2.2 above and in Figures 7.1, 7.2 and 7.3.

Important to note are the high numbers of rock engravings and rock gongs associated with the dolerite outcrops in the area. No direct impact to these dolerite outcrops is anticipated however their archaeological sensitivity cannot be overstated and due concern in this regard must be noted.

### ***Recommendations***

Based on the outcomes of this report, it is not anticipated that the proposed development will negatively impact on significant archaeological heritage on condition that:

- The buffers recommended in Tables 2.1 and 2.2, and illustrated in Figures 7.1, 7.2 and 7.3 are implemented.
- Although all possible care has been taken to identify sites of cultural importance during the investigation of the study area, it is always possible that hidden or subsurface sites could be overlooked during the assessment. If any evidence of archaeological sites or remains (e.g., remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials or other categories of heritage resources are found during the proposed development, work must cease in the vicinity of the find and Heritage Western Cape (HWC) must be alerted immediately to determine an appropriate way forward.



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## 7. REFERENCES

Heritage Impact Assessments				
Nid	Report Type	Author/s	Date	Title
5014	AIA Phase 1	Julius CC Pistorius	01/06/2007	A Phase 1 Heritage Impact Assessment Study for the Proposed New 88 kV Power Line Running from the Majuba Power Station near Amersfoort to the Camden Power Station near Ermelo in the Mpumalanga Province
5749	AIA Phase 1	Julius CC Pistorius	01/05/2003	Heritage Impact Assessment Study for Eskom's Proposed New Power Line on the Farms Driefontein 114 IT and Lettieskeus 105 IT near Chrissiesmeer, Mpumalanga
5829	HIA Phase 1	Polke Birkholtz	02/04/2008	Phase 1 Heritage Impact Assessment for the Lothier Siding for Golfview Mining (Pty) Ltd. on the Farm Leliefontein 136 IT Portion 6 in the Vicinity of Ermelo, Mpumalanga Province, South Africa
6382	AIA Phase 1	Wouter Fourie	28/11/2008	Archaeological Impact Assessment: Camden Power Station Rail Expansion Project on Portions of the Farm Mooiplaats 290 IT and the Farm Camden Power Station 329 IT, District Ermelo, Mpumalanga
7957	AIA Phase 1	Wouter Fourie	23/05/2008	Archaeological Impact Assessment Proposed Mining Development for Xstrata Group - Spitzkop Mine, Breyten - Ermelo Region, Mpumalanga Province Version 2.0
8200	AIA Phase 1	Polke Birkholtz	07/11/2008	Voorslag Siding for SA Coal Mining Holdings on the Farm Voorslag 274 IS Portion 10 of Ptn of Ptn of Ptn 5
16357	AIA Phase 1	Anton van Vollenhoven	01/06/2012	A Report on a Heritage Impact Assessment for a proposed opencast Coal Mine on the farms Joubertsvei 260IT and Meppel 264It close to Ermelo, Mpumalanga Province.
108270	AIA Phase 1	Tobias Coetzee		ARCHAEOLOGICAL IMPACT ASSESSMENT: Vunene Mining
110581	AIA Phase 1	Tobias Coetzee	15/02/2013	Phase 1 AIA for the proposed relocation of the Umlabu Colliery processing plant between Ermelo and Breyten, Mpumalanga
114858	HIA Phase 1	Stephan Gaigher	13/12/2011	First Phase Heritage Impact Assessment for the Proposed Extension to the Camden Ash Disposal Facilities
116756	AIA Phase 1	Jean-Pierre Celliers	22/01/2013	Report on Phase 1 Archaeological Impact Assessment on Portion 22 of the farm Witpunt 267 IT, Ermelo, Mpumalanga Province.
133732	HIA Phase 1	Johnny Van Schalkwyk	29/01/2014	Cultural Heritage Impact Assessment Report for the development of the proposed Ermelo Ring Road, Mpumalanga Province
145653	AIA Phase 1	Mungadziwa Magoma	30/05/2011	PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT SPECIALIST STUDY REPORT FOR THE PROPOSED TOWNSHIP ESTABLISHMENT OF 5760 STANDS ON PORTION 6 OF FARM RIETSPRUIT 437-IS IN ERMELO REGION WITHIN MSUKALIGWA LOCAL MUNICIPALITY OF GERT SIBANDE DISTRICT, MPUMALANGA PROVINCE.





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152426	PIA Desktop	John E Almond	31/10/2013	RECOMMENDED EXEMPTION FROM FURTHER PALAEONTOLOGICAL STUDIES: PROPOSED AGGREGATE MINE ON PORTION 7 OF FARM ROODEPOORT 435 NEAR ERMELO, MPUMALANGA
152427	AIA Phase 1	Jaco van der Walt	31/10/2013	Archaeological Impact Assessment For the proposed Mine on De Roodepoort 435, IS, Mpumalanga Province
162098	HIA Phase 1	Johnny Van Schalkwyk	01/09/2013	Cultural heritage impact assessment for THE PROPOSED SWAZILAND RAIL LINK, WESTERN SECTION, MPUMALANGA REGION
163823	HIA Phase 1	Udo Kusel	24/02/2014	CULTURAL HERITAGE RESOURCES IMPACT ASSESSMENT FOR THE REMAINDER OF PORTION 89 OF THE FARM NOOITGEDACHT 268 IT ERMELO MPUMALANGA PROVINCE
164257	Palaeontological Specialist Reports	Gideon Groenewald	15/02/2014	Paleontological desktop assessment for the proposed upgrade of the Davel to Nerston Rail Line in the Mpumalanga Province
164316	Palaeontological Specialist Reports	Gideon Groenewald	16/02/2014	Palaeontological Desktop Assessment for the proposed upgrade of the Golela to Nsezi Line in KwaZulu - Natal Province.
182088	PIA Phase 1	Heidi Fourie	23/09/2014	Phase 1 Palaeontological Impact Assessment for the Proposed Relocation of the Umlabu Coal Handling and Preparation Plant and Tailings Storage Facility to Portions 5 and 10 of the Farm Voorslag 274 IS.
182097	AIA Phase 1	Tobias Coetzee	10/10/2014	Phase 1 Archaeological Impact Assessment for the Proposed Relocation of the Coal Handling and Preparation Plant and Tailings Storage Facility to Portions 5 and 10 of the Farm Voorslag 274 IS
182469	AIA Phase 1	Christine Van Wyk Rowe	21/11/2014	Phase 1 Archaeological and Heritage impact assessment for the proposed Bahlangene residential township establishment on portion 2 of the farm Langverwacht 293, Ermelo, Mpumalanga province
183145	Heritage Impact Assessment Specialist Reports	Wouter Fourie, Jennifer Kitto	31/10/2013	Heritage Impact Assessment (HIA) for expansion of mining activities on Portion 25 of the farm Witbank No 262 IT, Ferreirâs Extension of Penumbra Mine, near Ermelo, Gert Sibande District Municipality, Mpumalanga Province.
342931	PIA Desktop	Barry Millstead	22/02/2014	Desktop Palaeontological Heritage Impact Assessment Report on the site of four alternative road locations (Alternatives 1-4) for a proposed ring road around Ermelo, Mpumalanga Province
374698	BGG Phase 3	Henk Steyn	17/10/2016	Msobo Coal (Spitzkop Colliery) Test Excavation on portion 15 of the Farm Waterval 244 IS



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## **APPENDIX 2: Palaeontological Assessment (2023)**

## PALAEONTOLOGICAL HERITAGE INPUT: COMBINED FIELD-BASED & DESKTOP STUDY

### **Basic Assessment Process for two Solar Photovoltaic Facilities, Rhino PV on Remainder of Farm Rhenosterkop 155 and Sunnyside PV on Farm 400, Beaufort West Local Municipality, Central Karoo District, Western Cape**

Dr John E. Almond  
*Natura Viva* cc  
 PO Box 12410 Mill Street  
 CAPE TOWN 8010, RSA  
 naturaviva@universe.co.za

February 2024

#### **EXECUTIVE SUMMARY**

K2022578692 South Africa (Pty) Ltd (K2022), has appointed SiVEST SA (Pty) Ltd to undertake the required Basic Assessment process for the proposed development of the 500 MWac solar PV facility and associated infrastructure. The proposed solar energy facility (SEF) is to be located approximately 20 kilometres (km) to the east and north-east of Beaufort West in the Western Cape Province in the Beaufort West Local Municipality (Central Karoo District Municipality). This SEF comprises the “Rhino PV” on the Remainder of Farm Rhenosterkop 155 and “Sunnyside PV” on Farm 400.

The project is being developed either to supply the national grid under the Renewable Energy Independent Power Producer Programme (REIPPPP) or similar procurement programme.

The SEF project areas are underlain at depth by Permian continental sediments of the Lower Beaufort Group (Karoo Supergroup) assigned to the Teekloof Formation which are locally baked by dolerite dykes. Based on desktop studies, including several previous palaeontological heritage reports for the low-lying Beaufort West – Aberdeen region of the Great Karoo, as well as the recent two-day site visit on 25-26 October 2023 All the SEF project areas are in practice of low palaeosensitivity. No fossils were recorded from either the very poorly-exposed, weathered bedrocks nor from the overlying Late Caenozoic superficial sediments (calcrete, alluvium, surface gravels, *etc.*).

Potential impacts on local palaeontological heritage resources due to the proposed Rhino and Sunnyside SEF are anticipated to be of LOW significance. There are therefore no objections on palaeontological grounds to authorization of this renewable energy project. Pending the discovery of significant new fossil remains before or during construction, no further palaeontological studies, monitoring or mitigation are recommended for this development. Given the potential (albeit small) for the exposure or recognition of scientifically valuable fossil occurrences within the bedrocks underlying the SEF project footprint, a Chance Fossil Finds Protocol, as outlined below and tabulated in **Appendix 1**, must be included within the EMPr and fully implemented throughout the construction phase of the solar project.

The Environmental Control Officer (ECO) / Environmental Site Officer (ESO) responsible for the SEF development should be made aware of the possibility of important fossil remains (vertebrate bones, teeth, burrows, petrified wood, plant-rich horizons, *etc.*) being found or unearthed during the construction phase of the proposed development. Monitoring for fossil material of all major surface clearance and deeper (>1 m) excavations by the ECO/ESO on an on-going basis during the construction phase is therefore recommended. Significant fossil finds should be safeguarded and reported at the earliest opportunity to Heritage Western Cape (HWC) for recording and sampling by a



professional palaeontologist (Contact details: Heritage Western Cape. 3<sup>rd</sup> Floor Protea Assurance Building, 142 Longmarket Street, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 021 483 5959 Email: ceoheritage@westerncape.gov.za). The palaeontologist concerned will need to submit a Work Plan for approval by HWC.

## 1. INTRODUCTION AND BRIEF

The Applicant, K2022578692 Pty (Ltd), is proposing to develop a solar energy facility (SEF) *plus* associated infrastructure on two properties situated due south of the N1 trunk road and railway line some 25 to 30 kilometres (km) to the east (E) and north-east (NE) of Beaufort West in the Beaufort West Local Municipality (Central Karoo District Municipality), Western Cape Province. The two Photovoltaic (PV) facilities are known as (1) the Rhino SEF, to be located on the Remainder of Farm Rhenosterkop 155 (available development area of 563 hectares [ha]) and (2) the Sunnyside SEF situated on Farm 400 (available development area of 525.2 ha), refer to **Figure 1** to **Figure 3**.

The solar project areas are all located within the gazetted Beaufort West Renewable Energy Development Zone (REDZ 11) (*cf* Van der Walt 2019) and are therefore subject to a Basic Assessment (BA) process. The present combined desktop and field-based Palaeontological Heritage Report contributes palaeontological heritage data to the overarching Heritage Impact Assessment for the solar project that is being compiled by CTS Heritage, Cape Town (Contact details: Ms Jenna Lavin, CTS Heritage. 16 Edison Way, Century City, Cape Town. Tel: +27 (0)87 073 5739. Cell: +27 (0)83 619 0854. E-mail: info@ctsheritage.com). The independent Environmental Assessment Practitioner (EAP) for this solar PV project is SiVEST SA (Pty) Ltd.

## 2. INFORMATION SOURCES

This combined desktop and field-based Palaeontological Heritage Study for the Rhino and Sunnyside SEF was based on the following information resources:

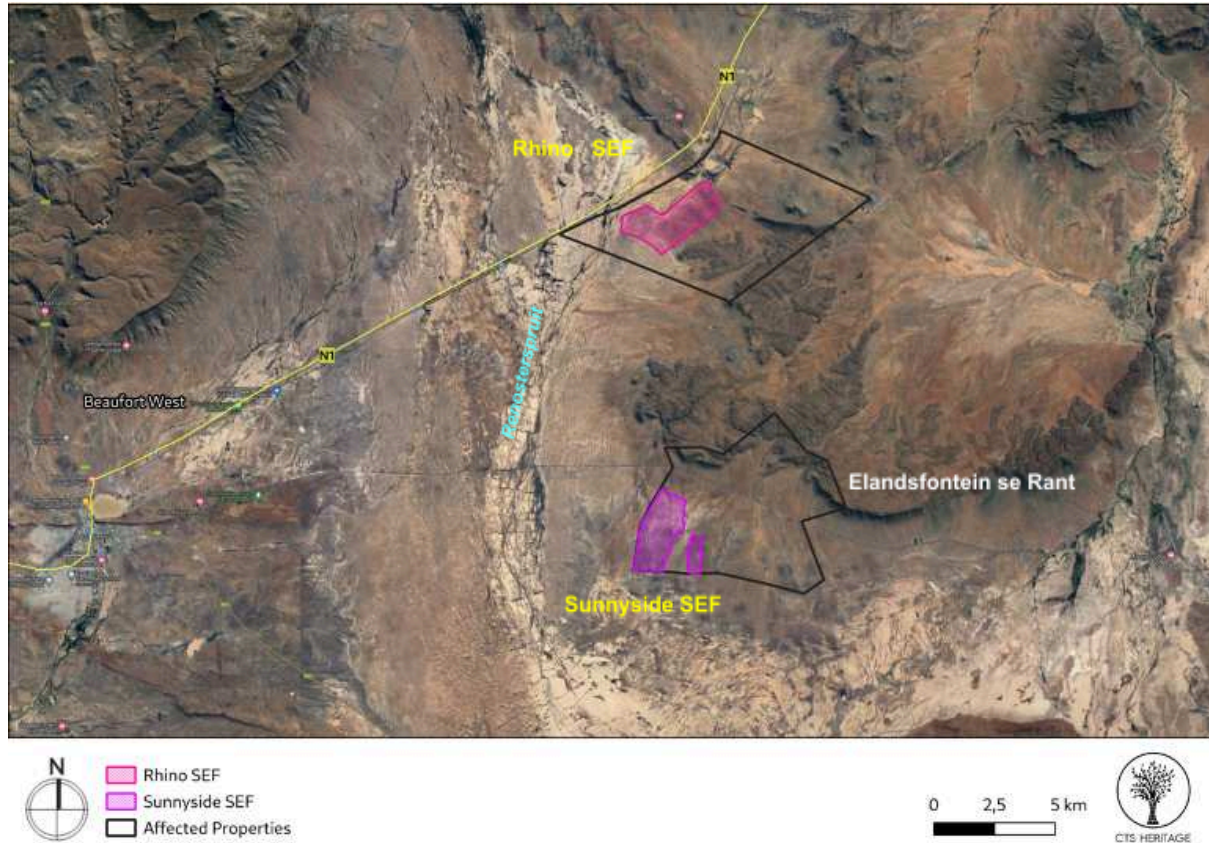
- Short project outlines (Heritage Screener), kmz files, Screening Reports generated from the National Web-Based Environmental Screening Tool (Screening Tool) enacted in terms of Regulation 16(1)(b)(v) of the Environmental Impact Assessment Regulations, 2014 as amended (EIA Regulations), promulgated under Section 24(5) and 44 of the National Environmental Management Act, 1998 (Act 107 of 1998) as amended (NEMA), and maps provided by CTS Heritage, Cape Town (CTS Heritage 2023);
- A desktop review of:
  - o the relevant 1:50 000 scale topographic maps (3222BB Renosterkop, 3222BD Lemoen) and the 1:250 000 scale topographic map 3222 Beaufort West);
  - o Google Earth® satellite imagery; and
  - o published geological and palaeontological literature, including the 1:250 000 geological map (3222 Beaufort West) and relevant sheet explanation (Johnson & Keyser 1979) as well as several previous and fossil heritage (PIA<sup>1</sup>) assessments for renewable energy and transmission line projects in the Beaufort West – Nelspoort region by the author and colleagues (*e.g.* Almond 2022a, 2022b, 2023);
- The author's field experience with the formations concerned and their palaeontological heritage (*cf* Almond & Pether 2008 and PIA reports listed in the References);
- A two-day field assessment of the two solar project areas by the author and an experienced field assistant (Ms Madelon Tusenius, *Natura Viva* cc) from 25 to 26 October 2023;
- Government Notice No. 320 of 2020 enacted under the NEMA – **Appendix 2**; and

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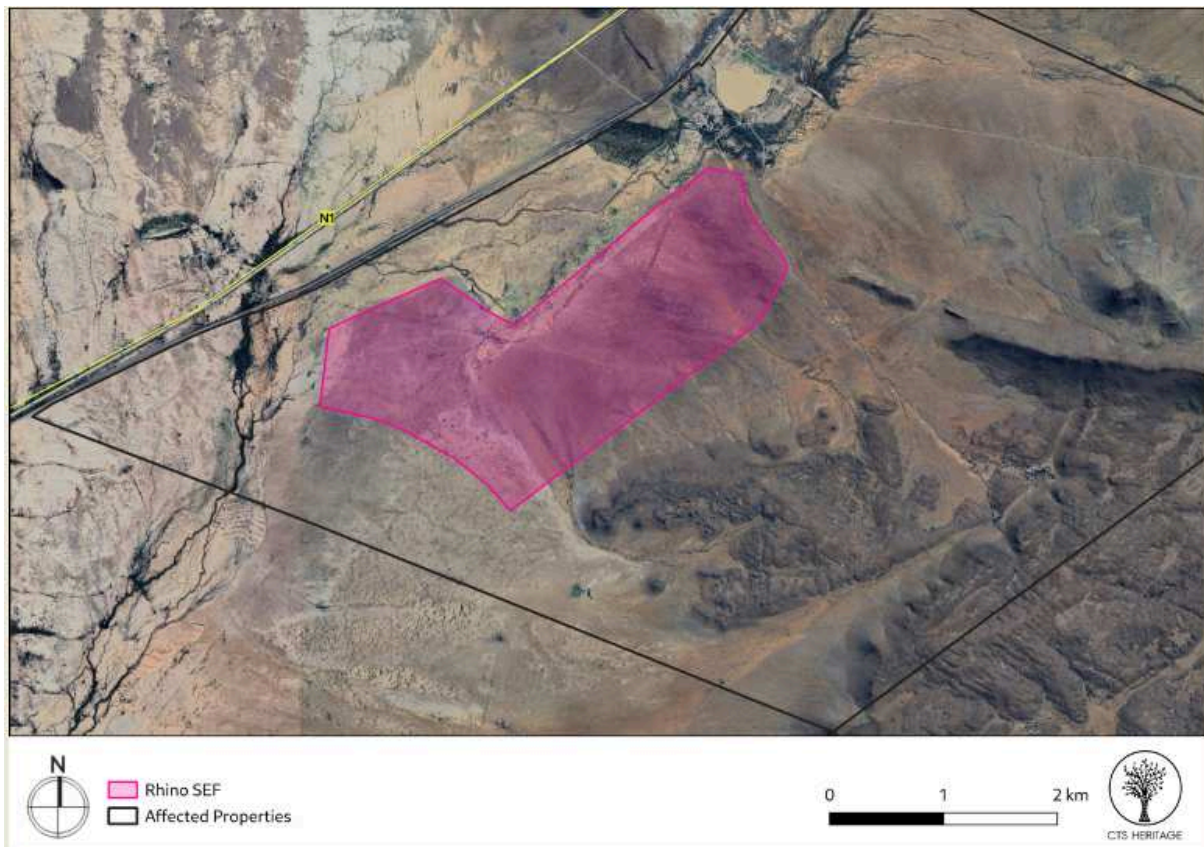
<sup>1</sup> Palaeontology Impact Assessment

- Appendix 6 of the EIA Regulations.

The season in which the site visit took place has no critical bearing on the Palaeontological Study.



**Figure 1: Google Earth© satellite image of the Beaufort West area of the Great Karoo showing the location of the Rhino SEF on the Remainder of Farm Rhenosterkop 155 and the Sunnyside SEF on Farm 400 (Based on map generated by CTS Heritage 2023).**



**Figure 2: Google Earth© satellite image showing the Rhino SEF project area (pink polygon) on the Remainder of Farm Rhenosterkop 155. The majority of the area is mantled by sandy to gravelly alluvial soils with a calcrete-capped pediment surface (paler area) in the south-west. Bedrock exposure here is very low, apart from occasional shallow stream gullies.**





**Figure 3:** Google Earth© satellite image showing the Sunnyside SEF project areas (purple polygons) on Farm 400. The majority of the area is mantled by sandy to gravelly alluvial soils underlain by a calcrete-capped pediment surface. Bedrock exposure within the SEF project areas themselves is very low but occasional small patches of Beaufort Group mudrocks with diagenetic carbonate concretions occur further to the east (darker areas on satellite image).

### 3. GEOLOGICAL CONTEXT

The Rhino and Sunnyside SEF project areas are all situated in fairly flat-lying, semi-arid terrain within an otherwise dissected, hilly to mountainous zone that lies in front of the Great Escarpment, *i.e.*, along the north-western margins of the Great Karoo *sensu stricto* (*cf* Figure 1, where relevant land parcels are indicated).

The geology of the SEF project area is covered by 1: 250 000 geology sheet 3222 Beaufort West (Council for Geoscience, Pretoria; Johnson & Keyser 1979), refer to **Figure 4** ). Low-lying, topographically subdued areas are largely underlain by the mudrock-dominated continental (fluvial / lacustrine) deposits of the Lower Beaufort Group which are currently mapped within the **Teekloof Formation** (Pt, green in **Figure 4**) and are of earliest Late Permian age (Johnson *et al.* 2006). The Teekloof beds are not well-differentiated at member level on the published 1: 250 000 geology sheet. The mudrock-dominated bedrock succession underlying the Rhino and Sunnyside SEF project areas is *provisionally* assigned to the Early Permian **Hoedemaker Member** (**Figure 35** ). If correct, the sandstone package(s) cropping out along the upper slopes of the adjoining Driekop - Renosterkop and Elandsfontein se Rant would be equivalent to the Oukloof Member (**Figure 5** and **20** ). However, detailed mapping of the Teekloof Formation members is poorly resolved in this region due to the generally low levels of bedrock exposure, especially as far as the potentially fossiliferous overbank mudrocks are concerned; these mudrocks are mainly seen in occasional incised streams and erosion gullies as well as farm dams and borrow pits. Recent palaeontological studies in the Nelspoort area

and further east bordering the Aberdeen *Vlakte*s suggest that older (Middle Permian) beds of the Abrahamskraal Formation might be represented at low elevations in the pre-Escarpment Zone here, beneath the Poortjie Member sandstone package (*cf* Almond 2022a, 2022b, 2023).

The Lower Beaufort Group sediments near the Great Escarpment are extensively intruded by Early Jurassic sills and dykes of the **Karoo Dolerite Suite** (e.g., Renosterkop, Elandsfontein se Rant). These intrusions cap most of the *koppies* and build prominent ridges across the landscape. Intrusion of hot dolerite magmas and associated metasomatism by hot mineral-rich fluids has extensively baked and otherwise altered the Palaeozoic country rocks.

Bedrocks in lower-lying areas are mostly blanketed by unconsolidated to semi-consolidated **Late Caenozoic superficial sediments** including thick gravelly to sandy or silty alluvial deposits, eluvial surface gravels and soils of ill-defined Late Caenozoic age. Calcrete hardpans are widely developed in the subsurface here due to the high levels of carbonate derived from local dolerite weathering. Mountain slopes and low rocky scarps are for the most part mantled by rubbly doleritic and sandstone colluvial deposits.

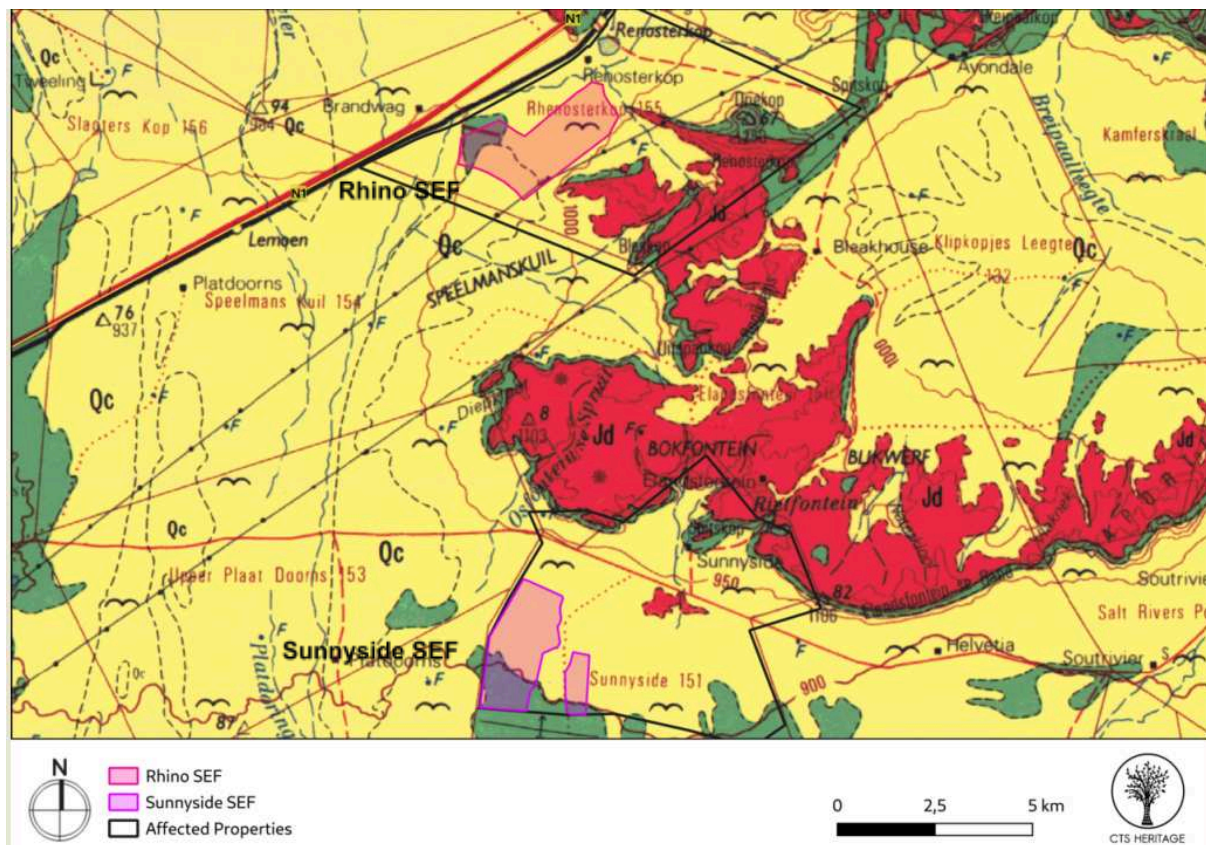


Figure 4: Extract from 1: 250 000 geological map 3222 Beaufort West (Council for Geoscience, Pretoria) showing the location of the Rhino and Sunnyside SEF to be situated near Beaufort West, Western Cape. As mapped, the SEF project areas are underlain by Permian continental sediments of the Teekloof Formation (Lower Beaufort Group) depicted in green as well as Late Caenozoic alluvium (yellow with flying bird symbol). Image prepared by CTS (2023). The Teekloof beds concerned *might* belong to the Hoedemaker Member but this remains to be confirmed by more detailed mapping.



### 3.1. Rhino SEF Project Area

The Rhino SEF project area is situated on the Remainder of Farm Rhenosterkop 155 and comprises gently sloping, low-relief terrain between c. 960 and 1 000 metres above mean sea level (mamsl) due south of the N1 trunk road and railway line some 27.5 km NE of Beaufort West (**Figure 2**). The area is largely mantled by grassy karroid *bossieveld*, alluvial soils and surface gravels (**Figure 6**). It is drained by small tributary streams of the braided Renosterspruit network which borders the project area in the north. Only very limited exposures of sedimentary bedrocks are seen along low scarps, shallow drainage lines and erosion gullies within and on the margins of the area (**Figure 7** to **Figure 10**). They comprise weathered, calcrete-veined purple-brown and grey-green mudrocks as well as friable, platy-weathering, khaki sandstones. A thin package of well-jointed, ripple cross-laminated, pale brownish channel wacke builds a low escarpment just outside the south-eastern margins of the area (**Figure 7**). Occasional narrow Karoo dolerite dykes build slightly prominent ridges across the area marked by denser shrubby vegetation and locally bordered by baked country rocks (**Figure 11**). The majority of the area is covered by sandy to sparsely or densely gravelly, orange-brown alluvial soils, sections through which are visible in more deeply incised stream gullies as well as in the banks of the Platdoring River just outside the area itself (**Figure 14** to **Figure 19**). The younger, unconsolidated alluvial sands and gravels are underlain by distinctive, massive, polygonally jointed and calcrete-veined, semi-consolidated gritty deposits which might be of debrite origin and Pleistocene in age. Surface and subsurface gravels of pebble to boulder size are dominated by rounded dolerite corestones as well as more angular clasts of quartzite (occasionally flaked), sandstone, platy siltstone, dark hornfels, Late Caenozoic calcrete and occasional darker carbonate pedocrete nodules reworked from the Beaufort Group bedrocks. Surface gravels reworked by sheetwash are well seen in open, unvegetated areas. The south-western sector of the project area (paler on satellite images) features a slightly elevated pediment surface capped by a substantial hardpan of creamy-hued, karstified calcrete (**Figure 12** and **Figure 13**). The calcrete pedocrete reflects several phases of exposure, weathering and erosion, locally containing lenses of re-cemented eluvial calcrete debris as well as fine gravels. Thick, well-sorted, orange-brown sands in the south-eastern sector of the project area may originally be of aeolian (wind-blown) origin (**Figure 19**).



**Figure 5: View eastwards across the Platdoring River drainage system towards uplands of Driekop (LHS) and Renosterkop (RHS) situated NE of the Rhino SEF project area. The former is**



built of mudrocks and at least two sandstone packages (arrowed) attributed to the Teekloof Formation while the latter mainly comprises intrusive dolerite.



Figure 6: View north-westwards across the Rhino SEF project area showing low relief, sandy terrain largely covered with grassy *bossieveld* vegetation and negligible bedrock exposure. The Nuweveld Escarpment is seen on the skyline.



Figure 7: Thin package of well-jointed, ripple cross-laminated channel sandstones (foreground) building a low scarp on the south-eastern margins of, but outside, the Rhino project area, close to the area of the proposed On-site Substation. Note the shallow incised drainage line in the middle ground.





**Figure 8: Rare, low exposure of well-jointed Beaufort Group channel sandstone within the Rhino SEF project area, just north of the proposed BESS site, baked by a dolerite dyke in the vicinity.**



**Figure 9: Limited exposure of purple-brown, hackly-weathering overbank mudrocks of the Lower Beaufort Group along the incised drainage line seen in the previous figure.**





**Figure 10: Shallow gully exposures of weathered, calcrete-veined Lower Beaufort Group mudrocks in the south-western sector of the Rhino SEF project area, beneath the low calcrete escarpment.**



**Figure 11: Concentration of rounded dolerite corestones marking the line of a narrow ENE-WSW trending dolerite dyke crossing the Rhino SEF project area to the north of the proposed BESS site. Hammer = 30 cm.**





**Figure 12:** Exposure of the margins of a thick, jointed and karstified calcrete hardpan capping the low pediment surface in the south-western sector of the Rhino SEF project area (hammer = 30 cm).



**Figure 13:** Close-up of the calcrete hardpan illustrated above showing composite nature with re-cemented, well-rounded and concentrically-laminated calcrete clasts (pisolitic texture) *plus* occasional gravels. Scale = c. 15 cm.





**Figure 14: Thick, partially calcretised, sparsely gravelly alluvial sands overlying bedrocks exposed in a stream gully on the south-eastern margins of the Rhino SEF project area. Coarse, unconsolidated surface gravels are dominated by dolerite corestones and wacke clasts of colluvial and alluvial origin.**



**Figure 15: Polygonally-jointed, semi-consolidated, orange-brown gritty sands of possible debris origin and Pleistocene age underlying the unconsolidated younger alluvium illustrated above. Hammer = 30 cm.**





**Figure 16: Thick, sandy to silty alluvium with occasional gravels of the Platdoring River drainage system which runs along the north-western edge of the Rhino SEF project area, seen just outside the area itself.**



**Figure 17: Typical eluvial surface gravels in the western sector of the Rhino SEF project area, dominated by subrounded to angular clasts of dolerite, calcrete, and wacke overlying a sandy substrate. Hammer = 30 cm.**





**Figure 18: Open areas with sheetwash gravels and silty alluvial soils in the north-western sector of the Rhino SEF project area.**



**Figure 19: Thick, orange-brown, sandy soils in the south-eastern sector of the Rhino SEF project area may be, at least in part, of aeolian origin.**



### 3.2. Sunnyside SEF Project Area

The Sunnyside SEF project areas are situated on Farm 400 and comprise flat to gently sloping, low-relief terrain between c. 890 and 935 mamsl due south of Elandsfontein se Rant and some 24 km E of Beaufort West (**Figure 3**). The area is largely mantled by grassy karroid *bossieveld*, alluvial soils and surface gravels. It is drained by very shallow, that flow southwards into pan-like areas on the margins of the Platdoring River network which forms a western extension of the Aberdeen Vlakte. Almost no exposures of undisturbed sedimentary bedrocks are seen within the SEF project areas. Local low exposures of flaggy, brownish wacke of channel or crevasse splay origin have been extensively exploited and disturbed for building material (**Figure 27**). Weathered, crumbly and calcretised Lower Beaufort Group mudrocks of greyish-green and purple-brown hue are visible around occasional trench-like excavations of agricultural origin (**Figure 21**). Outside and east of the Sunnyside SEF project areas, several darker patches visible on satellite images of Farm 400 feature small, low-relief exposures of Lower Beaufort Group sediments. These include platy brown wacke, gullied purple-brown and grey-green overbank mudrocks, lenses and extensive sheets of rusty-brown ferruginous carbonate concretions as well as patches of dispersed, small, pale greyish pedogenic calcrete concretions (**Figure 22 to Figure 26**).

Exposures in burrow pits, aardvark burrows, as well as farm tracks on the margins of as well as within the Sunnyside SEF project areas show that most or all of the terrain is underlain by a well-developed calcrete hardpan overlying, and locally incorporating, the weathered and calcrete-veined Beaufort Group bedrocks (**Figure 28 to Figure 30**). Pale creamy, pebbly to cobbly nodular calcrete is well seen in several farm tracks. Surface sediments include thin to thick sandy soils (often in grassier areas) as well as eluvial gravels dominated by clasts of calcrete, wacke, quartzite, hornfels, dolerite, rare apple-green tuffite and silicified desert roses *plus* locally abundant diagenetic / pedogenic carbonate concretions (**Figure 31 to Figure 33**).



**Figure 20:** View north-eastwards across Farm 400 showing level, gravel-strewn plains extending from the foot of the Elandsfontein se Rant in the background. The latter is built of mudrocks and at least one channel sandstone package (arrowed) of the Teekloof Formation, capped by a sill of intrusive Karoo dolerite.





**Figure 21: Disturbed, weathered, partially calcretised Lower Beaufort Group mudrocks exposed along a trench-like excavation within the western sector of the Sunnyside SEF project area.**



**Figure 22: Weathered purple-brown and grey-green Beaufort Group mudrocks exposed along a stream gully c. 2.5 km east of the Sunnyside SEF project areas on Farm 400. Similar mudrocks underlie much of the Sunnyside project areas themselves.**





Figure 23: *In situ*, hackly-weathering purple-brown Beaufort Group siltstones exposed in the south-east sector of Farm 400, c. 4.7 km east of the Sunnyside SEF project areas. Hammer = 30 cm.



Figure 24: Jointed lens of rusty-brown diagenetic carbonate within the Lower Beaufort Group exposed along the southern edge of the Sunnyside SEF project areas. Hammer = 30 cm.





**Figure 25: Surface gravels dominated by reworked pebbles and cobbles of diagenetic concretionary carbonate as well as sparser clasts of dark hornfels seen along the southern edge of the Sunnyside SEF project areas. Hammer = 30 cm.**



**Figure 26: Dispersed pale greyish palaeocalcrete nodules of pedogenic origin seen among surface gravels c. 1.25 km east of the Sunnyside SEF project areas. These nodules are derived from palaeosol horizons and may be associated with fossil vertebrate remains. Hammer = 30 cm.**





**Figure 27:** Platy slabs of wacke excavated for historical farm buildings close to the western edge of the Sunnyside SEF project areas. Good *in situ* exposures of Lower Beaufort Group sandstone facies are not seen in this very low-relief region.



**Figure 28:** The well-developed composite calcrete hardpan underlying the karroid *vlaktes* within the Sunnyside SEF project area is best exposed in several nearby burrow pits and incised streams, such as c. 4 km to the west. Calcrete veining of the bedrocks has led to folding and crumpling of the greyish weathered sediments.





**Figure 29: Concentrations of pebble- to cobble-sized calcrete nodules derived from the near-surface calcrete hardpan are exposed locally along farm tracks within the SEF project areas. Hammer = 30 cm.**



**Figure 30: Comparable nodular calcrete excavated from an aardvark burrow within the north-west sector of the Sunnyside SEF project areas. In most areas the hardpan is mantled by thin, orange-brown sands and surface gravels shown in Figure 31.**





**Figure 31: Typical view across the flat, gravelly plains represented within the Sunnyside SEF project areas. Dark lines of higher shrubs mark very shallow drainage lines that do incise down into bedrock.**



**Figure 32: Eluvial and sheetwash surface gravels within the Sunnyside SEF project areas are dominated by subrounded to angular clasts of wacke, quartzite, hornfels, dolerite and calcrete, with locally abundant pedogenic carbonate concretionary material. No reworked petrified wood clasts were observed. Hammer = 30 cm.**





**Figure 33: Grassy patches within the Sunnyside SEF project areas are often associated with thicker sandy soils with only sparse surface gravels.**

#### **4. PALAEOONTOLOGICAL HERITAGE CONTEXT**

The bedrocks of the Hoedemaker Member (Teekloof Formation) which are provisionally taken to underlie the Rhino and Sunnyside SEF project areas near Beaufort West at depth were originally assigned to the *Tropidostoma* Assemblage Zone (AZ) (Smith & Keyser 1995, Smith *et al.* 2012). They are now largely referred to the upper part of the newly defined ***Endothiodon* AZ** (Day & Smith 2020), viz. the *Tropidostoma* – *Gorgonops* Subzone (**Figure 34** and **Figure 35**). This diverse continental fossil biota of earliest Late Permian age is characterised by several medium to large-sized, dicynodonts such as *Tropidostoma*, *Rachiocephalus* and *Endothiodon* with its highly-specialized herbivorous dentition (the first large-bodied herbivore to appear after the end-Capitanian extinction event) as well as a range of small-bodied dicynodonts with or without post-canine teeth, palaeoniscoid bony fish, rhinesuchid temnospondyl amphibians, large herbivorous pareiasaur reptiles, the small, lizard-like reptile *Youngina* as well as several carnivorous gorgonopsian, therocephalian and cynodont therapsids. Non-vertebrate fossils include non-marine bivalve molluscs, a limited range of trace fossils (e.g., vertebrate tracks, tetrapod burrows, invertebrate burrows and trackways) as well as plant remains of the Gondwanan *Glossopteris* Flora.

No historical fossil sites are shown in the wider solar project area near Beaufort West on the 1: 250 000 geology sheet 3222 Beaufort West (**Figure 4**) or on the early Karoo vertebrate fossil site map of Kitching (1977). A couple of recorded vertebrate fossil sites are shown in the region in the more recent fossil site map of Nicolas (2007), however.

No fossil remains of any sort, including bones, teeth, trace fossils and petrified wood, were recorded within the Rhino and Sunnyside SEF project areas during the recent two-day site visit. This is probably due to (1) the very poor exposure levels of the Lower Beaufort Group bedrocks as well as (2) the weathered and calcretised condition of the mudrock facies immediately underlying the extensive calcrete hardpan in low-lying areas. In addition, the bedrocks are locally baked by dolerite dykes.



The Late Caenozoic superficial sediments – calcretes, alluvium, eluvial and alluvial surface gravels are generally of low palaeosensitivity in the Great Karoo region. With few exceptions, similar results were obtained in recent palaeontological heritage surveys of low-relief, calcrete- and alluvial-dominated terrain east of Beaufort West (including the Aberdeen *Vlaktes*) by Almond (2022a, 2022b, 2023). The potential for scientifically valuable fossil remains (bones, teeth, trace fossils) within the Lower Beaufort Group bedrocks cannot be excluded however.

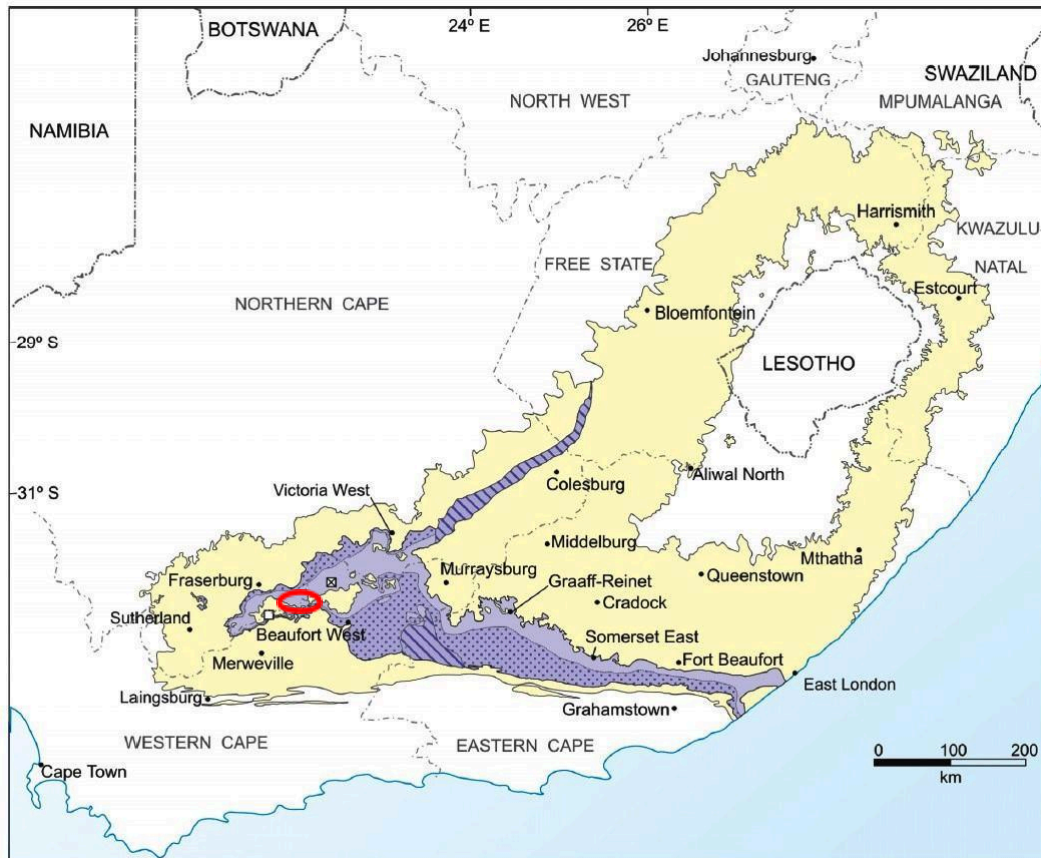
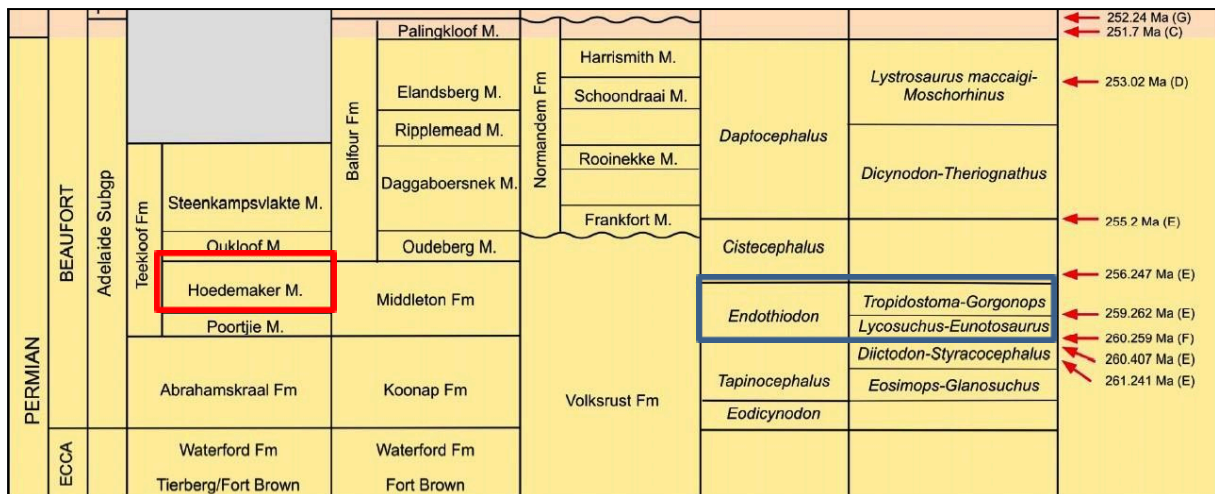


Figure 34: Distribution of the *Endothiodon* AZ within the Main Karoo Basin of the RSA (Day & Smith 2020). The Rhino and Sunnyside SEF project areas to the NE and E of Beaufort West (red ellipse), probably fall largely or entirely within the *Tropicostoma* – *Gorgonops* Subzone (plain lilac area) but this is unconfirmed due to insufficient palaeontological data and it is even possible that older biotas of the *Tapinocephalus* AZ may be represented here.



**Figure 35: Chart showing the latest, newly revised fossil biozonation of the Lower Beaufort Group of the Main Karoo Basin (abstracted from Smith *et al.* 2020). Rock units and fossil AZs mapped within the Rhino and Sunnyside SEF project areas are outlined in red and blue, respectively.**

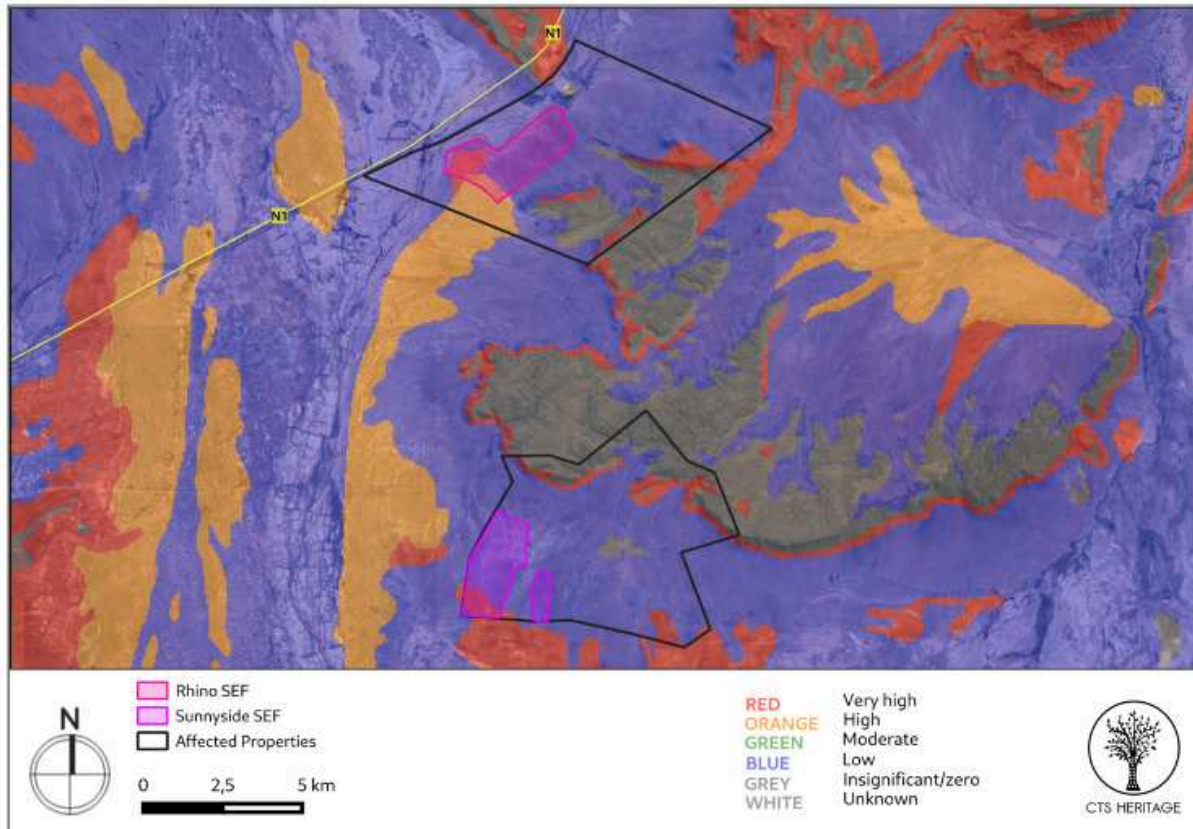
## 5. SITE SENSITIVITY VERIFICATION

Preliminary palaeosensitivity mapping of the Rhino and Sunnyside SEF project based on the Screening Tool is shown below in **Figure 36**. Outcrop areas of Lower Beaufort Group bedrocks shown on the 1: 250 000 geology map (**Figure 4**) are assigned a Very High palaeosensitivity, surface exposures of calcrete hardpans a Medium Sensitivity while mapped alluvial areas are assigned a Low palaeosensitivity and dolerite intrusions an Insignificant / Zero palaeosensitivity.

While a sparse scatter of previously recorded vertebrate fossil sites are known in the wider region (Nicholas 2007), low relief areas of the Great Karoo such as this and the adjoining Aberdeen *Vlakte* have generally yielded very few fossil remains. Based on the recent 2-day palaeontological site visit, the great majority of the solar project areas is mantled by thick superficial deposits (alluvium, colluvium/ eluvium, calcrete, soils) of low palaeosensitivity (Section 4).

No fossil remains of any sort, including bones, teeth, trace fossils and petrified wood, were recorded within the Rhino and Sunnyside SEF project areas during the recent two-day site visit. This is probably due to (1) the very poor exposure levels of the Lower Beaufort Group bedrocks as well as (2) the weathered and calcretised condition of the mudrock facies immediately underlying the extensive calcrete hardpan in low-lying areas. The Late Caenozoic superficial sediments, calcretes, alluvium, eluvial and alluvial surface gravels, are generally of low palaeosensitivity in the Great Karoo region.

It is concluded that all the proposed Rhino and Sunnyside SEF project areas are in practice of Low palaeosensitivity overall. Therefore, the preliminary Screening Tool site sensitivity mapping shown in Figure 36 is contested.



**Figure 36: Preliminary palaeosensitivity mapping of the proposed Rhino and Sunnyside SEF project areas near Beaufort West (pink polygons) based on the Screening Tool. In practice, all these areas show very low bedrock exposure, are mantled by largely or entirely unfossiliferous superficial deposits and are therefore of Low Palaeosensitivity.**

## 6. CONCLUSIONS & RECOMMENDATIONS

The proposed SEF project areas are underlain at depth by Permian continental sediments of the Lower Beaufort Group (Karoo Supergroup) assigned to the Teekloof Formation. Based on desktop studies, including several previous palaeontological heritage reports for the low-lying Beaufort West, Aberdeen region of the Great Karoo, as well as the recent two-day site visit, all the proposed Rhino and Sunnyside SEF project areas are in practice of Low palaeosensitivity. No fossils were recorded from either the very poorly-exposed, weathered bedrocks nor from the overlying Late Caenozoic superficial sediments (calcrete, alluvium, surface gravels, etc.).

Potential impacts on local palaeontological heritage resources due to the proposed Rhino and Sunnyside SEF are anticipated to be of LOW significance. There are therefore no objections on palaeontological grounds to authorise the proposed renewable energy project. Pending the discovery of significant new fossil remains before or during construction, no further palaeontological studies, monitoring or mitigation are recommended for these developments.

Given the potential (albeit small) for the exposure or recognition of scientifically valuable fossil occurrences within the bedrocks underlying the SEF project footprints, a Chance Fossil Finds Protocol, as outlined below and tabulated in Appendix 1, must be included within the EMP and fully implemented throughout the construction phase of the solar project.



The ECO/ESO responsible for the SEF development should be made aware of the possibility of important fossil remains (vertebrate bones, teeth, burrows, petrified wood, plant-rich horizons, etc.) being found or unearthed during the construction phase of the development. Monitoring for fossil material of all major surface clearance and deeper (>1 m) excavations by the ECO/ESO on an on-going basis during the construction phase is therefore recommended. Significant fossil finds should be safeguarded and reported at the earliest opportunity to HWC for recording and sampling by a professional palaeontologist (Contact details: Heritage Western Cape. 3<sup>rd</sup> Floor Protea Assurance Building, 142 Longmarket Street, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 021 483 5959 Email: ceoheritage@westerncape.gov.za). The palaeontologist concerned will need to submit a Work Plan for approval by HWC.

## 7. ACKNOWLEDGEMENTS

Ms Jenna Lavin of CTS Heritage, Cape Town is thanked for commissioning this study as well as for providing the necessary project information. The companionship in the field, palaeontological contributions as well as logistical backup kindly provided by Ms Madelon Tusenius are all highly appreciated, as always.

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## 9. SHORT CV OF AUTHOR

Dr John Almond has an Honours Degree in Natural Sciences (Zoology) as well as a PhD in Palaeontology from the University of Cambridge, UK. He has been awarded post-doctoral research fellowships at Cambridge University and the University of Tübingen in Germany, and has carried out palaeontological research in Europe, North America, the Middle East as well as North and South Africa and Madagascar. For eight years he was a scientific officer (palaeontologist) for the Geological Survey / Council for Geoscience in the RSA. His current palaeontological research focuses on fossil record of the Precambrian - Cambrian boundary and the Cape Supergroup of South Africa. He has recently written palaeontological reviews for several 1: 250 000 geological maps published by the Council for Geoscience and has contributed educational material on fossils and evolution for new school textbooks in the RSA.

Since 2002 Dr Almond has also carried out numerous palaeontological impact assessments for developments and conservation areas in the Western, Eastern and Northern Cape, Limpopo, Northwest Province, Mpumalanga, Gauteng, KwaZulu-Natal and the Free State under the aegis of his Cape Town-based company *Natura Viva* cc. He has served as a member of the Archaeology, Palaeontology and Meteorites Committee for Heritage Western Cape (HWC) and an advisor on palaeontological conservation and management issues for the Palaeontological Society of South Africa (PSSA), HWC and SAHRA. He is currently compiling technical reports on the provincial palaeontological heritage of Western, Northern and Eastern Cape for SAHRA and HWC. Dr Almond is an accredited member of PSSA and AHP (Association of Professional Heritage Practitioners – Western Cape).

### Declaration of Independence

I, John E. Almond, declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed development, application or appeal in respect of which I was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of my performing such work.



**Dr John E. Almond**  
**Palaeontologist**  
***Natura Viva* cc**



## APPENDIX 1: CHANCE FOSSIL FINDS PROTOCOL

Rhenosterkop North and Rhenosterkop South Solar Energy Facilities near Beaufort West	
<b>Province &amp; region:</b>	Western Cape (Central Karoo District, Beaufort West Local Municipality)
<b>Responsible Heritage Resources Agency</b>	Heritage Western Cape (Contact details: Heritage Western Cape. 3 <sup>rd</sup> Floor Protea Assurance Building, 142 Longmarket Street, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 021 483 5959 Email: ceoheritage@westerncape.gov.za)
<b>Rock unit(s)</b>	Teekloof Formation (Lower Beaufort Group), Late Caenozoic alluvium, colluvium, calcrete pedocretes, surface gravels & soils
<b>Potential fossils</b>	Fossil vertebrate bones, teeth, trace fossils ( <i>e.g.</i> vertebrate and invertebrate burrows), trackways, petrified wood, plant-rich beds in the Lower Beaufort Group bedrocks. Fossil mammal bones, teeth, horn cores, freshwater molluscs, calcretised trace fossils ( <i>e.g.</i> termitaria, rhizoliths), plant material in Late Caenozoic alluvium, calcretes.
<b>ECO protocol</b>	1. Once alerted to fossil occurrence(s): alert site foreman, stop work in area immediately ( <i>N.B.</i> safety first!), safeguard site with security tape / fence / sand bags if necessary.
	2. Record key data while fossil remains are still <i>in situ</i> : <ul style="list-style-type: none"> <li>Accurate geographic location – describe and mark on site map / 1: 50 000 map / satellite image / aerial photo</li> <li>Context – describe position of fossils within stratigraphy (rock layering), depth below surface</li> <li>Photograph fossil(s) <i>in situ</i> with scale, from different angles, including images showing context (<i>e.g.</i> rock layering)</li> </ul>
	3. If feasible to leave fossils <i>in situ</i> : <ul style="list-style-type: none"> <li>Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation</li> <li>Ensure fossil site remains safeguarded until clearance is given by the Heritage Resources Agency for work to resume</li> </ul>
	3. If <i>not</i> feasible to leave fossils <i>in situ</i> (emergency procedure only): <ul style="list-style-type: none"> <li><i>Carefully</i> remove fossils, as far as possible still enclosed within the original sedimentary matrix (<i>e.g.</i> entire block of fossiliferous rock)</li> <li>Photograph fossils against a plain, level background, with scale</li> <li>Carefully wrap fossils in several layers of newspaper / tissue paper / plastic bags</li> <li>Safeguard fossils together with locality and collection data (including collector and date) in a box in a safe place for examination by a palaeontologist</li> <li>Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation</li> </ul>
	4. If required by Heritage Resources Agency, ensure that a suitably-qualified specialist palaeontologist is appointed as soon as possible by the developer.
	5. Implement any further mitigation measures proposed by the palaeontologist and Heritage Resources Agency
<b>Specialist palaeontologist</b>	Record, describe and judiciously sample fossil remains together with relevant contextual data (stratigraphy / sedimentology / taphonomy). Ensure that fossils are curated in an approved repository ( <i>e.g.</i> museum / university / Council for Geoscience collection) together with full collection data. Submit Palaeontological Mitigation report to Heritage Resources Agency. Adhere to best international practice for palaeontological fieldwork and Heritage Resources Agency minimum standards.



CTS HERITAGE

### **APPENDIX 3: Chance Fossil Finds Procedure**

## **HWC PROCEDURE: CHANCE FINDS OF PALAEOLOGICAL MATERIAL**

**June 2016**

### **Introduction**

This document is aimed to inform workmen and foremen working on a construction and/or mining site. It describes the procedure to follow in instances of accidental discovery of palaeontological material (please see attached poster with descriptions of palaeontological material) during construction/mining activities. This protocol does not apply to resources already identified under an assessment undertaken under s. 38 of the National Heritage Resources Act (no 25 of 1999).

Fossils are rare and irreplaceable. Fossils tell us about the environmental conditions that existed in a specific geographical area millions of years ago. As heritage resources that inform us of the history of a place, fossils are public property that the State is required to manage and conserve on behalf of all the citizens of South Africa. Fossils are therefore protected by the National Heritage Resources Act and are the property of the State. Ideally, a qualified person should be responsible for the recovery of fossils noticed during construction/mining to ensure that all relevant contextual information is recorded.

Heritage Authorities often rely on workmen and foremen to report finds, and thereby contribute to our knowledge of South Africa's past and contribute to its conservation for future generations.

### **Training**

Workmen and foremen need to be trained in the procedure to follow in instances of accidental discovery of fossil material, in a similar way to the Health and Safety protocol. A brief introduction to the process to follow in the event of possible accidental discovery of fossils should be conducted by the designated Environmental Control Officer (ECO) for the project, or the foreman or site agent in the absence of the ECO

It is recommended that copies of the attached poster and procedure are printed out and displayed at the site office so that workmen may familiarise themselves with them and are thereby prepared in the event that accidental discovery of fossil material takes place.

### **Actions to be taken**

One person in the staff must be identified and appointed as responsible for the implementation of the attached protocol in instances of accidental fossil discovery and must report to the ECO or site agent. If the ECO or site agent is not present on site, then the responsible person on site should follow the protocol correctly in order to not jeopardize the conservation and well-being of the fossil material.

Once a workman notices possible fossil material, he/she should report this to the ECO or site agent.



**Procedure to follow if it is likely that the material identified is a fossil:**

- i. The ECO or site agent must ensure that all **work ceases** immediately in the vicinity of the area where the fossil or fossils have been found;
- ii. The ECO or site agent must **inform HWC of the find immediately**. This information must include photographs of the findings and GPS co-ordinates;
- iii. The ECO or site agent must compile a **Preliminary Report and fill in the Fossil Discoveries: HWC Preliminary Record Form** within 24 hours without removing the fossil from its original position. The **Preliminary Report** records basic information about the find including:
  - The date
  - A description of the discovery
  - A description of the fossil and its context (e.g. position and depth of find)
  - Where and how the find has been stored
  - Photographs to accompany the preliminary report (the more the better):
    - A scale must be used
    - Photos of location from several angles
    - Photos of vertical section should be provided
    - Digital images of hole showing vertical section (side);
    - Digital images of fossil or fossils.

Upon receipt of this **Preliminary Report**, HWC will inform the ECO or site agent whether or not a rescue excavation or rescue collection by a palaeontologist is necessary.

- v. **Exposed finds must be stabilised where they are unstable and the site capped, e.g. with a plastic sheet or sand bags.** This protection should allow for the later excavation of the finds with due scientific care and diligence. HWC can advise on the most appropriate method for stabilisation.
- vi. If the find cannot be stabilised, **the fossil may be collect with extreme care** by the ECO or the site agent and put aside and protected until HWC advises on further action. Finds collected in this way must be safely and securely stored in tissue paper and an appropriate box. Care must be taken to remove the all fossil material and any breakage of fossil material must be avoided at all costs.

No work may continue in the vicinity of the find until HWC has indicated, in writing, that it is appropriate to proceed.

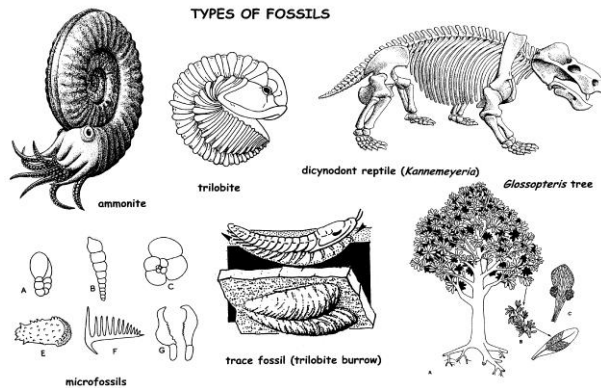
## FOSSIL DISCOVERIES: HWC PRELIMINARY RECORDING FORM

<b>Name of project:</b>		
<b>Name of fossil location:</b>		
<b>Date of discovery:</b>		
<b>Description of situation in which the fossil was found:</b>		
<b>Description of context in which the fossil was found:</b>		
<b>Description and condition of fossil identified:</b>		
<b>GPS coordinates:</b>	Lat:	Long:
<b>If no co-ordinates available then please describe the location:</b>		
<b>Time of discovery:</b>		
<b>Depth of find in hole</b>		
<b>Photographs (tick as appropriate and indicate number of the photograph)</b>	Digital image of vertical section (side)	
	Fossil from different angles	
	Wider context of the find	
<b>Temporary storage (where it is located and how it is conserved)</b>		
<b>Person identifying the fossil</b>	Name: Contact:	
<b>Recorder</b>	Name: Contact:	
<b>Photographer</b>	Name: Contact:	

## Palaeontology: what is a fossil?

Fossils are the traces of ancient life (animal, plant or microbial) preserved within rocks and come in two forms:

- Body fossils preserve parts, casts or impressions of the original tissues of an organism (e.g. bones, teeth, wood, pollen grains); and
- Trace fossils such as trackways and burrows record ancient animal behaviour.



### How to report chance fossil finds: What should I do if I find a fossil during construction/mining?

If you think you have identified a fossil:

Immediately inform the ECO or Site Agent.  
He/she will then contact HWC and write a report  
and if necessary operations will stop in that  
specific area until the fossil is recovered

Heritage Western Cape  
[ceoheritage@westerncape.gov.za](mailto:ceoheritage@westerncape.gov.za)

021 483 5959

[www.hwc.org.za](http://www.hwc.org.za)

iLifa leMveli iNtshona Kapa  
Erfenis Wes-Kaap  
Heritage Western Cape

## Types of palaeontological finding - What does a fossil look like?

Fossils vary in size, from fossilised tree trunks and dinosaur bones down to very small animals or plants.  
Finds can be **individual fossils** (one isolated wood log or bone) or **clusters and beds** (several bones, teeth, animal or plant remains, trace fossils in close proximity or bones resembling part of a skeleton). A bed of fossils is a layer with many fossil remains.

Below there is a list of few examples of fossils which may be identified during excavations in the Western Cape.

Image	Description	Image	Description
	Leaves		Snail shells and other shells
	Fossil wood		Bones of larger animals
	The remains of fish and marine life (e.g. teeth, scales, starfish)		Large burrows made by moles and other animals
	Stromatolites		Traces made by burrowing insects (ants, wasps, dung-beetles etc.).
	Animal footprints		

Images provided by Dr John Almond

Text by HWC's Archaeology, Palaeontology & Meteorites Committee June 2016







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## **APPENDIX 4: Heritage Screening Assessment and NID Submission**

## APPLICATION FORM

### NOTIFICATION FOR INTENT TO DEVELOP (NID)

### Section 38(1) and Section 38(8)

Completion of this form is required by Heritage Western Cape for the initiation of all impact assessment processes under Section 38 (1) & (8) of the National Heritage Resources Act (NHRA).

As per Section 38(1)(e) of the NHRA, submission of the NID must be initiated at the earliest stage of development. Should the development trigger any other legislation, practitioners may submit the NID without formal submission to other statutory bodies in order to comply with the NHRA.

This form is to be read in conjunction with the HWC Notification of Intent to Develop, Heritage Impact Assessment, (Pre-Application), Basic Assessment Reports, Scoping Reports and Environmental Impact Assessments.

All sections of the form must be completed in order to deem the application to be complete.

Making an incorrect statement or providing incorrect information may result in all or part of the application having to be reconsidered by HWC in the future, or submission of a new application.

**HERITAGE WESTERN CAPE REFERENCE NO., AS PROVIDED DURING SCRUTINY:**

#### SECTION A

#### **APPLICATION MADE IN TERMS OF:**

- ☐ Section 38(1) of the NHRA (This development will not require a NEMA application)
- ☒ Section 38(8) of the NHRA (This development requires an application with another authority)
- ☐ Amendment of approved Site Development Plan (SDP) for endorsement. Endorsements are only reviewed upon submission of an assessment by the heritage practitioner confirming heritage design indicators as approved are not compromised by the revision
- ☐ Advice in terms of Section 38(1)

#### **APPLICABILITY OF OTHER LEGISLATION:**

Specify the authorised department that makes the final decision in terms of NEMA (National Environmental Act.), i.e. Department of Mineral Resources, Department of Environmental Affairs and Development Planning Western Cape, Department of Forestry, Fisheries and Environment etc.: DFFE\_\_\_\_\_

Reference number of authority / government department: To be determined, pre-application reference number is 2023-08-0006

Present phase at which the process with that authority stands: Pre-application phase

## PREVIOUS HWC APPLICATIONS APPLICABLE TO THE SITE AND OR DEVELOPMENT

Provide details of any previous applications submitted to HWC on the site.

HWC Reference No.	NHRA Section	Summary of Proposal	Application Status (Approved, Not Approved, Pending)	Permit / Record of Decision Date

## SECTION B

### DETAILS OF SITE, PROPERTY OR PLACE

Physical address or Location (e.g., of the R44): Off the N1 \_\_\_\_\_

Erf or Farm Name and No. (including the name of the site): Remainder Farm Rhenosterkop 155 (N) and Farm 400 (S) \_\_\_\_\_

Coordinates for logical center point (WGS84): **Lat:** -32.250693 | **Lon:** 22.854679 (N) and **Lat:** -32.328475 | **Lon:** 22.849872 (S) \_\_\_\_\_

Town: Beaufort West \_\_\_\_\_ District / Municipality: Central Karoo \_\_\_\_\_

Property Extent: 4 247 ha for the Remainder of farm Rhenosterkop 155 but only 563 ha available for development, and 4 035 ha for Farm 400 but only 525.2 ha available for development. \_\_\_\_\_

Current land Use: Agriculture \_\_\_\_\_

Current zoning: Agriculture \_\_\_\_\_ Predominant land uses of surrounding properties: Agriculture \_\_\_\_\_

## SECTION C

### APPLICANT / AUTHORISED AGENT – Details of person to receive Record of Decision

Name: Jenna Lavin \_\_\_\_\_

Company: CTS Heritage \_\_\_\_\_

Address and postal code: 238 Queens Road, Simons Town \_\_\_\_\_

Cellular phone number: 083 619 0854 \_\_\_\_\_

E-mail: jenna.lavin@ctsheritage.com \_\_\_\_\_



Signature: \_\_\_\_\_ Date: 23/08/2023 \_\_\_\_\_



## **REGISTERED OWNER OF PROPERTY**

Name: See attached consent letters

Identity number of applicant: \_\_\_\_\_

Address and postal code: \_\_\_\_\_

Cellular phone number: \_\_\_\_\_

E-mail: \_\_\_\_\_

Declaration: I, \_\_\_\_\_ am fully aware of this application and accept its contents and declare that I intend to undertake the actions as proposed in this application.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## **SECTION D**

### **DETAIL OF PROPOSED DEVELOPMENT**

Provide a full description of the nature and extent of the proposed development.

K2022578692 South Africa (Pty) Ltd proposes to develop a solar photovoltaic PV facility on the Remainder of Farm Rhenosterkop 155 and Farm 400 ("Sunnyside"), situated approximately 20 km to the east and north-east of Beaufort West in the Western Cape Province. The two parcels of land have a combined footprint of 498.09 hectares (ha). The proposed project is envisaged to generate an output of up to 500 megawatt direct current energy. The project is being developed either to supply the national grid under South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or similar procurement programme. It should be noted that the proposed SEF is located within a Renewable Energy Development Zone formally gazetted for the purpose of development of solar and wind energy generation facilities. SiVEST, as an independent Environmental Assessment Practitioner (EAP), has been appointed to undertake the required Basic Assessment (BA) process for the proposed development. The project will consist of two (2) separate solar energy facilities (SEFs) including related infrastructure.

**DEVELOPMENT DETAILS** – Indicate which sections of the NHRA, or other legislation which requires a NID

### **PLEASE TICK THE APPROPRIATE BOX**

x	<b>Section 38(1)(a)</b> Construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier over 300m in length.
	<b>Section 38(1)(b)</b> Construction of a bridge or similar structure exceeding 50m in length.
<b>Section 38(1)(c)</b> Any development or activity that <u>will change the character of a site</u> :	
x	<b>(i)</b> exceeding 5 000m <sup>2</sup> in extent.
	<b>(ii)</b> involving three or more existing erven or subdivisions thereof.
	<b>(iii)</b> involving three or more erven or divisions thereof which have been consolidated within the past five years.
	*If (i), (ii) and/or (iii) are marked above, describe how the development will change the character of the site
	_____ Change from agricultural to Renewable Energy Facility

x	<b>Section 38(1)(d)</b> Rezoning of a site exceeding 10 000m <sup>2</sup> in extent.
	<b>Other triggers e.g., in terms of other legislation (NEMA, etc.)</b> – Describe the details:  

**ESTIMATED CONSTRUCTION COST AND/ OR VALUE OF DEVELOPMENT UPON COMPLETION:** R *not available* \_\_\_\_

<b>SECTION E</b>
------------------

**PROVIDE A SHORT HISTORY OF THE SITE, PROPERTY OR PLACE** – Include sources where applicable

See attached desktop assessment report

**ANTICIPATED IMPACTS ON HERITAGE RESOURCES**

Section 3 of the NHRA sets out the following categories of heritage resource as forming part of the national estate. Please indicate the known presence of any of these by checking the box alongside and then providing a description of each occurrence, including nature, location, size, type

Failure to provide sufficient detail or to anticipate the likely presence of heritage resources on the site may lead to a request for more detailed specialist information.

**IDENTIFICATION OF ALL HERITAGE RESOURCES ON THE SITE, PROPERTY OR PLACE AND ITS ENVIRONMENTS**

Please indicate where applicable:

	<b>Places, buildings, structures, and equipment of cultural significance:</b> Description of Heritage Resource: Descriptions of Heritage Impact:
	<b>Places to which oral traditions are attached or which are associated with living heritage:</b> Description of Heritage Resource: Descriptions of Heritage Impact:
	<b>Places to which oral traditions are attached or which are associated with living heritage:</b> Description of Heritage Resource: Descriptions of Heritage Impact:
	<b>Historical settlements and townscapes:</b> Description of Heritage Resource: Descriptions of Heritage Impact:

<input checked="" type="checkbox"/>	<b>Landscapes and natural features of cultural significance:</b> Description of Heritage Resource: See attached desktop assessment  Descriptions of Heritage Impact:
	<b>Geological resources of scientific or cultural significance:</b> Description of Heritage Resource:  Descriptions of Heritage Impact:
<input checked="" type="checkbox"/>	<b>Archaeological resources – Incl. archaeological sites and material, rock art, battlefields, and wrecks etc.:</b> Description of Heritage Resource: See attached desktop assessment  Descriptions of Heritage Impact:
<input checked="" type="checkbox"/>	<b>Palaeontological resources – i.e., fossils, geological formations etc.:</b> Description of Heritage Resource: See attached desktop assessment  Descriptions of Heritage Impact:
	<b>Graves and burial grounds – e.g.: ancestral graves, graves of victims of conflict, historical graves, cemeteries etc.:</b> Description of Heritage Resource:  Descriptions of Heritage Impact:
	<b>Sites of significance relating to the history of slavery in South Africa:</b> Description of Heritage Resource:  Descriptions of Heritage Impact:
	<b>Other heritage resources:</b> Description of Heritage Resource:  Descriptions of Heritage Impact:

**PROVIDE A SUMMARY OF THE ANTICIPATED IMPACTS ON HERITAGE RESOURCES**

The proposed development is likely to negatively impact on significant archaeological, palaeontological and cultural landscape resources.



## SECTION F

### RECOMMENDATION

In your opinion, do you believe that a Heritage Impact Assessment (HIA) is required?

☒

Yes

☐

No

### Specialist studies to be provided as part of the HIA:

	Architectural (i.e., fabric analysis, historical analysis, material analysis etc.)
x	Archaeological Impact Assessment
x	Paleontological Impact Assessment
	Townscape Assessment
x	Cultural Assessment
	Social Historical Study
	Visual Impact Assessment
	Other:

Recommendations made by: Jenna Lavin

Capacity: Heritage Assessment Practitioner

### PLEASE NOTE

Any further studies which HWC requires should be submitted in the form of a single, consolidated report with a single set of recommendations. Specialist studies must be incorporated in full, either as chapters of the report, or as annexures thereto.

Please refer to the Guidelines for Heritage Impact Assessments required in terms of Section 38 of the National Heritage Resources Act (25 of 1999).

Applications are considered to be public documents and are open to public scrutiny. Should you wish for your application to be kept confidential, please motivate your request on a separate sheet attached to your application form.

For applications that are granted confidentiality, this confidentiality will be limited to one year (12 months).

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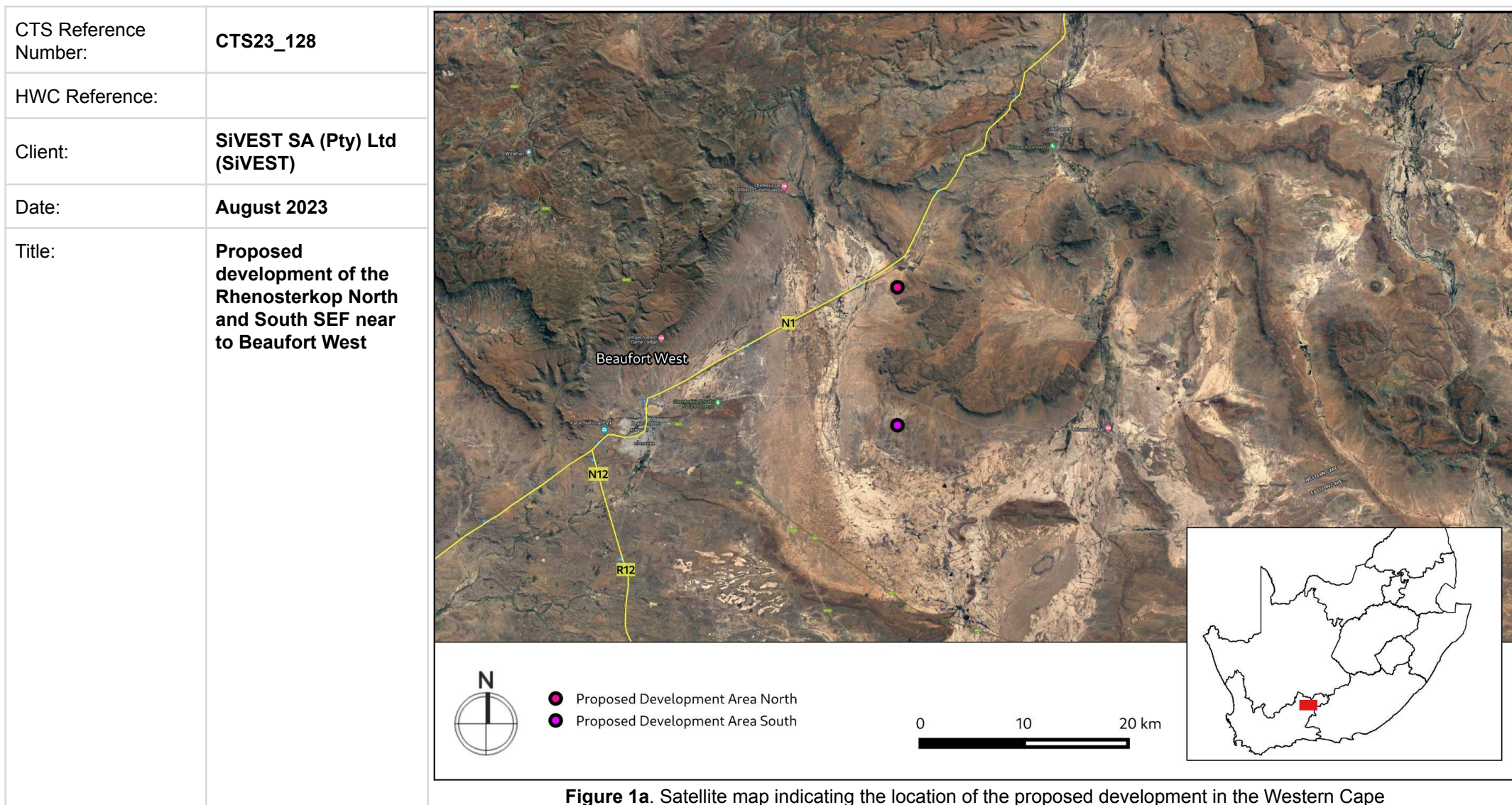


iLifa leMveli leNtshona Koloni  
Erfenis Wes-Kaap  
Heritage Western Cape



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## HERITAGE SCREENER



CTS Heritage

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## 1. Proposed Development Summary

K2022578692 South Africa (Pty) Ltd proposes to develop a solar photovoltaic PV facility on the Remainder of Farm Rhenosterkop 155 and Farm 400 (“Sunnyside”), situated approximately 20 km to the east and north-east of Beaufort West in the Western Cape Province. The two parcels of land have a combined footprint of 498.09 hectares (ha). The proposed project is envisaged to generate an output of up to 500 megawatt direct current energy. The project is being developed either to supply the national grid under South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or similar procurement programme. It should be noted that the proposed SEF is located within a Renewable Energy Development Zone formally gazetted for the purpose of development of solar and wind energy generation facilities. SiVEST, as an independent Environmental Assessment Practitioner (EAP), has been appointed to undertake the required Basic Assessment (BA) process for the proposed development. The project will consist of two (2) separate solar energy facilities (SEFs) including related infrastructure.

## 2. Application References

Name of relevant heritage authority(s)	HWC
Name of decision making authority(s)	DFFE

## 3. Property Information

Latitude / Longitude	Lat: -32.250693   Lon: 22.854679 (N) and Lat: -32.328475   Lon: 22.849872 (S)
Erf number / Farm number	Remainder Farm Rhenosterkop 155 (N) and Remainder Farm 400 (S)
Local Municipality	Beaufort West
District Municipality	Central Karoo
Province	Western Cape
Current Use	Agriculture
Current Zoning	Agriculture
Size of Property	4 247 ha for the Remainder of farm Rhenosterkop 155 but only 563 ha available for development, and 4 035 ha for Farm 400 but only 525.2 ha available for development.

## 4. Nature of the Proposed Development

<b>Total Area</b>	489.09 ha
<b>Depth of excavation (m)</b>	Max estimated depth 2m. To be confirmed during detail design.
<b>Height of development (m)</b>	3.5 m max height for Battery Energy Storage System (BESS), 3m for PV. 21 m for substation and associated infrastructure.

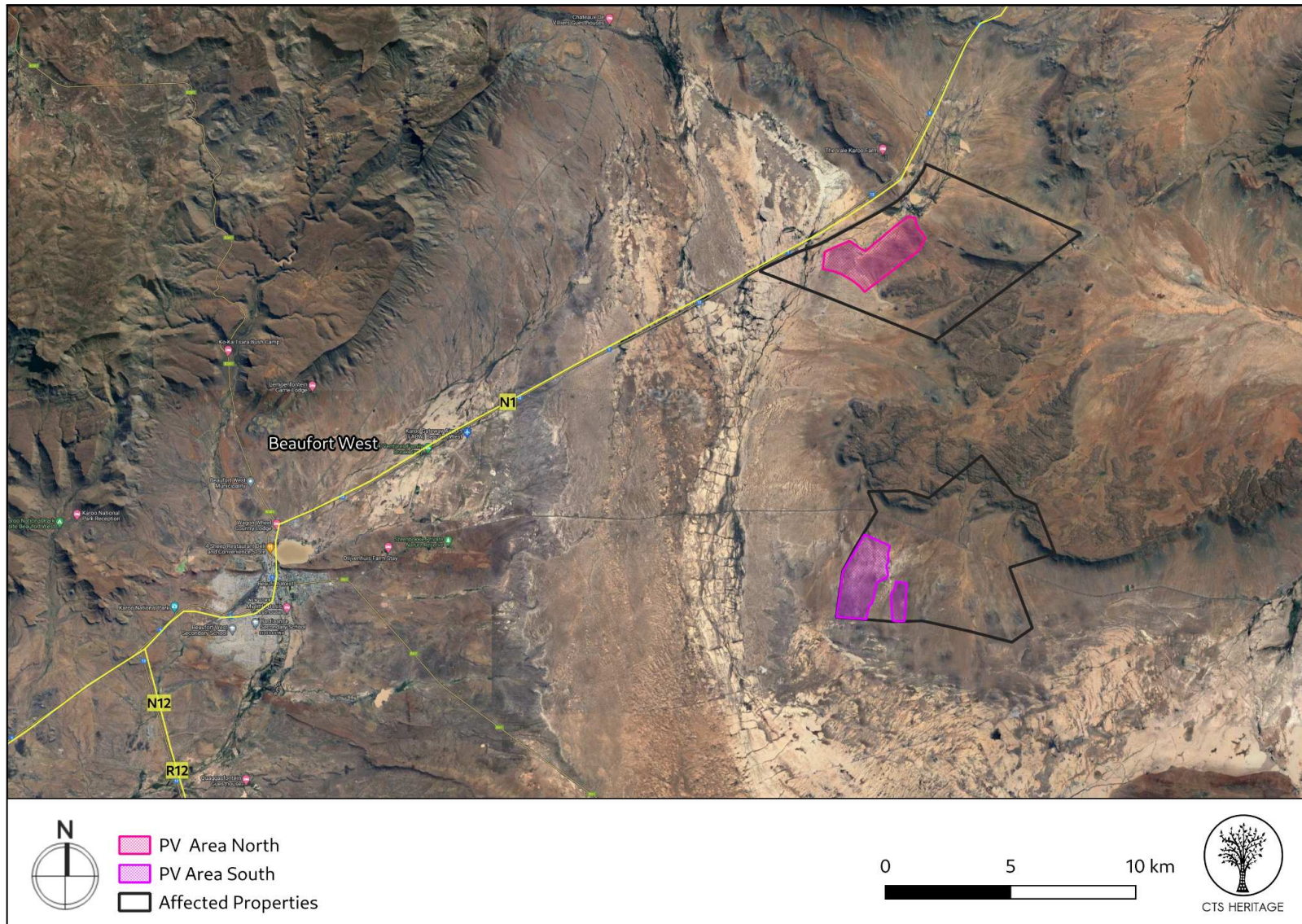
## 5. Category of Development

x	<b>Triggers: Section 38(8) of the National Heritage Resources Act</b>
	<b>Triggers: Section 38(1) of the National Heritage Resources Act</b>
x	1. Construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier over 300m in length.
	2. Construction of a bridge or similar structure exceeding 50m in length.
	3. Any development or activity that will change the character of a site-
x	a) exceeding 5 000m <sup>2</sup> in extent
	b) involving three or more existing erven or subdivisions thereof
	c) involving three or more erven or divisions thereof which have been consolidated within the past five years
x	4. Rezoning of a site exceeding 10 000m <sup>2</sup>
	5. Other (state):

## 6. Additional Infrastructure Required for this Development

Solar PV panels, mounting structures, power conversion systems, earthing and protection equipment, BESS, onsite substation, overhead lines, site buildings, laydown areas.
--

## 7. Mapping (please see Appendix 3 and 4 for a full description of our methodology and map legends)

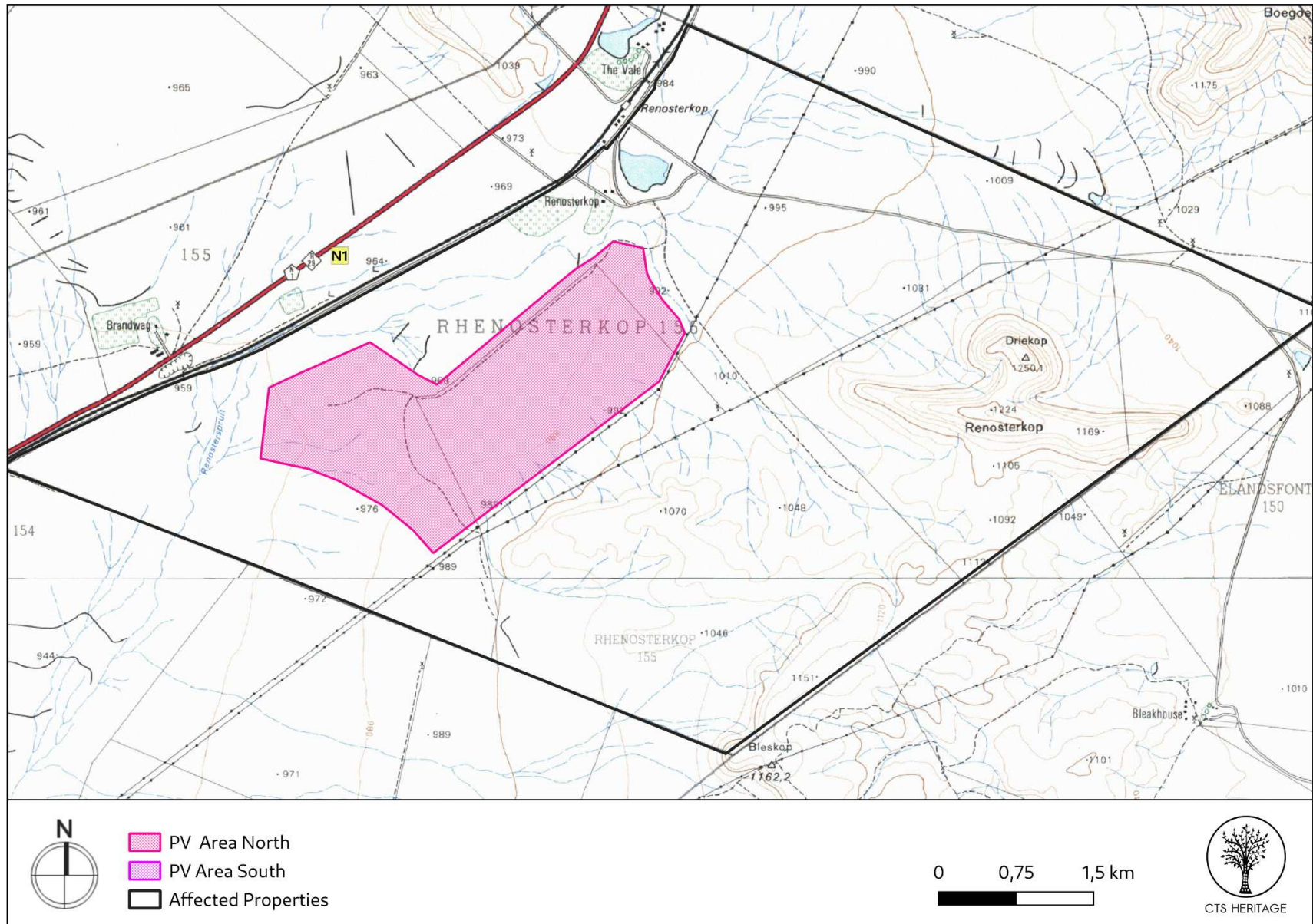


**Figure 1b. Overview Map.** Satellite image (2023) indicating the proposed development area





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**Figure 1c. Overview Map.** 1:50 000 Topo Map indicating the proposed development area

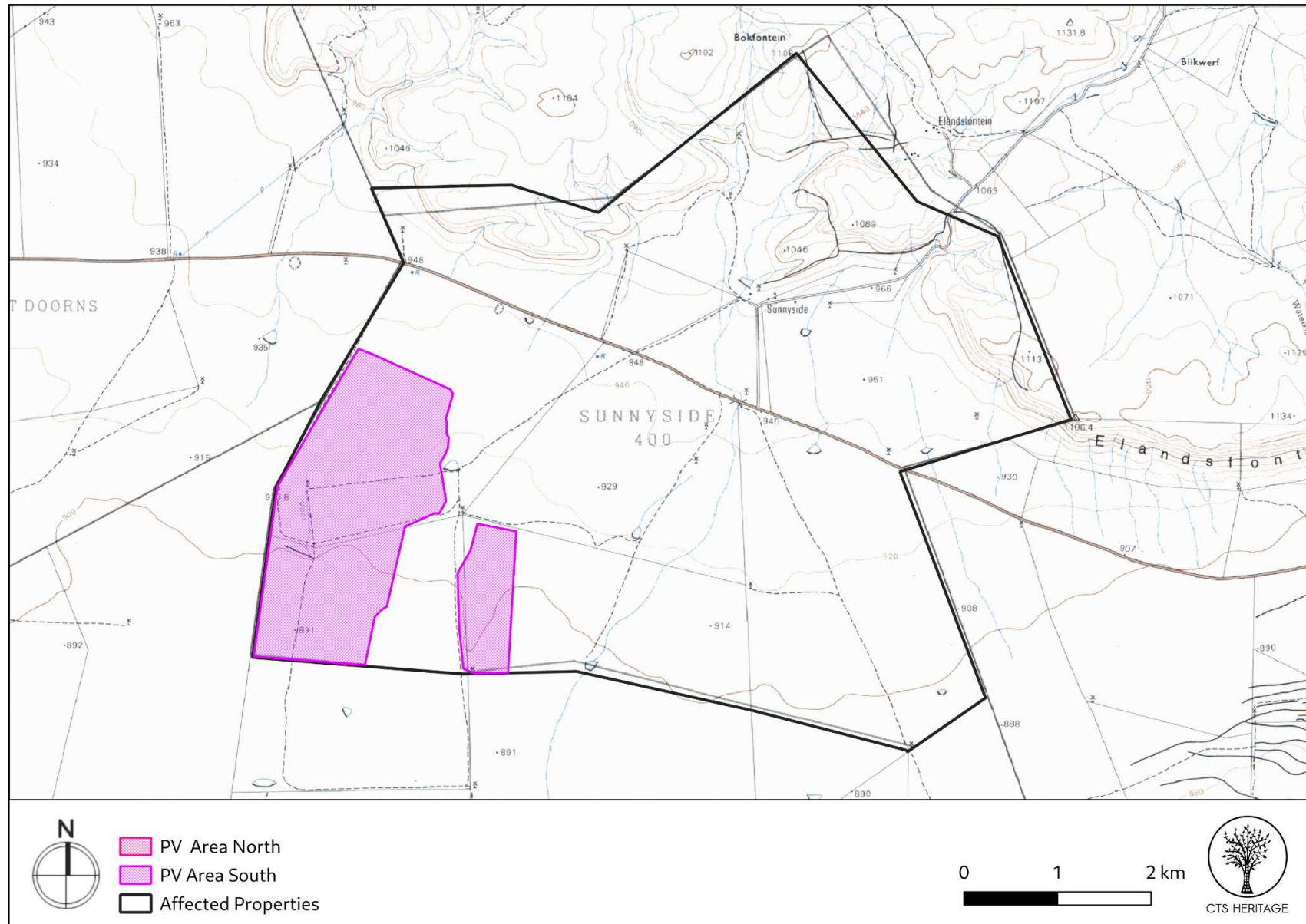
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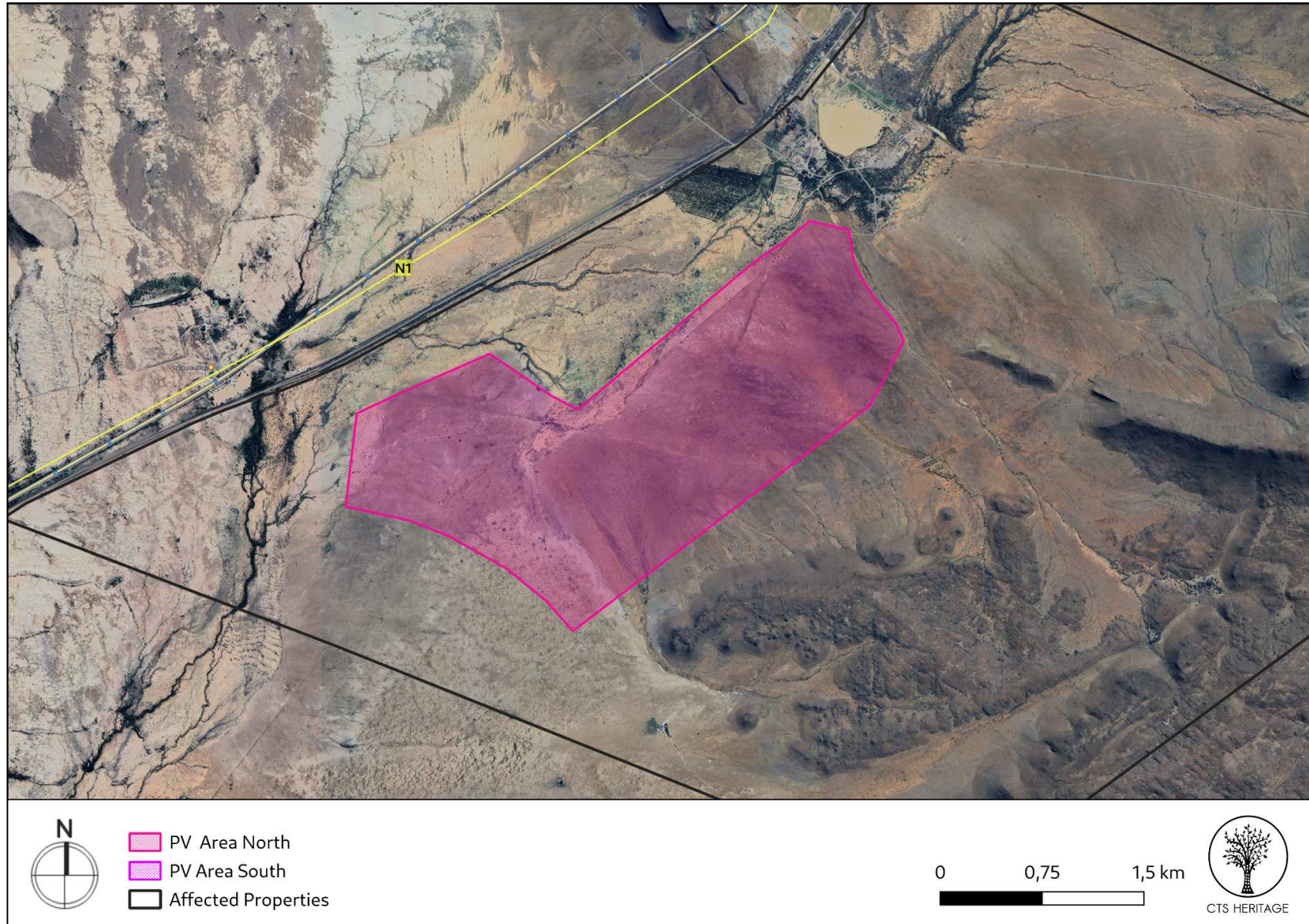


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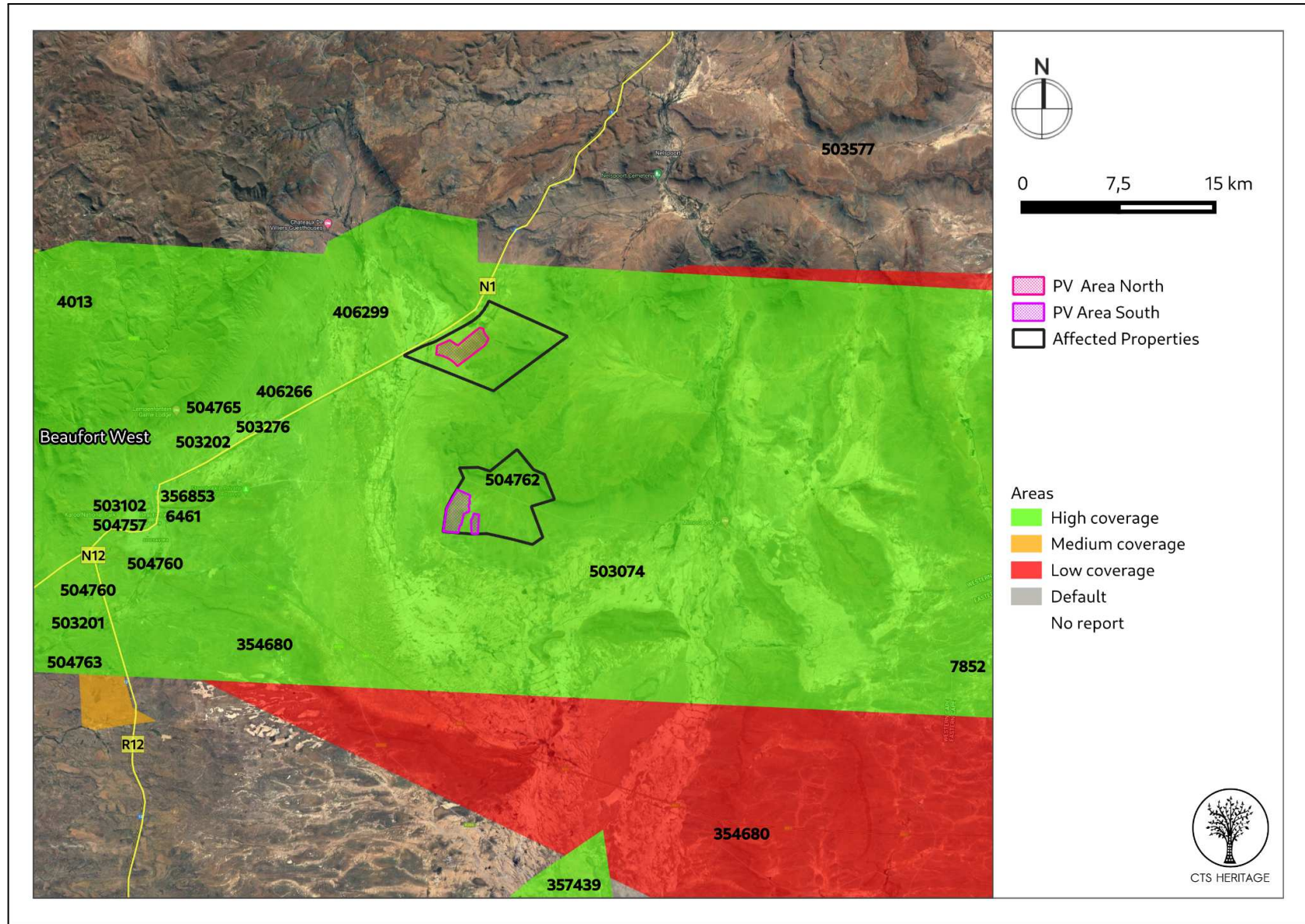
**Figure 1e. Overview Map. PV North Area**





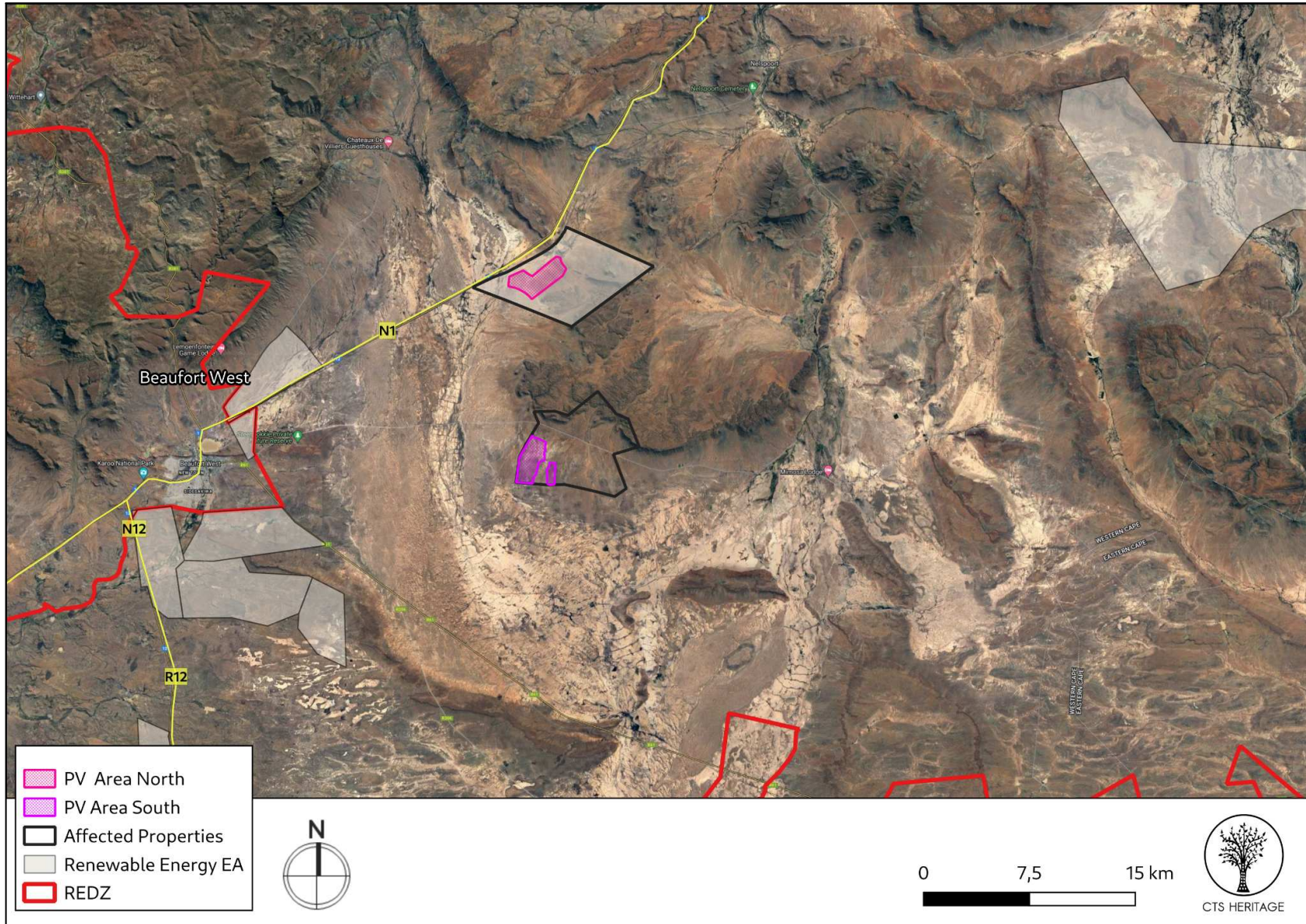
**Figure 1f. Overview Map. PV South Area**





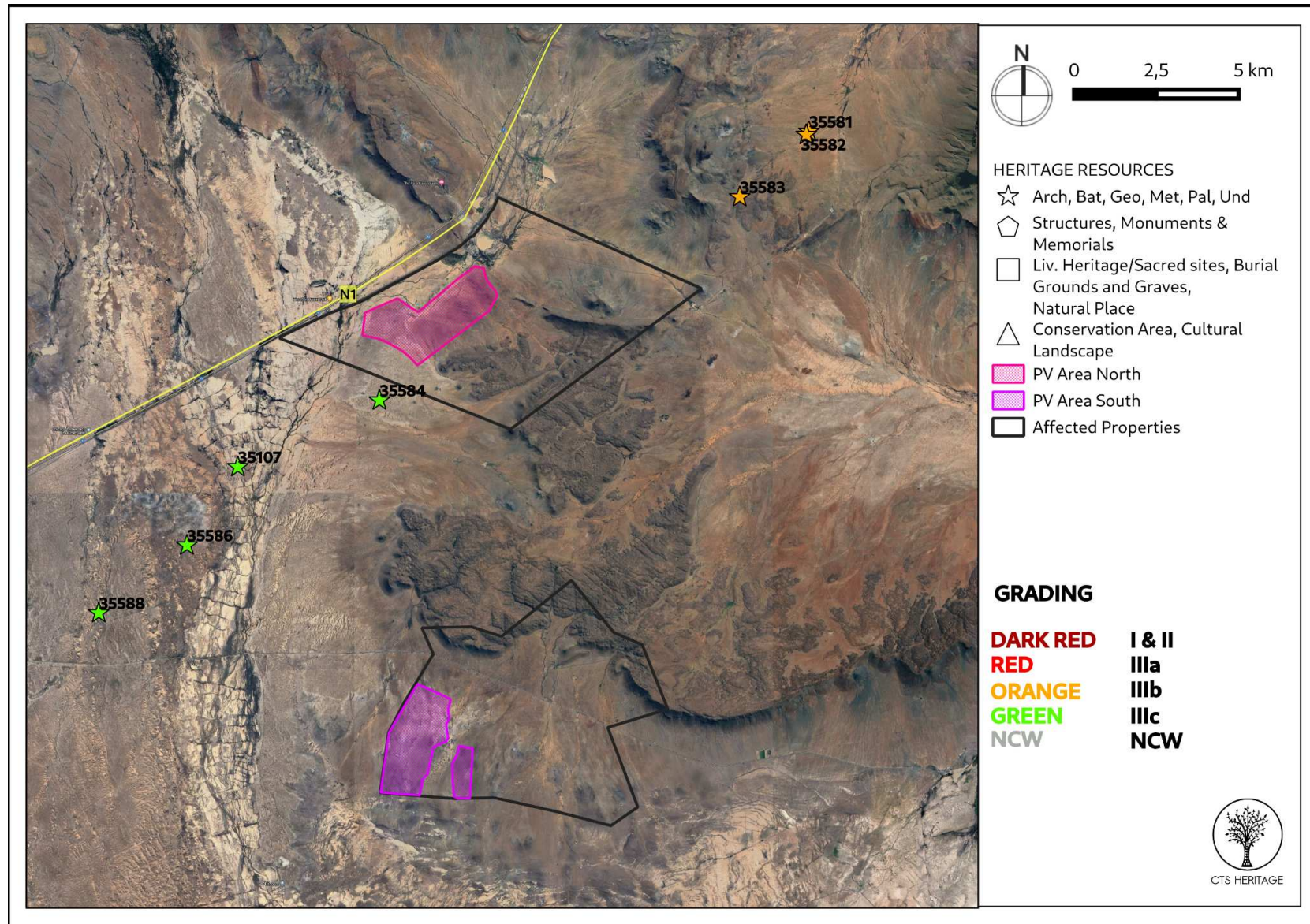
**Figure 2a. Previous HIAs Map.** Previous Heritage Impact Assessments covering the proposed development area with SAHRIS NIDS indicated. Please see Appendix 2 for a full reference list.





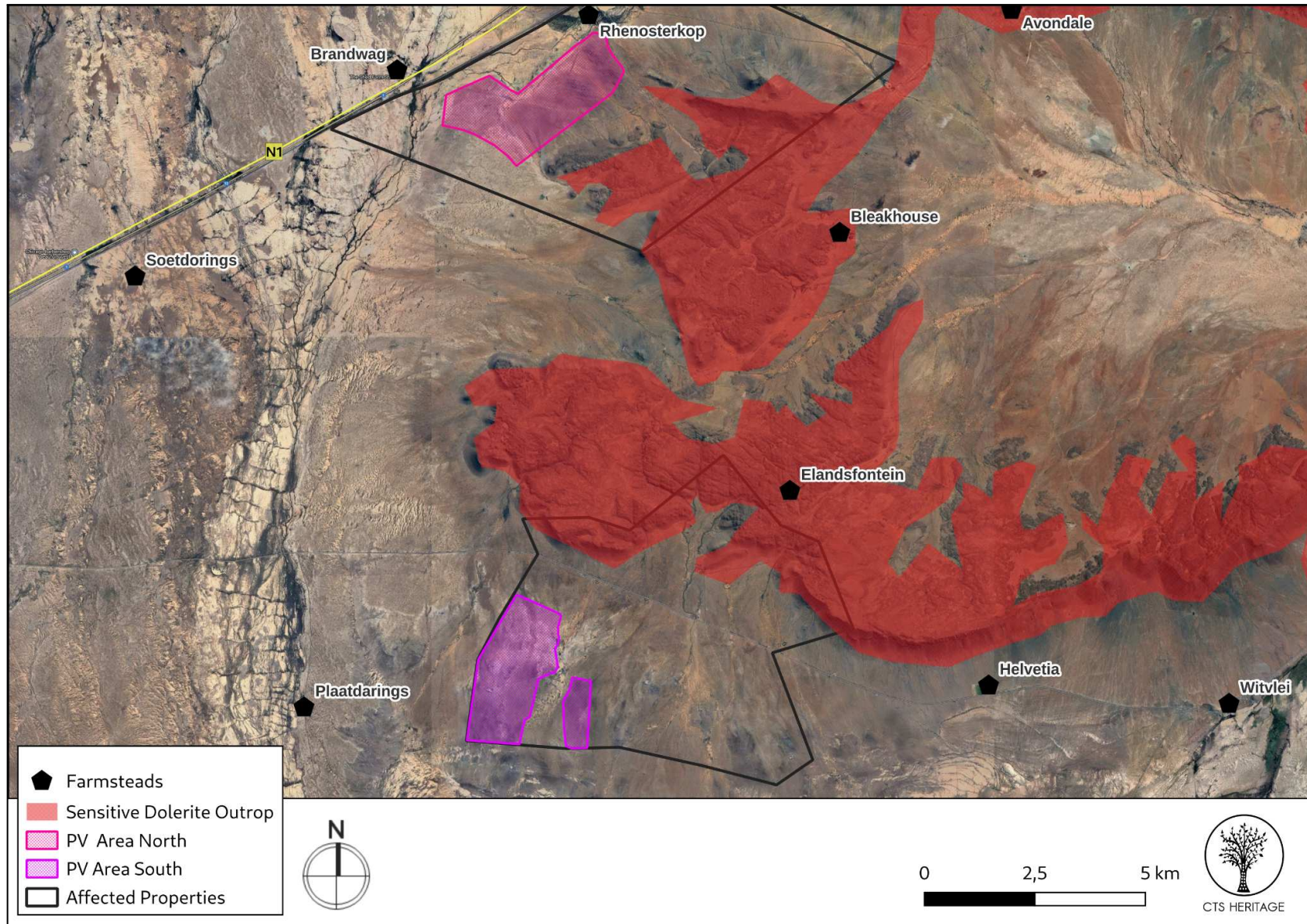
**Figure 2b. Previous Reports Map.** Map indicating the renewable energy developments that have received Environmental Authorisation





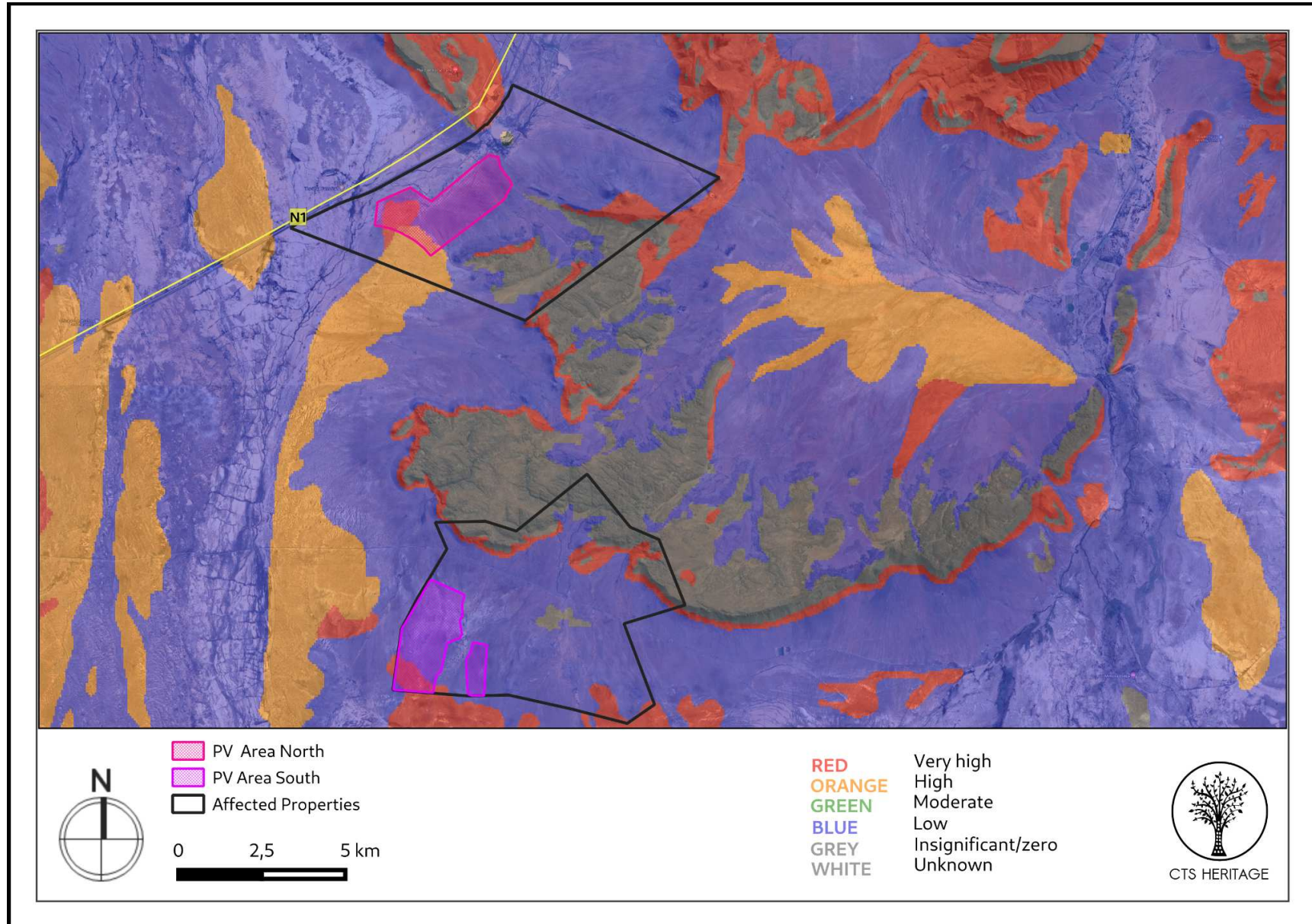
**Figure 3a. Heritage Resources Map.** Heritage Resources previously identified within the study area, with SAHRIS Site IDs indicated in the insets below. Please See Appendix 4 for full description of heritage resource types.





**Figure 3b. Heritage Resources Map. Cultural Landscape Elements**



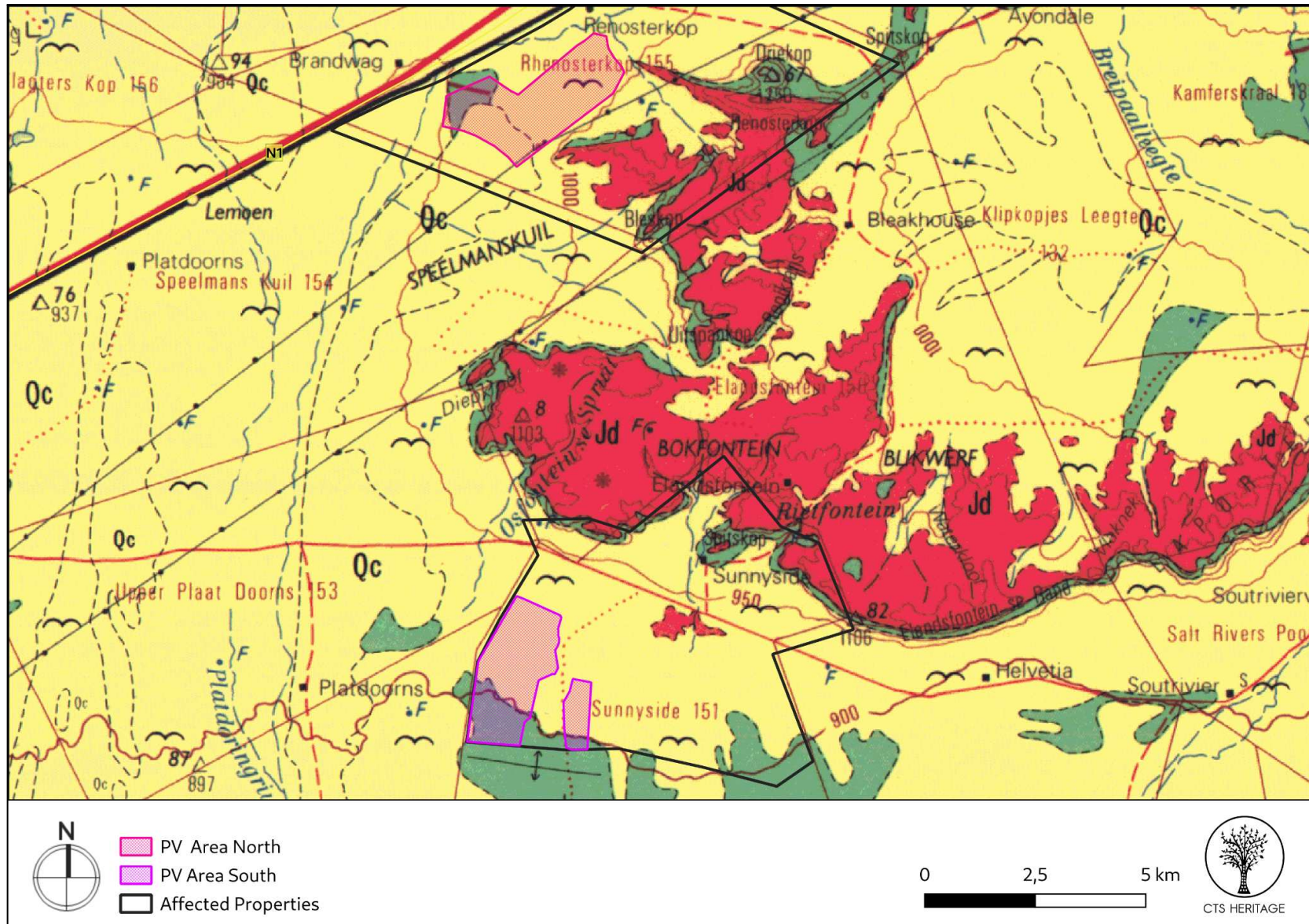


**Figure 4a. Palaeosensitivity Map.** Indicating fossil sensitivity underlying the study area. Please See Appendix 3 for a full guide to the legend.





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**Figure 4b. Geology Map.** Extract from the CGS 3222 Beaufort West Map indicating that the development area for the PV development is underlain by sediments of Pt: Poortjie Member of the Teekloof Formation of the Adelaide Subgroup and Jd: Jurassic Dolerite as well as Qc: Quaternary Sands

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**Figure 5a. Historic Image.** Riders and wagons outspanning in Nelspoort, 1868. By Anonymous - Cape Archives, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=25753608>





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Figure 5b. Historic Image. The area proposed for development is located between Nelspoort and Beaufort West in the Great Karoo. Map from 1911. By Encyclopedia Britannica. - 1911. Encyclopedia Britannica., Public Domain, <https://commons.wikimedia.org/w/index.php?curid=19573298>





**Figure 5c. Historic Image.** The Nuweveld Mountains in the vicinity of Nelspoort. By No machine-readable author provided. Moongateclimber assumed (based on copyright claims). - No machine-readable source provided. Own work assumed (based on copyright claims)., CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=1145033>



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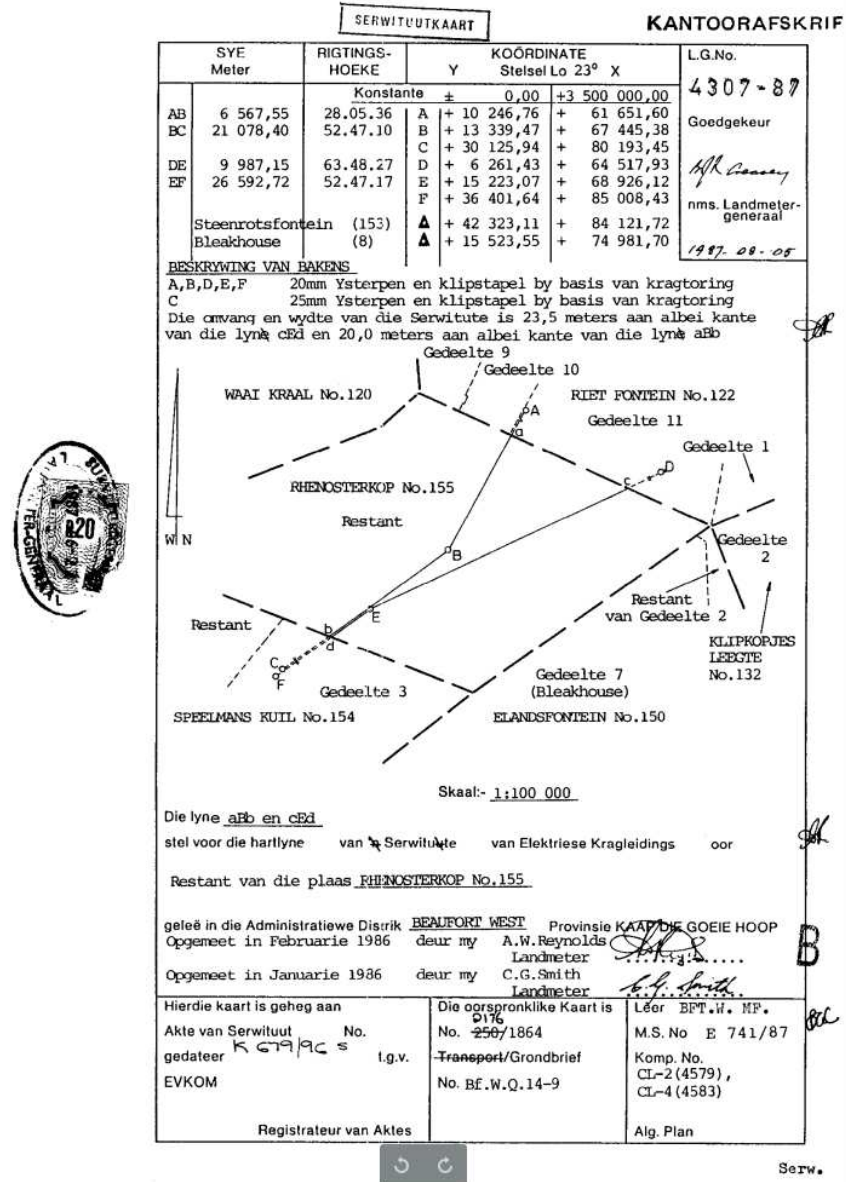


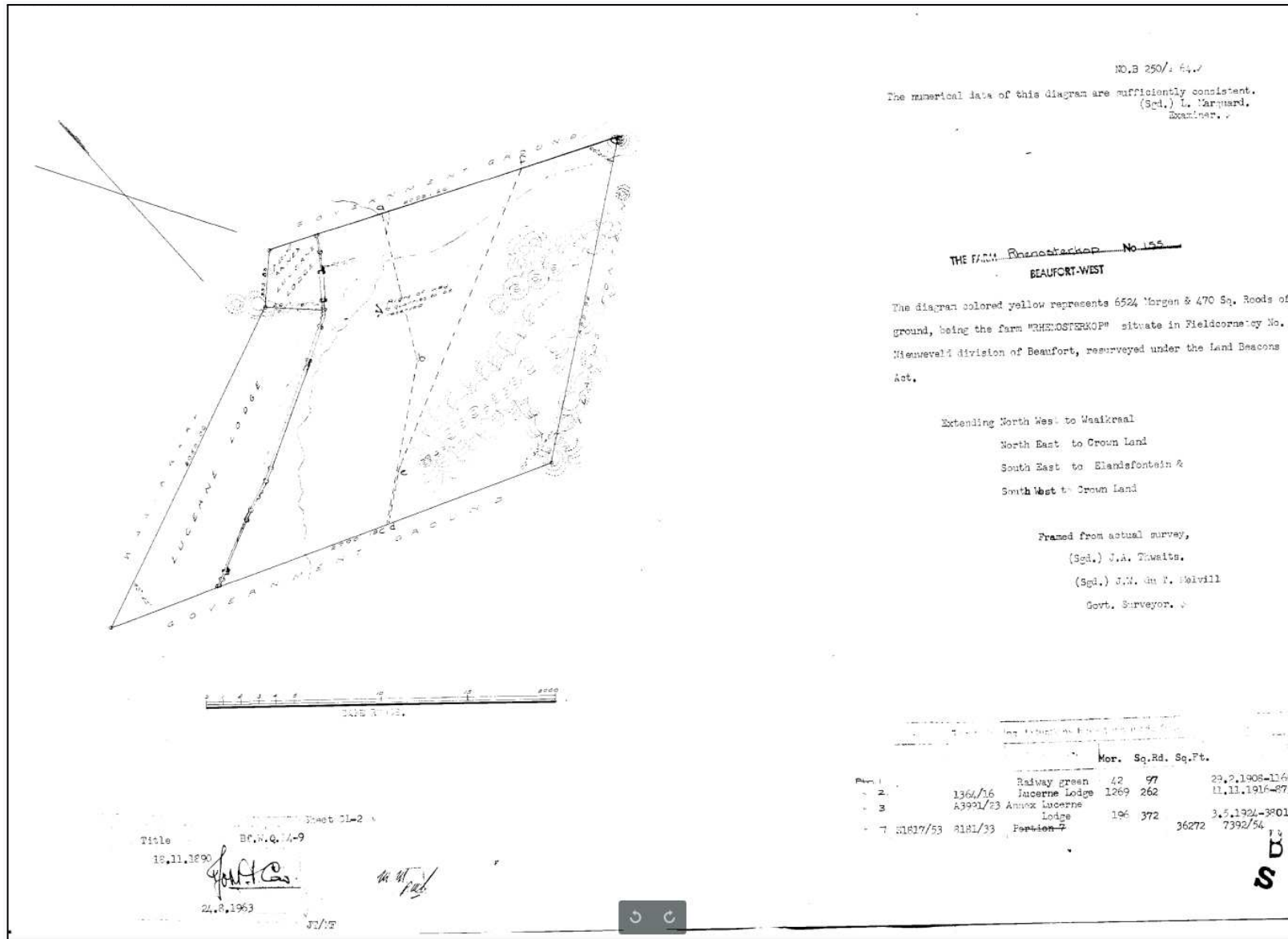
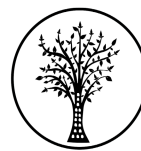
Figure 6a. SG Diagram. Remainder Farm Rhenosterkop 155

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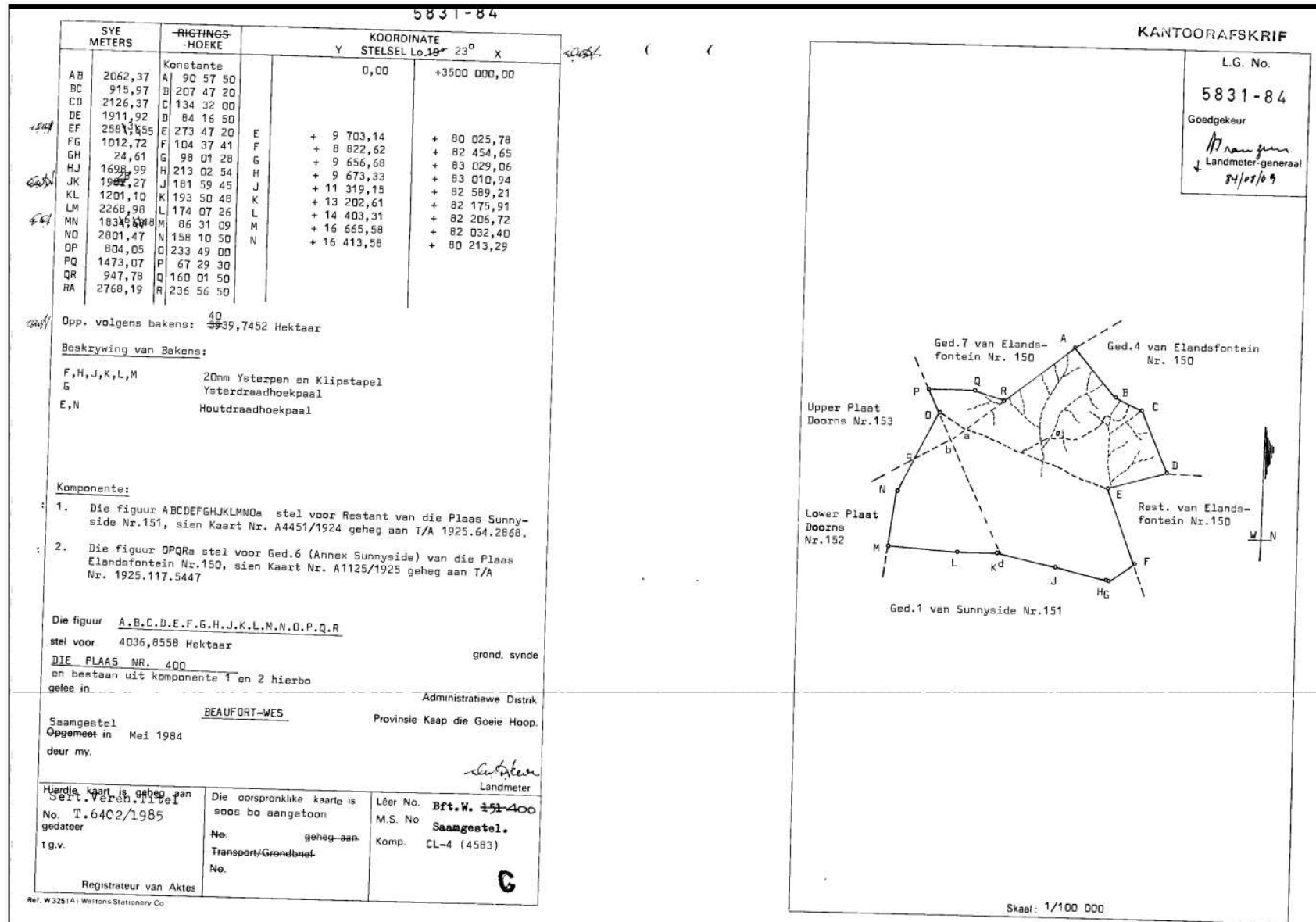


Figure 6c. SG Diagram. Farm 400

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**Figure 7a: Existing grid infrastructure lying to the east of the proposed solar PV area.**





Figure 7b: Existing grid infrastructure lying to the east of the proposed solar PV area with views of koppies near Rhenosterkop.





**Figure 7c: Contextual Images of landscape showing the national grid alongside the level plain of the solar PV area.**





Figure 7d: Contextual Images of landscape of the dolerite ridges and level plains.



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## 8. Heritage Assessment

The area proposed for the Rhensoterkop Renewable Energy Facility Projects is located between Beaufort West and Nelspoort in the Western Cape, and is located within the identified Beaufort West REDZ (Figure 2c). The town of Nelspoort lies at the foot of the Nuweveld Mountains on an old section of the N1 highway. It is near a watercourse, the Salt River, which flows after rains, from the Nuweveld mountains to a seasonal wetland to the south.

### Cultural Landscape

The name 'Karoo' has its roots in the Khoisan word meaning 'place of great dryness'. It once supported large grassy flatlands and the San and Khoekhoen migrated across the region for hunting and grazing purposes. Less than two hundred years ago large herds of antelope still roamed the grass plains. With the occupation of the area by stock farmers, the sheep gradually replaced the game and the grass receded along with changing grazing and weather patterns (Winter et al 2009; Winter & Oberholzer 2013). By the late 17th century, the Khoenkhoen had moved from the region into the more water-rich southern Karoo and the coastal plains. During the early colonial period, the harshness of the Karoo region formed an almost impenetrable barrier from the Cape to the interior for colonial explorers, hunters and travellers. The 18th century was characterised by a marked increase in the rate of expansion of the boundaries of the settlement at the Cape. This was associated with the emergence of the migrant stock farmer (trekboer) (Guelke 1982 In Winter et al 2009). Early routes into the interior largely followed the tracks initially used by migrating herds of game or the cattle herds and sheep flocks of the Khoekhoen on their seasonal route between coastal and inland grazing grounds. These routes were later reinforced by generations of trek farmers moving between the markets at the Cape and their farms (Winter et al 2009).

Permanent settlement of the region only really occurred in the 19th century with towns being established near permanent water sources. It was during this period that Beaufort West was established as a drostdy in 1818 on the farm Hooyvlakte. In the same year, a mission station was established at Kookfontein, just outside Beaufort West (Winter et al 2009). Beaufort West became the first municipality in South Africa on 3 February 1837 and had the country's first town hall. When the railroad reached the town in 1880 it became a marshalling yard and locomotive depot and today it is the largest town in the Karoo.

The area proposed for development is located near to Nelspoort, a detailed history for which is provided for online<sup>1</sup>. Nelspoort became a hub for the treatment of Tuberculosis. As far back as 1850, the famous explorer David Livingstone extolled the climate of the Karoo and noted it was "suitable for all patients with pulmonary complaints". By 1925, the Nelspoort Sanatorium opened its doors, with the official opening performed by the Prince of Wales, later Edward VIII and then Duke of Windsor in July, 1925. As part of this ceremony, a small grove of blue gums were planted. This species has subsequently established itself as an integral part of the cultural landscape of this area.

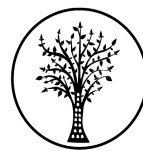
Nelspoort also has links with the Anglo-Boer War. In 1901, in an effort to prevent the northbound rail link from being destroyed, the British built hundreds of blockhouses. Two were erected to guard the bridges over the Krom River, near Nelspoort. In 1980, however, one was totally destroyed in a flash flood. The other still stands in the shade of pepper trees on the farm Smokey Grove. Guard posts and schantzes were also built on the Nelspoort koppies and soldiers were garrisoned nearby to man the lookouts and blockhouses. Their water source was a perennial fountain, to this day, called Kitchener's Well after Lord Kitchener, British Commander-in-Chief.

According to Winter and Wilson (2022), the area possesses a number of cultural landscape qualities and elements which are outlined below.

- The location of the site on the south Central Plateau of the Great Karoo, separated from the Karoo vlakte by the Great Escarpment, characterised by a combination of flat open plains punctuated by mountains and koppies. Parallel valley-ridge systems.
- The folded quality of the landscape - open plains interrupted by ridges and koppies - a function of its geology, semi-arid conditions and low vegetation cover; a relatively ephemeral pattern of human intervention on the landscape resulting in a sense of remoteness and stillness, known also for its night sky.
- Generally a widespread archaeological signature dating to the Earlier and Middle Stone Ages described as a low frequency ancient scatter across the landscape, as well as an

<sup>1</sup> <https://www.beaufortwest.net/explore/central-karoo/nelspoort/>





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archaeological signature dating to the Later Stone Age. In this case, dense archaeology around the dolerite koppies.

- Historical associations with colonial expansion of the northern frontier zone in the late 18th early 19th century resulting in the further displacement of transhumant pastoralism by settled agriculture and the emergence of extensive sheep farming in the early to mid-19th century; the farms Kruidfontein (pre-1890), Poortjie and Louws Baken (pre-1829), being first surveyed during this period.
- A distinctive pattern of settlement informed by access to limited water resources with small, isolated farmsteads forming green oases in the semi-arid landscape, sheltered from the heat by exotic trees and associated with springs, streams, dams and windpumps. The manner in which homesteads are positioned at the base of hills and koppies forming distinctive topographical settings. The dry-packed stone walls historically used for kraals, are a characteristic feature of the landscape.
- The N1 corridor following the alignment of the late 18th century route to the interior and its role as a structuring element in the landscape along which dispersed settlement has occurred like “beads on a string”.
- Nelspoort, significant for its wealth of tangible remains demonstrating a continuous history of occupation from pre-history, through to its mid-19th century role in the local wool farming boom, and development as a 20th century medical sanctuary.
- Poortjie Wes, significant as an identified place on an early linkage route between Beaufort West and Graaf Reinet.

### Archaeology

Recently, a number of heritage assessments have been completed within close proximity to the area proposed for development (Figure 2a). According to Nilssen (2014, SAHRIS NID 504763), “The Karoo houses a long and rich archaeological record dating from the earliest stages of Stone Age technology that are over a million years old, to the historic period that consists of the last few hundred years of human occupation (see Nilssen 2011 and references therein). Archaeological sites include caves and rock shelters, open air artefact scatters, rock engravings and historic structures with their associated cultural materials.” According to ACO (2013, SAHRIS NID 503074), “Because of the scarcity of caves and shelters, more than 90% of Karoo archaeological sites are open sites of stone artefacts, ostrich eggshell fragments and occasionally, pottery. Bone remains are rarely preserved. Artefacts of both the Early and Middle Stone Age are widespread and may generally be described as an ancient litter that occurs at a low frequency across the landscape. Where definable scatters of Early and Middle Stone Age material occur, they are considered to be significant heritage sites.

More intensive occupation of the Karoo started around 13 000 years ago during the Later Stone Age, which is essentially the heritage of Khoisan groups who lived throughout the region. The legacy of the San includes numerous open sites while traces of their presence can also be found in most large rock shelters, often in the form of rock art. They frequently settled a short distance from permanent water sources (springs or waterholes) and made use of natural shelters such as rock outcrops or large boulders or even large bushes. In the Great Karoo, natural elevated features such as dolerite dykes and ridges played a significant role in San settlement patterns” and as such, this broader area is renowned for its well-preserved rock art and other artefacts from this time, including rock engravings and rock gongs. It is likely that similar archaeological heritage exists within the areas proposed for development and as such, impact to these resources must be assessed.

There are currently 14 identified sites of archaeological interest with over 400 examples of rock engravings (petroglyphs) in the immediate Nelspoort area. All engravings are made on the flat surfaces of the dolerite rocks, with the dark outer layer scraped away leaving the image expressed in the lighter sub layer of the rock.

While the precise authorship of rock art is debated (Smith, Ouzman 2004), engravings fall broadly into three types described as follows:

- !xam San hunter-gatherer rock engravings: representations include elephant, giraffe, hartebeest, jackal, zebra and rhinoceros. Images also of human figures, bird-human figures and spirit world representations.
- Khoe herder geometric engravings: patterns such as lines radiating sun-like from a centre point, zig-zag patterns and concentric circles.
- Settler engravings: these include text, symbols and direction markers such as arrows and images including a windpump and animals.

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In many sites these different types of rock art co-exist, along with other evidence of habitation over an extended period of time, such as stone tools, grinding patches on stones, arranged stones, and rock gongs (Ouzman 2003). Nelspoort is the site of several rock gong complexes. The rock gong, or lithophone percussion instrument, is formed by dolerite boulders, some cracked as a result of lightening strike or extreme temperature fluctuation, balanced on each other so that they resonate with a deep ringing sound when struck in a specific way. They are believed to have been intrinsic to spiritual practices of the !xam San people. Two rock gong groupings are located on small rises across the shallow Nelspoort valley, suggesting that the gong's sound may have been used for communication purposes (Rusch 2016).

A recent field assessment completed by CTS Heritage for a renewable energy project located immediately north of the development area recorded 111 Observations. The bulk of these were open site scatters of Middle Stone Age cores, flakes and debitage. Local siltstones and hornfels rock cores had been used in the production of the flakes with very little introduction of exotic stone sourced in other regions. While only a handful of flakes were found dispersed across a very wide area, they form a constant backdrop to the landscape rather than being concentrated particularly in any one area. The MSA materials tended to be heavily patinated and weathered by water and mud runoff after storms with a high clay content. Typologically diagnostic artefacts included some radial cores and a fairly common spread of retouched blades and blade blanks. Earlier MSA material was also found such as bifacial points and larger flakes but we would deduce that most of this layer of occupation is buried on the floodplains. A cluster of conservation-worthy sites were found including Later Stone Age engravings on dolerite boulders and an historic ruined kraal. The engravings show a range of well-preserved imagery linking the ethnographic records of the San in the Bleek and Lloyd collection to these sites such as the scene depicted showing a cloudburst of rain, finely engraved eland and elephant. A large number of LSA and historical artefacts were found in association with these sites. Most of the scatters recorded were graded as not conservation-worthy due to the ubiquity of these artefacts across the landscape and the lack of a particular focal point of landscape use.

Fieldwork in this area has identified a correlation between the dolerite outcrops in the area and higher levels of Later Stone Age archaeology, rock engravings and rock gongs. It is likely that this pattern is also applicable for the area under consideration in this assessment. As such, the dolerite outcrop located here must be considered to have high levels of archaeological sensitivity.

### Palaeontology

According to the SAHRIS Palaeosensitivity Map (Figure 4a), the area proposed for development is underlain by very few sediments of very high paleontological sensitivity (red), some of high sensitivity (orange) and most of low sensitivity (blue). According to the extract from the Council for GeoSciences Map 3222 for Beaufort West, the development area is underlain by the Poortjie Member of the Teekloof Formations, both of the Adelaide Subgroup of the Beaufort Group of sediments. According to the SAHRIS Fossil Heritage Browser and the Palaeotechnic Report for the Western Cape (Almond and Pether, 2008), the Beaufort Group sediments are known to preserve diverse terrestrial and freshwater tetrapods of *Tapinocephalus* to *Lystrosaurus* Biozones (amphibians, true reptiles, synapsids – especially therapsids), palaeoniscoid fish, freshwater bivalves, trace fossils (including tetrapod trackways) and sparse vascular plants (*Glossopteris* Flora, including petrified wood). Based on the known paleontological sensitivity of this area, it is very likely that activities associated with the development of the proposed PV, WEF and grid connections will negatively impact on significant fossil heritage.

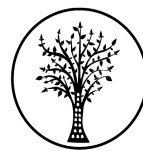
A recent field assessment of an adjacent site completed by Almond (2022) noted that “The great majority of the project areas is mantled by thick superficial deposits (alluvium, colluvium / eluvium, calcrete, soils) of low palaeosensitivity. Apart from occasional invertebrate trace fossils of limited scientific interest, the small number of tetrapod fossils recorded from Lower Beaufort Group bedrocks here comprise reworked, fragmentary bones preserved within channel basal breccias or weathered-out into surface gravels. No well-preserved, articulated postcrania or identifiable skull material of high scientific or conservation significance was recorded, although there is still potential for such material occurring at or beneath the surface within the sites. It is concluded that all six solar site options are in practice of Low Palaeosensitivity overall. The preliminary Low to Very High palaeosensitivity sensitivity mapped here by the DFFE Screening Tool is therefore *contested*. Given the low overall palaeosensitivity of all six of the solar project areas, the proposed renewable energy developments are all of Low impact significance in terms of palaeontological heritage resources.” It is likely that a similar finding will result from palaeontological fieldwork conducted in the area under consideration in this assessment.

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## APPENDIX 1

### List of heritage resources within close proximity to the development area

Site ID	Site no	Full Site Name	Site Type	Grading
35107	KLAV 1	Klavervlei 1	Artefacts	Grade IIIc
35562	GK092	Gamma Kappa 092	Artefacts	Grade IIIb
35563	GK093	Gamma Kappa 093	Artefacts	Grade IIIc
35581	GK094	Gamma Kappa 094	Artefacts	Grade IIIb
35582	GK095	Gamma Kappa 095	Artefacts	Grade IIIb
35583	GK096	Gamma Kappa 096	Artefacts	Grade IIIb
35584	GK097	Gamma Kappa 097	Artefacts	Grade IIIc
35586	GK098	Gamma Kappa 098	Artefacts	Grade IIIc
35588	GK099	Gamma Kappa 099	Artefacts	Grade IIIc
35598	GK064	Gamma Kappa 064	Rock Art	Grade IIIb
35602	GK067	Gamma Kappa 067	Artefacts	Grade IIIb
18303	KLPK1	Klipkraal 1	Rock Art	Grade IIIa
18304	KLPK2	Klipkraal 2	Rock Art	Grade IIIa
18305	KLPK3	Klipkraal 3	Rock Art	Grade IIIa

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## APPENDIX 2

### Reference List with relevant AIAs and PIAs

Heritage Impact Assessments				
Nid	Report Type	Author/s	Date	Title
354680	HIA Phase 1	Lita Webley, David Halkett	30/11/2015	Heritage Impact Assessment: Proposed Uranium Mining and Associated infrastructure on portions of the farm Quaggasfontein and Ryst Kuil near Beaufort West in the Western Cape and De Pannen near Aberdeen in the Eastern Cape
354681	AIA Phase 1	Lita Webley	30/11/2015	Archaeological Impact Assessment: Proposed uranium mining and associated infrastructure on portions of the farms Quaggasfontein and Ryst Kuil near Beaufort West in the Western Cape and De Pannen near Aberdeen in the Eastern Cape
354683	PIA Phase 1	Bruce Rubidge	24/04/2008	Palaeontological study of the Rystkuil channel
356853	PIA Phase 1	John Almond	01/05/2008	PALAEONTOLOGICAL IMPACT ASSESSMENT, DAMKOPPIE HOUSING DEVELOPMENT, BEAUFORT WEST (WESTERN CAPE)
4013	AIA Phase 1	Jonathan Kaplan	01/02/2006	Phase 1 Archaeological Impact Assessment Proposed Klavervlei Powerline Karoo National Park
6461	AIA Phase 1	Jonathan Kaplan	01/02/2008	Phase 1 Archaeological Impact Assessment: Proposed Development Remainder of Farm 185 (Now Called Plot 8419) Beaufort West, Western Cape Province
7852	AIA Phase 1	J Kinahan	03/10/2008	Archaeological Baseline Survey of the Proposed Ryst Kuil Uranium Project

#### Other References:

Lavin et al. (2022). Heritage Impact Assessment for the proposed Poortjie Renewable Energy Cluster. Section 38(3) of the NHRA. Submission to HWC.

Almond, J. (2022). Palaeontological Impact Assessment for the proposed Poortjie Renewable Energy Cluster. Section 38(3) of the NHRA. Submission to HWC.

Winter and Wilson (2022). Cultural Landscape Assessment for the proposed Poortjie Renewable Energy Cluster. Section 38(3) of the NHRA. Submission to HWC.

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## APPENDIX 3 - Keys/Guides

### Key/Guide to Acronyms

<b>AIA</b>	Archaeological Impact Assessment
<b>DARD</b>	Department of Agriculture and Rural Development (KwaZulu-Natal)
<b>DEA</b>	Department of Environmental Affairs (National)
<b>DEADP</b>	Department of Environmental Affairs and Development Planning (Western Cape)
<b>DEDEAT</b>	Department of Economic Development, Environmental Affairs and Tourism (Eastern Cape)
<b>DEDECT</b>	Department of Economic Development, Environment, Conservation and Tourism (North West)
<b>DEDT</b>	Department of Economic Development and Tourism (Mpumalanga)
<b>DEDTEA</b>	Department of economic Development, Tourism and Environmental Affairs (Free State)
<b>DENC</b>	Department of Environment and Nature Conservation (Northern Cape)
<b>DMR</b>	Department of Mineral Resources (National)
<b>GDARD</b>	Gauteng Department of Agriculture and Rural Development (Gauteng)
<b>HIA</b>	Heritage Impact Assessment
<b>LEDET</b>	Department of Economic Development, Environment and Tourism (Limpopo)
<b>MPRDA</b>	Mineral and Petroleum Resources Development Act, no 28 of 2002
<b>NEMA</b>	National Environmental Management Act, no 107 of 1998
<b>NHRA</b>	National Heritage Resources Act, no 25 of 1999
<b>PIA</b>	Palaeontological Impact Assessment
<b>SAHRA</b>	South African Heritage Resources Agency
<b>SAHRIS</b>	South African Heritage Resources Information System
<b>VIA</b>	Visual Impact Assessment

### Full guide to Palaeosensitivity Map legend

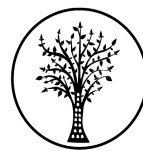
<b>RED:</b>	VERY HIGH - field assessment and protocol for finds is required
<b>ORANGE/YELLOW:</b>	HIGH - desktop study is required and based on the outcome of the desktop study, a field assessment is likely
<b>GREEN:</b>	MODERATE - desktop study is required
<b>BLUE/PURPLE:</b>	LOW - no palaeontological studies are required however a protocol for chance finds is required
<b>GREY:</b>	INSIGNIFICANT/ZERO - no palaeontological studies are required
<b>WHITE/CLEAR:</b>	UNKNOWN - these areas will require a minimum of a desktop study.

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## APPENDIX 4 - Methodology

The Heritage Screener summarises the heritage impact assessments and studies previously undertaken within the area of the proposed development and its surroundings. Heritage resources identified in these reports are assessed by our team during the screening process.

The heritage resources will be described both in terms of **type**:

- Group 1: Archaeological, Underwater, Palaeontological and Geological sites, Meteorites, and Battlefields
- Group 2: Structures, Monuments and Memorials
- Group 3: Burial Grounds and Graves, Living Heritage, Sacred and Natural sites
- Group 4: Cultural Landscapes, Conservation Areas and Scenic routes

and **significance** (Grade I, II, IIIa, b or c, ungraded), as determined by the author of the original heritage impact assessment report or by formal grading and/or protection by the heritage authorities.

Sites identified and mapped during research projects will also be considered.

### DETERMINATION OF THE EXTENT OF THE INCLUSION ZONE TO BE TAKEN INTO CONSIDERATION

The extent of the inclusion zone to be considered for the Heritage Screener will be determined by CTS based on:

- the size of the development,
- the number and outcome of previous surveys existing in the area
- the potential cumulative impact of the application.

The inclusion zone will be considered as the region within a maximum distance of 50 km from the boundary of the proposed development.

### DETERMINATION OF THE PALAEONTOLOGICAL SENSITIVITY

The possible impact of the proposed development on palaeontological resources is gauged by:

- reviewing the fossil sensitivity maps available on the South African Heritage Resources Information System (SAHRIS)
- considering the nature of the proposed development
- when available, taking information provided by the applicant related to the geological background of the area into account

### DETERMINATION OF THE COVERAGE RATING ASCRIBED TO A REPORT POLYGON

Each report assessed for the compilation of the Heritage Screener is colour-coded according to the level of coverage accomplished. The extent of the surveyed coverage is labeled in three categories, namely low, medium and high. In most instances the extent of the map corresponds to the extent of the development for which the specific report was undertaken.

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**Low coverage** will be used for:

- desktop studies where no field assessment of the area was undertaken;
- reports where the sites are listed and described but no GPS coordinates were provided.
- older reports with GPS coordinates with low accuracy ratings;
- reports where the entire property was mapped, but only a small/limited area was surveyed.
- uploads on the National Inventory which are not properly mapped.

**Medium coverage** will be used for

- reports for which a field survey was undertaken but the area was not extensively covered. This may apply to instances where some impediments did not allow for full coverage such as thick vegetation, etc.
- reports for which the entire property was mapped, but only a specific area was surveyed thoroughly. This is differentiated from low ratings listed above when these surveys cover up to around 50% of the property.

**High coverage** will be used for

- reports where the area highlighted in the map was extensively surveyed as shown by the GPS track coordinates. This category will also apply to permit reports.

## RECOMMENDATION GUIDE

The Heritage Screener includes a set of recommendations to the applicant based on whether an impact on heritage resources is anticipated. One of three possible recommendations is formulated:

**(1) The heritage resources in the area proposed for development are sufficiently recorded** - The surveys undertaken in the area adequately captured the heritage resources. There are no known sites which require mitigation or management plans. No further heritage work is recommended for the proposed development.

This recommendation is made when:

- enough work has been undertaken in the area
- it is the professional opinion of CTS that the area has already been assessed adequately from a heritage perspective for the type of development proposed

**(2) The heritage resources and the area proposed for development are only partially recorded** - The surveys undertaken in the area have not adequately captured the heritage resources and/or there are sites which require mitigation or management plans. Further specific heritage work is recommended for the proposed development.

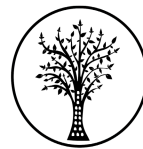
This recommendation is made in instances in which there are already some studies undertaken in the area and/or in the adjacent area for the proposed development. Further studies in a limited HIA may include:

- improvement on some components of the heritage assessments already undertaken, for instance with a renewed field survey and/or with a specific specialist for the type of heritage resources expected in the area
- compilation of a report for a component of a heritage impact assessment not already undertaken in the area

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- undertaking mitigation measures requested in previous assessments/records of decision.

**(3) The heritage resources within the area proposed for the development have not been adequately surveyed yet - Few or no surveys have been undertaken in the area proposed for development. A full Heritage Impact Assessment with a detailed field component is recommended for the proposed development.**

**Note:**

The responsibility for generating a response detailing the requirements for the development lies with the heritage authority. However, since the methodology utilised for the compilation of the Heritage Screeners is thorough and consistent, contradictory outcomes to the recommendations made by CTS should rarely occur. Should a discrepancy arise, CTS will immediately take up the matter with the heritage authority to clarify the dispute.

## **APPENDIX 5 -Summary of Specialist Expertise**

**Jenna Lavin**, an archaeologist with an MSc in Archaeology and Palaeoenvironments, and currently completing an MPhil in Conservation Management , heads up the heritage division of the organisation since 2016, and has a wealth of experience in the heritage management sector. Jenna's previous position as the Assistant Director for Policy, Research and Planning at Heritage Western Cape has provided her with an in-depth understanding of national and international heritage legislation. Her 8 years of experience at various heritage authorities in South Africa means that she has dealt extensively with permitting, policy formulation, compliance and heritage management at national and provincial level and has also been heavily involved in rolling out training on SAHRIS to the Provincial Heritage Resources Authorities and local authorities.

Jenna is on the Executive Committee of the Association of Professional Heritage Practitioners (APHP), and is also an active member of the International Committee on Monuments and Sites (ICOMOS) as well as the International Committee on Archaeological Heritage Management (ICAHM). In addition, Jenna has been a member of the Association of Southern African Professional Archaeologists (ASAPA) since 2009. Recently, Jenna has been responsible for conducting training in how to write Wikipedia articles for the Africa Centre's WikiAfrica project.

Since 2016, Jenna has drafted over 100 Heritage Impact Assessments and Screening Assessments throughout South Africa.

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## **APPENDIX 5: HWC NID Response**

**Our Ref:** HM / CENTRAL KAROO/ BEAUFORT WEST /  
REMAINDER FARM RHENOSTERKOP 155 (N) AND FARM 400 (S)  
**Case No.:** HWC23082802SB1010  
**Enquiries:** Stephanie Barnardt  
**E-mail:** Stephanie.Barnardt@westerncape.gov.za  
**Tel:** 021 483 5959



**Applicant:** Jenna Lavin  
[jenna.lavin@ctsheritage.com](mailto:jenna.lavin@ctsheritage.com)

**RESPONSE TO NOTIFICATION OF INTENT TO DEVELOP: HIA REQUIRED**  
**In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999) and the Western Cape**  
**Provincial Gazette 6061, Notice 298 of 2003**

**NOTIFICATION OF INTENT TO DEVELOP: PROPOSED DEVELOPMENT OF THE RHENOSTERKOP NORTH AND SOUTH SEF ON REMAINDER FARM RHENOSTERKOP 155 (N) AND REMAINDER FARM 400 (S), BEAUFORT WEST, S38, SUBMITTED IN TERMS OF SECTION 38(1) OF THE NATIONAL HERITAGE RESOURCES ACT (ACT 25 OF 1999)**

The matter above has reference.

Heritage Western Cape is in receipt of your application for the above matter received. This matter was discussed at the Heritage Officers Meeting held on 30 October 2023.

You are hereby notified that, since there is reason to believe that the proposed development of the Rhenosterkop North and South SEF on Remainder Farm Rhenosterkop 155 (N) and Remainder Farm 400 (S), Beaufort West, S38 will impact on heritage resources, HWC requires that a Heritage Impact Assessment (HIA) that satisfies the provisions of Section 38(3) of the NHRA be submitted. Section 38(3) of the NHRA provides

(3) *The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): **Provided that the following must be included:***

- (a) *The identification and mapping of all heritage resources in the area affected;*
- (b) *an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;*
- (c) *an assessment of the impact of the development on such heritage resources;*
- (d) *an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;*
- (e) *the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;*
- (f) *if heritage resources will be adversely affected by the proposed development, The consideration of alternatives; and*
- (g) *plans for mitigation of any adverse effects during and after the completion of the proposed development.*

(Our emphasis)

This HIA must in addition have specific reference to the following:

- Palaeontological Impact Assessment
- Archaeological Impact Assessment
- Visual impact on the Cultural Landscape Assessment

The HIA must have an overall assessment of the impacts to heritage resources which are not limited to the specific studies referenced above.

The required HIA must have an integrated set of recommendations.

The comments of relevant registered conservation bodies; all Interested and Affected parties; and the relevant Municipality must be requested and included in the HIA where provided. Proof of these requests must be supplied.

PAGE 2 OF 2

**Our Ref:** HM / CENTRAL KAROO/ BEAUFORT WEST /  
REMAINDER FARM RHENOSTERKOP 155 (N) AND FARM 400 (S)  
**Case No.:** HWC23082802SB1010  
**Enquiries:** Stephanie Barnardt  
**E-mail:** Stephanie.Barnardt@westerncape.gov.za  
**Tel:** 021 483 5959



If applicable, applicants are strongly advised to review and adhere to the time limits contained the Standard Operational Procedure (SOP) between DEADP and HWC. The SOP can be found using the following link <http://www.hwc.org.za/node/293>

Kindly take note of the HWC meeting dates and associated agenda closure date in order to ensure that comments are provided within as Reasonable time and that these times are factored into the project timeframes.

HWC reserves the right to request additional information as required.

Should you have any further queries, please contact the official above and quote the case number.



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Waseefa Dhansay

**Assistant Director: Professional Services**



[www.westerncape.gov.za/cas](http://www.westerncape.gov.za/cas)

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