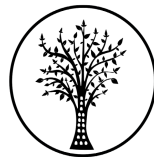


HERITAGE IMPACT ASSESSMENT

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

Proposed Nku, Moriri and Kwana PV Facilities which form part of the Great Karoo Renewable Energy Facility development near Richmond in the Northern Cape

Prepared by CTS Heritage

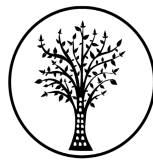


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For

Savannah Environmental

March 2022



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EXECUTIVE SUMMARY

1. Site Name:

Nku, Moriri and Kwana PV Facilities

2. Location:

Portion 1 of Farm Rondavel 85

3. Locality Plan:

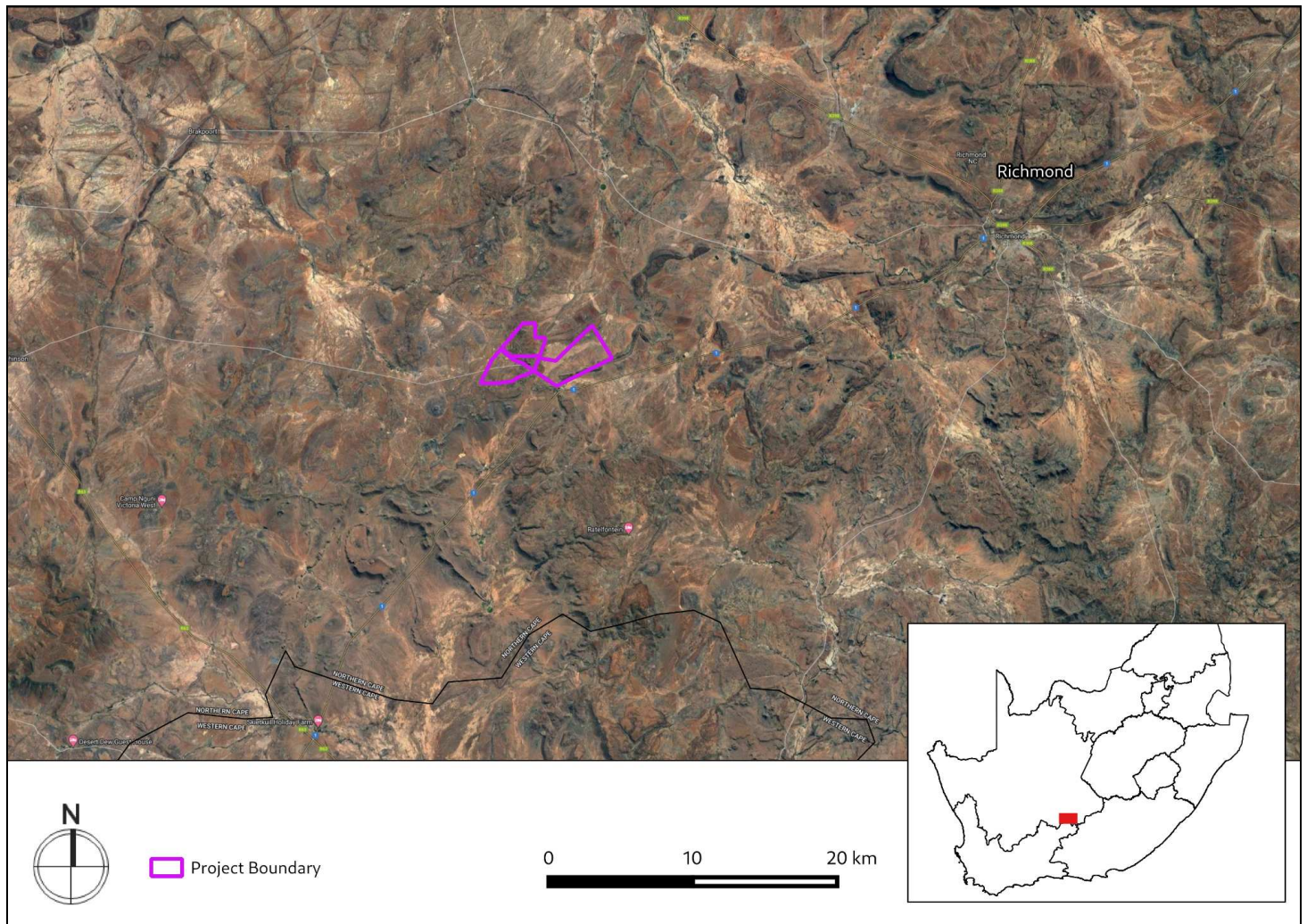


Figure A: Location of the proposed development area

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4. Description of Proposed Development:

Great Karoo Renewable Energy (Pty) Ltd is proposing the construction and operation of three photovoltaic (PV) solar energy facilities and associated infrastructure on Portion 1 of Farm Rondavel 85, located approximately 35km south-west of Richmond and 80km south-east of Victoria West, within the Ubuntu Local Municipality and the Pixley Ka Seme District Municipality in the Northern Cape Province.

A preferred project site with an extent of ~29 909ha and a development area of ~571ha (Nku PV), ~577ha (Moriri PV) and ~991ha (Kwana PV) within the project site has been identified by Great Karoo Renewable Energy (Pty) Ltd as a technically suitable area for the development of the three PV facilities, each with a contracted capacity of up to 100MW.

5. Heritage Resources Identified:

The landscape of the development area has been assessed for cultural heritage significance, and found to have five distinct character areas:

1. Historic movement corridors.
2. Open plains interrupted by low koppies.
3. Elevated areas with steep sided mountain ridges.
4. Areas of landscape that have been transformed by significant infrastructural development.
5. Remote landscape with wilderness qualities.

Of the five distinct character areas identified in the Cultural Landscape Assessment (Winter, 2021), the proposed PV developments fall within area 4.

In terms of the heritage resources identified in the archaeological field assessment, see Table A below.

Table A: Artefacts identified during the field assessment development area

POINT ID	Project Area	Period	Description	Co-ordinates		Grading	Mitigation
GK037	NA	Historic	Stone walled ruins x 2	-31.506165	23.611848	IIIB	No-go development buffer of 500m
GK038	NA	Historic	Rondavel farmhouse complex	-31.507875	23.614365	IIIA	No-go development buffer of 1km
GK048	NA	LSA, MSA	Lower, ground, grindstone, greywacke flakes, cores	-31.49589	23.64534	IIIB	No-go development buffer of 50m



In terms of the heritage resources identified in the palaeontological field assessment, see Table B below.

Table B: Palaeontological observations made during the field assessment for the development area

POINT ID	Project Area	Description	Co-ordinates		Grading	Mitigation
884	Merino	Rondavel 85. Hoedemaker Member. Thin crevasse splay sandstone exposed in shallow borrow pit with sandstone-infilled mudcracks, microbial mat textures, small-scale invertebrate trace fossils (narrow horizontal burrows of undermat miners), possible vertical burrows or plant stem casts. Proposed Field Rating IIIC Local Resource. No mitigation recommended.	-31.49779201	23.59721803	IIIC	NA

6. Anticipated Impacts on Heritage Resources:

The site forms part of an intact 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 a number of landscape elements contributing to a composite cultural landscape including topographical features, open plains, water features, historic scenic routes and farmsteads. The landscape affected by the proposed development has a number of character areas within varying significances and sensitivities to accommodate Renewable Energy infrastructure culminating in the identification of no-go areas, tread-lightly areas and areas more resilient to development, as well as a number of design indicators for placement of Renewable Energy infrastructure.

There are limited impacts anticipated to archaeological and palaeontological heritage from this proposed development and as such, the principle of a renewable energy facility in this location is supported from a heritage perspective provided that the infrastructure is located in areas able to tolerate the impact of the high degree of change from a cultural landscape perspective.

7. Recommendations:

Based on the outcomes of this report, it is not anticipated that the proposed development of the solar PV facility and its associated grid connection infrastructure will negatively impact on significant heritage resources. The following recommendations are made:

- The recommendations of the VIA must be implemented.
- A 50m no development buffer area must be implemented around site GK048
- A 1km no-go development buffer be maintained around Site GK038 and a 500m no-go development buffer be maintained around Site GK037 to ensure that no impact occurs. This no-go development buffer refers to new infrastructure and not the existing roads to be used by the PV facilities.
- The HWC Chance Fossil Finds Procedure must be implemented for the duration of construction activities
- 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



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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.

8. Author/s and Date:

Jenna Lavin

March 2022



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Details of Specialist who prepared the HIA

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, 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 250 Screening and Heritage Impact Assessments throughout South Africa.

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1. INTRODUCTION

1.1 Background Information on Project

Great Karoo Renewable Energy (Pty) Ltd is proposing the construction and operation of three photovoltaic (PV) solar energy facilities and associated infrastructure on Portion 1 of Farm Rondavel 85, located approximately 35km south-west of Richmond and 80km south-east of Victoria West, within the Ubuntu Local Municipality and the Pixley Ka Seme District Municipality in the Northern Cape Province.

A preferred project site with an extent of ~29 909ha and a development area of ~571ha (Nku PV), ~577ha (Moriri PV) and ~991ha (Kwana PV) within the project site has been identified by Great Karoo Renewable Energy (Pty) Ltd as a technically suitable area for the development of the three PV facilities, each with a contracted capacity of up to 100MW.

Each Solar PV Facility project site is proposed to accommodate the following infrastructure, which will enable the facility to supply a contracted capacity of up to 100MW:

- Solar PV array comprising PV modules and mounting structures.
- Inverters and transformers.
- Cabling between the panels.
- 33/132kV onsite facility substation.
- Cabling from the onsite substation to the collector substation (either underground or overhead).
- Electrical and auxiliary equipment required at the collector substation that serves that solar energy facility, including switchyard/bay, control building, fences, etc.
- Battery Energy Storage System (BESS).
- Site offices and maintenance buildings, including workshop areas for maintenance and storage.
- Laydown areas.
- Access roads and internal distribution roads.

The solar PV facility is proposed in response to the identified objectives of the national and provincial government and local and district municipalities to develop renewable energy facilities for power generation purposes. It is the developer's intention to bid each Solar PV Facility under the Department of Mineral Resources and Energy's (DMRE's) Renewable Energy Independent Power Producer Procurement (REIPPP) Programme, with the aim of evacuating the generated power into the national grid. This will aid in the diversification and stabilisation of the country's electricity supply, in line with the objectives of the Integrated Resource Plan (IRP) with each Solar PV Facility set to inject up to 100MW into the national grid.

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The project is planned as part of a larger cluster of renewable energy projects, which include two (2) 140MW Wind Energy Facilities (known as Merino Wind Farm and Angora Wind Farm) as well as the grid connection infrastructure connecting the renewable energy facilities to the existing Eskom Gamma Substation.

1.2 Description of Property and Affected Environment

The majority of the proposed solar PV infrastructure is located on Rondavel and Vogelstruisfontein farms which lie on the northern and western end of the N1 highway about 30km southwest of Richmond in the Northern Cape. Rondavel is a working sheep farm but is also a prominent guest farm. In the last two decades the N1 has become increasingly flooded with heavy trucking traffic due to the decreasing use of the railway system and the growth of the South African economy.

The terrain is a mixture of nearly perfectly level ground where the solar PV installations are positioned. The area falls within the Eastern Upper Karoo region and the vegetation consists of a mix of grass and shrub dominated vegetation types. Acacia thorn trees are found in the riverine zones and much of the shrubland is currently in a very poor state due to the extended 5 year drought afflicting the area. Aeolian sands and floodplains form a thick (>1m) layer of overburden in many places surrounding the dolerite ridges and there has been extensive burial and re-surfacing of Middle Stone Age material. Later Stone Age was relatively well represented in the study area and most of the MSA and LSA material was concentrated around the lower slopes of the dolerite ridges and koppies. The dominant agricultural activity is sheep farming and a number of windmills with small farm dams were recorded that feature on the built landscape. The western end of the properties hold the main route of South Africa's 765kV powerline infrastructure linking up the Western Cape to the coal-fired power stations in Mpumalanga and Gauteng.

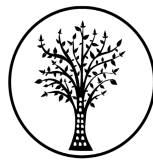
The area proposed for development is characterised as follows in the Cultural Landscape Assessment completed for this project (Winter, 2021);

- Regional location within the eastern upper area of the Great Karoo, which is a vast arid area with a dispersed pattern of settlement, extensive stock farms, more recent game farms, and irrigation based agriculture along the rivers; the vegetation cover is low consistent with the Nama Karoo Biome (Savannah Environmental 2021).
- Very distinctive topographical conditions, with a combination of steep slopes, ridgelines, flat topped mesa mountains and rounded koppies punctuating open plains.
- Location to the southwest of Richmond, which dates to the mid 18th century; it lies in a slight depression, surrounded by rises and hillocks, the most prominent of which is Vegkop to the north of town, which shields it from the N1; it is traversed by the occasional Ongers River
- The majority of the site lies directly to the north of the N1, being partially traversed and partially bounded

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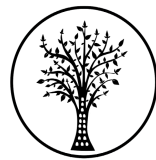
by it. This sector of the N1 connects Three Sisters in the south to Richmond. It crosses the R63 approximately 30 km south of the site at a point midway between Victoria West and Murraysburg. This sector of the N1 is not recognised as a scenic route however it has historic longevity.

- The N1 traversing the Great Escarpment runs largely straight, with very little topographical change. However, this consistency is interrupted on the south west approach to Richmond by topographical variety, and a threshold condition at a historic bend in the route. This is located at the south west boundary of the study area.
- The alignment of the N1 through this landscape follows an early transport and wagon route to the interior dating to, at least, the late 18th century.
- Farming settlements along this portion of the N1 are experienced as “beads on a string”, with small nodal groupings clustered on the foothills of the mountain ridges in proximity to the road.
- The distinctive nature of farming settlements within a semi-arid landscape is generally associated with a loose collection of farm buildings adjacent to watercourses and springs, and marked by clusters of tree planting, dams and wind pumps.
- Existing Eskom power lines run parallel to the northern boundary of the site and extend to the power station near the intersection of the N1 and R63.
- Located outside of the REDZ, but in proximity to other existing and proposed power facilities.

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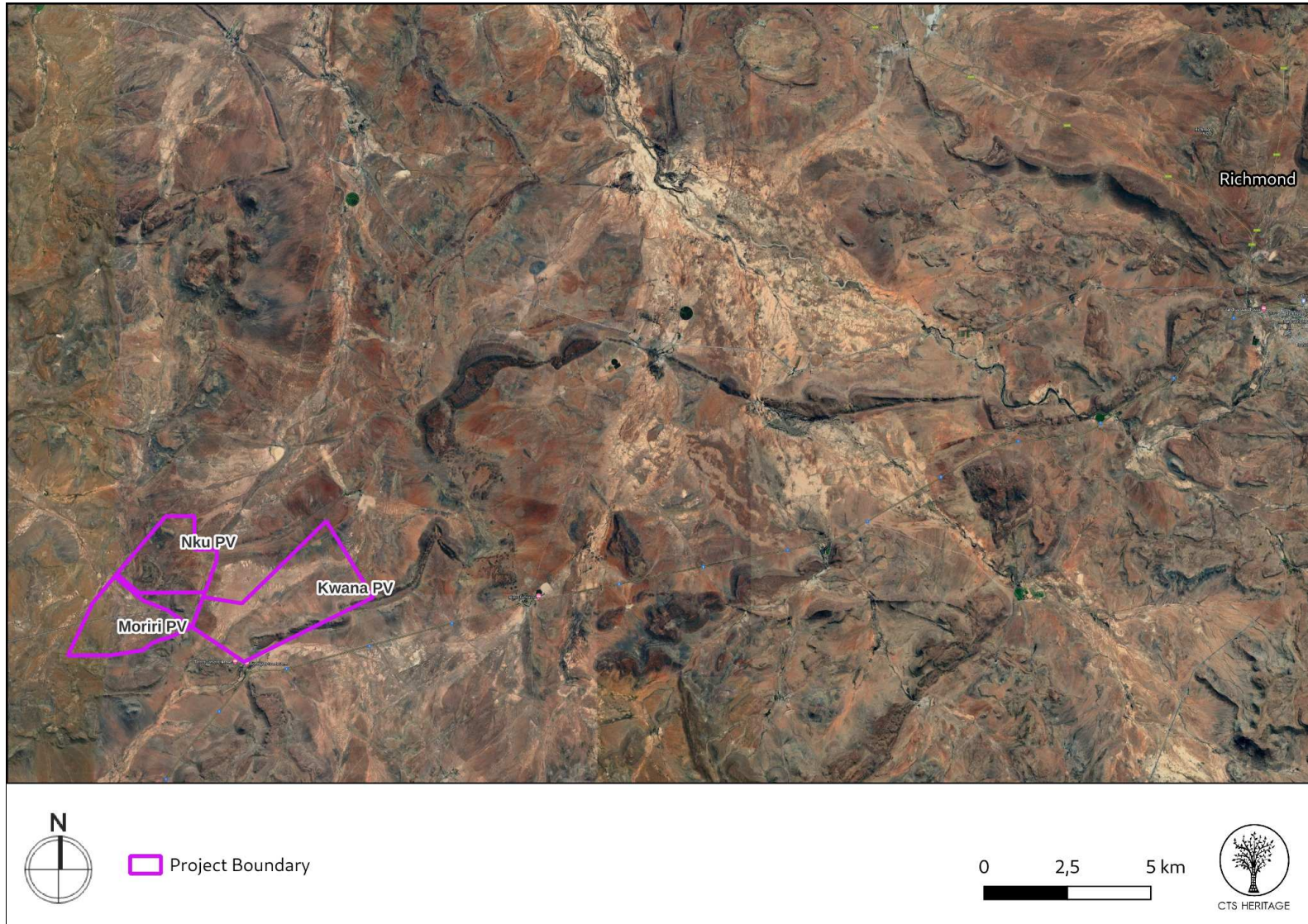
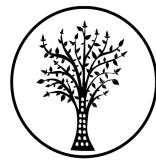


Figure 11: Proposed development relative to Richmond



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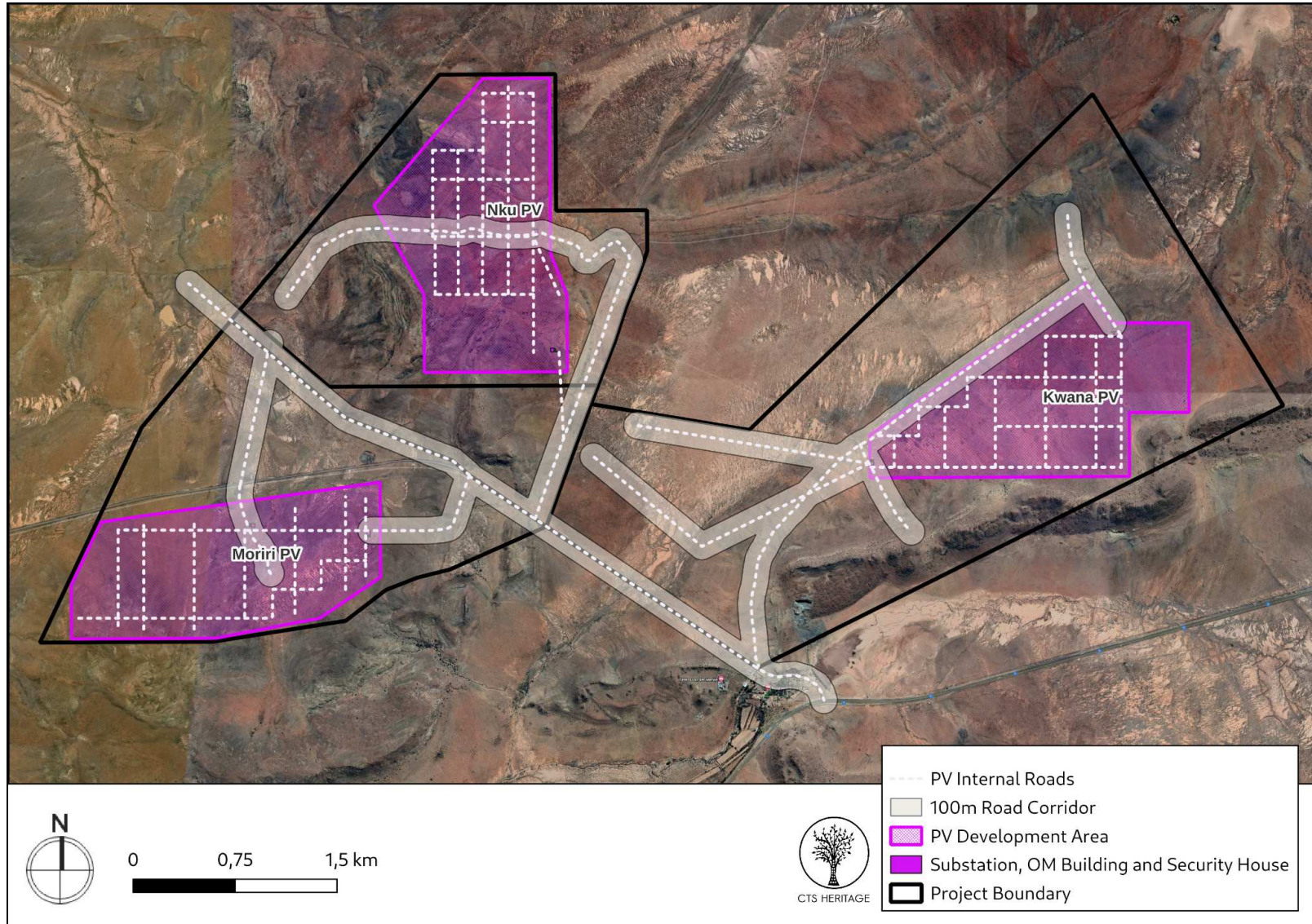
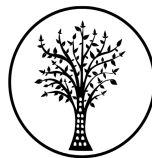


Figure 1.2: The proposed development layout of the Nku, Moriri and Kwana PV Facilities

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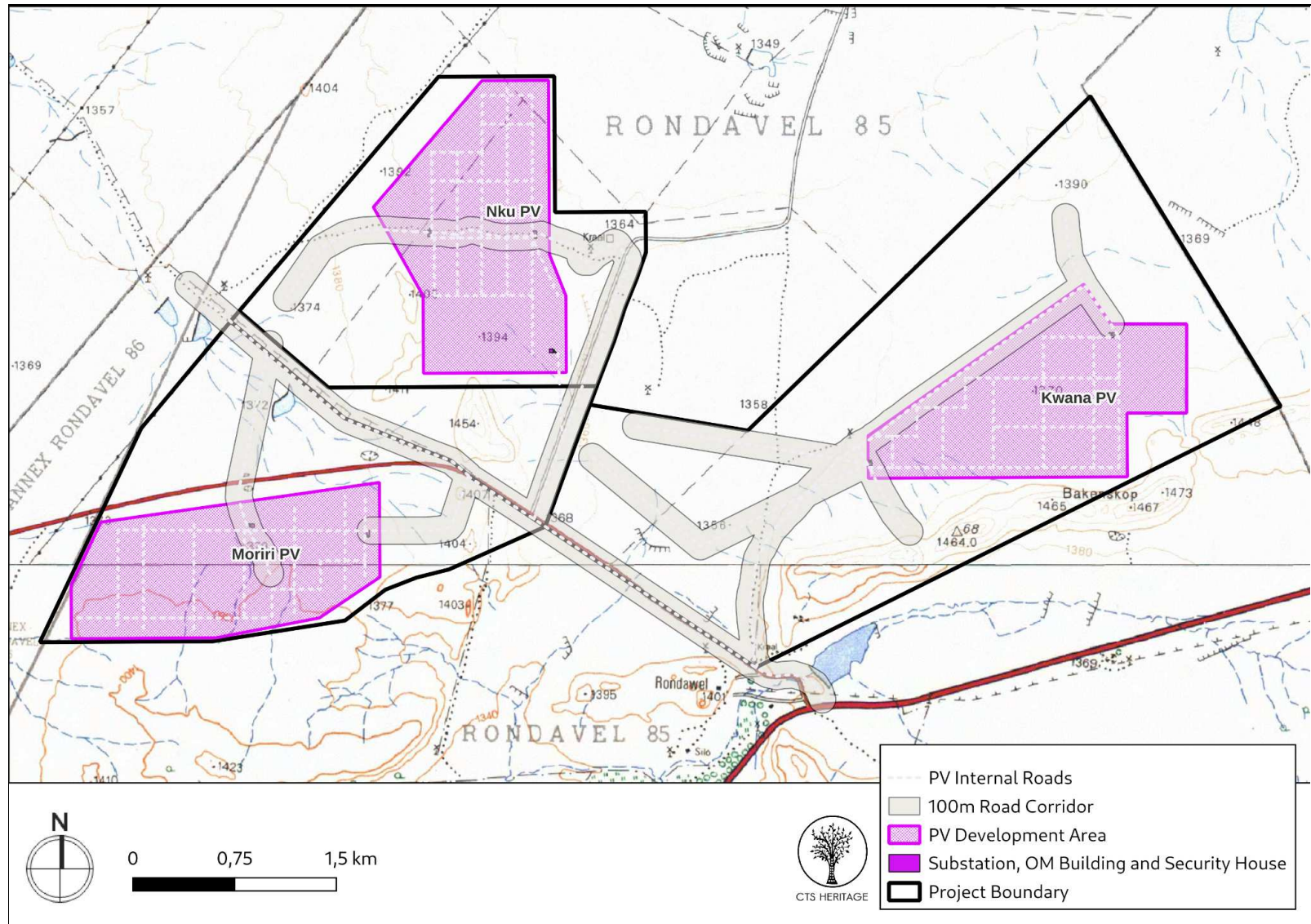


Figure 1.3: The proposed development layout of the Nku, Moriri and Kwana PV Facilities on an extract of the 1:50 000 Topo Map



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2. METHODOLOGY

2.1 Purpose of HIA

The purpose of this Heritage Impact Assessment (HIA) is to satisfy the requirements 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

- A Desktop Study was conducted of relevant reports previously written (please 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 his site visit from 11 to 16 September 2021
- A palaeontologist conducted an assessment of palaeontological resources likely to be disturbed by the proposed development. The palaeontologist conducted his site visit in November 2021
- A cultural landscape assessment was conducted that covers the proposed development area with fieldwork completed in November 2021. The results of this assessment were incorporated into this HIA.
- The identified resources were assessed to evaluate their heritage significance and impacts to these resources were assessed.
- Alternatives and mitigation options were discussed with the Environmental Assessment Practitioner

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 was allocated to provide an accurate assessment of the heritage sensitivity of the area.



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2.4 Constraints & Limitations

The current extended drought has led to poor conditions in the veld but this has also provided very good visibility of archaeological material exposed on the surface. A series of dongas were inspected to test whether archaeological material may be buried by aeolian and flooding events and this was confirmed in some places where exposed lines of gravels containing MSA artefacts were found buried over 1m below the surface. However, the exposure of MSA and LSA material was clearly evident on the lower slopes of the dolerite koppies and this provided a fair characterisation of the buried artefacts.

The experience of the heritage practitioner, and observations made during the study, allow us to predict with some accuracy the archaeological sensitivity of the receiving environment.

The experience of the heritage practitioner, and observations made during the study, allow us to predict with some accuracy the archaeological sensitivity of the receiving environment.

2.5 Savannah Impact Assessment Methodology

Direct, indirect and cumulative impacts of the issues identified through the Scoping study, as well as all other issues identified in the EIA phase were assessed in terms of the following criteria:

- The nature, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The extent, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high).
- The duration, wherein it will be indicated whether:
 - The lifetime of the impact will be of a very short duration (0 – 1 years) – assigned a score of 1.
 - The lifetime of the impact will be of a short duration (2 – 5 years) – assigned a score of 2.
 - Medium-term (5 – 15 years) – assigned a score of 3.
 - Long term (> 15 years) – assigned a score of 4.
 - Permanent – assigned a score of 5.
- The consequences (magnitude), quantified on a scale from 0 – 10, where 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.



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- The probability of occurrence, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1 – 5, where 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- The significance, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high.
- The status, which will be described as either positive, negative or neutral.
- The degree to which the impact can be reversed.
- The degree to which the impact may cause irreplaceable loss of resources.
- The degree to which the impact can be mitigated.

The significance is calculated by combining the criteria in the following formula:

$$S = (E + D + M) \times P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The significance weightings for each potential impact are as follows:

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

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3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT

3.1 Desktop Assessment

Background:

The area proposed for the Great Karoo Renewable Energy Facility Projects including the proposed Nku, Moriri and Kwana PV Facilities is located approximately 20km southwest of Richmond in the Northern Cape, and 40km east of Victoria West outside of the identified Beaufort West REDZ (Figure 8) along the N1. The town of Richmond was established in 1843 to service the needs of the growing farming community. It was renowned as a resort town in the 1800s for European aristocrats suffering lung disease due to its clean air and mineral-rich waters.

The central plateau of the Great Karoo, north of the Great Escarpment, falls in the Nama Karoo Biome. This is characterised by low rainfall and high temperatures, low-shrub vegetation and low relief topography punctuated by rugged outcrops. This expansive, arid region has lime-rich soils underlain by sediments of the Dwyka (glacial) formation covered by the Ecca and Beaufort groups, and is rich in substantial fossil records dating back 3 billion years (Seymour 2021). The archaeological record spans hundreds of thousands of years, with sites such as stone tool scatters typically occurring near dolerite outcrops due to the presence of underground water (Winter & Oberholzer 2013).

Historic settlement and the Cultural Landscape (Winter et al. 2021, Appendix 3)

The name Karoo has its roots in the Khoe word meaning “place of great dryness”. While used on a seasonal and nomadic basis by hunter-gather people, the uncertain access to water and grazing, and the extreme temperatures, made it less well suited to needs of pastoralist people. However, vast herds of antelope, quagga, white rhinoceros, hartebeest and ostrich moved through the landscape according to the availability water and seasonal rains.

Settled occupation of the region and the subsequent changes to the landscape followed over 100 years after the arrival of settlers in 1652. Settlement of the Cape and the privatisation of land and water alienated the Khoe people from their seasonal lands, pushing them northwards. From the 1700s, the growing settlement, hungry for more resources, followed in their wake, creating a shifting frontier of contact (Anderson 1985). This push was sanctioned by the VOC and largely undertaken by trekboers engaged in hunting, salt collection and cattle trade with inland groups. The lifestyle was essentially that of a semi-nomadic pastoralist as they followed transhumance routes dictated by annual rainfall and seasonal pastures. The expanding frontier came to a prolonged pause below the Great Escarpment, which was a natural barrier between the plains of the Karoo and the arid Central Plateau.

Settled agriculture, water management through the creation of boreholes, and extensive sheep grazing

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profoundly changed the landscape. A study of the survey diagrams for parent farms in the site area shows formalisation of ownership from 1835, although it is highly likely that all land with access to water and grazing was already in use, and possibly occupied, prior to its first record of survey. (Note: Access to archived title deeds is not possible under the restrictions imposed by Covid-19; historic survey diagrams have been studied in their place). The survey diagrams also paint a clear picture of the priorities in land acquisition: springs, rivers and grazing is noted.

Wool farming remained the dominant activity and benefited from the wool boom of the 1930s, which continued into the 1950s, thereafter declining, with a shift to less labour-intensive meat production (Manyani 2020). The physical impact of segregation along racial lines introduced under the Group Areas Act 1950 was localised to Richmond town, altering its urban form. It had little impact on the nearby farming settlements. The N1, completed in the 1950s, connected Cape Town to Beit Bridge and by-passed many of the smaller towns, including Richmond, which protected the historic centre but impacted urban income generated from through-travellers.

From the 1970s a process of farm consolidation, which continues to this day, was begun. Modernised farming practice and commercial opportunities stimulated farm development, with the introduction of stud, and livestock adapted for better yields. From the 1980s diversification introduced a shift to game farming, re-wilding, and more recently the introduction of nature tourism, conferences and events. The current focus on renewable energies is set to transform the landscape on a scale reminiscent of that which resulted from the introduction of wool production.

Details regarding the establishment and development of Richmond town is included in Appendix 3 and is not repeated here.

Archaeology

Very few 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

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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.” It is likely that similar archaeological heritage exists within the areas proposed for development and as such, impact to these resources must be assessed.

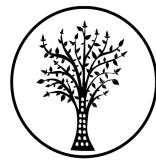
Palaeontology

According to the SAHRIS Palaeosensitivity Map (Figure 4a), the area proposed for development is underlain by sediments of very high paleontological sensitivity. According to the extract from the Council for GeoSciences Map 3122 for Victoria West, the development area is underlain by the Abrahamskraal and 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 WEF and grid connections will negatively impact on significant fossil heritage.

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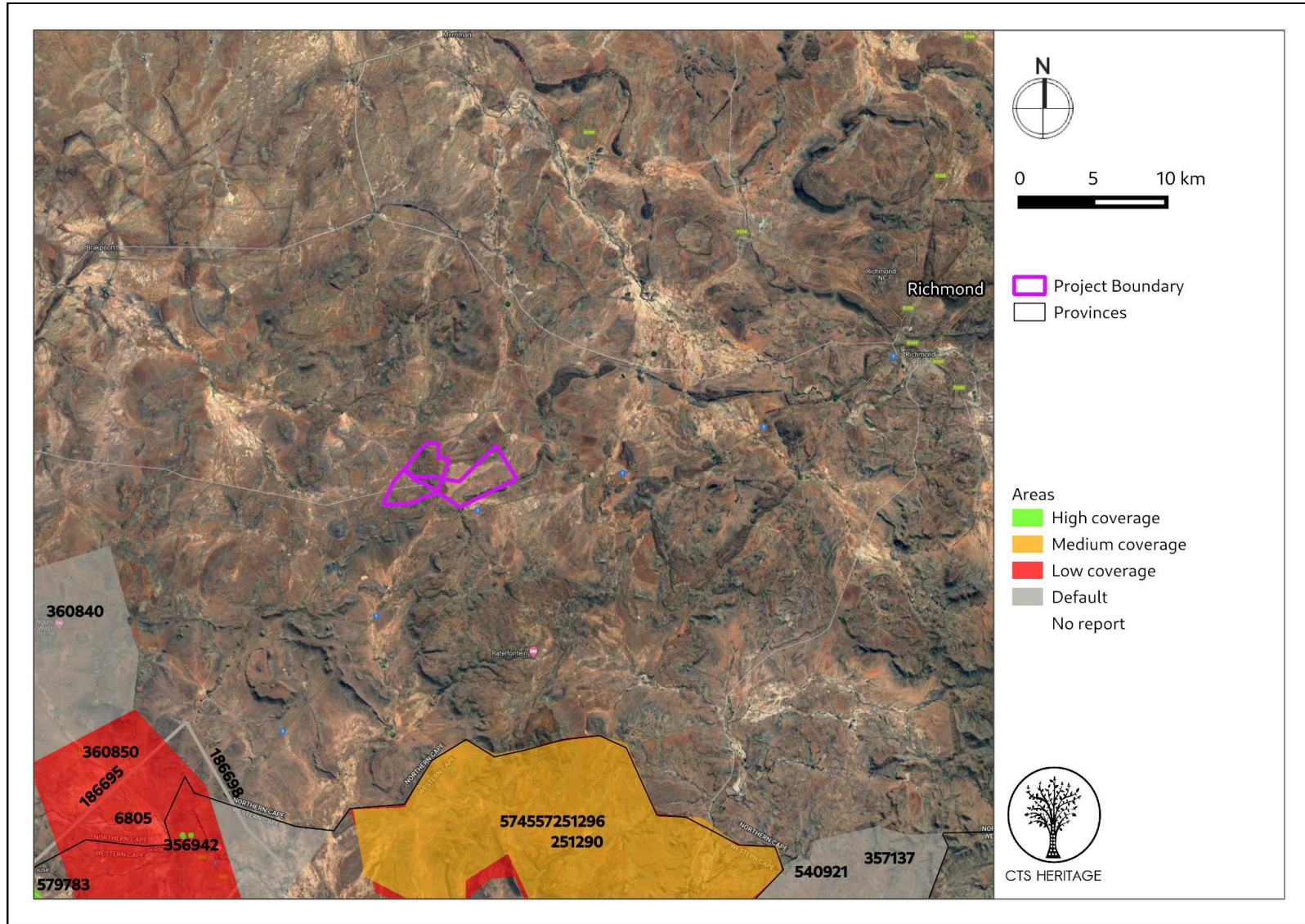
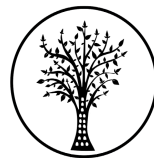


Figure 2: Spatialisation of heritage assessments conducted in proximity to the proposed development



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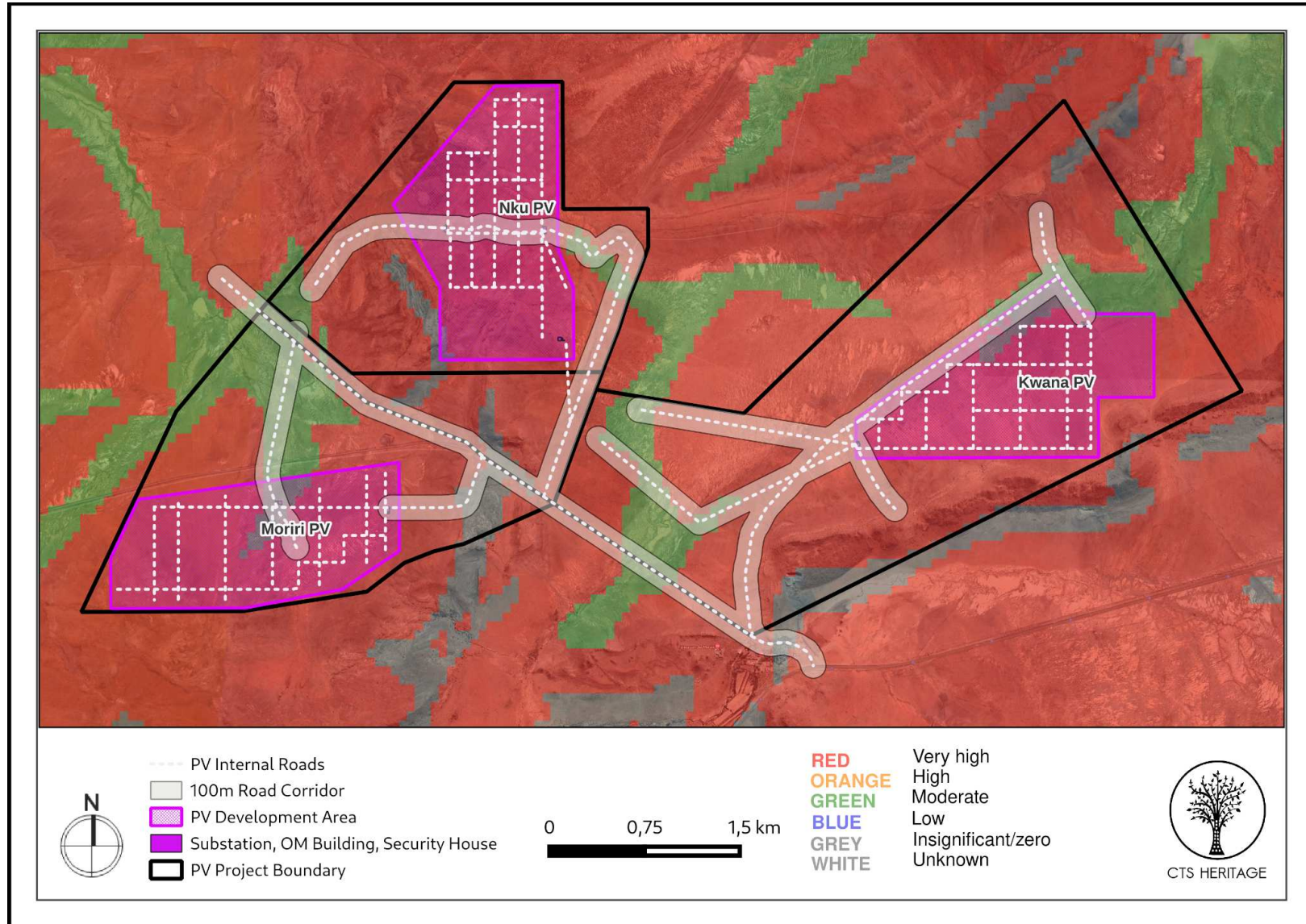
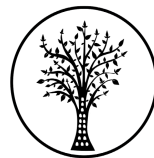


Figure 3.1: Palaeontological sensitivity of the proposed development area

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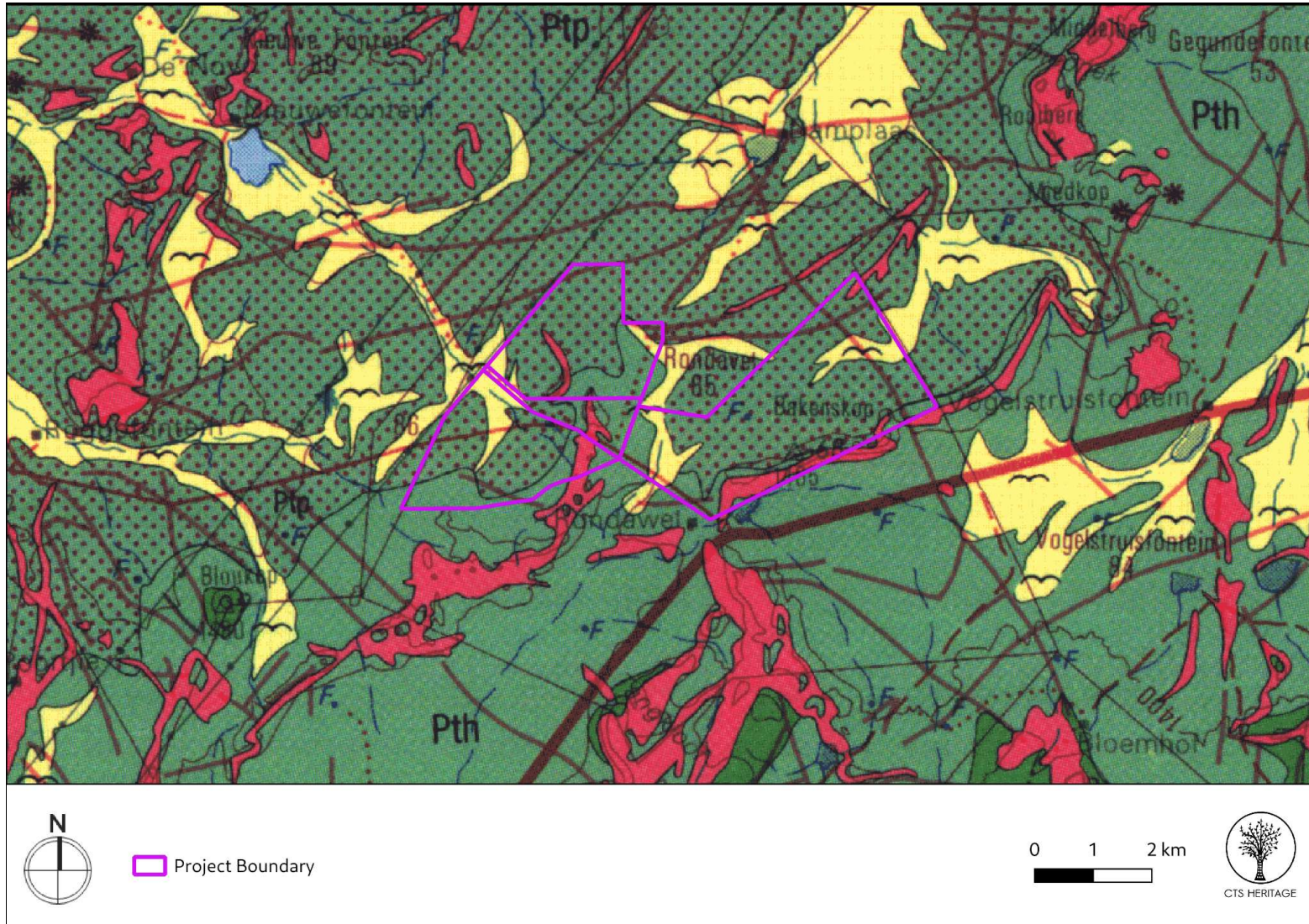


Figure 3.2: Geology Map. Extract from the CGS 3122 Victoria West Map indicating that the development area for the WEF development is underlain by sediments of Ptp: Poortjie Member and Pth: Hoedemaker Member of the Teekloof Formation of the Adelaide Subgroup and Jd: Jurassic Dolerite as well as Quaternary Sands



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4. IDENTIFICATION OF HERITAGE RESOURCES

4.1 Summary of findings of Specialist Reports

Cultural Landscape and the Built Environment (Winter et al. 2021, Appendix 3)

The concept of cultural landscape gives spatial and temporal expression to the processes and products of the interaction between people and the environment. It may thus be conceived as a particular configuration of topography, geology, vegetation, land use and settlement pattern and associations which establishes some coherence of natural and cultural processes.

The site forms part of an intact 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 a number of cultural landscape qualities and elements which are outlined below.

- The location of the site on the 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.
- The vast open qualities of the landscape, which are 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.
- 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 Rondavel (1835), Ratelfontein (1835), Vogelfontein (1835), Gegundefontein (1846), Bult and Rietfontein (1835) 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 constructed from the local shales, and 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”. Similarly, the route connecting Richmond to Victoria West as a historic linkage route to the north of the site.
- The stretch of the N1 corridor between Rondavel and Richmond which has distinctive experiential qualities: ranging from the ‘pinch point’ condition and kink in the alignment at Rondavel as the route passes through a hilly landscape and moves away from the national grid corridor; to the straight alignment of the

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route traversing an open flat landscape with expansive long views framed by mountains and koppies, and punctuated by farmstead settings; to the slight meandering and more enclosed nature of the route through undulating topography as it approaches Richmond.

- The high local and regional heritage significance of Richmond from a townscape and streetscape perspective, its role in the South African War, its distinctive topographical setting and cross route condition as part of a regional and national route network. While Richmond is located outside of the direct viewshed of the WEF portion of the proposed development, the experiential qualities of the N1 approaching the town will be potentially affected.

Archaeology (Appendix 1)

The vast majority of these sites hold MSA material but LSA observations were well represented in the study area. The various windmills and small farm dams were recorded but are of no further concern in terms of heritage impacts anticipated by the WEFs and solar PV facilities as the current farming activities will continue beyond the establishment of the energy infrastructure. The two primary farms at Rondavel and Vogelstruisfontein will also be unaffected and a large graveyard at Vogelstruisfontein held a number of marked graves within a central stone walled compound of the Conroy, Visser and Botha families spanning the late 18th to 20th centuries. A series of unmarked graves were also found nearby and the boundary of the graveyard consists of upright dolerite slabs and broken wire fencing that has all but disappeared. The central compound and the unmarked graves are deteriorating and signs of dilapidated walls and slabs were evident.

The Stone Age material was mainly produced on locally sourced hornfels cores. Flakes and cores in greywacke and siltstones were also found but these were far less prominent. A lower grindstone showing a clear grinding groove was found in a level sandy bay surrounded by dolerite ridges.

Despite the large number of dolerite outcrops, no engravings were found. We are not currently aware of a large number of Stone Age engravings in this area and the lack of sites found might possibly be due to the routes chosen for the access roads and turbine positions. It was noted in the field assessment that the archaeology located around the dolerite ridges is very dense and exposed and as such, we would recommend caution should changes be made to PV layouts or access roads.

Palaeontology (Appendix 2)

Fossil specimens recorded from the Teekloof Formation bedrocks during the site visit to the PV project area mainly comprise a handful of scrappy therapsid cranial and post-cranial material. The only specimens of potential scientific or conservation interest are several skeletal elements of a small-bodied pareiasaur reptile - possibly a juvenile or dwarf taxon. Almost all the other specimens are fragmentary and very poorly preserved

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due to thermal metamorphism and metasomatism (*i.e.* alteration through secondary mineralisation and dissolution by hot circulating groundwaters) during dolerite intrusion.

Thick deposits of Late Caenozoic, semi-consolidated alluvium might contain important assemblages of Plio-Pleistocene mammalian fossils (*e.g.* horn cores, bones and teeth) as well as reworked petrified wood and trace fossils (*e.g.* calcretised termitaria). However, the only fossils recorded here comprise assemblages of subvertical, calcretised rhizoliths (plant root casts) in riverbank settings. Voluminous, doleritic and quartzitic colluvial rock rubble mantling the steeper mountain slopes as well as younger alluvial sands and gravels mantling extensive *vlaktes* within the project area are unlikely to be fossiliferous.

4.2 Heritage Resources identified

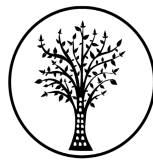
The landscape of the development area has been assessed for cultural heritage significance, and found to have five distinct character areas:

1. Historic movement corridors.
2. Open plains interrupted by low koppies.
3. Elevated areas with steep sided mountain ridges.
4. Areas of landscape that have been transformed by significant infrastructural development.
5. Remote landscape with wilderness qualities.

Of the five distinct character areas identified in the Cultural Landscape Assessment (Winter, 2021), the proposed PV developments fall within area 4.

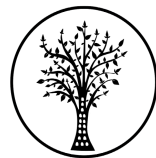
Table 1: Cultural Landscape Character Areas

Significance	Character	Carrying Capacity
<p>1. Historic Route corridors: N1 following alignment of a major historical linkage route with the interior, and along which a pattern of settle-ment has occurred</p>	<p>N1 corridor: National transport route across an open plain. Linkage between Richmond and Three Sisters. Long views framed by mountains and koppies. The section between Rondawel and Richmond traversing an intact and representative landscape of the Central Plateau of the Karoo region. Poort-like quality of the section of the N1, with koppies either side, as it passes Rondawel Minimal visual intrusions.</p>	<p>N1 corridor: Infrastructure to be set back from the N1 corridor. Infrastructure to be one-sided. Retain openness of views pre-dominantly to the south. Retain the visual quality of the N1 in terms of uninterrupted views towards ridgelines, and the absence of visual intrusion (except for telecommunication towers).</p>



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<p>Richmond - Victoria West corridor follows alignment of a strong, historical linkage route between two towns established in the 1840s, and along which a pattern of settlement has occurred.</p>	<p>Richmond-Victoria West corridor: Low traffic volume country road. Regular pattern of settlement; farmsteads located beside the road. Wide lateral views across open plains.</p>	<p>Richmond-Victoria West corridor: Infrastructure to be set back from the corridor. Infrastructure to be one sided, may transfer from side to side. Retain the uninterrupted lateral visual quality across plains</p>
<p>2. Open plains Distinctive landscape setting and edges</p>	<p>Extensive, framed, layered views interrupted by koppies. Distinctive landscape setting and edge conditions for farmstead settlements contributes to the overall 'sense of fit' within the landscape.</p>	<p>Well suited to PV infrastructure. Landscape can tolerate clustered infrastructure provided buffer areas are observed. No orthogonal rows of turbine development.</p>
<p>3. Elevated ridgelines and peaks Steep sided slopes and ridgelines of high visual significance Significant contribution to landscape quality of this sector of the Central Karoo Plateau.</p>	<p>Ridgelines and steep slopes highlight visible to long views. Steep sided slopes to ridgeline height +/-1450m ASL; ridgetop peaks +/-1550m ASL. Elevated zones of surveillance. Important ridgetop watershed. Contribute strong landscape structuring element. Homesteads back onto foothills of steep ridges; forward facing to open plains.</p>	<p>Ridgelines and peaks are highly sensitive to development. No development on visually sensitive ridgelines. No development on visually sensitive mountain slopes. Infrastructure to be clustered, and positioned in dips and on contours below the ridgeline.</p>
<p>4. Transformed landscape Electricity grid parallel to and set back from (4Km) the N1 corridor south of site.</p>	<p>Introduction of industrial activities and intrusion of large scale infrastructure in agricultural areas. Visual cluttering of the landscape by non-agricultural development.</p>	<p>Infrastructure can be concentrated in this area.</p>
<p>5. Remote Karoo landscape Landscape altered by farming practice but minimal-nil infrastructural development.</p>	<p>Sense of isolation: minimal visual interruption of long landscape views</p>	<p>Limited carrying capacity. Maintain scenic qualities of wilderness-type landscape. Avoid development on elevated exposed slopes because of their high visibility from surroundings.</p>



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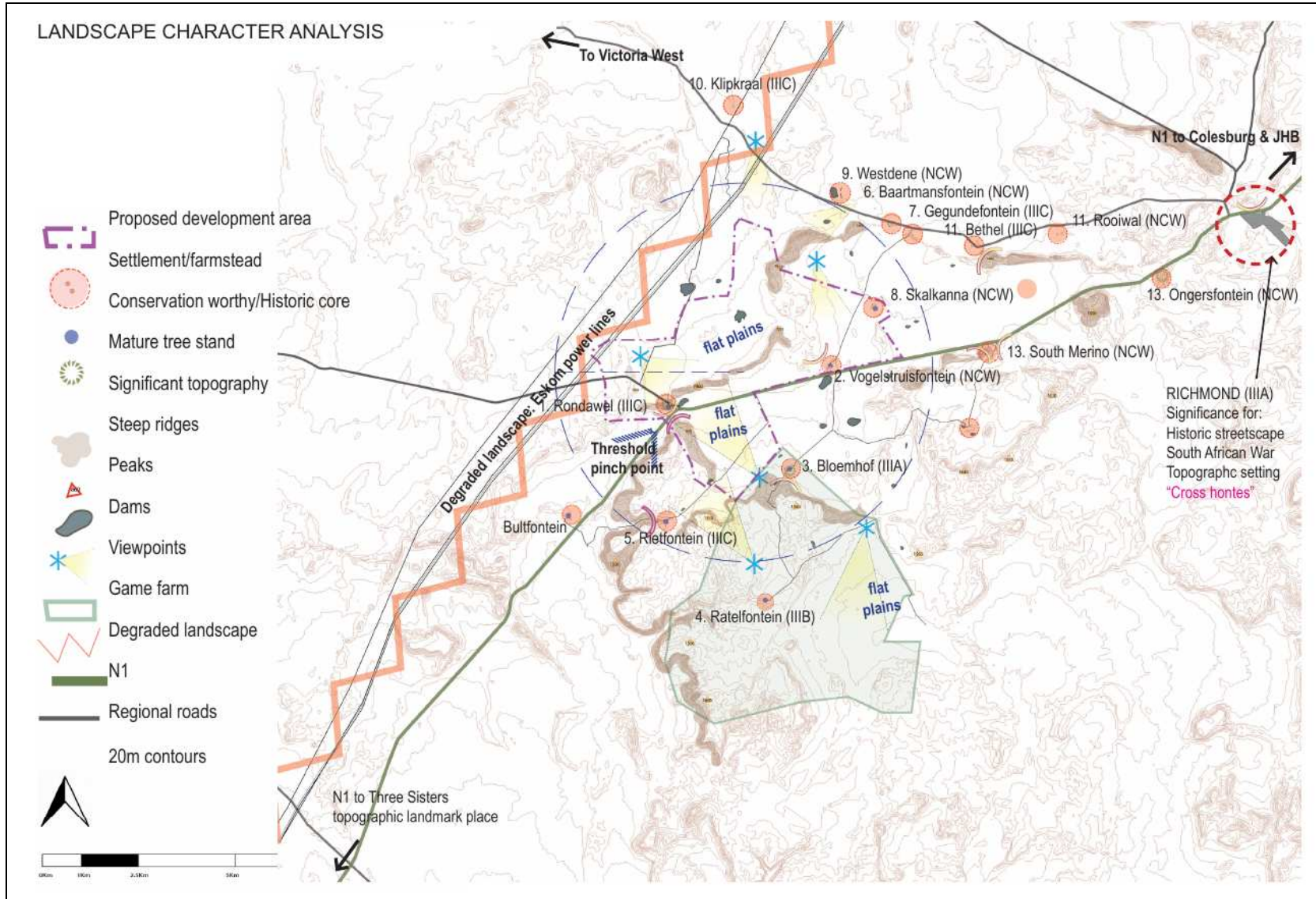


Figure 4.1 Cultural Landscape Elements Map from Winter et al. 2021 (Appendix 3)

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In terms of the heritage resources identified in the archaeological field assessment, see Table 2 below.

Table 2: Artefacts identified during the field assessment development area

POINT ID	Project Area	Period	Description	Co-ordinates		Grading	Mitigation
GK037	NA	Historic	Stone walled ruins x 2	-31.506165	23.611848	IIIB	No-go development buffer of 500m
GK038	NA	Historic	Rondawel farmhouse complex	-31.507875	23.614365	IIIA	No-go development buffer of 1km
GK048	NA	LSA, MSA	Lower, ground, grindstone, greywacke flakes, cores	-31.49589	23.64534	IIIB	No-go development buffer of 50m



Figure 5.1 Observation GK037



Figure 5.2 Observation GK048



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Figure 5.3 Observation GK048



Figure 5.4 Observation GK038

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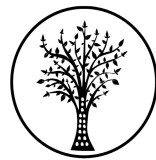


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In terms of the heritage resources identified in the palaeontological field assessment, see Table 3 below.

Table 3: Palaeontological observations made during the field assessment for the development area

POINT ID	Project Area	Description	Co-ordinates		Grading	Mitigation
884	Merino	Rondavel 85. Hoedemaker Member. Thin crevasse splay sandstone exposed in shallow borrow pit with sandstone-infilled mudcracks, microbial mat textures, small-scale invertebrate trace fossils (narrow horizontal burrows of undermat miners), possible vertical burrows or plant stem casts. Proposed Field Rating IIIC Local Resource. No mitigation recommended.	-31.49779201	23.59721803	IIIC	NA



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4.3 Mapping and spatialisation of heritage resources

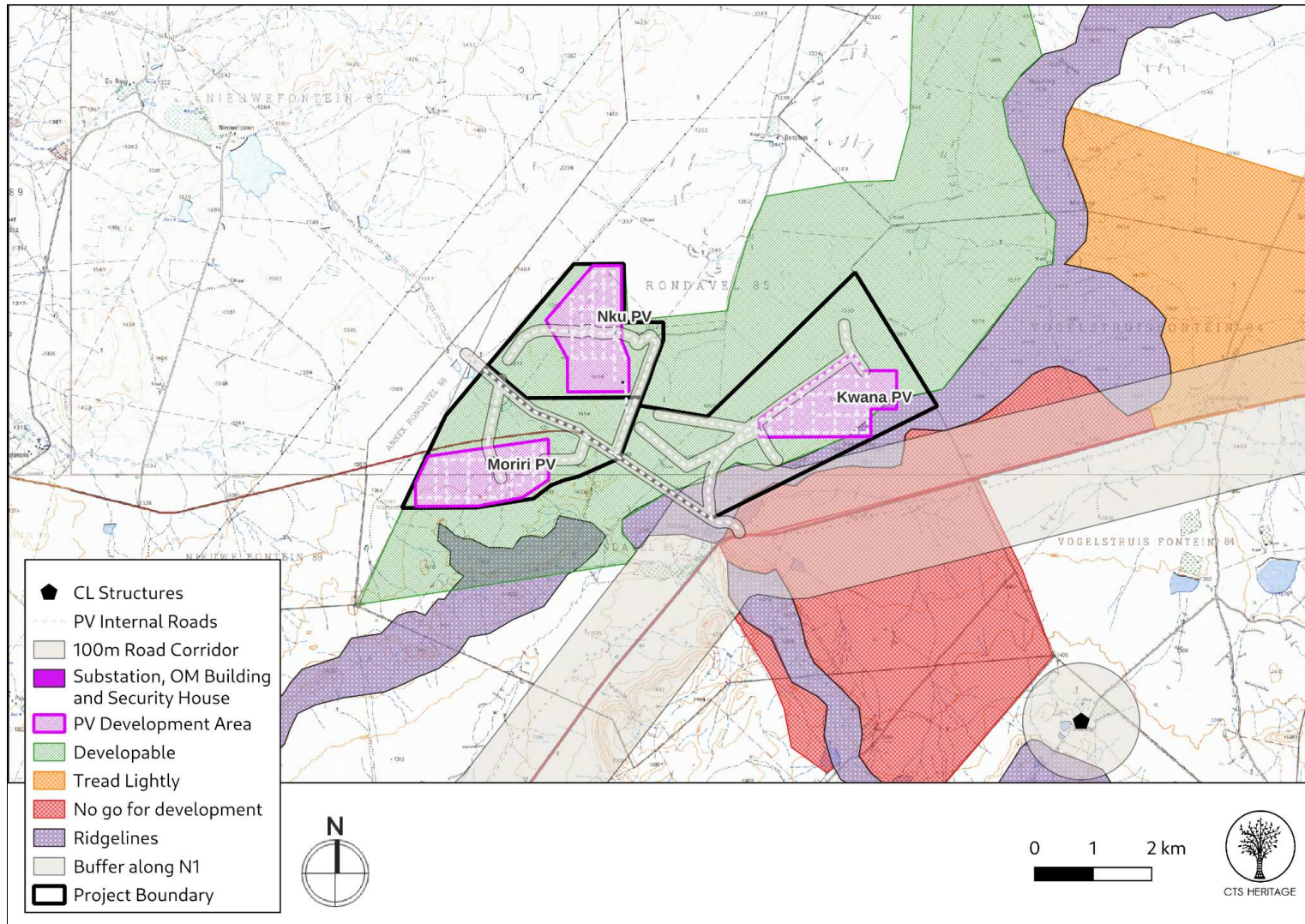
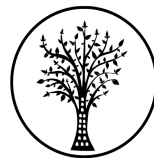


Figure 6.1: Map of ridgelines and sensitive areas within the proposed development area



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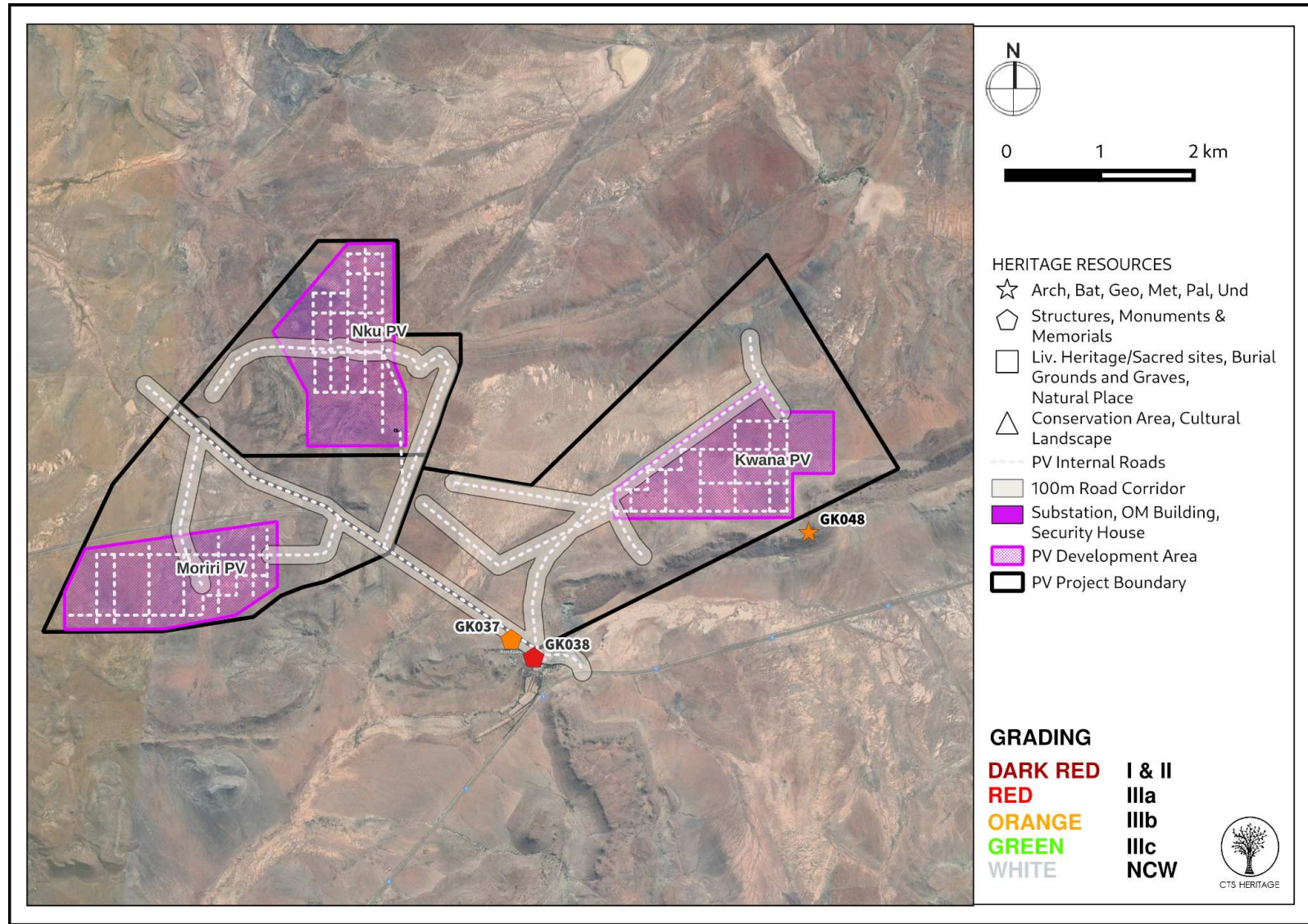
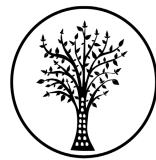


Figure 6.2: Map of archaeological heritage resources within the proposed development area



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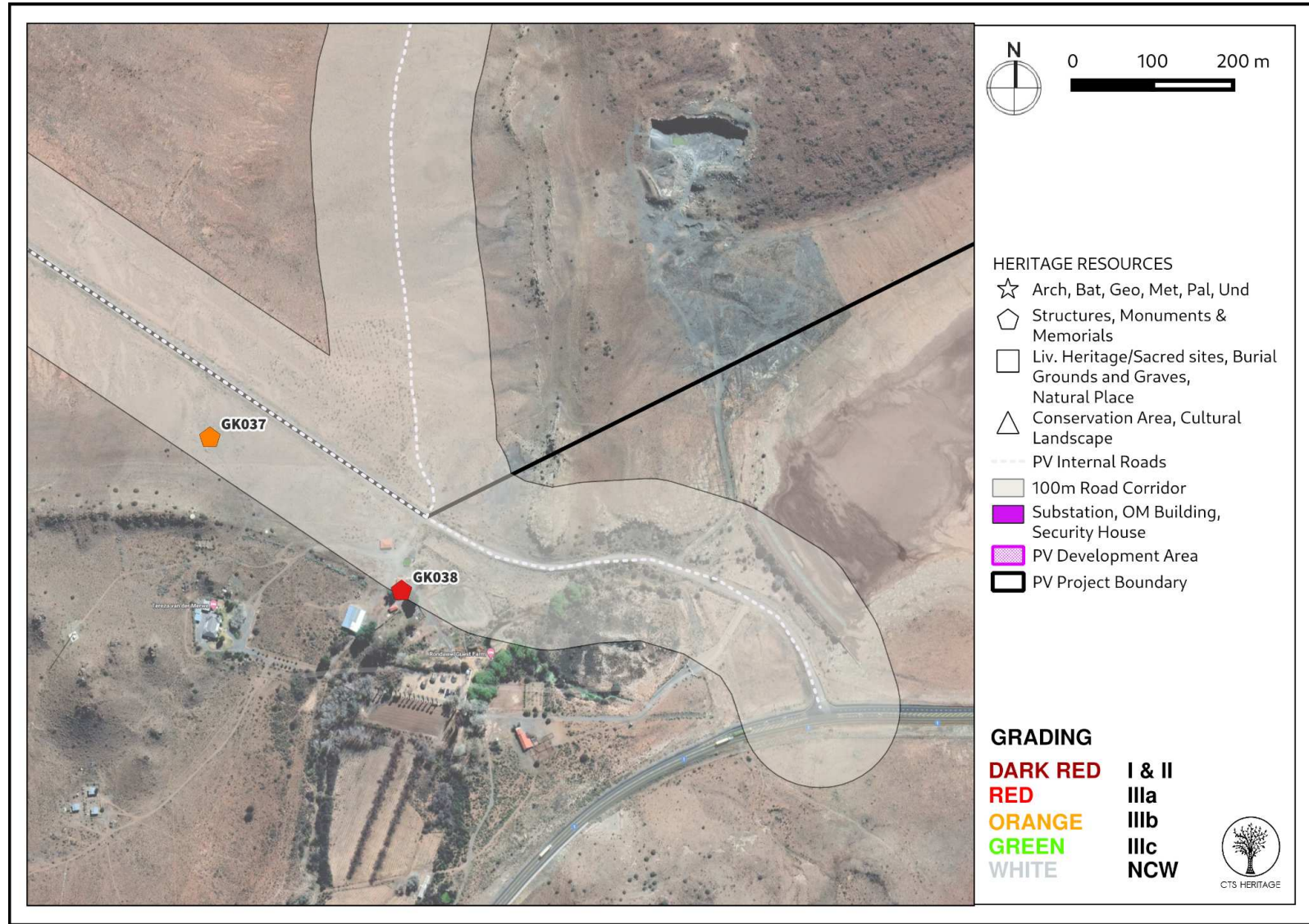
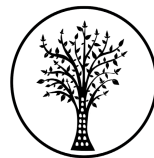


Figure 6.3: Map of heritage resources within the proposed development area

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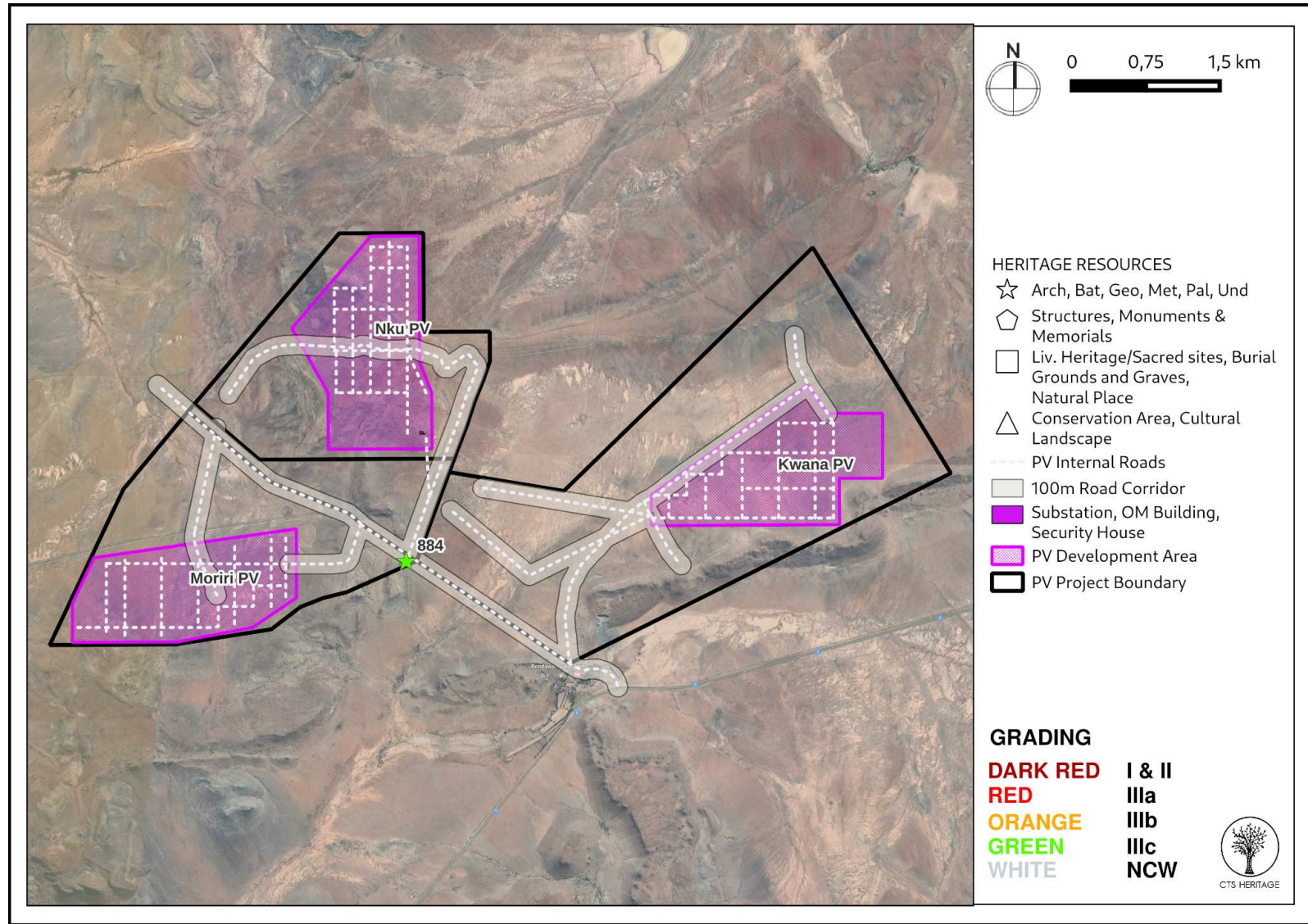
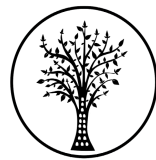


Figure 6.4: Map of palaeontological heritage resources within the proposed development area



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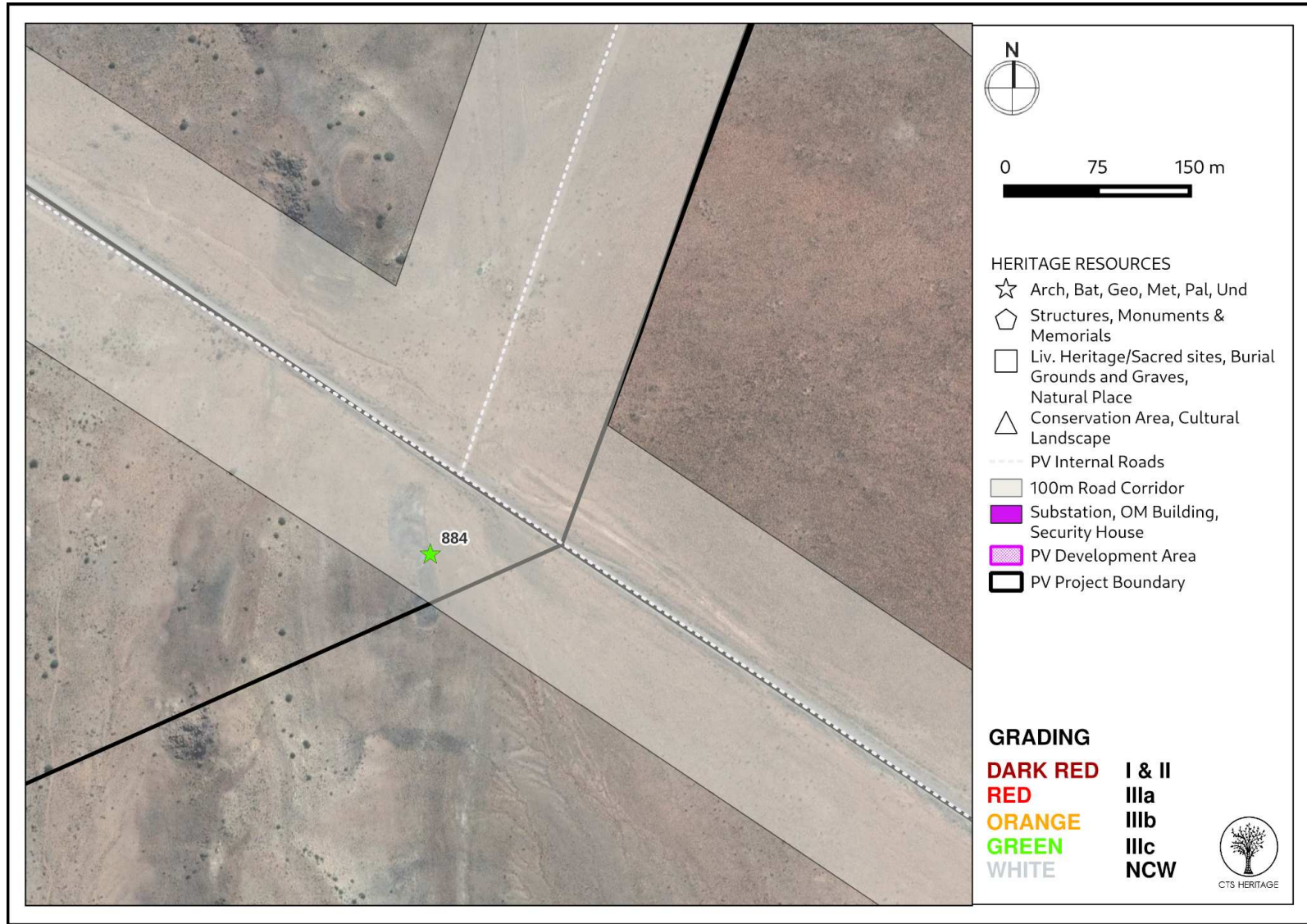


Figure 6.5: Map of palaeontological heritage resources within the proposed development area

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5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

5.1 Assessment of impact to Heritage Resources

5.1.1 Cultural Landscape

Solar PV placement (“where” and “how”):

The following general principles apply to the PV layout:

- Avoid steep slopes.
- Avoid proximity to historic corridors.
- Avoid placement within viewshed of farmsteads.

The indicators are aligned with the visual sensitivity analysis.

A 6Km visual radius incorporates the area of potential visual influence. The infrastructure of the three proposed solar installations has relatively constrained dimensions and includes PV panels, inverters and BESS. Examined individually, impact to each site is assessed as follows:

- Nku: PV development represents a fairly limited visual exposure contained to a 6Km radius and concentrated to the north east. The area of greatest visual impact (1-3Km radius) falls mostly on farmland but does include the Rondavel homestead and portion the N1 at its outer limit.
- Kwana: The low rise nature of the PV facility, and the ridgeline along the south of the portion of the development area contains the visual impact to the north of the site, with it being largely shielded from the N1, although visible in the 3Km radius of Rondavel settlement.
- Moriri: This is located to the north west limit of the development zone with visual exposure greatest to the north and east into an area traversed by existing Gamma power lines.

PV Facilities

The anticipated result of the PV installation is a potential impact to the visual character and sense of place of the Rondavel farmstead settlement, the road which meets the N1 at Rondavel, and potentially a portion of the N1. This is assessed as a long term negative impact of moderate to high significance, and a Visual Impact Assessment is recommended to determine more precisely the impact, absorption capabilities and recommended mitigation options.

The proposed solar PV facility, with a minor amendment to the proposed positioning to avoid high visibility sloped inclines, can be accommodated within an acceptable level of impact. Furthermore, the areas described by the character areas study as “tread lightly” zones have the capacity to accommodate some PV installation.



Table 4: Impact table for Cultural Landscape Heritage Resources for the proposed Nku, Moriri and Kwana PV Facilities

NATURE: The broader context of the area proposed for development has cultural significance that may be impacted by the proposed development			
		Before Mitigation	After Mitigation
MAGNITUDE	L (4)	While the cultural value of the pristine Karoo Landscape is very high, the location of the proposed PV infrastructure means that only a slight impact to the cultural landscape will result from the proposed development.	L (4) While the cultural value of the pristine Karoo Landscape is very high, the location of the proposed PV infrastructure means that only a slight impact to the cultural landscape will result from the proposed development.
DURATION	H (4)	Where manifest, the impact will be long term - for the duration of the PV infrastructure lifetime	H (4) Where manifest, the impact will be long term - for the duration of the PV infrastructure lifetime
EXTENT	H (5)	Regional	H (5) Regional
PROBABILITY	L (2)	It is unlikely that any significant cultural landscape resources will be impacted	L (2) It is unlikely that any significant cultural landscape resources will be impacted
SIGNIFICANCE	L	$(5+4+4) \times 2 = 26$	L $(5+4+4) \times 2 = 26$
STATUS		Neutral	Neutral
REVERSIBILITY	L	Any impacts to heritage resources that do occur are reversible once the grid connection infrastructure is removed	L Any impacts to heritage resources that do occur are reversible once the grid connection infrastructure is removed
IRREPLACEABLE LOSS OF RESOURCES?	L	Unlikely	L Unlikely
CAN IMPACTS BE MITIGATED		NA	
MITIGATION: Avoid the development of PV infrastructure on high visibility sloped inclines.			
RESIDUAL RISK: NA			



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5.1.2 Archaeology

The proposed development will not have a substantial negative impact on the heritage resources identified within the proposed development area for the renewable energy facilities and the grid connection. The majority of the lithic material identified is of low significance (not conservation-worthy), and even though the resources may be destroyed during construction, the impact is inconsequential. No mitigation is required for archaeological material recorded in the footprint areas of the proposed development.

Despite the high number of observations of artefacts, these resources are common and representative of similar scatters across widespread areas of the Karoo. Despite the very high numbers of observations made, the archaeological material is ubiquitous across the entire area and in general, the results of this assessment indicate that the archaeological sensitivity of the development area is low.

PV Facilities

A total of 38 archaeological observations were identified within the PV Facilities development area. None of the identified archaeological resources were determined to be conservation-worthy and no impact to any significant archaeological heritage is anticipated at this stage.

Observation GK048 which is described as both MSA and LSA material including lower, ground, grindstone, greywacke flakes and cores and is graded IIIB. This site is located approximately 180m outside of the PV Facilities development area, and as such no impact is anticipated at this stage. To ensure that no impact occurs, it is recommended that a no-go development buffer of 50m is imposed around this site. The PV layouts as proposed comply with this recommended buffer area.

Eight structures were identified within the PV Facilities development area, all of which are modern windmills and dams, and one quarry. None of these were determined to be conservation-worthy.

Site GK038 records a rondavel farmhouse complex that has historic significance and has been graded IIIA. Site GK037 records stone wall ruins and has been graded IIIB. Both of these sites are located outside of the PV Facilities development area and as such, no direct impact is anticipated at this stage. However, these sites do fall within the 100m internal road buffer. From the layouts provided, it seems that the internal roads are aligned with existing roads and as such, no impact is anticipated. It is recommended that a 1km no-go development buffer be maintained around Site GK038 and a 500m no-go development buffer be maintained around Site GK037 to ensure that no impact occurs. This no-go development buffer refers to new infrastructure and not the existing roads to be used by the PV facilities.



Table 5: Impact table for Archaeological Heritage Resources

NATURE: The area proposed for development is known to conserve heritage resources of archaeological significance that may be impacted by the proposed development			
		Before Mitigation	After Mitigation
MAGNITUDE	L (2)	No significant archaeological resources were identified within the development area	L (2) No significant archaeological resources were identified within the development area
DURATION	H (5)	Where manifest, the impact will be permanent.	H (5) Where manifest, the impact will be permanent.
EXTENT	L (1)	Localised within the site boundary	L (1) Localised within the site boundary
PROBABILITY	L (1)	It is extremely unlikely that any significant archaeological resources will be impacted	L (1) It is extremely unlikely that any significant archaeological resources will be impacted
SIGNIFICANCE	L	(2+5+1)x1=8	L (2+5+1)x1=8
STATUS		Neutral	Neutral
REVERSIBILITY	L	Any impacts to heritage resources that do occur are irreversible	L Any impacts to heritage resources that do occur are irreversible
IRREPLACEABLE LOSS OF RESOURCES?	L	Unlikely	L Unlikely
CAN IMPACTS BE MITIGATED		NA	
MITIGATION:			
A 50m no development buffer area must be implemented around site GK048			
A 1km no-go development buffer be maintained around Site GK038 and a 500m no-go development buffer be maintained around Site GK037 to ensure that no impact occurs. This no-go development buffer refers to new infrastructure and not the existing roads to be used by the PV facilities.			
Should any significant archaeological resources be uncovered during the course of the construction phase, work must cease in the area of the find and SAHRA must be contacted regarding an appropriate way forward.			
RESIDUAL RISK:			
Should any significant archaeological resources be impacted (however unlikely) residual impacts may occur, including a negative impact due to the loss of potentially scientific cultural resources			



5.1.3 Palaeontology

No palaeontological Very High Sensitivity / No-Go areas have been identified within the project areas. With the exception of three fossil sites of low scientific value, none of the recorded fossil sites overlaps directly with, or lies close to (< 20 m), proposed infrastructure and no modification of the layouts through micro-siting is proposed here on palaeontological grounds.

The anticipated impact significance of the proposed development in terms of palaeontological heritage resources is likely to be VERY LOW due to (1) the very sparse distribution of fossil remains as well as (2) their almost universally poor preservation. Given the very uniform geological, and hence palaeontological, setting throughout the combined project areas.

PV Facilities

One fossil site (884) is located in close proximity to a proposed road; however this site has low palaeontological significance and has been sufficiently recorded. No further mitigation is recommended for this site.

The potential for rare, unrecorded fossil sites of high scientific and/or conservation value cannot be completely excluded, however. These are best handled through a Chance Fossil Finds Protocol as per the recommendations below.

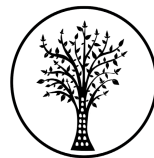
Table 6: Impact table for Palaeontological Heritage Resources

NATURE: The area proposed for development is known to conserve heritage resources of palaeontological significance that may be impacted by the proposed development				
		Before Mitigation		After Mitigation
MAGNITUDE	H (8)	No highly significant palaeontological resources were identified within the development area, however the geology underlying the development area is very sensitive for impacts to significant fossils	H (8)	No highly significant palaeontological resources were identified within the development area, however the geology underlying the development area is very sensitive for impacts to significant fossils
DURATION	H (5)	Where manifest, the impact will be permanent.	H (5)	Where manifest, the impact will be permanent.
EXTENT	L (1)	Localised within the site boundary	L (1)	Localised within the site boundary
PROBABILITY	H (5)	It is extremely likely that significant palaeontological resources will be negatively impacted	L (1)	It is extremely unlikely that any significant paleontological resources will be negatively impacted
SIGNIFICANCE	H	$(1+5+8) \times 5 = 70$	L	$(1+5+8) \times 1 = 14$
STATUS		Neutral		Neutral
REVERSIBILITY	L	Any impacts to heritage resources that do occur are irreversible	L	Any impacts to heritage resources that do occur are irreversible
IRREPLACEABLE LOSS OF RESOURCES?	H	Likely	L	Unlikely
CAN IMPACTS BE		Yes		



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MITIGATED		
MITIGATION: The attached Chance Fossil Finds Procedure must be implemented for the duration of construction activities		
RESIDUAL RISK: Should any significant palaeontological resources be impacted (however unlikely) residual impacts may occur, including a negative impact due to the loss of potentially scientific cultural resources		



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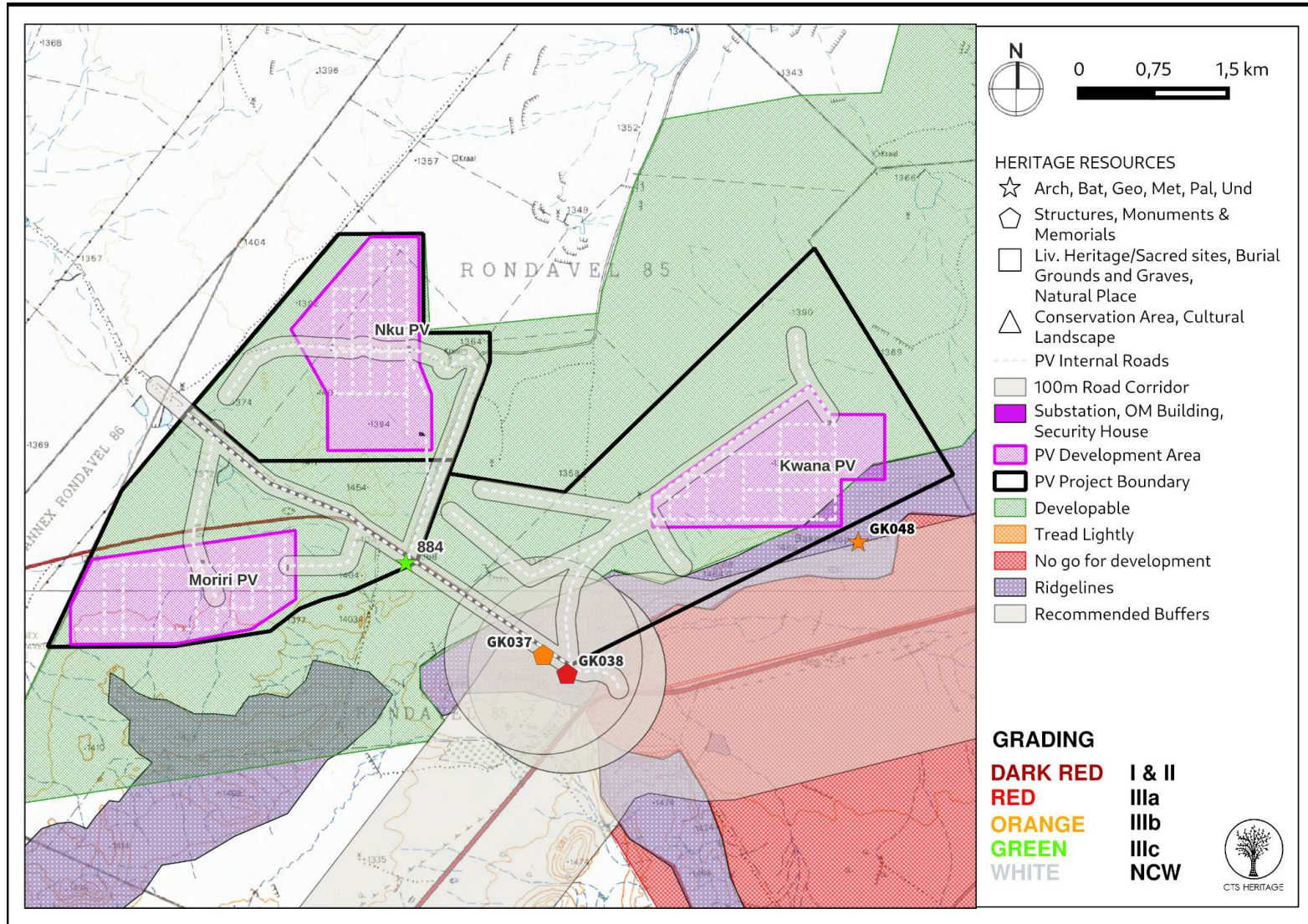


Figure 7: Map of palaeontological heritage resources within the proposed development area

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5.2 Sustainable Social and Economic Benefit

The development of the Great Karoo Projects has the potential to create employment opportunities, promote skills development, create opportunities to promote private sector investment and the development of SMMEs in the Northern Cape Province. The vision for the Pixley Ka Seme District Municipality Integrated Development Plan (IDP) (2019-2020) is “Developed and Sustainable District for Future Generations”. Of specific relevance, the IDP highlights the potential for renewable energy to help address some of these challenges.

The development of the Great Karoo Projects will promote economic development in the Pixley Ka Seme municipal area, thereby assisting in addressing some of the challenges faced by the district municipality as detailed in the IDP. The generation of electricity from renewable energy resources offers a range of potential socio-economic and environmental benefits for South Africa. These benefits include Socio-economic upliftment of local communities.

The Great Karoo Projects has the potential to create much needed employment for unskilled locals during the construction phase. Training opportunities will also be afforded to qualified local people who can be upskilled to undertake certain roles during the construction and operation phases. Some of the challenges facing the Local and District municipalities, as detailed in the IDPs include High rates of unemployment, high levels of poverty, and low levels of development despite the strategic location in terms of the national transport corridors. The Local and District municipalities are therefore in need of economic development, sustainable employment opportunities and growth in personal income levels. A study undertaken by the DMRE, National Treasury and the Development Bank of Southern Africa (DBSA) in June 2017 found that employment opportunities created during the construction phase of renewable energy projects implemented to date had created 40% more jobs for South African citizens than anticipated. The study also found that significantly more people from local communities were employed during construction than was initially planned, confirming the potential benefits for local communities associated with the implementation of renewable energy projects.

The PV Facility also has the potential to make a positive contribution towards the identified community needs. In terms of the economic development requirements of the REIPPPP, the project will commit benefits to the local community in the form of job creation, localisation, and community ownership. In accordance with the DMRE’s bidding requirements of the REIPPPP, a percentage of the revenue generated per annum during operation will be made available to local communities through a social beneficiation scheme. Therefore, the potential for creation of employment and business opportunities, and the opportunity for skills development for local communities is significant. Secondary social benefits can be expected in terms of additional spend in nearby towns due to the increased demand for goods and services. These socio-economic benefits would include an increase in the standard of living for local residents within the area as well as overall financial and economic upliftment.

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5.3 Proposed development alternatives

No alternatives are proposed for the PV facilities, and as indicated above, no impacts to significant heritage resources are anticipated and as such, no heritage alternatives are recommended.

5.4 Cumulative Impacts

At this stage, there is the potential for the cumulative impact of proposed renewable energy facilities to negatively impact the cultural landscape due to a change in the landscape character from natural wilderness to semi-industrial. Although this project falls outside of a REDZ area, it is noted that it is preferable to have renewable energy facility development clustered in an area such as a REDZ.

To address concerns about the cumulative impact of RE facilities within the greater Karoo region, a cautious approach is required in terms of assessing the desirability of such development from a cultural landscape perspective. The proposed site is located adjacent to an existing infrastructural corridor associated with the national grid, which suggests a level of suitability of RE facilities which can link in with the grid. Notwithstanding the existing infrastructure, the placement of RE facilities, both PV and WE turbines, must take cognisance of the very high visual impact on a relatively intact and representative cultural landscape, and the extremely limited ability to visually screen this infrastructural development, particularly in the case of the wind turbines and less so for PVs..

Table 8: Cumulative Impact Table

NATURE: Cumulative Impact to the sense of place				
		Overall impact of the proposed project considered in isolation		Cumulative impact of the project and other projects in the area
MAGNITUDE	L (4)	Low	L (4)	Low
DURATION	M (3)	Medium-term	H (4)	Long-term
EXTENT	L (1)	Low	L (1)	Low
PROBABILITY	L (2)	Improbable	H (3)	Probable
SIGNIFICANCE	L	$(4+3+1) \times 2 = 16$	L	$(4+4+1) \times 3 = 27$
STATUS		Neutral		Neutral
REVERSIBILITY	H	High	L	Low
IRREPLACEABLE LOSS OF RESOURCES?	L	Unlikely	L	Unlikely
CAN IMPACTS BE MITIGATED		NA		NA
CONFIDENCE IN FINDINGS: High				
MITIGATION: No impacts are anticipated and as such, no mitigation is required				



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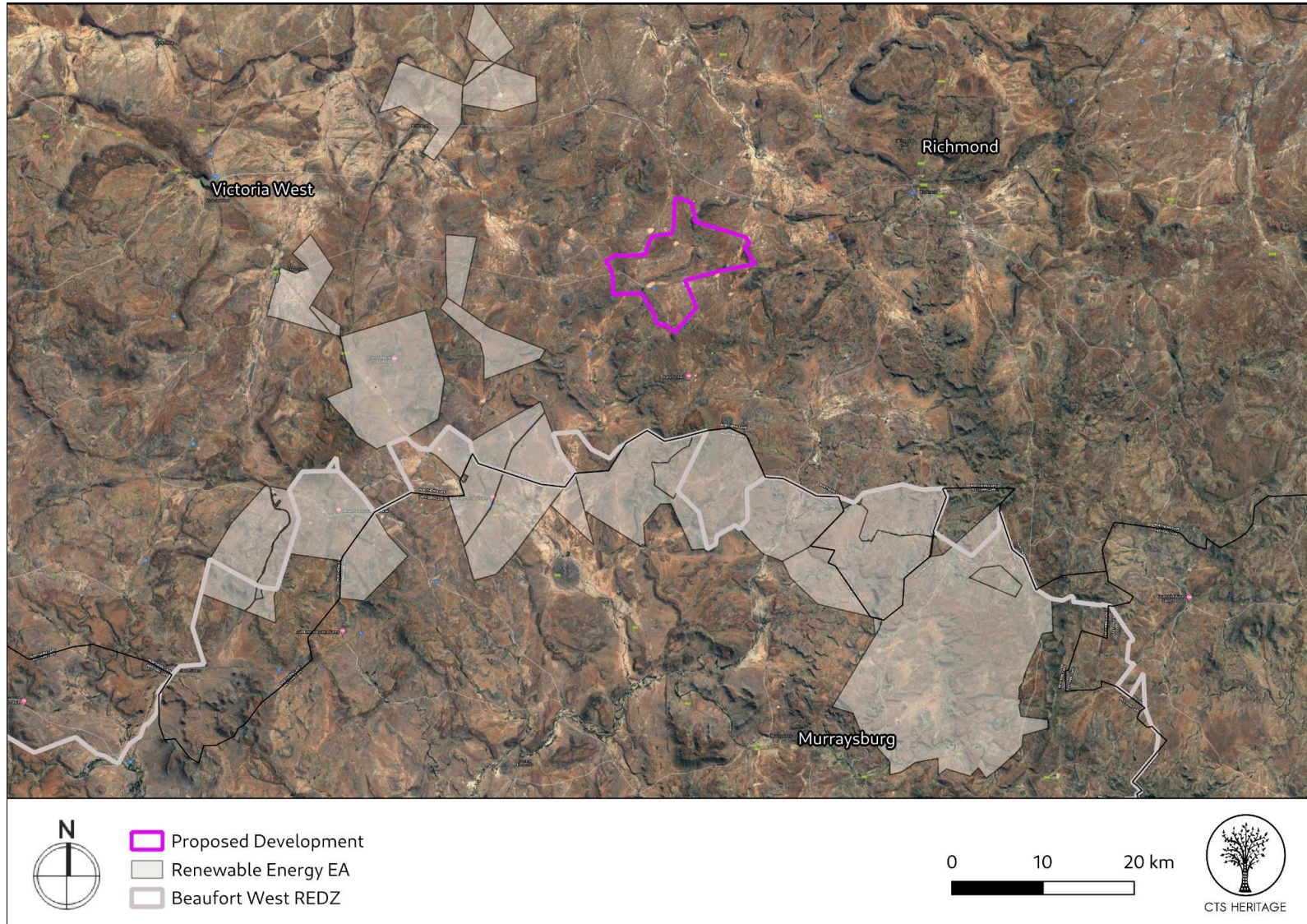


Figure 8: Approved REF projects within 50km of the proposed development area

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6. RESULTS OF PUBLIC CONSULTATION

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 Environmental Impact Assessment process and will be managed by the lead environmental consultants on the project.

7. CONCLUSION

The site forms part of an intact 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 a number of landscape elements contributing to a composite cultural landscape including topographical features, open plains, water features, historic scenic routes and farmsteads. The landscape affected by the proposed development has a number of character areas within varying significances and sensitivities to accommodate Renewable Energy infrastructure culminating in the identification of no-go areas, tread-lightly areas and areas more resilient to development, as well as a number of design indicators for placement of Renewable Energy infrastructure.

There are limited impacts anticipated to archaeological and palaeontological heritage from this proposed development and as such, the principle of a renewable energy facility in this location is supported from a heritage perspective provided that the infrastructure is located in areas able to tolerate the impact of the high degree of change from a cultural landscape perspective.

8. RECOMMENDATIONS

Based on the outcomes of this report, it is not anticipated that the proposed development of the solar PV facility and its associated grid connection infrastructure will negatively impact on significant heritage resources. The following recommendations are made:

- The recommendations of the VIA must be implemented.
- A 50m no development buffer area must be implemented around site GK048
- A 1km no-go development buffer be maintained around Site GK038 and a 500m no-go development buffer be maintained around Site GK037 to ensure that no impact occurs. This no-go development buffer refers to new infrastructure and not the existing roads to be used by the PV facilities.
- The HWC Chance Fossil Finds Procedure must be implemented for the duration of construction activities
- 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

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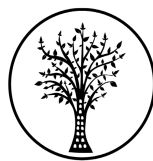
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development, work must cease in the vicinity of the find and HWC must be alerted immediately to determine an appropriate way forward.



9. REFERENCES

Heritage Impact Assessments				
Nid	Report Type	Author/s	Date	Title
120317	HIA Phase 1	Celeste Booth, Sholeen Shanker	01/12/2012	An archaeological ground-truthing walk-through for the proposed substation and associated overhead power line for the Nobelsfontein Wind Energy Facility situated on a site south of Victoria West on the Farm Nobelsfontein 227, Northern Cape Province
120325	HIA Phase 1	Celeste Booth, Sholeen Shanker	01/12/2012	An archaeological ground-truthing walk-through for the proposed substation and associated overhead power line for the Nobelsfontein Wind Energy Facility situated on a site south of Victoria West on the Farm Nobelsfontein 227, Northern Cape Province
120325	HIA Phase 1	Celeste Booth, Sholeen Shanker	01/12/2012	An archaeological ground-truthing walk-through for the proposed substation and associated overhead power line for the Nobelsfontein Wind Energy Facility situated on a site south of Victoria West on the Farm Nobelsfontein 227, Northern Cape Province
120820	HIA Phase 1	Celeste Booth	01/12/2012	An Archaeological Ground-Truthing Walk-Through For The Nobelsfontein Wind Energy Facility Situated On A Site South Of Victoria West On The Farms Nobelsfontein 227, Annex Nobelsfontein 234, Ezelsfontein 235, And Rietkloofplaaten 239, Northern Cape Province
251290	PIA Desktop	Lloyd Rossouw	01/01/2014	Combined Environmental Environmental Impact Assessment for the proposed Ishwati Emoyeni Wind Energy Facility and Supporting Eskom Transmission and Eskom Distribution Grid Connection Infrastructure near Murraysburg, Western Cape. Chapter 13: Palaeontology Impact Assessment.
251296	AIA Phase 1	Dave Halkett	01/01/2014	Combined Environmental Impact Assessment for the proposed Ishwati Emoyeni Wind Energy Facility and Supporting Eskom Transmission and Eskom Distribution Grid Connection Infrastructure near Murraysburg, Western Cape. Chapter 13: Archaeology Impact Assessment.
356942	AIA Phase 1	Johan Binneman, Celeste Booth, Natasha Higgitt	01/05/2010	A PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) FOR THE PROPOSED SKIETKUIL QUARRIES 1 AND 2 ON THE FARM SKIETKUIL No. 3, VICTORIA WEST, CENTRAL KAROO DISTRICT, WESTERN CAPE PROVINCE
356942	AIA Phase 1	Johan Binneman, Celeste Booth, Natasha Higgitt	01/05/2010	A PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) FOR THE PROPOSED SKIETKUIL QUARRIES 1 AND 2 ON THE FARM SKIETKUIL No. 3, VICTORIA WEST, CENTRAL KAROO DISTRICT, WESTERN CAPE PROVINCE



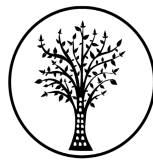
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357137	Heritage Impact Assessment Specialist Reports	Timothy Hart	13/10/2015	Heritage Impact Assessment for the proposed Umsinde Emoyeni Wind Energy Facility
360840	Non Impact Assessment Related Reports	Wouter Fourie	05/03/2016	Environmental Impact Assessment of the proposed amendments to the Environmental Authorisation for the Mainstream Renewable Power South Africa Wind Energy Project near Victoria West in the Northern Cape – Specialist Heritage Opinion
360850	HIA Phase 1	Wouter Fourie	04/03/2016	Basic assessment process for Proposed development of supporting infrastructure to the Victoria West Wind Energy Facility, Victoria West
6805	AIA Phase 1	Len van Schalkwyk, Elizabeth Wahl	01/09/2007	Heritage Impact Assessment of Gamma Grassridge Power Line Corridors and Substation, Eastern, Western and Northern Cape Provinces, South Africa
7035	AIA Phase 1	Johan Binneman, Celeste Booth, Natasha Higgitt	05/03/2011	A Phase 1 Archaeological Impact Assessment (AIA) for the proposed Karoo Renewable Energy Facility on a site south of Victoria West, Northern and Western Cape Province on the farms Phaisantkraal 1, Modderfontein 228, Nobelsfontein 227, Annex Nobelsfontein
7036	AIA Desktop	Celeste Booth, Natasha Higgitt	19/11/2010	An Archaeological Desktop Study for the proposed Karoo Renewable Energy Facility on a site south of Victoria West, Northern and Western Cape
8943	PIA Phase 1	Lloyd Rossouw	24/03/2011	Palaeontological desktop assessment of a commercial renewable energy facility site located approximately 34km south of Victoria West in the Western Cape Province (and Northern Cape)

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APPENDICES



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APPENDIX 1: Archaeological Assessment (2021)



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APPENDIX 2: Palaeontological Assessment (2021)



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APPENDIX 3: Cultural Landscape Assessment (2021)



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APPENDIX 4: Heritage Screening Assessments



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APPENDIX 5: Chance Fossil Finds Procedure