HERITAGE IMPACT ASSESSMENT

In terms of Section 38(8) of the NHRA

for the

Daisy Solar PV Facility and associated grid connection infrastructure, Northern Cape Province

SAHRIS Ref:

Prepared by CTS Heritage

CTS HERITAGE

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For

Savannah Environmental (Pty) Ltd

November 2022

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EXECUTIVE SUMMARY

1. Site Name:

Daisy PV Facility

2. Location:

Approximately 25km south-east of the coastal town of Kleinzee

3. Locality Plan:

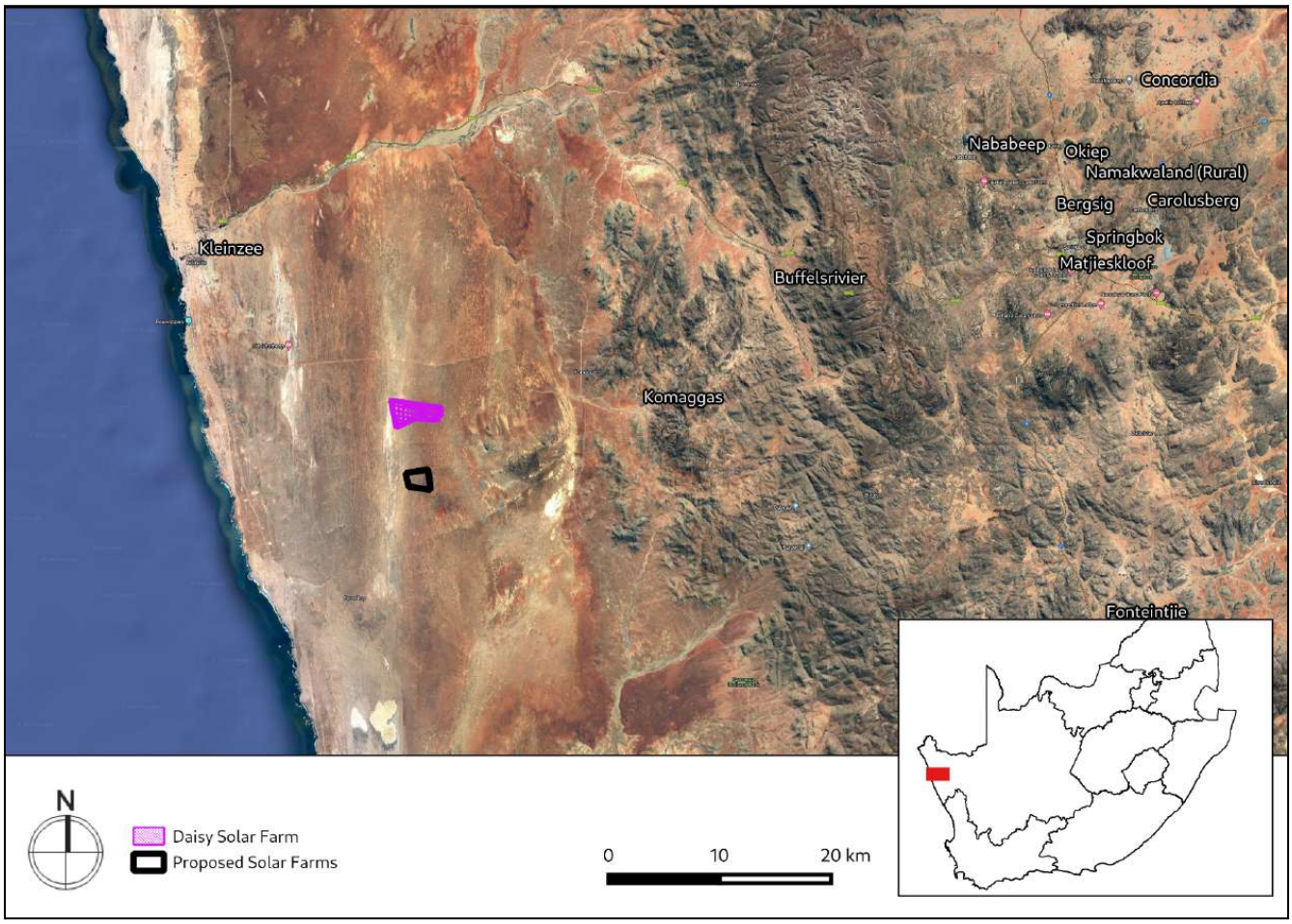

Figure A: Location of the proposed study area

4. Description of Proposed Development:

The development of a solar photovoltaic (PV) facility with a contracted capacity of up to 360MW is proposed by Energy Team (Pty) Ltd on a site located approximately 20km west of the town of Komaggas, and 24km southeast of Kleinzee. The project is located in the Nama Khoi Local Municipality within the Namakwa District Municipality, Northern Cape. The solar PV development will be known as the Daisy Solar PV Facility. The Daisy Solar PV Facility

is located within Focus Area 8 of the Renewable Energy Development Zones (REDZ), which is known as the Springbok REDZ, and within the Northern Corridor of the Strategic Transmission Corridors.

5. Heritage Resources Identified in the study area:

No resources of heritage significance were identified within the area proposed for development

6. Anticipated Impacts on Heritage Resources:

The proposed development is proposed within a belt of approved renewable developments located within the Springbok REDZ. While infrastructure associated with the Namaqualand Copper Mining Cultural Landscape is known to exist in this area, the proposed development is located well-away from the heart of the Cultural Landscape as described in the tentative listing. It is not anticipated that the proposed development will negatively impact on significant cultural landscape resources.

The SAHRIS palaeosensitivity map indicates that the development area is underlain by sediments of zero and low palaeontological sensitivity. This assessment is endorsed by other palaeontological studies completed in the area. No impact to significant palaeontological heritage is therefore anticipated. However, it is recommended that the attached Chance Fossil Finds Procedure is implemented during the course of construction activities.

The overall archaeological sensitivity of the Namaqualand with regard to the preservation of Early, Middle and Later Stone Age archaeology as well as Khoe and San heritage, early colonial settlement and the Namaqualand Copper Mining landscape is regarded as very high. Despite this, the field assessment conducted for this project has demonstrated that the specific area proposed for development has low sensitivity for impacts to significant archaeological heritage. One structure of significance is known to be located in close proximity to the proposed development and it is recommended that this site be protected by the implementation of a no-go buffer area.

As indicated above, the results of this assessment align with the findings of other specialists in the area such as Orton (2021) who notes that ephemeral LSA scatters are the dominant archaeological signature of the area and are therefore not archaeologically significant.

7. Recommendations:

There is no objection to the proposed development of the Daisy PV Facilities and associated overhead powerline in terms of impacts to heritage resources on condition that:

- The recommendations in the VIA must be implemented

- The attached Chance Fossil Finds Procedure (Appendix 3) is implemented during the course of construction activities.
- Should any buried archaeological resources or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. The South African Heritage Resources Agency (SAHRA) must be contacted immediately in order to determine an appropriate way forward.

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 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. 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 throughout South Africa.

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CONTENTS

1. INTRODUCTION

1.1 Background Information on Project

The development of a solar photovoltaic (PV) facility with a contracted capacity of up to 360MW is proposed by Energy Team (Pty) Ltd on a site located located approximately 20km west of the town of Komaggas, and 24km southeast of Kleinzee. The project is located in the Nama Khoi Local Municipality within the Namakwa District Municipality, Northern Cape. The solar PV development will be known as the Daisy Solar PV Facility. The Daisy Solar PV Facility is located within Focus Area 8 of the Renewable Energy Development Zones (REDZ), which is known as the Springbok REDZ, and within the Northern Corridor of the Strategic Transmission Corridors. The infrastructure associated with the 360MW solar PV facility will include:

- Solar PV array comprising PV modules and mounting structures
- Inverters and transformers
- Low voltage cabling between the PV modules to the inverters
- 33kV cabling between the project components and the facility substation
- 132kV onsite facility substation
- 132kV power line to connect to the grid at Zonnequa Collector Substation within a 300m wide and approximately 3.5km long corridor.
- Battery Energy Storage System (BESS)
- Site offices and maintenance buildings, including workshop areas for maintenance and storage
- Laydown areas
- Site access and internal roads.

The power generated by Daisy Solar PV Facility will be sold to Eskom and will feed into the national electricity grid. Ultimately, Daisy Solar PV facility and the associated grid connection infrastructure is intended to be part of the renewable energy projects portfolio for South Africa, as contemplated in the Integrated Resources Plan (IRP) and Renewable Energy Independent Power Producer Procurement (REIPPP) Programme.

Table 1 below provides the details of the project, including the main infrastructure components and services that will be required during the project life cycle.

Table 1: Details of the Daisy Solar PV Facility and associated infrastructure

Component	Description / Dimensions
District Municipality	Namakwa District Municipality
Local Municipality	Nama Khoi Local Municipality
Ward Number (s)	Ward 8
Nearest town(s)	20km west of the town of Komaggas, and 24km southeast of Kleinzee
Farm name(s) and number(s) of properties affected by the PV Facility	» Portion 0 of Farm Zonnekwa 326 (C05300000000032600000)
Portion number(s) of properties affected by the Solar Facility	
SG 21 Digit Code (s)	
Farm name(s) and number(s) of properties affected by the Grid Connection	Switching Substation: » Portion 0 of Farm Zonnekwa 326 (C05300000000032600000) Grid corridor (300m): » Portion 0 of Farm Zonnekwa 326 (C05300000000032600000) » Portion 1 of Farm Zonnekwa 326 (C05300000000032600001) » Portion 2 of Zonnekwa 328 (C05300000000032800002) » Portion 3 of Farm Zonnekwa 328 (C05300000000032800003) » Portion 4 of Farm Zonnekwa 328 (C05300000000032800004)
Portion number(s) of properties affected by the Grid Connection	
SG 21 Digit Code (s)	
Current zoning	Agricultural (i.e., grazing) and special use (i.e., energy generation)
Site Coordinates (centre of development area)	29°48'00.77"S, 17°17'01.12"E
Total extent of the Affected Properties, also referred to as the project site[1]	~3838.14ha
Total extent of the PV Development area[2]	Up to ~651.21ha
Total extent of the PV Development footprint[3]	Up to ~561.04ha
Contracted capacity of the PV facility	Up to 360MW
PV panels	Height: up to 5m from ground level (installed)
On-site Facility Substation	» Located within the development footprint. » Approximately 2ha in extent.
Coordinates of the On-site Facility Substation	» 29°47'35.84"S, 17°16'04.49"E

[1] The project site is that identified area within which the development area and development footprint are located. It is the broader geographic area assessed as part of the BA process, within which indirect and direct effects of the project may occur. The project site is ~3838.14ha in extent.

[2] The development area is that identified area where the 160MW PV facility is planned to be located. This area has been selected as a practicable option for the facility, considering technical preference and constraints. The development area is ~651.21ha in extent.

[3] The development footprint is the defined area (located within the development area) where the PV panel array and other associated infrastructure for the Daisy Solar PV facility is planned to be constructed. This is the actual footprint of the facility, and the area which would be disturbed.

Switching substation	» Located within the development footprint. Approximately 2ha in extent.
Coordinates of the Switching Substation	29°47'05.29"S 17°14'11.93"E
Power line capacity	» 132kV
Power line servitude width	» Up to 32m
Length of the power line	» Approximately 3.5km
Grid corridor width (for assessment purposes)	» 300m
Grid corridor length (for assessment purposes)	» 3.5km
Grid coordinates	Start: 29°47'34.53"S, 17°16'06.02"E Mid: 29°47'24.96"S, 17°15'16.95"E End: 29°47'05.29"S, 17°14'12.15"E
Grid details	The corridor extends between the switching substation located on the Daisy Solar PV Facility and the authorised Zonnequa Collector Substation which connects to Eskom Gromis Substation.
Access gravel roads and internal roads	» Existing roads will be used, wherever possible, to access the project site and development area. » current existing gravel road that connects to the DR2964 located to the North of the site » The site can also be accessed off a provincial gravel minor road that connects from the surfaced MR751 road located to the west of the project site.

1.2 Description of Property and Affected Environment

The proposed solar PV area lies immediately on the boundaries of the previously assessed Komas WEF (Orton, 2021). Two portions lie north of the ground surveyed by Orton and the third lies nestled south and west of his survey coverage. The project is about 25km south-east of Kleinzee and is most easily accessed from the Komaggas gravel road from the north onto an Eskom 765kV powerline access road which leads to Sonnekwa farm. The area lies within the vast dune cordon between the West Coast and the granite peaks of the Kamiesberg which divides this area from Springbok further east. The Namaqua National Park lies roughly 50km away by road to the south.

The terrain is generally soft underfoot due to the thick dune sands except where hardpan outcrops of calcrete have formed firming up the ground. The vegetation in the area is typical of the succulent Karoo of Namaqualand and low shrubs dominate the bulk of the study area. The region is extremely arid and areas along non-perennial streams hold denser stands of acacia thorn trees. The two farmhouse complexes at Sonnekwa A, B and

Graafwater straddle the western end of the proposed PV areas and most of the kraals, windmills and farm dams (JoJos and concrete dams) are situated closer to these homesteads.

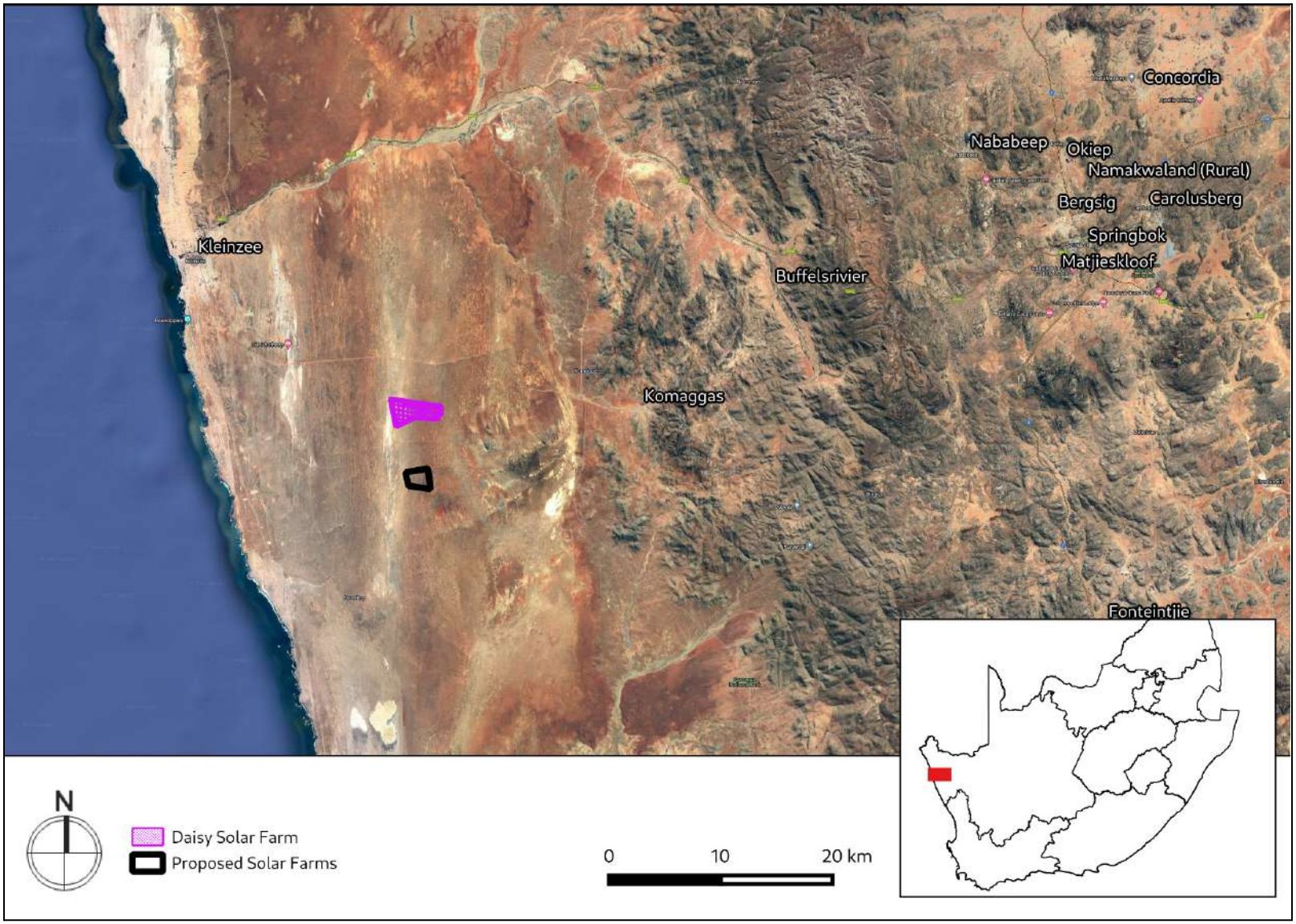

Figure 1.1: The proposed development area relative to Kleinzee

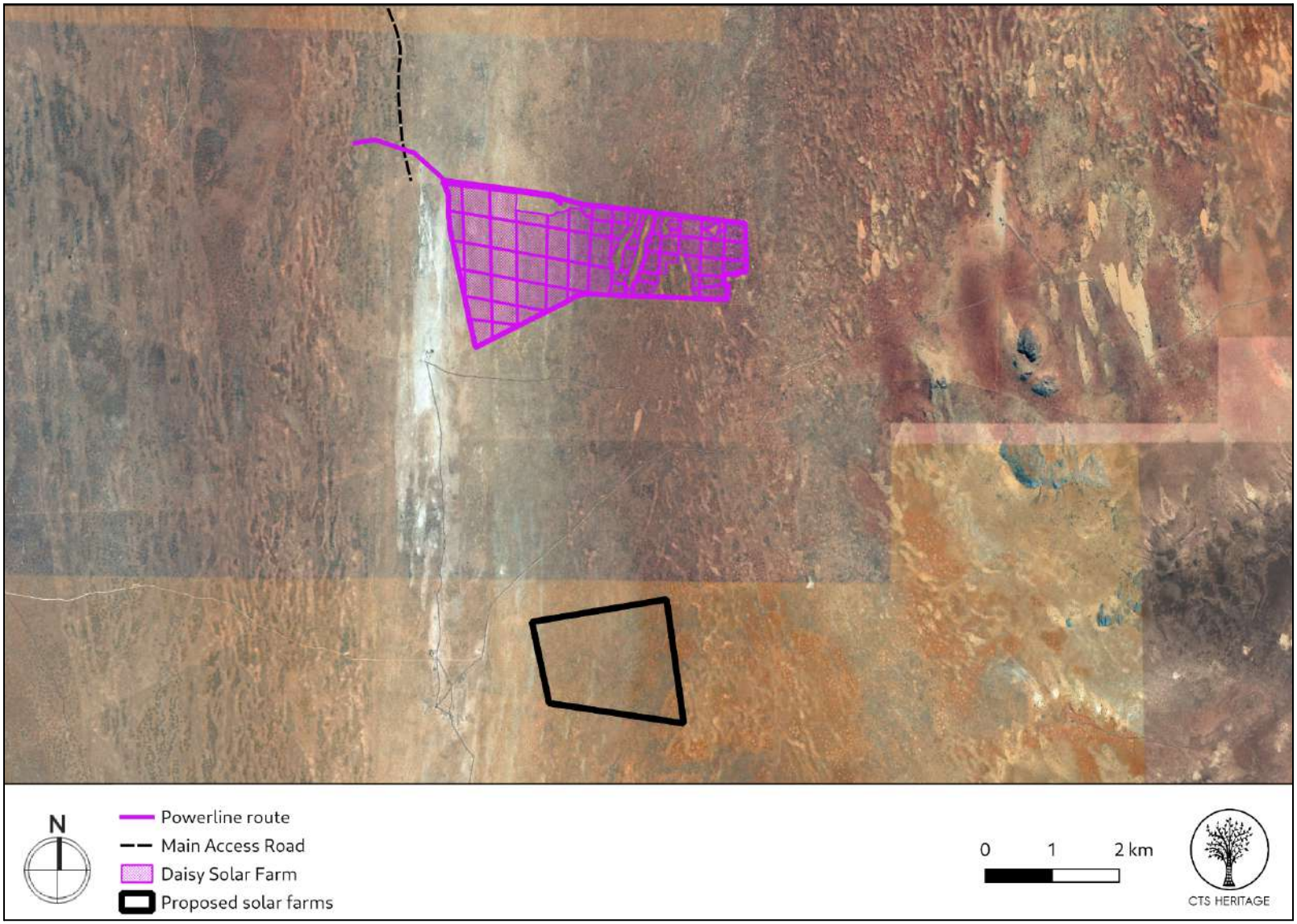

Figure 1.2: The proposed development area

Map 1.3: The proposed development area

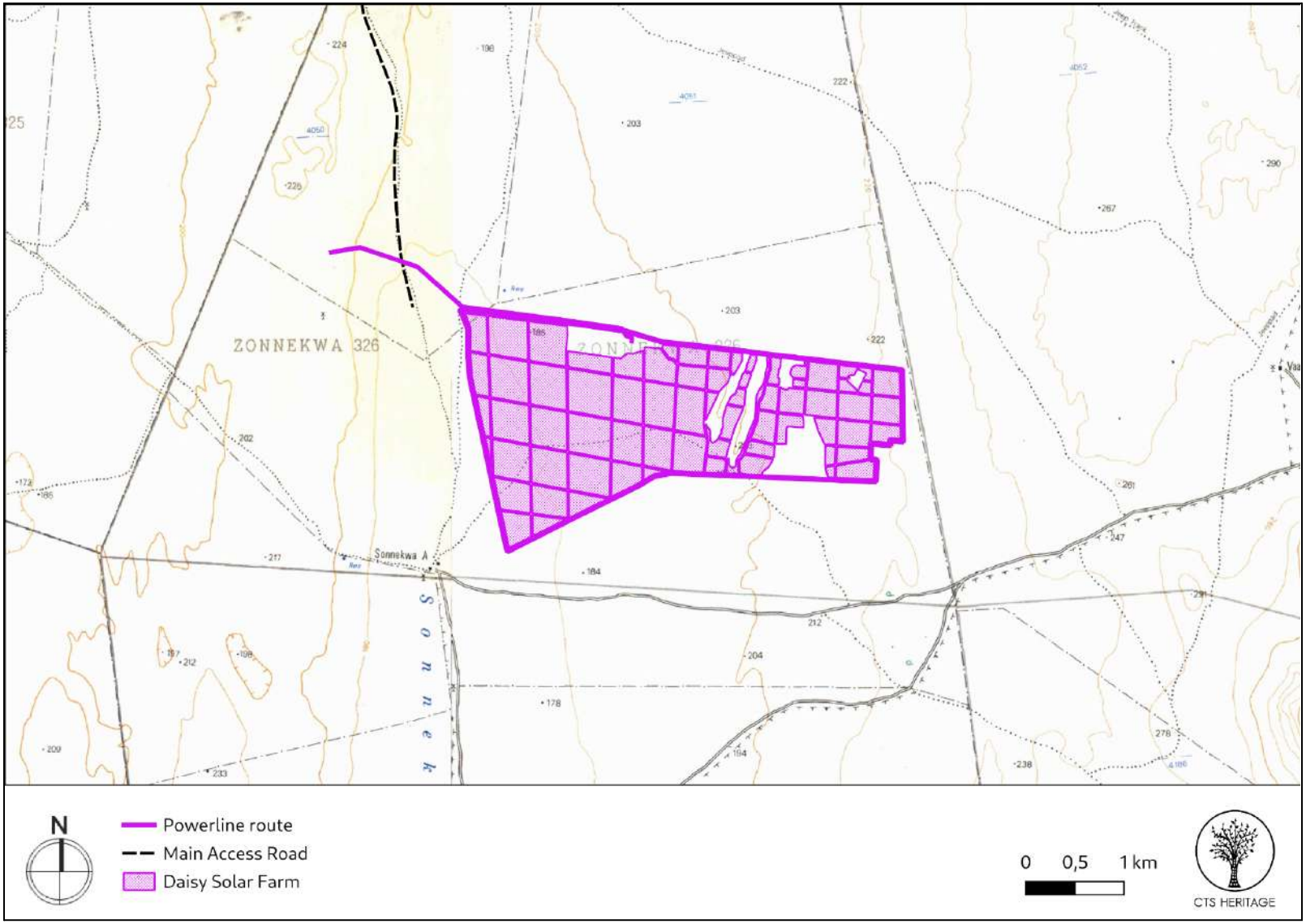

Figure 1.4. Overview Map. Extract from the 1:50 000 Topo Map indicating the proposed development area.

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) (Appendix 1)
- An archaeologist conducted an assessment of the broader study area in order to determine the archaeological resources likely to be disturbed by the proposed development. The archaeologist conducted his site visit on 23 and 24 June 2022 (Appendix 2)
- The identified resources were assessed to evaluate their heritage significance
- 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.

2.4 Constraints & Limitations

The ground was fairly easily traversed on foot but vehicle access was only possible on the well-maintained farm roads used by the owners of Sonnekwa. Thick sand made much of the Eskom servitude roads nearly unusable, even with a 4x4 vehicle. However, the sparse vegetation lends itself to good visibility of the surface material, primarily of Later Stone Age assemblages, while buried Early and Middle Stone Age material is typical in areas

affected by the vast dune cordon. The survey therefore managed to achieve a satisfactory account of the archaeological sensitivity of the area.

2.5 Savannah Impact Assessment Methodology

Direct, indirect and cumulative impacts of the issues identified through the Basic Assessment process 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.
- 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).

3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT

3.1 Desktop Assessment

Cultural Landscape

Prior to 1652, the indigenous peoples (the Khoisan or Nama) of the area extracted raw or "native copper" from the gneiss and granite hills that make up the surrounding Namaqualand Copper belt. This copper was beaten into decorative items, worn as bangles and neck adornments. Early settlers in the Cape Colony heard rumours of mountains in the north-west that were rich in copper. Governor Simon van der Stel was inclined to believe these tales when, in 1681, a group of Namas visited the Castle in Cape Town and brought along some pure copper. Van der Stel himself led a major expedition in 1685 and reached the fabled mountains on 21 October. Three shafts were sunk and revealed a rich lode of copper ore - the shafts exist to this day. For almost 200 years nothing was done about the discovery, largely because of its remote location.

The explorer James Alexander was the first to follow up on van der Stel's discovery. In 1852 he examined the old shafts, discovered some other copper outcrops and started mining operations. Prospectors, miners and speculators rushed to the area, but many companies collapsed when the logistical difficulties became apparent. The first miners were Cornish, and brought with them the expertise of centuries of tin-mining in Cornwall. The ruins of the buildings they constructed as well as the stonework of the bridges and culverts of the railway built to transport the ore to Port Nolloth, can still be seen. The Namaqualand Railway started operating in 1876 and lasted for 68 years, carrying ore to Port Nolloth and returning with equipment and provisions. The carriages were initially pulled by mules and horses, which were later replaced by steam locomotives - the last of these, the *Clara*, stands at Nababeep. Nowadays road transport is used to convey the ore to the railhead at Bitterfontein. The other principal mines of the area are at Carolusberg and Nababeep.

Kleinsee was established as a small mining town in 1927. According to legend, a teacher by the name of De Villiers from the local farm school had built a new school and was looking for lime deposits with which to whitewash the walls. In his search, accompanied by a builder called Alberts, he kicked at a mound in the veld. This dislodged a diamond which was recorded as the first alluvial diamond found in this area. The resultant diamond rush opened up the Kleinzee 'crater', reminiscent of the 'Big Hole' at Kimberley and subsequently, this area became known as the Diamond Coast.

All of the historic and present mining activities in Namaqualand form part of the Namaqualand Copper Mining Cultural Landscape that has been previously put forward for World Heritage Site status. According to the tentative listing, "The Namaqualand copper mines and their associated infrastructure and cultural landscape reflect the beginnings of the mining industry in South Africa in all the myriad ways in which that industry influenced and

continues to influence society through the movement and housing of people, the development of transport and other infrastructure and industries and in the development of technological and scientific endeavour. It also reflects the very close links between the development of the Southern African mining industry and mining technology pioneered in Britain, particularly in the counties of Cornwall and Devon, and the landscapes and social structures that went with them." Although the heart of this landscape is centred around Okiep, Concordia, Nababeep, Port Nolloth, Carolusberg and Springbok (Webley, 2016), some infrastructure related to this landscape has been identified to the north of the development area. However, no evidence of resources associated with this landscape were identified within the area proposed for development.

In 2021, Orton (SAHRIS NID 573587) conducted a detailed HIA for a proposed WEF located immediately adjacent to the proposed development area. Orton (2021) describes the development context as dominated by undulating sandy plains, interspersed with deflation hollows. He identifies an elongated valley through this development area which he calls the Zonnekwa Valley (Orton, 2021). This feature is visible to the west of the proposed PV areas in Figure 1.2.

Orton (2021) conducted an analysis of the cultural landscape of the broader context which is very relevant to this proposed development. Elements of significance that were identified include the mining towns and missionary stations of Kleinzee, Komaggas and Grootmis as well as the frontier nature of the landscape and the relationships between settlers and the indigenous Nama. Furthermore, in this resource-poor landscape, human occupation was always strongly linked to the presence of water. Orton (2021) notes that "in 1925 diamonds were discovered on the farm Oubeep, south of Port Nolloth, and in 1926 at Kleyne Zee, both by Jack Carstens. Mining commenced at the latter in 1927 and the town of Kleinzee was soon established (Rebelo 2003). Much of the coastline was then bought up for diamond mining and access for grazing was closed." Orton's field assessment confirmed that the area proposed for development is located in "a very remote area with little infrastructure. The study area lacks any sign of development aside from the gravel road passing through its northern part, although some recent/historical materials did betray a historical presence on the land."

Orton (2021) identified four farm werfs in the broader study area located outside of the development footprint. None of these were determined to have any heritage value. Interestingly, Orton (2021) identified many small stock posts in the Komaggas Reserve. He noted that "They generally have temporary structures, and sometimes caravans, as well as wire stock pens. Although these sites are modern, they are reminders of an important historical way of life practised by local Nama herders for at least the last two centuries since missionaries encouraged settlement. This effectively makes the Komaggas Reserve a living heritage site. Prior to this, the people would have been far more mobile and would likely have moved over greater distances." Orton (2021) goes

on to describe the cultural landscape as conveying "a sense of remoteness and inhospitality that is a result of the very frequent strong winds, the low scrubby vegetation and seemingly endless sand flats and dunes. While most of the broader landscape is fairly flat with the tallest anthropogenic features being wind pumps."

Orton (2021) concluded that "The historical/recent cultural landscape is deemed to have low-medium cultural significance for its aesthetic value but the archaeological cultural landscape is of medium significance for its scientific value and could be assigned a field rating of IIIB."

Archaeology and Built Environment Heritage

As a result of mining applications in the area, much is known about the archaeology of the region which is dominated by Early, Middle and Later Stone Age artefact scatters. According to Orton and Webley (2012, SAHRIS NID 16354), "the archaeology of the coastal strip is generally well-understood as a result of the extensive survey and mitigation work carried out there. High quality data have been extracted from these sites, but further inland, very little work has been carried out".

In the immediate context of Kleinsee, Halkett et al (1997 SAHRIS ID 4496) conducted an impact assessment for proposed upgrades to the Kleinsee Golf Course. Halkett et al. (1997) identified three Later Stone Age shell midden archaeological sites and in the report, it was noted that none of the three sites contains assemblages which are considered worthy of further study. Just east of Kleinsee, a collection of Early Stone Age artefact sites was noted by De Beers mining staff in 2001. The artefacts were determined to be deflating from the soil vestiges onto the more resistant hardpan deposits below and were therefore no longer *in situ* (Halkett et al. 2002 SAHRIS NID 4482). These artefacts were collected and contribute to the record of archaeological resources from this area.

In addition, a number of archaeological sites located to the north of the development area have been recorded by Orton (2016) on SAHRIS, however no information is available regarding the nature or significance of these archaeological resources (Figure 3b). Orton and Webley (2012, SAHRIS NID 16354) conducted a Heritage Impact Assessment for a proposed Wind Energy Facility located within 15km of the proposed development area. According to Orton and Webley (2012), "The survey revealed a large number of archaeological sites including deflated ESA and MSA artefact scatters (one with bone), LSA shell scatters and in situ shell middens, formal graveyards, and old structures. In some areas vast quantities of archaeological material was found to occur and such areas can be considered archaeological cultural landscapes. The local landscape itself also has value particularly where it forms the context for the settlement of Grootmis. Particularly significant archaeological finds were an ESA/MSA scatter with fossil bones preserved and a massive area of small shell scatters and middens in close proximity to the Buffels River near the point where fresh water was permanently available during historic

(and presumably also pre- colonial) times. The ESA material included predominantly flakes, cores and hand-axes but one cleaver was also found. MSA artefacts included flakes and cores and one bifacial point that may well be from the Still Bay period. LSA material included decorated pottery, retouched stone scrapers and *in situ* occurrences with generally higher research value."

Orton's assessment (2021) provides insight into the kinds of heritage resources likely to be impacted by the proposed development. Orton (2021) noted that "The region is well-known for its very high density of archaeological sites but their number and significance often decreases away from the coast. The survey revealed many small Later Stone Age archaeological sites with occasional historical artefacts also present. None of these was of high cultural significance."

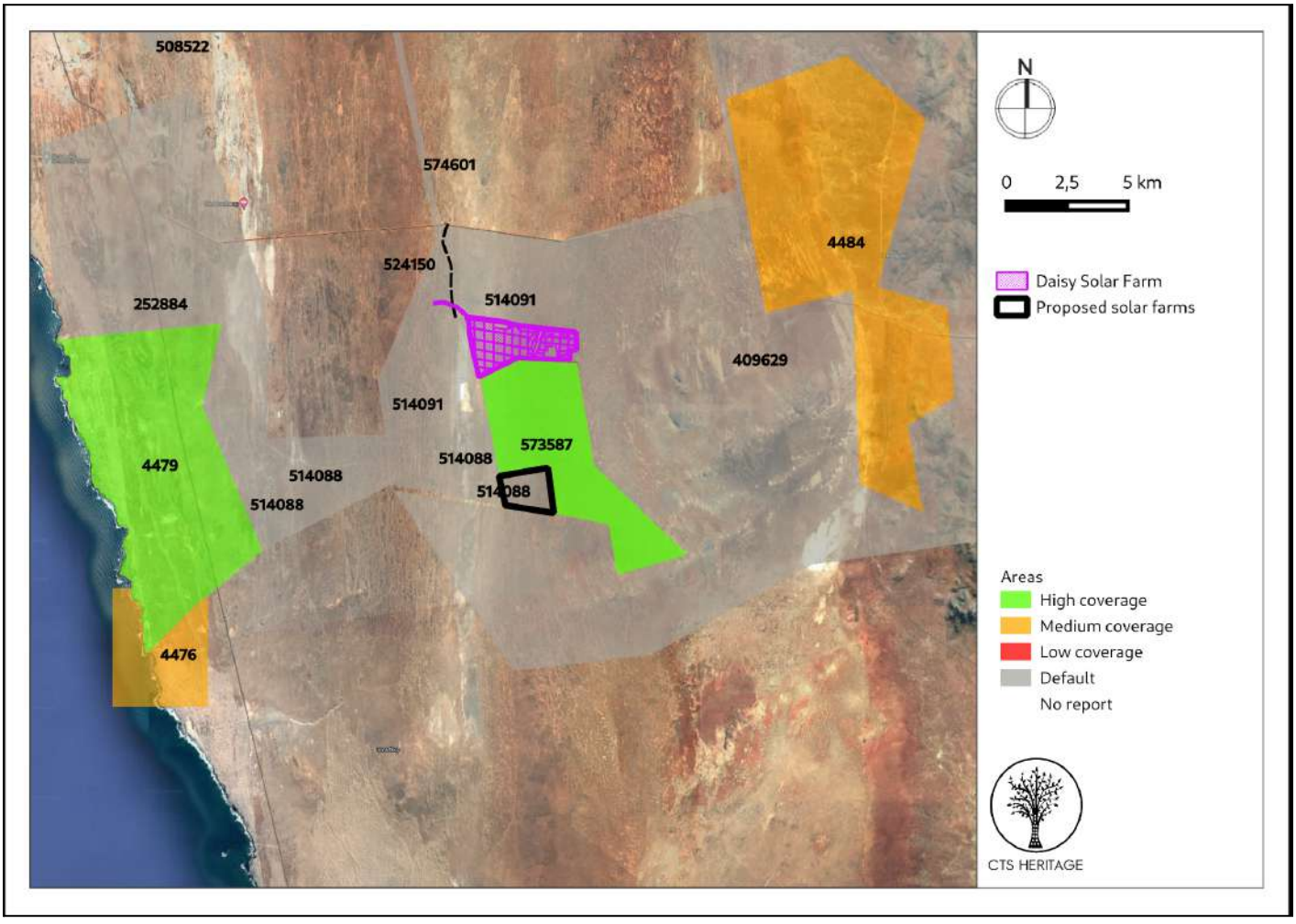

Figure 2.1: Spatialisation of heritage assessments conducted in proximity to the broader study area

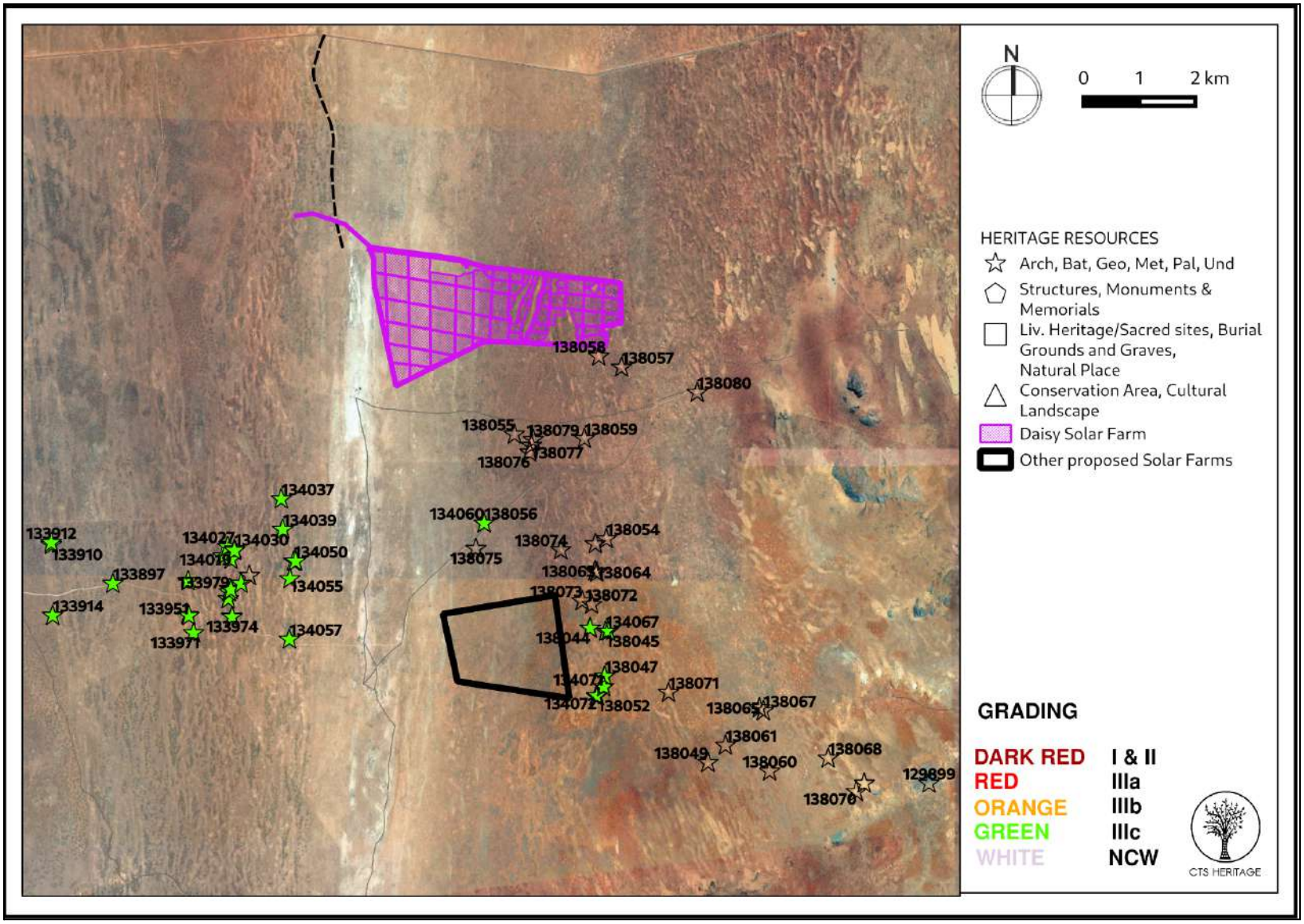

Figure 2.2: Spatialisation of heritage resources known in proximity to the broader study area

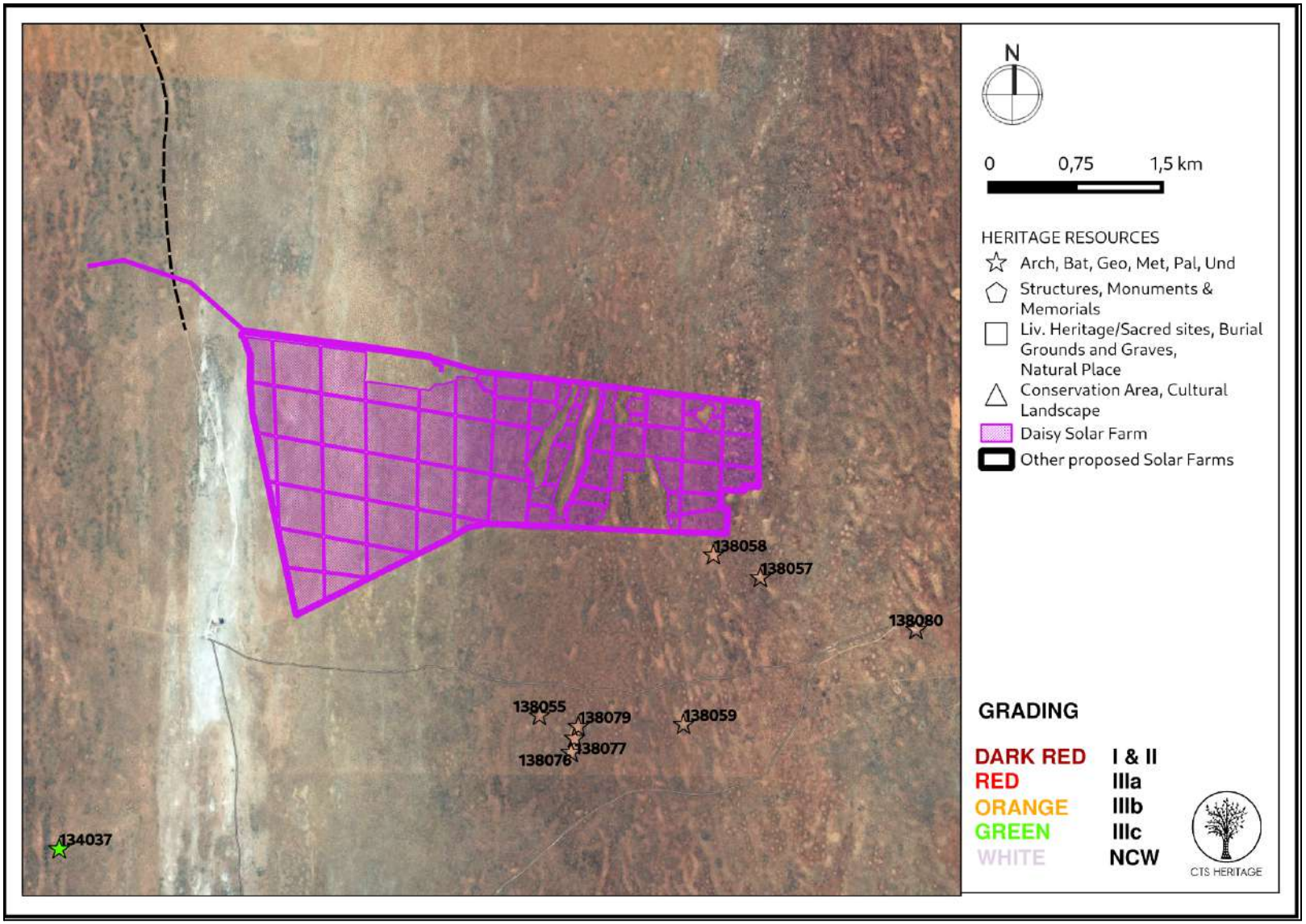

Figure 2.2. Heritage Resources Map. Inset A

3.2 Palaeontology

According to the SAHRIS Palaeosensitivity Map, the area proposed for development is underlain by scree/talus/alluvium grading into piedmont gravel of low palaeontological sensitivity. Pether (2011, SAHRIS NID 16355) conducted a PIA for a proposed development located approximately 10km away from the proposed development area. SImilar geology is present at this site. Pether (2011) noted that terrestrial deposits blanket the area. He goes on to note that "These deposits comprise the loose, surficial coversands and the underlying, older, "dorbank" compact, clayey deposits that also are chiefly aeolian sands, with the soils and pedocretes that have formed in them. Fossil bones are sparsely distributed on the palaeosurfaces within these deposits, but are locally abundant in contexts such as interdune deposits, carnivore bone accumulations in burrows and buried Stone Age sites. Trace fossils are ubiquitous and important palaeoenvironmental indicators. The significance rating is low for fossil potential as a consequence of the low probability of finding fossils in the terrestrial deposits.

Further observations in the surrounding area (Pether, 2020) indicate that the deposits are altered by pedogenic processes involving decalcification and the precipitation of pedocrete. Fossil shells are not preserved and fossil bone is very sparse. Pether (2020) notes that "the affected surficial formations include Holocene dunes of the Hardevlei Formation and earlier late Quaternary coversands of the Koekenaap Formation. Beneath these unconsolidated sands are compact, pedogenically-altered aeolianites termed the Dorbank Formation which are fossil dune plumes of later mid-Quaternary age." Orton (2021) elaborates that "the aeolian formations (Hardevlei and Koekenaap) are assumed to contain the typical fossil content seen in similar deposits elsewhere. The most common fossils are related to the ambient fossil content of dune sands, i.e. land snails, tortoise shells and mole bones. " Pether (2021) considers fossil finds to be unlikely. Given the low palaeontological potential, it is improbable that fossil bones will be encountered and no additional palaeontological study is recommended, however the attached Chance Fossil Finds Procedure must be implemented.

Figure 3: Palaeontological sensitivity of the area surrounding the broader study area

4. IDENTIFICATION OF HERITAGE RESOURCES

4.1 Summary of findings of Specialist Reports

Fourteen observations were recorded and almost all of these consisted of Later and Middle Stone Age open air scatters of artefacts. The werfs at Sonnekwa will not be negatively affected by the proposed PV areas which are well situated away from the areas actively farmed for sheep, goats and ostriches. Unsurprisingly, quartz dominated the assemblages with high percentages of cores, flakes, debitage and retouched flakes generally dispersed across the study area. Lower contributions of silcrete and CCS were also found and these were often extensively retouched or heavily reduced cores in these raw materials. We would expect to see higher densities of assemblages a few kms east of this study area along the foothills of the Brandberg and the Komaggasrivier which provide more reliable sources of water. The area can be characterised as a transitory area between the marine resources 20km to the west and the foothills of the Kamiesberg, featuring low density but widely dispersed archaeological material.

4.2 Heritage Resources identified

Table 2: Heritage resources identified in the study area

Site No.	Project	Description	Type	Period	Density	Co-ordinates		Grading	Mitigation
001	Outside Area	Sonnekwa farmhouse complex and kraals	Structure	Modern	n/a	-29.8126	17.24852	IIIB	NA
002	Daisy	Quartz core	Artefacts	LSA	0 to 5	-29.80293	17.29446	NCW	NA
003	Daisy	Ostrich eggshell fragments, could be natural or archaeological			0 to 5	-29.80138	17.28742	NCW	NA
004	Namaqua	Quartzite lower grindstone next to jeep track, not sure if context is in situ	Artefacts	LSA	0 to 5	-29.80584	17.24986	NCW	NA
005	Daisy	Quartz flake	Artefacts	LSA	0 to 5	-29.80431	17.28411	NCW	NA
006	Daisy	Quartz point, prep. Platform	Artefacts	MSA	0 to 5	-29.80384	17.27935	NCW	NA
007	Daisy	OES fragment, CCS core with relatively high amount of cortex remaining	Artefacts	LSA	0 to 5	-29.79688	17.28142	NCW	NA
008	Daisy	Backed quartz flake	Artefacts	MSA	0 to 5	-29.79893	17.28094	NCW	NA
009	Daisy	Quartz cores	Artefacts	LSA	0 to 5	-29.79622	17.29211	NCW	NA
010	Daisy	Quartzite flake	Artefacts	MSA	0 to 5	-29.79585	17.28957	NCW	NA
011	Daisy	Quartz core and flake with pointed end and disconformity along lateral edge	Artefacts	MSA, LSA	0 to 5	-29.79542	17.28187	NCW	NA
012	Namaqua	Quartz cores, fine grained darker quartz/quartzite point	Artefacts	LSA	0 to 5	-29.79665	17.25461	NCW	NA
013	Namaqua	Silcrete flake with retouched platform	Artefacts	MSA	0 to 5	-29.7969	17.26186	NCW	NA

014	Namaqua	Quartz core	Artefacts	LSA	0 to 5	-29.80152	17.26274	NCW	NA
015	Daisy	Silcrete flake, fairly large, no retouch seen	Artefacts	MSA	0 to 5	-29.79851	17.27027	NCW	NA
016	Namaqua	Quartz core and quartzite flake	Artefacts	LSA	5 to 10	-29.80787	17.26121	NCW	NA
017	Daisy	Silcrete core and quartz core flake	Artefacts	MSA	0 to 5	-29.80424	17.27002	NCW	NA
018	Namaqua	Quartz/quartzite flake, darker, quartz core	Artefacts	LSA, MSA	0 to 5	-29.8026	17.25515	NCW	NA
019	Namaqua	Silcrete and quartz flakes	Artefacts	MSA	0 to 5	-29.79422	17.25836	NCW	NA
020	Daisy	Quartz core	Artefacts	LSA	0 to 5	-29.79975	17.2934	NCW	NA
021	Daisy	Quartz core, flake	Artefacts	LSA	0 to 5	-29.7985	17.29008	NCW	NA

4.3 Mapping and spatialisation of heritage resources

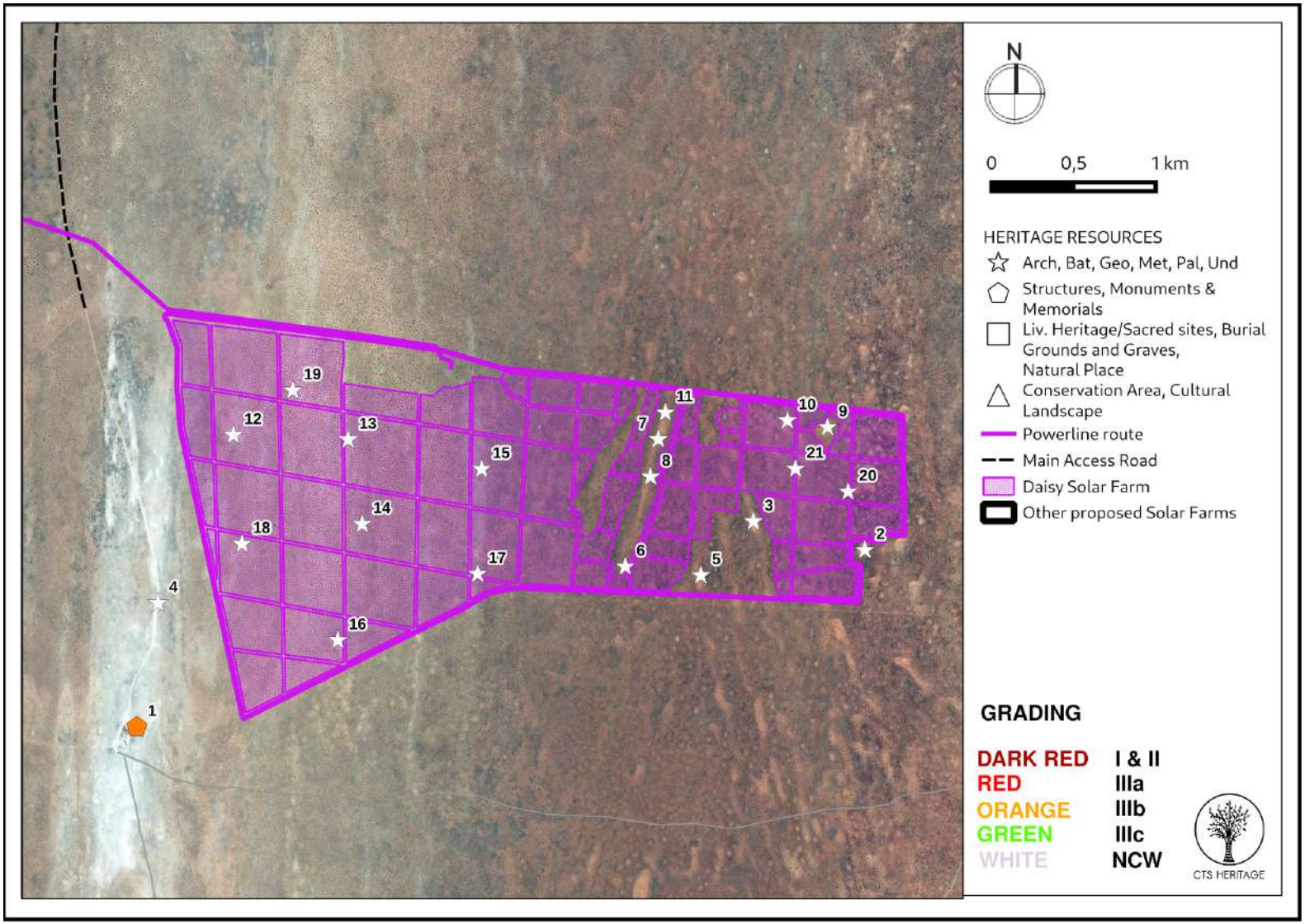

Figure 4: Map of heritage resources identified during the field assessment, relative to the proposed development

5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

5.1 Assessment of impact to Heritage Resources

All of the historic and present mining activities in Namaqualand form part of the Namaqualand Copper Mining Cultural Landscape that has been previously put forward for World Heritage Site status. No infrastructure related to this landscape is present within the development area. The proposed PV facility is located within an exceptionally flat landscape located well away from the nearest formal road. Due to the distance of the development area from the heart of the Namaqualand Copper Mining Cultural Landscape it is not anticipated that the proposed development will negatively impact on this significant cultural landscape.

According to the VIA:

The greater environment has a predominantly rural, undeveloped character and a natural appearance. These generally undeveloped landscapes are considered to have a high visual quality, except where urban development and power generation/distribution infrastructure represents existing visual disturbances.

The anticipated visual impact of the proposed PV facility on the regional visual quality (i.e. beyond 6km of the proposed infrastructure), and by implication, on the sense of place, is difficult to quantify, but is generally expected to be of **low** significance. This is due to the relatively low viewer incidence within close proximity to the proposed development and the presence of existing electricity infrastructure, as well as, the developments location within the Springbok REDZ.

The overall archaeological sensitivity of the Namaqualand with regard to the preservation of Early, Middle and Later Stone Age archaeology as well as Khoe and San heritage, early colonial settlement and the Namaqualand Copper Mining landscape is regarded as very high. Despite this, the field assessment conducted for this project has demonstrated that the specific area proposed for development has low sensitivity for impacts to significant heritage resources.

One heritage resource of significance was identified - that of the Sonnekwa farmhouse complex and kraals, graded IIIB. Based on the footprints provided, it is unlikely that this resource will be directly negatively impacted by the proposed development of the PV facilities in the area, although the sense of place associated with the farmhouse may be impacted.

The results of this field assessment align with the findings of Orton (2021) who noted that “The region is well-known for its very high density of archaeological sites but their number and significance often decreases away from the coast. The survey revealed many small Later Stone Age archaeological sites with occasional

historical artefacts also present. None of these was of high cultural significance." Based on these and Orton's findings (2021) it is unlikely that significant archaeological heritage resources will be impacted by the proposed development.

Table 3.1: Impacts of the proposed development to archaeological resources

NATURE: It is possible that significant archaeological resources may be impacted by the proposed development				
		Without Mitigation		**With Mitigation**
MAGNITUDE	**M (6)**	A number of archaeological observations of low scientific value were identified within the area proposed for development	**M (6)**	A number of archaeological observations of low scientific value were identified within the area proposed for development
DURATION	**H (5)**	Where manifest, the impact will be permanent.	**H (5)**	Where manifest, the impact will be permanent.
EXTENT	**L (1)**	Limited to the development footprint	**L (1)**	Limited to the development footprint
PROBABILITY	**M (3)**	It is possible that significant archaeological resources will be impacted	**L (1)**	It is unlikely that significant archaeological resources will be impacted
SIGNIFICANCE	**M**	(6+5+1)x3 = 36	**L**	(6+5+1)x1 = 12
STATUS		Negative		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?	**P**	Possible	**L**	Not Likely
CAN IMPACTS BE MITIGATED		Yes		
MITIGATION: • Should any buried archaeological resources or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. The South African Heritage Resources Agency (SAHRA) must be contacted immediately in order to determine an appropriate way forward.				
RESIDUAL RISK: None				

As indicated above, trace fossils are ubiquitous and important palaeoenvironmental indicators. The significance rating is low for fossil potential as a consequence of the low probability of finding fossils in the terrestrial deposits. Further observations in the surrounding area (John Pether) indicate that the deposits are altered by pedogenic processes involving decalcification and the precipitation of pedocrete. Fossil shells are not preserved and fossil bone is very sparse. Given the low palaeontological potential, it is improbable that fossil bones will be encountered and no impact is anticipated.

Table 3.2: Impacts of the proposed development to palaeontological resources

NATURE: It is possible that buried palaeontological resources may be impacted by the proposed development				
		Without Mitigation		**With Mitigation**
MAGNITUDE	**L (4)**	According to the SAHRIS Palaeosensitivity Map, the area proposed for development is underlain by sediments that have zero and low palaeontological sensitivity.	**L (2)**	According to the SAHRIS Palaeosensitivity Map, the area proposed for development is underlain by sediments that have zero and low palaeontological sensitivity.
DURATION	**H (5)**	Where manifest, the impact will be permanent.	**H (5)**	Where manifest, the impact will be permanent.
EXTENT	**L (1)**	Limited to the development footprint	**L (1)**	Limited to the development footprint
PROBABILITY	**L (1)**	It is unlikely that significant fossils will be impacted	**L (1)**	It is unlikely that significant fossils will be impacted
SIGNIFICANCE	**H**	(4+5+1)x1=10	**H**	(2+5+1)x1=8
STATUS		Negative		Negative
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?	**P**	Possible	**L**	Not Likely
CAN IMPACTS BE MITIGATED		Yes		
MITIGATION: ● The attached Chance Fossil Finds procedure must be implemented during the course of construction activities				
RESIDUAL RISK: None				

5.2 Sustainable Social and Economic Benefit

The following socio-economic benefits are anticipated to be derived from this project:

- During construction phase and operational phase, the proposed project will result in the creation of temporary and permanent employment opportunities (including job training and skills development). Example - The wages that the workers will receive will also have a positive impact on the local economy, because a percentage of their wages will be spent on the local businesses as well as on the hospitality industry- Hospitality and housing industry will benefit for housing construction workers for the duration of both construction and operational phase of the project
- The construction phase will result in an investment in the local and regional economy through the procurement of local goods and services.
- During the operational phase the supply of clean and renewable energy to the project region.

As such, the anticipated socio-economic benefits to be derived from the project outweigh any negative impact identified to heritage resources.

5.3 Proposed development alternatives

No alternatives are proposed at this stage. In addition, as no impacts to significant heritage resources are proposed, no alternatives are put forward in this assessment.

5.4 Cumulative Impacts

The proposed renewable energy facilities are located within a belt of approved renewable energy facilities (Figure 5) located inland of Kleinzee and within the Springbok REDZ. In addition, this area is already impacted by the numerous active mines located here.

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 culturally significant 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.

Table 4: Cumulative Impact Table

NATURE: Cumulative Impact to the sense of place and known archaeological and palaeontological resources				
		Overall impact of the proposed project considered in isolation		**Cumulative impact of the project and other projects in the area**
MAGNITUDE	**L (4)**	Low	**M (5)**	Moderate
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)x2=16	**L**	(5+4+1)x3=30
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: None				

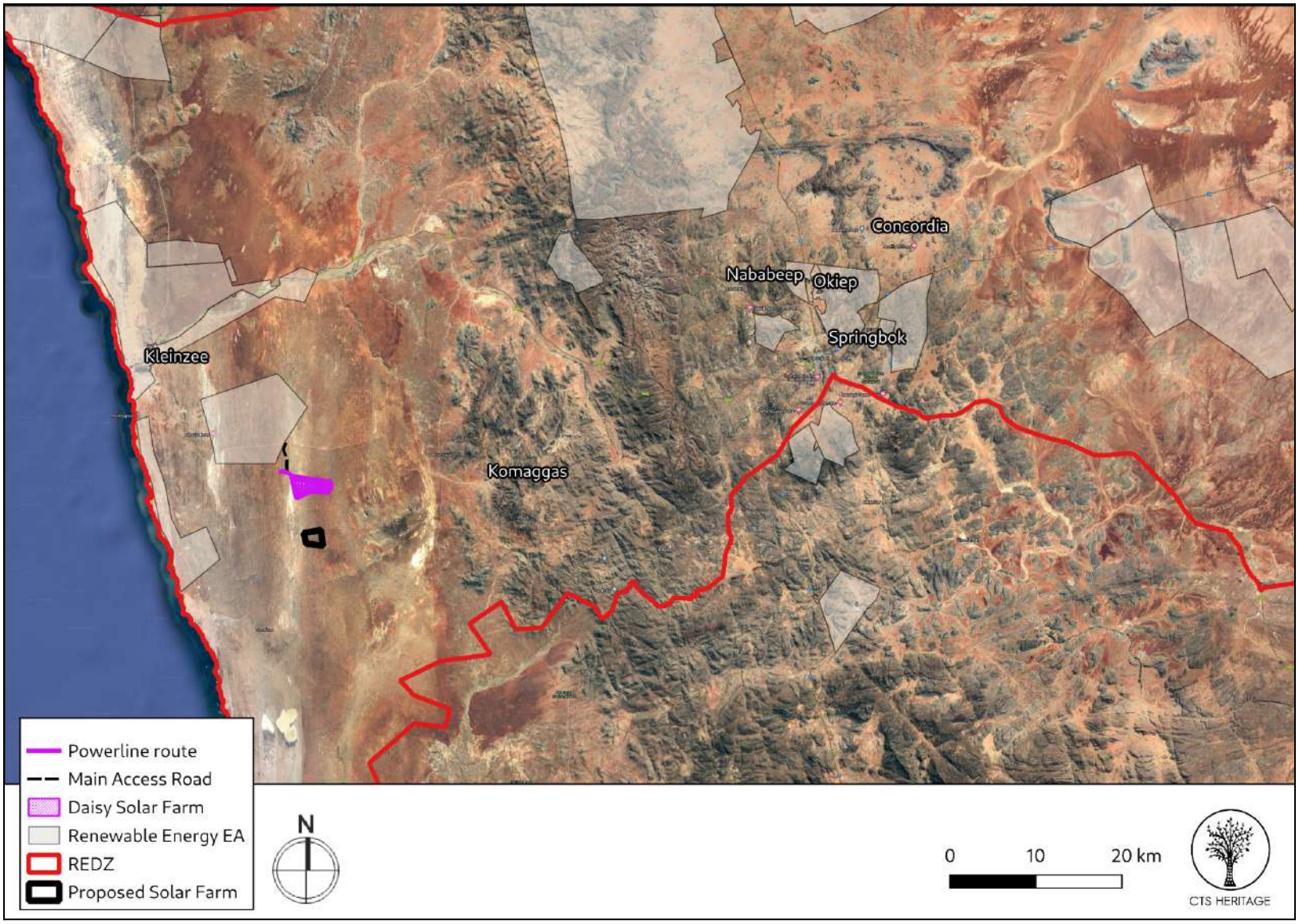

Figure 5: Map indicating the location of authorised renewable energy facilities in proximity to the proposed development

6. RESULTS OF PUBLIC CONSULTATION

The public consultation process will be undertaken by the EAP during the EIA. No heritage-related comments have been received to-date. SAHRA is required to comment on this HIA and make recommendations prior to the granting of the Environmental Authorisation.

7. CONCLUSION

The proposed development is proposed within a belt of approved renewable developments located within the Springbok REDZ. While infrastructure associated with the Namaqualand Copper Mining Cultural Landscape is known to exist in this area, the proposed development is located well-away from the heart of the Cultural Landscape as described in the tentative listing. It is not anticipated that the proposed development will negatively impact on significant cultural landscape resources.

The SAHRIS palaeosensitivity map indicates that the development area is underlain by sediments of zero and low palaeontological sensitivity. This assessment is endorsed by other palaeontological studies completed in the area. No impact to significant palaeontological heritage is therefore anticipated. However, it is recommended that the attached Chance Fossil Finds Procedure is implemented during the course of construction activities.

The overall archaeological sensitivity of the Namaqualand with regard to the preservation of Early, Middle and Later Stone Age archaeology as well as Khoe and San heritage, early colonial settlement and the Namaqualand Copper Mining landscape is regarded as very high. Despite this, the field assessment conducted for this project has demonstrated that the specific area proposed for development has low sensitivity for impacts to significant archaeological heritage. One structure of significance is known to be located in close proximity to the proposed development and it is recommended that this site be protected by the implementation of a no-go buffer area.

As indicated above, the results of this assessment align with the findings of other specialists in the area such as Orton (2021) who notes that ephemeral LSA scatters are the dominant archaeological signature of the area and are therefore not archaeologically significant.

8. RECOMMENDATIONS

There is no objection to the proposed development of the Daisy Solar PV Facilities in terms of impacts to heritage resources on condition that:

- The recommendations in the VIA must be implemented
- The attached Chance Fossil Finds Procedure (Appendix 3) is implemented during the course of construction activities.

- Should any buried archaeological resources or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. The South African Heritage Resources Agency (SAHRA) must be contacted immediately in order to determine an appropriate way forward.

9. REFERENCES

Heritage Impact Assessments				
Nid	**Report Type**	**Author/s**	**Date**	**Title**
252883	HIA	Jayson Orton	04/07/2012	Heritage Impact Assessment Report for Kleinzee Wind Energy Facility
252884	PIA Desktop	J Pether		Desktop Study - Palaeontological Impact Assessment for the Kleinzee Wind Farm
4476	AIA Phase 1	Dave Halkett, Timothy Hart	01/06/1997	An Archaeological Assessment of the Coastal Strip, and a Proposed Heritage Management Plan For: De Beers Namaqualand Mines Volume 2
4479	AIA Phase 1	Dave Halkett, Timothy Hart	01/03/2001	An Initial Assessment of Heritage Resources on the Coastal Farm, Brazil, Namaqualand
4484	AIA Phase 1	Hilary Deacon	22/04/2004	Specialist Report Heritage Impact Assessment Kornavlei Prospecting, near Komaggas, Northern Cape
16354	HIA Phase 1	Jayson Orton, Lita Webley	30/05/2012	Heritage Impact Assessment for the Proposed Project Blue Wind Energy Facility, Kleinzee, Namakwa Magisterial District, Northern Cape
573587	HIA Phase 1	Jayson Orton	19/05/2021	HIA (ARCHAEOLOGY, CULTURAL LANDSCAPE AND PALAEONTOLOGY) FOR KOMAS WEF
7871	AIA Phase 1	David Morris	04/12/2011	Sato Energy Holdings Zuurwater Photovoltaic energy generation facility development near Aggeneys, Northern Cape
368469	HIA	Lita Webley	01/05/2016	HISTORICAL OBSERVATIONS ON THE COPPER RAILWAY LINE BETWEEN ROOIWINKEL AND NABABEEP, NORTHERN CAPE

APPENDICES

APPENDIX 1: Heritage Screening Assessment (2022)

At the time of drafting the desktop Heritage Screening Assessments, Daisy and Namaqua PV Facilities were assessed separately. These projects were subsequently merged into one Project - the Daisy PV Facility.

Both desktop assessments are included below.

CTS HERITAGE

HERITAGE SCREENER

CTS Reference Number:	**CTS21_148**
SAHRA Ref Number	
Client:	**Savannah**
Date:	**May 2022**
Title:	**Proposed development of the Daisy Solar Energy Facilities in the Northern Cape**

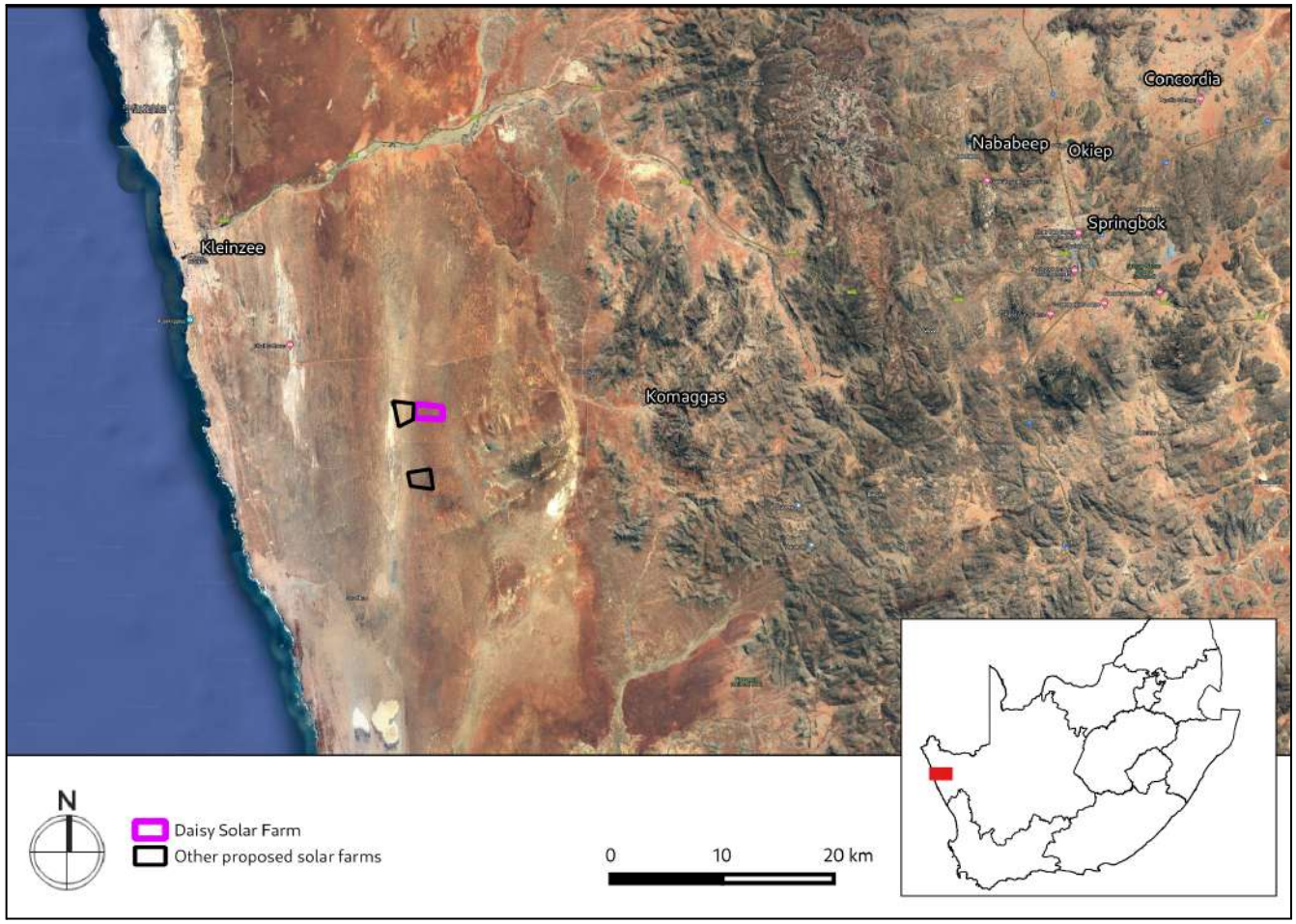

Figure 1a. Satellite map indicating the location of the proposed development in the Northern Cape Province

Recommendation:	**RECOMMENDATION** **The heritage resources in the area proposed for development are not yet sufficiently recorded** **Based on the available information, including the scale and nature of the proposed development, it is likely that significant heritage resources will be impacted by the proposed development and as such it is recommended that further heritage studies are required in terms of section 38 of the NHRA.**

CTS Heritage
238 Queens Road, Simons Town, Cape Town
Tel: +27 (0)87 073 5739 **Email:** info@ctsheritage.com **Web:** www.ctsheritage.com

CTS HERITAGE

1. Proposed Development Summary

The development of three (3) separate solar photovoltaic (PV) facilities, each with a contracted capacity of up to 100MW located approximately 15km southwest of the town of Komaggas, and 24km southeast of Kleinzee, within the Springbok REDZ. These projects are all located in the Nama Khoi Local Municipality within the Namakwa District Municipality, Northern Cape. The infrastructure associated with each 100MWac PV facility includes:

- Solar PV array comprising PV modules and mounting structures.
- Inverters and transformers.
- Low voltage cabling between the PV modules to the inverters
- 33kV cabling between the project components and the facility substation
- 33/132kV onsite facility substation.
- Battery Energy Storage System (BESS).
- Site offices and maintenance buildings, including workshop areas for maintenance and storage.
- Laydown areas.
- Site access and internal roads

This assessment is for the Daisy PV Facility

2. Application References

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

3. Property Information

Latitude / Longitude	
Erf number / Farm number	Farm Zonnekwa 326
Local Municipality	Nama Khoi
District Municipality	Namakwa
Province	Northern Cape
Current Use	Agriculture

Current Zoning	Agriculture

4. Nature of the Proposed Development

Total Surface Area	TBA
Depth of excavation (m)	TBA
Height of development (m)	TBA

5. Category of Development

x	**Triggers: Section 38(8) of the National Heritage Resources Act**
	Triggers: Section 38(1) of the National Heritage Resources Act
	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^2 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
	4. Rezoning of a site exceeding 10 000m^2
	5. Other (state):

6. Additional Infrastructure Required for this Development

TBA

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

Figure 1b Overview Map. Satellite image (2022) indicating the proposed development area

Figure 1c. Overview Map. Satellite image (2022) indicating the proposed development area at closer range.

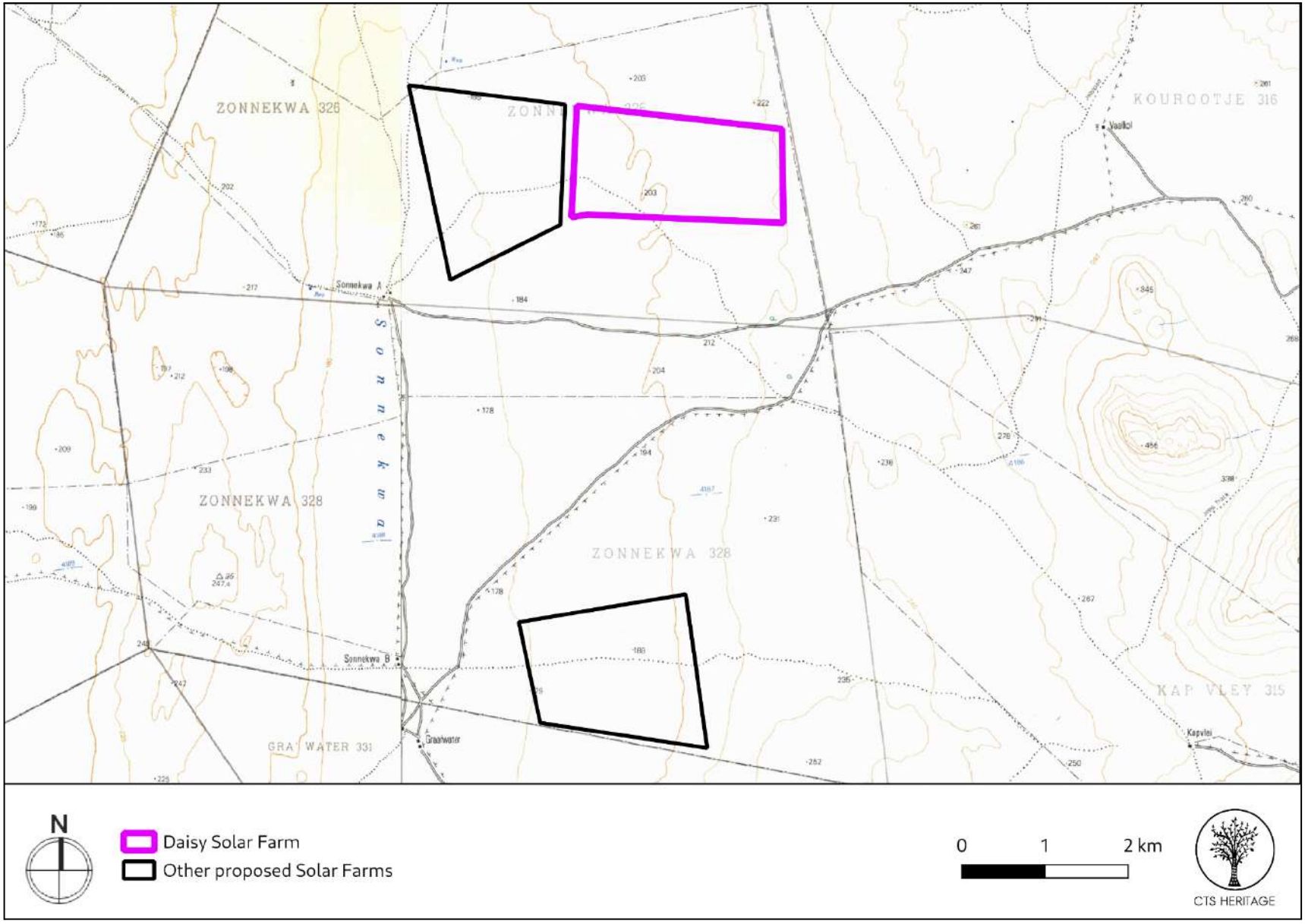

Figure 1d. Overview Map. Extract from the 1:50 000 Topo Map indicating the proposed development area.

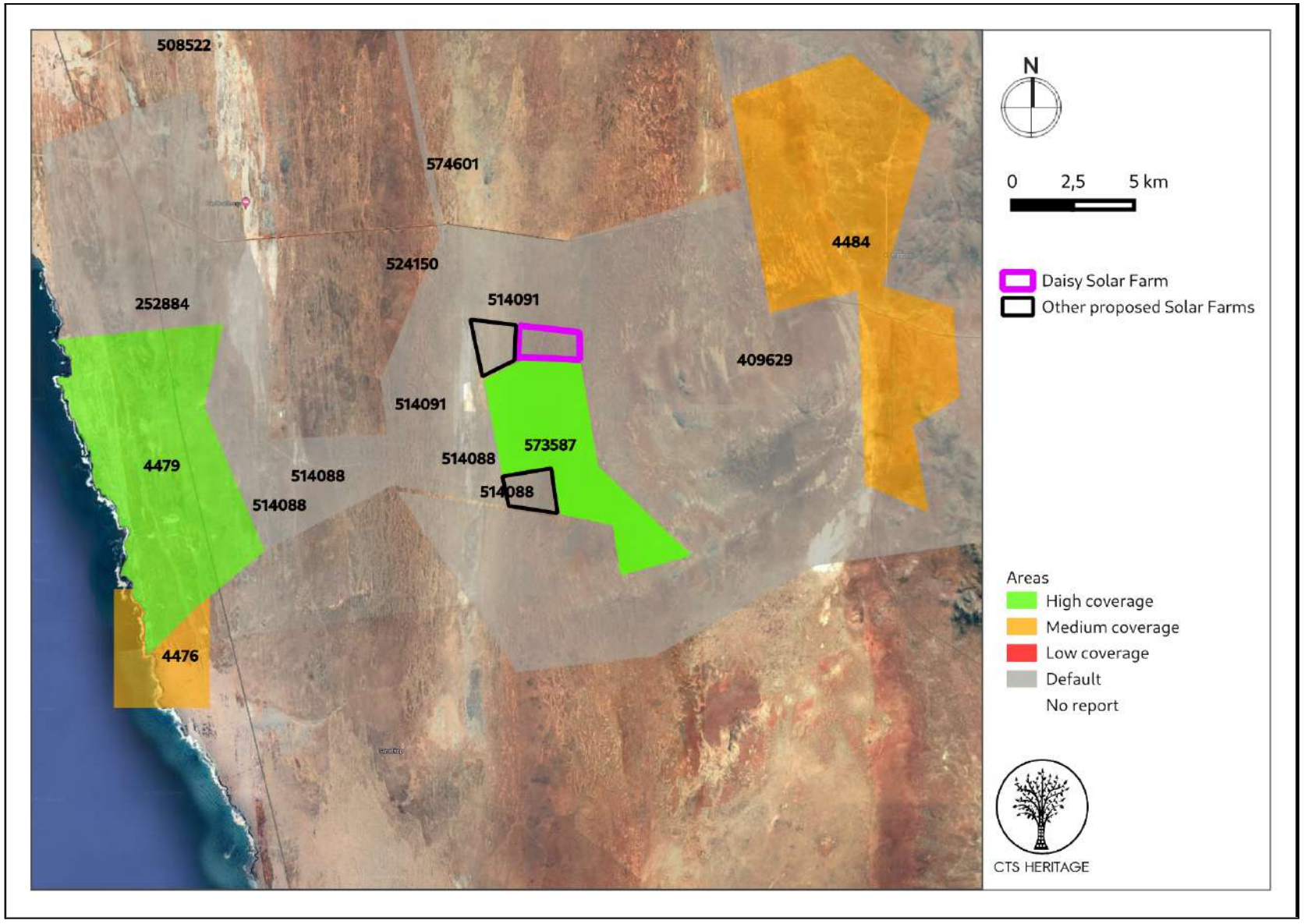

Figure 2. Previous HIAs Map. Previous Heritage Impact Assessments surrounding the proposed development area within 15km, with SAHRIS NIDS indicated. Please see Appendix 2 for a full reference list.

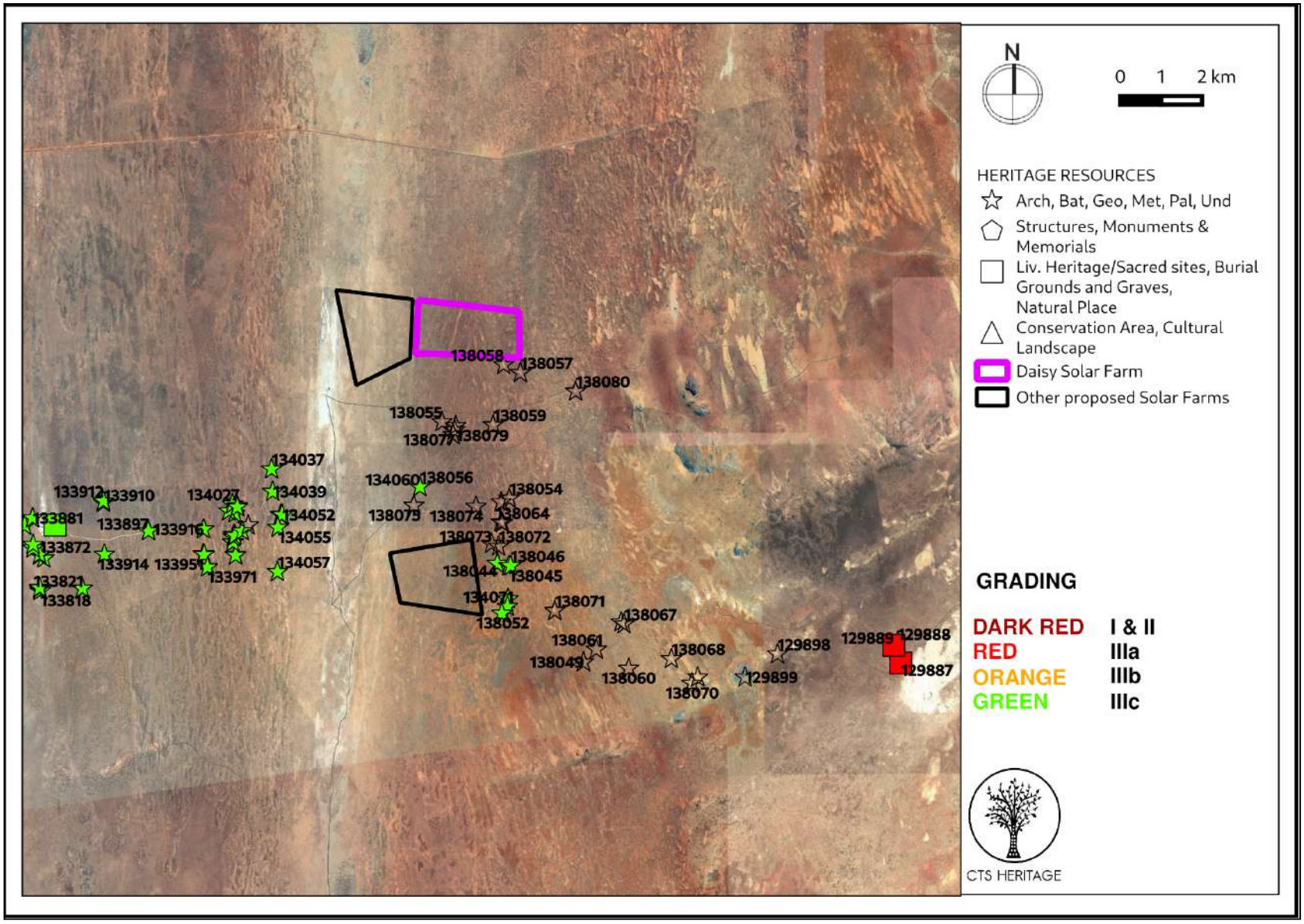

Figure 3. Heritage Resources Map. Heritage Resources previously identified in and near the study area, with SAHRIS Site IDs indicated. Please See Appendix 4 for full description of heritage resource types.

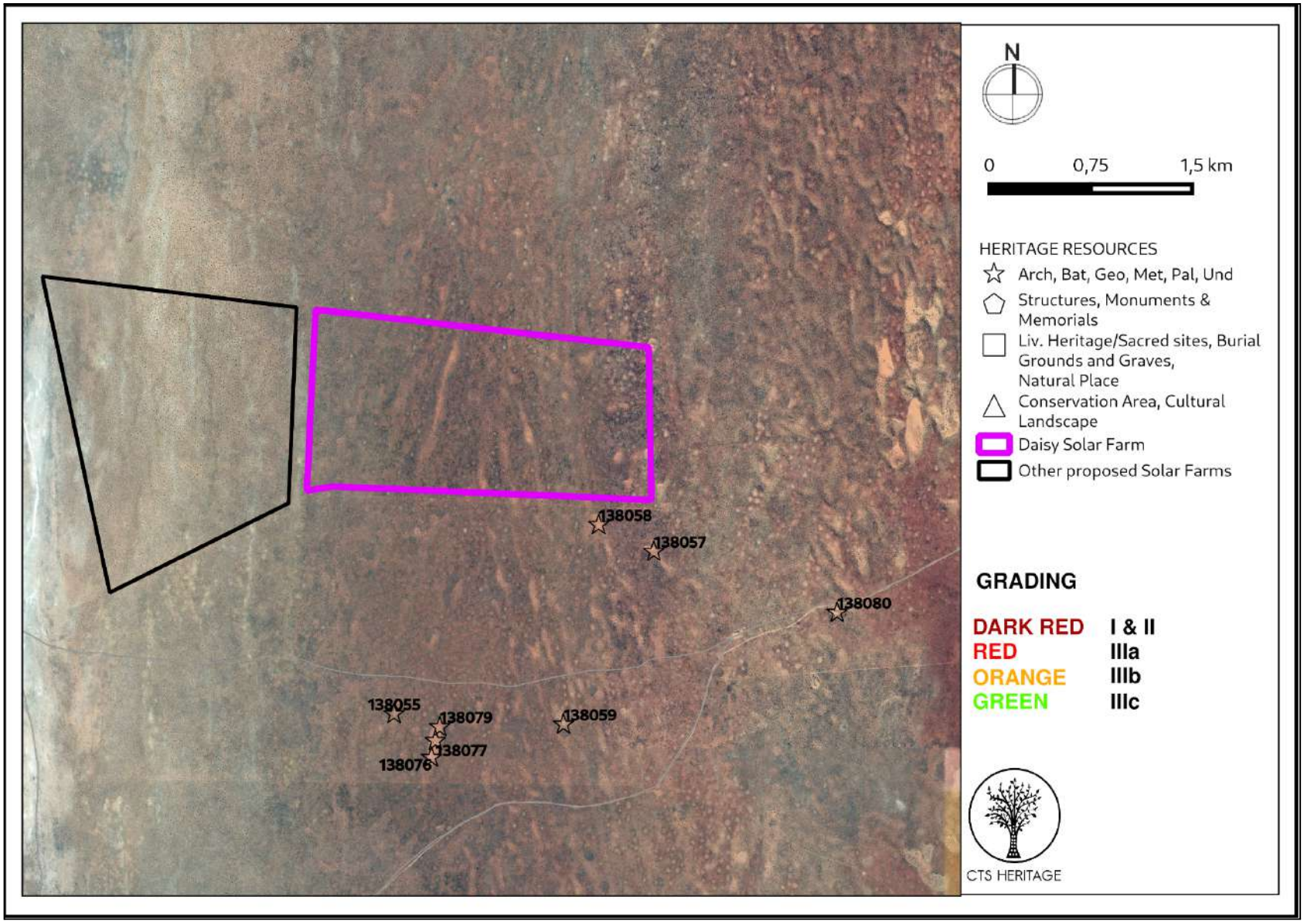

Figure 3a. Heritage Resources Map. Inset A

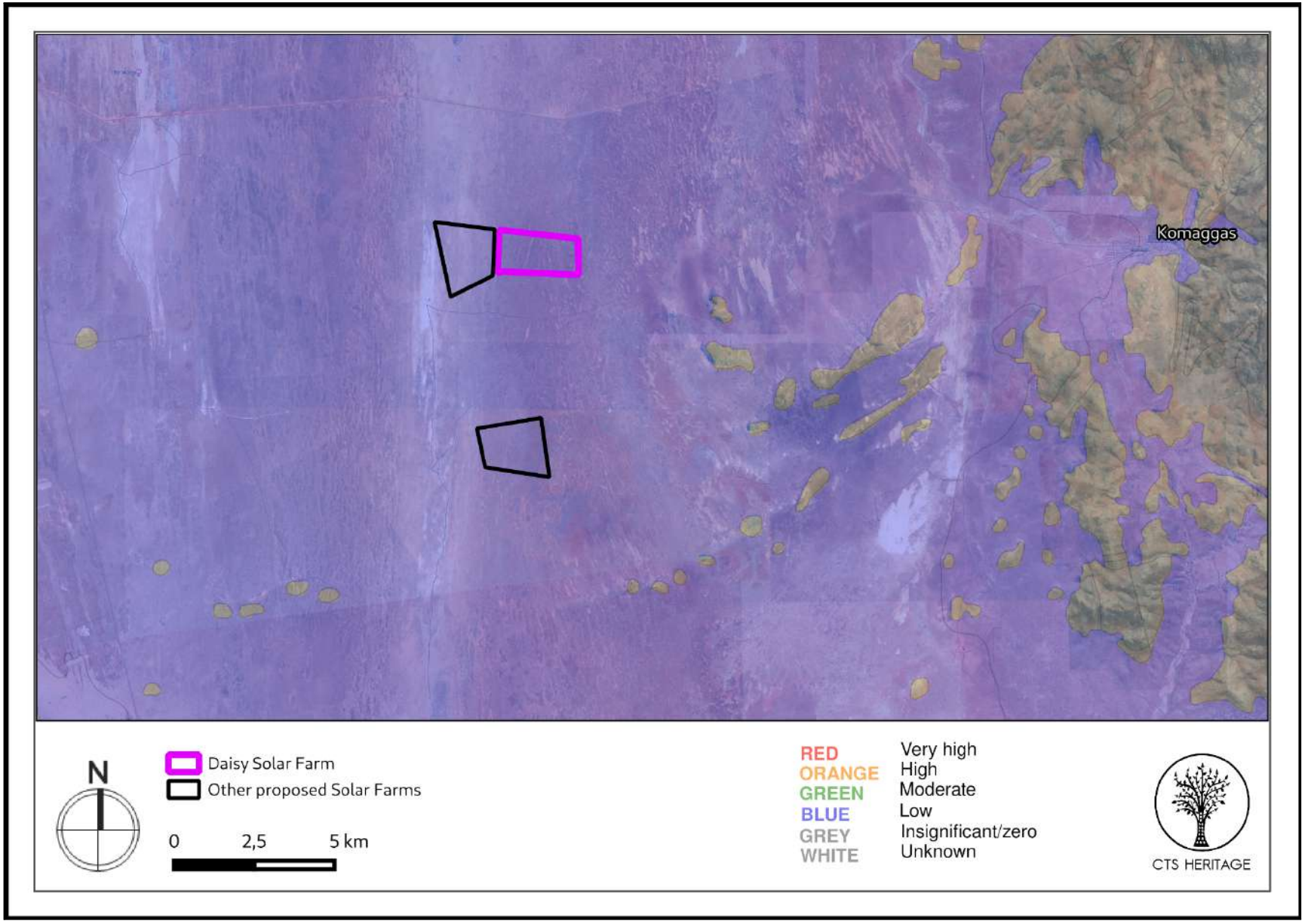

Figure 4. Palaeosensitivity Map. Indicating low and zero fossil sensitivity underlying the study area. Please See Appendix 3 for a full guide to the legend.

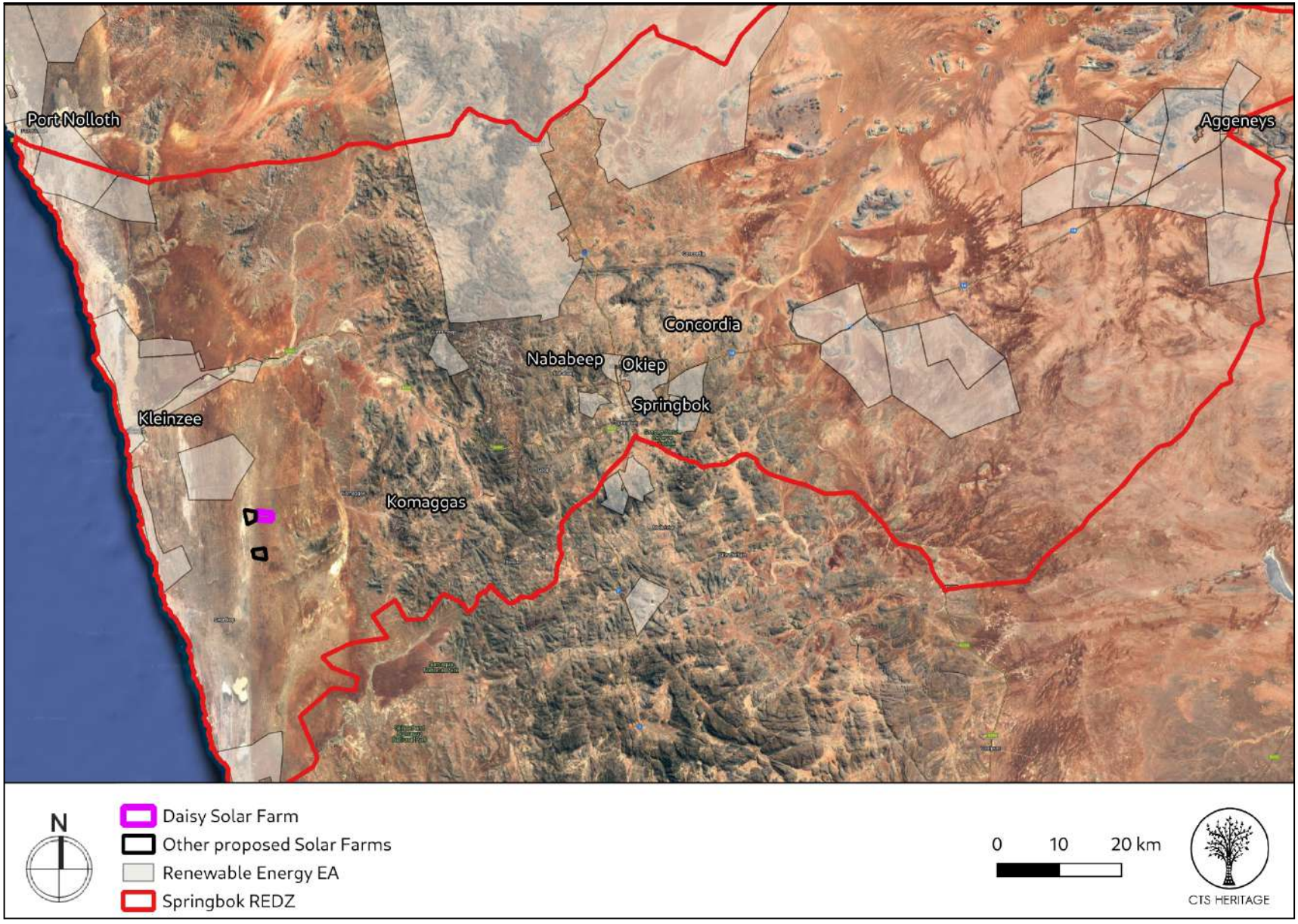

Figure 5. Renewable Energy EA Map. Renewable energy projects with Environmental Authorisation (EA)

8. Heritage statement and character of the area

Kleinsee was established as a small mining town in 1927. According to legend, a teacher by the name of De Villiers from the local farm school had built a new school and was looking for lime deposits with which to whitewash the walls. In his search, accompanied by a builder called Alberts, he kicked at a mound in the veld. This dislodged a diamond which was recorded as the first alluvial diamond found in this area. The resultant diamond rush opened up the Kleinsee 'crater', reminiscent of the 'Big Hole' at Kimberley and subsequently, this area became known as the Diamond Coast. In 2021, Orton (SAHRIS NID 573587) conducted a detailed HIA for a proposed WEF located immediately adjacent to the proposed development area. Orton (2021) describes the development context as dominated by undulating sandy plains, interspersed with deflation hollows. He identifies an elongated valley through this development area which he calls the Zonnekwa Valley (Orton, 2021). This feature is visible to the west of the proposed PV areas in Figure 1b.

Orton (2021) conducted an analysis of the cultural landscape of the broader context which is very relevant to this proposed development. Elements of significance that were identified include the mining towns and missionary stations of Kleinzee, Komaggas and Grootmis as well as the frontier nature of the landscape and the relationships between settlers and the indigenous Nama. Furthermore, in this resource-poor landscape, human occupation was always strongly linked to the presence of water. Orton (2021) notes that “In 1925 diamonds were discovered on the farm Oubeep, south of Port Nolloth, and in 1926 at Kleyne Zee, both by Jack Carstens. Mining commenced at the latter in 1927 and the town of Kleinsee was soon established (Rebelo 2003). Much of the coastline was then bought up for diamond mining and access for grazing was closed.” Orton’s field assessment confirmed that the area proposed for development is located in “a very remote area with little infrastructure. The study area lacks any sign of development aside from the gravel road passing through its northern part, although some recent/historical materials did betray a historical presence on the land.” Orton (2021) identified four farm werfs in the broader study area located outside of the development footprint. None of these were determined to have any heritage value. Interestingly, Orton (2021) identified many small stock posts in the Komaggas Reserve. He noted that “They generally have temporary structures, and sometimes caravans, as well as wire stock pens. Although these sites are modern, they are reminders of an important historical way of life practised by local Nama herders for at least the last two centuries since missionaries encouraged settlement. This effectively makes the Komaggas Reserve a living heritage site. Prior to this, the people would have been far more mobile and would likely have moved over greater distances.” Orton (2021) goes on o describe the cultural landscape as conveying “a sense of remoteness and inhospitability that is a result of the very frequent strong winds, the low scrubby vegetation and seemingly endless sand flats and dunes. While most of the broader landscape is fairly flat with the tallest anthropogenic features being wind pumps.” Orton (2021) concluded that “The historical/recent cultural landscape is deemed to have low-medium cultural significance for its aesthetic value but the archaeological cultural landscape is of medium significance for its scientific value and could be assigned a field rating of IIIB.”

As a result of mining applications in the area, much is known about the archaeology of the region which is dominated by Early, Middle and Later Stone Age artefact scatters. According to Orton and Webley (2012, SAHRIS NID 16354), “the archaeology of the coastal strip is generally well-understood as a result of the extensive survey and mitigation work carried out there. High quality data have been extracted from these sites, but further inland, very little work has been carried out”. In the immediate context of Kleinsee, Halkett et al (1997 SAHRIS ID 4496) conducted an impact assessment for proposed upgrades to the Kleinsee Golf Course. Halkett et al. (1997) identified three Later Stone Age shell midden archaeological sites and in the report, it was noted that none of the three sites contains assemblages which are considered worthy of further study. Just east of Kleinsee, a collection of Early Stone Age artefact sites was noted by De Beers mining staff in 2001. The artefacts were determined to be deflating from the soil vestiges onto the more resistant hardpan deposits below and were therefore no longer *in situ* (Halkett et al. 2002 SAHRIS NID 4482). These artefacts were collected and contribute to the record of archaeological resources from this area. In addition, a number of archaeological sites located to the north of the development area have been recorded by Orton (2016) on SAHRIS, however no information is available regarding the nature or significance of these archaeological resources (Figure 3b). Orton and Webley (2012, SAHRIS NID 16354) conducted a Heritage Impact Assessment for a proposed Wind Energy Facility located within 15km of the proposed development area. According to Orton and Webley (2012), “The survey revealed a large number of archaeological sites including deflated ESA and MSA artefact scatters (one with bone), LSA shell scatters and in situ shell middens, formal graveyards, and old structures. In some areas vast quantities of archaeological material was found to occur and such areas can be considered archaeological cultural landscapes. The local landscape itself also has value particularly where it forms the context for the settlement of Grootmis. Particularly significant archaeological finds were an ESA/MSA scatter with fossil bones preserved and a massive area of small shell scatters and middens in close proximity to the Buffels River near the point where fresh water was permanently available during historic (and presumably also pre-

colonial) times. The ESA material included predominantly flakes, cores and hand-axes but one cleaver was also found. MSA artefacts included flakes and cores and one bifacial point that may well be from the Still Bay period. LSA material included decorated pottery, retouched stone scrapers and *in situ* occurrences with generally higher research value."

Orton's assessment (2021) provides insight into the kinds of heritage resources likely to be impacted by the proposed development. Orton (2021) noted that "The region is well-known for its very high density of archaeological sites but their number and significance often decreases away from the coast. The survey revealed many small Later Stone Age archaeological sites with occasional historical artefacts also present. None of these was of high cultural significance." Based on Orton's findings (2021) it is unlikely that significant archaeological heritage resources will be impacted by the proposed development.

According to the SAHRIS Palaeosensitivity Map, the area proposed for development is underlain by scree/talus/alluvium grading into piedmont gravel of low palaeontological sensitivity. Pether (2011, SAHRIS NID 16355) conducted a PIA for a proposed development located approximately 10km away from the proposed development area. SImilar geology is present at this site. Pether (2011) noted that terrestrial deposits blanket the area. He goes on to note that "These deposits comprise the loose, surficial coversands and the underlying, older, "dorbank" compact, clayey deposits that also are chiefly aeolian sands, with the soils and pedocretes that have formed in them. Fossil bones are sparsely distributed on the palaeosurfaces within these deposits, but are locally abundant in contexts such as interdune deposits, carnivore bone accumulations in burrows and buried Stone Age sites. Trace fossils are ubiquitous and important palaeoenvironmental indicators. The significance rating is low for fossil potential as a consequence of the low probability of finding fossils in the terrestrial deposits.

Further observations in the surrounding area (Pether, 2020) indicate that the deposits are altered by pedogenic processes involving decalcification and the precipitation of pedocrete. Fossil shells are not preserved and fossil bone is very sparse. Pether (2020) notes that "the affected surficial formations include Holocene dunes of the Hardevlei Formation and earlier late Quaternary coversands of the Koekenaap Formation. Beneath these unconsolidated sands are compact, pedogenically-altered aeolianites termed the Dorbank Formation which are fossil dune plumes of later mid-Quaternary age." Orton (2021) elaborates that "the aeolian formations (Hardevlei and Koekenaap) are assumed to contain the typical fossil content seen in similar deposits elsewhere. The most common fossils are related to the ambient fossil content of dune sands, i.e. land snails, tortoise shells and mole bones. " Pether (2021) considers fossil finds to be unlikely. Given the low palaeontological potential, it is improbable that fossil bones will be encountered and no additional palaeontological study is recommended, however the attached Chance Fossil Finds Procedure must be implemented.

RECOMMENDATION

The heritage resources in the area proposed for development are not yet sufficiently recorded

Based on the available information, including the scale and nature of the proposed development, it is likely that significant heritage resources will be impacted by the proposed development and as such it is recommended that further heritage studies are required in terms of section 38 of the NHRA.

CTS HERITAGE

APPENDIX 1: List of heritage resources within 25km of the development area

Site ID	Site no	Full Site Name	Site Type	Grading
138044	KMWEF-001	Komas WEF	Artefacts	
138045	KMWEF-002	Komas WEF	Artefacts	
138046	KMWEF-003	KMWEF-003	Artefacts	
138047	KMWEF-004	Komas WEF	Artefacts	
138048	KMWEF-005	Komas WEF	Artefacts	
138049	KMWEF-006	Komas WEF	Deposit	
138052	KMWEF-007	Komas WEF	Artefacts	
138054	KMWEF-008	Komas WEF	Artefacts	
138055	KMWEF-009	Komas WEF	Artefacts	
138056	KMWEF-010	Komas WEF	Artefacts	
138057	KMWEF-011	Komas WEF	Artefacts	
138058	KMWEF-012	Komas WEF	Artefacts	
138059	KMWEF-013	Komas WEF	Artefacts	
138060	KMWEF-014	Komas WEF	Artefacts	
138061	KMWEF-015	Komas WEF	Artefacts	
138062	KMWEF-016	Komas WEF	Artefacts	
138063	KMWEF-017	Komas WEF	Artefacts	

138064	KMWEF-018	Komas WEF	Artefacts	
138065	KMWEF-019	Komas WEF	Artefacts	
138067	KMWEF-020	Komas WEF	Artefacts	
138068	KMWEF-021	Komas WEF	Artefacts	
138069	KMWEF-022	Komas WEF	Artefacts	
138070	KMWEF-023	Komas WEF	Artefacts	
138071	KMWEF-024	Komas WEF	Artefacts	
138072	KMWEF-025	Komas WEF	Artefacts	
138073	KMWEF-026	Komas WEF	Artefacts	
138074	KMWEF-027	Komas WEF	Artefacts	
138075	KMWEF-028	Komas WEF	Artefacts	
138076	KMWEF-029	Komas WEF	Artefacts	
138077	KMWEF-030	Komas WEF	Artefacts	
138079	KMWEF-031	Komas WEF	Artefacts	
138080	KMWEF-032	Komas WEF	Artefacts	
129887	2917CD/Wind/Kap Vley Farm 315/site PAN2017/001.	Grave	Burial Grounds & Graves	Grade IIIa
129888	2917CD/Wind/Kap Vley Farm 315/site PAN2017/002	Archaeological site	Archaeological	Grade IV
129889	2917CD/Wind/Kap Vley Farm 315/site	Graveyard	Burial Grounds &	Grade IIIa

	PAN2017/003		Graves	
129898	2917CD/Wind/Kap Vley Farm 315/site KAP2017/001	Stone artefacts	Artefacts	Grade IV
129899	2917CD/Wind/Kap Vley Farm 315/site KAP2017/002	Archaeological site	Archaeological	Grade IV
133864	NWF037	Namas Wind Farm	Artefacts	Grade IIIc
133897	NWF044	Namas Wind Farm	Artefacts	Grade IIIc
133910	NWF045	Namas Wind Farm	Artefacts, Shell Midden	Grade IIIc
133912	NWF046	Namas Wind Farm	Artefacts, Shell Midden	Grade IIIc
133914	NWF047	Namas Wind Farm	Artefacts, Shell Midden	Grade IIIc
133916	NWF048	Namas Wind Farm	Artefacts	Grade IIIc
133948	NWF049	Namas Wind Farm	Artefacts	Grade IIIc
133951	NWF050	Namas Wind Farm	Artefacts	Grade IIIc
133971	NWF051	Namas Wind Farm	Artefacts, Shell Midden	Grade IIIc
133972	NWF052	Namas Wind Farm	Artefacts, Shell Midden	Grade IIIc
133974	NWF053	Namas Wind Farm	Artefacts, Shell Midden	Grade IIIc
133976	NWF054	Namas Wind Farm	Artefacts	Grade IIIc
133979	NWF055	Namas Wind Farm	Artefacts	Grade IIIc
133983	NWF056	Namas Wind Farm	Artefacts	Grade IIIc
133986	NWF057	Namas Wind Farm	Artefacts	Grade IIIc

133994	NWF058	Namas Wind Farm	Artefacts	Grade IIIc
134000	NWF059	Namas Wind Farm	Artefacts	Grade IIIc
134002	NWF060	Namas Wind Farm	Artefacts, Shell Midden	
134019	NWF061	Namas Wind Farm	Artefacts	Grade IIIc
134024	NWF062	Namas Wind Farm	Artefacts	Grade IIIc
134027	NWF063	Namas Wind Farm	Artefacts	Grade IIIc
134030	NWF064	Namas Wind Farm	Artefacts	Grade IIIc
134034	NWF065	Namas Wind Farm	Artefacts	Grade IIIc
134037	NWF066	Namas Wind Farm	Artefacts	Grade IIIc
134039	NWF067	Namas Wind Farm	Artefacts	Grade IIIc
134050	NWF068	Namas Wind Farm	Artefacts	Grade IIIc
134052	NWF069	Namas Wind Farm	Artefacts	Grade IIIc
134055	NWF070	Namas Wind Farm	Artefacts	Grade IIIc
134057	NWF071	Namas Wind Farm	Artefacts	Grade IIIc
134060	NWF072	Namas Wind Farm	Artefacts	Grade IIIc
134062	NWF073	Namas Wind Farm	Artefacts	Grade IIIc
134067	NWF074		Artefacts	Grade IIIc
134069	NWF075	Namas Wind Farm	Artefacts	Grade IIIc
134070	NWF076	Namas Wind Farm	Artefacts	Grade IIIc

134071	NWF077	Namas Wind Farm	Artefacts	Grade IIIc
134072	NWF078	Namas Wind Farm	Artefacts	Grade IIIc
134073	NWF079	Namas Wind Farm	Burial Grounds & Graves	Grade IIIc

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APPENDIX 2: Reference List

Heritage Impact Assessments				
Nid	**Report Type**	**Author/s**	**Date**	**Title**
252883	HIA	Jayson Orton	04/07/2012	Heritage Impact Assessment Report for Kleinzee Wind Energy Facility
252884	PIA Desktop	J Pether		Desktop Study - Palaeontological Impact Assessment for the Kleinzee Wind Farm
4476	AIA Phase 1	Dave Halkett, Timothy Hart	01/06/1997	An Archaeological Assessment of the Coastal Strip, and a Proposed Heritage Management Plan For: De Beers Namaqualand Mines Volume 2
4479	AIA Phase 1	Dave Halkett, Timothy Hart	01/03/2001	An Initial Assessment of Heritage Resources on the Coastal Farm, Brazil, Namaqualand
4484	AIA Phase 1	Hilary Deacon	22/04/2004	Specialist Report Heritage Impact Assessment Kornavlei Prospecting, near Komaggas, Northern Cape
16354	HIA Phase 1	Jayson Orton, Lita Webley	30/05/2012	Heritage Impact Assessment for the Proposed Project Blue Wind Energy Facility, Kleinzee, Namakwa Magisterial District, Northern Cape
573587	HIA Phase 1	Jayson Orton	19/05/2021	HIA (ARCHAEOLOGY, CULTURAL LANDSCAPE AND PALAEONTOLOGY) FOR KOMAS WEF

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APPENDIX 3 - Keys/Guides

Key/Guide to Acronyms

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

Full guide to Palaeosensitivity Map legend

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

CTS HERITAGE

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.

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

- 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.

CTS HERITAGE

HERITAGE SCREENER

CTS Reference Number:	**CTS21_148**
SAHRA Ref Number	
Client:	**Savannah**
Date:	**May 2022**
Title:	**Proposed development of the Namaqua Solar Energy Facilities in the Northern Cape**

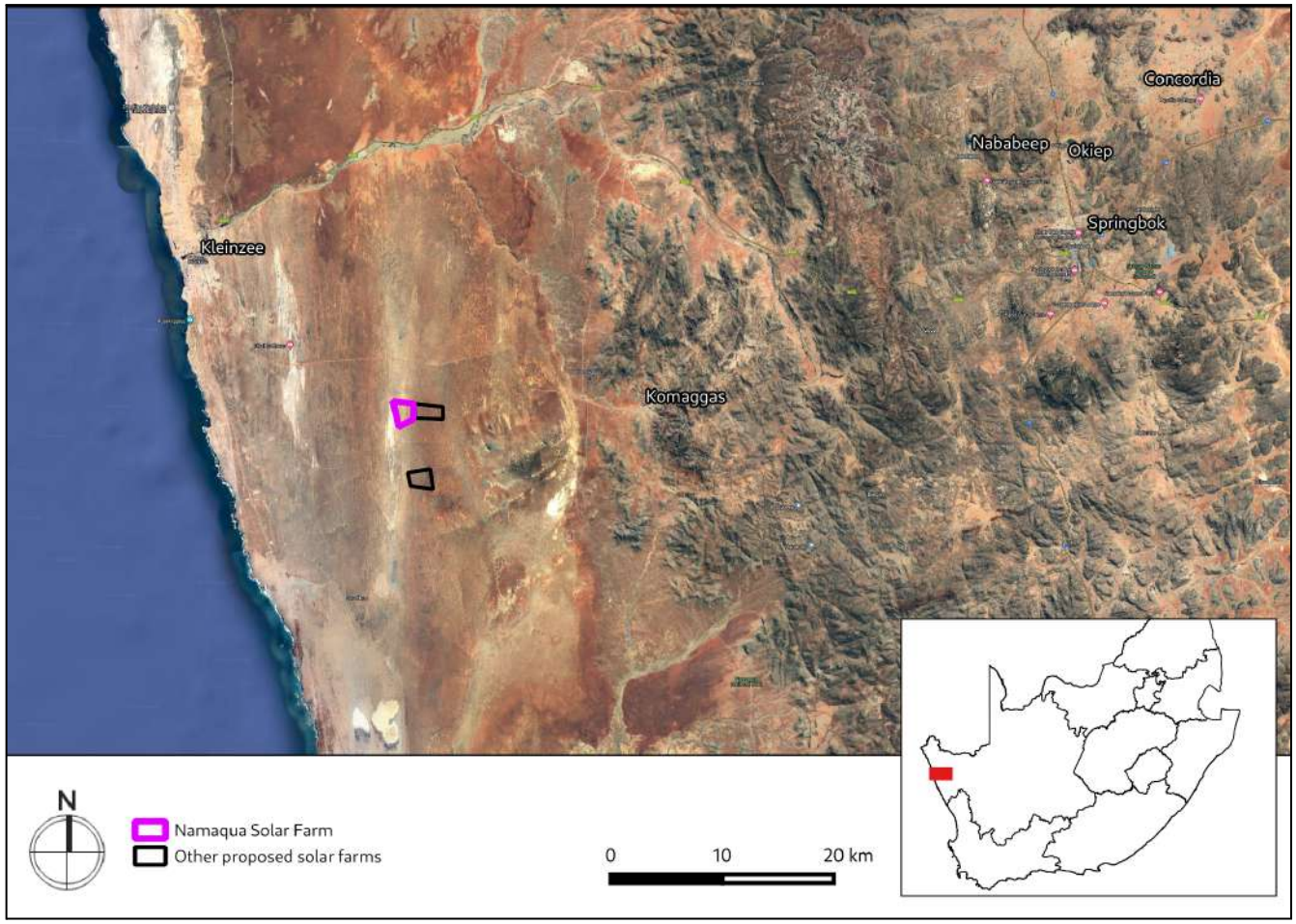

Figure 1a. Satellite map indicating the location of the proposed development in the Northern Cape Province

Recommendation:	**RECOMMENDATION** **The heritage resources in the area proposed for development are not yet sufficiently recorded** **Based on the available information, including the scale and nature of the proposed development, it is likely that significant heritage resources will be impacted by the proposed development and as such it is recommended that further heritage studies are required in terms of section 38 of the NHRA.**

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CTS HERITAGE

1. Proposed Development Summary

The development of three (3) separate solar photovoltaic (PV) facilities, each with a contracted capacity of up to 100MW located approximately 15km southwest of the town of Komaggas, and 24km southeast of Kleinzee, within the Springbok REDZ. These projects are all located in the Nama Khoi Local Municipality within the Namakwa District Municipality, Northern Cape. The infrastructure associated with each 100MWac PV facility includes:

- Solar PV array comprising PV modules and mounting structures.
- Inverters and transformers.
- Low voltage cabling between the PV modules to the inverters
- 33kV cabling between the project components and the facility substation
- 33/132kV onsite facility substation.
- Battery Energy Storage System (BESS).
- Site offices and maintenance buildings, including workshop areas for maintenance and storage.
- Laydown areas.
- Site access and internal roads

This assessment is for the Namaqua PV Facility

2. Application References

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

3. Property Information

Latitude / Longitude	
Erf number / Farm number	Farm Zonnekwa 326
Local Municipality	Nama Khoi
District Municipality	Namakwa
Province	Northern Cape
Current Use	Agriculture

Current Zoning	Agriculture

4. Nature of the Proposed Development

Total Surface Area	TBA
Depth of excavation (m)	TBA
Height of development (m)	TBA

5. Category of Development

x	**Triggers: Section 38(8) of the National Heritage Resources Act**
	Triggers: Section 38(1) of the National Heritage Resources Act
	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^2 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
	4. Rezoning of a site exceeding 10 000m^2
	5. Other (state):

6. Additional Infrastructure Required for this Development

TBA

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

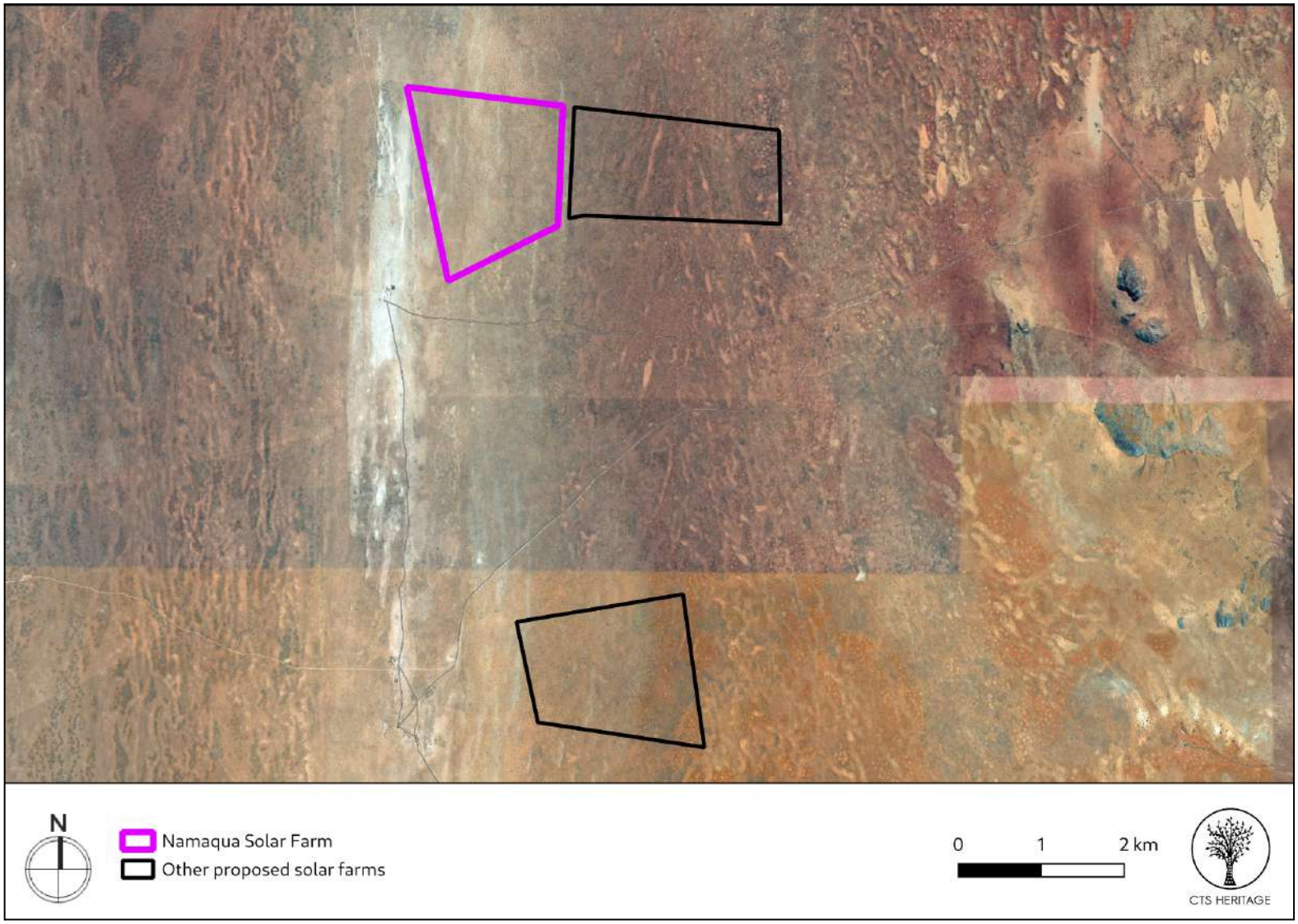

Figure 1b Overview Map. Satellite image (2022) indicating the proposed development area

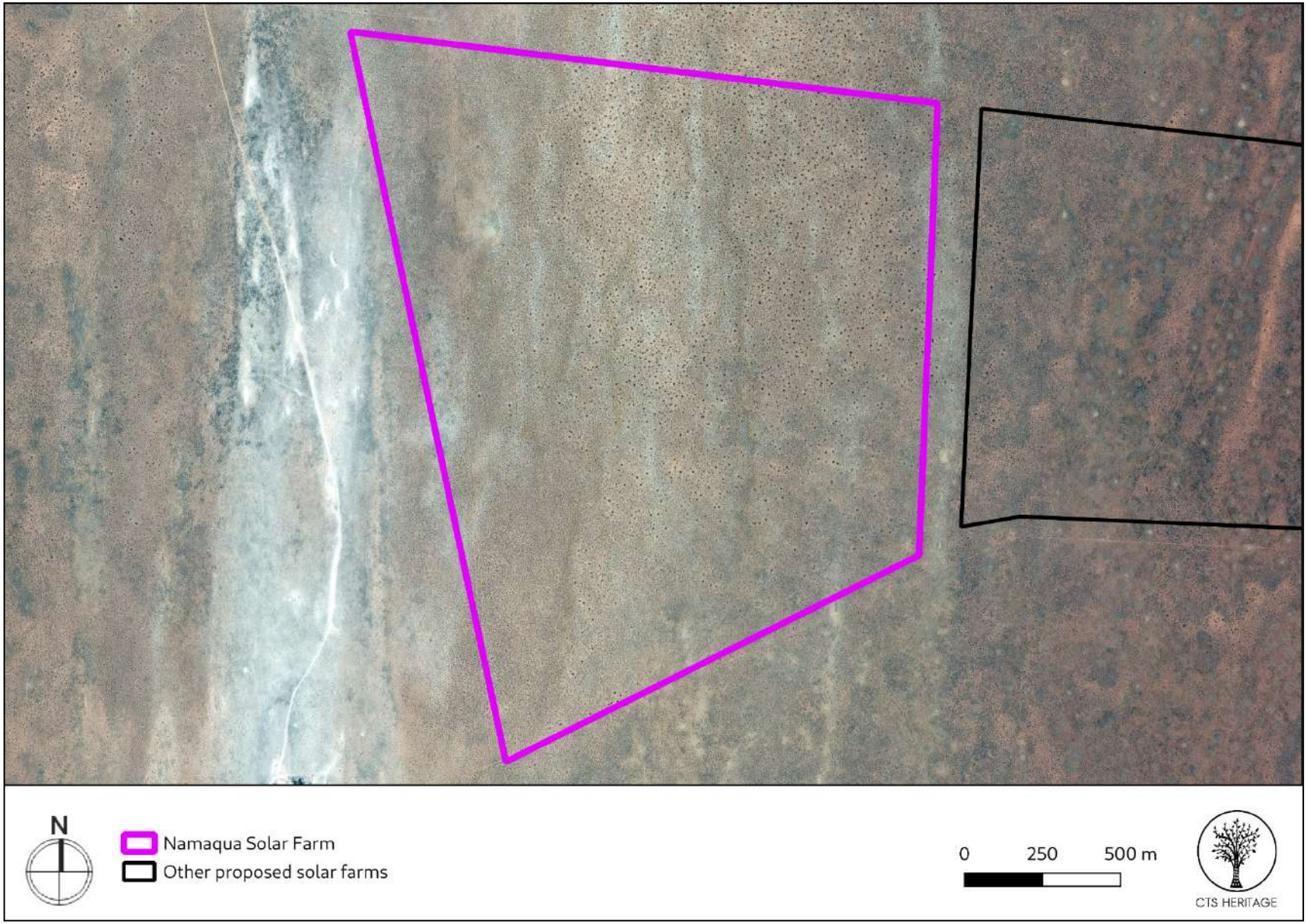

Figure 1c. Overview Map. Satellite image (2022) indicating the proposed development area at closer range.

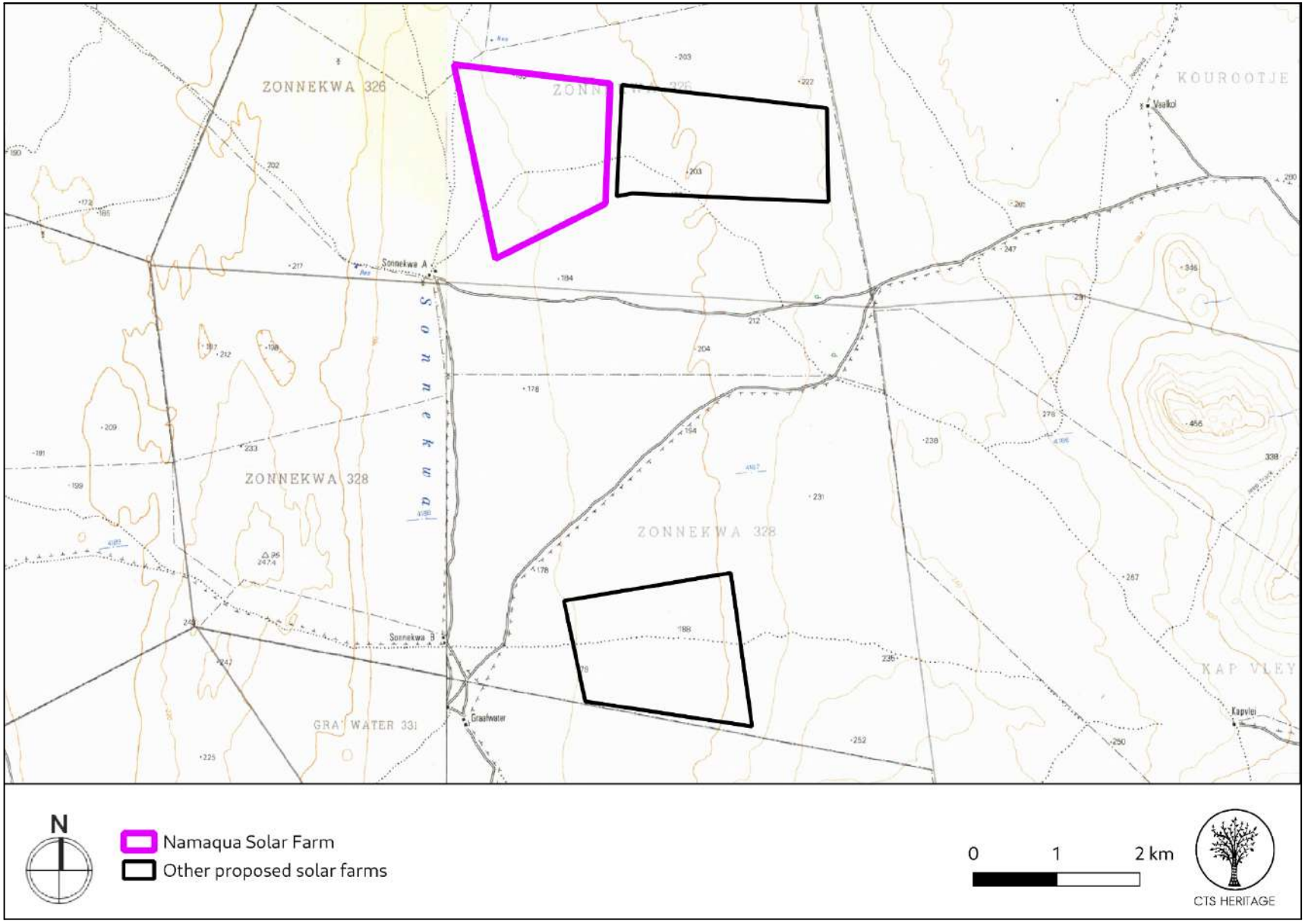

Figure 1d. Overview Map. Extract from the 1:50 000 Topo Map indicating the proposed development area.

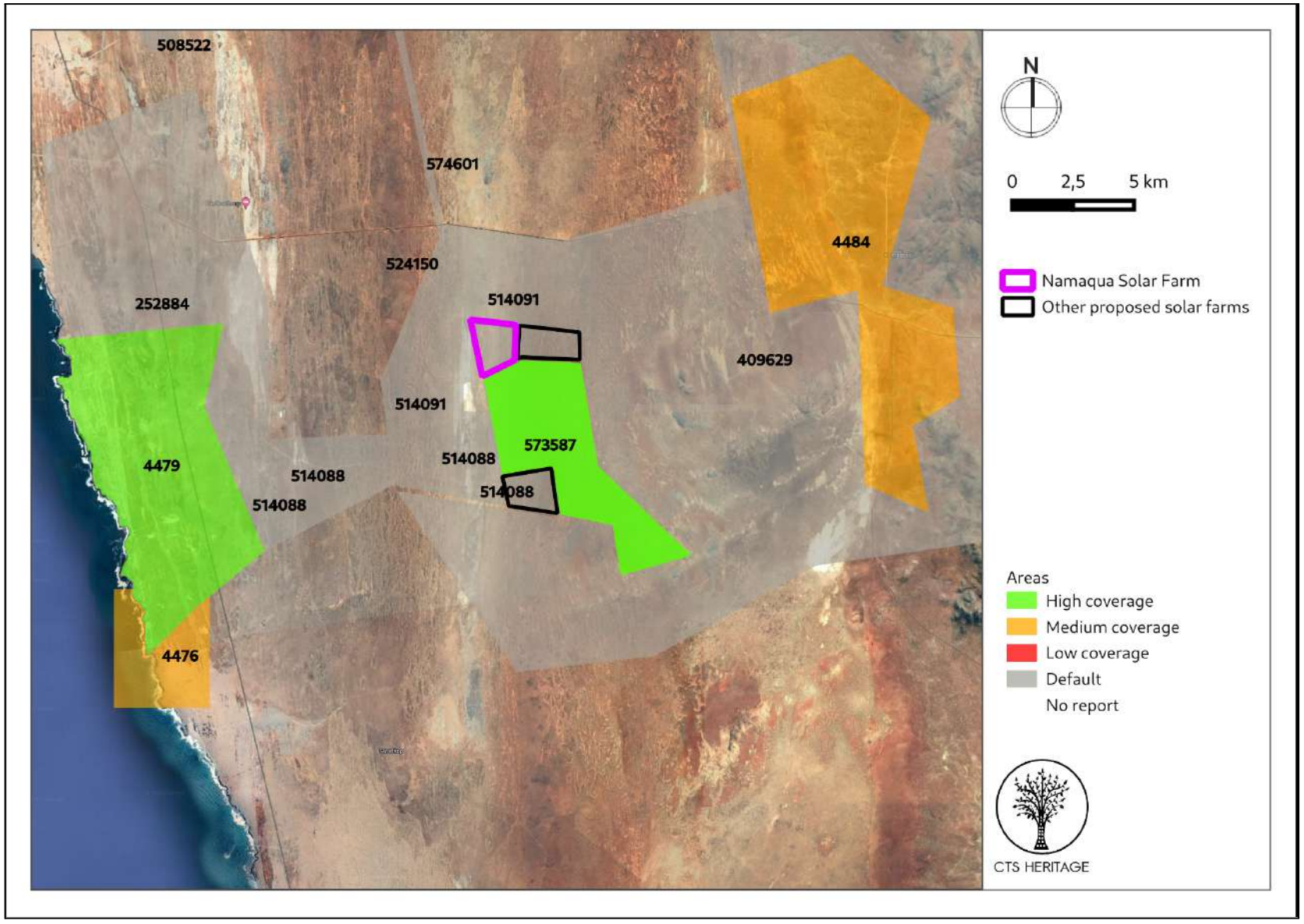

Figure 2. Previous HIAs Map. Previous Heritage Impact Assessments surrounding the proposed development area within 15km, with SAHRIS NIDS indicated. Please see Appendix 2 for a full reference list.

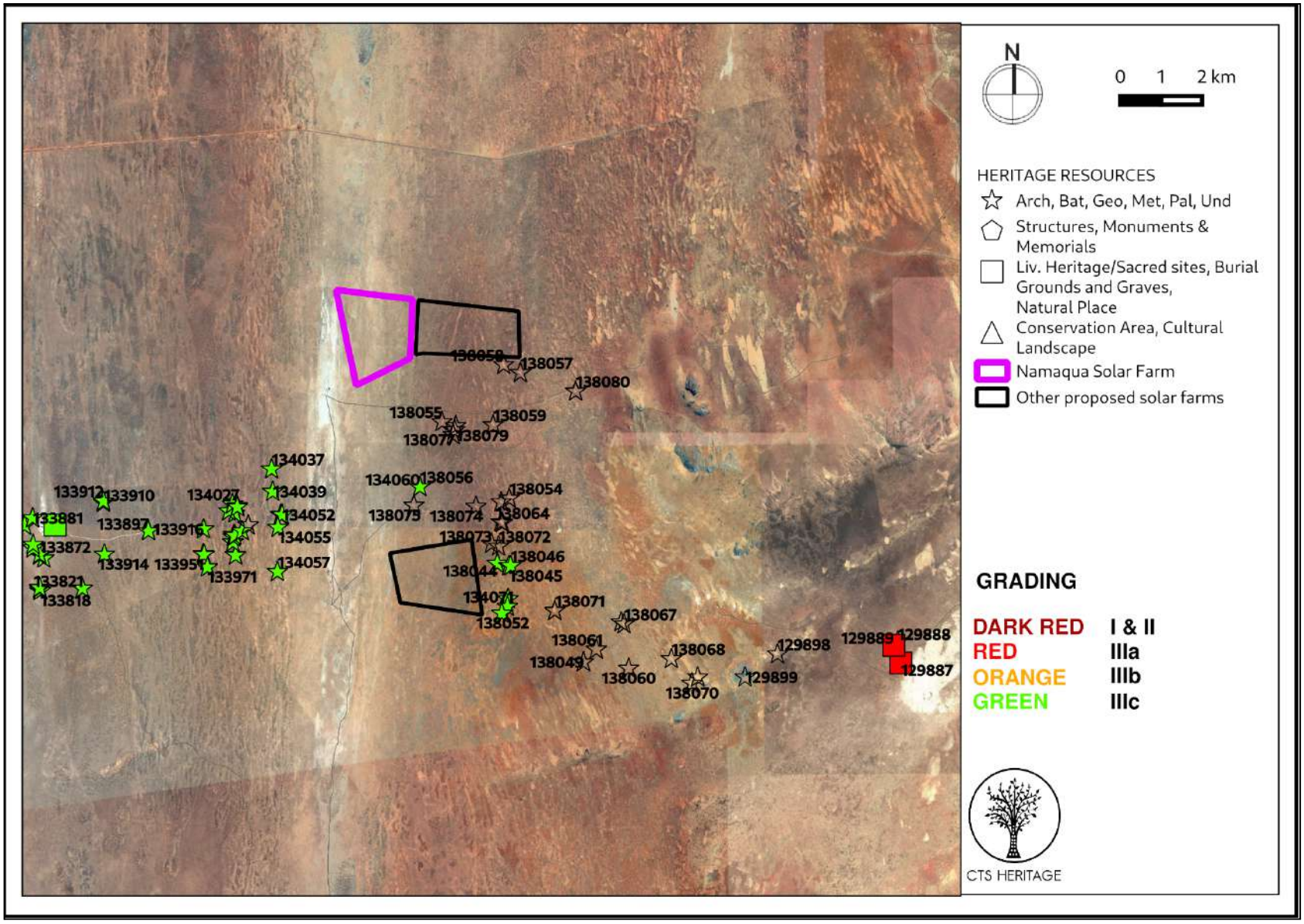

Figure 3. Heritage Resources Map. Heritage Resources previously identified in and near the study area, with SAHRIS Site IDs indicated. Please See Appendix 4 for full description of heritage resource types.

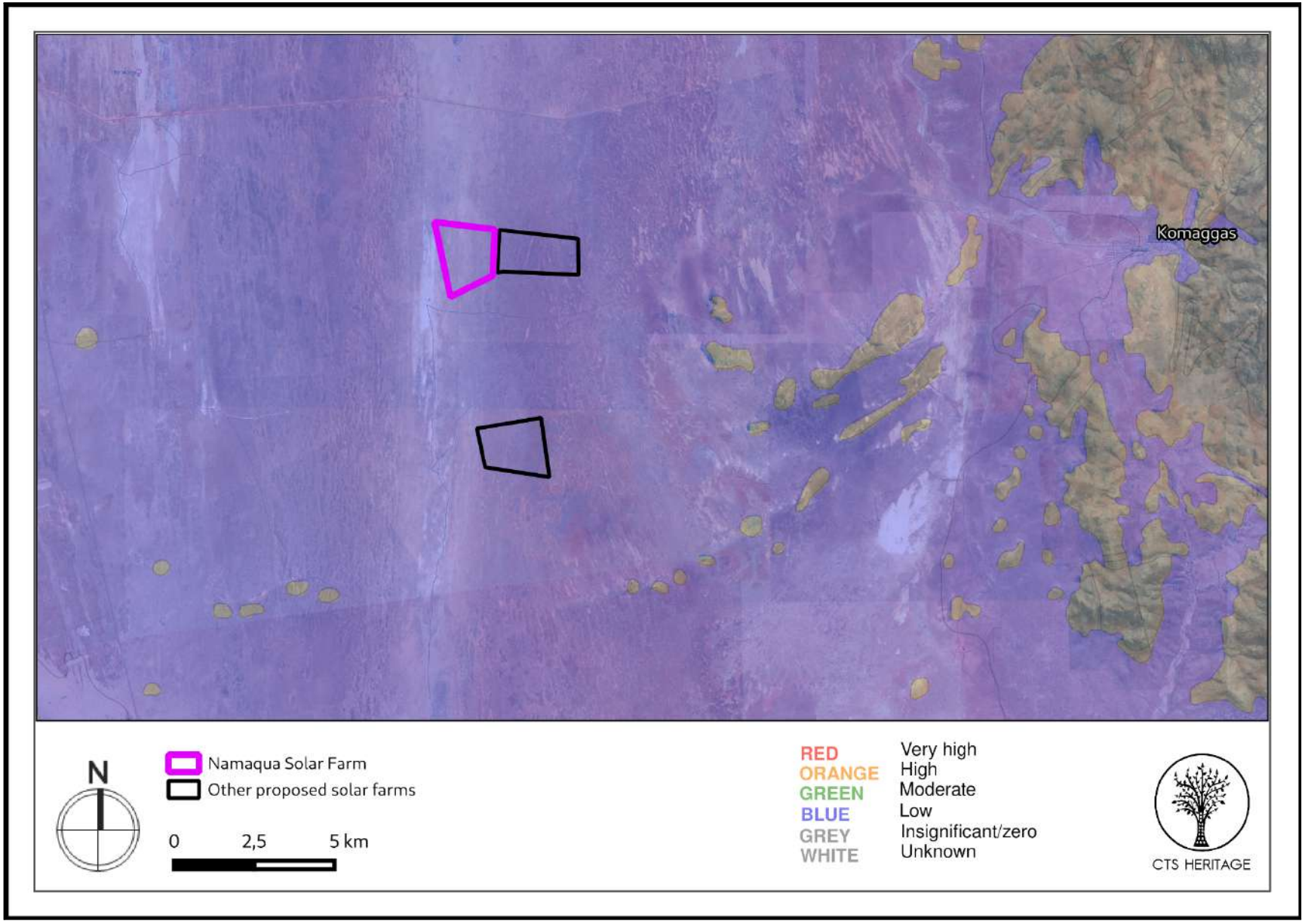

Figure 4. Palaeosensitivity Map. Indicating low and zero fossil sensitivity underlying the study area. Please See Appendix 3 for a full guide to the legend.

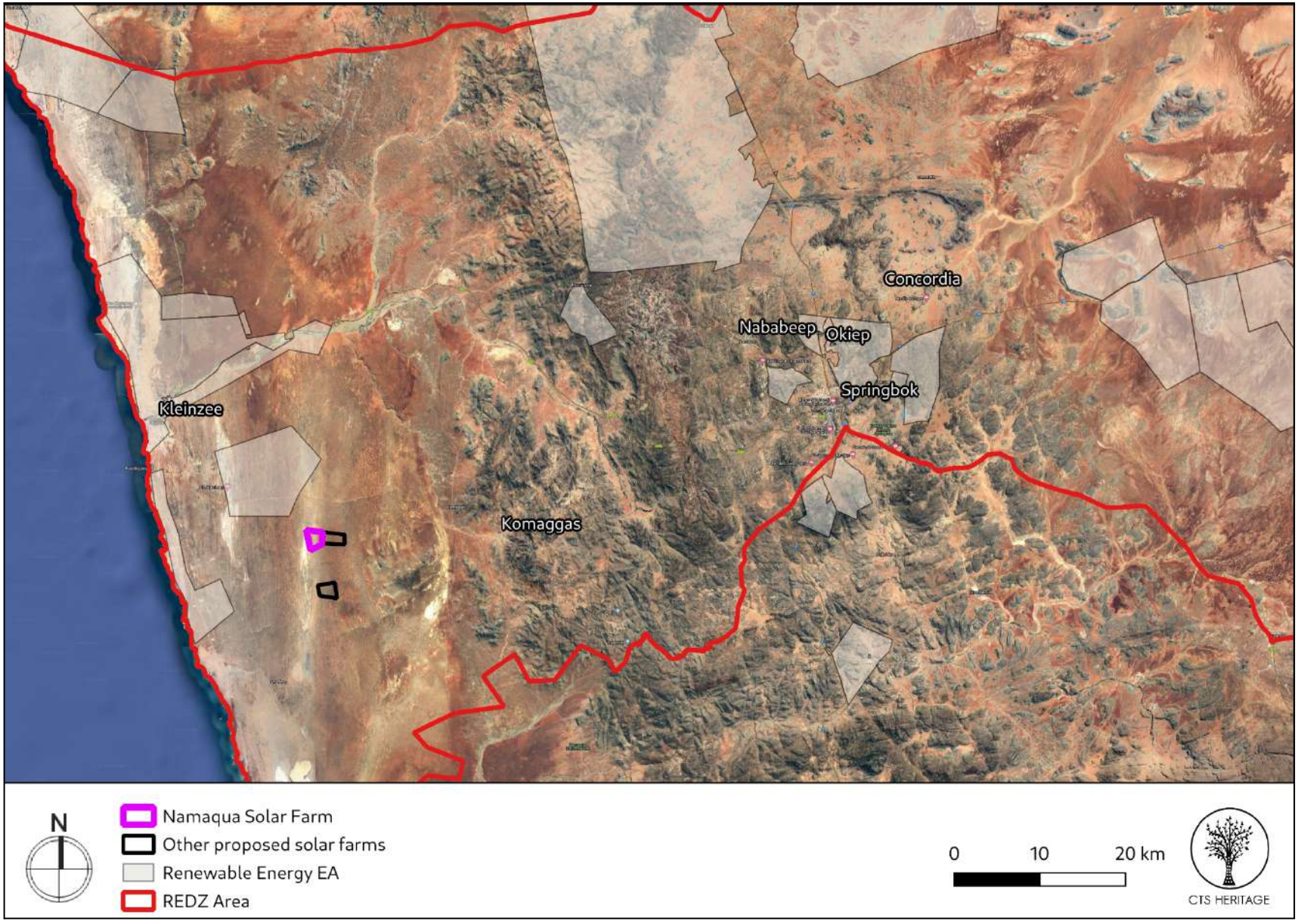

Figure 5. Renewable Energy EA Map. Renewable energy projects with Environmental Authorisation (EA)

8. Heritage statement and character of the area

Kleinsee was established as a small mining town in 1927. According to legend, a teacher by the name of De Villiers from the local farm school had built a new school and was looking for lime deposits with which to whitewash the walls. In his search, accompanied by a builder called Alberts, he kicked at a mound in the veld. This dislodged a diamond which was recorded as the first alluvial diamond found in this area. The resultant diamond rush opened up the Kleinsee 'crater', reminiscent of the 'Big Hole' at Kimberley and subsequently, this area became known as the Diamond Coast. In 2021, Orton (SAHRIS NID 573587) conducted a detailed HIA for a proposed WEF located immediately adjacent to the proposed development area. Orton (2021) describes the development context as dominated by undulating sandy plains, interspersed with deflation hollows. He identifies an elongated valley through this development area which he calls the Zonnekwa Valley (Orton, 2021). This feature is visible to the west of the proposed PV areas in Figure 1b.

Orton (2021) conducted an analysis of the cultural landscape of the broader context which is very relevant to this proposed development. Elements of significance that were identified include the mining towns and missionary stations of Kleinzee, Komaggas and Grootmis as well as the frontier nature of the landscape and the relationships between settlers and the indigenous Nama. Furthermore, in this resource-poor landscape, human occupation was always strongly linked to the presence of water. Orton (2021) notes that “In 1925 diamonds were discovered on the farm Oubeep, south of Port Nolloth, and in 1926 at Kleyne Zee, both by Jack Carstens. Mining commenced at the latter in 1927 and the town of Kleinsee was soon established (Rebelo 2003). Much of the coastline was then bought up for diamond mining and access for grazing was closed.” Orton’s field assessment confirmed that the area proposed for development is located in “a very remote area with little infrastructure. The study area lacks any sign of development aside from the gravel road passing through its northern part, although some recent/historical materials did betray a historical presence on the land.” Orton (2021) identified four farm werfs in the broader study area located outside of the development footprint. None of these were determined to have any heritage value. Interestingly, Orton (2021) identified many small stock posts in the Komaggas Reserve. He noted that “They generally have temporary structures, and sometimes caravans, as well as wire stock pens. Although these sites are modern, they are reminders of an important historical way of life practised by local Nama herders for at least the last two centuries since missionaries encouraged settlement. This effectively makes the Komaggas Reserve a living heritage site. Prior to this, the people would have been far more mobile and would likely have moved over greater distances.” Orton (2021) goes on o describe the cultural landscape as conveying “a sense of remoteness and inhospitability that is a result of the very frequent strong winds, the low scrubby vegetation and seemingly endless sand flats and dunes. While most of the broader landscape is fairly flat with the tallest anthropogenic features being wind pumps.” Orton (2021) concluded that “The historical/recent cultural landscape is deemed to have low-medium cultural significance for its aesthetic value but the archaeological cultural landscape is of medium significance for its scientific value and could be assigned a field rating of IIIB.” Based on Orton’s assessment,

As a result of mining applications in the area, much is known about the archaeology of the region which is dominated by Early, Middle and Later Stone Age artefact scatters. According to Orton and Webley (2012, SAHRIS NID 16354), “the archaeology of the coastal strip is generally well-understood as a result of the extensive survey and mitigation work carried out there. High quality data have been extracted from these sites, but further inland, very little work has been carried out”. In the immediate context of Kleinsee, Halkett et al (1997 SAHRIS ID 4496) conducted an impact assessment for proposed upgrades to the Kleinsee Golf Course. Halkett et al. (1997) identified three Later Stone Age shell midden archaeological sites and in the report, it was noted that none of the three sites contains assemblages which are considered worthy of further study. Just east of Kleinsee, a collection of Early Stone Age artefact sites was noted by De Beers mining staff in 2001. The artefacts were determined to be deflating from the soil vestiges onto the more resistant hardpan deposits below and were therefore no longer *in situ* (Halkett et al. 2002 SAHRIS NID 4482). These artefacts were collected and contribute to the record of archaeological resources from this area. In addition, a number of archaeological sites located to the north of the development area have been recorded by Orton (2016) on SAHRIS, however no information is available regarding the nature or significance of these archaeological resources (Figure 3b). Orton and Webley (2012, SAHRIS NID 16354) conducted a Heritage Impact Assessment for a proposed Wind Energy Facility located within 15km of the proposed development area. According to Orton and Webley (2012), “The survey revealed a large number of archaeological sites including deflated ESA and MSA artefact scatters (one with bone), LSA shell scatters and in situ shell middens, formal graveyards, and old structures. In some areas vast quantities of archaeological material was found to occur and such areas can be considered archaeological cultural landscapes. The local landscape itself also has value particularly where it forms the context for the settlement of Grootmis. Particularly significant archaeological finds were an ESA/MSA scatter with fossil bones preserved and a massive area of small shell scatters and middens in close proximity to the Buffels River near the point where fresh water was permanently available during historic (and presumably also pre-

colonial) times. The ESA material included predominantly flakes, cores and hand-axes but one cleaver was also found. MSA artefacts included flakes and cores and one bifacial point that may well be from the Still Bay period. LSA material included decorated pottery, retouched stone scrapers and *in situ* occurrences with generally higher research value."

Orton's assessment (2021) provides insight into the kinds of heritage resources likely to be impacted by the proposed development. Orton (2021) noted that "The region is well-known for its very high density of archaeological sites but their number and significance often decreases away from the coast. The survey revealed many small Later Stone Age archaeological sites with occasional historical artefacts also present. None of these was of high cultural significance." Based on Orton's findings (2021) it is unlikely that significant archaeological heritage resources will be impacted by the proposed development.

According to the SAHRIS Palaeosensitivity Map, the area proposed for development is underlain by scree/talus/alluvium grading into piedmont gravel of low palaeontological sensitivity. Pether (2011, SAHRIS NID 16355) conducted a PIA for a proposed development located approximately 10km away from the proposed development area. SImilar geology is present at this site. Pether (2011) noted that terrestrial deposits blanket the area. He goes on to note that "These deposits comprise the loose, surficial coversands and the underlying, older, "dorbank" compact, clayey deposits that also are chiefly aeolian sands, with the soils and pedocretes that have formed in them. Fossil bones are sparsely distributed on the palaeosurfaces within these deposits, but are locally abundant in contexts such as interdune deposits, carnivore bone accumulations in burrows and buried Stone Age sites. Trace fossils are ubiquitous and important palaeoenvironmental indicators. The significance rating is low for fossil potential as a consequence of the low probability of finding fossils in the terrestrial deposits.

Further observations in the surrounding area (Pether, 2020) indicate that the deposits are altered by pedogenic processes involving decalcification and the precipitation of pedocrete. Fossil shells are not preserved and fossil bone is very sparse. Pether (2020) notes that "the affected surficial formations include Holocene dunes of the Hardevlei Formation and earlier late Quaternary coversands of the Koekenaap Formation. Beneath these unconsolidated sands are compact, pedogenically-altered aeolianites termed the Dorbank Formation which are fossil dune plumes of later mid-Quaternary age." Orton (2021) elaborates that "the aeolian formations (Hardevlei and Koekenaap) are assumed to contain the typical fossil content seen in similar deposits elsewhere. The most common fossils are related to the ambient fossil content of dune sands, i.e. land snails, tortoise shells and mole bones. " Pether (2021) considers fossil finds to be unlikely. Given the low palaeontological potential, it is improbable that fossil bones will be encountered and no additional palaeontological study is recommended, however the attached Chance Fossil Finds Procedure must be implemented.

RECOMMENDATION

The heritage resources in the area proposed for development are not yet sufficiently recorded

Based on the available information, including the scale and nature of the proposed development, it is likely that significant heritage resources will be impacted by the proposed development and as such it is recommended that further heritage studies are required in terms of section 38 of the NHRA.

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APPENDIX 1: List of heritage resources within 25km of the development area

Site ID	Site no	Full Site Name	Site Type	Grading
138044	KMWEF-001	Komas WEF	Artefacts	
138045	KMWEF-002	Komas WEF	Artefacts	
138046	KMWEF-003	KMWEF-003	Artefacts	
138047	KMWEF-004	Komas WEF	Artefacts	
138048	KMWEF-005	Komas WEF	Artefacts	
138049	KMWEF-006	Komas WEF	Deposit	
138052	KMWEF-007	Komas WEF	Artefacts	
138054	KMWEF-008	Komas WEF	Artefacts	
138055	KMWEF-009	Komas WEF	Artefacts	
138056	KMWEF-010	Komas WEF	Artefacts	
138057	KMWEF-011	Komas WEF	Artefacts	
138058	KMWEF-012	Komas WEF	Artefacts	
138059	KMWEF-013	Komas WEF	Artefacts	
138060	KMWEF-014	Komas WEF	Artefacts	
138061	KMWEF-015	Komas WEF	Artefacts	
138062	KMWEF-016	Komas WEF	Artefacts	
138063	KMWEF-017	Komas WEF	Artefacts	

138064	KMWEF-018	Komas WEF	Artefacts	
138065	KMWEF-019	Komas WEF	Artefacts	
138067	KMWEF-020	Komas WEF	Artefacts	
138068	KMWEF-021	Komas WEF	Artefacts	
138069	KMWEF-022	Komas WEF	Artefacts	
138070	KMWEF-023	Komas WEF	Artefacts	
138071	KMWEF-024	Komas WEF	Artefacts	
138072	KMWEF-025	Komas WEF	Artefacts	
138073	KMWEF-026	Komas WEF	Artefacts	
138074	KMWEF-027	Komas WEF	Artefacts	
138075	KMWEF-028	Komas WEF	Artefacts	
138076	KMWEF-029	Komas WEF	Artefacts	
138077	KMWEF-030	Komas WEF	Artefacts	
138079	KMWEF-031	Komas WEF	Artefacts	
138080	KMWEF-032	Komas WEF	Artefacts	
129887	2917CD/Wind/Kap Vley Farm 315/site PAN2017/001.	Grave	Burial Grounds & Graves	Grade IIIa
129888	2917CD/Wind/Kap Vley Farm 315/site PAN2017/002	Archaeological site	Archaeological	Grade IV
129889	2917CD/Wind/Kap Vley Farm 315/site	Graveyard	Burial Grounds &	Grade IIIa

	PAN2017/003		Graves	
129898	2917CD/Wind/Kap Vley Farm 315/site KAP2017/001	Stone artefacts	Artefacts	Grade IV
129899	2917CD/Wind/Kap Vley Farm 315/site KAP2017/002	Archaeological site	Archaeological	Grade IV
133864	NWF037	Namas Wind Farm	Artefacts	Grade IIIc
133897	NWF044	Namas Wind Farm	Artefacts	Grade IIIc
133910	NWF045	Namas Wind Farm	Artefacts, Shell Midden	Grade IIIc
133912	NWF046	Namas Wind Farm	Artefacts, Shell Midden	Grade IIIc
133914	NWF047	Namas Wind Farm	Artefacts, Shell Midden	Grade IIIc
133916	NWF048	Namas Wind Farm	Artefacts	Grade IIIc
133948	NWF049	Namas Wind Farm	Artefacts	Grade IIIc
133951	NWF050	Namas Wind Farm	Artefacts	Grade IIIc
133971	NWF051	Namas Wind Farm	Artefacts, Shell Midden	Grade IIIc
133972	NWF052	Namas Wind Farm	Artefacts, Shell Midden	Grade IIIc
133974	NWF053	Namas Wind Farm	Artefacts, Shell Midden	Grade IIIc
133976	NWF054	Namas Wind Farm	Artefacts	Grade IIIc
133979	NWF055	Namas Wind Farm	Artefacts	Grade IIIc
133983	NWF056	Namas Wind Farm	Artefacts	Grade IIIc
133986	NWF057	Namas Wind Farm	Artefacts	Grade IIIc

133994	NWF058	Namas Wind Farm	Artefacts	Grade IIIc
134000	NWF059	Namas Wind Farm	Artefacts	Grade IIIc
134002	NWF060	Namas Wind Farm	Artefacts, Shell Midden	
134019	NWF061	Namas Wind Farm	Artefacts	Grade IIIc
134024	NWF062	Namas Wind Farm	Artefacts	Grade IIIc
134027	NWF063	Namas Wind Farm	Artefacts	Grade IIIc
134030	NWF064	Namas Wind Farm	Artefacts	Grade IIIc
134034	NWF065	Namas Wind Farm	Artefacts	Grade IIIc
134037	NWF066	Namas Wind Farm	Artefacts	Grade IIIc
134039	NWF067	Namas Wind Farm	Artefacts	Grade IIIc
134050	NWF068	Namas Wind Farm	Artefacts	Grade IIIc
134052	NWF069	Namas Wind Farm	Artefacts	Grade IIIc
134055	NWF070	Namas Wind Farm	Artefacts	Grade IIIc
134057	NWF071	Namas Wind Farm	Artefacts	Grade IIIc
134060	NWF072	Namas Wind Farm	Artefacts	Grade IIIc
134062	NWF073	Namas Wind Farm	Artefacts	Grade IIIc
134067	NWF074		Artefacts	Grade IIIc
134069	NWF075	Namas Wind Farm	Artefacts	Grade IIIc
134070	NWF076	Namas Wind Farm	Artefacts	Grade IIIc

134071	NWF077	Namas Wind Farm	Artefacts	Grade IIIc
134072	NWF078	Namas Wind Farm	Artefacts	Grade IIIc
134073	NWF079	Namas Wind Farm	Burial Grounds & Graves	Grade IIIc

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APPENDIX 2: Reference List

Heritage Impact Assessments				
Nid	**Report Type**	**Author/s**	**Date**	**Title**
252883	HIA	Jayson Orton	04/07/2012	Heritage Impact Assessment Report for Kleinzee Wind Energy Facility
252884	PIA Desktop	J Pether		Desktop Study - Palaeontological Impact Assessment for the Kleinzee Wind Farm
4476	AIA Phase 1	Dave Halkett, Timothy Hart	01/06/1997	An Archaeological Assessment of the Coastal Strip, and a Proposed Heritage Management Plan For: De Beers Namaqualand Mines Volume 2
4479	AIA Phase 1	Dave Halkett, Timothy Hart	01/03/2001	An Initial Assessment of Heritage Resources on the Coastal Farm, Brazil, Namaqualand
4484	AIA Phase 1	Hilary Deacon	22/04/2004	Specialist Report Heritage Impact Assessment Kornavlei Prospecting, near Komaggas, Northern Cape
16354	HIA Phase 1	Jayson Orton, Lita Webley	30/05/2012	Heritage Impact Assessment for the Proposed Project Blue Wind Energy Facility, Kleinzee, Namakwa Magisterial District, Northern Cape
573587	HIA Phase 1	Jayson Orton	19/05/2021	HIA (ARCHAEOLOGY, CULTURAL LANDSCAPE AND PALAEONTOLOGY) FOR KOMAS WEF

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APPENDIX 3 - Keys/Guides

Key/Guide to Acronyms

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

Full guide to Palaeosensitivity Map legend

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

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

- 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 2: Archaeological Assessment (2022)

The below AIA includes an identification of all archaeological resources within the areas proposed for the Kleinzee, Daisy and Namaqua PV Facilities.

At the time of drafting the Archaeology Impact Assessment, Daisy and Namaqua PV Facilities were assessed separately. These projects were subsequently merged into one Project - the Daisy PV Facility.

The AIA included below has these projects mapped as separate projects.
The body of the HIA above uses the information from the AIA to assess all heritage impacts within the area proposed for the Final Layout for the Daisy PV Facility.

ARCHAEOLOGICAL SPECIALIST STUDY

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

Proposed development of the Kleinzee, Daisy and Namaqua Solar Energy Facilities in the Northern Cape

Prepared by

CTS HERITAGE
Jenna Lavin and
Nic Wiltshire

In Association with

Savannah Environmental

July 2022

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EXECUTIVE SUMMARY

The development of three (3) separate solar photovoltaic (PV) facilities, each with a contracted capacity of up to 100MW located approximately 15km southwest of the town of Komaggas, and 24km southeast of Kleinzee, within the Springbok REDZ. These projects are all located in the Nama Khoi Local Municipality within the Namakwa District Municipality, Northern Cape.

The overall archaeological sensitivity of the Namaqualand with regard to the preservation of Early, Middle and Later Stone Age archaeology as well as Khoe and San heritage, early colonial settlement and the Namaqualand Copper Mining landscape is regarded as very high. Despite this, the field assessment conducted for this project has demonstrated that the specific area proposed for development has low sensitivity for impacts to significant archaeological heritage. One structure of significance is known to be located in close proximity to the proposed development and it is recommended that this site be protected by the implementation of a no-go buffer area.

As indicated above, the results of this assessment align with the findings of other specialists in the area such as Orton (2021) who notes that ephemeral LSA scatters are the dominant archaeological signature of the area and are therefore not archaeologically significant.

Recommendations

There is no objection to the proposed development of the proposed solar PV Facilities in terms of impacts to archaeological heritage on condition that:

- Should any buried archaeological resources or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. The South African Heritage Resources Agency (SAHRA) must be contacted immediately in order to determine an appropriate way forward.

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CONTENTS

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1. INTRODUCTION

1.1 Background Information on Project

The development of three (3) separate solar photovoltaic (PV) facilities, each with a contracted capacity of up to 100MW located approximately 15km southwest of the town of Komaggas, and 24km southeast of Kleinzee, within the Springbok REDZ. These projects are all located in the Nama Khoi Local Municipality within the Namakwa District Municipality, Northern Cape.

Daisy PV - Farm Zonnekwa 326
Namaqua PV - Farm Zonnekwa 326
Kleinzee PV - Portion 4 of the Farm Zonnekwa 328

The infrastructure associated with each 100MWac PV facility includes:

- Solar PV array comprising PV modules and mounting structures.
- Inverters and transformers.
- Low voltage cabling between the PV modules to the inverters
- 33kV cabling between the project components and the facility substation
- 33/132kV onsite facility substation.
- Battery Energy Storage System (BESS).
- Site offices and maintenance buildings, including workshop areas for maintenance and storage.
- Laydown areas.
- Site access and internal roads

1.2 Description of Property and Affected Environment

The three proposed solar PV areas lie immediately on the boundaries of the previously assessed Komas WEF (Orton, 2021). Two portions lie north of the ground surveyed by Orton and the third lies nestled south and west of his survey coverage. The project is about 25km south east of Kleinzee and is most easily accessed from the Komaggas gravel road from the north onto an Eskom 765kV powerline access road which leads to Sonnekwa farm. The area lies within the vast dune cordon between the West Coast and the granite peaks of the Kamiesberg which divides this area from Springbok further east. The Namaqua National Park lies roughly 50km away by road to the south.

The terrain is generally soft underfoot due to the thick dune sands except where hardpan outcrops of calcrete have formed firming up the ground. The vegetation in the area is typical of the succulent Karoo of Namaqualand and low shrubs dominate the bulk of the study area. The region is extremely arid and areas along non-perennial streams hold denser stands of acacia thorn trees. The two farmhouse complexes at Sonnekwa A, B and Graafwater straddle the western end of the proposed PV areas and most of the kraals, windmills and farm dams (JoJos and concrete dams) are situated closer to these homesteads.

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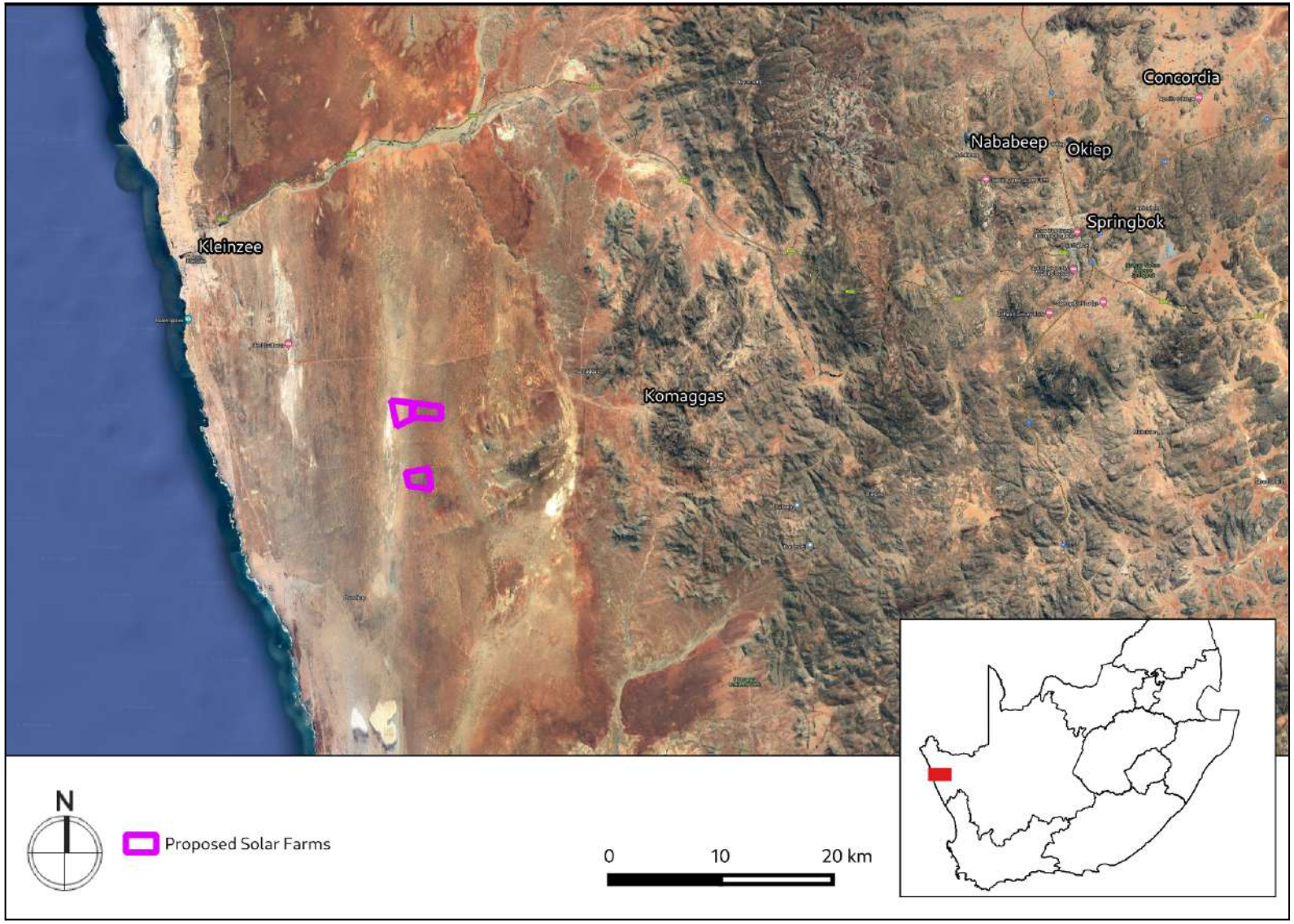

Figure 1.1: Close up satellite image indicating proposed location of study area

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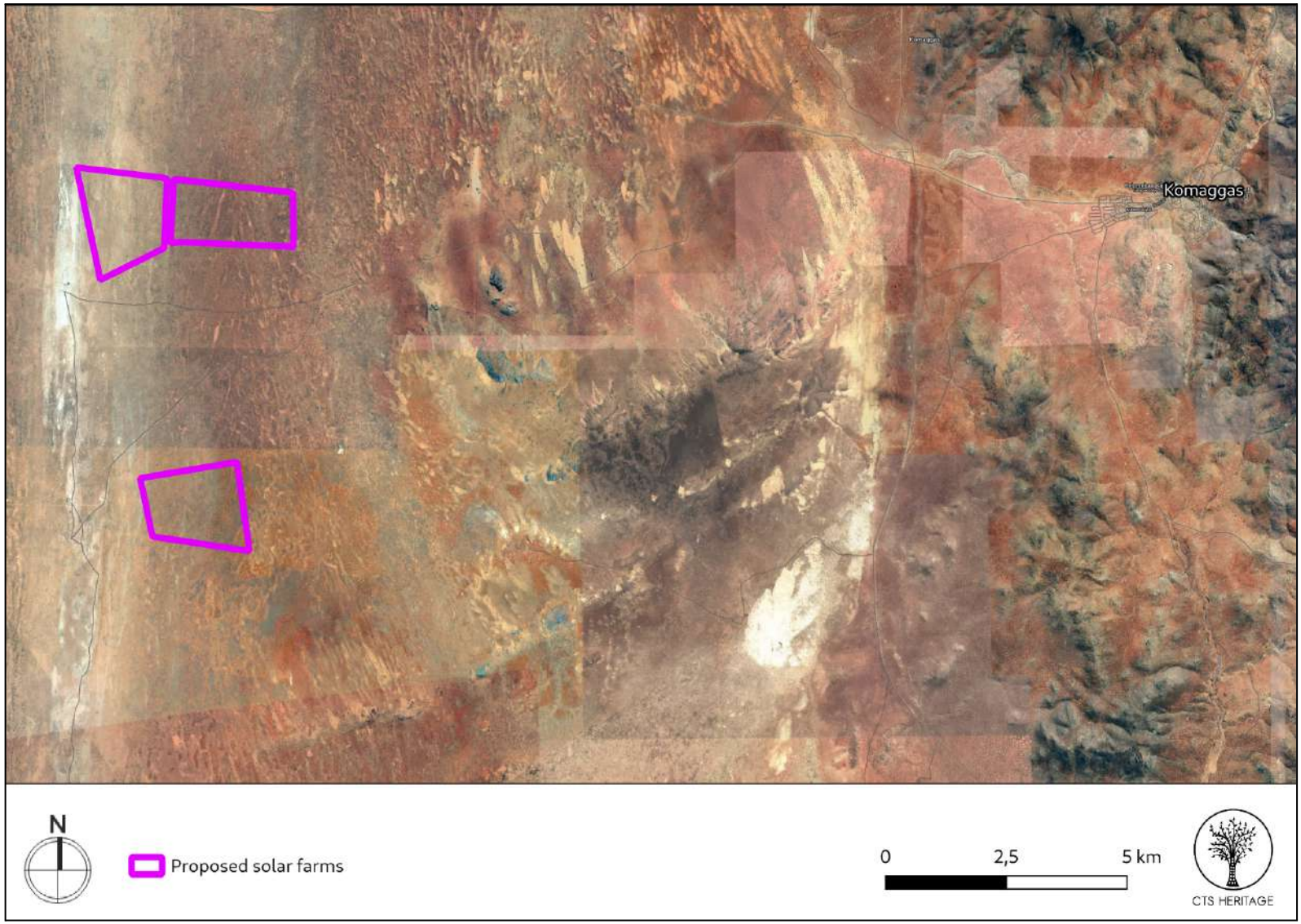

Figure 1.2: Study Area

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Figure 1.3: Study Area

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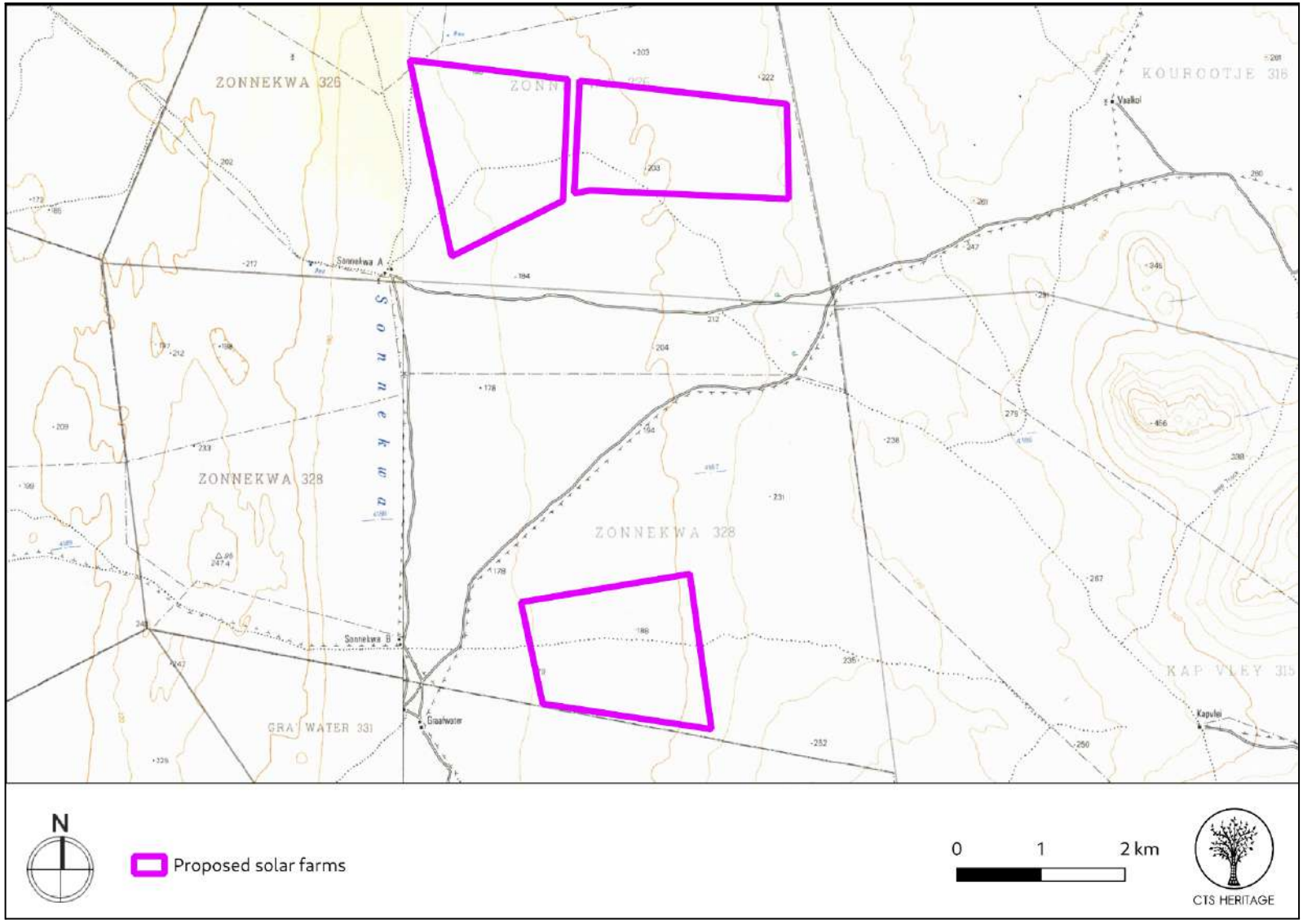

Figure 1.4: 1:50 000 Topo Map extracts

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2. METHODOLOGY

2.1 Purpose of Archaeological Study

The purpose of this archaeological study is to satisfy the requirements of section 38(8), and therefore section 38(3) of the National Heritage Resources Act (Act 25 of 1999) in terms of impacts to archaeological resources.

2.2 Summary of steps followed

- An archaeologist, Mr N. Wiltshire conducted a survey of the site and its environs on 23 and 24 June 2022 to determine what archaeological resources are likely to be impacted by the proposed development.
- The study area was assessed on foot in transects, 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 & Limitations

The ground was fairly easily traversed on foot but vehicle access was only possible on the well-maintained farm roads used by the owners of Sonnekwa. Thick sand made much of the Eskom servitude roads nearly unusable, even with a 4x4 vehicle. However, the sparse vegetation lends itself to good visibility of the surface material, primarily of Later Stone Age assemblages, while buried Early and Middle Stone Age material is typical in areas affected by the vast dune cordon. The survey therefore managed to achieve a satisfactory account of the archaeological sensitivity of the area.

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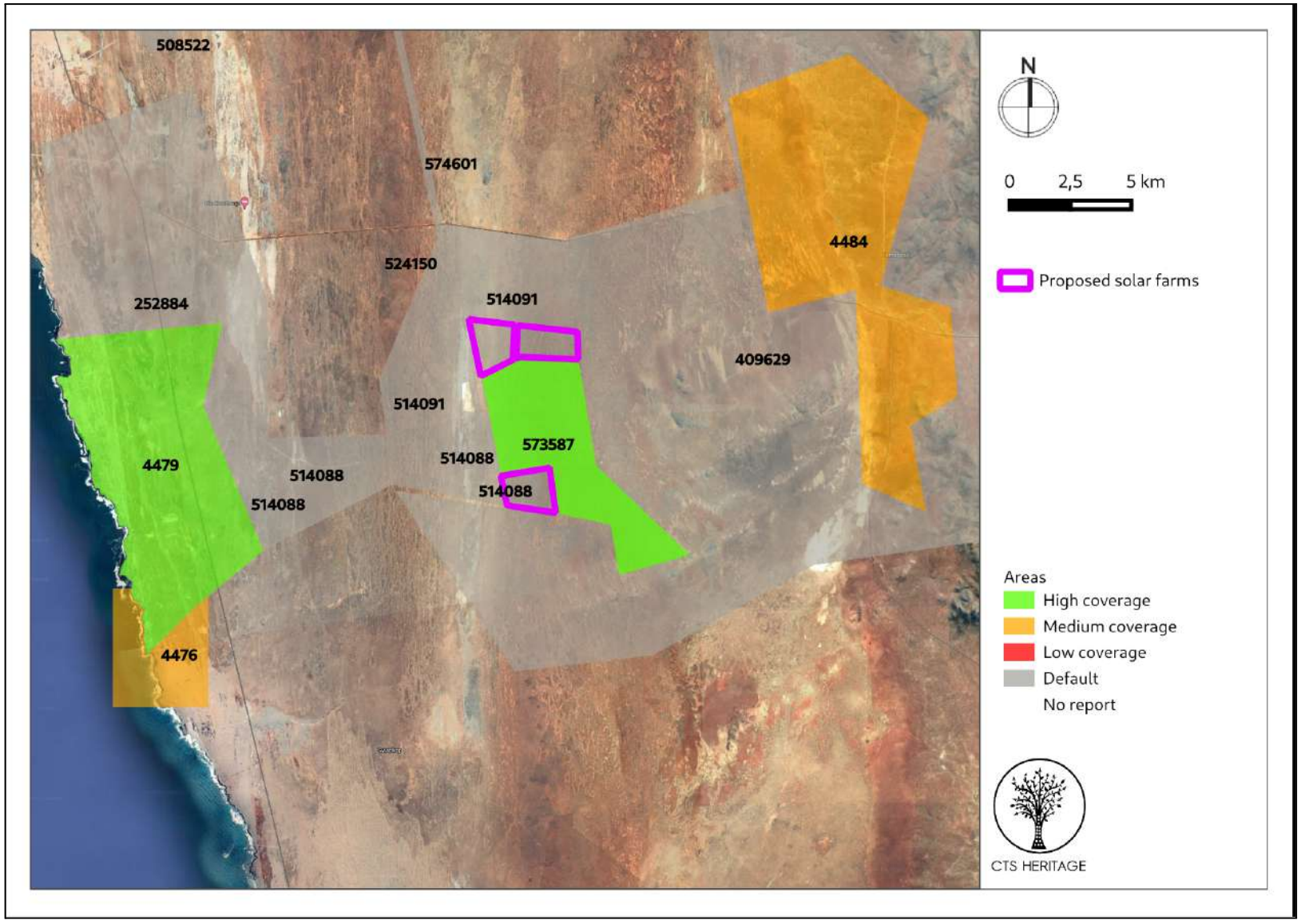

Figure 2: Close up satellite image indicating proposed location of the study area in relation to heritage studies previously conducted

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3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT

Prior to 1652, the indigenous peoples (the Khoisan or Nama) of the area extracted raw or "native copper" from the gneiss and granite hills that make up the surrounding Namaqualand Copper belt. This copper was beaten into decorative items, worn as bangles and neck adornments. Early settlers in the Cape Colony heard rumours of mountains in the north-west that were rich in copper. Governor Simon van der Stel was inclined to believe these tales when, in 1681, a group of Namas visited the Castle in Cape Town and brought along some pure copper. Van der Stel himself led a major expedition in 1685 and reached the fabled mountains on 21 October. Three shafts were sunk and revealed a rich lode of copper ore - the shafts exist to this day. For almost 200 years nothing was done about the discovery, largely because of its remote location.

The explorer James Alexander was the first to follow up on van der Stel's discovery. In 1852 he examined the old shafts, discovered some other copper outcrops and started mining operations. Prospectors, miners and speculators rushed to the area, but many companies collapsed when the logistical difficulties became apparent. The first miners were Cornish, and brought with them the expertise of centuries of tin-mining in Cornwall. The ruins of the buildings they constructed as well as the stonework of the bridges and culverts of the railway built to transport the ore to Port Nolloth, can still be seen. The Namaqualand Railway started operating in 1876 and lasted for 68 years, carrying ore to Port Nolloth and returning with equipment and provisions. The carriages were initially pulled by mules and horses, which were later replaced by steam locomotives - the last of these, the *Clara*, stands at Nababeep. Nowadays road transport is used to convey the ore to the railhead at Bitterfontein. The other principal mines of the area are at Carolusberg and Nababeep.

Kleinsee was established as a small mining town in 1927. According to legend, a teacher by the name of De Villiers from the local farm school had built a new school and was looking for lime deposits with which to whitewash the walls. In his search, accompanied by a builder called Alberts, he kicked at a mound in the veld. This dislodged a diamond which was recorded as the first alluvial diamond found in this area. The resultant diamond rush opened up the Kleinsee 'crater', reminiscent of the 'Big Hole' at Kimberley and subsequently, this area became known as the Diamond Coast. In 2021, Orton (SAHRIS NID 573587) conducted a detailed HIA for a proposed WEF located immediately adjacent to the proposed development area. Orton (2021) describes the development context as dominated by undulating sandy plains, interspersed with deflation hollows. He identifies an elongated valley through this development area which he calls the Zonnekwa Valley (Orton, 2021). This feature is visible to the west of the proposed PV areas in Figure 1b.

Archaeology and Built Environment Heritage

As a result of mining applications in the area, much is known about the archaeology of the region which is dominated by Early, Middle and Later Stone Age artefact scatters. According to Orton and Webley (2012, SAHRIS NID 16354), "the archaeology of the coastal strip is generally well-understood as a result of the extensive survey and mitigation work carried out there. High quality data have been extracted from these sites, but further inland, very little work has been carried out". In the immediate context of Kleinsee, Halkett et al (1997 SAHRIS ID 4496) conducted an impact assessment for proposed upgrades to the Kleinsee Golf Course. Halkett et al. (1997) identified three Later Stone Age shell midden

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archaeological sites and in the report, it was noted that none of the three sites contains assemblages which are considered worthy of further study. Just east of Kleinsee, a collection of Early Stone Age artefact sites was noted by De Beers mining staff in 2001. The artefacts were determined to be deflating from the soil vestiges onto the more resistant hardpan deposits below and were therefore no longer *in situ* (Halkett et al. 2002 SAHRIS NID 4482). These artefacts were collected and contribute to the record of archaeological resources from this area. In addition, a number of archaeological sites located to the north of the development area have been recorded by Orton (2016) on SAHRIS, however no information is available regarding the nature or significance of these archaeological resources (Figure 3b). Orton and Webley (2012, SAHRIS NID 16354) conducted a Heritage Impact Assessment for a proposed Wind Energy Facility located within 15km of the proposed development area. According to Orton and Webley (2012), "The survey revealed a large number of archaeological sites including deflated ESA and MSA artefact scatters (one with bone), LSA shell scatters and in situ shell middens, formal graveyards, and old structures. In some areas vast quantities of archaeological material was found to occur and such areas can be considered archaeological cultural landscapes. The local landscape itself also has value particularly where it forms the context for the settlement of Grootmis. Particularly significant archaeological finds were an ESA/MSA scatter with fossil bones preserved and a massive area of small shell scatters and middens in close proximity to the Buffels River near the point where fresh water was permanently available during historic (and presumably also pre- colonial) times. The ESA material included predominantly flakes, cores and hand-axes but one cleaver was also found. MSA artefacts included flakes and cores and one bifacial point that may well be from the Still Bay period. LSA material included decorated pottery, retouched stone scrapers and *in situ* occurrences with generally higher research value."

Orton's assessment (2021) provides insight into the kinds of heritage resources likely to be impacted by the proposed development. Orton (2021) noted that "The region is well-known for its very high density of archaeological sites but their number and significance often decreases away from the coast. The survey revealed many small Later Stone Age archaeological sites with occasional historical artefacts also present. None of these was of high cultural significance." Based on Orton's findings (2021) it is unlikely that significant archaeological heritage resources will be impacted by the proposed development.

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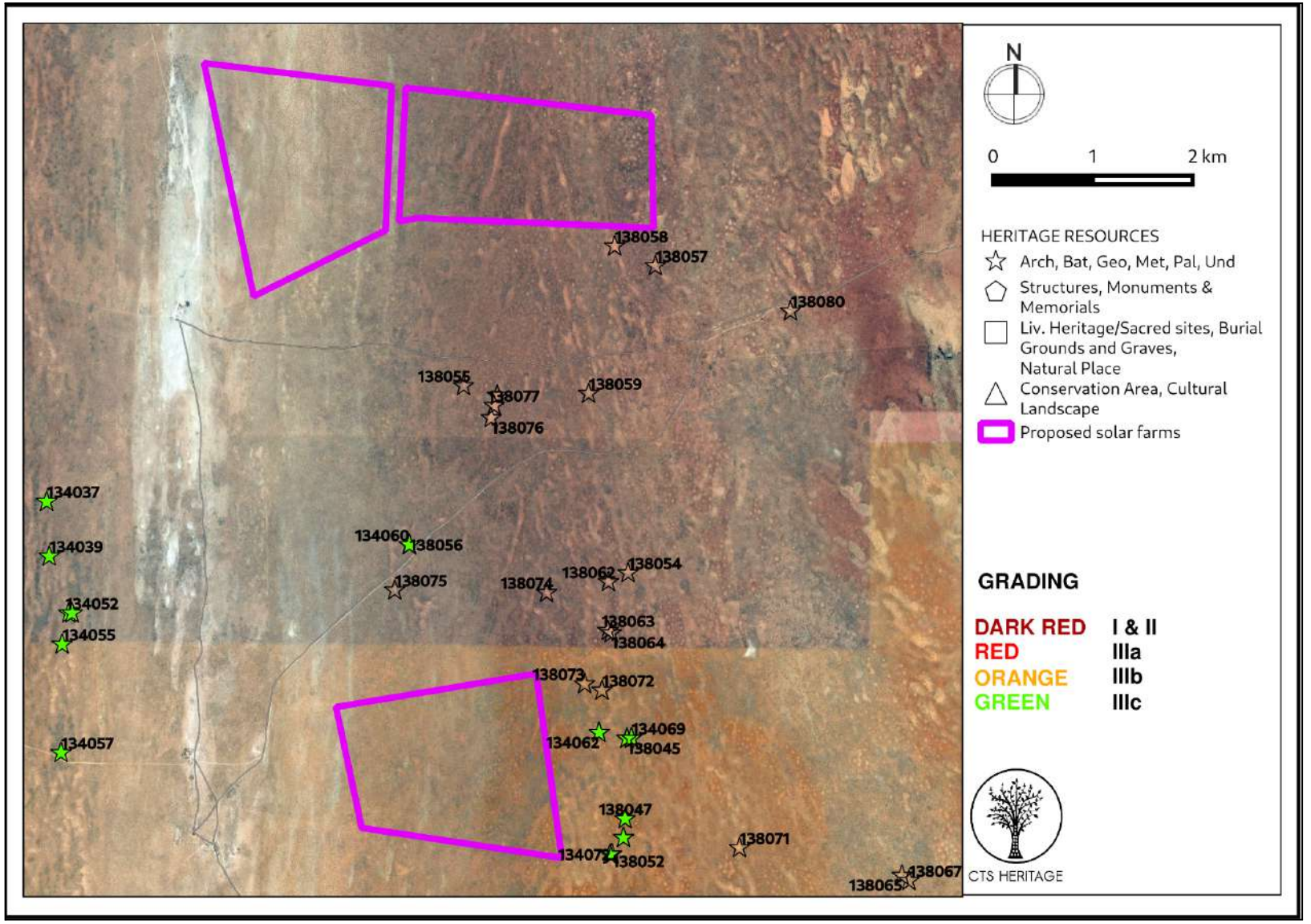

Figure 4.1. Heritage Resources Map. Heritage Resources previously identified in and near the study area, with SAHRIS Site IDs indicated

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4. IDENTIFICATION OF HERITAGE RESOURCES

4.1 Field Assessment

Over thirty observations were recorded and almost all of these consisted of Later and Middle Stone Age open air scatters of artefacts. The werfs at Sonnekwa will not be negatively affected by the proposed PV areas which are well situated away from the areas actively farmed for sheep, goats and ostriches. Unsurprisingly, quartz dominated the assemblages with high percentages of cores, flakes, debitage and retouched flakes generally dispersed across the study area. Lower contributions of silcrete and CCS were also found and these were often extensively retouched or heavily reduced cores in these raw materials. We would expect to see higher densities of assemblages a few kms east of this study area along the foothills of the Brandberg and the Komaggasrivier which provide more reliable sources of water. The area can be characterised as a transitory area between the marine resources 20km to the west and the foothills of the Kamiesberg, featuring low density but widely dispersed archaeological material.

Figure 5.1: Contextual Images

Figure 5.2: Contextual Images

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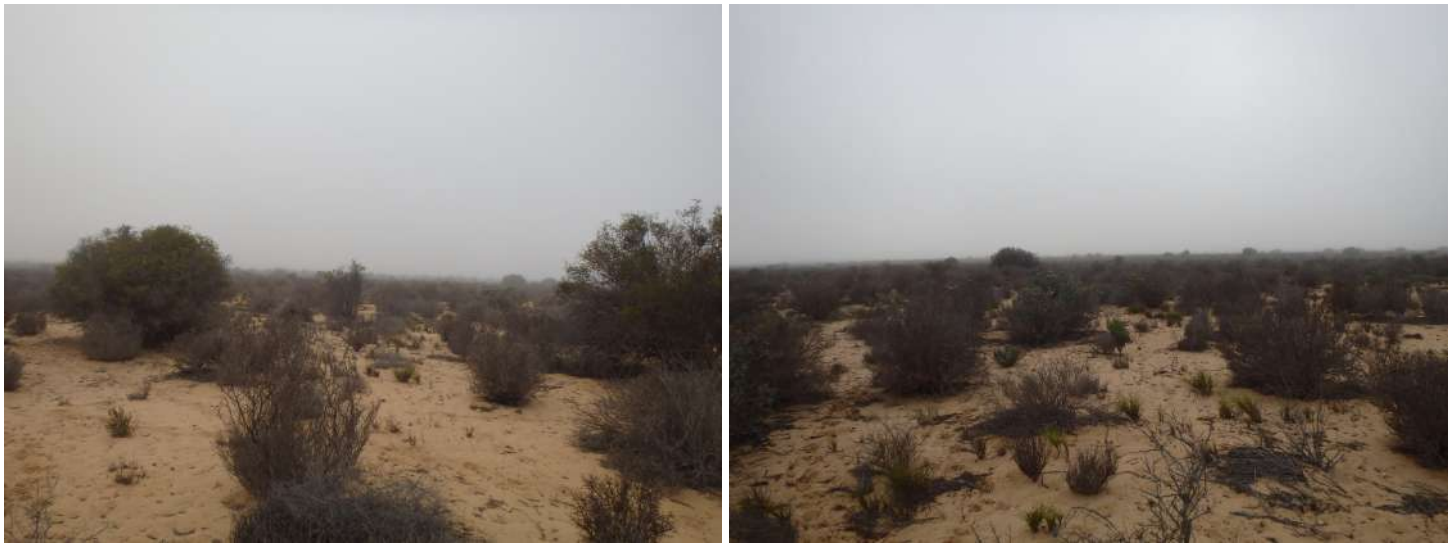

Figure 5.3: Contextual Images

Figure 5.4: Contextual Images

Figure 5.5: Contextual Images indicating existing electrical infrastructure on the property

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Figure 5.6: Contextual Images

Figure 5.7: Contextual Images

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Figure 6: Overall track paths of foot survey

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4.2 Archaeological Resources identified

Table 2: Observations noted during the field assessment

Site No.	Project	Description	Type	Period	Density	Co-ordinates		Grading	Mitigation
001	Outside Area	Sonnekwa farmhouse complex and kraals	Structure	Modern	n/a	-29.8126	17.24852	IIIB	NA
002	Daisy	Quartz core	Artefacts	LSA	0 to 5	-29.80293	17.29446	NCW	NA
003	Daisy	Ostrich eggshell fragments, could be natural or archaeological			0 to 5	-29.80138	17.28742	NCW	NA
004	Namaqua	Quartzite lower grindstone next to jeep track, not sure if context is in situ	Artefacts	LSA	0 to 5	-29.80584	17.24986	NCW	NA
005	Daisy	Quartz flake	Artefacts	LSA	0 to 5	-29.80431	17.28411	NCW	NA
006	Daisy	Quartz point, prep. Platform	Artefacts	MSA	0 to 5	-29.80384	17.27935	NCW	NA
007	Daisy	OES fragment, CCS core with relatively high amount of cortex remaining	Artefacts	LSA	0 to 5	-29.79688	17.28142	NCW	NA
008	Daisy	Backed quartz flake	Artefacts	MSA	0 to 5	-29.79893	17.28094	NCW	NA
009	Daisy	Quartz cores	Artefacts	LSA	0 to 5	-29.79622	17.29211	NCW	NA
010	Daisy	Quartzite flake	Artefacts	MSA	0 to 5	-29.79585	17.28957	NCW	NA
011	Daisy	Quartz core and flake with pointed end and disconformity along lateral edge	Artefacts	MSA, LSA	0 to 5	-29.79542	17.28187	NCW	NA
012	Namaqua	Quartz cores, fine grained darker quartz/quartzite point	Artefacts	LSA	0 to 5	-29.79665	17.25461	NCW	NA
013	Namaqua	Silcrete flake with retouched platform	Artefacts	MSA	0 to 5	-29.7969	17.26186	NCW	NA
014	Namaqua	Quartz core	Artefacts	LSA	0 to 5	-29.80152	17.26274	NCW	NA
015	Daisy	Silcrete flake, fairly large, no retouch seen	Artefacts	MSA	0 to 5	-29.79851	17.27027	NCW	NA
016	Namaqua	Quartz core and quartzite flake	Artefacts	LSA	5 to 10	-29.80787	17.26121	NCW	NA
017	Daisy	Silcrete core and quartz core flake	Artefacts	MSA	0 to 5	-29.80424	17.27002	NCW	NA
018	Namaqua	Quartz/quartzite flake, darker, quartz core	Artefacts	LSA, MSA	0 to 5	-29.8026	17.25515	NCW	NA
019	Namaqua	Silcrete and quartz flakes	Artefacts	MSA	0 to 5	-29.79422	17.25836	NCW	NA
020	Daisy	Quartz core	Artefacts	LSA	0 to 5	-29.79975	17.2934	NCW	NA
021	Daisy	Quartz core, flake	Artefacts	LSA	0 to 5	-29.7985	17.29008	NCW	NA
022	Kleinzee	Silcrete point with barb along one side	Artefacts	MSA	0 to 5	-29.86137	17.28439	NCW	NA
023	Kleinzee	Quartz core	Artefacts	LSA	0 to 5	-29.8585	17.28558	NCW	NA
024	Kleinzee	Rough silcrete core flake and quartz elongated flake	Artefacts	MSA	5 to 10	-29.85249	17.2846	NCW	NA
025	Kleinzee	Quartz core, flakes	Artefacts	LSA	0 to 5	-29.85752	17.28164	NCW	NA
026	Kleinzee	Quartz core, flakes	Artefacts	MSA	0 to 5	-29.85232	17.27936	NCW	NA
027	Kleinzee	Quartz core, flakes	Artefacts	MSA	0 to 5	-29.84925	17.28196	NCW	NA
028	Kleinzee	Quartz flake, core	Artefacts	LSA	0 to 5	-29.85524	17.28062	NCW	NA
029	Kleinzee	CCS flake point	Artefacts	LSA	0 to 5	-29.85145	17.28435	NCW	NA
030	Kleinzee	Quartz flakes	Artefacts	MSA	5 to 10	-29.86016	17.2856	NCW	NA

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031	Kleinzee	Silcrete unworked flake and quartz core	Artefacts	MSA	0 to 5	-29.85151	17.25772	NCW	NA

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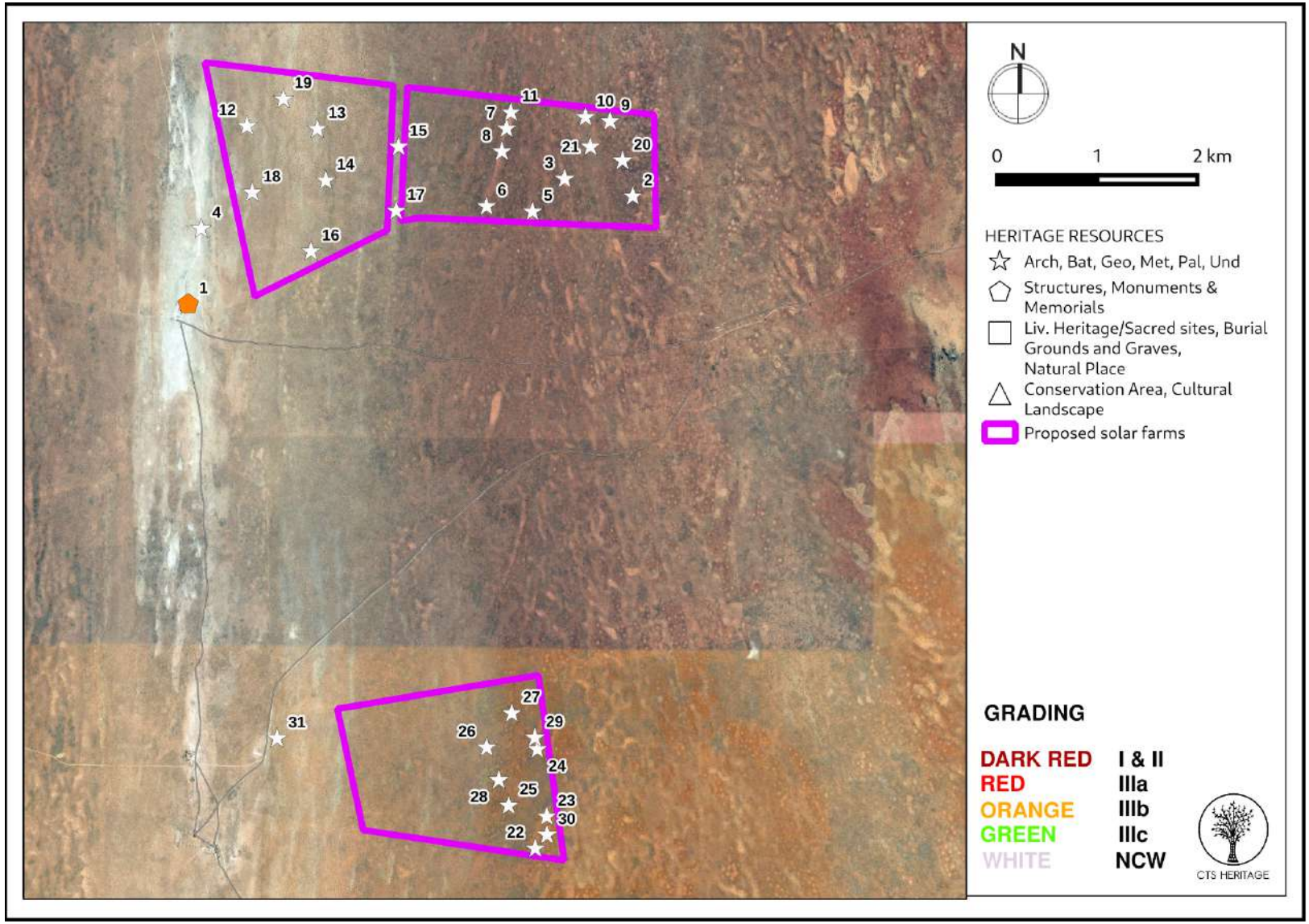

Figure 7: Map of field observations relative to the proposed development

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4.3 Selected photographic record

(a full photographic record is available upon request)

Figure 8.1: Observation 001

Figure 8.2: Observation 002

Figure 8.3: Observation 003

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Figure 8.4: Observation 004 and 005

Figure 8.5: Observation 006

Figure 8.6: Observation 007

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Figure 8.7: Observation 008 and 009

Figure 8.8: Observation 010 and 011

Figure 8.9: Observation 012

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Figure 8.10: Observation 013 and 014

Figure 8.11: Observation 015 and 016

Figure 8.12: Observation 017

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Figure 8.13: Observation 018 and 019

Figure 8.14: Observation 020 and 021

Figure 8.15: Observation 022 and 023

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Figure 8.16: Observation 024 and 025

Figure 8.17: Observation 026 and 027

Figure 8.18: Observation 028 and 029

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Figure 8.19: Observation 030

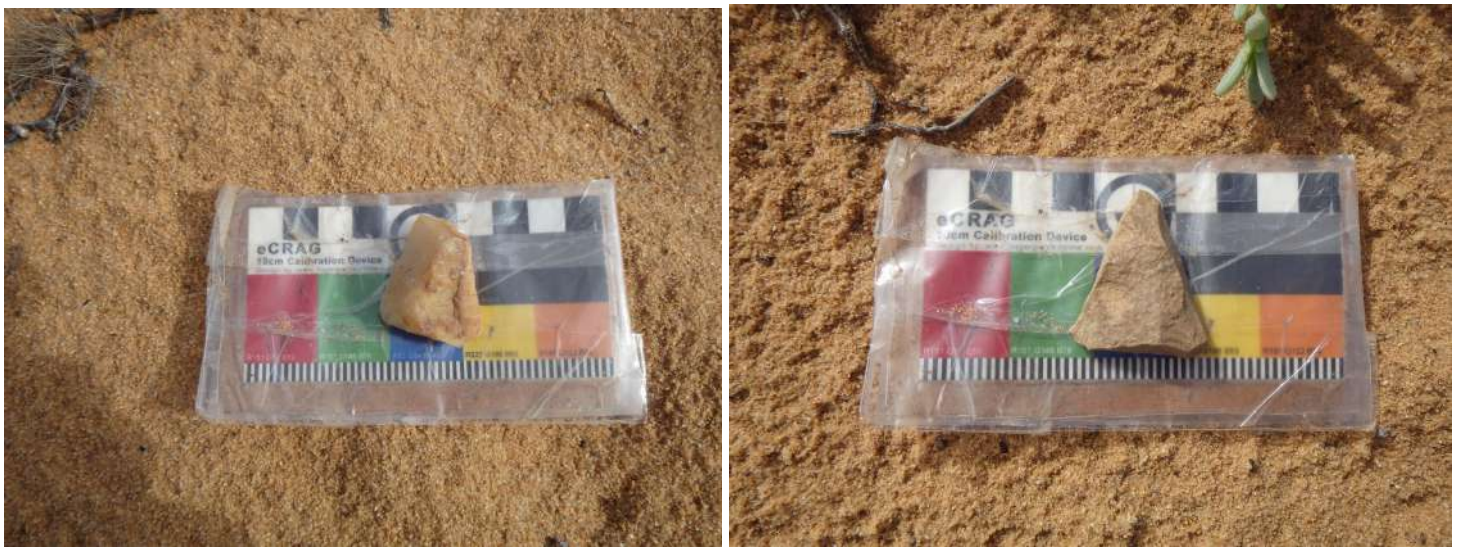

Figure 8.20: Observation 031

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5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

5.1 Assessment of impact to Archaeological Resources

The results of this field assessment align with the findings of Orton (2021) who noted that "The region is well-known for its very high density of archaeological sites but their number and significance often decreases away from the coast. The survey revealed many small Later Stone Age archaeological sites with occasional historical artefacts also present. None of these was of high cultural significance." Based on these and Orton's findings (2021) it is unlikely that significant archaeological heritage resources will be impacted by the proposed development.

One heritage resource of significance was identified - that of the Sonnekwa farmhouse complex and kraals, graded IIIB. Based on the footprints provided, it is unlikely that this resource will be directly negatively impacted by the proposed development of the PV facilities in the area, although the sense of place associated with the farmhouse may be impacted.

6. CONCLUSION AND RECOMMENDATIONS

The overall archaeological sensitivity of the Namaqualand with regard to the preservation of Early, Middle and Later Stone Age archaeology as well as Khoe and San heritage, early colonial settlement and the Namaqualand Copper Mining landscape is regarded as very high. Despite this, the field assessment conducted for this project has demonstrated that the specific area proposed for development has low sensitivity for impacts to significant archaeological heritage. One structure of significance is known to be located in close proximity to the proposed development and it is recommended that this site be protected by the implementation of a no-go buffer area.

As indicated above, the results of this assessment align with the findings of other specialists in the area such as Orton (2021) who notes that ephemeral LSA scatters are the dominant archaeological signature of the area and are therefore not archaeologically significant.

Recommendations

There is no objection to the proposed development of the proposed solar PV Facilities in terms of impacts to archaeological heritage on condition that:

- Should any buried archaeological resources or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. The South African Heritage Resources Agency (SAHRA) must be contacted immediately in order to determine an appropriate way forward.

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7. REFERENCES

Heritage Impact Assessments				
Nid	**Report Type**	**Author/s**	**Date**	**Title**
252883	HIA	Jayson Orton	04/07/2012	Heritage Impact Assessment Report for Kleinzee Wind Energy Facility
252884	PIA Desktop	J Pether		Desktop Study - Palaeontological Impact Assessment for the Kleinzee Wind Farm
4476	AIA Phase 1	Dave Halkett, Timothy Hart	01/06/1997	An Archaeological Assessment of the Coastal Strip, and a Proposed Heritage Management Plan For: De Beers Namaqualand Mines Volume 2
4479	AIA Phase 1	Dave Halkett, Timothy Hart	01/03/2001	An Initial Assessment of Heritage Resources on the Coastal Farm, Brazil, Namaqualand
4484	AIA Phase 1	Hilary Deacon	22/04/2004	Specialist Report Heritage Impact Assessment Kornavlei Prospecting, near Komaggas, Northern Cape
16354	HIA Phase 1	Jayson Orton, Lita Webley	30/05/2012	Heritage Impact Assessment for the Proposed Project Blue Wind Energy Facility, Kleinzee, Namakwa Magisterial District, Northern Cape
573587	HIA Phase 1	Jayson Orton	19/05/2021	HIA (ARCHAEOLOGY, CULTURAL LANDSCAPE AND PALAEONTOLOGY) FOR KOMAS WEF

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APPENDIX 3: Chance Fossil Finds Procedure

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CHANCE FINDS OF PALAEONTOLOGICAL MATERIAL

(Adopted from the HWC Chance Fossils Finds Procedure: 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:

- 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;
- The ECO or site agent must inform SAHRA of the find immediately. This information must include photographs of the findings and GPS co-ordinates;
- The ECO or site agent must compile a Preliminary Report and fill in the attached Fossil Discoveries: 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, SAHRA will inform the ECO or site agent whether or not a rescue excavation or rescue collection by a palaeontologist is necessary.

- 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. SAHRA can advise on the most appropriate method for stabilisation.
- 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 SAHRA 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 SAHRA has indicated, in writing, that it is appropriate to proceed.

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

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