

HERITAGE WALKDOWN REPORT

for the approved Karreebosch WEF near Sutherland in the Northern Cape

Prepared by



CTS HERITAGE

Jenna Lavin and Nic Wiltshire

In Association with

WSP

September 2021

Updated August 2022



CTS HERITAGE

EXECUTIVE SUMMARY

Karreebosch Wind Farm RF (Pty) Ltd proposes the establishment of a Wind Energy Facility (WEF) on a site located approximately 30km north of Matjiesfontein, and approximately 40 km south of Sutherland. The site falls largely within the Karoo Hoogland Local Municipality of the Northern Cape Province. The authorised Karreebosch Wind Energy Facility (WEF) falls within the Northern Cape and as such, falls under the jurisdiction of the South African Heritage Resources Agency (SAHRA) which manages heritage resources in the Northern Cape.

The original Environmental Impact Assessment (EIA) was undertaken in September of 2015 for up to 71 wind turbines with a hub height of up to 100m and a rotor diameter of up to 140m including associated infrastructure. Environmental authorisation (EA) for 65 turbines was granted on the 29th of January 2016 (EA Ref: 14/12/16/3/3/2/807). The project underwent subsequent amendments (EA Ref: 14/12/16/3/3/2/807/AM1, 14/12/16/3/3/2/807/AM2, 14/12/16/3/3/2/807/AM3) which included increases in the hub height (up to 125m), rotor diameter (up to 160m), blade length (up to 80m), and minor amendments to the wording of certain conditions of the authorisation, as well as an extension of the validity of the EA to 2026. The associated 132kV overhead powerline (OHPL) and onsite 33/132kV substation is currently subject to a separate EA application process.

The archaeological and heritage walkdown was conducted in order to ensure that the amended layout of the Karreebosch WEF does not impact on significant heritage resources, and to ensure compliance with condition 111 of the original EA for the project (EA Ref: 14/12/16/3/3/2/807).

The findings of this field assessment largely correlate with the findings of the Karreebosch HIA (2015) which *“revealed that the study area is relatively austere in terms of pre-colonial heritage, however valley bottoms contain evidence of early trekboer cultural landscapes – ruins, graves and occasional middens. These consist of collections of ruined stone and mud buildings, threshing floors and kraals located exclusively in the valley areas between the high longitudinal ridges that characterise the study area.”*

No significant heritage resources were identified in close proximity to any of the proposed infrastructure to be developed in the final layout. Some of the existing roads within the development area pass close by to known heritage resources, however as these are existing roads that will be used by the WEF, no impact is anticipated. As such, no negative impact to significant archaeological heritage is anticipated and there is no preferred alternative alignment in terms of impacts to archaeological resources. The final layout for the Karreebosch WEF avoids impact to all known significant heritage resources present within the development area. The walkdown of the final layout revealed no new significant heritage resources that are likely to be impacted. It is therefore recommended that this report is accepted as satisfying the following conditions of the Environmental Authorisation issued for the Karreebosch West WEF project:

- All buffers and no-go areas stipulated in this (HIA) report must be adhered to for both the facilities and all roads and power lines.

CTS Heritage

238 Queens Road, Simons Town

Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

CONTENTS

1. INTRODUCTION	3
1.1 Background Information on Project	3
1.2 Description of Property and Affected Environment	5
1.3 Proposed Amendments	6
2. METHODOLOGY	10
2.1 Purpose of Walkdown	10
2.2 Summary of steps followed	10
2.3 Constraints & Limitations	10
3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT	12
4. IDENTIFICATION OF HERITAGE RESOURCES	18
4.1 Findings of previous assessments	18
4.2 Heritage Resources identified in the Walkdown	30
4.3 Selected photographic record	33
5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT	36
5.1 Assessment of impact to Archaeological Resources	36
6. CONCLUSION AND RECOMMENDATIONS	36
7. REFERENCES	38



1. INTRODUCTION

1.1 Background Information on Project

Karreebosch Wind Farm (Pty) Ltd proposes the establishment of a Wind Energy Facility (WEF) on a site located approximately 30km north of Matjiesfontein, and approximately 40 km south of Sutherland. The site falls largely within the Karoo Hoogland Local Municipality of the Northern Cape Province. The authorised Karreebosch Wind Energy Facility (WEF) falls within the Northern Cape and as such, falls under the jurisdiction of the South African Heritage Resources Agency (SAHRA) which manages heritage resources in the Northern Cape.

The original Environmental Impact Assessment (EIA) was undertaken in September of 2015 for up to 71 wind turbines with a hub height of up to 100m and a rotor diameter of up to 140m including associated infrastructure. Environmental authorisation (EA) for 65 turbines was granted on the 29th of January 2016 (EA Ref: 14/12/16/3/3/2/807). The project underwent subsequent amendments (EA Ref: 14/12/16/3/3/2/807/AM1, 14/12/16/3/3/2/807/AM2, 14/12/16/3/3/2/807/AM3) which included increases in the hub height (up to 125m), rotor diameter (up to 160m), blade length (up to 80m), and minor amendments to the wording of certain conditions of the authorisation, as well as an extension of the validity of the EA to 2026. The associated 132V overhead powerline (OHPL) and onsite 33/132kV substation is currently subject to a separate EA application process.

EA was granted for the Karreebosch WEF on 29 January 2016. In the EA, various requirements were stipulated in terms of mitigation of impacts to Historical, Cultural and Palaeontological sites (Table 1 below).

Table 1: EA requirements for Heritage (EA Ref: 14/12/16/3/3/2/807)

No.	EA Requirements	Implementation
109	If concentration of archaeological heritage material, fossils and human remains are uncovered during construction, all work must cease immediately and be reported to SAHRA and HWC so that systematic and professional investigation/excavation can be undertaken	Operational
110	Construction managers/foremen must be informed before construction starts on the possible types of heritage sites and cultural material they may be encountered and the procedures to follow when they find sites	Operational
111	All buffers and no-go areas stipulated in this report must be adhered to for both the facilities and all roads and powerlines	Addressed in this report
112	Should any human remains be uncovered during development they must be immediately protected in situ and reported to the heritage authorities or to an archaeologist. The remains will need to be exhumed at the cost of the developer.	Operational
113	All construction and maintenance crew and vehicles (except small vehicles which may use existing farm tracks) should be kept out of the buffer zones.	During construction



CTS HERITAGE

The Karreebosch WEF was previously referred to as Phase 2 of the Roggeveld WEF. SAHRA has made numerous comments on both the Roggeveld WEF HIA (Hart and Webley, 2013) and the Karreebosch WEF HIA (Hart and Kendrick, 2014) with the last comment issued on 26 September 2018 as part of the 2018 Part 2 EA Amendment process (14/12/16/3/3/2/807/AM2) for the Karreebosch WEF. As such, section 38(8) of the NHRA has been complied with.

On 26 September 2018, SAHRA issued a Final Comment on the Karreebosch WEF development in terms of section 38(8) of the NHRA. In this comment, SAHRA endorsed and supported the recommendations made in the Heritage Impact Assessment and made a number of recommendations (see attached Annexure A). SAHRA's Final Comment stated:

The SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit notes the proposed amendment and is satisfied that the proposed changes to the project will not impact significant heritage resources. The comments provided in the Final Comment for Case ID 4503 with regards to turbines 28 and 29 are still valid and must be adhered to. The following additional conditions must be included in the Environmental Management Programme (EMPr):

- The final Amendment Report must be submitted to the SAHRIS Case application for record purposes;
- The condition provided in SAHRIS Case ID 473 with regards to the 3 km buffer from the R354 for the original Roggeveld WEF is amended to 1 km so that Phase 2 (Karreebosch) is aligned with the condition provided for Phase 1 of the project as per the Final Comment issued on SAHRIS Case ID 4503;
- If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Mimi Seetelo 012 320 8490), must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;
- Should the project be granted the amended Environmental Authorisation, SAHRA must be notified and all relevant documents submitted to the case file.



CTS HERITAGE

1.2 Description of Property and Affected Environment

The Karreebosch WEF is located on Farm Appels Fontein 201, Remainder and Portion 1 and 2 of Ek Kraal 199, Remainder of Karreebosch 200, Portion 1 of Karree Kloof 196, Remainder and 1 of Klipbanks Fontein 198, Farm Oude Huis 195, Farm Rietfontein 197, Farm Roode Wal 187, Remainder of Wilgebosch Rivier 188, and Remainder of Bon Espirange 73. Ek Kraal farm lies in much of the eastern valley and Klipbanks Fontein lies in the western valley in a more rugged area than Ek Kraal. Ek Kraal has small-scale farming activities with very small patches of ground dedicated to crop agriculture along the Tankwarivier in addition to providing grazing for sheep. The valley on the western route over Klipbanks Fontein is largely vacant as most of the primary farming occurs in the next valley further west where water supplies are more predictable. Water was running in most of the rivers and streams at the time of the survey but the previous extended drought brought almost all farming activities in the area to the point of closure. A number of abandoned farmhouses and ruins have been documented in the area from previous surveys which confirms the rather precarious state that these farms are in due to the environment.

The region is regarded as semi-arid as it receives limited precipitation. It is located on the border of the summer and winter rainfall regions. Precipitation is in the form of snow and rain in winter, with occasional thunderstorms during the summer. The vegetation cover falls within the Roggeveld Shale Renosterveld of the Karoo Renosterveld Bioregion and consists predominantly of low shrubs and very few trees in this area.

1.3 Proposed Amendments

The authorised Karreebosch WEF and associated infrastructure is currently undergoing a Part 2 EA Amendment Process for further amendments as tabulated in the Table 2 below. Condition 16 of the original EA (EA Ref: 14/12/16/3/3/2/807) requires that the final development layout plan be made available for public comment and thereafter submitted to the Department of Forestry, Fisheries and Environment (DFFE) for approval. Condition 18 of the original EA (Ref: 14/12/16/3/3/2/807) states that the Environmental Management Programme (EMPr) submitted as part of the FEIAR (2015) was not approved and must be amended to include the final layout which has undergone micro siting and walkdowns by relevant specialists, be made available for public comment and thereafter re-submitted to the DFFE for final approval. The final layout and EMPr approval process will run concurrently with the Part 2 EA Amendment process.

The proposed amendments are detailed in Table 2 below. The following alternatives, as part of the amendments, have been proposed for consideration:

- Substation Options 1 and 2, along with the associated 33kV Overhead Powerline Lines (OHPL) and 4x4 access road alignment (refer to Figure 1.2 below). The southern 33kV and access road alignment are associated with Substation Option 1, whereas the northern 33kV and access road alignment are associated with Substation Option 2.
- Four alternative construction camp locations have been considered (refer to Figure 1.2 below).
- A 200m wide road assessment corridor along the internal access roads for micro-siting during construction.
- Two access roads off the R354 to the eastern turbine ridge have been considered. The access roads along the ridge lines avoid previous no-go's as much as practically possible, where there are route alternatives, specialists should state which is preferred and where any minor amendments are needed.

Table 2: Proposed amendments

Project Details	EA first issue 2016 (14/12/16/3/3/2/807)	2022 Amendments proposed
Properties	Farm Appelsfontein 201	Farm Roode Wal No. 187
	Remainder of Ekkraal 199	Farm Appels Fontein No. 201
	Portion 1 of Ekkraal 199	Portion 1 of Farm Ek Kraal No. 199
	Portion 2 of Ekkraal 199	Portion 2 (Nuwe Kraal) of Farm Ek Kraal No. 199
	Remainder of Karreebosch 200	Portion 1 of Farm Klipbanks Fontein No. 198
	Remainder of Karreekloof 196	Remainder of Farm Klipbanks Fontein No. 198
	Remainder of Klipbanksfontein 198	Remainder of Farm Wilgebosch Rivier No. 188
	Portion 1 of Klipbanksfontein 198	Farm Rietfontein No. 197



CTS HERITAGE

Project Details	EA first issue 2016 (14/12/16/3/3/2/807)	2022 Amendments proposed
	Farm Kranskraal 189	Remainder of Farm Kareebosch No. 200
	Farm Oude Huis 195	Portion 1 of Farm Karreebosch No. 200
	Farm Rietfontein 197	Farm Oude Huis No. 195
	Farm Roode Wal 187	Portion 1 of Farm Karree Kloof No. 196
	Portion 2 of Standvastigheid 210	Remainder of Farm Brandvalley No. 75
	Remainder of Wilgebosch Rivier 188	
	Farm Aprils Kraal 105	
	Remainder of Bon Espirange 73	
	Portion 1 of Bon Espirange 73	
EA Approved Infrastructure	EA first issue 2016	2022 Amendment
Page 1	Karreebosch Wind Farm (Pty) Ltd	Karreebosch Wind Farm RF (Pty) Ltd
Technical details of the proposed facility		
Component	EA first issue 2016	2022 Amendment
number of turbines	Up to 65 turbines (generation capacity of up to 140MW)	Up to 40 turbines (installed capacity is 149.9 MW and export capacity will be 140MW) with a foundation of 30m in diameter and 5m in depth
Hub Height	100m	up to 140m
Blade Length	~70m	~85m
Rotor Diameter	140m	up to 170m
Area occupied by transformer stations/ substation	>> One 33/132kV Substation 100m x 200m >>Extension of the existing 400kV substation at Komsberg >>Transformer art each turbine: total area <1500m ² (2 m ² per turbine up to 10m ² at some locations)	one 33/132kV substation 150m x 200m (3ha) Extension of the existing 400kV substation at Komsberg >>Transformer at each turbine: 6m x 3m= 720m ² total area <0.4ha (up to 10mX10m at some locations)
Capacity of on-site substation	132kV	33/132kV
Areas occupied by construction camp	300 x 300m = 90 000m ²	Areas occupied by construction camp and laydown areas up to 14ha
Area occupied by laydown areas	Operation: (70 x 50) x 71 =248 500m ²	(included above)
Areas occupied by buildings	~10 000m ²	~10 000m ² and will be located within the construction camp for use during the operational phase

CTS Heritage

238 Queens Road, Simons Town

Email: info@ctsheritage.com Web: www.ctsheritage.com



CTS HERITAGE

Project Details	EA first issue 2016 (14/12/16/3/3/2/807)	2022 Amendments proposed
Length of (new) internal access roads	~40 km	~64 km of new internal access roads and up to ~57 km of 4x4 access tracks . ~30km of existing access roads which are 4m wide will be widened by up to 9m
Width of internal roads	Up to 12m	Internal Access roads up to 12m wide (turns will have a radius of up to 55m) with additional yet associated servitudes/ reserve for above/underground cabling installation and maintenance where needed. 200m wide road corridor along the internal access roads for micro-siting during construction. Internal 4x4 tracks associated with the 33kV and 132Kv OHPLs will be up to 4m wide and substation access roads of up to 9m.
height of fencing	Up to 3m	Up to 4m
Type of Fencing	Steel or wire mesh	Steel or wire mesh



CTS HERITAGE

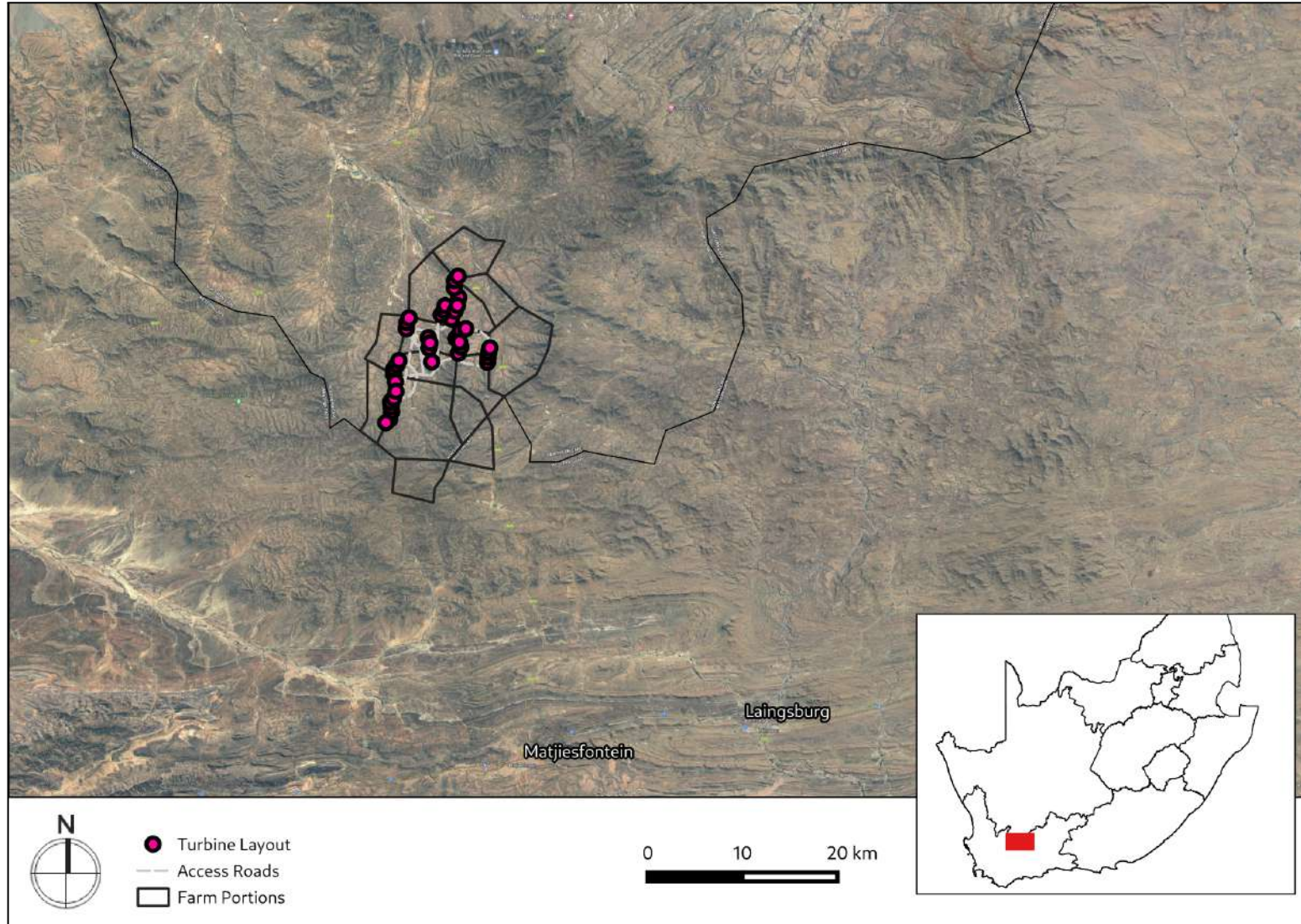


Figure 1.1: Close up satellite image indicating proposed location of the Karreebosch WEF development



CTS HERITAGE

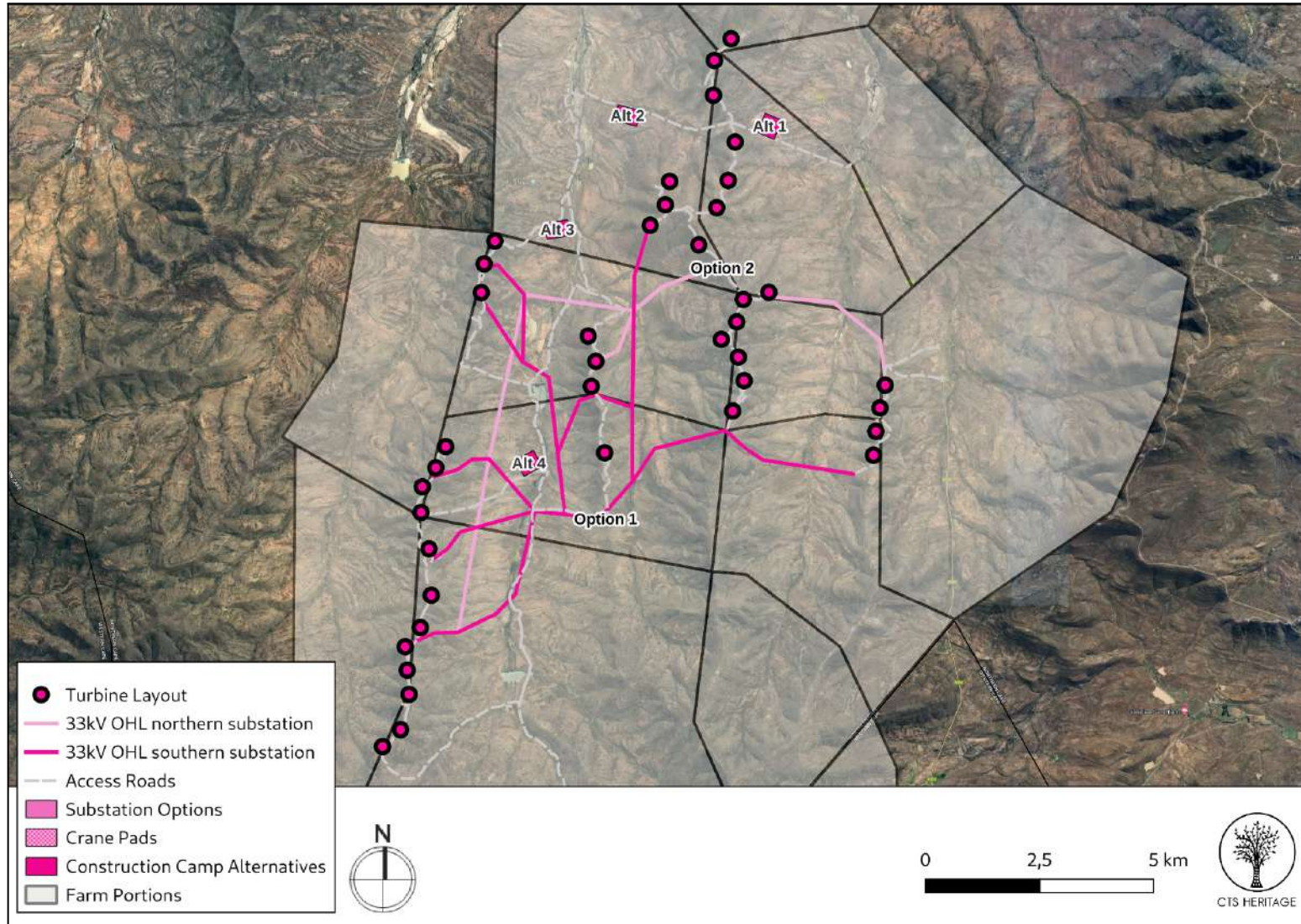


Figure 1.2: Final proposed final layout for the Karreebosch WEF development - July 2022



CTS HERITAGE

2. METHODOLOGY

2.1 Purpose of Walkdown

The archaeological and heritage walkdown was conducted in order to ensure that the amended layout of the Karreebosch WEF does not impact on significant heritage resources, and to ensure compliance with condition 111 of the original EA for the project (EA Ref: 14/12/16/3/3/2/807) as outlined in Table 1 above.

2.2 Summary of steps followed

- An archaeologist conducted a full detailed walkdown and micro-siting of the final development footprint for the Karreebosch WEF development footprint between 9 and 14 August 2021 to determine what archaeological resources are likely to be impacted by the approved development.
- The results of the 2021 walkdown were mapped and assessed against the updated layout provided in July 2022.
- The area proposed for development was assessed on foot and by 4x4 vehicle, photographs of the context and finds were taken, and tracks were recorded (at 20m intervals) 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).

2.3 Constraints & Limitations

The vegetation did not pose any challenges to the archaeological survey but much of the ground was covered in broken rock and stone eroding down the slopes of the ridges.

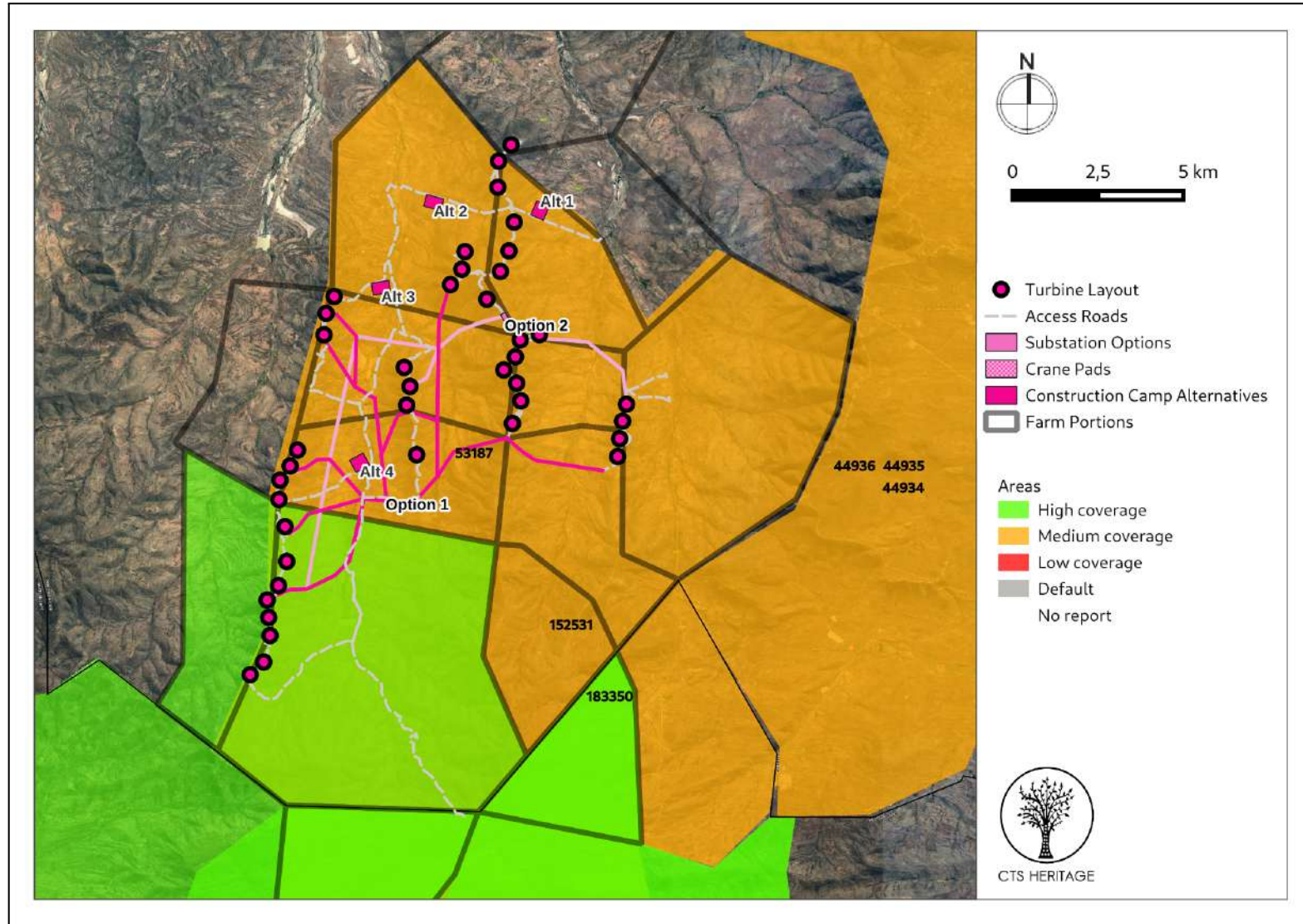


Figure 2: Close up satellite image indicating proposed location of development in relation to heritage studies previously conducted



CTS HERITAGE

3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT

The Karreebosch WEF was previously referred to as Phase 2 of the Roggeveld WEF. As part of the Impact Assessment process for these WEF projects, various Heritage Impact Assessments have been drafted that are relevant to this project including the Roggeveld WEF HIA (Hart and Webley 2013, SAHRIS Case ID 4503) and the Karreebosch WEF HIA (Hart and Kendrick, 2014 SAHRIS Case ID 6884). In response to these HIA's, SAHRA has made numerous comments on both the Roggeveld WEF (2013) and the Karreebosch WEF (2014) with the last comment issued on 26 September 2018 (Case 7379, attached). EA was granted for the Karreebosch WEF on 29 January 2016 (EA Ref: 14/12/16/3/3/2/807). In the EA, various requirements were stipulated in terms of impacts to Historical, Cultural and Palaeontological sites. The heritage information identified in these reports have been extracted and are mapped in Figures 3.1 to 3.4. These reports are also referred to below in order to provide a contextual analysis of the heritage sensitivity of the area proposed for development.

Archaeology and Built Environment Heritage

The area proposed for development has been previously assessed, more than once. The original fieldwork conducted for the Roggeveld WEF HIA (Hart and Webley, 2013) which covered the area proposed for development was comprehensive and remains relevant, similarly the fieldwork conducted for the Karreebosch WEF (Kendrick and Hart, 2014). The Karreebosch HIA (Kendrick and Hart, 2014) *“revealed that the study area is relatively austere in terms of pre-colonial heritage, however valley bottoms contain evidence of early trekboer cultural landscapes – ruins, graves and occasional middens. These consist of collections of ruined stone and mud buildings, threshing floors and kraals located exclusively in the valley areas between the high longitudinal ridges that characterise the study area. There are a number of existing farm houses that contain 19th century fabric, however very few of these have anything more than moderate heritage significance. Parts of the study area enjoy very high aesthetic qualities with the area known by locals as “Gods Window” having grade II aesthetic qualities, hence the significance of the study area lies mainly with its undeveloped wilderness qualities. Interestingly, pre-colonial or stone age heritage and archaeology is extremely scarce in the areas that were searched. Very few archaeological sites of these kinds were recorded despite the fact that overall 9 experienced archaeologists were involved in scouring the landscape.”*

According to various Archaeology Contracts Office (ACO) reports (2011, 2013 and 2015), parts of the study area enjoy very high aesthetic qualities hence the significance of the study area lies mainly with its undeveloped wilderness qualities which may be negatively impacted by the proposed development. However, it must be noted that the proposed development is located within a Renewable Energy Development Zone (namely the Komsberg REDZ) which has been identified for this kind of development. In REDZ areas, there is a reasonable expectation that the cultural landscape of an area will be changed to be dominated, or at least heavily altered, by renewable energy development and its associated infrastructure. In fact, this is the intention of the REDZ areas. Furthermore, the proposed WEF is located within a suite of authorised renewable energy facilities (Figure 5) and as such, the impact of this proposed development on the cultural landscape is likely to be negligible. No further specialist cultural landscape assessment is therefore recommended.



CTS HERITAGE

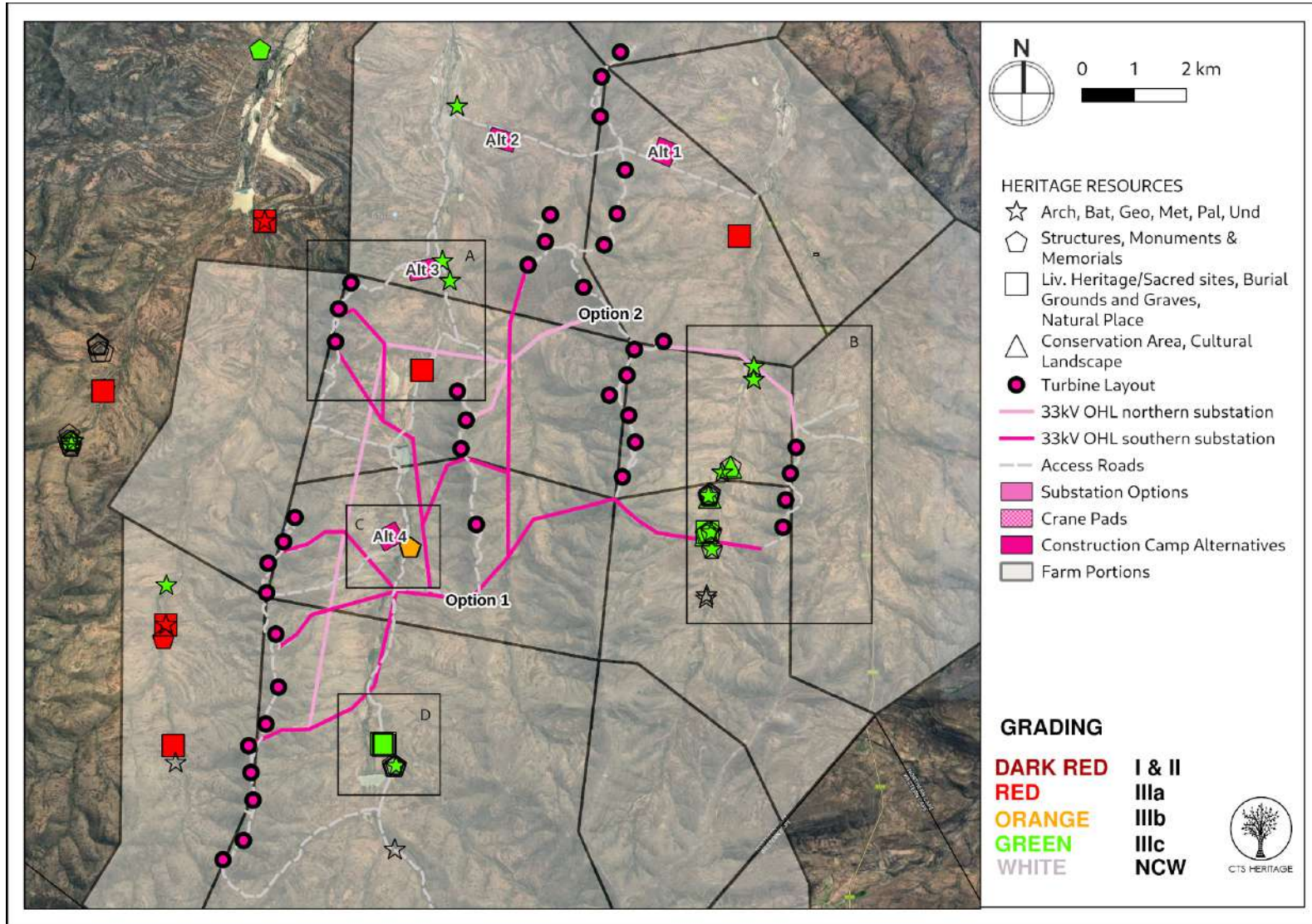


Figure 3. Heritage Resources Map. Heritage Resources previously identified in and near the study area from SAHRIS



CTS HERITAGE

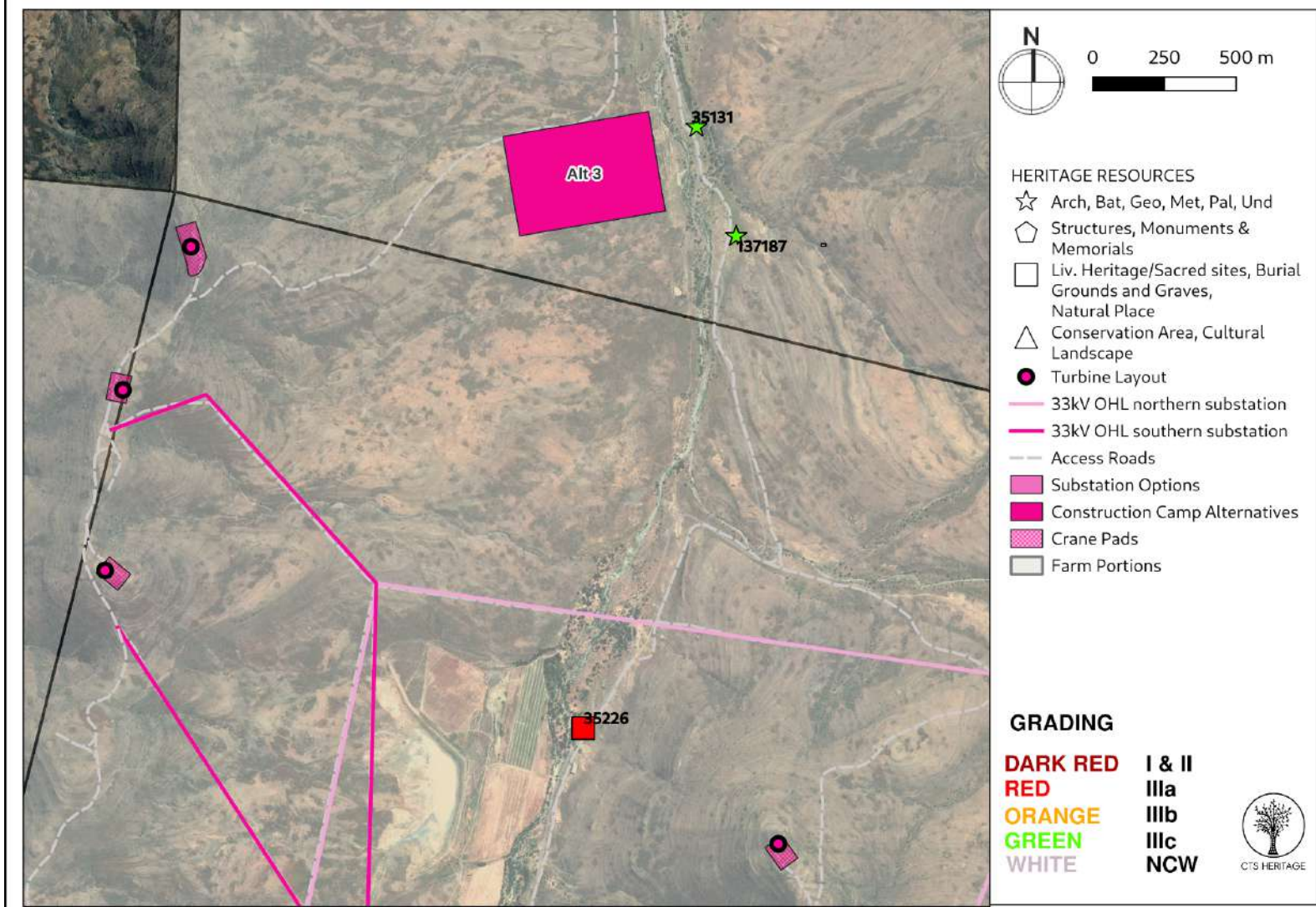


Figure 3.1. Heritage Resources Map. Inset A

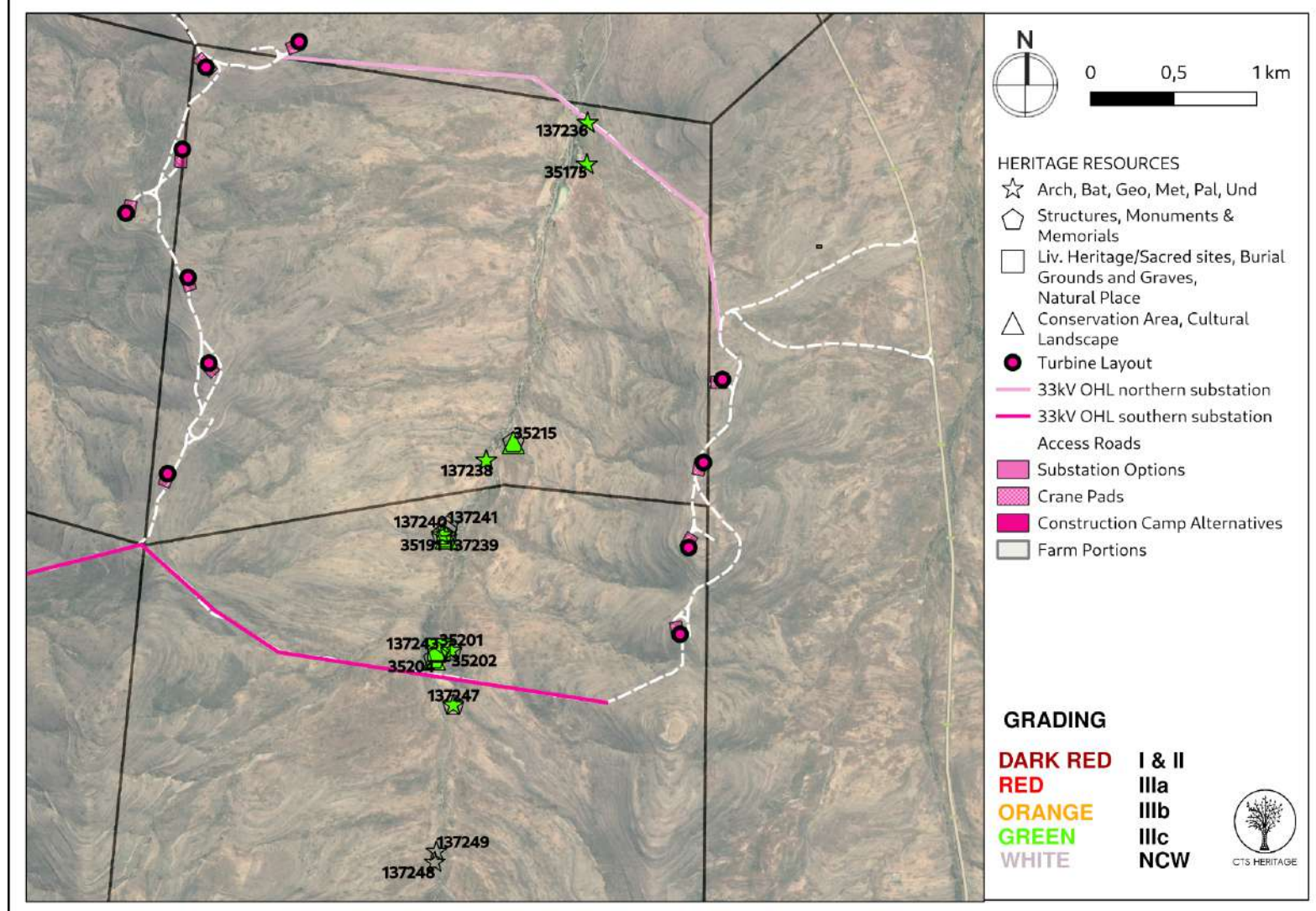


Figure 3.2. Heritage Resources Map. Inset B



CTS HERITAGE

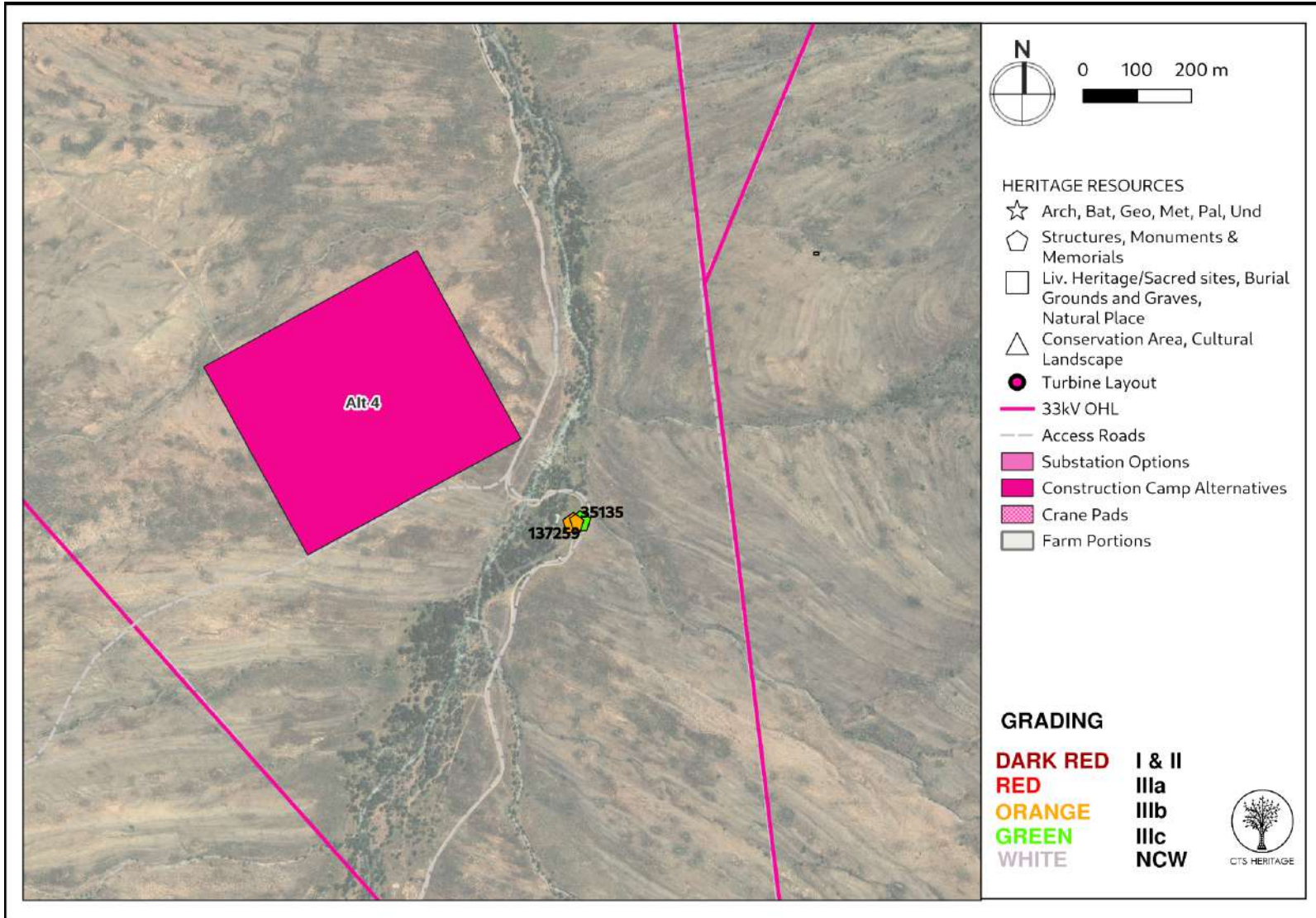


Figure 3.3. Heritage Resources Map. Inset C



CTS HERITAGE

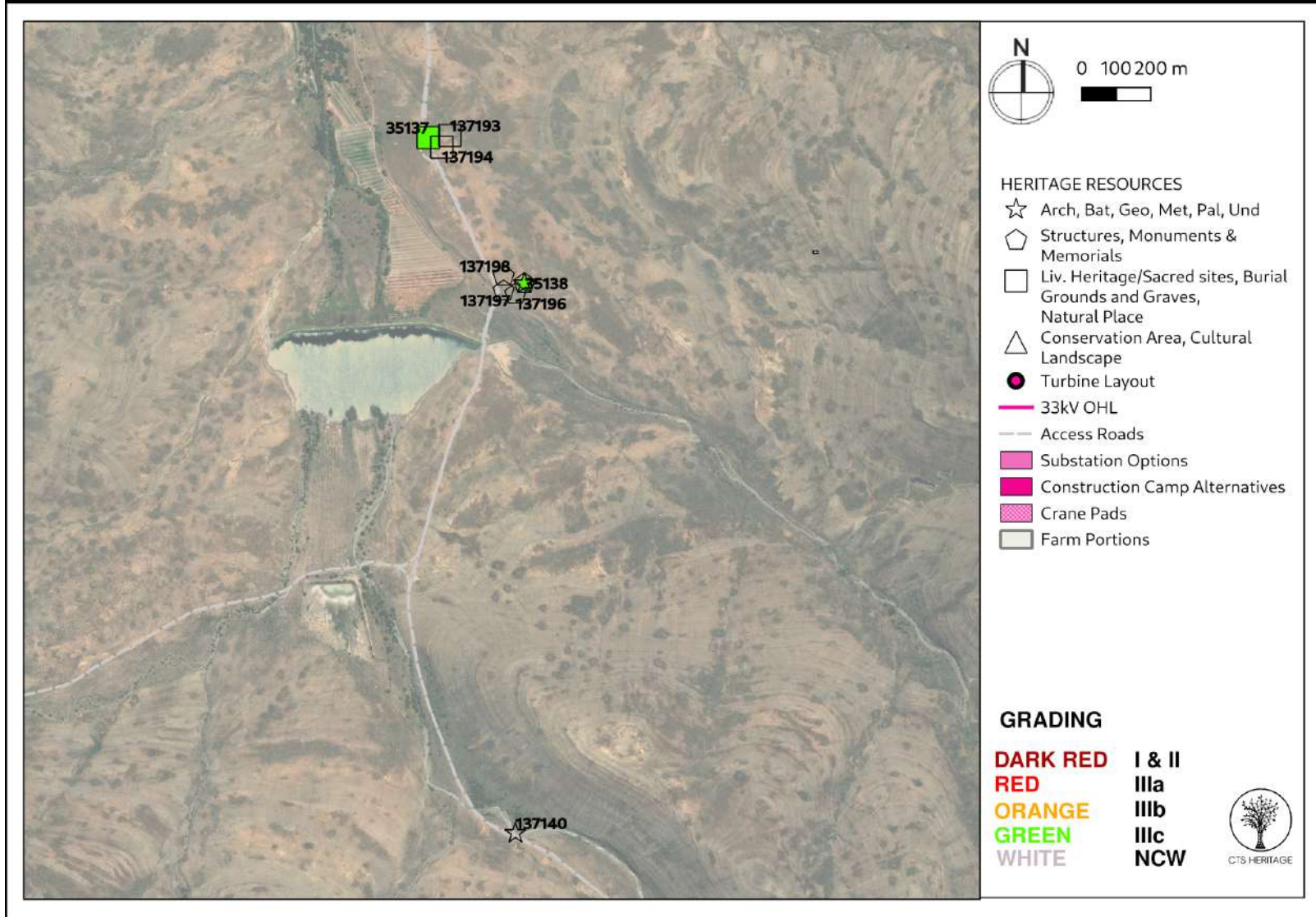


Figure 3.4. Heritage Resources Map. Inset D



4. IDENTIFICATION OF HERITAGE RESOURCES

4.1 Findings of previous assessments

Archaeology, Graves and the Built Environment

The HIA for the Karreebosch WEF (Kendrick and Hart, 2015) notes that “*the study area is relatively austere in terms of pre-colonial heritage, however valley bottoms contain evidence of early trekboer cultural landscapes – ruins, graves and occasional middens. These consist of collections of ruined stone and mud buildings, threshing floors and kraals located exclusively in the valley areas between the high longitudinal ridges that characterise the study area.*” These findings reiterate the earlier findings from the Roggeveld WEF HIA (Hart and Webley, 2013).

Very few archaeological resources were identified during the archaeological field assessment completed for the proposed Karreebosch WEF (Kendrick and Hart, 2015). The resources that were identified were all single artefact occurrences or low density artefact scatters, none of which were determined to have any scientific cultural value. Where archaeological material was found, lithics consisted of local quartzites used to manufacture Middle and Later Stone Age flakes as well as cherts that were sourced in the more general region such as the Tanqua and Ceres Karoo by people in the Later Stone Age.

All of the heritage resources identified by Hart and Webley (2013) and Kendrick and Hart (2015) have been recorded on SAHRIS and mapped relative to the final proposed layout for the Karreebosch WEF (July 2022). The previously identified heritage resources located in close proximity to the development area have been listed in Table 2 and mapped in Figure 3.

Table 3: Archaeological, palaeontological and built environment observations noted during the HIA (2013 and 2015) completed for the Karreebosch WEF and associated infrastructure, and from other relevant heritage assessments (Mapped in Figure 3)

Site ID	Site no	Full Site Name	Site Type	Grading
35222	ROG037	Roggeveld 037	Building	Grade IIIb
35135	ROG005	Roggeveld 005	Building	Grade IIIc
35138	ROG008	Roggeveld 008	Stone walling	Grade IIIc
35152	ROG012	Roggeveld 012	Building	Grade IIIc
35154	ROG013	Roggeveld 013	Stone walling	Grade IIIc
35157	ROG014	Roggeveld 014	Transport infrastructure	Grade IIIc
35159	ROG015	Roggeveld 015	Building	Grade IIIc
35171	ROG016	Roggeveld 016	Stone walling	Grade IIIc
35172	ROG017	Roggeveld 017	Stone walling	Grade IIIc
35174	ROG019	Roggeveld 019	Stone walling	Grade IIIc
35175	ROG020	Roggeveld 020	Stone walling	Grade IIIc



CTS HERITAGE

Site ID	Site no	Full Site Name	Site Type	Grading
35177	ROG021	Roggeveld 021	Stone walling	Grade IIIc
35178	ROG022	Roggeveld 022	Conservation Area	Grade IIIc
35191	ROG025	Roggeveld 025	Ruin > 100 years, Artefacts	Grade IIIc
35202	ROG028	Roggeveld 028	Artefacts	Grade IIIc
35204	ROG029	Roggeveld 029	Cultural Landscape	Grade IIIc
35208	ROG030	Roggeveld 030	Stone walling	Grade IIIc
35215	ROG033	Roggeveld 033	Cultural Landscape	Grade IIIc
35137	ROG007	Roggeveld 007	Burial Grounds & Graves	Grade IIIc
35201	ROG027	Roggeveld 027	Burial Grounds & Graves	Grade IIIc
35226	ROG038	Roggeveld 038	Burial Grounds & Graves	Grade IIIa
137190	KWF-005	KAREEBOSCH WIND FARM	Building	
137192	KWF-007	KAREEBOSCH WIND FARM	Burial Grounds & Graves	
137193	KWF-008	KAREEBOSCH WIND FARM	Burial Grounds & Graves	
137194	KWF-009	KAREEBOSCH WIND FARM	Burial Grounds & Graves	
137195	KWF-010	KAREEBOSCH WIND FARM	Structures	
137196	KWF-011	KAREEBOSCH WIND FARM	Structures	
137197	KWF-012	KAREEBOSCH WIND FARM	Structures	
137198	KWF-013	KAREEBOSCH WIND FARM	Structures	
137202	KWF-017	KAREEBOSCH WIND FARM	Building	
137203	KWF-018	KAREEBOSCH WIND FARM	Stone walling	
137204	KWF-019	KAREEBOSCH WIND FARM	Archaeological	
137205	KWF-020	KAREEBOSCH WIND FARM	Building	
137233	KWF-021	KAREEBOSCH WIND FARM	Stone walling	
137234	KWF-022	KAREEBOSCH WIND FARM	Stone walling	
137236	KWF-024	KAREEBOSCH WIND FARM	Stone walling	
137237	KWF-025	KAREEBOSCH WIND FARM	Stone walling	
137238	KWF-026	KAREEBOSCH WIND FARM	Stone walling	
137239	KWF-027	KAREEBOSCH WIND FARM	Structures	
137240	KWF-028	KAREEBOSCH WIND FARM	Structures	



CTS HERITAGE

Site ID	Site no	Full Site Name	Site Type	Grading
137241	KWF-029	KAREEBOSCH WIND FARM	Structures	
137242	KWF-030	KAREEBOSCH WIND FARM	Structures	
137243	KWF-031	KAREEBOSCH WIND FARM	Structures	
137244	KWF-032	KAREEBOSCH WIND FARM	Burial Grounds & Graves	
137245	KWF-033	KAREEBOSCH WIND FARM	Structures, Artefacts	
137246	KWF-034	KAREEBOSCH WIND FARM	Structures	
137247	KWF-035	KAREEBOSCH WIND FARM	Structures	
137248	KWF-036	KAREEBOSCH WIND FARM	Stone walling	
137249	KWF-037	KAREEBOSCH WIND FARM	Stone walling	
137250	KWF-038	KAREEBOSCH WIND FARM	Structures	
137259	KWF-046	KAREEBOSCH WIND FARM	Structures	Ungraded
137260	KWF-047	KAREEBOSCH WIND FARM	Burial Grounds & Graves	
137137	BWE-048	Brandvalley Wind Energy	Deposit	
137138	BWE-049	Brandvalley Wind Energy	Deposit	
137139	BWE-050	Brandvalley Wind Energy	Deposit	
137140	BWE-051	Brandvalley Wind Energy	Deposit	



CTS HERITAGE

Palaeontology

According to the SAHRIS Palaeosensitivity Map (Figure 4), the area proposed for the WEF is underlain by sediments of very high palaeontological sensitivity belonging to the Abrahamskraal Formation of the Beaufort Group. A Palaeontological Assessment was conducted by Almond (2015) for the Karreebosch WEF (Figure 2, Appendix to the ACO Report 2015, SAHRIS Ref 183350). According to Almond (2015), “*The fluvial Abrahamskraal Formation (Lower Beaufort Group, Karoo Supergroup) that underlies almost the entire wind farm study area is known for its diverse fauna of Permian fossil vertebrates - notably various small- to large-bodied therapsids and reptiles - as well as fossil plants of the Glossopteris Flora and low diversity trace fossil assemblages. However, desktop analysis of known fossil distribution within the Main Karoo Basin shows a marked paucity of fossil localities in the study region between Matjiesfontein and Sutherland where sediments belonging only to the lower part of the thick Abrahamskraal Formation succession are represented.*”

Bedrock exposure levels in the Karreebosch WEF study area are generally very poor due to the pervasive cover by superficial sediments (colluvium, alluvium, soils, calcrete) and vegetation. Nevertheless, a sufficiently large outcrop area of Abrahamskraal Formation sediments, exposed in stream and riverbanks, borrow pits, erosion gullies as well as road cuttings along the R354, has been examined during the present fieldwork to infer that macroscopic fossil remains of any sort are very rare indeed here. Exceptions include common trace fossil assemblages (invertebrate burrows) and occasional fragmentary plant remains (horsetail ferns). Levels of tectonic deformation of the bedrocks are generally low and baking by dolerite intrusions (Early Jurassic Karoo Dolerite Suite) is very minor. It is concluded that the Lower Beaufort Group bedrocks in the study area are generally of low palaeontological sensitivity and this also applies to the overlying Late Caenozoic superficial sediments (colluvium, alluvium, calcrete, soils etc).”



CTS HERITAGE

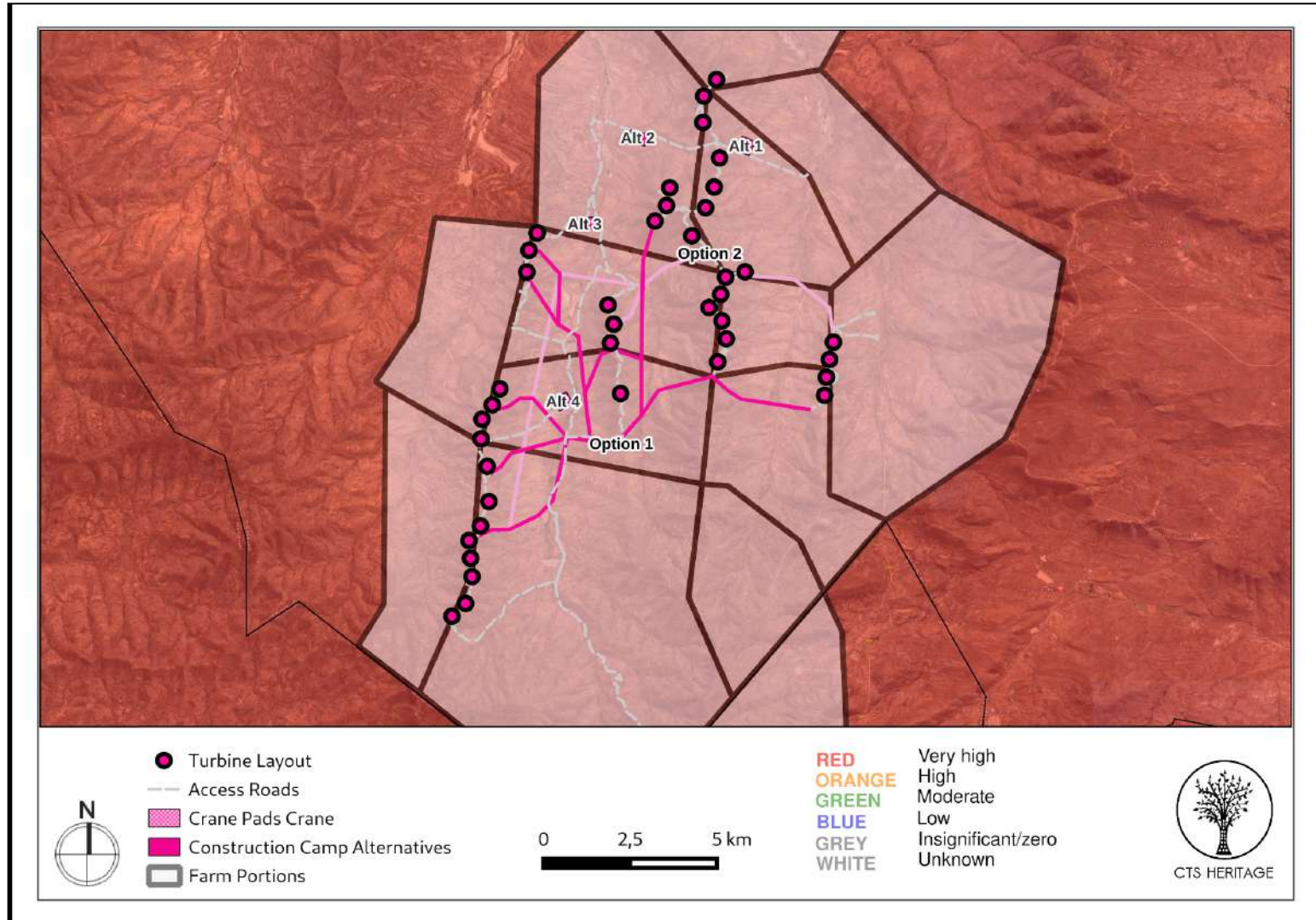


Figure 4.1: Palaeosensitivity Map. Indicating fossil sensitivity underlying the study area



CTS HERITAGE

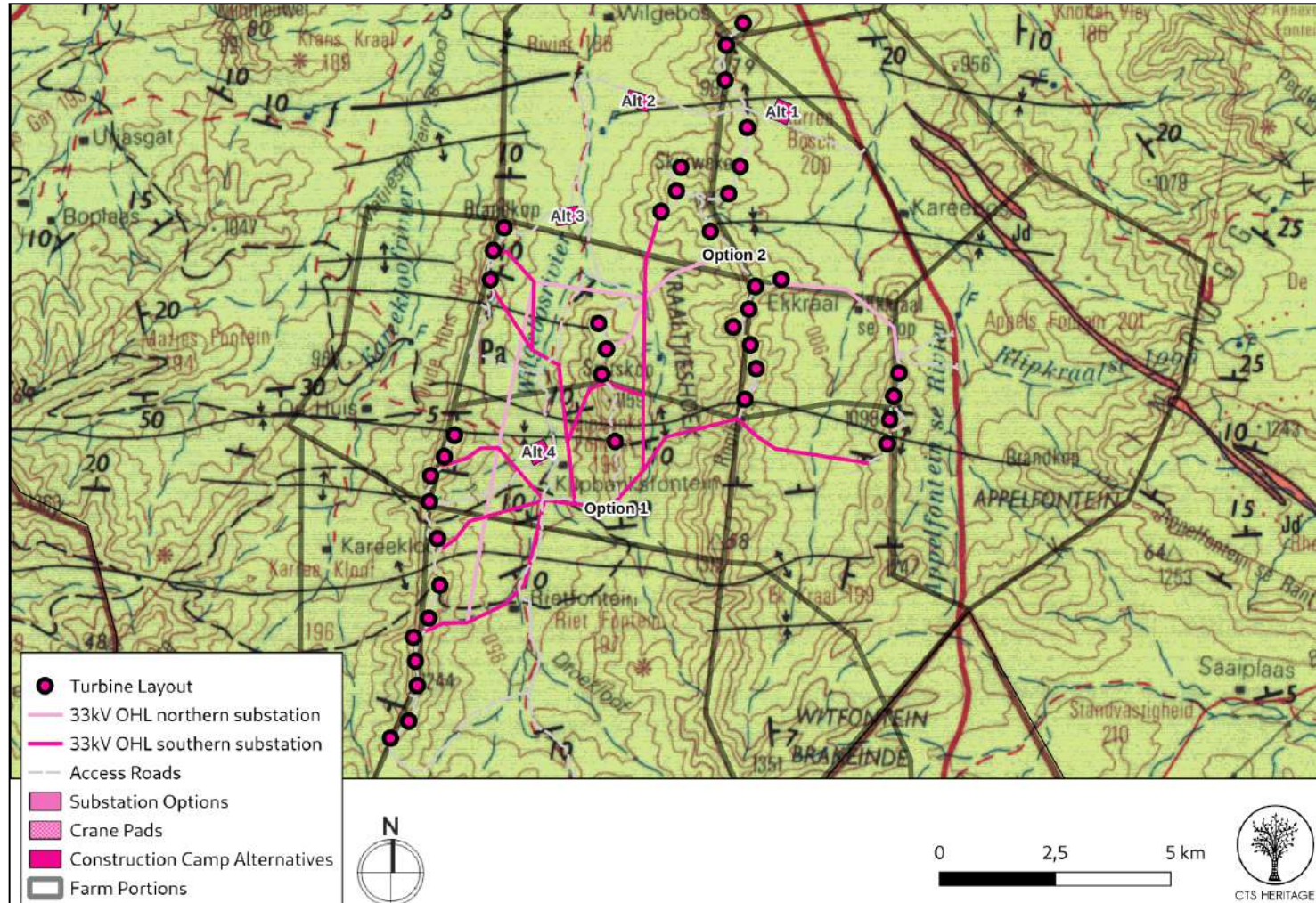


Figure 4.2: Geology Map. Extract from the CGS 3220 Sutherland Map indicating that the development area is underlain by sediments of the Karoo Supergroup assigned to the Dwyka group (C-Pd), as well as the Prince Albert (Pp), Tierberg (Pt) and Collingwood (Pc) formations of the Ecca Group, as well as the Blinkberg (Dbl), Witpoort (Dwi), Floriskraal (Cf), Swartruggens (Ds), Waiipoort (Cw) and Kweekvlei (Ck) formations of the Witteberg Group and Quaternary Sands



CTS HERITAGE

Summary of heritage recommendations from the completed reports (Hart and Kendrick 2014):

The Palaeontological Impact Assessment recommended:

- Field inspection of borrow pits, turbine footing excavations and cable trenches.
- Mitigation normally involves recording and/or collection of fossil material with a permit issued by SAHRA and/or Heritage Western Cape;
- It seems unlikely that any infrastructure will have to be repositioned;
- Selective monitoring of substantial excavations may be required.

The Pre-colonial and Colonial Archaeology:

- No recommendations are made with respect to pre-colonial heritage. The most important colonial archaeological sites in the study area are associated with Ekkraal where an access road is proposed up the valley. This area must be subject to a detailed archaeological survey, important sites flagged and the road routed to avoid impacts.

The Built Environment:

- Re-use of empty farm houses is encouraged as long as renovations carried out are subject to the approval of the relevant heritage compliance authority. It is suggested that the services of a conservation architect is sought if any farm houses are to be altered for re-use.
- Consideration should be made with respect to the positioning of two turbines within sight of the farm Hartjieskraal.

Graves:

- No known graves will be impacted by the proposal, however it is possible that unmarked graves may be encountered during trenching and excavations. In the event of this happening work in the immediate area should cease and the find reported to the heritage authority and an archaeologist. Human remains must not be removed from the find site, but the area cordoned off until a formal exhumation and investigation can be put in place.

Cultural Landscape:

- The proposed energy facility will not be visible from any major transport routes (N1) but there will be visibility from tertiary roads in the area and especially the R354 between Matjiesfontein and Sutherland, a scenic tourism route. This will affect the sense of wilderness of a large chunk of the region. Conservation-worthy buildings or places of celebrated heritage significance are limited.
- The visual impact of the turbine positions will be assessed by a separate Visual Impact Assessment.



CTS HERITAGE



Figure 5.1: Contextual Image of development area

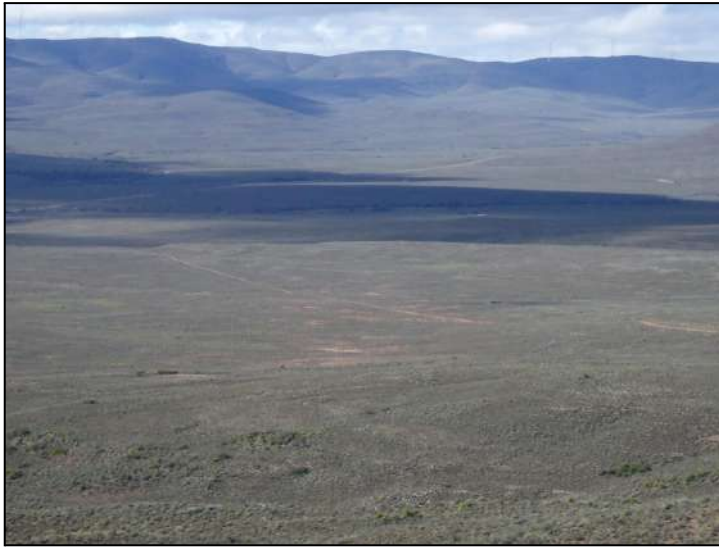


Figure 5.2: Contextual Image of development area



Figure 5.3: Contextual Image of development area



CTS HERITAGE



Figure 5.4: Contextual Images of Development Area



Figure 5.5: Contextual Images of Development Area



Figure 5.6: Contextual Images of Development Area



CTS HERITAGE



Figure 5.7: Contextual Images of Development Area



Figure 5.8: Contextual Images of Development Area



CTS HERITAGE



Figure 5.9: Contextual Images of Development Area



CTS HERITAGE

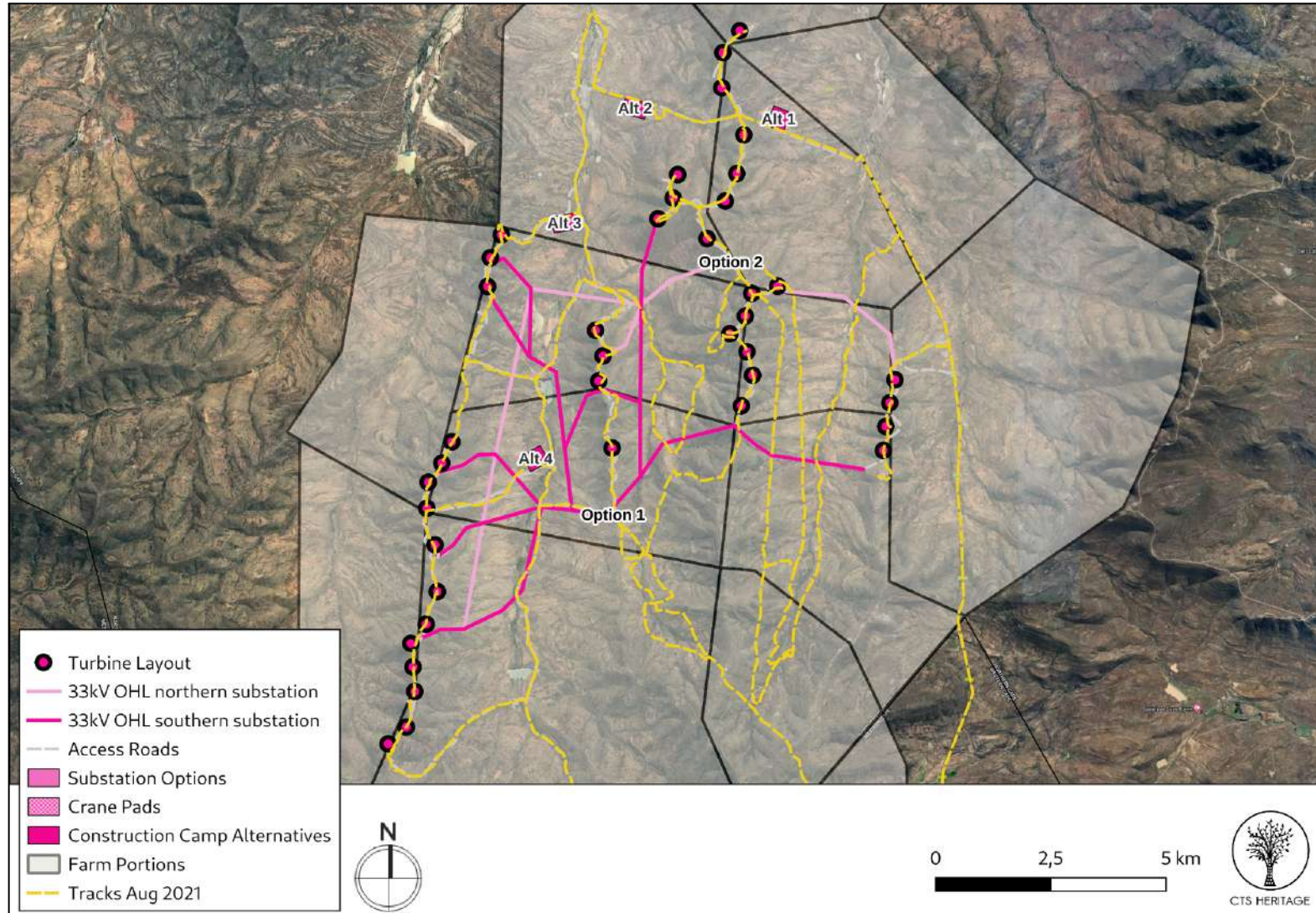


Figure 6: Overall track paths of foot survey conducted in August 2021 over the July 2022 Layout



4.2 Heritage Resources identified in the Walkdown

The findings of this field assessment largely correlate with the findings of the Karreebosch HIA (Kendrick and Hart, 2015) which “revealed that the study area is relatively austere in terms of pre-colonial heritage, however valley bottoms contain evidence of early trekboer cultural landscapes – ruins, graves and occasional middens. These consist of collections of ruined stone and mud buildings, threshing floors and kraals located exclusively in the valley areas between the high longitudinal ridges that characterise the study area.”

No significant heritage resources were identified in close proximity to any of the proposed infrastructure to be developed in the proposed final layout. Some of the existing roads within the development area pass close by to known heritage resources, however as these are existing roads that will be used by the WEF, no impact is anticipated.

As such, no negative impact to significant archaeological heritage is anticipated and there is no preferred alternative alignment in terms of impacts to archaeological resources.

Table 4: Archaeological and built environment observations noted during the walk down for the WEF and associated infrastructure

Obs #	Site Name	Description	Period	Co-ordinates		Grading
KRB016	Karreebosch 016	Ruined structure	Historic	-32.77085	20.47301	IIIB
KRB017	Karreebosch 017	Quartzite flakes, thinly struck, prep. Platforms, MSA. Near valley floor; cores and flakes, knapping and production site	MSA	-32.85936	20.47184	NCW
KRB018	Karreebosch 018	Chert flake, LSA. On top of the ridge.	LSA	-32.84809	20.44152	NCW
KRB019	Karreebosch 019	Quartzite flake, MSA	MSA	-32.84897	20.44073	NCW
KRB020	Karreebosch 020	Quartzite flake, MSA	MSA	-32.86418	20.43635	NCW
KRB021	Karreebosch 021	Chert and quartz flakes, lower grindstone near wind pump, LSA	LSA	-32.90585	20.44082	NCW
KRB022	Karreebosch 022	Chert flake, LSA	LSA	-32.88297	20.517862	NCW



CTS HERITAGE

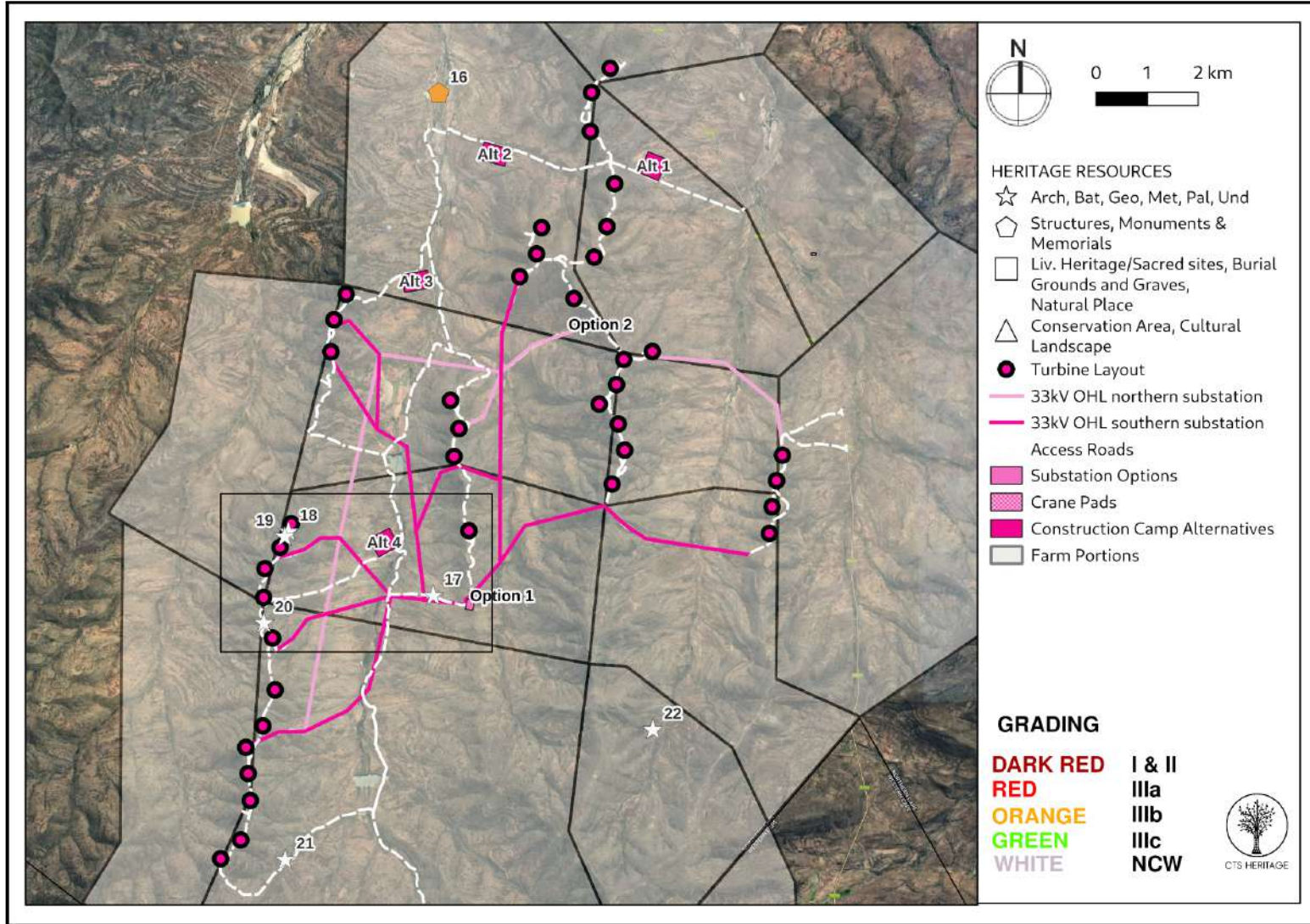


Figure 7: Location of observations recorded during the walkdown



CTS HERITAGE

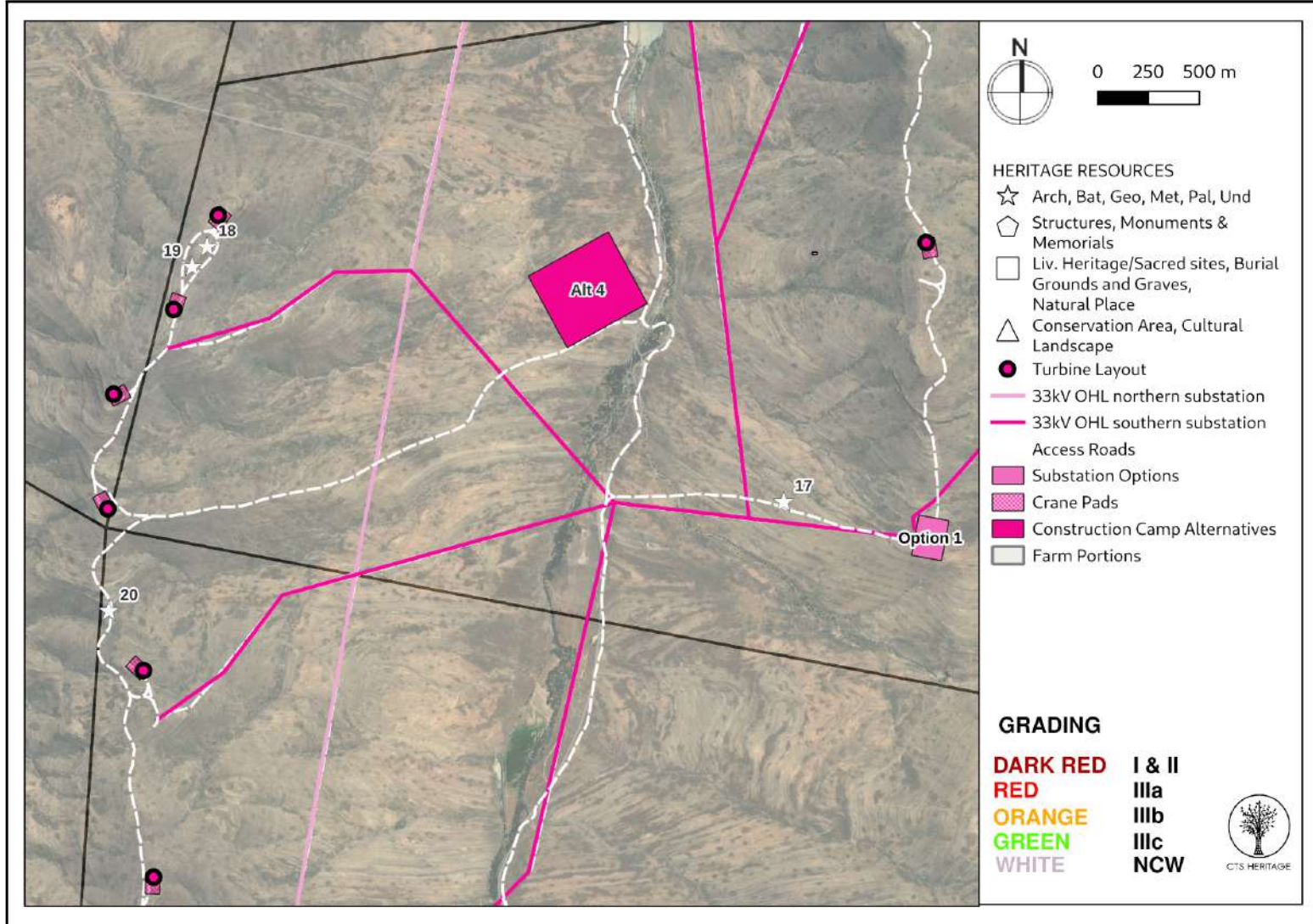


Figure 7.1.: Location of observations recorded during the walkdown - Inset A



CTS HERITAGE

4.3 Selected photographic record

(a full photographic record is available upon request)



Figure 8.1: KRB016



Figure 8.2: KRB017



Figure 8.3: KRB017



CTS HERITAGE



Figure 8.4: KRB017



Figure 8.5: KRB018



Figure 8.6: KRB019



CTS HERITAGE



Figure 8.7: KRB020



Figure 8.8: KRB021



Figure 8.9: KRB022



CTS HERITAGE

5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

5.1 Assessment of impact to Archaeological Resources

The survey provided a very good account of the generally ubiquitous MSA material spread across the study area in low densities. No impacts on significant heritage resources are anticipated as the final layout of the Karreebosch WEF has been designed to avoid the previously recorded sites of significance by Hart and Kendrick in 2015.

6. CONCLUSION AND RECOMMENDATIONS

The findings of this field assessment largely correlate with the findings of the ACO in the HIA completed for the Karreebosch WEF (Kendrick and Hart, 2015, SAHRIS Ref 183350) and the Roggeveld WEF (Hart and Webley, 2013, SAHRIS Ref 152531). The archaeological resources identified within the area proposed for development are all *ex situ* and are of limited scientific and heritage significance.

The final layout for the Karreebosch WEF avoids impact to all known significant heritage resources present within the development area. The walkdown of the final layout revealed no new significant heritage resources that are likely to be impacted. There are no preferred alternatives for the proposed access roads, construction camps or substations from a heritage perspective.

It is therefore recommended that this report is accepted as satisfying the following conditions of the Environmental Authorisation issued for the Karreebosch WEF project:

- All buffers and no-go areas stipulated in this (HIA) report must be adhered to for both the facilities and all roads and power lines.

No further heritage assessment is recommended for this development.

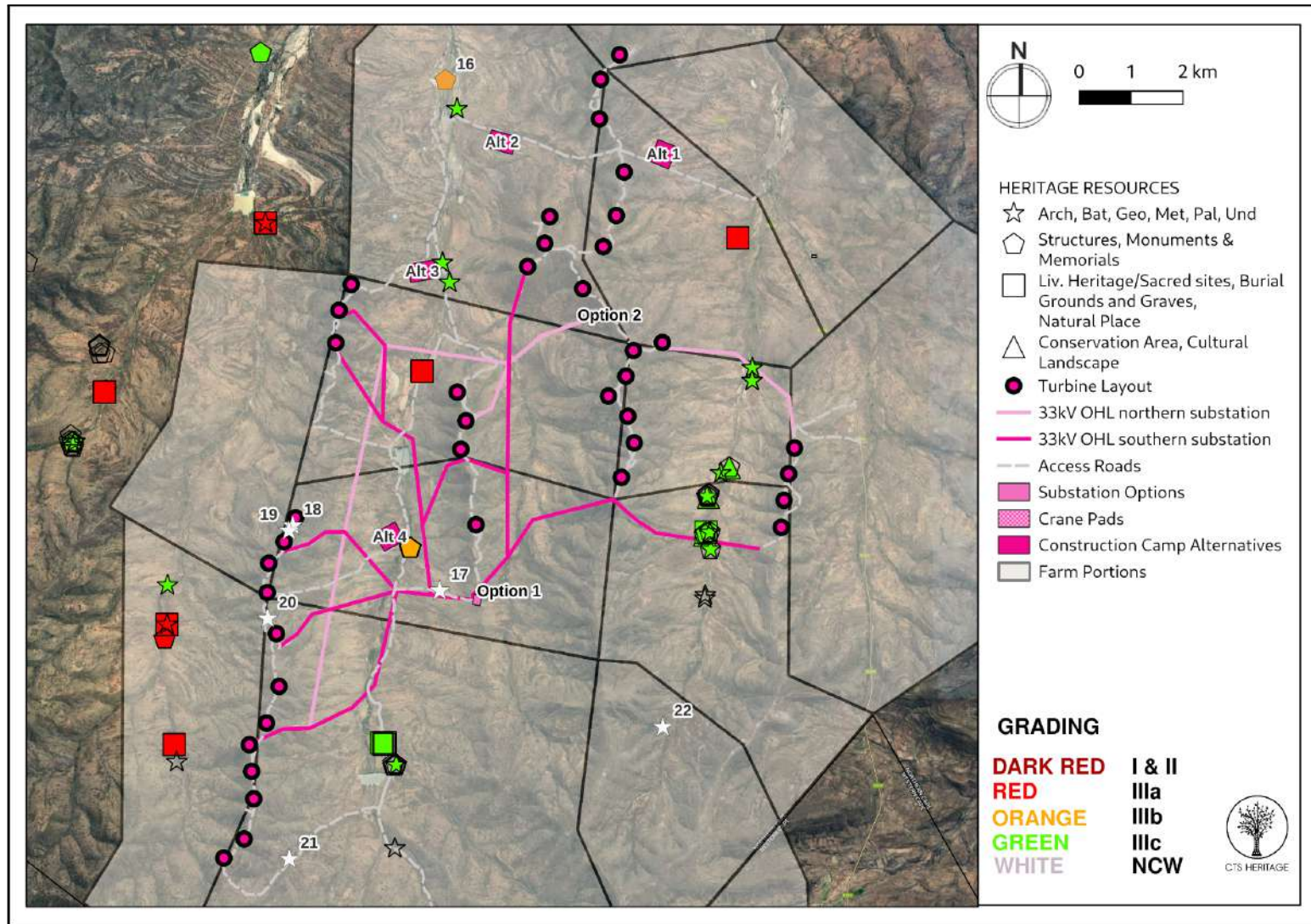


Figure 9: Map of all known heritage resources relative to the final proposed development footprint



7. REFERENCES

Heritage Impact Assessments				
Nid	Report Type	Author/s	Date	Title
359488	Heritage Screener	Mariagrazia Galimberti, Kyla Bluff, Nicholas Wiltshire	09/03/2016	Brandvalley Wind Energy Facility
53187	HIA Phase 1	Timothy Hart, Lita Webley	01/03/2011	HERITAGE IMPACT ASSESSMENT PROPOSED WIND ENERGY FACILITY
337370	PIA Phase 1	Duncan Miller	01/03/2011	Palaeontological Impact Assessment Proposed Roggeveld Wind Energy Facility
356316	Heritage Screener	Mariagrazia Galimberti, Kyla Bluff, Nicholas Wiltshire	02/02/2016	Heritage Screener CTS15_015b EOH Brandvalley Wind Energy Facility
356318	Heritage Screener	Mariagrazia Galimberti, Kyla Bluff, Nicholas Wiltshire	01/02/2016	Heritage Screener CTS15_015a EOH Rietkloof Wind Energy Facility
364162	PIA Phase 1	John E Almond	01/04/2016	PALAEONTOLOGICAL HERITAGE ASSESSMENT: COMBINED DESKTOP & FIELD-BASED STUDY - PROPOSED BRANDVALLEY WIND ENERGY FACILITY LAINGSBURG, WESTERN & NORTHERN CAPE PROVINCES
364163	AIA Phase 1	Celeste Booth	01/04/2016	A PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) FOR THE PROPOSED BRANDVALLEY WIND ENERGY FACILITY (WEF) SITUATED IN THE KAROO HOOGLAND LOCAL MUNICIPALITY (NAMAKWA DISTRICT MUNICIPALITY), THE WITZENBURG LOCAL MUNICIPALITY (CAPE WINELANDS DISTRICT MUNICIPALITY) AND LAINGSBURG LOCAL MUNICIPALITY (CENTRAL KAROO DISTRICT MUNICIPALITY).
4843	AIA Phase 1	Hilary Deacon	28/03/2008	Archaeological Impact Assessment: Proposed Breede Valley De Doorns Housing Project
	HIA	Dave Halkett, Lita Webley	11/04/2011	HERITAGE IMPACT ASSESSMENT: PROPOSED PERDEKRAAL WIND AND SOLAR ENERGY FACILITY , WESTERN CAPE PROVINCE

Additional References:

Hart, T. et al. (2016). **HERITAGE IMPACT ASSESSMENT (SCOPING) FOR THE PROPOSED KOLKIES WIND ENERGY FACILITY AND ASSOCIATED GRID CONNECTION TO BE SITUATED IN THE SOUTHERN TANKWA KAROO.** (Assessment conducted under Section 38 (8) of the National Heritage Resources Act (No. 25 of 1999) as part of an EIA). For Arcus Consulting. Unpublished and not submitted.

Hart, T. et al. (2016). **HERITAGE IMPACT ASSESSMENT (SCOPING) FOR THE PROPOSED KAREE WIND ENERGY FACILITY AND ASSOCIATED GRID CONNECTION TO BE SITUATED IN THE SOUTHERN TANKWA KAROO.** (Assessment conducted under Section 38 (8) of the National Heritage Resources Act (No. 25 of 1999) as part of an EIA). For Arcus Consulting. Unpublished and not submitted.



CTS HERITAGE

Shaw, Matthew & Ames, Christopher & Phillips, Natasha & Chambers, Sherrie & Dosseto, Anthony & Douglas, Matthew & Goble, Ron & Jacobs, Zenobia & Jones, Brian & Lin, Sam & Low, Marika & Mcneil, Jessica-Louise & Nasoordeen, Shezani & O'driscoll, Corey & Saktura, Rosaria & Sumner, T. & Watson, Sara & Will, Manual & Mackay, Alex. (2020). **The Doring River Archaeology Project: Approaching the Evolution of Human Land Use Patterns in the Western Cape, South Africa.**

Smith, Andrew B., and Michael R. Ripp. "An Archaeological Reconnaissance of the Doorn/Tanqua Karoo." *The South African Archaeological Bulletin*, vol. 33, no. 128, 1978, pp. 118–133