ARCHAEOLOGICAL SPECIALIST STUDY

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

Proposed Development of the Vetlaagte infrastructure associated with the authorised PV Facilities near De Aar

Prepared by



In Association with

Savannah Environmental

November 2021



EXECUTIVE SUMMARY

Background

- Vetlaagte Farm consists of 3x PV farms of which Environmental Authorisation was obtained in 2012/14
- The 3x PV farms will each have a Switching Station as well as a grid connection connecting the PV farm to the new MTS
- The new MTS will connect via Loop In Loop Out (LILO) power lines to an existing 400kV power line

The overall archaeological sensitivity of the development area with regard to the preservation of Early, Middle and Later Stone Age archaeology as well as Khoe and San heritage, early colonial settlement 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.

As indicated above, the results of this assessment align with the findings of other specialists such as Morris (2011) who notes that ephemeral MSA and 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 in terms of impacts to archaeological heritage on condition that:

- Site Vetlaagte 03 (SAHRIS ID 34471) be properly recorded prior to construction.
- Should any buried archaeological resources or human remains 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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1. INTRODUCTION

1.1 Background Information on Project

Background

- Vetlaggte Farm consists of 3x PV farms of which Environmental Authorisation was obtained in 2012/14
- The 3x PV farms will each have a Switching Station as well as a grid connection connecting the PV farm to the new MTS
- The new MTS will connect via Loop In Loop Out (LILO) power lines to an existing 400kV power line

Project components and areas for assessment

- 3x grid connections WITH A 300M CORRIDOR
- 3x switching stations (note that the Switching Stations fall within the 300m corridor)
- Main Transmission Substation note that there are two site alternatives within the assessment area. These alternative sites need to be assessed and other sites recommended should these sites not be suitable.
- LILO lines to connect the MTS to the existing 400kV lines
- The entire assessment area (as per info provided for quoting purposes) needs to be investigated and no go areas demarcated.

General

- The grid connections connecting PV1 and PV2 are running adjacent to each other and to the direct east of an existing 132kV line (the existing line is in red in the map below)
- The PV3 grid connection and switching station are situated within the assessment area.

1.2 Description of Property and Affected Environment

The farm, Vetlaagte 4, lies 5.5 km east of the town of De Aar and about 2km north of the large Hydra substation. A number of renewable energy projects, particularly solar PV farms, have been proposed immediately surrounding this development and three completed solar farms lie north and northwest of Vetlaagte 4 such as De Aar Solar and Paarde Valley. A completed 144MW wind farm lies on the plateau north east of the development and can be seen from parts of Vetlaagte. The Vetlaagte project has a roughly 4km long stretch of proposed powerlines running right next to an existing powerline as well as the various solar PV panels and infrastructure clustered on the southern end of the development area. The powerline route runs along flat grassland and much of the eastern half of Vetlaagte is similarly flat with only a few very small dolerite outcrops. The western half of Vetlaagte is rockier and hilly with two clusters of dolerite outcrops split either side of a jeep track.

The farms are currently used for grazing by sheep and a few farm kraals, dams and windmills were observed. The vegetation is typical of the Karoo and the grassland was dense enough over much of the site to hamper visibility of archaeological material lying on the surface. Some small scale crop agricultural production is placed at the Vetlaagte farmhouse complex which lies on the banks of a floodplain running north - south past the eastern end of the study area. A few (currently dry) farm dams were evident that appear to be in a state of disuse within the floodplain.



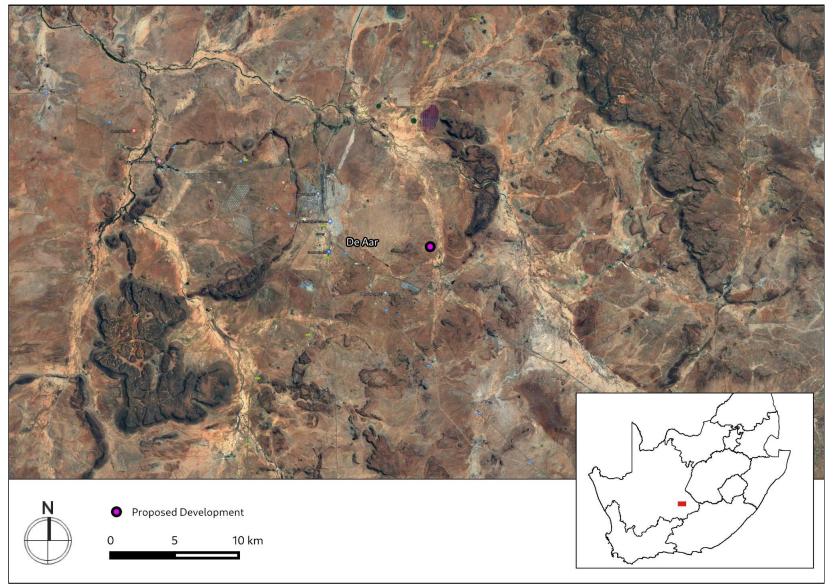


Figure 1.1: Close up satellite image indicating proposed location of study area



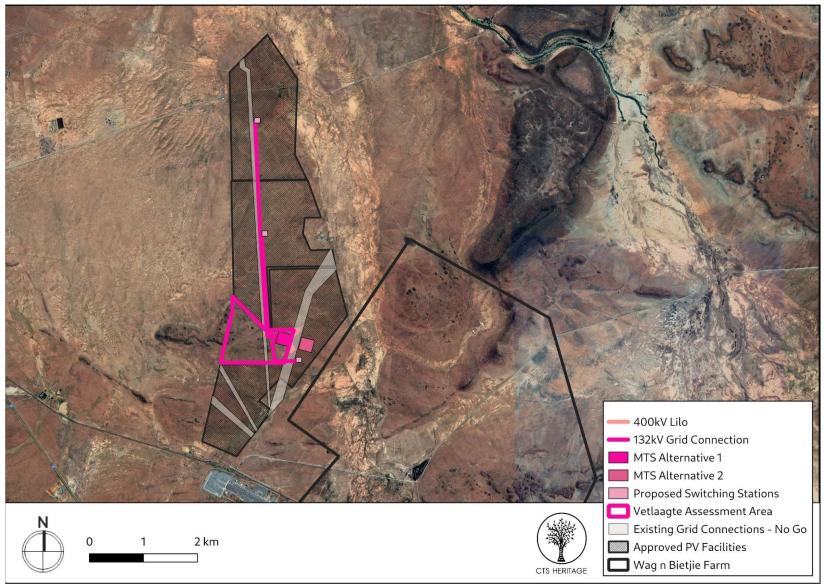


Figure 1.2: Study Area



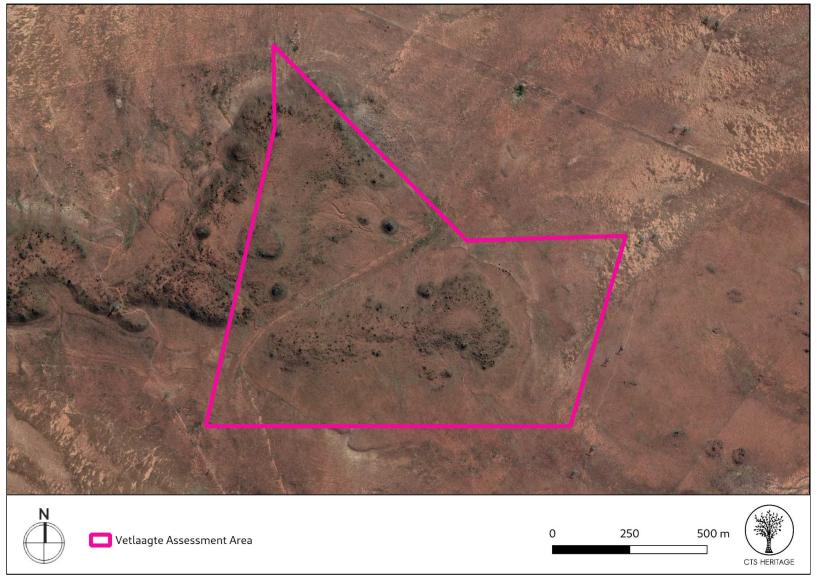


Figure 1.3: Study Area



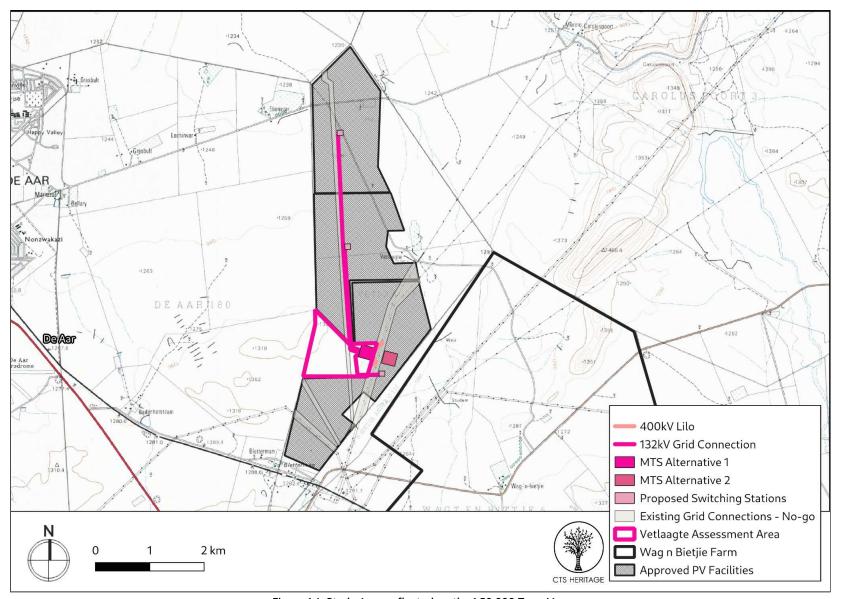


Figure 1.4: Study Area reflected on the 1:50 000 Topo Map



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 conducted a survey of the site and its environs on 9 November 2021 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.

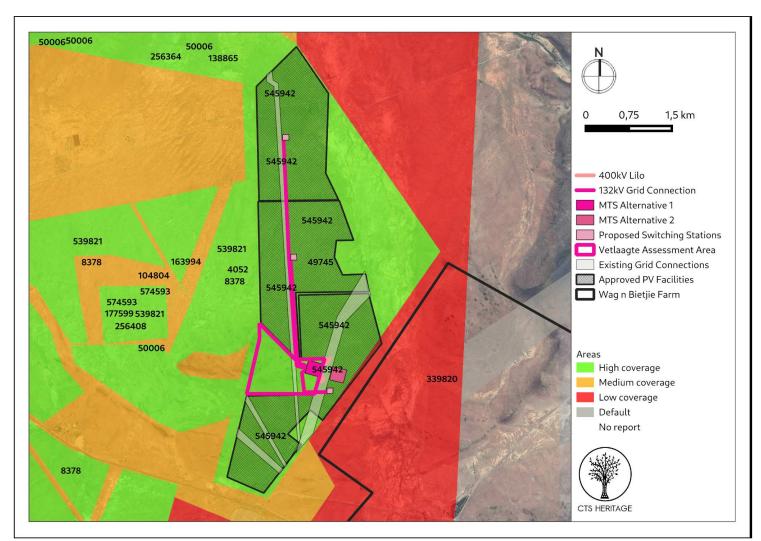


Figure 2: Close up satellite image indicating proposed location of the study area in relation to heritage studies previously conducted



2.3 Constraints & Limitations

The grassland areas could be quite densely covered in places spread throughout the site which certainly contributed to obscuring the archaeological material on the surface. However, enough patches of exposed and open ground were encountered throughout the study area and scatters of artefacts were easily recorded in these spots along with Stone Age material associated with occupation areas nearer to the dolerite outcrops. There were therefore no major limitations or constraints to the survey carried out and we are confident that the assessment provided an accurate report on the archaeological sensitivity of the area.

3. HISTORY AND EVOLUTION OF THE SITE AND CONTEXT

This application is for the proposed development of supplementary infrastructure associated with the Vetlaagte Solar Energy Facility located West of De Aar in the Northern cape. De Aar was originally established on the Farm "De Aar." The name means "the artery," a reference to its underground water supply. The Cape Government Railways were founded in 1872, and the route that the government chose for the line to connect the Kimberley diamond fields to Cape Town on the coast, ran directly through De Aar. Because of its central location, the government also selected the location for a junction between this first railway line, and the other Cape railway networks further east, in 1881. In 1899 two brothers who ran a trading store and hotel at the junction, Isaac and Wulf Friedlander, purchased the farm of De Aar. Following the Anglo Boer War, the Friedlander brothers surveyed the land for the establishment of a town. The municipality was created a year later in 1900.

The area proposed for development has been previously approved for the establishment of the Vetlaagte Solar Energy Facility in 2012 (SAHRIS Case ID 192). As such, the development area has been subject to a previous heritage impact assessment process (Kruger, 2012 SAHRIS ID 49745) and a palaeontology assessment (Almond, 2012 SAHRIS ID 49843). Both of these reports are referred to extensively below.

Kruger (2012) describes the development area as "characterised by flat undulating Karoo vegetation comprised out of relatively sparse scrub and grasses, with dolerite hills in the surrounding landscape. Large portions of the land is currently devoted to livestock farming but a number of solar energy facilities are to be constructed on farms around De Aar. Shallow soils covers a combination of calcrete, shale and dolerite substrates, and large sections in the landscape are exposed to sheet erosion, specifically along low lying areas and drainage lines. Dolerite and sandstone is present, while exotic rocks occur in the gravel of the Orange River bed and terraces. These provided suitable material for stone tool production during the Earlier, Middle and Later Stone Ages. "

Archaeology

As part of the 2012 process for approval of the Vetlaagte Solar Energy Facility, Kruger conducted a detailed Heritage Impact Assessment of the area proposed for development. According to Kruger (2012), "During the survey, widespread Middle Stone Age (MSA) material, including characteristic formal MSA stone tools such as points, blades and scrapers were documented in the survey area along a north-south oriented drainage on the eastern periphery of the property. The lithic remains occur in three large scatters and, almost without exception, in low lying areas along non-perennial



drainage lines and wetland areas where precipitation and groundwater have exposed the stone tools, originally deposited on a decomposed calcrete rock layer approximately 30cm sub surface. Preliminary examinations of some of the lithics indicated that a number of flakes displayed facetted platforms, characteristic of the MSA."

Kruger (2012) also documented historical period remains, "specifically the old Vetlaagte homestead with restored farmhouse, outbuildings, midden and labourers quarters, as well as a dilapidated dam wall constructed in the drainage line east of the farmstead are present on the property. The date of construction of the farm house is denoted by a year count ("1930") on the front gable of the structure. The entire farmstead is situated in an area excluded from the solar farm development. A small family graveyard, associated with the farmstead at Vetlaagte, also occurs in the exclusion zone about 100m north of the farm house."

All of the heritage resources identified by Kruger (2012) have been mapped relative to the proposed development in Figure 3. No impact to any known heritage resources are anticipated. None of the infrastructure proposed as part of this development application are located near the archaeologically sensitive drainage located along the eastern periphery of the property. The sites listed in the table below are located within the development footprint however direct impact is only anticipated to Site Vetlaagte 03 (SAHRIS ID 34471) as it is located within the proposed 132kV alignment. As per Kruger (2012), it is recommended that the site be properly recorded prior to construction.

Table 1: Heritage resources identified through previous assessments

NID	Site No.	Site Name	Description	Grading	Latitude	Longitude	Mitigation
34479	VLG007	VETLAAGTE 7	Burial Grounds & Graves - A small family graveyard, associated with the farmstead at Vetlaagte. It contains a single grave of a former farm owner who passed away in 1933.	Grade IIIa	-30,669722	24,103228	No impact anticipated
34470	VLG002	Vetlaagte 2	Artefacts - High density MSA artefact and debris scatters in drainage line at Vetlaagte.	Grade IIIb	-30,65015	24,100117	No impact anticipated
34471	VLG003	VETLAAGTE 3	Artefacts - MSA, single blades and scrapers occur along with flakes and debris. The site integrity has been compromised by the mixing of artefacts caused by riverbank erosion	Grade IIIc	-30,677206	24,090869	Located within the proposed 132kV grid connection. Documentation of sites.
34474	VLG004	VETLAAGTE 4	Artefacts - High density MSA Lithics exposed as a result of calcrete erosion.	Grade IIIb	-30,699747	24,091936	No impact anticipated
34475	VLG005	VETLAAGTE 5	Building - Historical period remains, specifically the old Vetlaagte homestead with restored farmhouse, outbuildings, midden and labourers quarters. The date of construction of the farm house is denoted by a year count ("1930") on the front gable of the structure.	Grade IIIb	-30,671839	24,102522	No impact anticipated



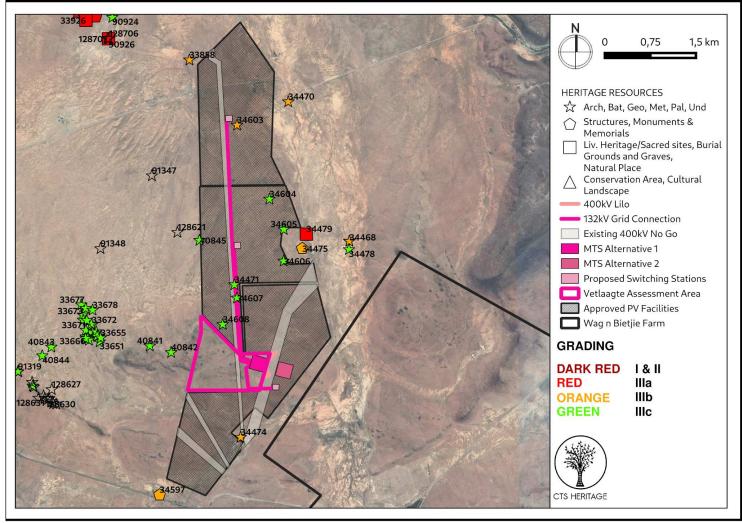


Figure 3. Heritage Resources Map. Heritage Resources previously identified in and near the study area, with SAHRIS Site IDs indicated



4. IDENTIFICATION OF HERITAGE RESOURCES

4.1 Field Assessment

Over 20 archaeological observations were made on Vetlaagte. Hornfels dominated the assemblages with smaller components of CCS and siltstones. While the vast majority of the scatters were made during the Middle Stone Age, there was also a relatively clear Later Stone Age presence in the study area. Many examples of blade forms were found which is typical of the Still Bay period (>70 000 years BP) and the neighbouring Wag 'n Bietjie farm was also surveyed whilst conducting an HIA for a similar solar PV facility there. Relatively dense Later Stone Age sites were found on the far eastern end of Wag 'n Bietjie and these date within the last 2000 years due to the presence of pottery in these sites. The areas around the dolerite outcrops on Vetlaagte were not nearly as densely occupied and this is probably due to the distance from the Brakrivier which runs around Caroluspoort (4km northeast of Wag 'n Bietjie).

None of the sites found at Vetlaagte warranted further study as they are typical of the area and are ubiquitously distributed in low densities of less than 5 artefacts per observation. Kruger's previous survey on ground overlapping with this study area found similar material but we feel the gradings attributed to these (IIIC) are better downgraded to NCW now that we have greater coverage contextualising these finds and that they are widespread. Much of the archaeological material will be well conserved within a series of areas that can't be developed for the solar PV arrays while the flat, grassy vlaktes that are idea for the solar PV are also the areas with the lowest archaeological sensitivity.



Figure 4.1: Contextual Images





Figure 4.2: Contextual Images



Figure 4.3: Contextual Images



Figure 4.4: Contextual Images with existing electrical infrastructure



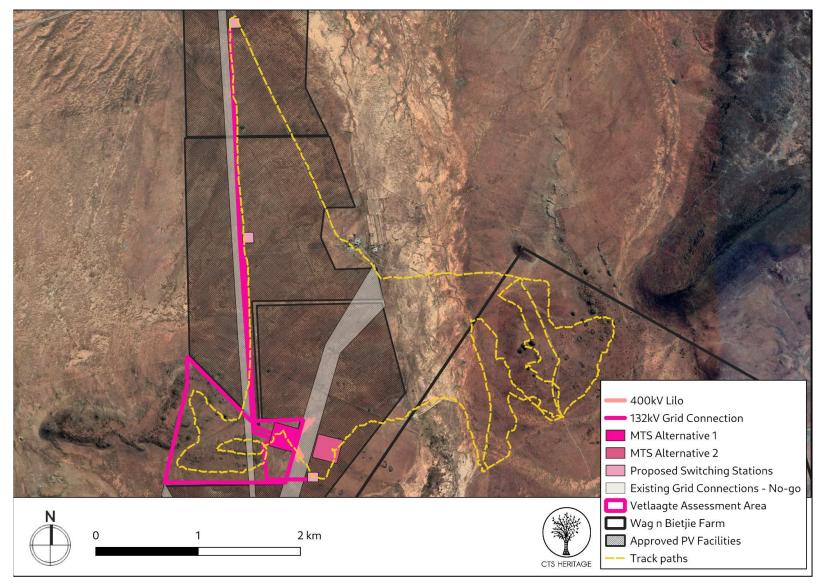


Figure 5.1: Overall track paths of foot survey



Archaeological Resources identified 4.2

Site No.	Site Name	during the field assessment Description	Density m ²	Period	Co-ordinates		Grading	Mitigation	
026	Next to old dam wall. Hornfels points and flakes, siltstone flake worth adze Vetlaagte 026 wear, possibly scraping		0-5	MSA	-30.68727	24.10714	NCW	NA	
027	Vetlaagte 027	Patinated hornfels flake blade with flakes removed from ventral side 0-5 MSA -30.68745 24.10386		NCW	NA				
028	Vetlaagte 028	Small hornfels point with hafted platform retouch	0-5	MSA	-30.68891	24.10134	NCW	NA	
029	Vetlaagte 029	Two heavily patinated hornfels flakes near low dolerite outcrop	0-5	MSA	-30.68995	24.10134	NCW	NA NA	
030	Vetlaagte 030	Hornfels flake, heavily weathered	0-5	MSA	-30.69168	24.10013	NCW	NA NA	
031	Vetlaagte 030	Heavily weathered hornfels flakes	0-5	MSA	-30.69228	24.0979	NCW	NA NA	
032	Vetlaagte 031	Hornfels points, flakes, some fresher, others still heavily patinated	5-10	MSA	-30.69075	24.09674	NCW	NA	
033	Vetlaagte 033	Hornfels flake with very finely struck secondary scars on dorsal	0-5	MSA	-30.68823	24.09485	NCW	NA	
034	Vetlaagte 034	Hornfels chunk, debitage	0-5	LSA	-30.68937	24.09264	NCW	NA	
035	Vetlaagte 035	Two hornfels flakes in amongst dolerite outcrops	0-5	MSA	-30.68906	24.09129	NCW	NA	
036	Vetlaagte 036	Hornfels microlith	0-5	LSA	-30.69	24.08837	NCW	NA	
037	Vetlaagte 037	Hornfels flakes, segment	0-5	MSA	-30.69021	24.09002	NCW	NA	
038	Vetlaagte 038	Hornfels flake	Hornfels flake 0-5 MSA -30.69028 24.092		24.09267	NCW	NA		
039	Vetlaagte 039	Hornfels flakes, one retouched all around, triangular point	0-5	MSA	-30.69163	24.09172	NCW	NA	
040	Vetlaagte 040	Hornfels flakes	0-5	LSA	-30.69188	24.08705	NCW	NA	
041	Vetlaagte 041	Hornfels flake, prepared platform	0-5	MSA	-30.69166	24.08503	NCW	NA	
042	Vetlaagte 042	Heavily weathered hornfels flakes	0-5	MSA	-30.68811	24.08625	NCW	NA	
043	Vetlaagte 043	Hornfels flake	0-5	MSA	-30.68584	24.08541	NCW	NA	
044	Vetlaagte 044	Hornfels flakes with views onto de Aar (west) and already built solar farm (north)	0-5	MSA	-30.68473	24.08571	NCW	NA	
045	Vetlaagte 045	Hornfels flakes, point	0-5	MSA	-30.68571	24.0871	NCW	NA	
046	Vetlaagte 046	Hornfels core	0-5	MSA	-30.68706	24.08877	NCW	NA	
047	Vetlaagte 047	Hornfels flakes in jeep track	0-5	MSA	-30.68724	24.09022	NCW	NA	
048	Vetlaagte 048	Heavily weathered hornfels flakes	0-5	MSA	-30.68164	24.09155	NCW	NA	
049	Vetlaagte 049	Heavily weathered hornfels flakes	0-5	MSA	-30.67917	24.09155	NCW	NA	
050	Vetlaagte 050	Hornfels retouched flake blade	0-5	MSA	-30.67774	 		NA	
051	Vetlaagte 051	Hornfels flake	0-5	MSA	-30.67396	24.09136	NCW	NA	
052	Vetlaagte 052	Hornfels flakes	0-5	LSA	-30.66739	24.09051	NCW	NA	
053	Vetlaagte 053	Unifacially retouched hornfels flake on dorsal surface	0-5	MSA	-30.66513	24.09031	NCW NA		
054	Vetlaagte 054	Ccs flake edge retouched end scraper, hornfels blade lateral retouch	0-5	MSA, LSA	-30.66287	24.09025	NCW	NCW NA	
055	Vetlaagte 055	Hornfels flakes, one blade	0-5	MSA	-30.65858	24.08986	NCW	NA	
056	Vetlaagte 056	Hornfels flake, triangular, notched	0-5	MSA	-30.68495	24.11804	NCW NA		
057	Vetlaagte 057	Hornfels bladelet and flake	0-5	LSA	-30.68727	24.11874	NCW	NA	
058	Vetlaagte 058	Hornfels core flake	0-5	LSA	-30.68672	24.12147	NCW	NA	





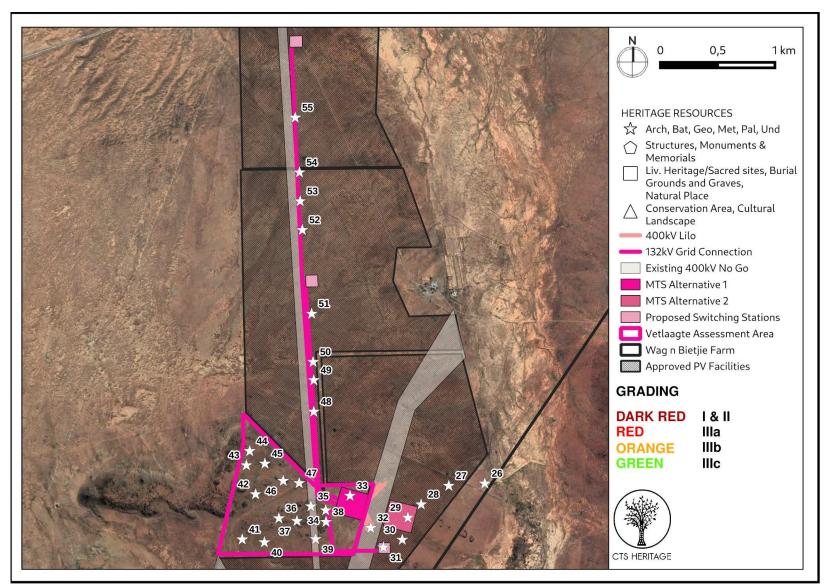


Figure 6.1: Map of field observations relative to the proposed development



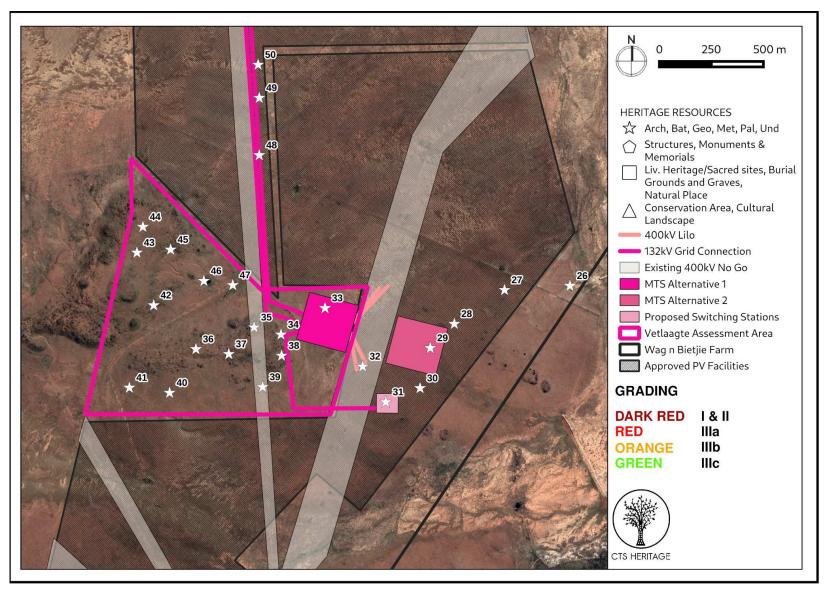


Figure 6.2: Map of field observations relative to the proposed development



4.3 Selected photographic record

(a full photographic record is available upon request)





Figure 7.1: Observation Vetlaagte 026





Figure 7.2: Observation Vetlaagte 027





Figure 7.3: Observation Vetlaagte 028







Figure 7.4: Observation Vetlaagte 032 adjacent to existing electrical infrastructure





Figure 7.5: Observation Vetlaagte 035





Figure 7.6: Observation Vetlaagte 044







Figure 7.7: Observation Vetlaagte 054



Figure 7.8: Observation Vetlaagte 058



5. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

5.1 Assessment of impact to Archaeological Resources

The results of the archaeological field assessment conducted largely aligns with the findings of previous archaeological assessments completed in the vicinity of the proposed development. The archaeological resources identified within the development area are dominated by Later and Middle Stone Age flakes, which corresponds with similar findings of others (Kruger, 2012). All of the archaeological resources identified within the areas proposed for the development in this field assessment have been determined to be not conservation-worthy. As such, these resources have been sufficiently recorded and there is no objection to the proposed development in these locations from an archaeological perspective.

None of the infrastructure proposed as part of this development application are located near the archaeologically sensitive drainage located along the eastern periphery of the property. The sites listed in table 1 above are located within the development footprint however direct impact is only anticipated to Site Vetlaagte 03 (SAHRIS ID 34471) as it is located within the proposed 132kV alignment. As per Kruger (2012), it is recommended that the site be properly recorded prior to construction.

Other than LSA and MSA artefacts that have been determined to be not conservation-worthy, the archaeological field assessment completed in November 2021 identified no structures or other kinds of heritage resources located within the areas proposed for development.

6. CONCLUSION AND RECOMMENDATIONS

The overall archaeological sensitivity of the development area with regard to the preservation of Early, Middle and Later Stone Age archaeology as well as Khoe and San heritage, early colonial settlement 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.

As indicated above, the results of this assessment align with the findings of other specialists such as Morris (2011) who notes that ephemeral MSA and 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 in terms of impacts to archaeological heritage on condition that:

- Site Vetlaagte 03 (SAHRIS ID 34471) be properly recorded prior to construction.
- Should any buried archaeological resources or human remains 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.



7. REFERENCES

Heritage Impact Assessments						
Nid	Report Type	Author/s	Date	Title		
104574	Heritage Scoping	Wouter Fourie	10/10/2012	Heritage Scoping Report for the Proposed Wind Farm Facility for Renosterberg Wind Energy Company (RWEC) near Petrusville, Northern Cape Province		
104576	Heritage Scoping	Wouter Fourie	10/10/2012	Heritage Scoping Report for the Proposed Solar PV Facility for Renosterberg Wind Energy Company (RWEC) near Petrusville, Northern Cape Province		
104804	PIA Desktop	John E Almond	01/09/2012	Palaeontological specialist assessment: desktop study PROPOSED RENOSTERBERG SOLAR PV AND WIND ENERGY FACILITIES NEAR DE AAR, NORTHERN CAPE PROVINCE		
133138	HIA Phase 1	Jayson Orton, Lita Webley	09/07/2013	HERITAGE IMPACT ASSESSMENT FOR MULTIPLE PROPOSED SOLAR ENERGY FACILITIES		
133536	Palaeontologi cal Specialist Reports	John E Almond	01/07/2013	PALAEONTOLOGICAL SPECIALIST STUDY		
133536	Palaeontologi cal Specialist Reports	John E Almond	01/07/2013	PALAEONTOLOGICAL SPECIALIST STUDY		
163982	Palaeontologi cal Specialist Reports		31/08/2013	Palaeontological specialist assessment: combined desktop and field study: Proposed development PV Solar Facility near De Aar, Northern CApe Province		
163994	HIA	Wouter Fourie	03/08/2013	Proposed PV Facility: Heritage Impact Report		
177599	AIA Phase 1	Jonathan Kaplan	01/04/2010	ARCHAEOLOGICAL IMPACT ASSESSMENT PROPOSED PHOTOVOLTAIC POWER GENERATION FACILITY IN DE AAR NORTHERN CAPE		
177600	Site Inspection Report	Will Archer, Jonathan Kaplan	01/05/2012	Reconnaissance and plan for further mitigation: sites impacted on by proposed photovoltaic power generation facility in De Aar Northern Cape		
256408	Palaeontologi cal Specialist Reports	John E Almond	16/07/2013	Palaeontological Specialist Study: Combined Desktop and Field-based Assessments - Proposed Photovoltaic (Solar) Energy Facilities on Badenhorst Dam Farm near De Aar, Northern Cape		
256413	Heritage Impact Assessment Specialist Reports	Jayson Orton	09/07/2013	Heritage Impact Assessment for Multiple Proposed Solar Energy Facilities on De Aar 180/1 (Badenhorst Dam Farm), De Aar, Northern Cape		
339820	Heritage	Lita	01/12/2011	Proposed De Aar Wind Energy Facility on the North and South Plateau,		



	Impact Assessment Specialist Reports	Webley, Jayson Orton		Northern Cape Province
339824	Heritage Impact Assessment Specialist Reports	Lita Webley, David Halkett	01/06/2015	Addendum: Proposed Wind Energy Facility situated on the Eastern plateau (South) near De Aar, Northern Cape Province.
4052	HIA Phase 1	Albert van Jaarsveld	01/03/2006	Hydra-Perseus and Beta-Perseus 765 kV Transmission Power Lines Environmental Impact Assessment. Impact on Cultural Heritage Resources
49745	AIA Phase 1	Neels Kruger	01/03/2012	ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) OF DEMARCATED SURFACE AREAS ON THE OF THE FARM VETLAAGTE 4, DE AAR, NORTHERN CAPE PROVINCE
49843	PIA Phase 1	John E Almond	01/05/2012	PALAEONTOLOGICAL SPECIALIST STUDY: COMBINED DESKTOP AND FIELD-BASED ASSESSMENTS Proposed solar power generation facilities on the remaining extent of the farm Vetlaagte No. 4, De Aar, Northern Cape Province
50006	HIA Phase 1	Jayson Orton	20/02/2012	HERITAGE IMPACT ASSESSMENT FOR THREE SOLAR ENERGY FACILITIES AT DE AAR, WESTERN CAPE
53198	HIA Phase 1	Elize Becker	20/04/2012	Phase 2 Heritage Impact Assessment De Aar Solar One Photovoltaic Power Project Heritage Impact Assessment Phase 2
53200	Heritage Scoping	Elize Becker	18/01/2012	HERITAGE IMPACT ASSESSMENT SCOPING REPORT Prepared for De Aar Solar One Photovoltaic Power Plant, Nothern Cape
58989	PIA Desktop	James Brink	10/08/2012	A Palaeontological Desktop Study of the Area to be Affected by the Proposed Photovoltaic Power Project on Portion 3 of Farm Hartebeestplaats 135
8378	HIA Phase 1	Jayson Orton	29/02/2012	HIA for three solar energy facilties at the De Aar, Northern Cape (Paarde Valley, Badenhorst Dam Farm and Annex Du Plessis Dam Farm)
89361	HIA Phase 1	Neels Kruger	01/03/2012	ENNEX DEVELOPMENTS: PROPOSED ESTABLISHMENT OF A SOLAR ENERGY FACILITY NEAR DE AAR, NORTHERN CAPE PROVINCE Phase 1 Archaeological Impact Assessment Report