

HERITAGE SCREENER

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CTS Reference Number:	CTS20_178	
SAHRIS Reference:	2005	
HWC Reference:		
Client:	Terramanzi	
Date:	November 2020	
Title:	Proposed part 2 amendment to the existing Environmental Authorisation for the Modderfontein WEF, near Victoria West located in both the Northern and Western Cape	
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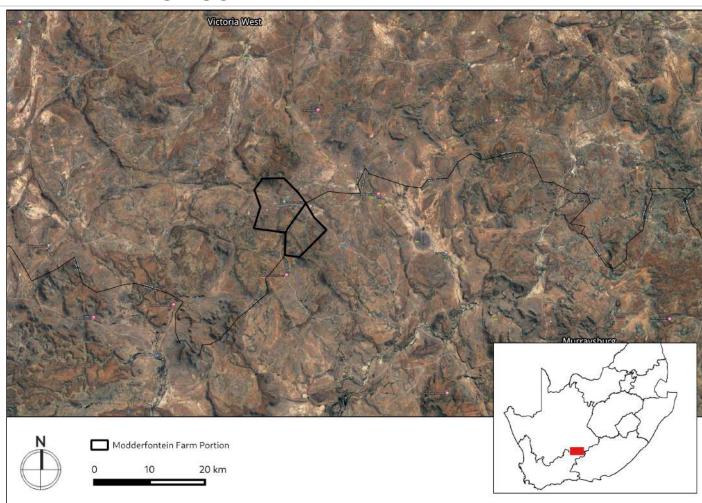


Figure 1a. Satellite map indicating the location of the proposed development in the Northern and Western Cape

Recommendation

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.



1. Proposed Development Summary

The original Environmental Authorisation has authorised up to 67 wind turbines for the Modderfontein WEF with a total generating capacity of 201 MW using turbines with a generating capacity of up to 3 MW. The Applicant has proposed the following amendment to the existing Authorisation: Up to 25 wind turbines with a total generating capacity of 140 MW using turbines with a generating capacity of up to 5.6 MW. Please note the proposed development will be an approximately 67% reduction in turbine density which should at least maintain and possibly even reduce the impact levels as previously authorised.

2. Application References

Name of relevant heritage authority(s)	SAHRA and HWC
Name of decision making authority(s)	DEFF

3. Property Information

Latitude / Longitude	31°44'14.59"S 23°14'48.90"E
Erf number / Farm number	Modderfontein (RE/228) and Phaisant Kraal 1
Local Municipality	Victoria West and Central Karoo
District Municipality	Pixley Ka Seme and Central Karoo
Previous Magisterial District	Victoria West and Murraysburg
Province	Northern and Western Cape
Current Use	Agriculture
Current Zoning	Agriculture
Total Extent	662,07440ha (Modderfontein) and 405,10262ha (Phaisant Kraal)



4. Nature of the Proposed Development

Depth of excavation (m)	TBD
Height of development (m)	119m hub height

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
х	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-
х	a) exceeding 5 000m² 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

NA



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

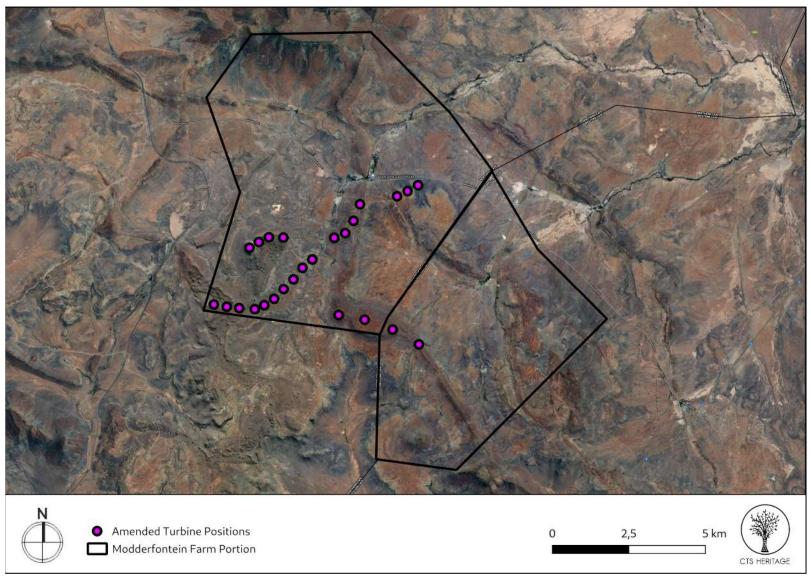


Figure 1b. Overview Map. Satellite image (2020) indicating the proposed development area with the proposed amended layout



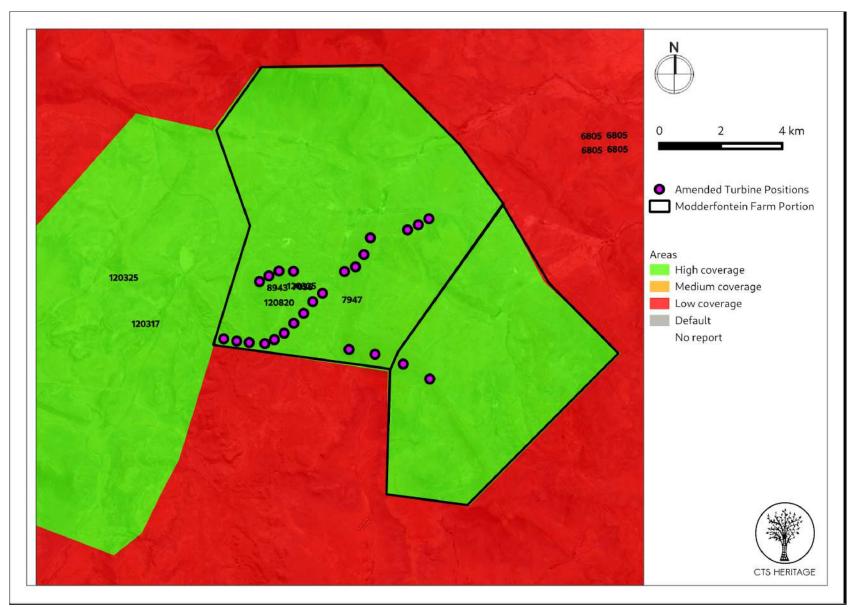


Figure 2. Previous HIAs Map. Previous Heritage Impact Assessments covering the proposed development area with SAHRIS NIDS indicated. Please see Appendix 2 for a full reference list.



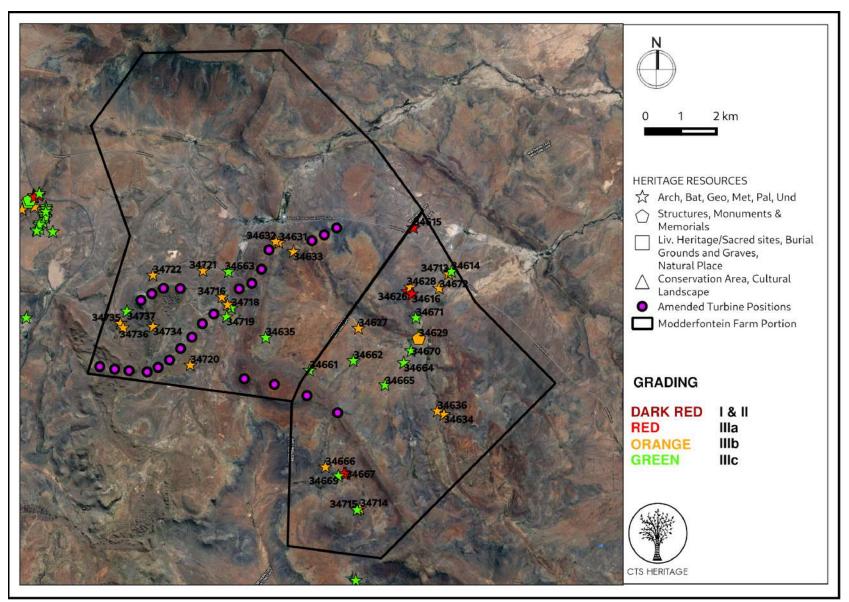


Figure 3. Heritage Resources Map. Heritage Resources previously identified within the study area, with SAHRIS Site IDs indicated in the insets below. Please See Appendix 4 for full description of heritage resource types.



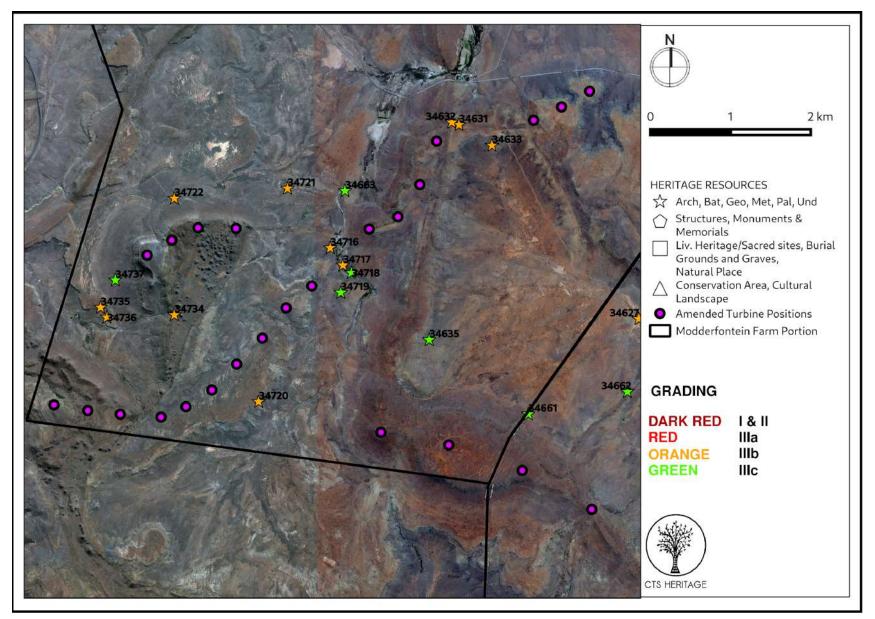


Figure 3a Heritage Resources Map. With focus on the amended layout



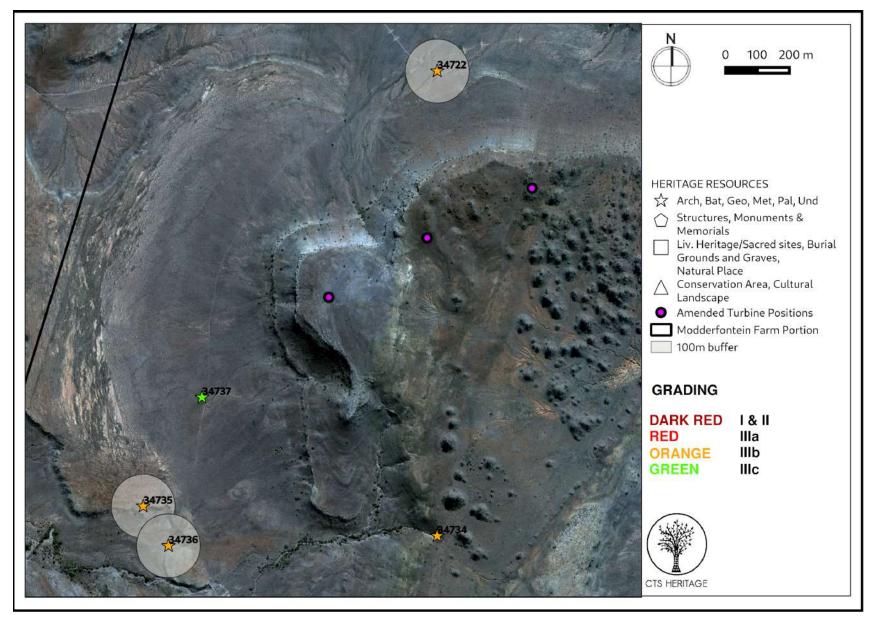


Figure 3b Heritage Resources Map. With focus on sites with 100m buffer area



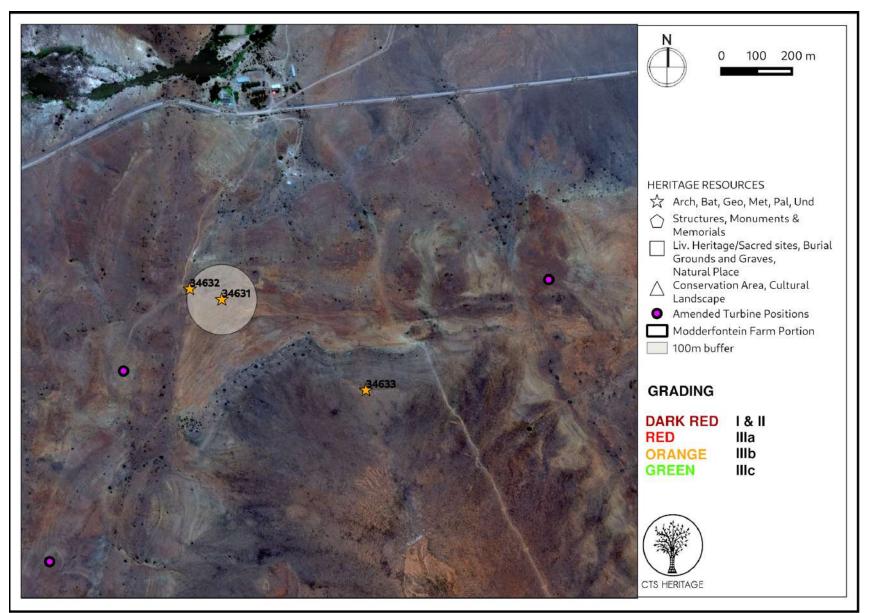


Figure 3c Heritage Resources Map. With focus on sites with 100m buffer area



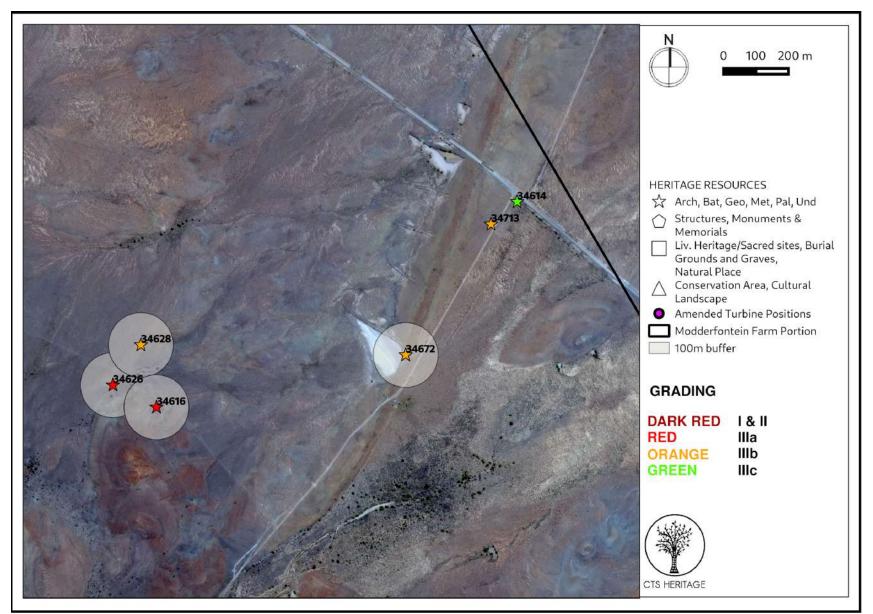


Figure 3d. Heritage Resources Map. With focus on sites with 100m buffer area



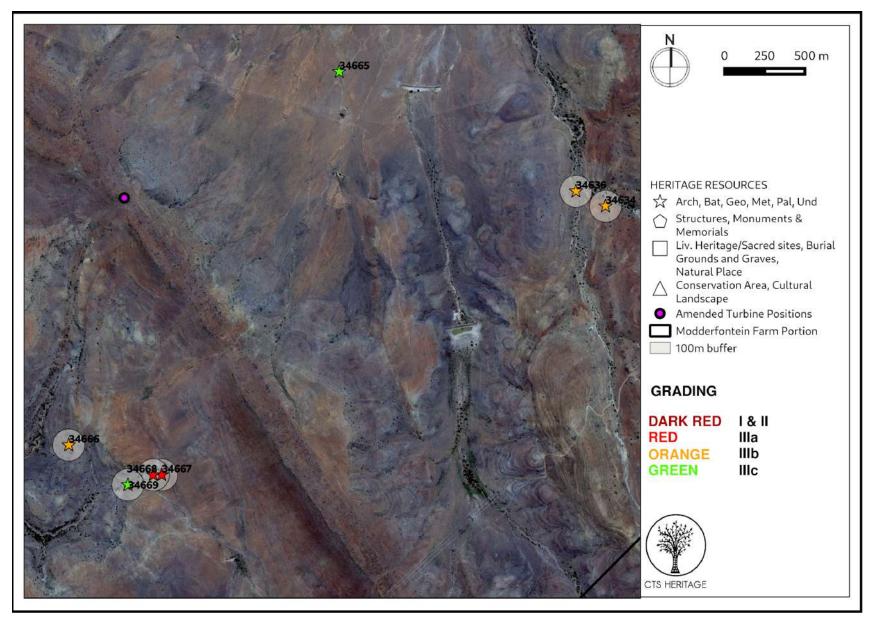


Figure 3e. Heritage Resources Map. With focus on sites with 100m buffer area



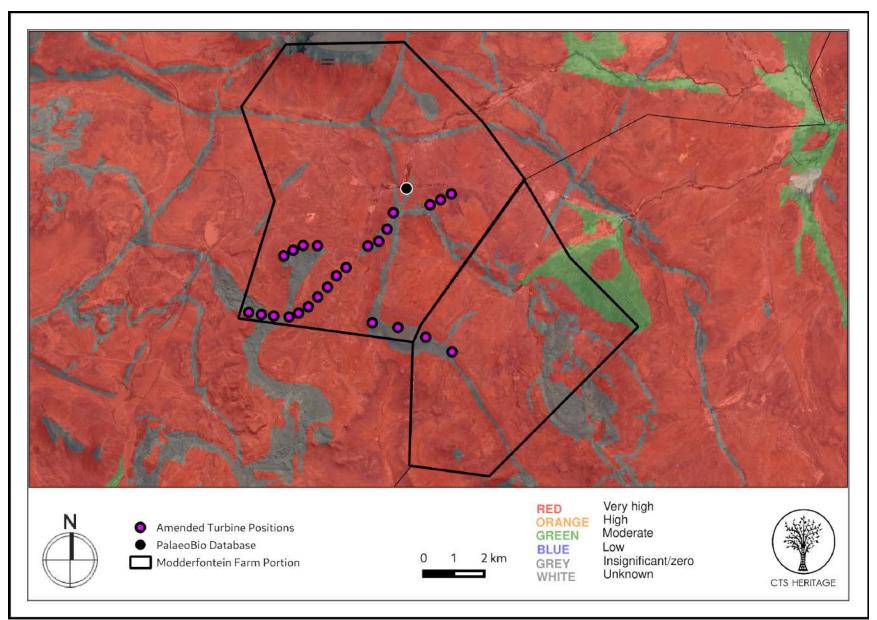


Figure 4a. Palaeosensitivity Map. Indicating fossil sensitivity underlying the study area. Please See Appendix 3 for a full guide to the legend.



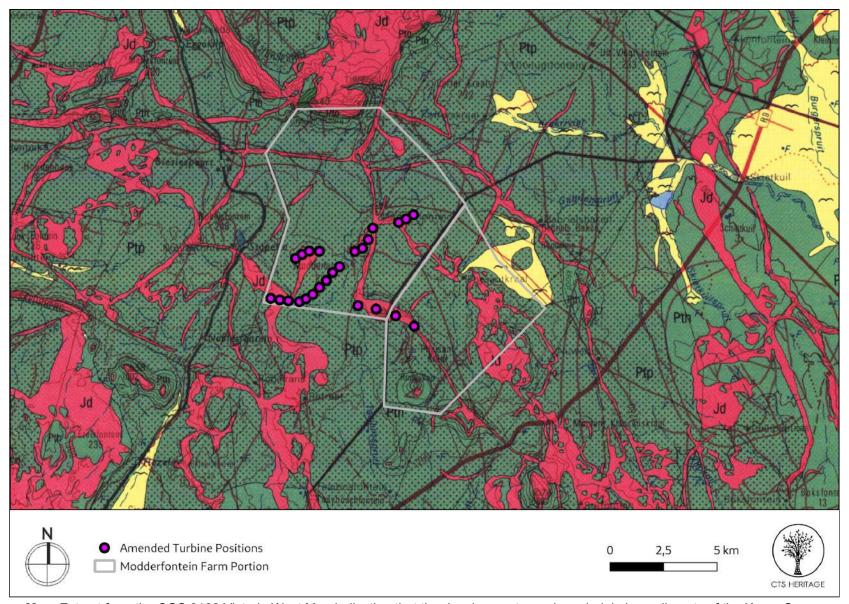


Figure 4b. Geology Map. Extract from the CGS 3122 Victoria West Map indicating that the development area is underlain by sediments of the Karoo Supergroup assigned to the Beaufort group, within the Poortjie Member of the Teekloof Formation of the Adelaide Subgroup.





Figure 5. Renewable Energy Environmental Authorisations granted.



8. Heritage Assessment

The area proposed for development is located approximately 35km south southeast of Victoria West in the Central Karoo region of the Northern Cape. Victoria West was established by the Dutch Reformed Church in 1843 along the banks of the Brakrivier watercourse. In 1859, the town became a municipality. According to the Desktop Assessment completed by Booth et al. (2010, SAHRIS ID 7036), the records of early colonial travellers through the area and from Victoria West note interactions with San people who inhabited the area up until the late 19h century. In the mid-1920s, archaeologists identified a stone tool technological industry from the area and along the Vaal River known as the Victoria West Industry. Further evidence of San persistence in this landscape comes from the Later Stone Age archaeology and the rock engravings found throughout the Karoo, and on this farm.

In March 2011, Binneman et al. (SAHRIS ID 7035) completed an archaeological impact assessment that includes the area assessed in this report. Binneman et al. (2011) describe the farm as consisting of a varied landscape, including "flat, open floodplains, ridges, rocky outcrops and hillocks or koppies... The farm also consists of natural springs and dams. Disturbances owing to the construction of farm roads, fences, powerlines, telephone lines, windmills and dams, as well as domestic stock grazing and other farming activities occur throughout the area." Binneman et al (2011) identified surface scatters of Middle Stone Age (MSA) artefacts throughout the farm, primarily located in flat floodplains at the base of rocky outcrops. Binneman et al (2011) also identified a possible purple mudstone quarry next to a river and small rocky outcrop. According to Binneman et al (2011) this quarry may have been the source for some of the MSA artefacts identified on the property. Later Stone Age (LSA) scatters were also identified on the property, however these are not as prevalent as the MSA artefacts. SAHRIS Site ID 34718 (MOD31) represents one of the more dense LSA sites on the property, including *in situ* bone. A stone kraal (Site ID 34719, MOD32) is located in close proximity to the LSA site and may even overlap it. Binneman et al (2011) also identified two areas of rock engravings (SAHRIS Site ID 34631, MOD10), some in close proximity to MSA artefacts, as well as a rock gong (SAHRIS Site ID 34632, MOD11). Binneman et al (2011) also identified several stone wall structures on the property including a large stone wall complex consisting of three large kraals and a small pen and occupation area at SAHRIS Site ID 34720 (MOD33). It must be noted that it is unclear from the report by Binneman et al (2011) whether the whole of the farm was surveyed for archaeology, or if only the area proposed for turbines was assessed as no track paths are included in the assessment. Booth (2012) completed a walkdown assessment of the neighbou

According to Binneman et al (2011), "It is highly likely that the surface scatters of Middle Stone Age stone artefacts encountered occur in a disturbed context owing to water runoff, wash and erosion along the floodplains as well as being washed down the slopes of rocky outcrops and ridges". Similarly the occurrence of Later Stone Age stone artefacts may have been disturbed by erosion as well as natural and animal disturbances. Documented areas containing rock engravings on boulders should be avoided and further investigation into the areas containing boulders surrounding the points of the proposed turbines should be investigated for further possible occurrences of rock engravings. The stone wall structures must be avoided during the construction phase of the proposed development." Based on the location of known archaeological heritage located within the proposed development area, the amended layout will not impact on any known heritage resources and all proposed turbines are located more than 100m from any known resources. There is no objection to the proposed amended layout on condition that the recommendations included in the assessment completed by Binneman (2011) are adhered to. These are -

- 1. The exposed human remains must be reported to the South African Heritage Resources Agency (SAHRA) so that they may appoint the relevant archaeologist/s to remove the exposed human remains.
- 2. No construction activities may take place within 100m of the documented rock shelters containing rock paintings and boulders containing rock engravings.
- 3. The ridges and rocky outcrops surrounding the locations of the turbines and solar panels must be investigated prior to construction to establish whether undocumented rock shelters contain rock paintings and rocky outcrops contain boulders with rock engravings. If any are encountered the recommendations in point 2 will be implemented.
- 4. No construction activities may take place within 100m of the documented stone-wall structures.
- 5. If it is inevitable that construction activities must take place within 100m of any documented and undocumented rock shelters containing paintings, rocky outcrops with boulders containing rock engravings and stone-wall structures a perimeter fence must erected to protect the sensitive area from any possible negative impact.



6. It is possible that in situ archaeological sites/remains, and human remains may be uncovered during construction. Therefore, a professional archaeologist should be appointed during the vegetation removal and construction phases of the development.

According to the SAHRIS Palaeosensitivity Map, the area under assessment is underlain by sediments of very high palaeontological sensitivity. The sediments underlying the development area include sediments of the Karoo Supergroup assigned to the Beaufort group, within the Poortjie Member of the Teekloof Formation of the Adelaide Subgroup (Council of GeoScience Map 3122, Victoria West). Rossouw (2011) conducted a desktop Palaeontological Assessment for an area that includes the area assessed in this report (SAHRIS ID 8943). According to Rossouw, the Teekloof Formation bedrock sediments located in this area have high palaeontological significance for the potential to impact on terrestrial tetrapods. Plants, silicified wood and trace fossils. Rossouw (2011) further notes that Quaternary alluvial deposits in the area, especially near water courses and drainage lines, are of medium palaeontological sensitivity and have the potential to yield microfossils and fossil mammal remains as well as Early Stone Age artefacts.

Furthermore according to the PalaeoBio Database (a non-governmental, non-profit public resource for palaeontological data), a palaeontological collection is known from this farm (Figure 4a). Reference to this collection is made by Broom (1903) and it is likely that this collection is housed with the Karoo Vertebrate Palaeontology collection at the University of the Witwatersrand, however this will require confirmation. The Modderfontein Fossil Collection speaks to the high palaeontological sensitivity of this farm. Due to this high sensitivity, Rossouw (2011) recommends that a palaeontological field assessment be undertaken to mitigate impacts to palaeontological heritage. SAHRA agreed with this recommendation in their comment dated 4 June 2013 indicating that a palaeontological field assessment is required (attached correspondence). This recommendation remains applicable as no palaeontological field assessment of the area has yet been undertaken.

According to the Environmental Authorisation granted for the original layout of the Modderfontein WEF, "If there are any changes to the layout of the turbines from the approved plan, the additional survey work will be required in order to ensure that no sites are directly impacted and/or to identify the need for an excavation permit". Furthermore, as a portion of the Modderfontein WEF project falls within the Western Cape, Heritage Western Cape (HWC) who is the heritage authority that oversees the heritage in the Western Cape was also consulted in the original application. HWC replied that they are "satisfied with the reports being referenced and that Section 38 comments and decisions whether under a NID or HIA phase still stands therefore the requirements of 2011 stated in the NID (if one was done) still stands. However an integrated HIA (including integrated recommendation) which fulfils the requirement of Section 38(3) of the NHRA still needs to be submitted attached with the AIA, EA and other associated reports."



RECOMMENDATION

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.

It is recommended that any new proposed layout avoids impact to the identified heritage resources in Figure 3 and adheres to the recommendations by Binneman (2011).

Once the layout has been established, it is recommended that an archaeological and palaeontological field assessment be undertaken to ensure that significant heritage resources are not impacted by the proposed development. As EA has already been granted for the proposed WEF, it is recommended that these field assessments be integrated into a report that satisfies section 38(3) of the NHRA and is submitted to HWC and SAHRA for noting purposes only.



APPENDIX 1

List of heritage resources within the development area (highlighted sites with 100m buffer)

		1000011000 171111111 1110 0011		
Site ID	Site no	Full Site Name	Site Type	Grading
34627	MOD9	Modderfontein 9	Artefacts	Grade IIIb
34716	MOD29	Modderfontein 29	Artefacts	Grade IIIb
34717	MOD30	Modderfontein 30	Stone walling, Artefacts	Grade IIIb
34626	PHAIS4	Phaisantkraal 4	Artefacts, Rock Art	Grade IIIa
34628	PHAIS5	Phaisantkraal 5	Rock Art	Grade IIIb
34629	PHAIS6	Phaisantkraal 6	Building	Grade IIIb
34631	MOD10	Modderfontein 10	Rock Art, Artefacts	Grade IIIb
34632	MOD11	Modderfontein 11	Artefacts	Grade IIIb
34633	MOD12	Modderfontein 12	Artefacts	Grade IIIb
34634	PHAIS7	Phaisantkraal 7	Rock Art, Stone walling	Grade IIIb
34635	MOD13	Modderfontein 13	Artefacts	Grade IIIc
34636	PHAIS8	Phaisantkraal 8	Stone walling	Grade IIIb
34661	MOD14	Modderfontein 14	Artefacts	Grade IIIc
34662	MOD15	Modderfontein 15	Artefacts	Grade IIIc
34663	MOD16	Modderfontein 16	Artefacts	Grade IIIc
34664	MOD17	Modderfontein 17	Artefacts	Grade IIIc



34665	MOD18	Modderfontein 18	Artefacts	Grade IIIc
34666	PHAI19	Phaisantkraal19	Stone walling	Grade IIIb
34667	PHAI20	Phaisantkraal 20	Rock Art	Grade IIIa
34668	PHAI21	Phaisantkraal 21	Deposit, Rock Art	Grade IIIa
34669	PHAI22	Phaisantkraal 22	Rock Art	Grade IIIc
34670	PHAI23	Phaisantkraal 23	Artefacts	Grade IIIc
34671	PHAI24	Phaisantkraal 24	Artefacts	Grade IIIc
34672	PHAI25	Phaisantkraal 25	Stone walling	Grade IIIb
34713	PHAI26	Phaisantkraal 26	Artefacts	Grade IIIb
34714	PHAI27	Phaisantkraal 27	Artefacts	Grade IIIb
34715	PHAI28	Phaisantkraal 28	Artefacts	Grade IIIc
34718	MOD31	Modderfontein 31	Artefacts	Grade IIIc
34719	MOD32	Modderfontein 32	Artefacts	Grade IIIc
34720	MOD33	Modderfontein 33	Stone walling	Grade IIIb
34721	MOD34	Modderfontein 34	Artefacts	Grade IIIb
34722	MOD35	Modderfontein 35	Rock Art	Grade IIIb
34734	MOD36	Modderfontein 36	Artefacts	Grade IIIb
34735	MOD37	Modderfontein 37	Stone walling	Grade IIIb
34736	MOD38	Modderfontein 38	Stone walling	Grade IIIb



34737	MOD39	Modderfontein 39	Artefacts	Grade IIIc
34614	PHAIS1	Phaisantkraal 1	Artefacts	Grade IIIc
34615	PHAIS2	Phaisantkraal 2	Stone walling	Grade IIIa
34616	PHAIS3	Phaisantkraal 3	Stone walling	Grade IIIa

Sites from PalaeoBiology Database in Figure 4a

Collection No.	Collection	Period	Formation	Reference
179590	Modderfontein Farm	Wuchiapingian between 259.1 and 254.14Ma	Unknown, likely Teekloof	Broom, R. 1903. On the Classification of the Theriodonts and their Allies. Report of the South African Association for the Advancement of Science 1, 286-295



APPENDIX 2

Reference List with relevant AIAs and PIAs

	Heritage Impact Assessments					
Nid	Report Type	Author/s	Date	Title		
7035	AIA Phase 1	Johan Binneman, Celeste Booth, Natasha Higgitt	05/03/2011	A Phase 1 Archaeological Impact Assessment (AIA) for the proposed Karoo Renewable Energy Facility on a site south of Victoria West, Northern and Western Cape Province on the farms Phaisantkraal 1, Modderfontein 228, Nobelsfontein 227, Annex Nobelsfontein		
7036	AIA Desktop	Celeste Booth, Natasha Higgitt	19/11/2010	An Archaeological Desktop Study for the proposed Karoo Renewable Energy Facility on a site south of Victoria West, Northern and Western Cape		
7947	AIA Desktop	Frans Prins	05/02/2011	DRAFT Technical Report in support of the EMP for the South Western Karoo Basin Gas Exploration Application Project: CULTURAL HERITAGE: CENTRAL PRECINCT		
8943	PIA Phase 1	Lloyd Rossouw	24/03/2011	Palaeontological desktop assessment of a commercial renewable energy facility site located approximately 34km south of Victoria West in the Western Cape Province (and Northern Cape)		
120317	HIA Phase 1	Celeste Booth, Sholeen Shanker	01/12/2012	An archaeological ground-truthing walk-through for the proposed substation and associated overhead power line for the Nobelsfontein Wind Energy Facility situated on a site south of Victoria West on the Farm Nobelsfontein 227, Northern Cape Province		
120325	HIA Phase 1	Celeste Booth, Sholeen Shanker	01/12/2012	An archaeological ground-truthing walk-through for the proposed substation and associated overhead power line for the Nobelsfontein Wind Energy Facility situated on a site south of Victoria West on the Farm Nobelsfontein 227, Northern Cape Province		
120820	HIA Phase 1	Celeste Booth	01/12/2012	An Archaeological Ground-Truthing Walk-Through For The Nobelsfontein Wind Energy Facility Situated On A Site South Of Victoria West On The Farms Nobelsfontein 227, Annex Nobelsfontein 234, Ezelsfontein 235, And Rietkloofplaaten 239, Northern Cape Province		



APPENDIX 3 - Keys/Guides

Key/Guide to Acronyms

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AIA	Archaeological Impact Assessment
DARD	Department of Agriculture and Rural Development (KwaZulu-Natal)
DEA	Department of Environmental Affairs (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

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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.



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.