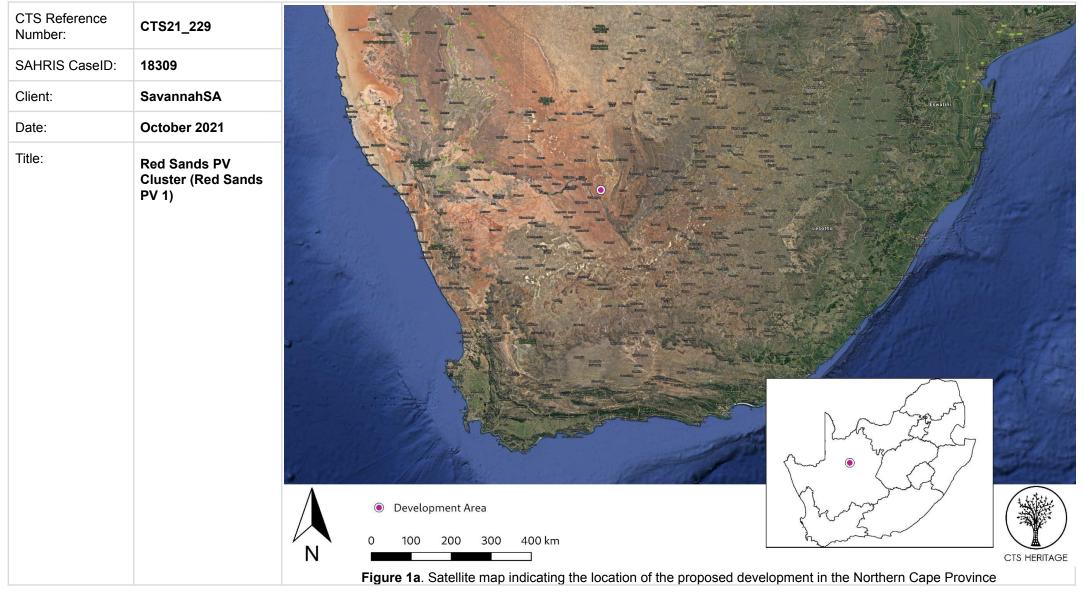


HERITAGE SCREENER





1. Proposed Development Summary

The proposed Red Sands Solar PV Cluster projects are located approximately 17 km northeast Groblershoop in the Northern Cape Province. The three proposed project development areas (Red Sands PV1 - PV3) occupy a combined area of about 751 Ha of undeveloped land. The project site is best accessed by a combination of paved route (N8) and an unnamed gravel route leading to the project site. The turn-off to the project site is approximately 13 km from Groblershoop along the N8.

The three (3) solar facilities would use photovoltaic (PV) electric generation system technology to produce solar energy at the utility scale, including inverters, an on-site substation, an O&M building, and possibly a battery storage facility. The planned total installed capacity of the Red Sands Solar PV project is 225 MWac which consists of three (3) 75 MWac Solar PV facilities. The proposed developments require Environmental Authorisation in terms of the National Environmental Management Act (Act 107 of 1998) from the Department of Forestry, Fisheries, and the Environment (DFFE).

2. Application References

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

3. Property Information

Latitude / Longitude	-28.66197695, 22.12266833
Erf number / Farm number	Rooisand 387 & Tities Poort 386
Local Municipality	Kheis & Tsantsabane
District Municipality	Z F Mgcawu
Province	Northern Cape
Current Use	Agricultural
Current Zoning	Agricultural

4. Nature of the Proposed Development

Total Surface Area of development

Red Sands PV1 = 219 ha



Depth of excavation (m)	<5m
Height of development (m)	<4m (array) <17m (substation)

5. Category of Development

Triggers: Section 38(8) of the National Heritage Resources Act
Triggers: Section 38(1) of the National Heritage Resources Act
1. Construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier over 300m in length.
2. Construction of a bridge or similar structure exceeding 50m in length.
3. Any development or activity that will change the character of a site-
a) exceeding 5 000m ² in extent
b) involving three or more existing erven or subdivisions thereof
c) involving three or more erven or divisions thereof which have been consolidated within the past five years
4. Rezoning of a site exceeding 10 000m ²
5. Other (state):

6. Additional Infrastructure Required for this Development

Interconnecting roads, power lines, solar PV arrays, inverters, on site substation, O&M building and a possible battery storage facility (BESS). Parking + Lay-down areas + Fence surrounding facility + Security house + Camera Surveillance



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

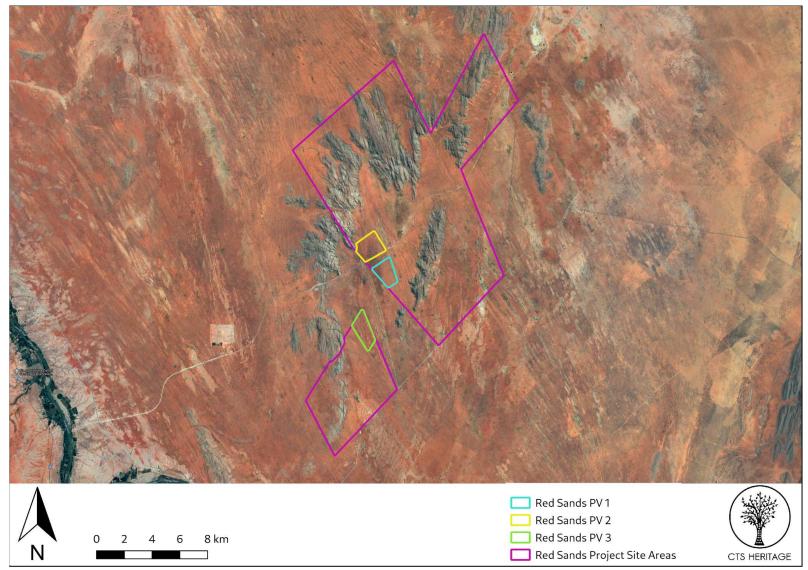


Figure 1b Overview Map. Satellite image (2019) indicating the proposed project sites for the Red Sands PV1-PV3 developments.



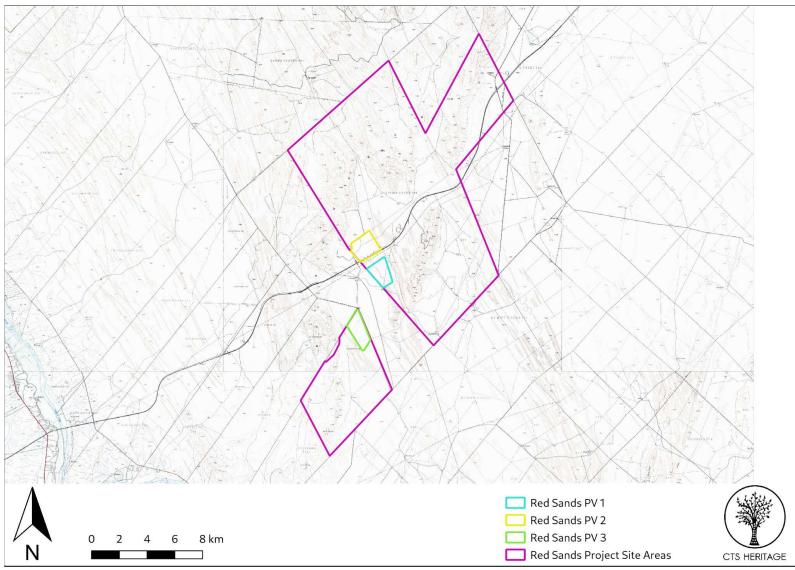


Figure 1c. Overview Map. 1:50 000 Topo Map for the proposed project sites for the Red Sands PV1-PV3 developments.



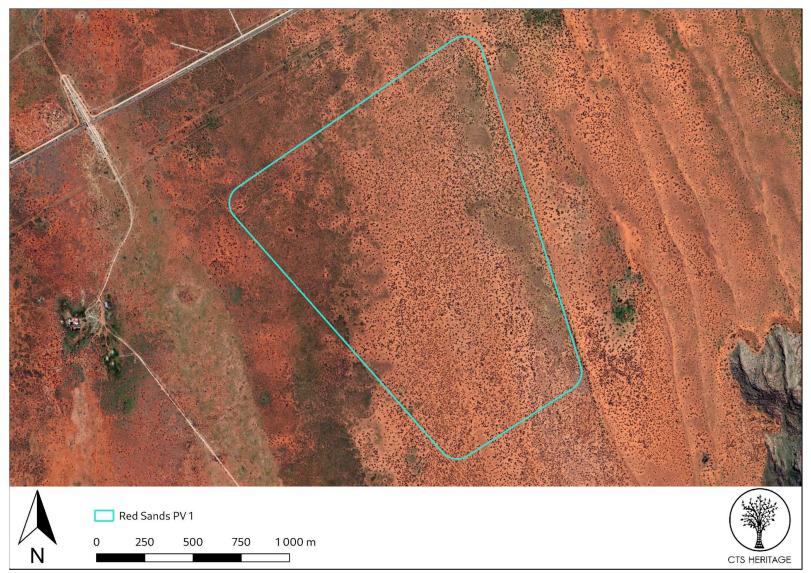


Figure 1d. Overview Map. Satellite image (2019) indicating the proposed project site for the Red Sands PV1 at closer range.



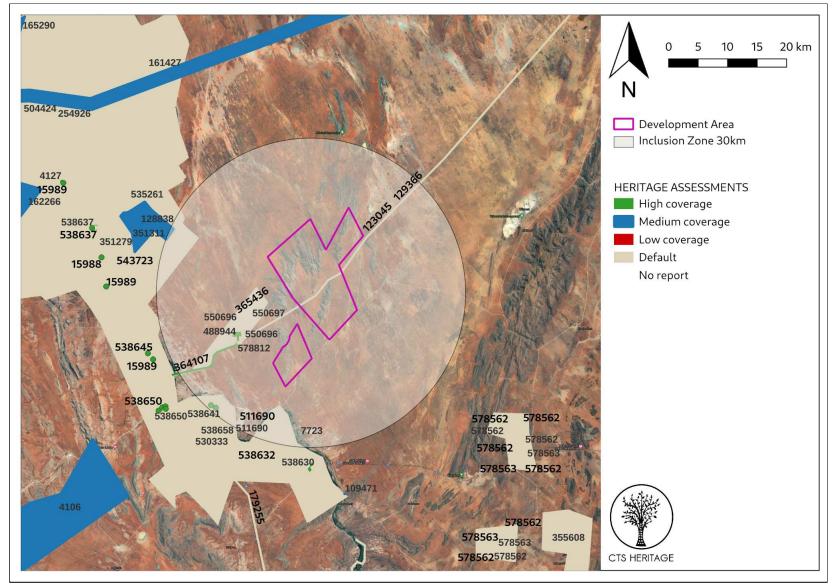


Figure 2. Previous HIAs Map. Previous Heritage Impact Assessments surrounding the proposed project sites for the Red Sands PV1-PV3 developments, with SAHRIS NIDS indicated. Please see Appendix 2 for a full reference list.



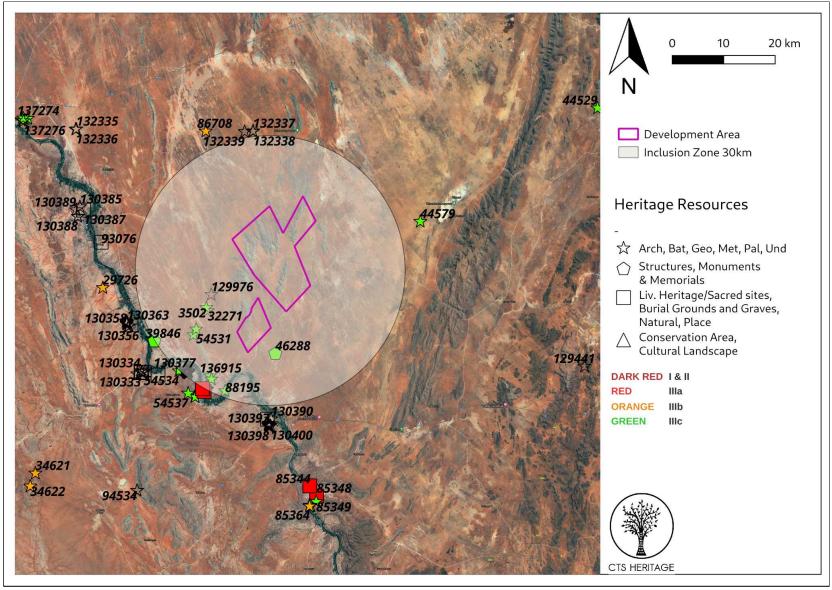


Figure 3. Heritage Resources Map. Heritage Resources previously identified in and near the proposed project sites for the Red Sands PV1-PV3 developments, with SAHRIS Site IDs indicated. Please See Appendix 4 for full description of heritage resource types.



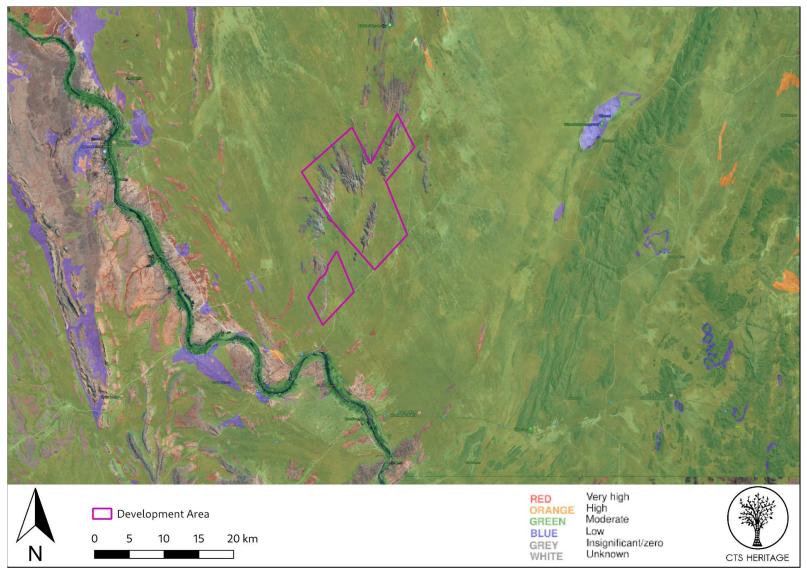


Figure 4. Palaeosensitivity Map. Indicating Moderate fossil sensitivity underlying the proposed project sites for the Red Sands PV1-PV3 developments. Please See Appendix 3 for a full guide to the legend.



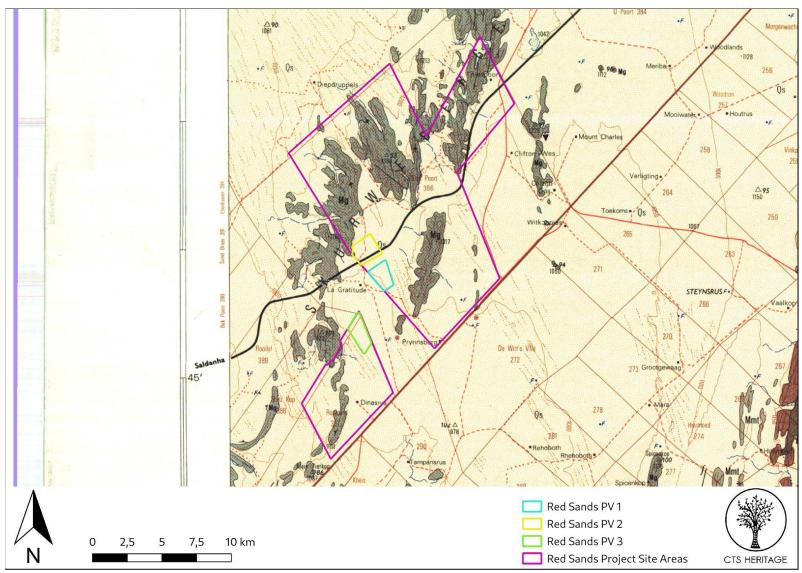


Figure 5. Geology Map. Indicating the underlying geology across the proposed project sites for the Red Sands PV1-PV3 developments through overlaying the geology maps from the CGS series 2822 Postmasburg (Mg: Prynnsberg (muscovite quartzite schist), Qs: Gordonia (Red-brown, wind-blown sand and dunes)



8. Heritage statement and character of the area

Background

The proposed Red Sands Solar PV Cluster projects are located approximately 17 km northeast Groblershoop in the Northern Cape Province. The three proposed project development areas (Red Sands PV1 – PV3) occupy a combined area of about 751 hectares of undeveloped land. The project site is best accessed by a combination of paved route (N8) and an unnamed gravel route leading to the project site. The turn-off to the project site is approximately 13 km from Groblershoop along the N8.

The three (3) solar facilities would use photovoltaic (PV) electric generation system technology to produce solar energy at the utility scale, including inverters, an on-site substation, an O&M building, and possibly a battery storage facility. The planned total installed capacity of the Red Sands Solar PV project is 225 MWac which consists of three (3) 75 MWac Solar PV facilities. The proposed developments require Environmental Authorisation in terms of the National Environmental Management Act (Act 107 of 1998) from the Department of Forestry, Fisheries, and the Environment (DFFE).

The area proposed for development is located approximately 80km east south east of Upington and 25km north east of Groblershoop. Upington originated as a mission station established along the banks of the Orange River in 1871 and run by Reverend Christiaan Schröder, and was founded as a town in 1873. Groblershoop was founded in 1914 on the farm Sternham, but was renamed in 1939 after Piet Grobler, a former Minister of Agriculture. The region became more developed after the construction of the Boegoeberg Dam and water channels in 1929. Known as the gateway to the Green Kalahari, the Groblershoop region is a major wine-producing area¹. According to Gaigher (2012, SAHRIS ID 34135), prior to colonial settlement, this area was occupied by the Korana who had been forced to the outskirts of the Cape Colony along the Gariep River. When this area was eventually settled by colonists, war broke out between the colonial settlers and the Korana, who were then dispursed upon their defeat. Upington has been noted as being the sunniest location on the planet for three months of the year, from November through to January, which is likely why this area has been earmarked for the development of renewable energy facilities as part of the Red Sandsd Solar PV development. The geomorphology of the area has been described by Van Schalkwyk (2011, SAHRIS ID 162266) as irregular plains with hills occuring to the south. The vegetation is described as Orange River Nama Karoo.

Archaeology

Numerous Renewable Energy developments have been proposed for this area and each of these proposed developments have undergone assessments for impacts to archaeological resources (Figure 2). Areas located to the south west of the study area were surveyed by Webley (2013), revealing a number of MSA sites, as well as ruined historical stone structures recorded by Morris (2015). Dreyer (2012) carried out an archaeological survey just to the west of this development area and found stone tools made from banded ironstone, chalcedony and quartzites. These were predominantly MSA in age and showed few pieces with retouch as most of the flakes were discarded without being further reduced and retouched. Given the ubiquity of Stone Age material recorded on farms to the west and south west of this development area it is highly likely that more Stone Age material, particularly Middle Stone Age, will be found in a field survey of the proposed development area.

Built Environment & Cultural Landscapes

According to Webley (2013), the Cultural Landscape in this area can be characterised as a region which "consists of intensive agriculture in a narrow belt along the Orange River surrounded by the red Aeolian sands of the Kalahari." At the time of compiling her assessment in 2013, most of the renewable energy facilities had not yet been built in the Upington area which is located within a RED zone (area 7). The Cultural Landscape has since changed significantly over the last 8 years as a number of very large solar PV projects (including CSP) have been completed and are in construction. This form of development has therefore very much become a part of the Cultural Landscape today.

The construction of another solar PV development will therefore be in keeping with the ongoing development of the general Upington area as an intensive solar power generating

¹ https://en.wikipedia.org/wiki/Groblershoop



area. A few farm buildings are also expected on the farms that have been identified in the desktop study and these should be assessed during a field survey as there may be other structures or ruins on the farms.

Palaeontology

According to Almond's Desktop PIA for the proposed Eskom Groblershoop Substation & Garona-Groblershoop 132 kV Powerline (2013), the area is "underlain, at or below the surface, by highly metamorphosed Precambrian basement rocks (schists, quartzites, gneisses) of the Namaqua-Natal Province that are <u>entirely unfossiliferous</u>. These are locally mantled by Late Caenozoic superficial sediments including Quaternary aeolian sands of the Gordonia Formation (Kalahari Group), calcrete pedocretes and alluvium of the Orange River and its tributaries. These younger superficial sediments are generally of low palaeontological sensitivity". This study area is right next to the area assessed by Almond and has the same geological context.

The Gordonia Formation dune sands were mainly active during cold, drier intervals of the Pleistocene Epoch that were inimical to most forms of life, apart from hardy, desert-adapted species. **Porous dune sands are not generally conducive to fossil preservation**. However, mummification of soft tissues may play a role here and migrating lime-rich groundwaters derived from the underlying bedrocks (including, for example, dolerite) may lead to the rapid calcretisation of organic structures such as burrows and root casts. Occasional terrestrial fossil remains that might be expected within this unit include calcretized rhizoliths (root casts) and termitaria (*e.g. Hodotermes*, the harvester termite), ostrich egg shells (*Struthio*) and shells of land snails (*e.g. Trigonephrus*) (Almond 2008, Almond & Pether 2008). Other fossil groups such as freshwater bivalves and gastropods (*e.g. Corbula, Unio*) and snails, ostracods (seed shrimps), charophytes (stonewort algae), diatoms (microscopic algae within siliceous shells) and stromatolites (laminated microbial limestones) are associated with local watercourses and pans. Microfossils such as diatoms may be blown by wind into nearby dune sands. These Kalahari fossils (or subfossils) can be expected to occur sporadically but widely, and **the overall palaeontological sensitivity of the Gordonia Formation is therefore considered to be low and the Prynnsberg quartzites are unfossiliferous**.

The proposed development will therefore have a low to negligible impact on fossils.

RECOMMENDATIONS

As it is possible that any proposed development within the study area may negatively impact on significant archaeological heritage resources, it is recommended that a Heritage Impact Assessment that satisfies section 38(3) of the NHRA is completed.



APPENDIX 1

List of heritage resources within close proximity to the development area from SAHRIS

Site ID	Site no	Full Site Name	Site Type	Grading
88195	GRO292/ 001	Farm 292 Groblershoop/ 001	Artefacts	Grade IIIc
32271	TSPP-001	Thermal Solar Power Plant	Archaeological	
3502	Bokpoort 390	Bokpoort 390 scatter	Artefacts	Grade IIIc
46288	TAMP01	TAMPANSRUS 294/295 -01	Artefacts, Structures	Grade IIIc
54525	GROB007	Groblershoop 007	Artefacts	Grade IIIc
54531	GROB008	Groblershoop 008	Archaeological	Grade IIIc
129976	Bokpoort		Archaeological	
130365	OPW001	OPWAG	Burial Grounds & Graves	
130366	OPW002	OPWAG	Artefacts	
130367	OPW003	OPWAG	Artefacts	
130368	OPW004	OPWAG	Artefacts	
130369	OPW005	OPWAG	Artefacts	
130370	OPW006	OPWAG	Artefacts	
130371	OPW007	OPWAG	Artefacts	
130372	OPW008	OPWAG	G Artefacts	
130373	OPW009	OPWAG	Artefacts	



130374	OPW010	OPWAG	Artefacts	
130375	OPW011	OPWAG	Artefacts	
130376	OPW012	WEGDRAAI	Artefacts	
130377	OPW013	OPWAG	Artefacts	
130378	OPW014	OPWAG	Artefacts	
130379	OPW015	OPWAG	Artefacts	
130381	OPW016	OPWAG	Artefacts	
130382	OPW017	OPWAG	Artefacts	
130383	OPW018	OPWAG	Artefacts	
130384	OPW019	OPWAG	Artefacts	
136915	GBP-001	GROBLERSHOOP	Artefacts	Grade IIIc
136920	GBP-002	GROBLERSHOOP	Artefacts	Grade IIIc
136921	GBP-003	GROBLERSHOOP	Artefacts	Grade IIIc
136955	GBP-011	GROBLERSHOOP	Artefacts	Grade IIIc
136960	GBP-015	GROBLERSHOOP	Artefacts	Grade IIIc
136961	GBP-016	GROBLERSHOOP	Artefacts	Grade IIIc
136963	GBP-017	GROBLERSHOOP	Artefacts	Grade IIIc
136966	GBP-019	GROBLERSHOOP	Artefacts	Grade IIIc



APPENDIX 2

Reference List from SAHRIS

NID	Author(s)	Date	Туре	Title	
128827	Barry Millsteed	12/02/2014	AIA Phase 1	Full Palaeontological Heritage Impact Assessment Report on the site of Proposed Solar Energy Generation Facilities (Kheis Solar projects 1-3) to be located on the farm Namkwari 656 near Upington, Northern Cape	
351273	Barry Millsteed	01/12/2015	Palaeontologic al Specialist Reports	FULL PALAEONTOLOGICAL HERITAGE IMPACT ASSESSEMENT REPORT ON THE SITE OF PROPOSED SOLAR ENERGY GENERATION FACILITIES (TEWA ISITHA SOLAR 1 AND 2) TO BE LOCATED ON THE REMAINING EXTENT OF THE FARM ALBANY 405 NEAR KAROS, NORTHERN CAPE PROVINCE	
104308	Cobus Dreyer	06/11/2012	HIA Phase 1	First Phase Archaeological and Cultural Heritage Assessment of the Proposed Water Pipeline from Sanddraai 391 to Bokpoort 390, Groblershoop, Northern Cape	
4103	Cobus Dreyer	10/03/2006	AIA Phase 1	First Phase Archaeological and Cultural Heritage Assessment of the Proposed Concentrated Solar Thermal Plant (Csp) at the Farms Olyvenhouts Drift, Upington, Bokpoort 390 and Tampansrus 294/295, Groblershoop, Northern Cape	
108398	David Morris	01/12/2012	HIA Phase 1	Archaeological Impact Assessment Phase 1: 15 km Water Pipeline across farms Sand Draai 391 and Bok Poort 390 near Groblershoop, Northern Cape	
128838	David Morris	03/02/2014	Heritage Scoping	Proposed Kheis Solar Park Phases 1-3 on portions 7 and 9 of the farm Namakwari 656, south-east of Upington in Northern Cape: Scoping phase Heritage Input	
180264	David Morris	01/08/2014	AIA Phase 1	Archaeological Impact Assessment - ACWA Power Solafrica Bokpoort CSP Power Plant (PTY) LTD: Amended Alignment: Bokpoort Water Pipeline, Groblershoop, Northern Cape.	
351279	Jaco van der Walt	02/12/2015	Archaeological Specialist Reports	Archaeological Impact Assessment for the proposed Tewa Isitha Solar 1 PV Facility East Of Upington, Northern Cape Province.	
351311	Jaco van der Walt	02/12/2015	Archaeological Specialist Reports	Archaeological Impact Assessment for the proposed Tewa Isitha Solar 2 PV Facility East Of Upington, Northern Cape Province.	



7723	Peter Beaumont	09/10/2008	AIA Phase 1	Phase 1 Archaeological Impact Assessment Report on Portion of the Farm 292 near Groblershoop, Karoo District Municipality, Northern Cape Province
123045	Cobus Dreyer	26/06/2013	Archaeological Specialist Reports	Report Eskom Garona Ferrum Mercury
129366	Cobus Dreyer	28/08/2013	AIA Phase 1B	First Phase Archaeological & Heritage Assessment of the Proposed Garona-Ferrum Transmission Line, Northern Cape
180264	David Morris	01/08/2014	AIA Phase 1	Archaeological Impact Assessment - ACWA Power Solafrica Bokpoort CSP Power Plant (PTY) LTD: Amended Alignment: Bokpoort Water Pipeline, Groblershoop, Northern Cape.
364107	Cobus Dreyer	16/09/2015	HIA Phase 1	First Phase Archaeological & Heritage Assessment of the Proposed Bokpoort II 300 MW Combined 2 x 75 PV & 150 MW CSP Tower Solar Development on the Remainder of the Farm Bokpoort 390, Groblershoop, Northern Cape Province.
365436	John E. Almond	29/06/2016	PIA Desktop	Palaeontological Impact Assessment: Desktop Study - Proposed Bokpoort II Solar Power Facility on the Remaining Extent of Farm Bokpoort 390 near Groblershoop, Northern Cape Province.
115034	Lita Webley	25/03/2015	HIA Phase 1	Heritage Impact Assessment for Proposed Construction of the Eskom Groblershoop substation and the Garona-Groblershoop 132 kV powerline, Groblershoop, Northern Cape



APPENDIX 3 - Keys/Guides

Key/Guide to Acronyms

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
ΡΙΑ	Palaeontological Impact Assessment
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
VIA	Visual Impact Assessment

Full guide to Palaeosensitivity Map legend

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



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

CTS Heritage 34 Harries Street, Plumstead, Cape Town, 7800 Tel: +27 (0)82 303 7870/ 083 619 0854 Email: info@ctsheritage.com Web: www.ctsheritage.com



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.