

**CULTURAL HERITAGE ASSESSMENT OF THE
PROPOSED ESTABLISHMENT OF PHOTO VOLTAIC (SOLAR POWER) PANELS ON
THE FARM WICKLOW, HERBERT DISTRICT, NORTHERN CAPE**

(Forming part of a Basic Assessment Report for the project)

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Prepared for:

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Sustainable Development Projects

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1 Introduction and Background Information

The specialist and writer of this report was appointed by Scatec Solar SA (Pty) Ltd (the Applicant) and Sustainable Development Projects, the environmental assessment practitioner (EAP) in July 2011 to undertake an cultural heritage assessment of the project site for the proposed construction of photovoltaic panels for the production of solar power.

The assessment forms part of the Basic Assessment (BA) for the establishment of photovoltaic farm on the farm Wicklow, No. 218 in the Herbert district.

2 Legislative Requirements

Heritage resources are protected in South Africa by the National Heritage Resources Act (NHRA), No. 25 of 1999. A heritage resource is defined in the Act as any place or object of cultural significance. Cultural significance is defined as a place or object as having aesthetic, architectural, historical, scientific, social, spiritual, linguistic and technological value.

The above mentioned Act states that heritage resources that are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of the heritage resources authorities.

The term heritage resource is defined as places and objects of 'cultural significance' which is defined as "aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

The national estate may include-

- places, buildings, structures and equipment of cultural significance;
- places which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features of cultural significance;
- geological sites of scientific or cultural importance;
- archaeological and paleontological sites;
- graves and burial grounds;
- sites of significance relating to the history in South Africa;
- movable objects, including-
 - objects recovered from the soil or waters of South Africa including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
 - objects to which oral traditions are attached or which are associated with living heritage; etc.

This assessment is performed in accordance with sections 34 through to 37 of the NHRA that refers to the protection of structures older than 60 years; archaeological and palaeontological sites, burial grounds and graves, public monuments and memorials. Such heritage resources may not be disturbed, damaged, altered, exhumed or removed without a permit issued by the relevant provincial and/or national heritage resources authority.

3 Details of Consultants

The cultural heritage assessment was undertaken by Jean Beater, who is an independent heritage consultant and an accredited heritage practitioner with Amafa aKwaZulu Natali and an affiliate member of the Association of Southern African Professional Archaeologists (ASAPA).

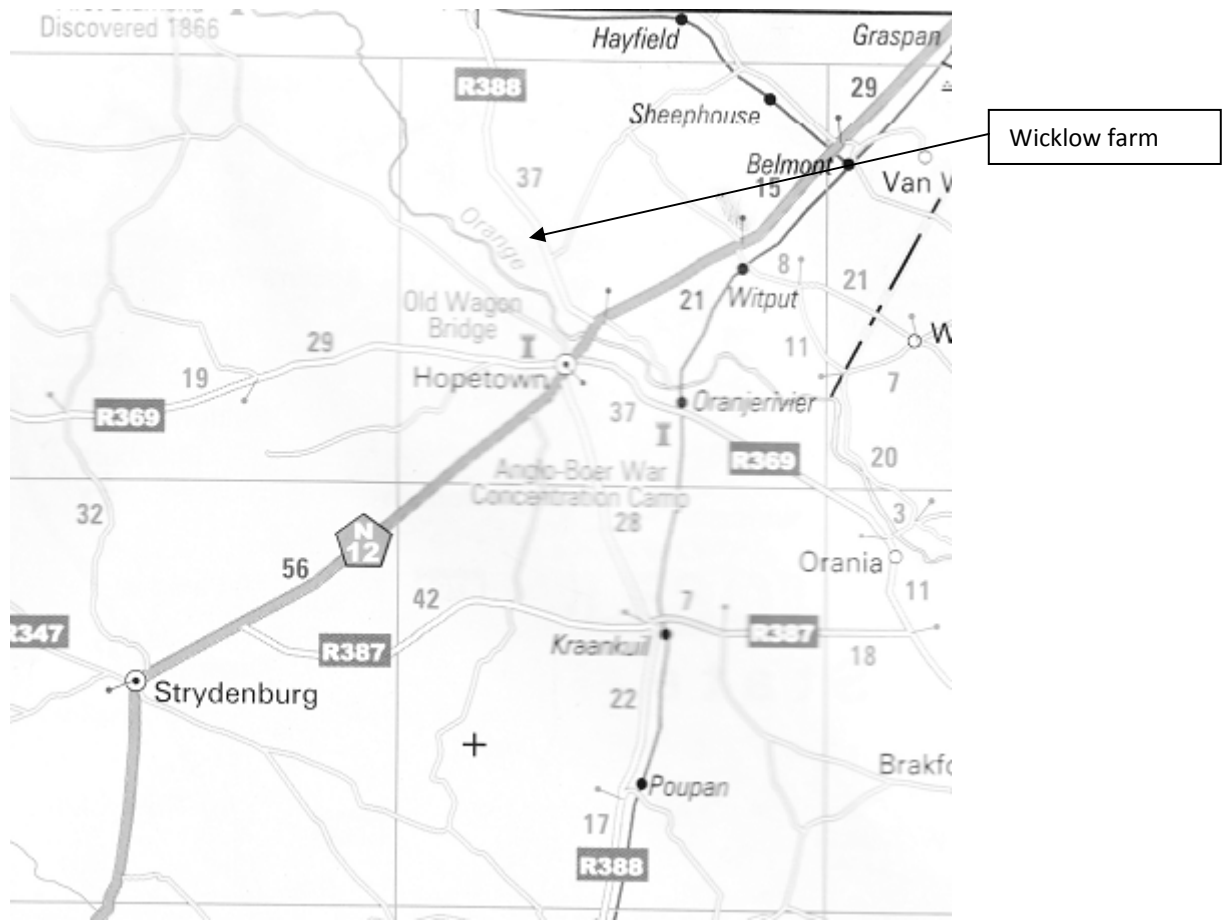
The archaeological impact assessment was undertaken by Cobus Dreyer who is accredited with SAHRA and is a member of ASAPA.

The desk-top palaeontological assessment was undertaken by Metsi Metseng Geological and Environmental Services who are accredited with SAHRA.

4 Description of Project Site

The farm Wicklow is situated just off the R388, a gravel road that joins the town of Douglas with the N12 and with the town of Hopetown. The farm and project area is situated just over 4km north east of the Orange River (Gariep River) and 9km from the N12 that goes to Kimberley.

A substation called Osbourne has recently been constructed on the farm and the area where it is proposed that the solar panels will be placed is immediately west, south west of the substation between two existing power lines. The location of Osbourne substation is S29°31'181", E024°03'646". Below is the location of the farm in relation to Hopetown, the N12 and the Orange River.



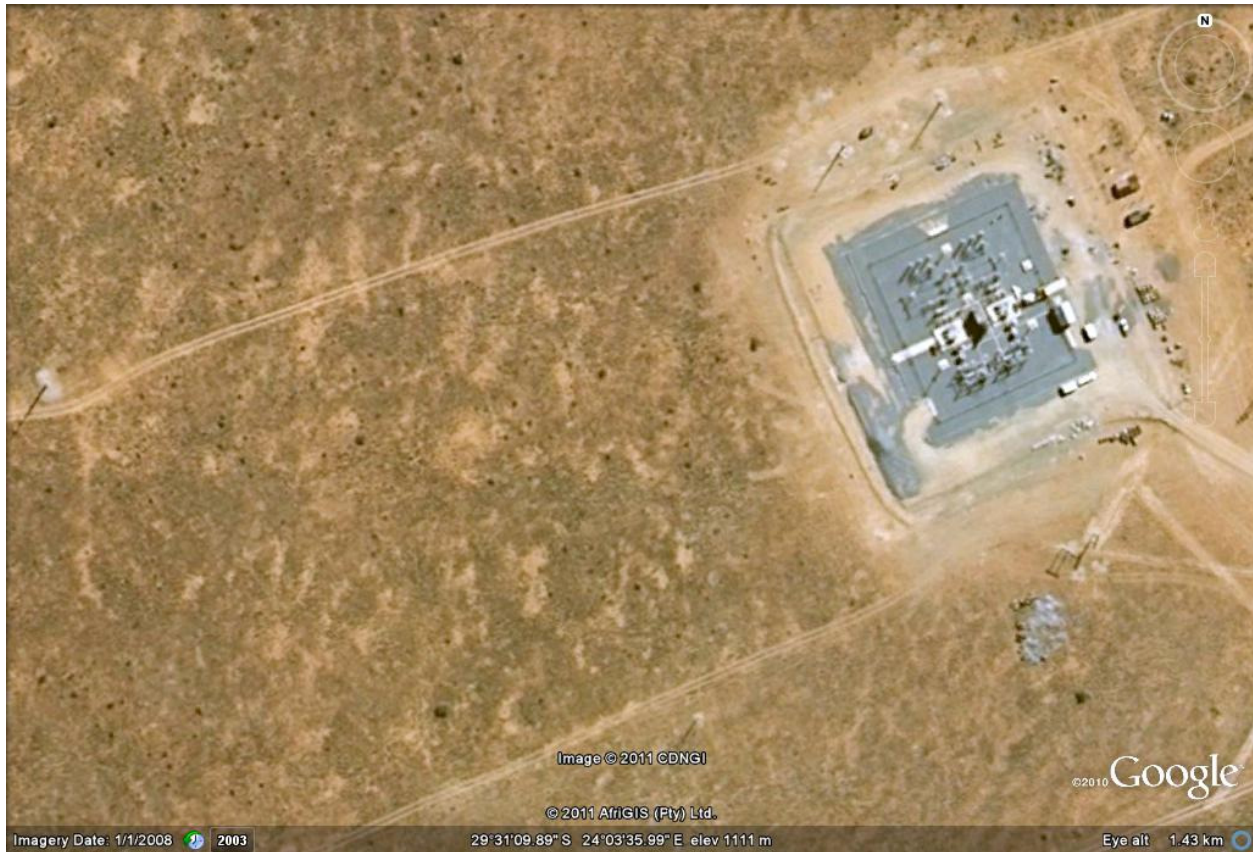
Map 1: Location of Farm Wicklow

The Google Earth image below indicates the substation and project in relation to the Orange River and the R388 road.



Map 2: Google Image of Larger Environment

The Google Earth image below shows the substation and project area in more detail.



Map 3: Google image of Substation and Project Area

5 Project Motivation and Description

5.1 Project Motivation¹

The provision of power or energy has become a significant limiting factor to both economic growth and competitiveness in South Africa. Additionally, there are both mandatory and voluntary directives for the establishment of sustainable energy projects, including wind and solar energy.

The Applicant has identified the need for the provision of solar power and through its international sister organisation is proposing the establishment of a number of solar farms that will supplement power to the power grid. Solar power is considered a desirable energy production mechanism as its utilisation has no adverse bi-products; the method of harnessing solar energy is relatively innocuous in comparison to fossil fuel power production and most existing land use practices can continue with little interruption.

¹ First Draft: Environmental Scoping Report. Establishment of Photovoltaic (Solar Power) Farms in the Northern Cape, p 11-12

It is also stated by the Applicant that photo voltaic centres offer employment opportunities with approximately 80 people been required on a 10MW plant.

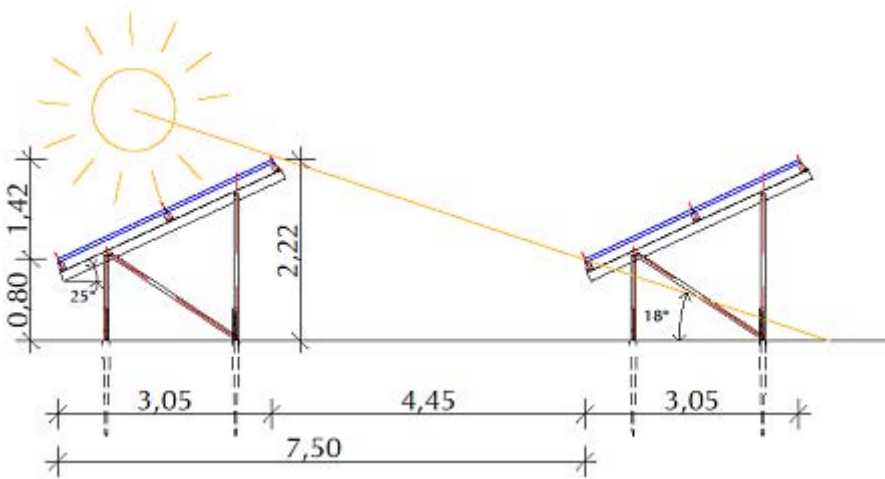
5.2 Project Description²

Identified or selected sites will have panels of photo voltaic (PV) cells mounted on wood or aluminium frames across level areas of the sites. Minor earthworks may have to be undertaken to accommodate such frames and such excavations will be surface related and is required to ensure that the orientation of the panels is congruous throughout the PV farm. Small removable plinths will be established to anchor the panels.

The panels will be approximately 2.2m in height above ground level with a width of approximately 3.0m. The panels are constructed of selenium based material encapsulated in a laminated plastic of high durability. Each panel is edged in plastic and feeds a small circuit board that delivers a direct current to the inverter that step up the current for delivery to the grid. The panels are non-reflective and are of a dark grey colour.

The schematic diagram below indicates the approximate size of the proposed solar panels.

Diagram 2: Schematic Diagram of Photo Voltaic Panels



6 Methodology

- The site of the proposed area of development was walked through by the author of this report on 25 August 2011.
- A desktop and internet search revealed general information regarding the larger area around the project site including the history of the town of Hopetown.

² First Draft: Environmental Scoping Report. Establishment of Photovoltaic (Solar Power) Farms in the Northern Cape, p 12-13

- Google imagery of the proposed site for the development as well as the relevant 1:50 000 map was also studied.
- The archaeological impact assessment was undertaken in March 2012
- The palaeontological desk-top assessment was undertaken in early April 2012

7 Historical Context

The prehistory of the Great Karoo, like that of the rest of the country, is conventionally divided into the Early (approx. 2 million to 200 000 years ago), Middle (250 000 to 20 000 years ago) and Late Stone Ages (20 000 years BP to historic times). The Early Stone Age people who roamed the Karoo were essentially hunters and gatherers and used their stone tools for butchering meat, making other stone tools and cutting and shaping plants and wood. During the Middle Stone Age they hunted more efficiently and seemed to prefer caves and shelters to live in.³

The Later Stone Age is characterised by the prehistory of the more recent and historically more familiar people of the Karoo, the San/Bushmen and Griqua, Korana/'Hottentots'. Iron Age crop farmers probably entered southern Africa along the north eastern coastal margins in or before the 3rd Century AD and within a few years descendants of these farmers moved westwards along river valleys.⁴

Hopetown lies on the Orange River just over one hundred kilometers to the South of Kimberley and is close to the border between the Northern Cape Province and the Free State. The town was first established in 1854 as a Dutch Reformed Church parish, the first church being constructed of mud and manure. The town was originally called Gonna, meaning Place of Water, but was renamed in honour of its Mayor, William Hope.⁵

The first diamond discovered in South Africa was found in Hopetown in 1867 and Hopetown boomed for a period during the so-called diamond rush. An old wagon route passed just north of the town and the first bridge across the Orange River was built along this route in 1871. Depending on the source one reads, this bridge was destroyed either by the Boer forces⁶ or by the British troops⁷ during the Anglo-Boer War of 1899-1902. The reason provided for the British destroying the bridge was to prevent Boer access to the Cape Colony.⁸ The project area is situated about 6km northwest of the bridge.

³ www.karooariep.co.za

⁴ ditto

⁵ www.internetaccommodation.co.za/town/hopetown

⁶ www.heritage.org.za/karoo/hope.htm

⁷ Jones, HM and Jones, MGM, 1999. A Gazetteer of the Second Anglo-Boer War 1899-1902, p.100

⁸ ditto

During the Anglo-Boer War a skirmish took place near the town at Houtkraal and a blockhouse can be found on the banks of the Orange River.⁹ It is unclear where the blockhouse is situated in relation to the project area.

8 Site Investigation Report

The project site was extensively walked by the specialist on 25 of August 2011. No visible heritage sites were discovered and little archaeological material was seen during the walk through. No sites relating to the Anglo-Boer War were observed and although the site is situated relatively close to the Orange River ($\pm 4\text{km}$) that would have attracted the San/Bushmen and Stone Age people to the area, little archaeological material was found and with the existing disturbed state of the project site, the context of material found could not be established.

The farm is used for sheep farming and the project area is used as grazing for the sheep. As stated earlier, an Eskom substation has recently been built adjacent to the project area and there are already existing power lines crossing the farm with access roads to the substation and power lines. There vegetation cover the study area is relatively sparse. The photographs below show the project area and surrounding environment.

Photograph 1: Existing Power Lines and Roads (photograph taken by Francis Smith)



⁹ www.karooplaces.com/n12

Photograph 2: Receiving Environment (photograph Francis Smith)



David Morris, Head of Archaeology at the McGregor Museum, Kimberley undertook an archaeological desktop study and stated that as it was situated not far from the Orange River there could be the remains of Anglo-Boer structures such as forts, redoubts, etc. However, there are no such features on the proposed site.

Mr Morris also stated that there could be rocky outcrops/hills that could possibly have rock engravings on them. Again, no rocky outcrops of significance were noted during the site visit nor any rock engravings could be found (as confirmed by archaeological assessment). See photograph 3 of a small rocky outcrop below.

The on-site archaeological impact assessment (see Appendix 1) found archaeological material in the form of flakes and flaked cores made from water worn meta-quartzites from Tillite layers in the Ventersdorp Super group, Chert and Lydianite. The archaeologist also found scatters of stone flakes and flaked cores near the existing Osbourne substation and three other locations in the project area as indicated in Appendix 1. The archaeologist was of the opinion that there would be a limited impact on archaeological remains in the area and the proposed development should proceed.

The palaeontological desktop assessment (Appendix 2) found that the development site is underlain by Late Cretaceous Quaternary Calcrete deposits and that there is a low potential for fossil material being uncovered during excavations hence the development site was given a low palaeontological sensitivity rating and it was recommended that application for exemption from further palaeontological studies be made to SARHA.

Photograph 3: Small Rocky Outcrop (Francis Smith)



9 Conclusions and Recommendations

It is the opinion of the heritage specialist that the proposed development of a solar farm on the farm Wicklow (project Osbourne) can proceed as long as the following recommendations are implemented:

- In the event that any heritage sites are discovered or unearthed during the construction process, work in the immediate vicinity of the find must be stopped, the Northern Cape Provincial Heritage Agency and the Cape Town office of the South African Heritage Resources Agency (SAHRA) must be informed and the services of the above-mentioned archaeologist used for an assessment of the heritage resources found.
- All measures recommended by the heritage professional in terms of resources found during construction must be implemented and adhered to.
- Existing access roads should be used where possible to avoid the building of new access roads.
- Application to SAHRA for exemption from further palaeontological studies is recommended.

10 Sources Consulted

Internet Sites

www.karogariep.co.za

www.routes.co.za/nc/hanover/index.html

www.internetaccommodation.co.za/town/hopetown

www.heritage.org.za/karoo/hope.htm

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Jones, Huw M. and Jones, Meurig G.M. A Gazetteer of the Second Anglo-Boer War 1899-1902. The Military Press, 1999