

**HERITAGE IMPACT ASSESSMENT OF THE
PROPOSED ESTABLISHMENT OF PHOTO VOLTAIC (SOLAR POWER) PANELS ON
THE FARM HANGKLIP (ANNEX ALOE RIDGE, NO. 451)
GRAAFF REINET DISTRICT, EASTERN 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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Appendix 1: CV of Jean Beater

Appendix 2: Archaeological Impact Assessment by Dr. Johan Binneman

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) for the project in July 2011 to undertake a heritage impact assessment (HIA) of the farm Annex Aloe Ridge, No. 451 in the Graaff-Reinet district of the Eastern Cape for the establishment of a photovoltaic (solar power) farm. It should be noted that the reference to or description of the project as Hangklip is because the existing Eskom substation located adjacent to the project area is called Hangklip substation.

The compiler of this report undertook the cultural heritage assessment of the site and the archaeological component of the HIA was undertaken by Dr Johan Binneman of Eastern Cape Heritage Consultants.

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 Heritage Specialist

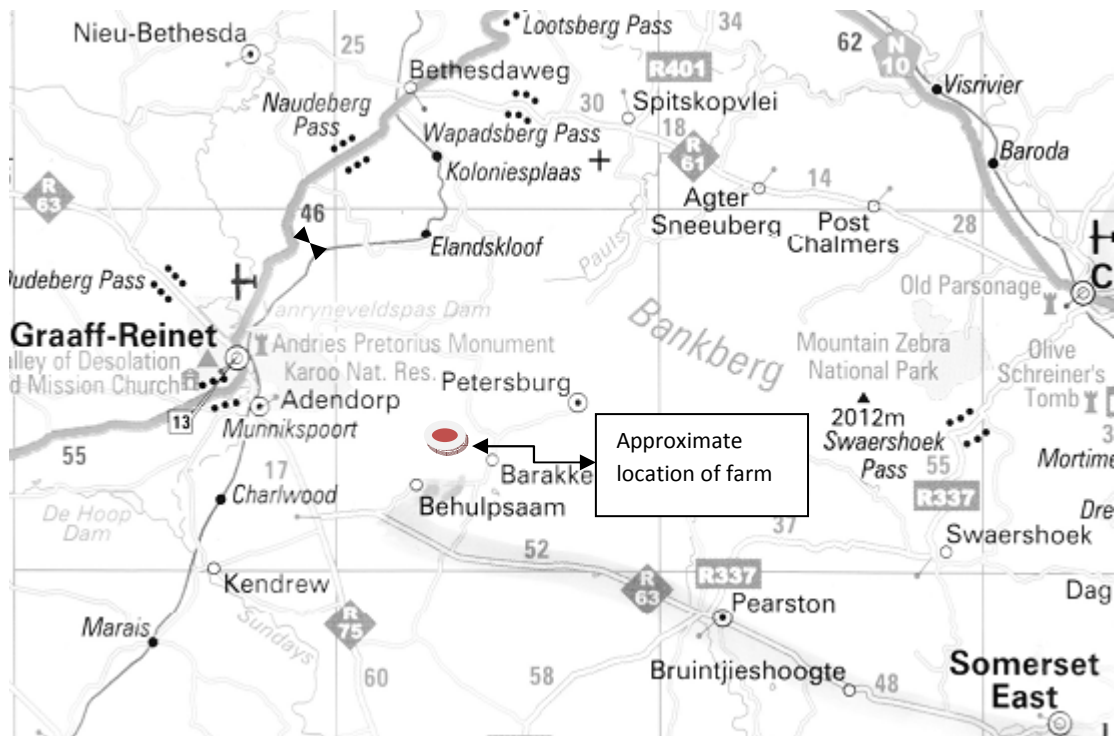
The CV of the specialist, Jean Beater, is included as Appendix 1 of this report. A brief overview is provided here below:

- South African Heritage Resources Agency (SAHRA)(1991 – 2002)
- Gauteng Department of Agriculture, Environment and Conservation (GDACE) Management Authority of the Cradle of Humankind World Heritage Site (late 2003 – June 2005).
- PBA International, Consulting Engineers (2005-2010).
- Independent Consultant (2010 -)
- She is an accredited heritage practitioner with Amafa aKwaZulu Natali and she is an affiliate member of the Association of Southern African Professional Archaeologists (ASAPA).

4 Description of Project Site

The farm is situated off the R63 that connects the towns of Graaff-Reinet, Pearston and Somerset East. The farm is situated on a gravel road that goes to the small hamlet of Petersburg. The farm is situated approximately 26km south east of Graaff-Reinet. See maps below indicating the position of the farm and project site.

Map 1: Location of Farm within wider Geographic Area



The farm is used for cattle and sheep farming and is covered by grass, scrubby bush with a few areas of open ground. The proposed development site is situated west and north west of the existing Eskom substation. The location of the Hangklip substation is $S32^{\circ}26'782''$, $E024^{\circ}43'762''$.

It should be noted in Diagram 1 below that the area indicated as 'Site 3 davypvec' is the project area that was investigated and it is proposed that the solar panels will be placed within this area.

Map 2: Google Earth Image of Substation and Surrounding Area

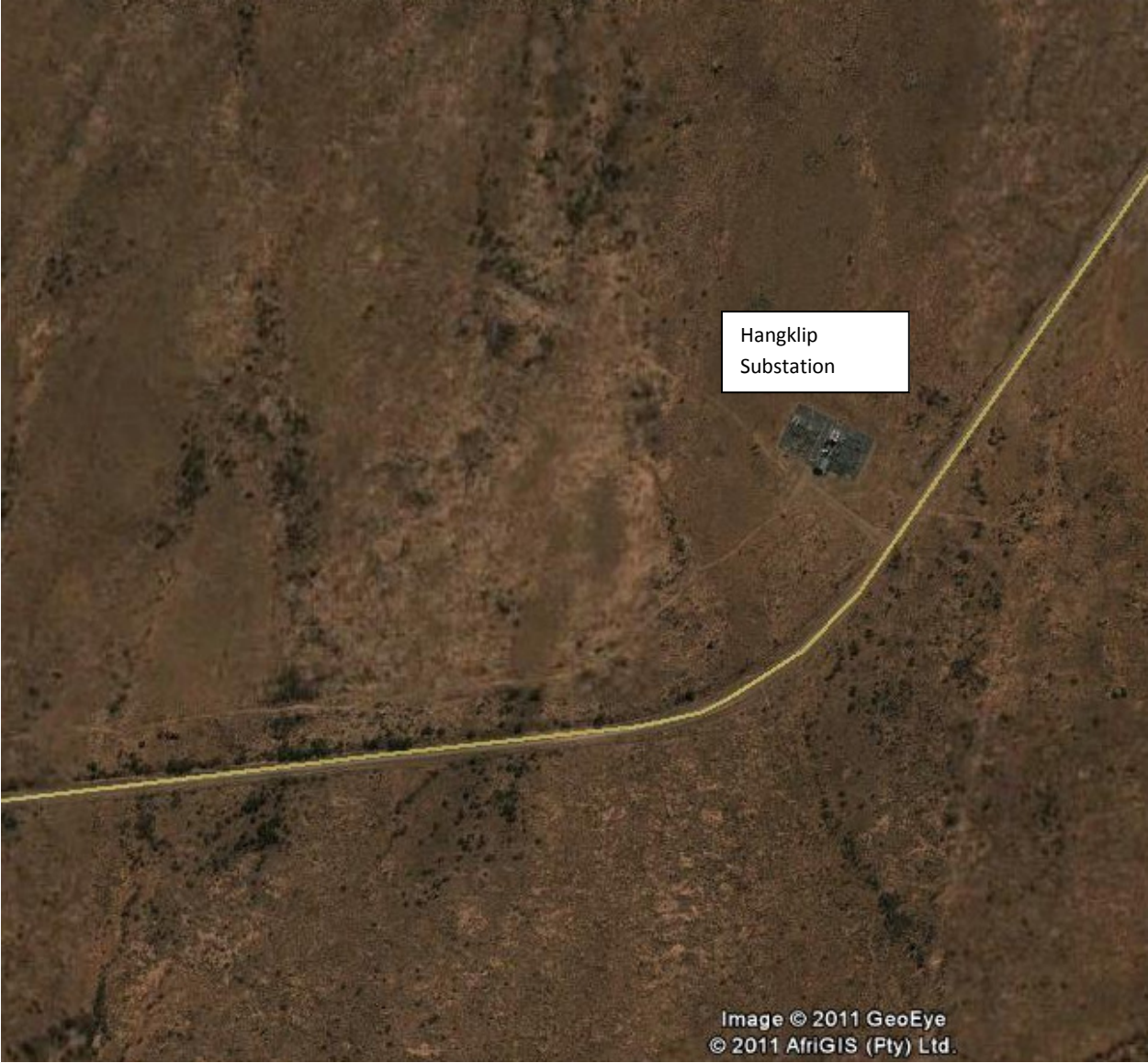
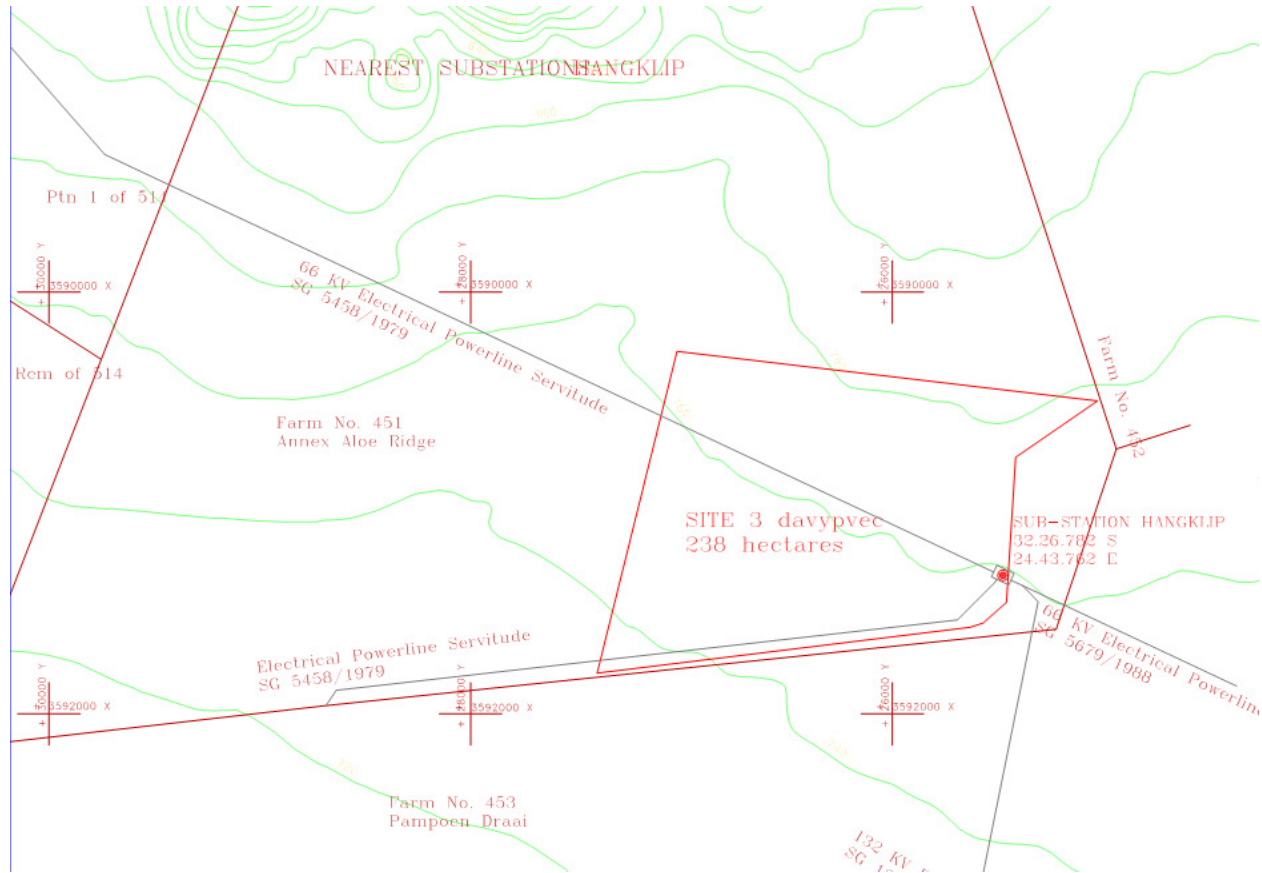


Diagram 1: Proposed Project Site on Hangklip



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.

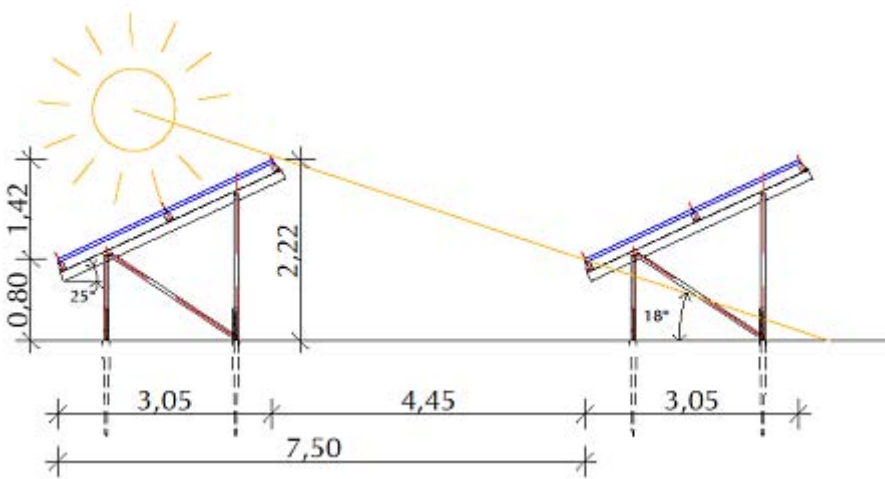
5.2 Project Description²

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 extensively walked through by the author of this report on 23 August 2011. The archaeological assessment was undertaken in December 2011.

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

- A desktop and internet search revealed general information regarding the larger area around the project site including the histories of the towns of Graaff-Reinet and Pearston and of the small hamlet Petersburg. Other heritage/archaeological or environmental studies undertaken in the area were searched for on the internet with limited results that did not pertain to the area under review.
- Google imagery of the proposed site for the development was also studied.

7 Historical Context

The prehistory of the Eastern Cape 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 the Australopithecines. These Early Stone Age people were essentially hunters and gatherers and used their stone tools for butchering meat, making other stone tools and cutting and shaping plants and wood. As the intellectual capacity and skills of the early Karoo humans improved, they produced more effective and smaller tools from harder materials. Thus, during the Middle Stone Age they hunted more efficiently and hunted smaller species and they 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 gathering-hunting |Xam (San/Bushmen) and the herding Khoekhoen (Griqua, Korana/'Hottentots').⁴ 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.

A more specific summary of the early history or prehistory of the area around the Hangklip site can be found in the archaeological impact assessment which is attached to this report as Appendix 2.

The historical period refers to the last 500 years when European settlers and colonialism entered Southern Africa. By the end of the 18th Century the trekboers who had been steadily moving northwards from the Dutch East India Company and its rules and had reached the Fish River and the boundary of the Cape Colony. By crossing the Fish River, the trekboers and Xhosa people who occupied the area north of the river came into conflict and there were numerous Frontier Wars that eventually led to the domination of the Xhosa by the British by the mid-1850s.⁵

Prior to this, concerns regarding the failure of the border to keep trekboers and the Xhosa apart led to the establishment of a new district Graaff-Reinet in 1786 where officials would be present to enforce Company policy.⁶ The newly appointed magistrate purchase a site for his residency that was selected

³ www.karogariep.co.za

⁴ ditto

⁵ Reader's Digest Illustrated History of South Africa - The Real Story. The Reader's Digest Association, p.68, 133

⁶ Ditto, p 70

primarily for its defensive position being surrounded by rivers on three sides. The new settlement was named after Governor Cornelis Jacob van de Graaff and his wife Cornelia Reynat. It was the fourth district in the Cape Colony to be granted a drostdy or seat of local government.⁷

The town or village of Pearston was founded on 21 September 1859 by the Dutch Reformed Church which managed the town until 1861 when the town management board acquired all rights to the town from the church. On 3 April 1894 the town was proclaimed a municipality and the district of Pearston was proclaimed on 8 June 1911.⁸

The Graaff-Reinet district, Pearston and surroundings saw a lot of Anglo-Boer War (1899-1902) activity with running skirmishes between the British troops (with many based at Graaff-Reinet) and small bands of Boers whose aim was to harass the British troops and disrupt communication lines including destroying railway lines. Commandant Gideon Scheepers, a successful leader of one of the Boer commandos was one of eight Boers executed at Graaff Reinet during the War.⁹

Even the small Hamlet of Petersburg saw action during the War, with one of the British columns launching an attack on Commandant JC Lotter's laager at Groen Kloof on 5 September 1901.¹⁰

8 Site Investigation Report

A site visit took place on 23 August 2011. The project site was walked by the author of this report and no visible heritage resources were found. The project site is disturbed by an access road to the substation and to the rest of the farm as well as the gravel road to Petersburg that runs along the southern boundary of the site. There are also several power lines crossing the farm. The photograph below shows the substation and access road with the project site to the west of the substation.

A number of drainage lines have been dug throughout the farm adding to the disturbed state of the project site. The vegetation is quite thick in places and several of these thickets were investigated and no heritage sites or material was found.

The archaeologist visited the site in early December 2011. Although areas of surface erosion (wash out), exposed the occasional Middle Stone Age (MSA) (older than 30 000 years) and Later Stone Age (LSA) (less than 30 000 years) stone tools, no significant archaeological sites/materials were observed. The area is not well presented by archaeological material. Although it is possible that concentrations of such material may be covered by soil and vegetation, in general it would appear that it is unlikely that any sensitive archaeological remains will be exposed during development.

⁷ www.sahistory.org.za/places/reinet

⁸ www.pearston.co.za

⁹ www.samilitaryhistory.org/vol73vm.html

¹⁰ Jones, HM and Jones, MGM, 1999. A Gazetteer of the Second Anglo-Boer War 1899-1902, p. 172

Two small areas were observed with more than 4 stone tools per square metre and both were observed in washed out areas hence the material is in secondary context and is of low significance and not worth collecting.

The first site, comprising of two MSA bladelet cores and four LSA hornfel flakes is situated at S32°26'657", E024°43'705" and the second site, comprising a MSA core and five LSA hornfel flakes is situated at S32°26'620", E024°43'739". Photographs of the two finds are included in the archaeological impact assessment report (Appendix 2).

Photograph 1: Substation and Access Road



Photograph 2 below that was taken in January 2011 of the Hangklip site shows the condition of the site and surrounding vegetation.

Photograph 2: View of Project Site



9 Conclusions and Recommendations

It is the opinion of the heritage specialist and the archaeologist that the proposed development of a solar farm on the site Hangklip can proceed as long as the following recommendations and mitigation measures are implemented:

- In the event that heritage or archaeological sites are discovered or unearthed during the construction process, work in the vicinity of the find must be stopped, the Eastern Cape Provincial Heritage Agency, the Albany Museum in Grahamstown and the South African Heritage Resources Agency (SAHRA) must be informed and the services of an accredited heritage professional obtained so that a systematic and professional assessment can be undertaken.
- Sufficient time should be allowed for the investigation to take place and all measures recommended by the heritage professional must be implemented and adhered to.
- Construction managers/foremen should be informed before construction starts of the possible types of heritage resources which may be encountered during construction and the procedure to be followed if such resources are found or unearthed.
- Existing access roads should be used where possible to avoid the building of new access roads.

10 Sources Consulted

Internet Sources

www.pearston.co.za

www.sahistory.org.za/places/reinet

www.samilitaryhistory.org/vol73vm.html

Books and Unpublished Reports

A Gazetteer of the Second Anglo-Boer War 1899-1902. Jones, HM and Jones, MGM, Milton Keynes, 1999

First Draft: Environmental Scoping Report. Establishment of Photovoltaic (Solar Power) Farms in the Northern Cape. Sustainable Development Projects, November 2010.

Reader's Digest Illustrated History of South Africa - The Real Story. The Reader's Digest Association, Cape Town, 1992