# Heritage Impact Assessment

Heritage Impact Assessment for the Proposed Manlenox Expansion Solar Park and the Manlenox 2 Solar Park on the Farm Grootvlei 296, west of Barkley West in the Kgatelopele Local Municipality, Northern Cape Province.

**Compiled for:**
Africa Geo-Environmental Services (AGES)

**Survey conducted & Report compiled by:**
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**02 September 2016**

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# Executive Summary

**Site name and location:** Proposed developments of the Manlenox Expansion Solar Park and the Manlenox 2 Solar Park on parts of the Farm Grootvlei 296, approximately 65 km west of Barkley West in the Kgatelopele Local Municipality, Northern Cape Province.

**Local Authority:** Kgatelopele Local Municipality.

**Developer:** Manlenox (Pty) Ltd.

**Date of field work:** 13 & 14 April 2013.

**Date of report:** 02 September 2016.

**Findings:** Hutten Heritage Consultants was contracted by Africa Geo-Environmental Services (AGES) to conduct a Heritage Impact Assessment (HIA) for the proposed developments of the Manlenox Expansion Solar Park and the Manlenox 2 Solar Park on parts of the Farm Grootvlei 296, approximately 65 km west of Barkley West in the Kgatelopele Local Municipality, Northern Cape Province.

An archival and historical desktop study was undertaken which was used to compile a historical layering of the study area within its regional context. This component indicated that the landscape within which the project area is located has a rich and diverse history. However, the desktop study did not reveal any historic or heritage sites from within the specific locations of the study area.

The Sahris Palaeontological Sensitivity Map was also consulted and it was found that the palaeontological sensitivity for the study area was high and that a Palaeontological Impact Assessment is required.

Prof. Bruce Rubidge completed a desktop palaeontological study for the study area. He concluded that the development of the two proposed Manlenox Solar Parks will extend over Precambrain rocks of the Transvaal Supergroup as well as Caenozoic calcrete deposits of the Kalahari Group. It is extremely unlikely that fossils will be exposed as a result of the Solar Park developments.

He recommended that, from a palaeontological perspective, the development of the two proposed Manlenox Solar Parks should proceed, but that if fossils are uncovered in the course of construction activities, the developer immediately calls in a qualified palaeontologist to assess the situation and, if necessary, undertake excavation of the fossils.

The desktop studies were followed by a fieldwork component which comprised an inspection of the study area.

Isolated finds of a few Late Stone Age stone tools were made during the study. These stone tools were found amongst protruding calcrete reefs/outcrops across the study area. These finds did not constitute heritage site/s due to their limited numbers and isolated nature. It is however important to note that these stone tools do occur in the study area regardless of their limited number and/or isolated nature.

A scheduled watching brief performed by a suitable qualified person is therefore recommended during the bush clearing and construction phases of the projects. This person should act and recommend on any possible open air Late Stone Age sites which could possibly be associated with the current isolated finds of Late Stone Age stone tools across the study area.

The proposed developments of the Manlenox Expansion Solar Park and the Manlenox 2 Solar Park and their associated infra-structures in the indicated areas can continue from a heritage point of view if the recommendations as outlined in this report are adhered to.

**Disclaimer:** *Although all possible care is taken to identify all sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites and/or graves could be overlooked during the study. Hutten Heritage Consultants and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.*

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## 1. Introduction

Hutten Heritage Consultants was contracted by Tekplan Environmental to conduct a Heritage Impact Assessment (HIA) for the proposed developments of the Manlenox Expansion Solar Park and the Manlenox 2 Solar Park on parts of the Farm Grootvlei 296, approximately 65 km west of Barkley West in the Kgatelopele Local Municipality, Northern Cape Province.

The aim of the study was to identify all heritage sites, to document and to assess their significance within Local, Provincial and National context. The report outlines the approach and methodology implemented before and during the survey, which includes in Phase 1: Information collection from various sources and social consultations; Phase 2: Physical surveying of the area on foot and by vehicle; and Phase 3: Reporting the outcome of the study.

This HIA forms part of the Environmental Impact Assessment (EIA) as required by various Acts and Laws as described under the next heading and is intended for submission to the provincial South African Heritage Resources Agency (SAHRA) for peer review.

Minimum standards for reports, site documentation and descriptions are set by the Association of Southern African Professional Archaeologists (ASAPA) in collaboration with SAHRA. ASAPA is a legal body representing professional archaeology in the Southern African Development Community (SADC) region.

The extent of the proposed development sites were determined as well as the extent of the areas to be affected by secondary activities (access routes, construction camps, etc.) during the development.

## 2. Legislative Requirements

The identification, evaluation and assessment of any cultural heritage site, artefact or find in the South African context is required and governed by the following legislation:

National Environmental Management Act (NEMA) Act 107 of 1998
National Heritage Resources Act (NHRA) Act 25 of 1999
Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002
Development Facilitation Act (DFA) Act 67 of 1995

The following sections in each Act refer directly to the identification, evaluation and assessment of cultural heritage resources.

National Environmental Management Act (NEMA) Act 107 of 1998

Basic Environmental Assessment (BEA) – Section (23)(2)(d)
Environmental Scoping Report (ESR) – Section (29)(1)(d)
Environmental Impacts Assessment (EIA) – Section (32)(2)(d)
Environmental Management Plan (EMP) – Section (34)(b)
National Heritage Resources Act (NHRA) Act 25 of 1999
Protection of Heritage resources – Sections 34 to 36; and
Heritage Resources Management – Section 38
Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002
Section 39(3)
Development Facilitation Act (DFA) Act 67 of 1995
The GNR.1 of 7 January 2000: Regulations and rules in terms of the Development Facilitation Act, 1995. Section 31.

## 3. Project Area Description

The proposed developments of the Manlenox Expansion Solar Park and the Manlenox 2 Solar Park will be situated on parts of the Farm Grootvlei 296, approximately 65km west of Barkly West in the Northern Cape Province.

The property is situated approximately 10km south of the R31 tar road from Barkly West to Daniëlskuil. It is also situated adjacent and to the north of the Klein-Riet River.

Eskom's "Olien-Ulco" and "Siverstreams-Ulco" 132kV power lines (figure 1) cross the northern half of the property from the west to the east. These two power lines are situated parallel next to each other across the property.

The proposed study area is approximately 1345ha in size and the footprints of the proposed two Solar Parks will be up to 250ha each within this study area. The developer prefers sites which are situated as close as possible to the 132kV power lines. A proposed layout for the developments is shown in figure 11. These proposed layouts will be situated in the north-eastern corner of the study area. The footprints for the developments will be selected after the conclusion of all specialist studies.

The proposed site was previously and is presently used as a cattle/small stock grazing facility and is bordered with properties with the same intend (figure 2). Cattle-watering facilities are situated within the proposed study area (figure 3). The proposed site, however, is not intensely used as grazing area, as game were noted on the property as well as on neighbouring properties. The property is relatively flat on the northern side (figure 4) and it slopes gently down to the Klein-Riet River on the southern extent of the property. Several small pans (figure 5), and/or depressions, of various sizes are also situated across the property. The property is mostly covered with red Aeolian sandy soils with typical monotonous Kalahari/Karoo vegetation (figure 6). Several calcrete reefs are protruding through the red sandy surface across most of the study area (figure 7).

The proposed study area is largely undisturbed except for the fencing of several camps (figure 8), and several small tracks which cross the property.

The proposed developments will be situated on the 2823 BD Ariefontein and 2823 BC Silver Streams 1:50 000 topographical maps (figures 9 & 10).

Figure 1: View of the power lines across the study area.

Figure 2: General view of the study area from the north-west.

Figure 3: View of one of the cattle drinking facilities.

Figure 4: General view of the property.

Figure 5: View of one of the pans on the property

Figure 6: View of the general vegetation across the site.

Figure 7: View of the protruding calcrete reefs.

Figure 8: View of one of the fences across the property.

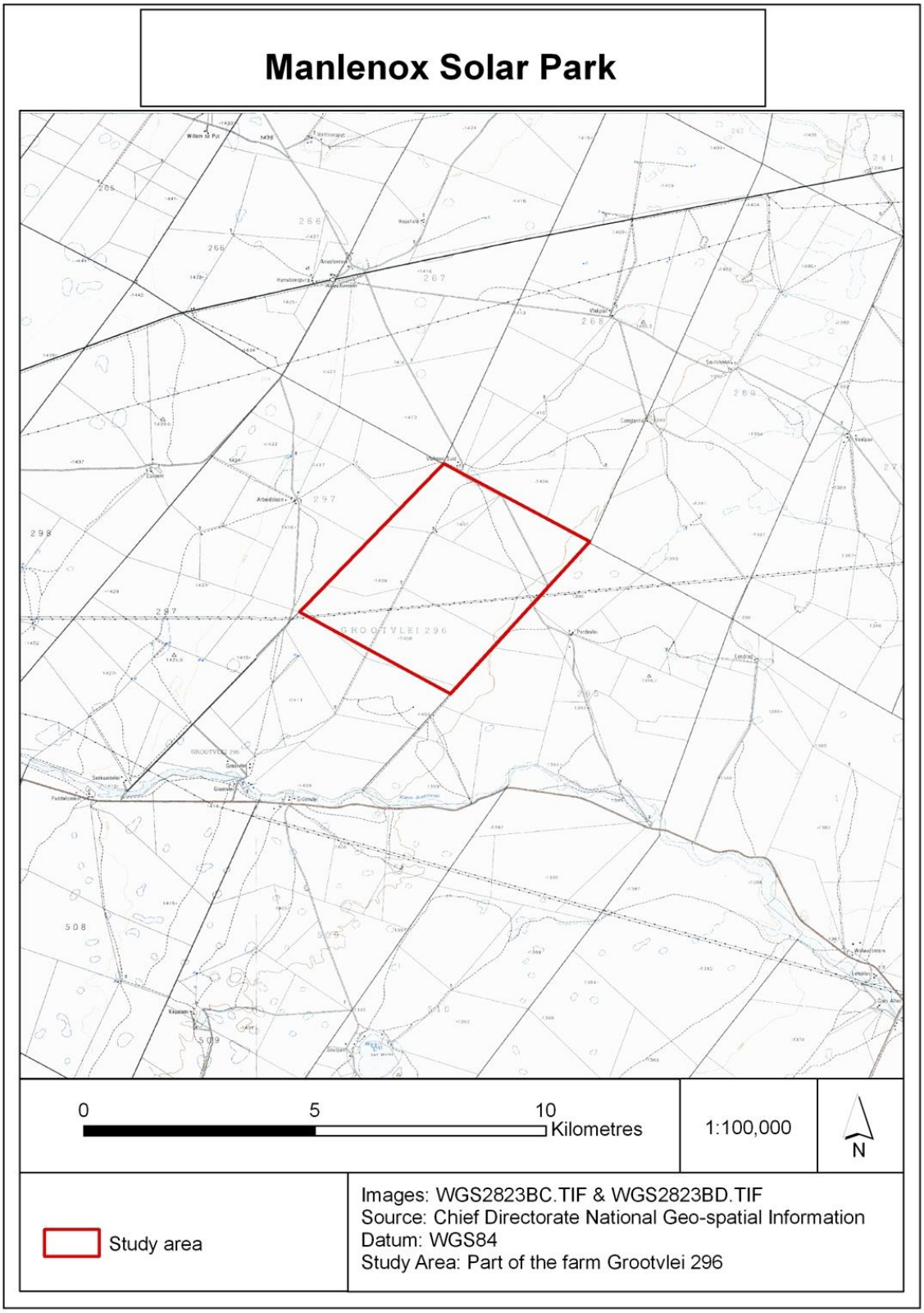


Figure 9: General topographical map of the proposed study area.

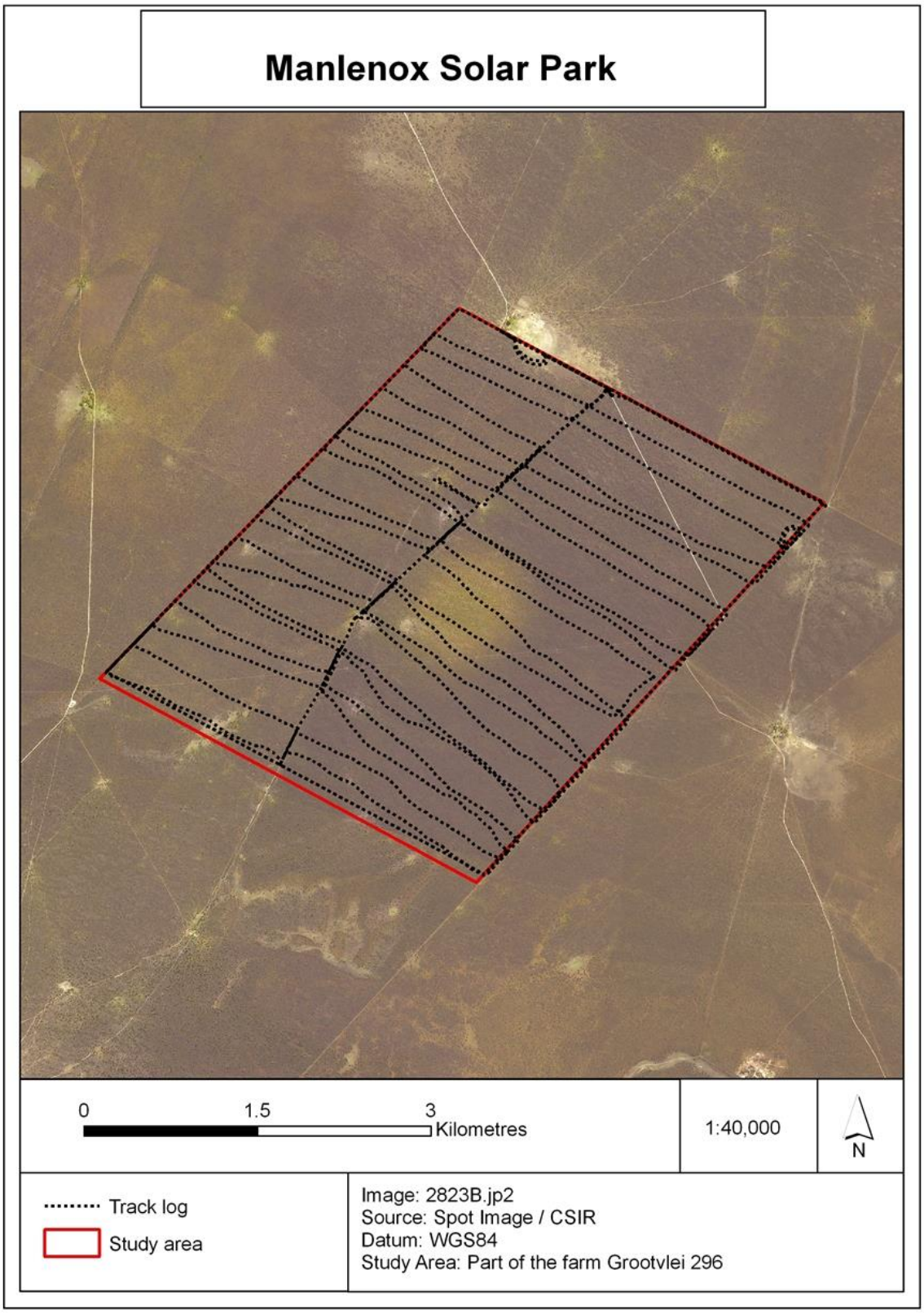


Figure 10: Satellite image of the proposed study area.

## 4. Proposed Project

Manlenox (Pty) Ltd has proposed the developments of the Manlenox Expansion Solar Park and the Manlenox 2 Solar Park on parts of the Farm Grootvlei, approximately 65km west of Barkly West in the Northern Cape Province. The two proposed Solar Parks will be situated on either side of the "Olien-Ulco" or "Siverstreams-Ulco" 132kV power lines (figure 11).

The final footprints for the developments will be selected after the conclusion of all specialist studies. These developments will mainly be the establishment of a renewable energy generation facilities (Photovoltaic Solar Facility). The generated energy (electricity) will be supplied to the existing Eskom or municipal grid.

After bush clearing, construction will concentrate on the erection of Photovoltaic panels which will be mounted on constructed foundations. The proposed facilities will make use of this photovoltaic technology with a total generating capacity of up to 120MW each. The generated energy will be connected to the Eskom grid through the Eskom "Olien-Ulco" or "Siverstreams-Ulco" 132kV power lines which run parallel to each other across the northern section of the farm. Associated engineering infrastructure such as service roads, water and sewerage lines for administrative and accommodation areas and electrical lines will also be installed.

The proposed facilities will be located on the Farm Grootvlei 296, which measured approximately 2720ha in size. The study area for the project is approximately 1345ha in size and covers the northern part of the farm. The footprint of the proposed developments will be up to 250ha each to be leased from within the proposed study area of 1345ha. The two proposed Solar Parks will be situated on either side of the "Olien-Ulco" or "Siverstreams-Ulco" 132kV power lines. The footprint will be selected after the conclusion of all specialist studies.

The purpose of the study was to determine if the proposed area was suitable for the development of the two Solar Parks from a heritage point of view.

The project was tabled during November 2015 and the developer intends to commence as soon as possible after receipt of the ROD from the Department of Environmental Affairs.

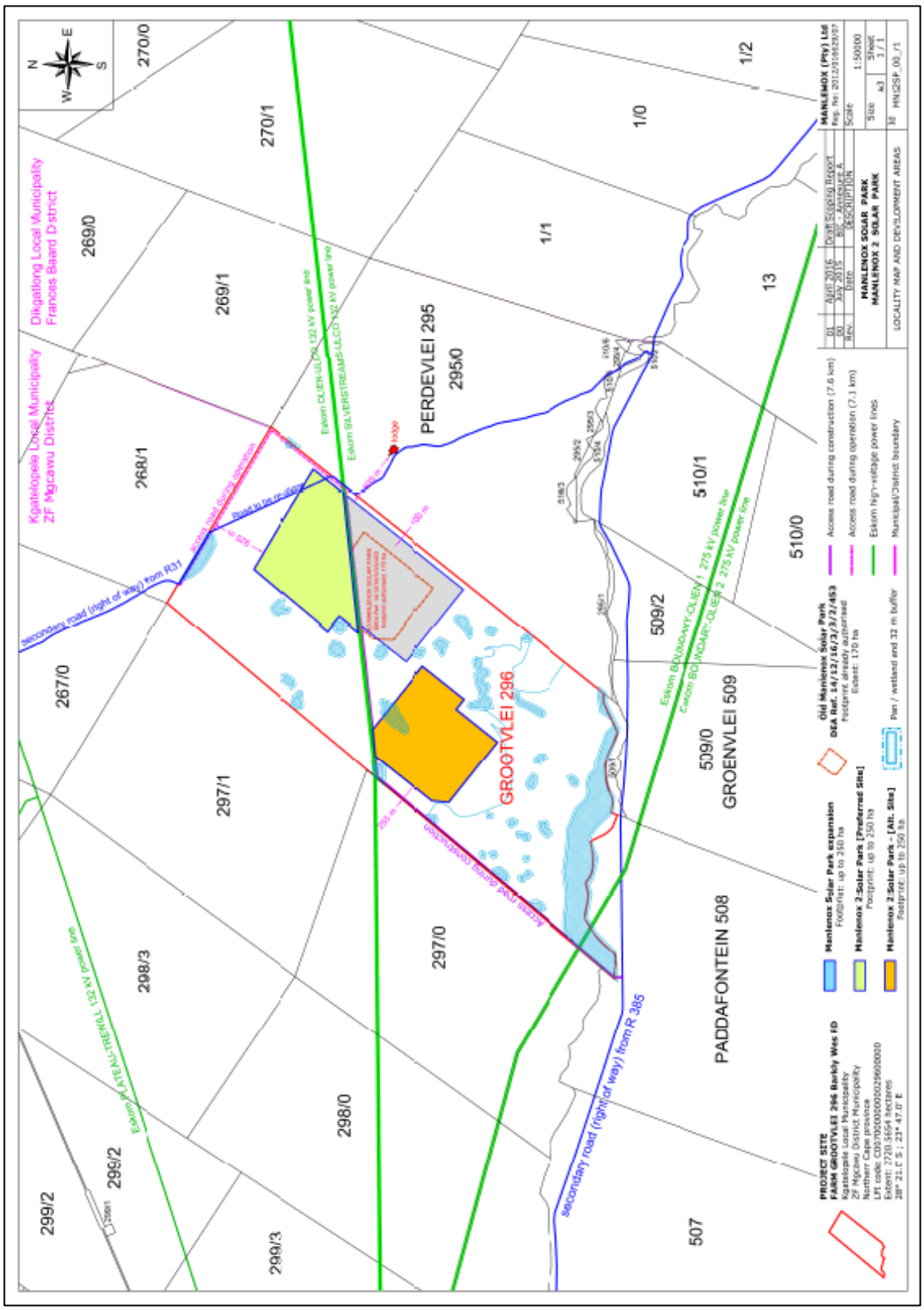


Figure 11: Proposed two Solar Park locations within the study area (as supplied by the developer).

# 5. Desktop Study Findings

The examination of heritage databases, historical data and cartographic resources represents a critical additional tool for locating and identifying heritage resources and in determining the historical and cultural context of the study area. Therefore an internet literature search was conducted and relevant archaeological and historical texts were also consulted. Relevant topographic maps and satellite imagery were studied. Researching the SAHRA APM Report Mapping Project records and the SAHRIS online database (http://www.sahra.org.za/sahris), it was determined that no previous archaeological studies had been carried out in the study area. However, a number of previous archaeological or historical studies had been performed within the wider vicinity of the study area with one study immediately adjacent to the current study area.

## 5.1. Previous Heritage Studies

Previous surveys in the vicinity of the study area listed in the APM Report Mapping Project and the SAHRIS database included the following reports and cases listed in chronological order below:

Morris, D. & Beaumont, P.B. 1994. **Ouplaas 2 Rock Engravings, Danielskuil.** McGregor Museum. 1994-SAHRA-0025.

Morris, D. 1999. **Proposed Mining Areas and Properties at Ulco, Northern Cape, Including the Vicinities of Gorrokop and Groot Kloof.** McGregor Museum. 1999-SAHRA-0055.

Van Ryneveld, K. & Morris, D. 2003. **Diamond Kopje Surface and Sub-Surface Reconnaissance.** McGregor Museum. 2003-SAHRA-0117.

Henderson, Z.L. 2005. **Cultural Heritage Assessment for Finsch Mine.** National Museum Bloemfontein, Archaeology Contracts Office. 2005-SAHRA-0202.

Van Ryneveld, K. 2005. **Cultural Resources Management Impact Assessment: Rooipoort: (Portions of) Klipfontein 99, Berg Plaats 100, Vogelstruis Pan 98, Vogelstruis Pan 101 and Zand Plaats 102, Kimberley District, Northern Cape, South Africa.** McGregor Museum. 2005-SAHRA-0321.

Morris, D. 2006. **Archaeological and Heritage Impact Assessment on Portion 20 Mosesberg, near Schmidtsdrift, Northern Cape.** McGregor Museum. 2006-SAHRA-0271.

Morris, D. 2007. **Archaeological Impact Assessment of a Proposed Mining Project at 'Kareevlei', near Koopmansfontein, Northern Cape, for Tawana Resources Sa. Dme Ref NC 30/5/1/2/3/2/1/081 Em.** McGregor Museum. 2007-SAHRA-0201.

Van Ryneveld, K. 2007. **Archaeological Site Inspection Mining Impact on Two Graveyard Sites, Smitsdrift Mining Area, Boomplaats 21, Schmidtsdrift District, Northern Cape, South Africa.** Archaeomaps. 2007-SAHRA-0284.

Dreyer, C. 2007. **Archaeological and Historical Investigation of the Proposed Mining Activities at the Farm Rosslyn, Lime Acres, Northern Cape.** Pr. Archaeologist/Heritage Specialist. 2007-SAHRA-0549.

Morris, D. 2008. **Archaeological and Heritage Impact Assessment on Remainder of Carter Block 458, near Limeacres, Northern Cape.** McGregor Museum. 2008-SAHRA-0320.

Van Schalkwyk, J. 2011. **Heritage impact assessment for the proposed development of photovoltaic power plants on five different locations in North West and Northern Cape Provinces**. SAHRIS case number 355.

Eternal City Trading 538 CC. 2011. **Consultation of an Environmental Management Plan submitted in terms of Section 16 of the Mineral and Petroleum Resources Development Act 2002, (Act 28 of 2002) in respect of Blouklip no.519, situated in the Magisterial District of Hay.** SAHRIS case number 1338.

Nicholson, A. 2011. Environmental **Impact Assessment and Environmental Management Programme.** Umhlaba Environmental Consulting CC. SAHRIS case number 1505.

Morris, D. 2012. **Archaeological & Cultural Heritage Impact Assessment Phase 1: Proposed Olien Solar Project development on Portion 4 of Farm 300, Barkly West, near Limeacres, Northern Cape.** McGregor Museum. SAHRIS case number 543.

Botha-Brink, J. 2012. **Palaeontological Impact Assessment of the Proposed Olien Solar Project on Farm 300, Barkly West, Northern Cape Province.** Karoo Palaeontology Department, National Museum. SAHRIS case number 543.

Fourie, W. 2012. **The proposed 10mw Photovoltaic (PV) Power Plant on the Farm Arriesfontein (Farm 267) near Daniëlskuil, Northern Cape Province – Heritage Impact Assessment.** PGS Heritage & Grave Relocation Consultants. SAHRIS case number 1468.

Beaumont, P. B. 2013. **Phase 1 Archaeological Impact Assessment Report on a ~4.5 ha area on portion 1 of Farm 185, situated ~35 km ENE of Daniëlskuil, Barkly West Magisterial District, Northern Cape Province.** McGregor Museum. SAHRIS case number 1374.

The studies listed above located a significant number of heritage sites belonging to the Stone Age for which the region is renowned (Sampson 1985) as well as sites belonging to the historical period of which the history of Griqualand, the discovery of diamonds and

the Anglo Boer War of 1899-1902 had important impacts. Fourie (2012) carried out a detailed background study and survey of the farm Arriesfontein immediately adjacent and to the north of the current study area and identified low concentrations of Stone Age artefacts around the pans and dry drainage courses, indicating the possibility of there being sensitive heritage resources within the study area. Fourie (2012) noted that, in the Northern Cape, archaeological material is mostly located near to water sources including rivers, pans and springs or in rock shelters and on hills. The farm Arriesfontein is also known historically as the springs on the property were a watering point on the old transport route where the current railway line now runs (Fourie 2012).

Many other studies located Stone Age material. For example 35km to the north-east on the Ghaap Escarpment Morris (1999) identified LSA and MSA lithics and referred to known rock painting sites at Groot Kloof. These paintings are of unusual quality and the most elaborate of their kind along the Ghaap escarpment (Morris 1999; Nicholson 2011). Henderson (2005) reported finding a large number of ESA, MSA and LSA lithics in a fairly extensive survey 20 km to the west of the study area. In a survey of Diamond Kopje some 40 km to the south-east Van Ryneveld & Morris (2003) catalogued a large number of MSA and LSA sites, the latter including both micro- and macro-lithic assemblages while further MSA and LSA tools were found in an adjacent study site (Morris 2006). In another survey for a potential mine development in the same area Van Ryneveld (2005) located 33 sites ranging from the ESA to the LSA (including six factory sites belonging to the MSA and LSA) and recommended that Provincial Heritage Site status be afforded as a level of protection. The extent of the Stone Age remains is further evidenced in that during a survey of two formal graveyards to the south-east, culturally associated with the BaTlhaping people and threatened by mining developments, Van Ryneveld (2007) noted the occurrence of MSA lithics across the site. There are several engraving sites in the area including two at Danielskuil some 24 km to the north-west, at Klipvlei and at Limeacres to the west. The Limeacres engravings consist of 119 distinct images spread over some 22 dolomite rock slabs and are interesting in that they are fairly recent, depicting colonial scenes such as horses with riders and were likely engraved by Korana people descendants of Khoekhoen pastoralists (Morris & Beaumont 1994).

A number of studies found no or very few heritage resources. In some cases these were limited to a small number of surface stone tools (e.g. Morris 2012; Beaumont 2013) or graves and remains of old kraals (e.g. Morris 2012; Van Ryneveld 2007).

### 5.2. Archaeological & Historical Sequence

The historical background and timeframe of the study area and other areas in Southern Africa can be divided into the Stone Age, Iron Age and Historical period. These can be divided as follows:

**Stone Age sites**

The Stone Age is divided into the Early; Middle and Late Stone Age. The Early Stone Age (ESA) includes the period from 2.5 million years B.P. to 250 000 years B.P. and is associated with Australopithecines and early Homo species who practiced stone tool industries such as the Oldowan and Acheullian. The Middle Stone Age (MSA) covers various tool industries, for example the Howiesons Poort industry, in the period from 250 000 years B.P. to 25 000 years B.P. and is associated with archaic and modern Homo sapiens. The Late Stone Age (LSA) incorporates the period from 25 000 years B.P. up to the Iron Age and Historical Periods and contact between hunter-gatherers and Iron Age farmers or European colonists. This period is associated with modern humans and characterised by lithic tool industries such as Smithfield and Robberg.

Excavations at several well-known sites in the region attest to ESA occupation. Taung National Heritage Site some 130 km to the north-east of the study area yielded the first Australopithecus africanus skull, the Taung Child (Dart 1925). More recent surveys have documented Acheullian industries and continuity between ESA and MSA lithic technologies in the same area (Kuman 2001). Wonderwerk Cave some 70 km to the north of the study area is a significant site characterised by continuous settlement from the ESA up to historical times. The ESA Acheulean lithics at Wonderwerk date to approximately 780 000 B.P. and are followed in sequence by MSA Fauresmith tools dating to between 276 000 and 510 000 B.P. and LSA Oakhurst industry replaced by Wilton industry tools (Beaumont & Vogel 2006). Excavations at other well known sites in South Africa attest to earlier ESA occupation, for example at Makapansgat which provided evidence of long occupation, initially by Australopithecus africanus from approximately 3.3 million years B.P. (Bergh 1999). The LSA is extremely well represented in the wider vicinity of the study area and it is particularly well known for its abundance of rock engravings as well as rock paintings (e.g. Morris & Beaumont 1994; Morris 2003; Morris 2007; Van Jaarsfeld 2006) belonging to San forager and Khoekhoen herder communities (Smith & Ouzman 2004) with the Duggan-Cronin Gallery in Kimberley chronicling a photographic record of the San culture. Near Postmasburg some 65 km to the west of the study area and at Blinklipkop two specularite mines have been identified dating to 1200 B.P. or before, specularite being prized for cosmetic purposes by San, Khoekhoen and later Iron Age settlers (Beaumont & Boshier 1974; Fourie 2012).

**Iron Age**

The Iron Age incorporates the arrival and settlement of Bantu speaking people and overlaps the Pre-Historic and Historical Periods. It can be divided into three phases. The Early Iron Age includes the majority of the first millennium A.D. and is characterised by traditions such as Happy Rest and Silver Leaves. The Middle Iron Age spans the 10$^{th}$ to the 13$^{th}$ Centuries A.D. and includes such well known cultures as those at K2 and Mapungubwe. The Late Iron Age is taken to stretch from the 14$^{th}$ Century up to the colonial period and includes traditions such as Icon and Letaba.

The study area is very much on the boundary of Iron Age settlement with Sotho-Tswana peoples settling in the vicinity of the study area in the eastern portion of the Northern Cape Province in the 17th century. Humphreys (1976) analysed historical and archaeological records to determine the southernmost distribution of Tswana Iron Age settlement in the Northern Cape and determined that the limit of settlement was along a line between Postmasburg and just to the south of Taung. Certainly there is evidence that the specularite mine at Blinklipkop was controlled by Thlaping (Sotho-Tswana) groups by the beginning of the 19th century (Thackeray et al. 1983; Fourie 2012). According to Van Jaarsveld (2006) the Iron Age is absent to the south of the study area as a result of the regions aridity and poor carrying capacity for cattle herds. Again, the western limits of Iron Age settlement were a considerable distance to the east of the study area where studies have documented the south- and westwards migration and the replacement of hunter-gatherer ceramics by agro-pastoralist ceramics (Maggs 1976; Thorp 1996).

**Historical Period**

The beginning of the Historical Period overlaps the demise of the late Stone and Iron Ages and is characterised by the first written accounts of the region from 1600 A.D. At the beginning of the 19th century the area was populated by San, Khoekhoen (Korana) and Thlaping (Sotho-Tswana) peoples, the latter two having close inter-relationships through marriage (Humphreys & Thackeray 1983; Fourie 2012). The region was by no means isolated and was attractive to fugitives from the Cape Colony and later in the early 1800s to Xhosa groups from todays Eastern Cape and such figures as Coenraad de Buys. Armed raiding groups on horseback led by such characters caused considerable instability in the region and a breakdown in the social order (Fourie 2012). The Griqua people arose out of the 'Bastaards' who were Christians of mixed white, Khoekhoen and slave descent. The earliest mission station amongst them was established by William Anderson of the London Missionary Society between 1801 and 1804. They adopted their first constitution in 1813 and adopted the name Griqua apparently at the suggestion of the missionary John Campbell (Fourie 2012).

The subsequent history of Griqualand and Transorangia involved considerable conflict between San, Griqua (also between opposing Griqua groups) and Sotho-Tswana peoples with the San initially becoming reduced to Griqua clients as the latter expanded their sphere of control. Dfecane raiders in the in the 1820s and 1830s added to the turmoil as did larger numbers of Sotho-Tswana settlers who displaced the local San. In the 1830s European traders became active in the area and in 1842 Griqua leader Andries Waterboer reached a border agreement with the Tlhaping (Sotho-Tswana) which marked the close of Griqua expansion (Legassick 1989; Fourie 2012).

The discovery of diamonds in the region in the 1860s led to conflict between various polities including the Griqua, Sotho-Tswana, the British and the Transvaal and Orange Free State Republics. In the early 1870s the area was brought under British control as Griqualand West and there were a number of skirmishes with the Thlaping Sotho-Tswana who resisted. A further rebellion in 1878 did little to stop colonial authority and the region was annexed by the Cape in 1880 with Danielskuil subsequently becoming

established as a European town (Legassick 1989; Fourie 2012). The Anglo-Boer War of 1899 to 1902 saw most of the farmers in the area opposing the British who responded by occupying Danielskuil and fortifying the town. The Boer forces were either captured or surrendered and a counter-attack against the British in 1901 failed (Leggasick 1989; Fourie 2012). In the wider region the Anglo-Boer War saw substantial activity including the siege and shelling of Kimberley and the use of the mines as shelter from the bombardment. Battlefields in the region include Graspan, Koedoesburg, Magersfontein, Paardeberg, Driefontein and Poplar Grove. The latter battle, possibly the most decisive in the region, took place in March 1900 and resulted in the prolonging of the war as the poorly equipped British were unable to capture the fleeing Boer forces including Paul Kruger (Pakenham 1979). A significant number of studies and surveys report the presence of troop camps, battlefield debris and soldiers graves scattered across the region (e.g. Morris 2003; Dreyer 2008; Heather-Clark 2012).

### 5.3. Palaeontology

The SAHRIS online database (http://www.sahra.org.za/sahris) was accessed and the Palaeontological Sensitivity Map was consulted. This map is colour coded to indicate the varied palaeontological sensitivities across the country. The following guidelines/recommendations are provided in the table below regarding the palaeontological sensitivity for each identified colour.

PalaeoSensitivity Map Action Guideline.

| Colour | Sensitivity | Required Action |
|---|---|---|
| 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 | LOW | No palaeontological studies are required however a protocol for finds is required |
| GREY | INSIGNIFICANT/ZERO | No palaeontological studies are required |
| WHITE/CLEAR | UNKNOWN | These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map. |

It was found that the palaeontological sensitivity for the study area was high and that a palaeontological desktop study is required and based on the outcome of the desktop study, a field assessment is likely.

Prof. Bruce Rubidge completed a Palaeontological Desktop Study for the proposed development (Rubidge, 2013). The following are excerpts from that study:

"…The entire area is underlain by rocks of the Transvaal Supergroup comprising sedimentary rocks of the Precambrian Gaap Group (Campbell Rand Subgroup) which comprise dolomites. Over most of the study area these rocks are overlain by Caenozoic Calcretes of the Kalahari Group (Figure 2).

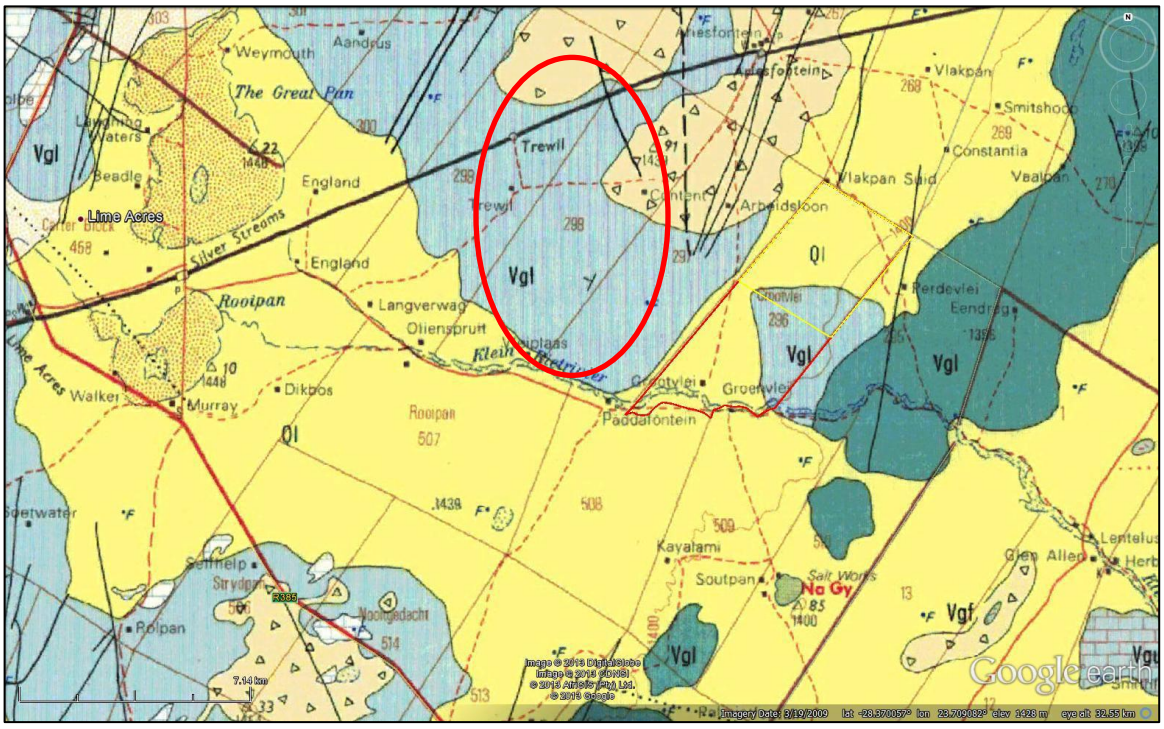


*Figure 2: Geology of the Study area (1:250 000 Geological Map Series of the Republic of South Africa, Sheet number 2822 Postmasburg). Red oval shows study area.*

**Palaeontological Heritage**

The dolomites and carbonite rocks of the Gaap Group which are exposed in only a small part of the study area could potentially host fossil of stromatolites. The calcretes of the Kalahari Group which are also sedimentary of origin could also host much younger fossils but this is extremely unlikely.

Collections of stromatolites from the Transvaal Supergroup are present in the collections of the Evolutionary Studies Institute (ESI), formerly BPI Palaeontology, at the University of the Witwatersrand, and the Council for Geoscience in Pretoria."

# 6. Assessment Criteria

This chapter describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The significance of archaeological and heritage sites were based on the following criteria:

- The unique nature of a site
- The amount/depth of the archaeological deposit and the range of features (stone walls, activity areas etc.)
- The wider historic, archaeological and geographic context of the site
- The preservation condition and integrity of the site
- The potential to answer present research questions.

## 6.1. Site Significance

Site significance classification standards prescribed by the South African Heritage Resources Agency (2006) and approved by the Association for Southern African Professional Archaeologists (ASAPA) for the Southern African Development Community (SADC) region, were used for the purpose of this report.

| ***FIELD RATING*** | ***GRADE*** | ***SIGNIFICANCE*** | ***RECOMMENDED MITIGATION*** |
|---|---|---|---|
| National Significance (NS) | Grade 1 | - | Conservation; National Site nomination |
| Provincial Significance (PS) | Grade 2 | - | Conservation; Provincial Site nomination |
| Local Significance (LS) | Grade 3A | High Significance | Conservation; Mitigation not advised |
| Local Significance (LS) | Grade 3B | High Significance | Mitigation (Part of site should be retained) |
| Generally Protected A (GP.A) | Grade 4A | High / Medium Significance | Mitigation before destruction |
| Generally Protected B (GP.B) | Grade 4B | Medium Significance | Recording before destruction |
| Generally Protected C (GP.C) | Grade 4C | Low Significance | Destruction |

### 6.2. Impact Rating:

**Low or No Significance:**
The constraint is absent, but in instances where present, poses a negligible significance on the proposed development in terms of heritage concerns.

**Moderate Significance:**
The constraint is present and poses a notable but not major significance on the proposed development in terms of heritage concerns. If the constraint can't be avoided, appropriate mitigation measures must be implemented to minimize the significance.

**High Significance:**
The constraint is present and poses a high significance on the proposed development in terms of heritage concerns. It is recommended that the constraint be avoided or appropriate mitigation measures must be implemented to minimize the significance.

### 6.3. Certainty

*DEFINITE:* More than 90% sure of a particular fact. Substantial supportive data exist to verify the assessment.
*PROBABLE:* Over 70% sure of a particular fact, or of the likelihood of an impact occurring.
*POSSIBLE:* Only over 40% sure of a particular fact, or of the likelihood of an impact occurring.
*UNSURE:* Less than 40% sure of a particular fact, or of the likelihood of an impact occurring.

### 6.4. Duration

| | |
|---|---|
| *SHORT TERM:* | 0 – 5 years |
| *MEDIUM:* | 6 – 20 years |
| *LONG TERM:* | more than 20 years |
| *DEMOLISHED:* | site will be demolished or is already demolished |

### 6.5. Mitigation

Management actions and recommended mitigation, which will result in a reduction in the impact on the sites, will be classified as follows:

- **A** – No further action necessary
- **B** – Mapping of the site and controlled sampling required
- **C** – Preserve site, or extensive data collection and mapping required; and
- **D** – Preserve site

# 7. Methodology

## 7.1. Physical Survey

The extent of the proposed development sites were determined as well as the extent of the areas to be affected by secondary activities (access route, construction camp, etc.) during the development.

The physical survey was conducted on foot over the entire area proposed for development. Priority was placed on the undisturbed areas. A systematic inspection of the area on foot along linear transects resulted in the maximum coverage of the proposed area. The author and two experienced field workers, who did not have a GPS device with them, transected the study area in transects of approximately 50m -75m between them. The field work was conducted on April 13 & 14, 2013 and most of the two days were spent on the survey, which was performed by M. Hutten and field workers T. Mulaudzi and E. Khorommbi.

The survey focused on the indicated study area as provided by the developer where the proposed development will be situated. Areas outside of the indicated study area were not surveyed. No sampling was done.

## 7.2. Interviews

The owner of the farm, Mr. Piet Austin and his wife Annetjie were questioned during the survey and they indicated that they were not aware of any sites of heritage value or significance (such as graves) in the proposed area.

## 7.3. Restrictions

Vegetation proved the major restriction and contributed to poor surface visibility after a spate of good rains before the survey

## 7.4. Documentation

All sites/find-spots, if any, located during the foot surveys were briefly documented. The documentation included digital photographs and descriptions as to the nature and condition of the site and recovered materials. The sites/find-spots were plotted using a Global Positioning System (GPS) (Garmin GPSmap 60CSx) and numbered accordingly. The track logs and identified sites are depicted on the following map and satellite image.

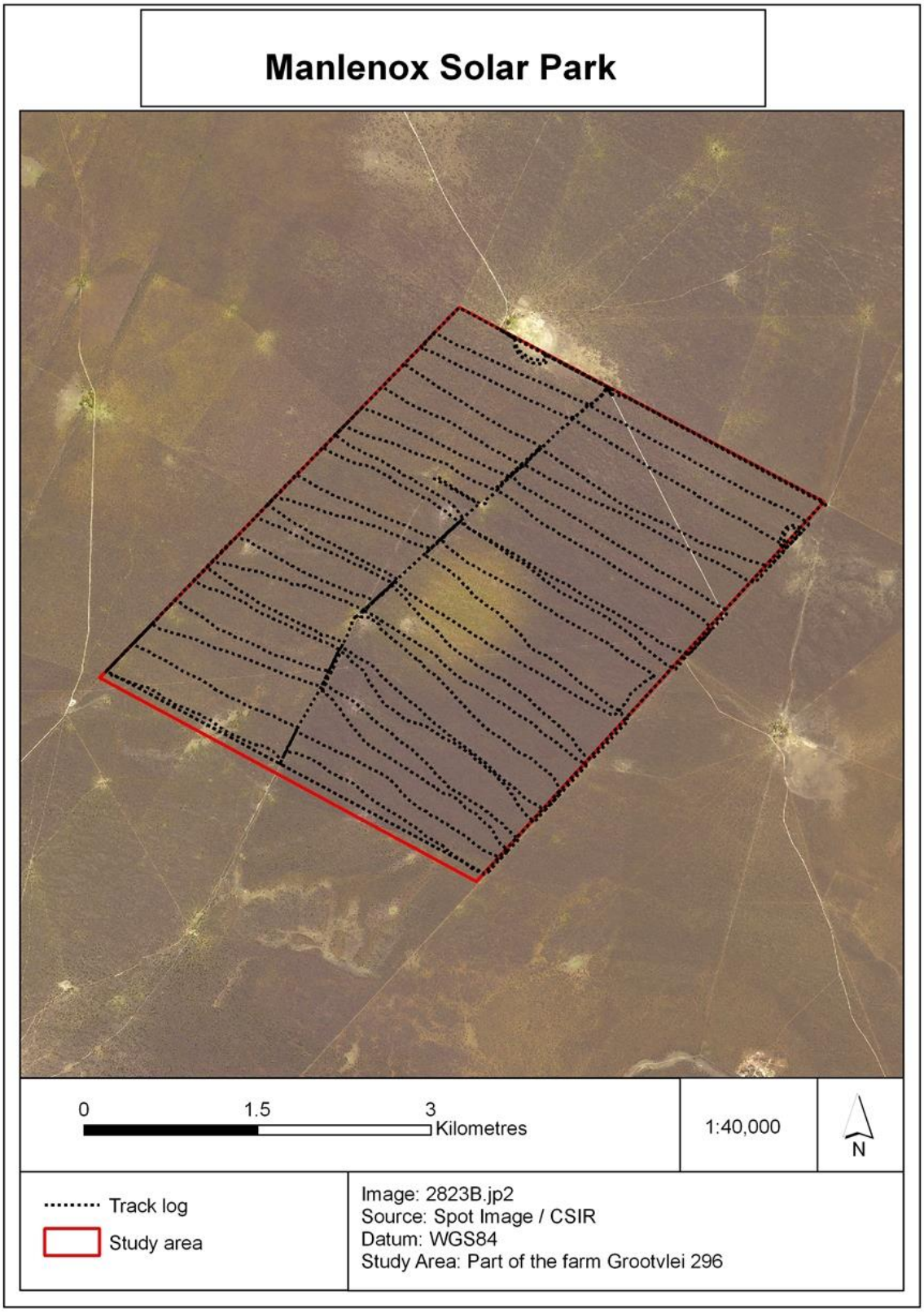


Figure 12: Satellite image of the study area with the track log

## 8. Assessment of Sites and Finds

This section contains the results of the heritage site/find assessment.

### Manlenox Expansion Solar Park and Manlenox 2 Solar Park Developments

The proposed developments of the Manlenox Expansion Solar Park and the Manlenox 2 Solar Park will be situated on parts of the Farm Grootvlei 296, approximately 65km west of Barkly West in the Northern Cape Province.

The property is relatively flat on the northern side and it slopes gently down to the Klein-Riet River on the southern extent of the property. Several small pans, and/or depressions, of various sizes are also situated across the property. The property has sandy soils with typical monotonous Kalahari/Karoo vegetation. Several calcrete reefs are protruding through the sandy surface across most of the study area.

Isolated finds of Late Stone Age stone artefacts were found amongst these protruding calcrete reefs (photos 13 & 14). These artefacts were found scattered along the calcrete reefs across most of the study area. The artefacts were mostly utilized and re-touched flakes, scrapers, blades and cores from the Late Stone Age. The artefacts were mostly made of fine grained quartzite and CCS. The number of stone tools was, however, very limited and finds were isolated. These finds did not constitute any Late Stone Age sites due to their limited numbers and isolated nature. It is important to note that isolated Late Stone Age stone tools do occur across the property although no particular sites were identified.

The proposed study area is largely undisturbed except for the fencing of several camps, and several small tracks which cross the property.

Figure 13: View of some of the Late Stone Age finds.

Figure 14: Another view of some of the Late Stone Age finds.

After intensive investigations, no other sites or finds of any heritage value or potential were identified in proposed study area.

| | |
|---|---|
| Field Rating: | Generally Protected; Grade 4B |
| Heritage Significance: | Low significance |
| Impact: | Low |
| Certainty: | Possible |
| Duration: | Demolished |
| Mitigation: | B – Recording before destruction |

## 9. Conclusion and Recommendations

The following steps and measures are recommended regarding the investigated area:

### Manlenox Expansion Solar Park and Manlenox 2 Solar Park Developments

Hutten Heritage Consultants was contracted by Africa Geo-Environmental Services (AGES) to conduct a Heritage Impact Assessment (HIA) for the proposed development of the Manlenox Expansion Solar Park and the Manlenox 2 Solar Park on parts of the Farm Grootvlei 296, approximately 65 km west of Barkley West in the Kgatelopele Local Municipality, Northern Cape Province.

An archival and historical desktop study was undertaken which was used to compile a historical layering of the study area within its regional context. This component indicated that the landscape within which the project area is located has a rich and diverse history. However, the desktop study did not reveal any historic or heritage sites from within the specific locations of the study area.

The Sahris Palaeontological Sensitivity Map was also consulted and it was found that the palaeontological sensitivity for the study area was high and that a Palaeontological Impact Assessment is required.

Prof. Bruce Rubidge completed a desktop palaeontological study for the study area. He concluded that the development of the two proposed Manlenox Solar Parks will extend over Precambrain rocks of the Transvaal Supergroup as well as Caenozoic calcrete deposits of the Kalahari Group. It is extremely unlikely that fossils will be exposed as a result of the Solar Park developments.

He recommended that, from a palaeontological perspective, the development of the two proposed Manlenox Solar Parks should proceed, but that if fossils are uncovered in the course of construction activities, the developer immediately calls in a qualified palaeontologist to assess the situation and, if necessary, undertake excavation of the fossils.

The desktop studies were followed by a fieldwork component which comprised an inspection of the study area.

Isolated finds of a few Late Stone Age stone tools were made during the study. These stone tools were found amongst protruding calcrete reefs/outcrops across the study area. These finds did not constitute a heritage site/s due to their limited numbers and isolated nature. It is however important to note that these stone tools do occur in the study area regardless of their limited number and/or isolated nature.

A scheduled watching brief performed by a suitable qualified person is therefore recommended during the bush clearing and construction phases of the projects. This person should act and recommend on any possible open air Late Stone Age sites which could possibly be associated with the current isolated finds of Late Stone Age stone tools across the study area.

The proposed developments of the Manlenox Expansion Solar Park and the Manlenox 2 Solar Park and their associated infra-structures in the indicated areas can continue from a heritage point of view if the recommendations as outlined in this report are adhered to.

## 10. References


Beaumont, P.B. & Boshier, A.K. 1974. Report on Test Excavations in a Prehistoric Pigment Mine near Postmasburg, Northern Cape. South African Archaeological Bulletin 29: 41-59.

Beaumont, P.B. & Vogel, J.C. 2006. On a timescale for the past million years of human history in central South Africa. South African Journal of Science 102: 217-228.

Bergh, J.S. 1999. Geskiedenisatlas van Suid-Afrika. Die vier Noordelike Provinsies. Pretoria: J.L. van Schaik.

Botha-Brink, J. 2012. Palaeontological Impact Assessment of the Proposed Olien Solar Project on Farm 300, Barkly West, Northern Cape Province. An unpublished study by the Karoo Palaeontology Department, National Museum. SAHRIS case number 543, accessed 21 April 2013.

Dart, R.A., 1925. Australopithecus africanus: the man-ape of South Africa. Nature 115:195–199.

Dreyer, C. 2008. Archaeological and Cultural Heritage Assessment of the Proposed MTN Mast at the Farm Elandsdraai 88, near Orange River Station, Hopetown District, Northern Cape. Pr. An unpublished report by Archaeologist/Heritage Specialist on file at SAHRA as 2008-SAHRA-0241.

Fourie, W. 2012. The proposed 10mw Photovoltaic (PV) Power Plant on the Farm Arriesfontein (Farm 267) near Daniëlskuil, Northern Cape Province - Heritage Impact Assessment. An unpublished report by PGS Heritage & Grave Relocation Consultants. SAHRIS case number 1468, available from http://www.sahra.org.za/sahris accessed 21 April 2013.

Heather-Clark, S. 2012. Solaire Direct Graspan EIR. Environmental Resources Management.

Humphreys, A.J.B. 1976. Note on the Southern Limits of Iron Age Settlement in the Northern Cape. South African Archaeological Bulletin 31: 54-57.

Humphreys, A.J.B. & Thackeray, A.I. 1983. Ghaap and Gariep: Later Stone Age studies in the Northern Cape. Cape Town: South African Archaeological Society Monograph Series No 2.

Kuman, K., 2001. An Acheulean Factory Site with Prepared Core Technology near Taung, South Africa. The South African Archaeological Bulletin, Vol. 56, No. 173/174 (Dec., 2001), pp. 8-22.

Legassick, M.C. 1989. The northern frontier to c. 1840: the rise and decline of the Griqua people. Elphick, R. & Giliomee, H. (eds) The Shaping of South African Society, 1652-1840. Middletown: Wesleyan University Press.

Maggs, T.M.O'C. 1976. Iron Age communities of the southern highveld. Pietermaritzburg: Occasional Publications of the Natal Museum 2.

Morris, D. & Beaumont, P.B. 1994. Ouplaas 2 Rock Engravings, Danielskuil. An unpublished report by the McGregor Museum on file at SAHRA as 1994-SAHRA-0025.

Morris, D. 2003. Archaeological Survey of the Farm Koodoosberg No.141. McGregor Museum**.** 2003-SAHRA-0166.

Morris, D. 2007. Mokala National Park: a first report on heritage resources. McGregor Museum.

Pakenham, T., 1979. The Boer War. Weidenfeld and Nicolson Limited, London.

Sampson, C.G. 1985. Atlas of Stone Age settlement in the central and upper Seacow Valley. Memoirs of the National Museum 20.

Smith, B.W. & Ouzman, S. 2004. Taking Stock: Identifying Khoekhoen Herder Rock Art in Southern Africa. Current Anthropology, Vol. 45, No. 4.

South African Heritage Resources Agency, 2009. Archaeology and Palaeontology Report Mapping Project. DVD Version 1.0. Cape Town.

South African Heritage Resources Information System, http://www.sahra.org.za/sahris. Accessed 21 April 2013.

Thackeray, A.I, Thackeray, J.F. & Beaumont, P.B. 1983. Excavations at the Blinkklipkop Specularite Mine near Postmasburg, Northern Cape. South African Archaeological Bulletin 38:17-25.

Thorp, C.R. 1996. A Preliminary Report on Evidence of Interaction between Hunter-Gatherers and Farmers along a Hypothesised Frontier in the Eastern Free State. The South African Archaeological Bulletin, Vol. 51, No. 164.

Van Jaarsveld, A. 2006. Hydra-Perseus and Beta-Perseus 765 kV Transmission Power Lines Environmental Impact Assessment. Impact on Cultural Heritage Resources. An unpublished study by Heritage Resource Manager on file at SAHRA as 2006-SAHRA-0084.