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A PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) FOR THE PROPOSED SOLAR FACILITY ON THE FARM TOITDALE, PORTION 1 OF 167, SITUATED NEAR NOUPOORT, NORTHERN CAPE PROVINCE

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REFERENCES

A PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) FOR THE PROPOSED TOITDALE SOLAR FACILITY PORTION 1 OF 167, SITUATED NEAR NOUPOORT, NORTHERN CAPE PROVINCE

Note: This report follows the minimum standard guidelines required by the South African Heritage Resources Agency for compiling Phase 1 Archaeological Impact Assessment (AIA).

EXECUTIVE SUMMARY

Purpose of the Study

The purpose of the study was to conduct a Phase 1 Archaeological Impact Assessment (AIA) for the proposed solar facility and associated infrastructure on the Farm Toitdale, Portion of 167, situated near Noupoort, Northern Cape Province. The survey was conducted to establish the range and importance of the exposed and *in situ* archaeological heritage materials and features, the potential impact of the development and, to make recommendations to minimize possible damage to these sites.

Brief Summary of Findings

Isolated occurrences of very weathered and patinated Middle Stone Age (MSA) stone artefacts were observed within the proposed <20ha area for the development of the solar facility. It is unlikely that these Middle Stone Age stone artefact occurrences are *in situ* and are, therefore, considered being in a secondary context. Although it is possible that stone artefacts may occur *in situ* between the surface and 50cm-80cm below ground. No sites containing any depth of deposit or other archaeological material associated with the stone tool artefacts were observed within the area. The proposed area for development is considered as having a low cultural significance, and the following recommendations must be taken into consideration prior to the construction activities.

Recommendations

The area is of a low cultural sensitivity and development may proceed as planned, although the following recommendations must be considered:

1. A professional archaeologist (with an already authorised collection permit) must be appointed during the various phases of development including vegetation clearing and the excavation activities to monitor and identify possible archaeological material remains and features that may occur below the surface and further make appropriate recommendations on removing and / or protecting the archaeological material remains and features.

2. If concentrations of archaeological heritage material and human remains are uncovered during construction, all work must cease immediately and be reported to the Albany Museum (046 622 2312) and/or the South African Heritage Resources Agency (SAHRA) (021 642 4502) so that systematic and professional investigation/ excavation can be undertaken.
3. Construction managers/foremen must be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.

BACKGROUND INFORMATION

The Phase 1 Archaeological Impact Assessment (AIA) report is required for the Basic Assessment.

Terra Solar Energy is proposing to establish a <10MW commercial solar energy facility and associated infrastructure on the Farm Toitdale, Portion 1 of 167 near Noupoot in the Northern Cape Province. The proposed solar facility will be connected to the Newgate Substation situated to the east of the site and within 1km.

The area for the proposed solar energy is situated between 5-6km to the north-west of the mid-Karoo town of Noupoot in the Northern Cape Province. Noupoot is situated between the Karoo towns of Middelburg, about 35km south within the border of the Eastern Cape, Colesburg, about 55km north, Hanover, approximately 60km north-west, and Richmond, about 80km west. The proposed focus area is situated on the flat plains. The vegetation cover is sparse and archaeological visibility was relatively good. The proposed focus area is relatively undisturbed, however, would have been disturbed by general farming activities such as stock grazing as well as the construction of farm fences and roads. Natural processes and soil deposition over the years would also contribute as slight disturbances.

Terms of Reference

To conduct a survey of possible archaeological heritage sites within the area for the proposed solar energy facility and associated infrastructure on the Farm Toitdale, Portion 1 of 167, situated near Noupoot, Northern Cape Province. The survey was conducted to establish the range and importance of the exposed and *in situ* archaeological heritage materials and features, the potential impact of the development and, to make recommendations to minimize possible damage to these sites.

LEGISLATIVE REQUIREMENTS

Parts of sections 35(4), 36(3) and 38(1) (8) of the National Heritage Resources Act 25 of 1999 apply:

Archaeology, palaeontology and meteorites

35 (4) No person may, without a permit issued by the responsible heritage resources authority—

- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;*
- (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;*
- (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.*

Burial grounds and graves

36. (3) (a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—

- (a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;*
- (b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or*
- (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.*

Heritage resources management

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as –

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- (b) the construction of a bridge or similar structure exceeding 50m in length;*
- (c) any development or other activity which will change the character of the site –*
 - (i) exceeding 5000m² in extent, or*

- (ii) involving three or more erven or subdivisions thereof; or*
- (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
- (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA, or a provincial resources authority;*
- (d) the re-zoning of a site exceeding 10 000m² in extent; or*
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must as the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.*

ARCHAEOLOGICAL BACKGROUND

Literature review

Substantial Later Stone Age Research within the last 20 000 years has been conducted within the immediate areas surrounding the area proposed for development. However, less research has been conducted on the Early Stone Age and Middle Stone Age periods. Historically, the area is rich in military history as part of the Anglo-Boer War, railway histories, and was the route taken by the Great Trek Pioneers (Groot Trek Voortrekkers).

EARLY STONE AGE (1.5 million – 250 000 years ago)

Early Stone Age stone artefacts endure for long periods and generally occur as open air surface scatters either as isolated occurrences or in large quantities and very rarely in association with other archaeological heritage, plant and material remains. Significant South African sites include Wonderwerk in the Northern Cape near Kimberly, and Montagu Cave in the Western Cape Province situated on the outskirts of the small town of Montagu in the Western Cape, and Amanzi Springs near to the small town of Uitenhage close to Port Elizabeth in the Eastern Cape, whereby some bone and plant material was found to be *in situ* and associated with the stone artefacts. The Albany Museum database includes records of occurrences of Acheulian handaxes between Middelburg and the Camdeboo National Park near Graaff Reinet, as well as a collection of stone artefacts from the Cradock area. Sampson (1985) located a large number of sites to the west of the proposed area of development within the Seacow River Valley.

MIDDLE STONE AGE (250 000 – 30 000 years ago)

The Middle Stone Age spans a period from 250 000-30 000 years ago and focuses on the emergence of modern humans by the change in technology, behaviour, physical appearance, art, and symbolism. Surface scatters of these flake and blade industries occur widespread across southern Africa although rarely with any associated botanical and faunal remains. It is also common for these stone artefacts to be found between the surface and approximately 50-80cm below ground. Fossil bone may be associated with Middle Stone Age occurrences. These stone artefacts, like the Earlier Stone Age handaxes are usually observed in secondary context with no other associated archaeological material. The Albany Museum database holds records of the occurrence of Middle Stone Age stone artefacts around the Cradock area and has Middle Stone Age stone artefacts in its collection from the Cradock area including Highlands Rock Shelter **excavated by H.J. Deacon during the 1970's**. Relevant archaeological impact assessments conducted by the Albany Museum in 2008 have recorded surface scatters of Middle Stone Age stone artefacts in the Cradock vicinity (Binneman & Booth 2008). Sampson on the other hand reported many open-air MSA sites which he assigned to the Orangian Industry (dating between 128 000 - 75 000 years old), Florisbad and Zeekoegat Industries dating between 64 000 and 32 000 years old.

THE LATER STONE AGE (30 000 – recent)

The Later Stone Age spans a period from 30 000 years ago to the historical period (the last 500 years) until 100 years ago and is associated with the archaeology of San hunter-gatherers. The majority of archaeological sites date from the past 10 000 years where San hunter-gatherers inhabited the landscape living in rock shelters and caves as well as on the open landscape, inland and along the coast. The open sites are difficult to locate because they are in the open veld. The preservation of these sites is poor and it is not always possible to date them (Deacon & Deacon 1999). Caves and rock shelters, however, in most cases, provide a more substantial preservation record of pre-colonial human occupation. The Later Stone Age archaeology of the Karoo is rich and varied. Various studies (Beaumont & Morris 1990, Beaumont & Vogel 1984, Morris & Beaumont 1990, Sampson 1985) have shown that the general area has been relatively marginal regarding pre-colonial human settlement, but is in fact exceptionally rich in archaeological sites and rock art. Bifacial and tanged barbed arrow heads made on very fine-grained dark or black chalcedony are distributed over the southern two-thirds of the Free State, the Kimberly area in the west, Lesotho in the east and along the southern boundary of this area as far south as Britstown and Steynsburg (Humphreys 1969).

Some 2 000 years ago Khoekhoen pastoralists entered into the region and lived mainly in small settlements. They were the first food producers in South Africa and introduced domesticated animals (sheep, goats and cattle) and ceramic vessels to southern Africa. Often, these archaeological sites are found close to the banks of large streams and rivers and along the coast. Large piles of freshwater mussel shell (called freshwater middens) usually mark the large stream and river sites and large piles of marine shellfish middens mark the coastal sites.

One of the most complete archaeological research surveys in South Africa was conducted in the Agter Sneeuberg region (northern side of the Sneeuberg) in the central and upper Seacow River Area that covered an area of 734 square kilometres between Hanover, Richmond and Noupoot in the Northern Cape (Sampson 1985). Later Stone Age Lithics and rare Khoekhoe pottery sherds were uncovered during systematic surveys of the area (Sadr & Sampson 1999). Several dense clusters of Smithfield settlementsites are concentrated among the lower dolerite hills and ridges in preference to flats and mountains. In the Free State, this particular stone artefact industry may be traced back to the 8th century AD, however, only occurs in the Northern Cape as late as the 14th century AD. Today the term Smithfield is only used for stone tool assemblages with backed bladelets and long end scrapers dating within the last 1000 years and replaces the term Smithfield B (Sampson 1988). Typical Smithfield assemblages contain flaked lithics (most commonly of unpatinated blue-black hornfels), grinding and pounding equipment, bored stones, and sherds of a highly characteristic bowl form decorated with stamp-impressed motifs and date within the last 1000 years (Sampson 1988). Endscrapers dominate the flaked stone artefact, the only other formal tools being reamers, single platform cores recycled as trimming hammers, and rare convex scrapers

commonly called thumbnail scrapers. Almost 5000 Smithfield sites were recorded during the 1979-1981 survey. These predominantly open sites, were categorized according to size, setting and artefact and included categories such as camps, chipping stations (or factories / manufacture areas), lookouts, quarries (for hornfels raw material), and mussel camps. However, these sites may also be attributed to rock shelters that have been occupied. Waterholes or natural springs were attractive areas for settlement and three different kinds of camps emerge when associated with water holes such as camp-clusters near waterholes, camp-clusters occurring singly or in pairs within some strong and many weak site clusters more than 1km from water and isolated camps far from water (Sampson 1984). In the southern Seacow Valley the presence of Khoekhoen ceramics and stone circular kraals demonstrates a dense occupation by herders, 30 – 40km south west of the town of Noupoot and the proposed area for development. In addition, Blydefontein Rock Shelter, situated about within 15km to the west of the town of Noupoot in the upper reaches of the Oorlogspoort River drainage in the Kikvorsberg Mountain Range, has been excavated and researched extensively (Bousman 2005). Hunter-gatherers occupied Blydefontein Rock Shelter sporadically during the Late Pleistocene and throughout the Holocene. The stratigraphic profile and associated ¹⁴C dates range between 11 850 ± 150 BP and 1810 ± 50 BP and include several stone artefact industries. The cultural sequence consists of the Robberg, Lockshoek, Interior Wilton, and Smithfield components. Discarded stone artefacts, lithic manufacturing **debris, bone refuse and hearths scattered throughout the stratified rock shelter's** deposits, as well as the occasional potsherd in the later components, represent the enduring record of hunter-gatherer settlement occupation. The majority of formal tools in the Blydefontein sequence consists of endscrapers and backed microliths.

ROCK ART (Engravings and Paintings)

Rock art is generally associated with the Later Stone Age period mostly dating from the last 5000 years to the historical period. It is difficult to accurately date the rock art without destructive practices. The southern African landscape is exceptionally rich in the distribution of rock art which is determined between paintings and engravings. Rock paintings occur on the walls of caves and rock shelters across southern Africa. Rock engravings, however, are generally distributed on the semi-arid central plateau, with most of the engravings found in the Orange-Vaal basin, the Karoo stretching from the Eastern Cape (Cradock area) into the Northern Cape as well as the Western Cape, and Namibia. At some sites both paintings and engravings occur in close proximity to one another especially in the Karoo and Northern Cape. The greatest concentrations of engravings occur on the andesite basement rocks and the intrusive Karoo dolerites, but sites are also found on about nine other rock types including dolomite, granite, gneiss, and in a few cases on sandstone (Morris 1988). Maria Wilman recorded engraving sites between Colesburg and Middelburg (Parkington *et al.* 2008:33). Rock art of the Middelburg area includes a site with numerous styles such as fine-lined paintings of antelope and human figures, probably done by San individuals, as well as red, yellow, black, orange and white finger dots done in the Khoekhoen style. Other figures include

medium-grained white chalky paints with red accents such as fat-tailed sheep; two horse-and riders; a black rhinoceros; and two stretched-out and spotted animal skins or aprons (Ouzman. 2005: 106).

HISTORICAL ARCHAEOLOGY

Historical archaeology refers to the last 500 years when European settlers and colonialism entered into southern Africa. The route between Graaff Reinet and Bloemfontein is the same route followed by Afrikaans pioneers of the Great Trek. Colesburg is known for a number of historical events. A skirmish between the Boers and the Griquas, including Adam Kok (the head of the PhilippolisGriquas) occurred in 1845 near Colesburg. One Griqua was killed and 6 captured, while five Boers had been killed and had gained 300 horses and 3600 heads of cattle (Walker 1938: 349). Near **Colesburg at Alleman's Drift, Adam Kok, along with many British individuals, created a** beacon declaring the whole country from that point to be British Territory, though not including areas that in were in control by the Portuguese and native tribes.

In the early days of colonialism the Karoo was still a sparse and unknown area. It was only until the early travellers and pioneer European farmers ventured into this harsh landscape and documented their encounters with the San hunter-gatherers and Khoekhoen that had originally inhabited the landscape. Therefore, the towns of the Great Karoo were established much later. Between the years 1860 and 1875, there was an increase of travels through the Karoo between Graaff Reinet, Middelburg and Colesburg, due to the improvement of the Frontier Wagon Track or Public Roads Network (Neville *et al.* 1994).

DESCRIPTION OF THE PROPERTY

Area surveyed

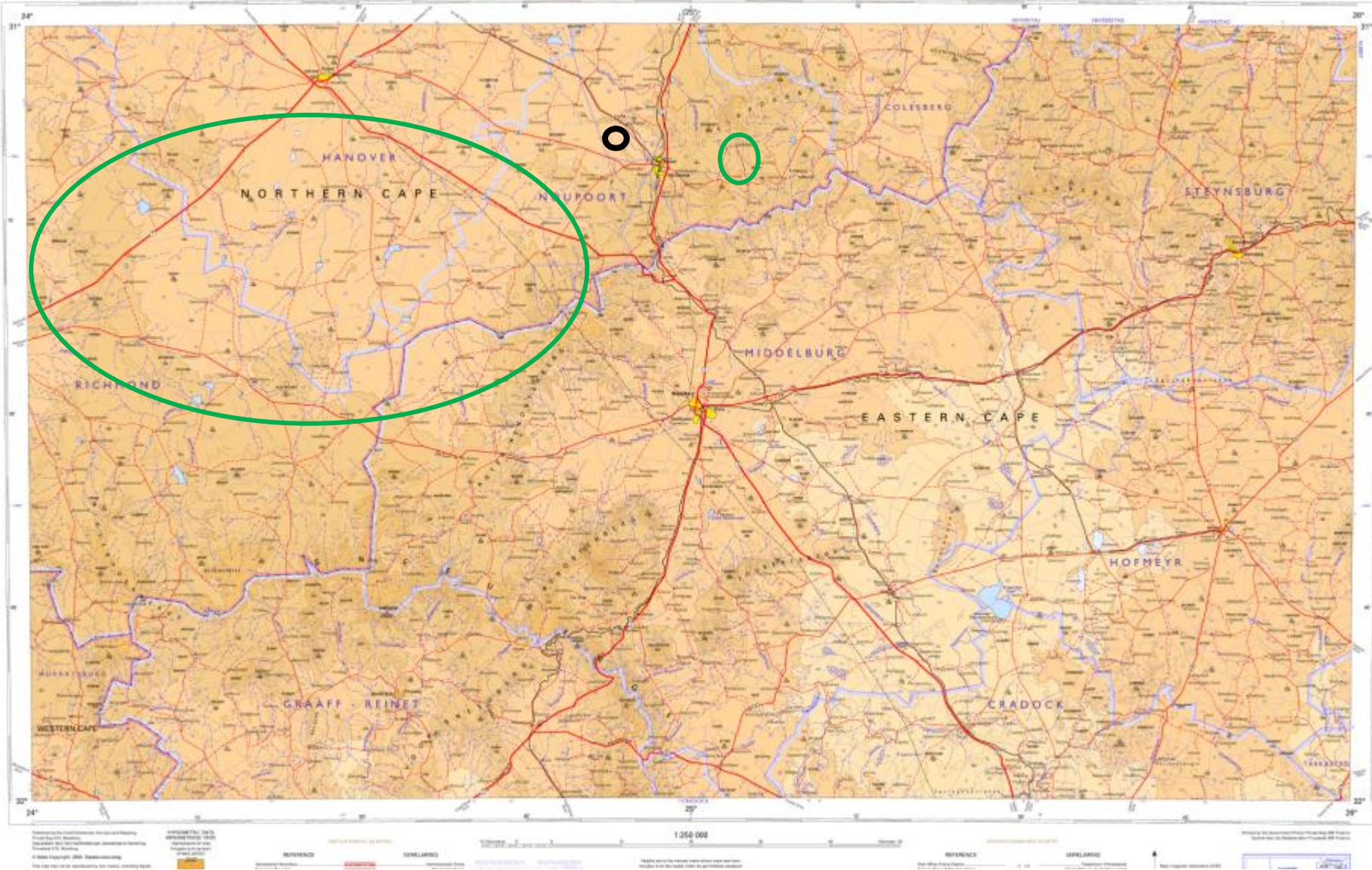
Location data

The area for the proposed solar energy facility on the farm Kleinfontein, Portion 4 of 167, is situated between 5-6km to the north-west of the mid-Karoo town of Noupoort in the Northern Cape Province between the Karoo towns of Middelburg, about 35km south within the border of the Eastern Cape, Colesburg, about 55km north, Hanover, approximately 60km north-west, and Richmond, about 80km west. The proposed project development site (i.e. less than 20 ha) for the proposed solar energy facility is situated on the flat plains. The vegetation cover is sparse and archaeological visibility was relatively good. The proposed focus area is relatively undisturbed; however, would have been disturbed by general farming activities such as stock grazing as well as the construction of farm fences and roads. Natural processes and soil deposition over the years would also contribute as slight disturbances.

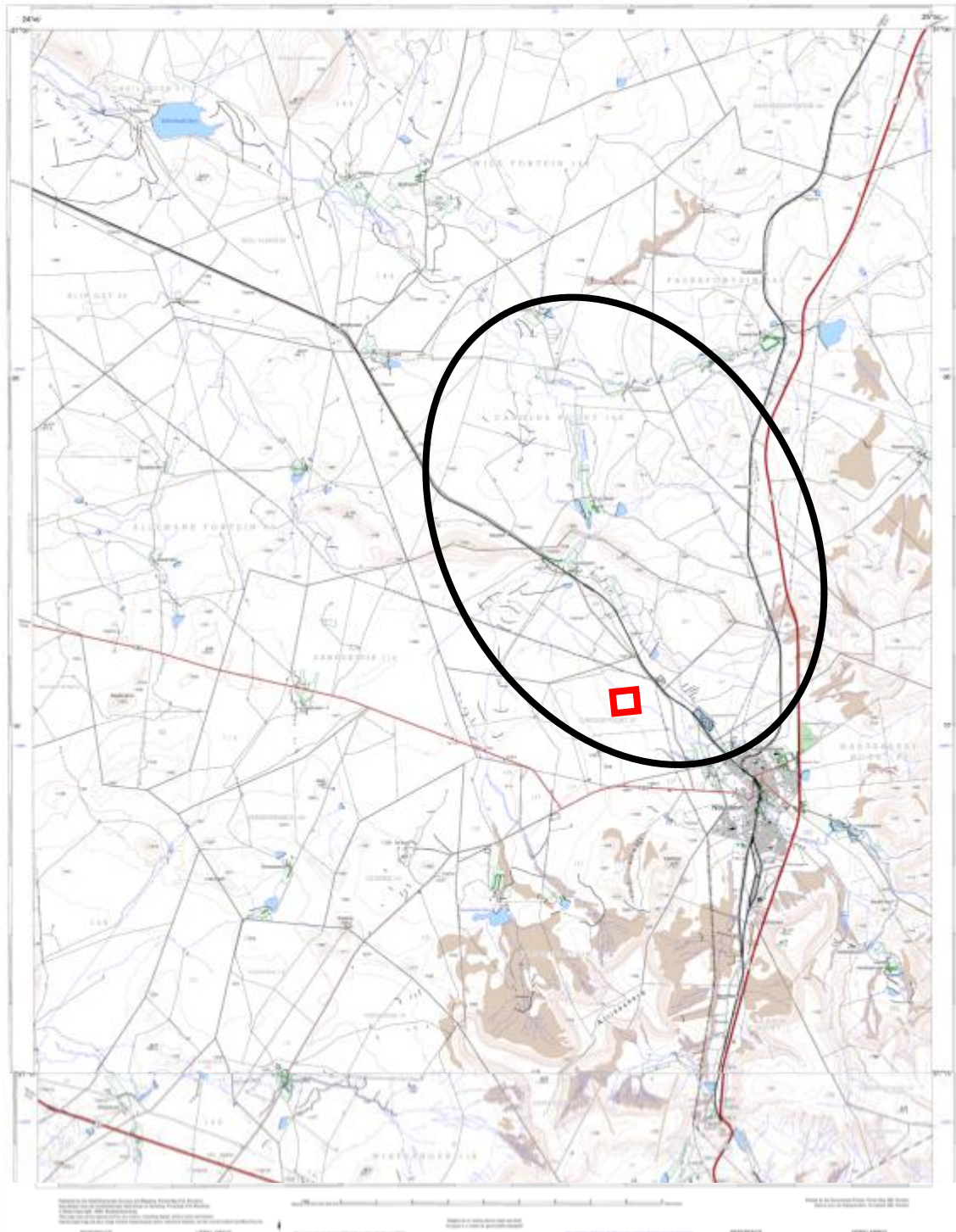
Map

1: 250 000 Map: 3124 MIDDLEBURG(Map 1).

1: 50 000 Maps: 3124BB NOUPOORT and 3124BD CARLTON (Map 2)



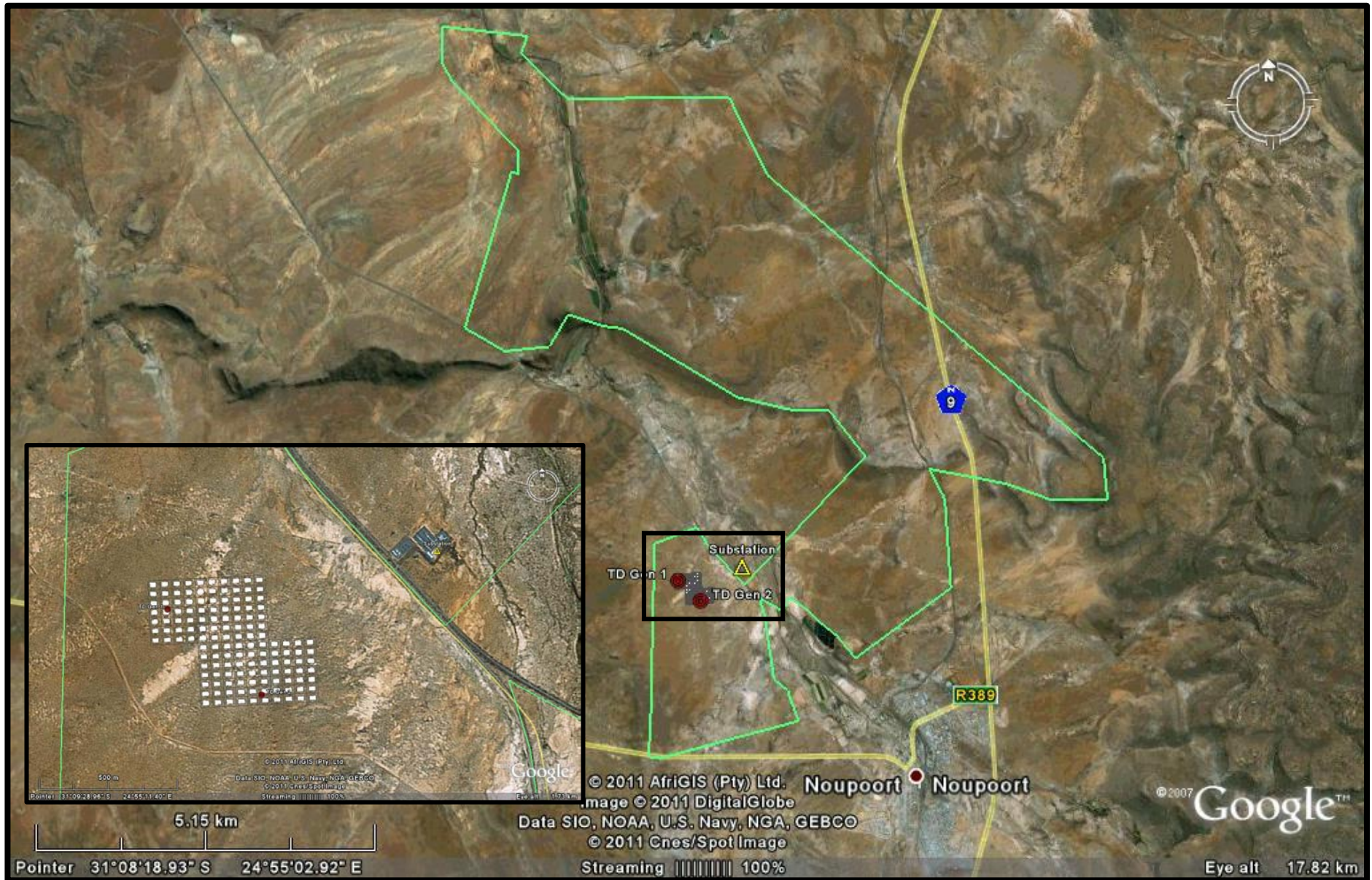
Map 1. 1:250 000 topographic map showing the area proposed for development and neighbouring towns and adjacent archaeological research areas.



Map 2. 1: 50 000 topographic map showing the area proposed for development (red square).



Map 3. Wide aerial view of the area proposed for the solar facility and associated infrastructure on the Farm Toitdale, Portion 1 of 167, near Noupoort, Northern Cape Province.



Map 4. Close-up aerial view and GPS co-ordinates plotted on the area proposed for the solar facility and associated infrastructure on the Farm Toitdale, Portion 1 of 167, near Noupoort, Northern Cape Province.

ARCHAEOLOGICAL INVESTIGATION

Methodology

The survey was conducted on foot. GPS readings were taken using a Garmin Oregon 550 (Table 1). The GPS readings have been plotted on Map 3 and Map 4. The proposed area for development is situated on the flat plains and mostly covered in low Karoo shrubs and some dense grass vegetation with some exposed areas allowing for good archaeological visibility (Figs 1-4). The proposed focus area is relatively undisturbed by construction activities, although it is probable that the area has been disturbed by general farming activities such as stock grazing and the construction of farm fences and roads. Natural processes and soil deposition over the years would also contribute as slight disturbances.



Figs 1-4. Views of the landscape.

Isolated occurrences of very weathered and patinated Middle Stone Age stone artefacts made on hornfels raw material were documented within the proposed focus area for development (Fig 5). The stone artefacts were observed in a secondary, disturbed context, although, it is likely that stone artefacts would occur between the surface and 50-80 cm below ground. No depth of deposit or other archaeological material remains were observed in association with the stone artefacts.

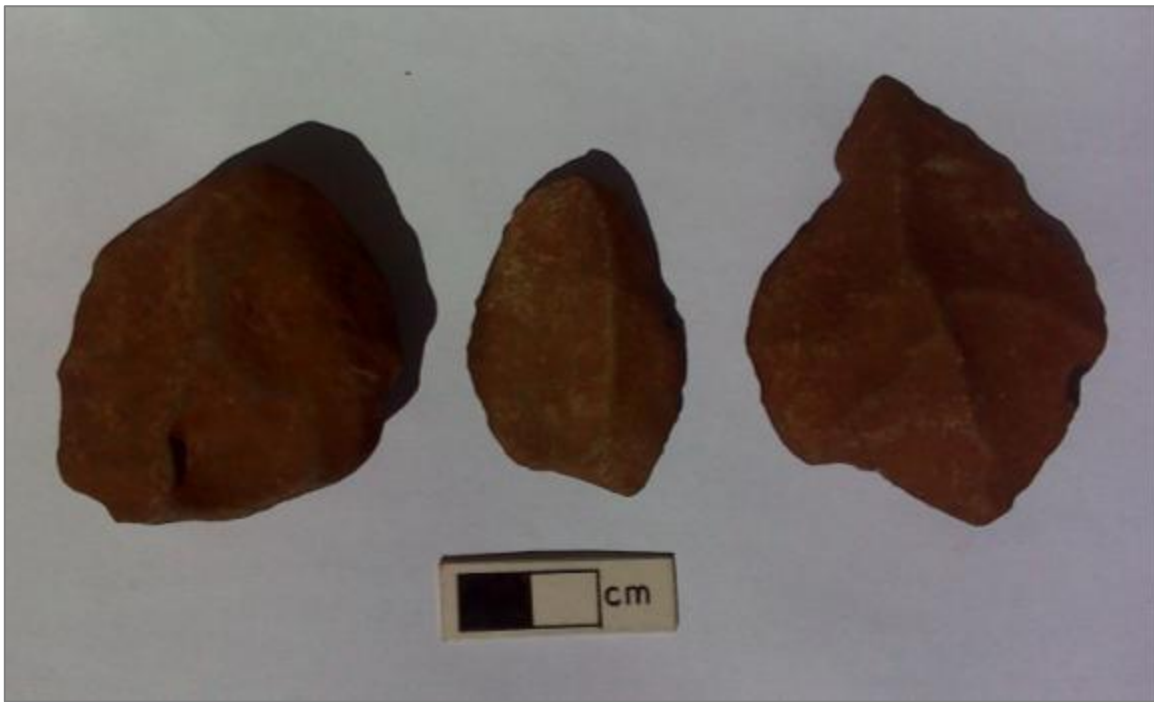


Fig 5. Examples of the stone artefacts documented.

SURVEY/DESCRIPTION OF SITES

No archaeological sites with any depth of deposit or associated material and organic remains were identified within the area proposed for development. Only isolated surface scatters of very weathered and patinated Middle Stone Age flakes made on hornfels raw material were documented. It is unlikely that the stone artefacts occur *in situ* owing to previous natural, human and animal activities within and surrounding the proposed area. Therefore, it can be established that the stone artefacts occur in a secondary disturbed context; however, it is likely that stone artefacts may occur between the surface and 50-80 cm below ground, as has been observed in numerous occasions. No depth of deposit or other archaeological material remains were observed in association with the stone artefacts.

CULTURAL LANDSCAPE

According to the archaeological research that has been conducted in the surrounding area the associated evidence presents a dynamic and changing cultural landscape over the last 1.5 million years from the Early Stone Age inhabitants until historical settlement and the current changing cultural landscape. However, the proposed focus area for the development of the solar facility only shows evidence of a portion of the precolonial cultural landscape. Isolated surface scatters of Middle Stone Age stone artefacts manufactured predominantly on hornfels raw materials shows that the focus area was not the preferred area for occupation and that the inhabitants may have preferred to settle closer to the rocky outcrops than on the open flat plains. The evidence also shows that hornfels raw materials, which occur locally, were the preferred raw material of choice for the manufacture of stone artefacts similarly to the Pleistocene and Holocene Later Stone Age hunter-gatherers within the last 20 000 years.

Currently the proposed focus area for the solar facility and associated infrastructure spells the remains of historical landscape inhabited by the early farmers and trekboers into the area and **a changing South Africa during the late 1800's and during the 1900's with the advent of the railways and growing European influenced infrastructure.** Farming activities continue as does the functioning of the railway line.

RECOMMENDATIONS

The proposed focus area for the construction of the solar facility and associated infrastructure is of a low cultural sensitivity and development may proceed as planned, although the following recommendations must be considered:

1. A professional archaeologist (with an already authorised collection permit) must be appointed during the various phases of development including vegetation clearing and the excavation activities to monitor and identify possible archaeological material remains and features that may occur below the surface and further make appropriate recommendations on removing and / or protecting the archaeological material remains and features.
2. If concentrations of archaeological heritage material and human remains are uncovered during construction, all work must cease immediately and be reported to the Albany Museum (046 622 2312) and/or the South African Heritage Resources Agency (SAHRA) (021 642 4502) so that systematic and professional investigation/ excavation can be undertaken.
3. Construction managers/foremen must be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.

GENERAL REMARKS AND CONDITIONS

Note: This report is a phase 1 archaeological heritage impact assessment/investigation **only** and does **not** include or exempt other required heritage impact assessments (see below).

The National Heritage Resources Act (Act No. 25 of 1999, section 35) requires a full Heritage Impact Assessment (HIA) in order that all heritage resources, that is, all places or objects of aesthetics, architectural, historic, scientific, social, spiritual linguistic or technological value or significance are protected. Thus any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures older than 60 years, living heritage, historical settlements, landscapes, geological sites, palaeontological sites and objects.

It must be emphasised that the conclusions and recommendations expressed in this archaeological heritage sensitivity investigation are based on the visibility of archaeological sites/features and may not therefore, reflect the true state of affairs. Many sites/features may be covered by soil and vegetation and will only be located once this has been removed. In the event of such finds being uncovered, (during any phase of construction work), archaeologists must be informed immediately so that they can investigate the importance of the sites and excavate or collect material before it is destroyed. The *onus* is on the developer to ensure that this agreement is honoured in accordance with the National Heritage Act No. 25 of 1999.

It must also be clear that Archaeological Specialist Reports (AIAs) will be assessed by the relevant heritage resources authority. The final decision rests with the heritage resources authority, which should give a permit or a formal letter of permission for the destruction of any cultural sites.

APPENDIX A: IDENTIFICATION OF ARCHAEOLOGICAL FEATURES AND MATERIAL FROM INLAND AREAS: guidelines and procedures for developers

1. Human Skeletal material

Human remains, whether the complete remains of an individual buried during the past, or scattered human remains resulting from disturbance of the grave, should be reported. In general the remains are buried in a flexed position on their sides, but are also found buried in a sitting position with a flat stone capping and developers are requested to be on the alert for this.

2. Freshwater mussel middens

Freshwater mussels are found in the muddy banks of rivers and streams and were collected by people in the past as a food resource. Freshwater mussel shell middens are accumulations of mussel shell and are usually found close to rivers and streams. These shell middens frequently contain stone tools, pottery, bone, and occasionally human remains. Shell middens may be of various sizes and depths, but an accumulation which exceeds 1 m² in extent, should be reported to an archaeologist.

3. Stone artefacts

These are difficult for the layman to identify. However, large accumulations of flaked stones which do not appear to have been distributed naturally should be reported. If the stone tools are associated with bone remains, development should be halted immediately and archaeologists notified

4. Fossil bone

Fossil bones may be found embedded in geological deposits. Any concentrations of bones, whether fossilized or not, should be reported.

5. Large stone features

They come in different forms and sizes, but are easy to identify. The most common are roughly circular stone walls (mostly collapsed) and may represent stock enclosures, remains of wind breaks or cooking shelters. Others consist of large piles of stones of different sizes and heights and are known as *isisivane*. They are usually near river and mountain crossings. Their purpose and meaning is not fully understood, however, some are thought to represent burial cairns while others may have symbolic value.

6. Historical artefacts or features

These are easy to identified and include foundations of buildings or other construction features and items from domestic and military activities.

Table 1. GPS co-ordinates and range of the archaeological stone artefact surface scatters for the proposed solar facility and associated infrastructure on the Farm Toitdale, Portion 1 of 167, near Noupoort, Northern Cape Province.

Reference	Description	GPS Co-ordinates
TD Gen 1	General reading – isolated surface scatters of Middle Stone Age stone artefacts	31°09'26.25"S; 25°54'52.77"E
TD Gen 2	General reading – isolated surface scatters of Middle Stone Age stone artefacts	33°09'36.93"S; 24°55'04.91"E

Table 2: List of predicted impacts on the archaeological heritage as a result of the proposed solar facility and associated infrastructure on the Farm Toitdale, Portion 1 of 167, near Nouport, Northern Cape Province.

Nature: Disturbance to possible surface and sub-surface pre-colonial archaeology heritage remains.		
	Without Mitigation	With Mitigation
Extent	Local (5)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	High (8)	Low (4)
Probability	High (4)	High (4)
Significance	High <72	Medium <40
Status (positive or negative)	Negative	Negative
Reversibility	None	None
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	Yes
<p>Mitigation measures:</p> <ul style="list-style-type: none"> • A professional archaeologist (with an already authorised collection permit) must be appointed during the various phases of development including vegetation clearing and the excavation activities to monitor and identify possible archaeological material remains and features that may occur below the surface and further make appropriate recommendations on removing and / or protecting the archaeological material remains and features. • If concentrations of archaeological heritage material and human remains are uncovered during construction, all work must cease immediately and be reported to the Albany Museum (046 622 2312) and/or the South African Heritage Resources Agency (SAHRA) (021 642 4502) so that systematic and professional investigation/ excavation can be undertaken. • Construction managers/foremen must be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites. 		
Cumulative impacts: Low		
Residual impacts: Yes. Irreplaceable loss of archaeological heritage resources.		

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