McGregor Museum
Department of Archaeology

Proposed Kheis Solar Park Phases 1-3 on Portions 7 and 9 of the Farm Namakwari 656, east of Grootdrink in Northern Cape: Heritage Impact Assessment

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1. INTRODUCTION

Gestamp Asetym Solar South Africa (Pty) Ltd appointed Savannah Environmental (Pty) Ltd to undertake an Environmental Impact Assessment Process and compile an Environmental Management Programme (EMP) for the proposed photovoltaic solar plant to comprise: Kheis Solar Park – 1; Kheis Solar Park – 2; and Kheis Solar Park - 3

Savannah Environmental appointed the McGregor Museum to provide specialist input with respect to heritage (Morris 2013).

The project proposes construction of 3 x 75 MW photovoltaic facilities and associated infrastructure, with each phase to be located in different positions within the following farm portions: Portion 7 and portion 9 of Farm Namakwari 656 east of Grootdrink in Northern Cape Province.

This document reports on heritage resources within delimited project areas defined following assessment of other environmental constraints.

1.1 Focus and Content of Scoping Report: Heritage

This heritage scoping report is focused on the proposed development footprint of the solar energy facility. It is proposed that each phase would have a generating capacity of up to 75MW, each solar energy facility phase being envisaged as accommodating Photovoltaic (PV) panel technology, together with the following infrastructure:

» Arrays of photovoltaic (PV) panels
» Mounting structure to be either rammed steel piles or piles with pre-manufactured concrete footings to support the PV panels.
» Cabling between the project components, to be lain underground where practical.
» A new on-site substation to evacuate the power from the facility into the Eskom grid (point of connection to be advised)
» Internal access roads and fencing.
» Workshop area for maintenance, storage, and offices.

Relative to the anticipated impact of such a development, the report assesses observations from a field survey against background information and scoping phase predictions.

1.2 Heritage Specialist

The author of this report is a qualified archaeologist (PhD, University of the Western Cape) accredited as a Principal Investigator by the Association of Southern African Professional Archaeologists. The author has worked as a museum archaeologist in the Northern Cape since 1985 and has since the late 1980s carried out surveys in the general area of Upington (e.g. Morris & Beaumont 1991; Morris 2000 – 2012). In addition the author has a comprehensive knowledge of the province's history and built environment, and received UCT-accredited training at a workshop on *Architectural and Urban Conservation: researching and assessing local (built) environments* (S. Townsend, UCT). He is also Chairman of the Historical Society of Kimberley and the Northern Cape.

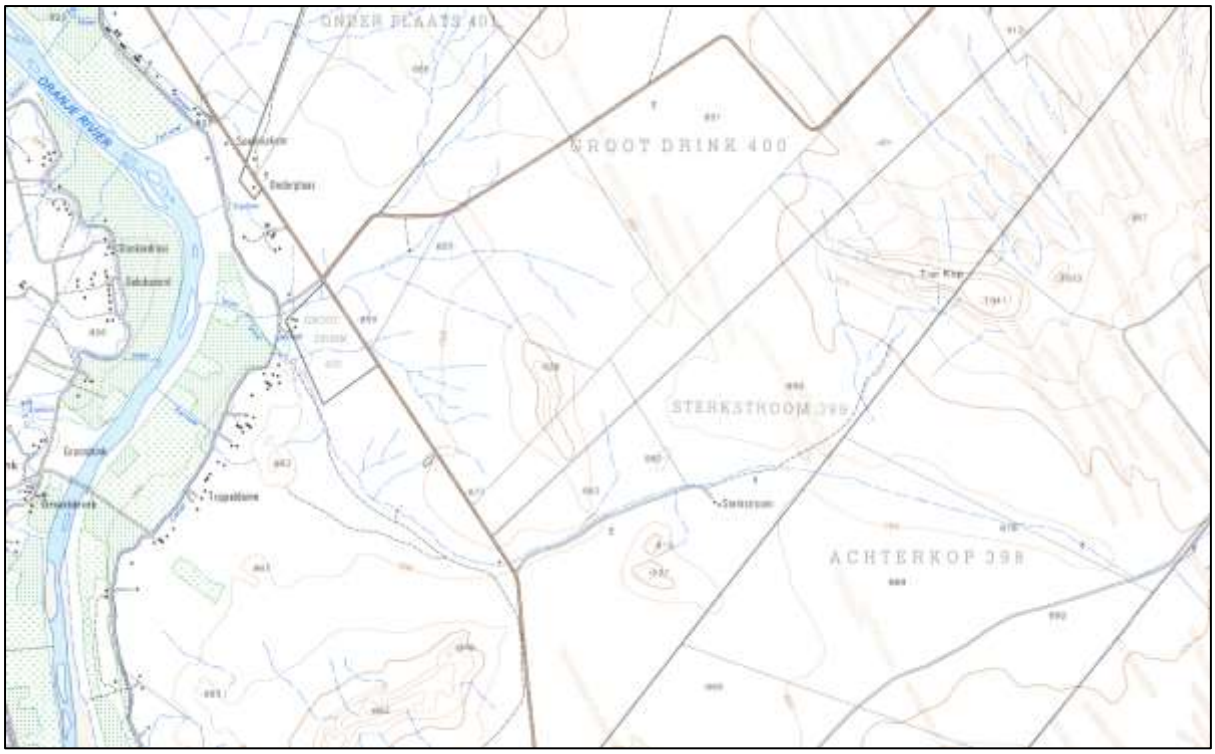
The author is independent of the organization commissioning this specialist input, and provides this Specialist Report within the framework of the National Heritage Resources Act (No 25 of 1999).

The National Heritage Resources Act no. 25 of 1999 (NHRA) protects heritage resources which include archaeological and palaeontological objects/sites older than 100 years, graves older than 60 years, structures older than 60 years, as well as intangible values attached to places. The Act requires that anyone intending to disturb, destroy or damage such sites, objects and/or structures may not do so without a permit from the relevant heritage resources authority. This means that a Heritage Impact Assessment should be performed, resulting in a specialist report as required by the relevant heritage resources authority/ies to assess whether authorisation may be granted for the disturbance or alteration, or destruction of heritage resources.

2. DESCRIPTION OF THE AFFECTED ENVIRONMENT

The environment in question is arid, comprising relatively flat drainage plains, with ranges of hills, up to some 12 km east of the Orange River west of Upington. The landscape is sparsely vegetated, with generally shallow soils (but including localised dunes), in consequence of which, for much of the area, surface archaeological traces would tend to be highly visible and informative.

Google Earth image indicating the Portions 7 and 9 of the farm "Namakwari".



Extract from 1:50 000 sheet 2821DB indicating the farms Grootdrink, Sterkstroom and Achterkop across which the proposed development spans.

2.1 Heritage features of the region

No previous archaeological survey work by the McGregor Museum has been carried out on the farm Namakwari. However previous survey work has documented archaeological

observations on nearby properties. For the broader region the following comments can be made as background or baseline information from which certain heritage predictions were made for testing in this full HIA study.

2.1.1 Colonial frontier

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The eighteenth- and nineteenth-century records for this region (Penn 2005) pertain mainly to the areas south of and along the Orange River. The travellers Wikar and Gordon followed the river as far as and beyond this region in the 1770s, describing communities living along the river. Dunn and others describe the situation a century later (Robinson 1978). Eighteenth and nineteenth century records document a volatile frontier in this region. None of these accounts refers to the specific area of the proposed development.

The local farm names Groot Drink, Sterkstroom and Zwemkuil, allude to the proximity of the river (although Sterkstroom may refer to a watercourse or spring discharging, perhaps seasonally, into the Orange). Achterkop, another of the local farm names, has topographical reference.

2.1.2 Later Stone Age

Late Holocene Later Stone Age (LSA) sites are frequently noted in surveys in the wider region of proposed development and along the Orange River (e.g. Morris & Beaumont 1991; Beaumont *et al*. 1995). These are generally short-duration occupations by small groups of hunter-gatherers. In contrast, there are substantial herder encampments along the Orange River floodplain itself (Morris & Beaumont 1991). In a range of hills north east of Keimoes, on Zovoorby, a rock shelter and specularite working (a sparkling mineral with known cosmetic and ritual use in the precolonial past) has been excavated (Smith 1995), while an ochre source is known at Nauga near the Orange River south of the study area (Beaumont & Morris 1990). LSA sites are usually focused on a particular feature in the landscape such as a hill or rocky outcrop and in relation to resources like water and associated habitats richer in animals and plant foods (Morris 2011).

Rock art sites are known in the area, including engravings on open sites and paintings in shelters in the hills (Fock & Fock 1989).

2.1.3 Pleistocene: Middle and Earlier Stone Age

Beaumont *et al*. (1995:240-1) note a widespread low density stone artefact scatter of Pleistocene age across areas of Bushmanland to the south west where raw materials, mainly quartzite cobbles, were derived from the Dwyka glacial till. Systematic collections of this material at Olyvenkolk south west of Kenhardt and Maans Pannen east of Gamoep could be separated out by abrasion state into a fresh component of Middle Stone Age

(MSA) with prepared cores, blades and points, and a large aggregate of moderately to heavily weathered Earlier Stone Age (ESA) (Beaumont *et al*. 1995).

The ESA included Victoria West cores on dolerite and quartzite (a fine example has been found at Hondeblaf north of Upington), long blades, and a very low incidence of handaxes and cleavers. The Middle (and perhaps in some instances Lower) Pleistocene occupation of the region that these artefacts reflect must have occurred at times when the environment was more hospitable than today. This is suggested by the known greater reliance of people in Acheulean times on quite restricted ecological ranges, with proximity to water being a recurrent factor in the distribution of sites.

2.2 Description and evaluation of environmental issues and potential impacts

Heritage resources including archaeological sites are in each instance unique and non-renewable resources. Area and linear developments such as those envisaged can have a permanent destructive impact on these resources. The objective of an HIA would be to assess the sensitivity of such resources where present, to evaluate the significance of potential impacts on these resources and, if and where appropriate, to recommend no-go areas and measures to mitigate or manage said impacts.

Area impacts are possible in the case of the Kheis Solar Park development and the proposed substation; the power lines and access roads would represent linear impacts.

2.2.1 Direct, indirect and cumulative impacts (in terms of nature, magnitude and extent)

The destructive impacts that are possible in terms of heritage resources would tend to be direct, once-off events occurring during the initial construction period. In the long term, the proximity of operations in a given area could result in secondary indirect impacts resulting from the movement of people or vehicles in the immediate or surrounding vicinity. The Environmental Management Plan should seek to minimize the latter impacts as far as possible.

With respect to the magnitude and extent of potential impacts, it has been noted that the erection of power lines would have a relatively small impact on Stone Age sites, in light of Sampson's (1985) observations during surveys beneath power lines in the Karoo (actual modification of the landscape tends to be limited to the footprint of each pylon), whereas a road or a water supply pipeline would tend to be far more destructive (modification of the landscape surface would be within a continuous strip), albeit relatively limited in spatial extent, i.e. width (Sampson compares such destruction to the pulling out of a thread from an ancient tapestry).

2.2.2 Issues potentially influencing choice of preferred development locales

Areas along natural drainage lines – water resources and ecology: Various considerations including possible concentration of past human activity (and hence archaeological traces) along water courses may suggest that the development footprint not be directly on or near the main drainage channels.

Other environmental sensitivity studies have delimited the development footprint to three areas on the property which exclude some of these features such as hills, dunefields and major drainage lines.

2.2.3 Observations derived from previous experience of the area: scoping phase predictions

- Based on previous experience (including studies undertaken in the vicinity – Dreyer 2006, 2012, Morris 2012), it was predicted (Morris 2013) that the terrain on which the proposed Kheis Solar Park development would be located was likely not to be rich in archaeological traces of major significance, although significant sites may occur at or near features such as hills and watercourses, as well as on the dunes.
- Where local sources of Dwyka tillite occur, these may have served as raw materials often drawn upon in Pleistocene times. Where such deposits are not exposed at the surface, it was predicted that any archaeological traces would be sparse. Similar terrain in the region (as shown by Morris 2012) has minimal Stone Age traces comprising generally widely scattered/isolated stone artefacts mainly based on jaspilite (banded ironstone) sourced from the banks and terraces of the Orange/Gariep River.
- Ranges of hills, watercourses and dunes which, in other parts of this landscape are known to have provided shelters and/or resources focusing human activity in the past, may be places where by virtue of such focused Stone Age occupation/activity may have higher densities of atefacts/sites.
- Nineteenth- and twentieth-century cultural history and intangible heritage values attached to places may be difficult to recover owing to the sparse population.
- There appear not to be colonial era built environment features in the areas of proposed solar development, except at the farm Sterkstroom where it might also be expected there could be farm graves.
- The likelihood of palaeontological features of significance occurring would be subject to a separate study.

3. PROPOSED METHODOLOGY FOR FULL HERITAGE STUDY

A site visit was necessary to inspect various parts of the terrain on foot, focusing on areas of expected impact (construction of facility, sub-station, and secondary infrastructure such as roads, pipelines and power lines). Heritage traces would be evaluated in terms of their archaeological significance (see tables below). The predictions set out in sections 2.2.2 and 2.2.3 above would be tested by way of observations made

on the ground. Preparatory to fieldwork, relevant reports for surveys in the area (Dreyer 2006, 2012; Morris 2012) were reviewed.

3.1 Assumptions and constraints

It was assumed that, by and large in this landscape, with its sparse vegetation and generally shallow soil profiles, some sense of the archaeological traces to be found in the area would be readily apparent from surface observations (including assessment of places of erosion or past excavations of any kind exposing erstwhile below-surface features). Given a prevailing erosion regime noticed in nearby segments of this landscape (Morris 2012), it was not be considered necessary to conduct excavations as part of the full HIA to establish the potential of sub-surface archaeology.

A routine proviso is given, however, that should sites or features of significance be encountered during construction (this could include an unmarked burial, an ostrich eggshell water flask cache, or a high density of stone tools, for instance), specified steps are necessary (cease work, report to heritage authority).

3.2 Potentially significant impacts to be assessed in the HIA process

Any area or linear, primary and secondary, disturbance of surfaces in the development locales could have a destructive impact on heritage resources, where present. In the event that such resources are found, they are likely to be of a nature that potential impacts could be mitigated by documentation and/or salvage following approval and permitting by the South African Heritage Resources Agency and, in the case of any built environment features, by Ngwao Boŝwa jwa Kapa Bokone (the Northern Cape Heritage Authority). Although unlikely, there may be some that could require preservation *in situ* and hence modification of intended placement of development features.

Disturbance of surfaces includes any construction: of a road, a pipeline, erection of a pylon, or preparation of a site for a sub-station, or plant, or building, or any other *clearance* of, or *excavation* into, a land surface. In the event of archaeological materials being present such activity would alter or destroy their context (even if the artefacts themselves are not destroyed, which is also obviously possible). Without context, archaeological traces are of much reduced significance. It is the contexts as much as the individual items that are protected by the heritage legislation.

Some of the activities indicated here have a generally lower impact than others. For example, Sampson (1985) has shown that powerlines tend to be less destructive on Stone Age sites than roads since access along the route of the line during construction and maintenance tends to be by way of a 'twee-spoor' temporary roadway (not scraped, the surface not significantly modified). Individual tower positions might be of high archaeological significance (e.g. a grave, or an engraving). Note: the impact of a 'twee-

spoor' could be far greater on Iron Age landscapes in other parts of South Africa, where stone walling might need to be breached.

3.4 Determining archaeological significance

In addition to guidelines provided by the National Heritage Resources Act (Act No. 25 of 1999), a set of criteria based on Deacon (nd) and Whitelaw (1997) for assessing archaeological significance has been developed for Northern Cape settings (Morris 2000a). These criteria include estimation of landform potential (in terms of its capacity to contain archaeological traces) and assessing the value to any archaeological traces (in terms of their attributes or their capacity to be construed as evidence, given that evidence is not given but constructed by the investigator).

Estimating site potential

Table 1 (below) is a classification of landforms and visible archaeological traces used for estimating the potential of archaeological sites (after J. Deacon nd, National Monuments Council). Type 3 sites tend to be those with higher archaeological potential, but there are notable exceptions to this rule, for example the renowned rock engravings site Driekopseiland near Kimberley which is on landform L1 Type 1 – normally a setting of lowest expected potential. It should also be noted that, generally, the older a site the poorer the preservation, so that sometimes *any* trace, even of only Type 1 quality, can be of exceptional significance. In light of this, estimation of potential will always be a matter for archaeological observation and interpretation.

Assessing site value by attribute

Table 2 is adapted from Whitelaw (1997), who developed an approach for selecting sites meriting heritage recognition status in KwaZulu-Natal. It is a means of judging a site's archaeological value by ranking the relative strengths of a range of attributes (given in the second column of the table). While aspects of this matrix remain qualitative, attribute assessment is a good indicator of the general archaeological significance of a site, with Type 3 attributes being those of highest significance.

Table 1. Classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deacon, National Monuments Council).

Class	Landform	Type 1	Type 2	Type 3
L1	Rocky surface	Bedrock exposed	Some soil patches	Sandy/grassy patches
L2	Ploughed land	Far from water	In floodplain	On old river terrace
L3	Sandy ground, inland	Far from water	In floodplain or near feature such as hill	On old river terrace
L4	Sandy ground, Coastal	>1 km from sea	Inland of dune cordon	Near rocky shore
L5	Water-logged deposit	Heavily vegetated	Running water	Sedimentary basin

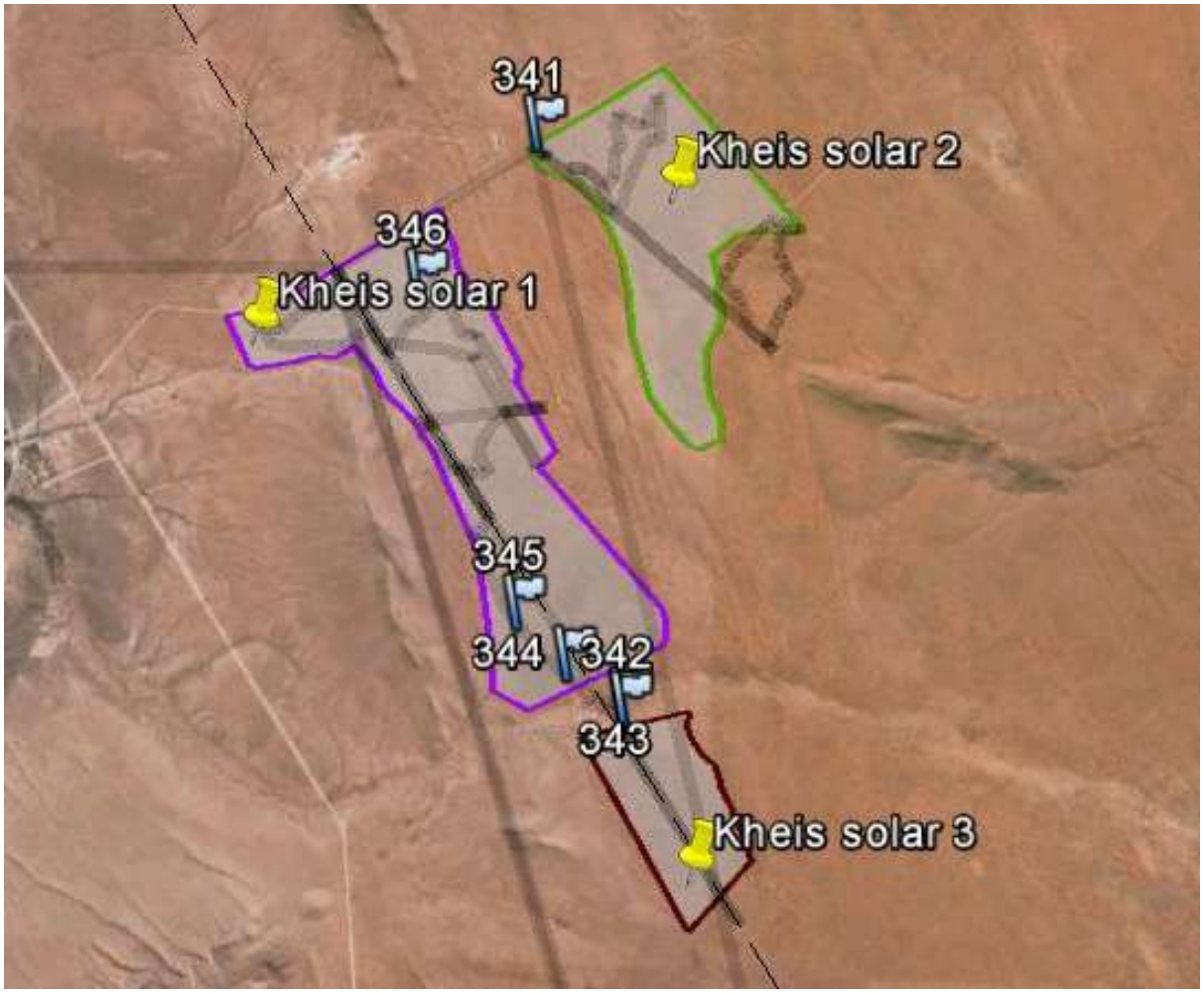
Class	Landform	Type 1	Type 2	Type 3
L6	Developed urban	Heavily built-up with no known record of early settlement	Known early settlement, but buildings have basements	Buildings without extensive basements over known historical sites
L7	Lime/dolomite	>5 myrs	<5000 yrs	Between 5000 yrs and 5 myrs
L8	Rock shelter	Rocky floor	Sloping floor or small area	Flat floor, high ceiling
Class	**Archaeo-logical traces**	**Type 1**	**Type 2**	**Type 3**
A1	Area previously excavated	Little deposit remaining	More than half deposit remaining	High profile site
A2	Shell or bones visible	Dispersed scatter	Deposit <0.5 m thick	Deposit >0.5 m thick; shell and bone dense
A3	Stone artefacts or stone walling or other feature visible	Dispersed scatter	Deposit <0.5 m thick	Deposit >0.5 m thick

Table 2. Site attributes and value assessment (adapted from Whitelaw 1997)

Class	Attribute	Type 1	Type 2	Type 3
1	Length of sequence/context	No sequence Poor context Dispersed distribution	Limited sequence	Long sequence Favourable context High density of arte/ecofacts
2	Presence of exceptional items (incl regional rarity)	Absent	Present	Major element
3	Organic preservation	Absent	Present	Major element
4	Potential for future archaeological investigation	Low	Medium	High
5	Potential for public display	Low	Medium	High
6	Aesthetic appeal	Low	Medium	High
7	Potential for implementation of a long-term management plan	Low	Medium	High

4 Observations

The area was visited over two days in January 2014, when three identified locales for development were inspected (development footprint areas for Kheis Solar 1, 2 and 3). Remaining portions of the property had been excluded owing to findings by other environmental specialists. The identified landscapes (indicated in the Google Earth map below) are a flat portion at the northern corner of the property (Kheis Solar 2) and plains to either side of the powerline running north-west to south-east (Kheis Solar 1 and 3). The Google Earth map includes GPS survey tracks (grey) in each of the identified development footprint areas.



Google Earth image indicating areas of proposed solar energy facility development (labelled Kheis Solar 1-3) and GPS survey tracks (grey).

The findings may be summarised with reference to Scoping Phase predictions (paragraph 2.2.3 above), as follows:

- That, based on previous experience (e.g. Dreyer 2006, 2012, Morris 2012), it was predicted (Morris 2013) the terrain was likely not to be rich in archaeological traces of major significance, although significant sites may occur at or near features such as hills and watercourses, as well as on the dunes.

The latter features were largely excluded (following other environmental studies) from the development area which consists of flat plains either side of the powerline running north-west to south-east through Groot Drink, Sterkstroom and Achterkop farms.

Generally very low densities of essentially isolated stone artefacts were found in all areas, with exceptions occurring in locales where tillite is exposed at the surface (addressed in terms of the following prediction).

Similar terrain in the region (as shown by Morris 2012) has minimal Stone Age traces comprising generally widely scattered/isolated stone artefacts mainly based on jaspilite (banded ironstone) sourced from the banks and terraces of the Orange/Gariep River.

Flakes, rare and widely dispersed (one of them
cf Middle Stone Age), found in the northern area in dune
sand in the vicinity of 28.53607 S 21.83747 E (adjacent to Kheis Solar 2)

On an eroded surface, widely dispersed individual flakes
(>1 artefact per 10 x 10 m) in the vicinity of 28.53805 S 21.81560 E (Kheis Solar 1).

- That where local sources of Dwyka tillite occur, these may have served as raw materials often drawn upon in Pleistocene times.

This prediction holds for a limited area where relatively plentiful raw material is available in a gravel/tillite on higher ground just to the north west of the Sterkstroom farm yard.

At the south eastern end of the area Kheis Solar 1, sediments consist of Dwyka tillite, rich in raw materials that became a 'factory' source evidently exploited on an opportunistic basis: artefacts at densities often exceeding 1/m^2 could be found over much of the area where these sediments are exposed. Artefacts pictured below came from an area of about 10 x 10 m in the vicinity of 28.56218 S 21.82726 E.

- In the scoping phase it was further predicted that there appear not to be colonial era built environment features in the areas of proposed solar development, except at the farm Sterkstroom, where it might also be expected there could be farm graves. Nineteenth- and twentieth-century cultural history and intangible heritage values attached to places may be difficult to recover owing to the sparse population.

No colonial era built environment features were found except in the vicinity of the Sterkstroom farmstead, which is in a state of ruin. An ash midden was found with indications of last occupancy in at least the late twentieth century. No graves were found in the vicinity.

Ruins of Sterkstroom farm dwelling and associated structures, situated at the northern end of area Kheis Solar 3. These buildings include an older twentieth century Karoo style dwelling unit with later enclosed veranda and other additions.

4.2 Characterising the archaeological significance (Refer to 3.4 above)

In terms of the significance matrices in Tables 1 and 2 under 3.4 above, most of the archaeological observations fall under Landforms L3 Type 1 and Type 2. In terms of archaeological traces they all, furthermore, fall under Class A3 Type 1. These ascriptions (Table 1) reflect poor contexts and likely low significance for these criteria.

For site attribute and value assessment (Table 2), all of the observations noted fall under Type 1 for Classes 1-7, reflecting low significance, low potential and absence of contextual and key types of evidence.

On archaeological grounds, the occurrences observed can be said to be of low significance for proposed development footprints in all three areas (referred to as Kheis Solar 1-3 in this report).

4.3 Characterising the significance of impacts

The following criteria are used in this Environmental Impact Assessment to characterise the significance of direct, indirect and cumulative impacts (Jodas 2010):

- The **nature**, which shall include a description of what causes the effect, what will be affected, and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional:
  - local extending only as far as the development site area – assigned a score of 1;
  - limited to the site and its immediate surroundings (up to 10 km) – assigned a score of 2;
  - will have an impact on the region – assigned a score of 3;
  - will have an impact on a national scale – assigned a score of 4; or
  - will have an impact across international borders – assigned a score of 5.
- The **duration**, wherein it will be indicated whether:
  - the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
  - the lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
  - medium-term (5–15 years) – assigned a score of 3;
  - long term (> 15 years) - assigned a score of 4; or

- permanent - assigned a score of 5.

» The **magnitude**, quantified on a scale from 0-10, where a score is assigned:

- 0 is small and will have no effect on the environment;
- 2 is minor and will not result in an impact on processes;
- 4 is low and will cause a slight impact on processes;
- 6 is moderate and will result in processes continuing but in a modified way;
- 8 is high (processes are altered to the extent that they temporarily cease); and
- 10 is very high and results in complete destruction of patterns and permanent cessation of processes.

» The **probability** *of occurrence*, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale, and a score assigned:

- Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
- Assigned a score of 2 is improbable (some possibility, but low likelihood);
- Assigned a score of 3 is probable (distinct possibility);
- Assigned a score of 4 is highly probable (most likely); and
- Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).

» the **significance**, which shall be determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.

» the **status**, which will be described as either positive, negative or neutral.

» the degree to which the impact can be reversed.

» the degree to which the impact may cause irreplaceable loss of resources.

» the *degree* to which the impact can be *mitigated.*

The **significance** is determined by combining the criteria in the following formula:

S= (E+D+M) P; where

S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

The **significance weightings** for each potential impact are as follows:

» < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),

» 30-60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),

» > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

Impact table summarising the significance of impacts (with and without mitigation): applicable for all three areas.

Nature: Acts or activities resulting in disturbance of surfaces and/or sub-surfaces containing artefacts (causes) resulting in the destruction, damage, excavation, alteration, removal or collection from its original position (consequences), of any archaeological material or object (what affected).		
	Without mitigation	**With mitigation**
Extent	1	
Duration	5	
Magnitude	2	
Probability	2	
Significance	**16**	
Status (positive or negative)		
Reversibility	No	No
Irreplaceable loss of resources?	Yes, where present – but occurrence is generally extremely low density and of low significance.	Not regarded as necessary
Can impacts be mitigated?	Yes – but not considered necessary.	Not regarded as necessary
Mitigation: Mitigation Measures: Artefact densities are low over the three development footprint areas that were investigated. Unlike biological processes, heritage destruction generally has a once-off permanent impact and in view of this the figures given in the "Without mitigation" column err on the side of caution. Even so, the criteria for significance indicated in this matrix give a Low significance weighting (<30 points). Mitigation measures are not considered necessary.		
Cumulative impacts: Cumulative Impacts: where any archaeological contexts occur the impacts are once-off permanent destructive events.		
Residual Impacts: -		

MEASURES FOR INCLUSION IN THE DRAFT ENVIRONMENTAL MANAGEMENT PLAN

OBJECTIVE: Archaeological or other heritage materials occurring in the path of any surface or sub-surface disturbances associated with any aspect of the development are highly likely to be subject to destruction, damage, excavation, alteration, or removal. The objective should be to limit such impacts to the primary activities associated with the development and hence to limit secondary impacts during the medium and longer term working life of the facility.

Project component/s	Any road or other linear construction over and above what is necessary and any spatial extension of other components addressed in this EIA.
Potential Impact	The potential impact if this objective is not met is that wider areas or extended linear developments may result in further destruction, damage, excavation, alteration, removal or collection of heritage objects from their current context on the site.
Activity/risk source	Activities which could impact on achieving this objective include deviation from the planned lay-out of infrastructure without taking heritage impacts into consideration.
Mitigation: Target/Objective	Mitigation measures are not considered necessary. However, a facility environmental management plan must take cognizance of heritage resources in the event of any future extensions of any infrastructure.

Mitigation: Action/control	**Responsibility**	**Timeframe**
Provision for on-going heritage monitoring in a facility environmental management plan which also provides guidelines on what to do in the event of any major heritage feature being encountered during any phase of development or operation.	Environmental management provider with on-going monitoring role set up by the developer.	Environmental management plan to be in place before commencement of development.

Performance Indicator	Inclusion of further heritage impact consideration in any future extension of infrastructural elements. Immediate reporting to relevant heritage authorities of any heritage feature discovered during any phase of development or operation of the facility.
Monitoring	Officials from relevant heritage authorities (National and Provincial) to be permitted to inspect the operation at any time in relation to the heritage component of the management plan.

5. CONCLUSIONS

Generally very sparse heritage traces were found over most of the proposed development area in two portions of the Namakwari property, designated Kheis Solar 1-3 in this report.

From an archaeological perspective the observed heritage resources over the areas surveyed were found to be mainly of low density and low significance.

A colonial era farm dwelling, modified through time, and now in a state of ruin, was recorded at Sterkstroom. It is not considered to be of major heritage significance.

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