McGregor Museum
Department of Archaeology

Proposed Boundary Solar Energy Facility on the farm Karreeboom 1716, east of Kimberley, in the Tokologo Local Municipality, Free State:

Heritage Impact Assessment

David Morris
January 2014

Proposed Boundary Solar Energy Facility on the farm Karreeboom 1716, east of Kimberley, in the Tokologo Local Municipality, Free State: Heritage Impact Assessment

David Morris, McGregor Museum, Kimberley
P.O. Box 316 Kimberley 8300
Tel 082 2224777 email dmorriskby@gmail.com
January 2014

1. INTRODUCTION

Rodicon Trading and Investments (Pty) Ltd appointed Savannah Environmental (Pty) Ltd to undertake an Environmental Impact Assessment Process and compile an Environmental Management Programme (EMP) for the proposed solar energy facility and associated infrastructure 15 km east of Kimberley in the western Free State.

Savannah Environmental has appointed the McGregor Museum to provide/co-ordinate specialist input with respect to heritage.

This document reports on the Impact Assessment for this project.

The project proposes construction of a 75 MW photovoltaic facility and associated infrastructure on the farms Karreeboom 438 and Rietpan 390 in the western Free State, east of Kimberley.

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 the project would entail construction of:

» Arrays of photovoltaic (PV) panels
» Appropriate mounting structures
» Cabling between the project components, to be lain underground where practical.
» A new on-site substation and overhead power line to connect directly to the existing Boundary Substation located on the site
» Internal access roads and fencing.
» Workshop area for maintenance, storage, and offices.

Relative to the anticipated impact of such a development, the scoping report presents a brief baseline description and sets out a modus operandi for a full heritage impact study.

1.2 Heritage Specialist

The author of this report is a qualified archaeologist (PhD, UWC) accredited as a Principal Investigator by the Association of Southern African Professional Archaeologists. The author has worked as a museum archaeologist in Kimberley in the Northern Cape since 1985. In addition the author has a comprehensive knowledge of the area'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.

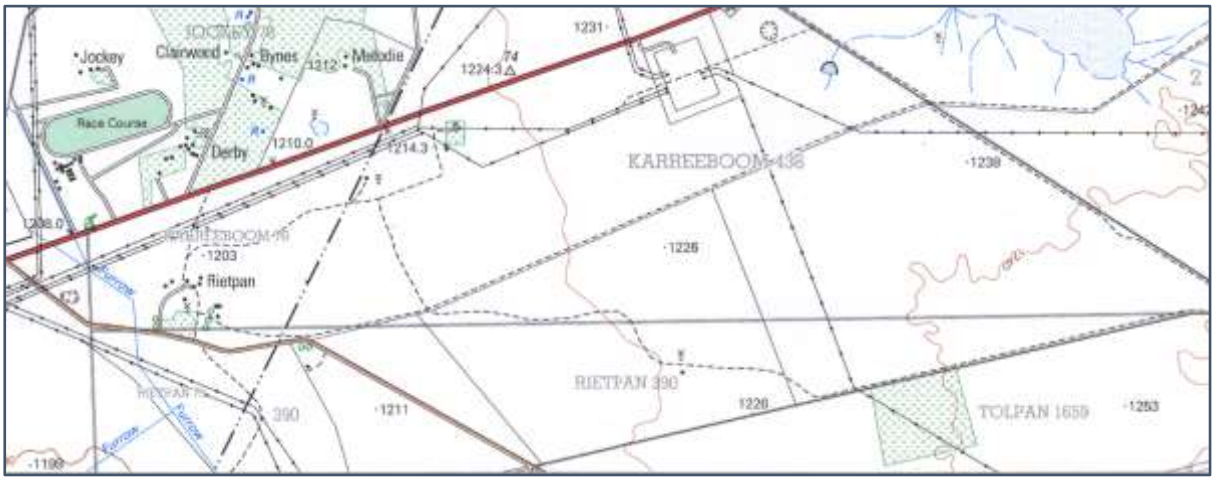
The author is independent of the organization commissioning this specialist input, and provides this Specialist Report within the framework of the National Heritage Resources Act (No 25 of 1999).

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 in a generally flat western Free State grassland/Kimberley Thornveld setting on a Hutton Sands-covered calcrete substrate. Dolerite hills cluster beyond the project area. It is estimated that surface archaeological traces including those in disturbances and erosion features would provide informative indications of the likely archaeological landscape in question.

Map 1. Google Earth image (above) indicating the project area straddling the Kimberley-Boshof road east of Kimberley.



Map 2. Extract from sheet 1:50 000 2824DB showing Kareeboom 438 and Rietpan 390(which is now known as Kareeboom 1716 – study area).

Map 3. The proposed layout of the facility (revised version received 29 Jan 2014).

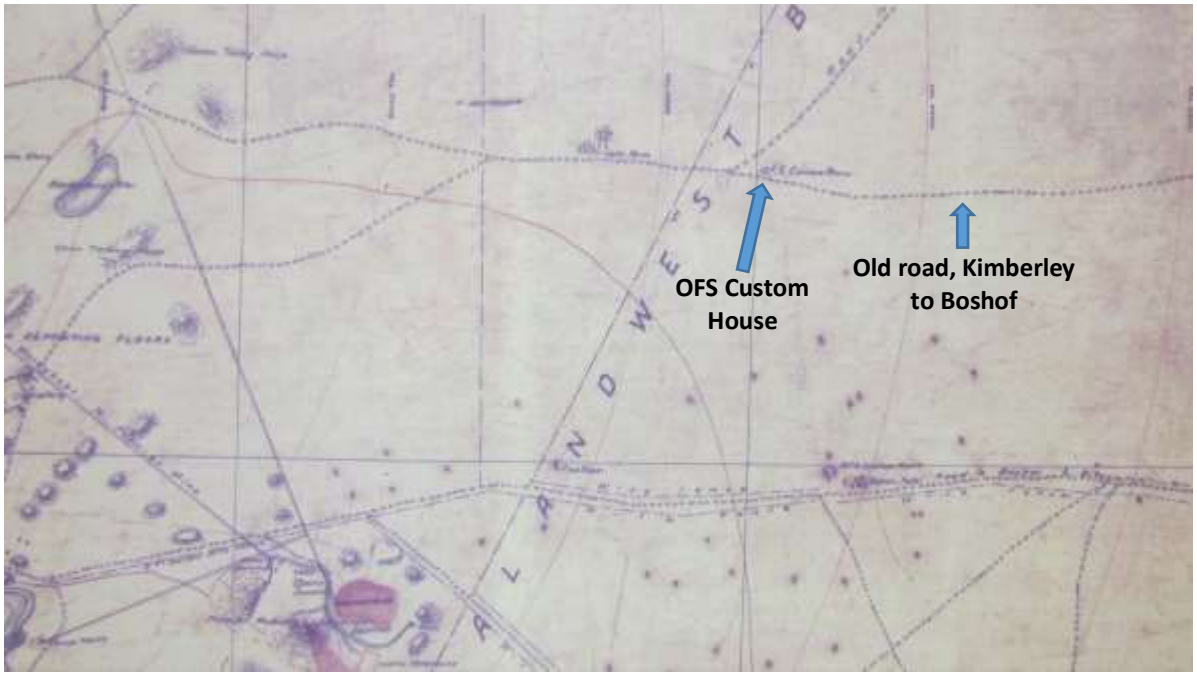
2.1 Heritage features of the region

Previous archaeological surveys carried out in the region include an impact assessment east of the project site in the vicinity of the Wab'nbiekiespan proposed solar energy facility (Morris 2011) and a range of locales west of the property in the vicinity of Kimberley including Roseberry Plain (Beaumont 1990), as well as archaeological observations made over the areas impacted by the Combined Treatment Plant (Morris 1999). To the south west is the Alexandersfontein Pan, a large Pleistocene lake on the margins of which numerous Stone Age occurrences have been documented in lake-shore and spring eye settings (summarised in Morris 2002). For the broader region the following comments can be made as background or baseline information from which certain heritage predictions are made for testing in this full HIA study.

2.1.1 Colonial frontier and historical setting

Nineteenth century farming infrastructure representing the influx of frontier (Trekboer, in some cases Griqua) settlers occurs in the area in the form of stone kraals and dwellings (or ruins thereof), as well as graves (e.g. Morris 2011). The study area is close to the Diamond Fields (1870 onwards) and straddles one of the old Kimberley-Boshof roads, with the western edge of the proposed development abutting the boundary between the former Crown Colony of Griqualand West/Cape Colony and the Free State Republic, where, early maps show, there was an "OFS Custom House". The old road running

through the study area from west to east was still in use in the early 1940s (see 1941/2 1:50 000 sheet 2824DB), with deep cuts in the sand parallel with it testifying to this having been an old wagon road probably from perhaps the earliest days of the Diamond Fields. The road certainly existed in 1899 when it was shown in maps (such as that below, which also indicates the OFS Custom House).



Map 4. Extract from a map relating to the Siege of Kimberley, 1899-1900, from copy preserved at the McGregor Museum.

2.1.2 Later Stone Age

Later Stone Age sites have been noted in the region, particularly on the farm Benfontein (Alexandersfontein) as well as on Wag'nbiekiespan. A notable feature, apart from surface scatters of stone tools, are rock engraving sites on dolerite hills (Morris 1988) such as at the nearby Tafelkop and Olifantsfontein/Suzanna south west of the property (Fock & Fock 1989).

2.1.3 Pleistocene: Middle and Earlier Stone Age

Assemblages ascribed to the Pleistocene age Earlier and Middle Stone Age, including the 'Fauresmith' industry, are known to occur in the area (Beaumont 1990; Beaumont & Morris 1990; Morris 1999). These occur typically within and at the base of the red Hutton Sands overlying calcrete or dolerite. Mostly very low density occurrences have been noted in surveys nearby, while in certain localities sites of higher density and significance have been documented, notably on the fringes of the Alexandersfontein Pan (e.g. Butzer *et al*. 1973; Butzer 1976; Morris 2002).

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 likely in the case of the Boundary Solar Energy Facility development and infrastructure; 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 Scoping phase predictions

- Based on previous experience, it was predicted that the terrain selected for the proposed Boundary Solar Energy Facility is likely to include traces of Stone Age utilization of the landscape with palimpsests of material spanning Pleistocene and Holocene times.
- Where there are dolerite outcrops or hills (though none within the study area), rock engravings could occur.
- Nineteenth- and twentieth-century cultural history may occur in the form of stone kraals, ruins of dwellings, extant dwellings and infrastructure (those over 60 years old are explicitly protected by the Act), ash middens, and graves. Intangible heritage values attached to places may be recoverable from current or former inhabitants (farmers, farm-workers).

3. METHODOLOGY FOR FULL HERITAGE STUDY

The footprint of the proposed development was inspected on the ground, to test the above scoping phase predictions and with all heritage traces evaluated in terms of their archaeological significance (see tables below).

3.1 Assumptions and constraints

It was be assumed that, by and large in this landscape, with its relatively sparse vegetation and often shallow soil profiles, some sense of the archaeological traces to be found in the area would be readily apparent from surface observations (particularly where it is also possible to assess places of erosion or past excavations of any kind that had exposed erstwhile below-surface features). Sub-surface occurrences are likely to be widespread in this landscape, which is mantled by Hutton Sands that mask earlier palaeosurfaces. Deliberate burial (most obviously graves, but also domestic refuse) may also feature. 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 must be taken: cease work and 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 the Free State Provincial Heritage Resources 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	Heavily vegetated	Running water	Sedimentary basin

Class	Landform	Type 1	Type 2	Type 3
	deposit			
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

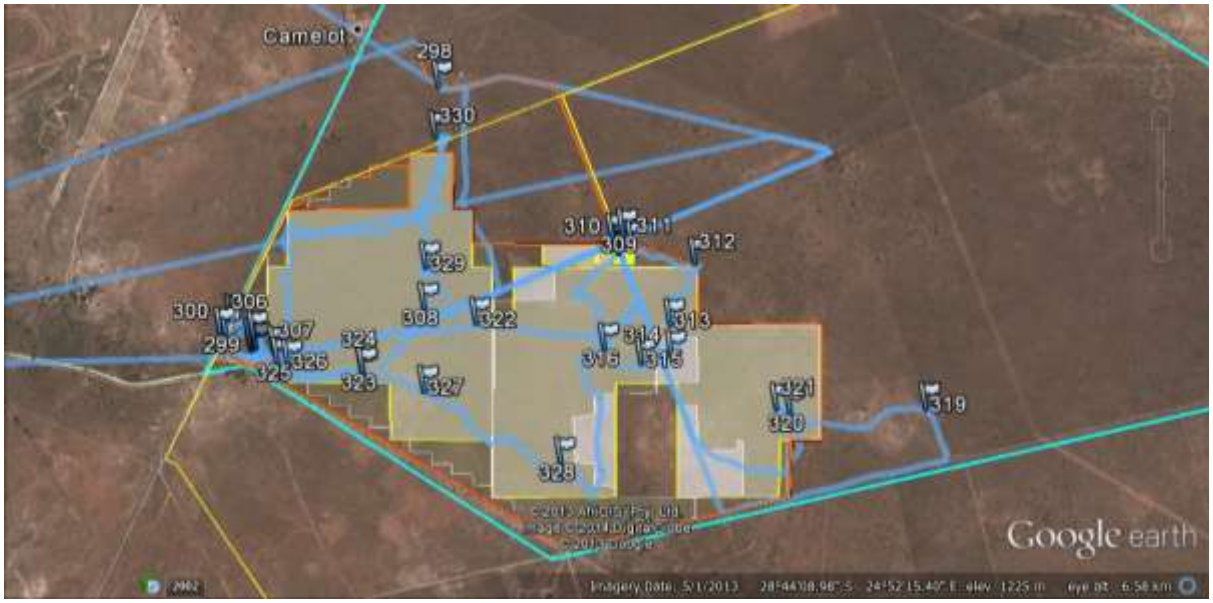
Table 2. Site attributes and value assessment (adapted from Whitelaw 1997)

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

4.1 Field survey observations

The study area was visited over two days in January 2014 during which the terrain was examined on foot. The following archaeological observations were made, with comments provided relative to Scoping Phase predictions:



Map 5. GPS tracks: study area as a whole.

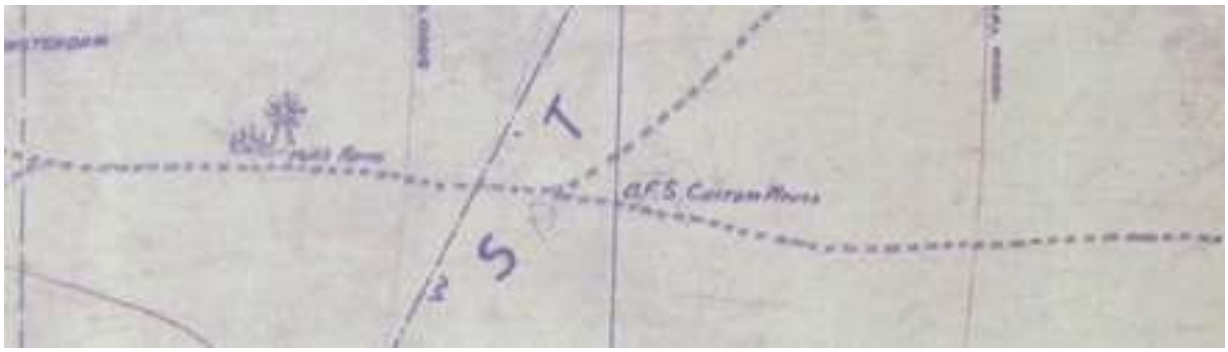
Engravings

The scoping phase prediction of engravings potentially being found in the event of dolerite koppies or exposures occurring could be discounted, as no such hills or exposures were noted.

Colonial era

Nineteenth- and twentieth-century cultural history remains were found in the form of low densities of mainly rusted metal items and bottle glass alongside the former public road running west to east across the study area.

More substantially and of much greater historical significance were remains of what is believed to be the OFS Custom House, found in a situation corroborated by the 1899-1900 map included above in this report and with detail indicated here:



Map 6. The Custom house is indicated just east of the Free State border and north of the road to Boshof.

Map 7. GPS tracks: detail at western end of the study area.

GPS point 300 is a limestone-walled feature, possibly a small kraal, while the line of features numbered 302, 303 and 304 are clear rectangular building foundations most likely representing the actual custom post. Points 299, 301 and 305-6 are traces of middens, the most substantial of which is at 306. These places constitute a sensitive heritage feature which should not be disturbed by the development. The area circled in red should be regarded as sensitive – including the gum trees outside of the property which probably date from the time of the Custom House.


Foundation of the northern-most of three adjacent structure identified as the OFS Custom House.

Debris found at and near the OFS Custom House – a nail (the structure may have consisted of corrugated iron and wood on a stone foundation) and window glass; bottle glass contemporary with the building; and part of a mouth organ.

The appendix to this report provides historical notes on the Custom House.

GPS points 320-321 (Map 5) are the locations of an abandoned domestic structure and outside toilet with associated ash midden and other farm features such as former gardens.

The current (ruined) structures are of second half of twentieth century date, the associated midden material including recent glass, metal and plastic contents including ointment jars and bottle screw-tops. It is possible that an earlier generation of farming infrastructure once existed here.

These structures may have served as dwellings for farm labourers. The structures and associated artefacts in a nearby midden suggest a second half of twentieth century occupation prior to abandonment.

No graves were found during the survey. In the event that any should be noted during development they should be reported immediately.

A worker met on the property indicated that he had not been on the farm more than six months and he was unable to comment on any possible intangible heritage values attached to places there.

Stone Age

It had been predicted, on the basis of observations in the surrounding area, that the terrain selected for the proposed Boundary Solar Energy Facility was likely to include traces of Stone Age utilization of the landscape, with palimpsests of material spanning Pleistocene and Holocene times.

This entire area is covered with Aeolian Hutton Sands which very substantially overlie or contain the traces of Stone Age inhabitation, know to occur often at the base of the sands in adjacent areas. This was confirmed in almost all places where the sand has been cleared away either by natural erosion or, more commonly, on the edges of borrow pits, or where burrowing animals such as ant-eaters have brought material to the surface. The edges of borrow pits provided opportunities to assess comparative density of material relative to findings at the nearby Roseberry Plains sites (Beaumont 1990). In all cases in the study area densities of artefacts can been said to be comparatively much reduced: none of the occurrences could be said to be significant.

Edge of borrow pit at GPS point 330 (Map 5).

Cf Fauresmith artefacts found at the edge-of-quarry interface between Hutton Sands and underlying decomposing dolerite at GPS point 330.

Borrow pit with twentieth and twenty first century dumping at GPS point 308 (Map 5). Very few Stone Age artefacts were noted around its edge, these being heavily patinated hornfels flakes most likely ascribable to Middle Stone Age or cf Fauresmith (pictured below).

In some instances artefacts (these noted at GPS position 314) are less heavily patinated and may include some of Holocene age, i.e. Later Stone Age.

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 mostly fall under Class A3 Type 1. These ascriptions (Table 1) generally reflect poor contexts and likely low significance for these criteria.

However, in the case of the western-most part of the proposed development area historically significant and sensitive traces relating to the OFS Custom House east of the old Cape Colony-Free State boundary have been identified (circled in red in Map 7). In relation to other nearby heritage, particularly the Boer War African refugee camp, contemporary with the Custom House, and relative to the history of the Diamond Fields more generally, it is suggested that these sites are of high significance.

For site attribute and value assessment (Table 2), most 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.

Again, however, the western-most part of the proposed development area (circled in red in Map 7) is of higher significance, scoring as Type 2 or 3 under Class 2 (because of the presence of distinctive features identifiable as historical phenomena documented in the archive), Type 3 for Class 4 (high value in terms of future investigation), with some potential for display or site visits, and having good potential for site management.

On archaeological grounds, the occurrences observed can be said to be of generally low significance for proposed development footprints 2-4 (while noting that higher significance finds could be made in subsurface zones during construction). In the case of

proposed development footprint 1 somewhat higher significance is assigned on account of the high density Middle Stone Age occurrence noted over a large area in that vicinity.

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 tables summarising the significance of impacts (with and without mitigation)

At the western side of the proposed development footprint as indicated in Map 7 above.

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	Regional (3)	Regional (3)
Duration	Permanent (5)	Permanent (5)
Magnitude	Very High (10)	Very High (10)
Probability	Definite (5)	Probable (3)
Significance	High (90)	Medium (54)
Status (positive or negative)	Negative	Negative
Reversibility	No	No
Irreplaceable loss of resources?	Yes, with regional impact given the uniqueness of this site regulating the Free State/Cape Colony/ Diamond Fields frontier.	Unique resources would be lost: there is reason to motivate exclusion of this western-most part of the proposed development to preserve it for future study

		and heritage use.
Can impacts be mitigated?	Yes – Recommend exclusion of this western-most portion of the proposed development area; reservation as a no-go area.	On-going management as per EMP
Mitigation: There is reason to motivate exclusion of this western-most part of the proposed development, to preserve it for future study and possible heritage use.		
Cumulative impacts: Cumulative Impacts: where any archaeological contexts occur the impacts are once-off permanent destructive events. Infrastructure development may lead to spatially extended impacts in the vicinity, hence the need to demarcate areas for zero impact.		
Residual Impacts: Depleted archaeological record.		

Across the remainder of the proposed development footprint.

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	Local(1)	
Duration	Permanent (5)	
Magnitude	Minor (2)	
Probability	Improbable (2)	
Significance	Low (1)	
Status (positive or negative)	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: Artefact densities are low over the development footprint area in question. 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 as recommended, namely exclusion of the western-most part of the proposed development (as indicated in Map 7above). A facility environmental management plan that takes 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. This report argues for exclusion of the western-most fringe of the proposed development area (as indicated in Map 7).	Environmental management provider with on-going monitoring role set up by the developer. 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	Preservation of archaeological traces at the site of the OFS Custom House. Completed mitigation as recommended including demarcation of possible no-go area/s in the vicinity of the proposed development locale 1. 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 sparse heritage traces were found over most of the proposed development area. Remains of the historically recorded OFS Custom House situated just east of the Cape Colony/OFS boundary were found and a recommendation is made that this particular locale be excluded from the proposed development.

From an archaeological perspective the observed heritage resources over the bulk of the area surveyed, excepting the western-most fringe of the proposed development area, were found to be mainly of low density and low significance.

References

Beaumont, P.B. & Morris, D. *Guide to archaeological sites in the Northern Cape*. Kimberley: McGregor Museum.

Beaumont, P.B. 1990. Rosebery Plains. In Beaumont, P.B. & Morris, D. *Guide to archaeological sites in the Northern Cape*. Kimberley: McGregor Museum.

Butzer, K.W. 1976. A settlement archaeology project in the Alexandersfontein Basin (Kimberley). *Palaeoecology of Africa* 9:144-145. Beaumont, P.B. & Morris, D. 1990. *Archaeological sites in the Northern Cape*. Kimberley: McGregor Museum.

Butzer, K.W., Fock, G.J., Stuckenrath, R. & Zilch, A. 1973. Palaeohydrology of Late Pleistocene Lake, Alexandersfontein, Kimberley, South Africa. *Nature* 243:328-330.

Deacon, J. nd. Archaeological Impact Assessment - specialist input to planning and design. Unpublished notes compiled for the National Monuments Council.

Fock, G.J. & Fock, D.M.L. 1989. *Felsbilder in Südafrika Teil III: Die Felsbilder im Vaal-Oranje-Becken*. Köln: Böhlau Verlag.

Morris, D. 1988. Engraved in place and time: a review of variability in the rock art of the Northern Cape and Karoo. *South African Archaeological Bulletin* 43:109-121.

Morris, D. 1999. A phase 1 archaeological impact assessment: proposed Combined Treatment Plant and associated Haul Roads, Kimberley. Unpublished Report to De Beers Consolidated Mines Ltd.

Morris, D. 2000. Gamsberg Zinc Project environmental impact assessment specialist report: archaeology.

Morris, D. 2002. Palaeoenvironmental, archaeological and historical aspects of Benfontein and Alexandersfontein Pan. Report for De Beers.

Morris, D. 2011. Wag'nBiekiespan Solar Energy Facility: Specialist Input for the Environmental Management Programme for the Proposed Wag'nBiekiespan Solar Energy Facility near Boshof, Free State Province: Archaeology. Report prepared for Savannah Environmental.

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

Whitelaw, G. 1997. Archaeological monuments in KwaZulu-Natal: a procedure for the identification of value. Natal Museum Journal of Humanities. 9:99-109.

Appendix 1: Report on the building materials and activities associated with Tolpan Customs post.

Garth Benneyworth,
McGregor Museum, Kimberley.
January 2014

Archival records in the Free State archives relating to customs posts on the border of the Cape Colony and Orange River colony during 1901 indicate a relationship between these posts and the military/social history of Kimberley during the South African War (1899-1902). During the war the records reflect two posts, one at Rooifontein and the other at Tolpan. Prior to the Union of South Africa in 1910, records reflect that in addition to these two customs posts at least two additional South African Constabulary (SAC) posts were operational in the area.

These records when viewed collectively indicate building materials used to construct these posts before the war and prior to 1910.

During site visits by David Morris and Garth Benneyworth to Tolpan and Rietpan on 23 January 2014, three stone foundations were located at Tolpan. Within the area of the foundations, fragments of window panes and a screw used to affix corrugated iron to a structure were found. Metal strapping built into the foundations indicated that the walls had been built with either corrugated iron or timber, as no additional collapsed rock or brick were found in the immediate vicinity. Additionally rubbish middens were located downwind from these ruins at an approximate distance where rubbish was dumped by the occupants.

The following archival records indicate the type of construction materials used to assemble these structures during this era and the activities associated with these sites.

During the war on 14 June 1901, a customs official at Rooifontein was reported to have been implicated in the illegal diamond buying trade when farming on Tolpan before the war. It was recommended that his services be ended.[1]

On 17 June 1901, two Orange River Colony customs officials at Rietpan and Tolpan stated that they have no customs work to do. The Commissioner of Police District No. 2 requested their removal as he suspected them of communicating with the Boers. Their presence on the border was described as "most undesirable". They were subsequently interned in the Kimberley Burgher Refugee Camp. [2]

This activity occurred while the Native Refugee Camp at Kimberley, located at Blankenbergvlei, was being formalised under the control of the British military's newly formed Native Refugee Department (NRD) during August 1901. [3] The NRD at the time were pursuing options with De Beers

[1] VAB, CO/24/2143/01
[2] VAB, CO/24/2143/01
[3] VAB, SRC, Vol 9/2979

Consolidated mines to relocate these refugees to a farm in the area as part of their agricultural scheme. [4]

Post war records prior to the Union of South Africa in 1910 reflect that on 11 September 1905 recommendations were made to remove the South African Constabulary (SAC) buildings at Keeromost Post to Klippiespan Post.[5]

On 1 May 1906 negotiations for lease of land at Klippiespan started. On 19 May it was decided that the SAC post would be moved to Rietpan not Klippiespan, as Klippiespan was owned by De Beers.[6]

Permission to repair the customs house at Rietpan was requested in May 1906. The structure is described as being built of brick. A tender was issued and accepted.[7]

In June 1906 the customs post at Keeromost was moved to Rietpan and the building is described as being corrugated iron erected on foundations.[8]

Correspondence by the Director of Public Works on 19 May 1906 regarding the removal of the SAC from Keeromost to Klippiespan refers to a tender submitted in 1905 and describes the buildings to be re-erected on the farm Rietpan. A reference to “some extra glazing” is made and presumably referred to window panes.[9]

[4] VAB, CO Vol 29/2770/01
[5] VAB, PWD/87/2
[6] VAB,CO/24/2143/01
[7] VAB,PWD/86/126
[8] VAB,PWD/88/354
[9] VAB,PWD 6848/304/06