Archaeological Impact Assessment

Proposed establishment of the Inca Solar Energy Facility, De Aar, Northern Cape

Prepared For

Savannah Environmental (Pty) Ltd

By

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Contracts and Archaeological Consulting

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I, Jaco van der Walt as duly authorised representative of Heritage Contracts and Archaeological Consulting CC, hereby confirm my independence as a specialist and declare that neither I nor the Heritage Contracts and Archaeological Consulting CC have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which the client was appointed as Environmental Assessment practitioner, other than fair remuneration for work performed on this project.

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EXECUTIVE SUMMARY

Site name and location: INCA De Aar Solar (Pty) Ltd proposes to establish a commercial photovoltaic (PV) solar energy facility as well as the associated infrastructure on Remainder of Portion 2 (Bletterman) (Portion of Portion 1) of the farm De Aar 180 and Portion 1 of Farm 4 (Vetlaagte), which lies approximately 8 km southeast of the town of De Aar in the Northern Cape Province.

Purpose of the study: Phase 1 Archaeological Impact Assessment to determine the presence of cultural heritage sites and the impact of the proposed project on these resources within the area demarcated for the solar development.

1:50 000 Topographic Map: 3024 CA

EIA Consultant: Savannah Environmental (Pty) Ltd

Developer: Inca De Aar Solar (Pty) Ltd

Heritage Consultant: Heritage Contracts and Archaeological Consulting CC (HCAC).

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Date of Report: 2 November 2011

Findings of the Assessment: The abundance of locally available raw material in the form of hornfels or indurated shale resulted in the use of the landscape over millennia by Stone Age people. Stone Age remains are mostly represented by Middle Stone Age (MSA) artefacts scattered over the study area. Site 2 and Site 4(Figure 3) indicate relatively high frequencies of such artefacts. Erosion of large hills, just outside and to the south of the study area, results in the gravitating of raw material and artefacts towards the gently dipping plains of the study area. Some of these deposits might be covered by the accumulation of clay and sandy soils in the valleys or plains.

Morris (2011) noted that the predominant archaeological component at most documented sites in the area appears to be Pleistocene and early Holocene in age. As a result of prolonged exposure to the elements, most of the artefacts show signs of weathering and/or oxidation and the knapped surfaces are thus highly patinated. There are, however, also places with a much younger component of tools, probably dating to the late Holocene Later Stone Age (LSA). These assemblages are still relatively fresh-looking (little or no apparent patination – the artefacts are nearly black or gray as opposed to the more heavily patinated orange-brown of older stone tools). It can, therefore, be concluded that MSA and LSA assemblages are present on the landscape (referred to as MSA and LSA), but Earlier Stone Age (ESA) tools may also occur.

Remnants of the farm's history are represented in the form of a dilapidated farm dwelling and more recent labourer housing. These sites are, however, located outside of the development footprint of the project.

From an archaeological point of view, there is no reason why the development cannot commence work, if the developers adhere to the recommendations made under section 7 of this report.

If any possible finds such as tool scatters, bone or fossil remains are exposed or noticed during construction, the operations must be stopped and a qualified archaeologist must be contacted to assess the find.

General

Due to high sand cover, ground visibility was low on portions of the site during survey. The possible occurrence of unmarked or informal graves and subsurface finds can thus not be excluded. If during construction any possible finds are made, operations must be stopped and a qualified archaeologist be contacted for an assessment of the find.

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

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ABBREVIATIONS

ASAPA: Association of South African Professional Archaeologists	SAHRA: South African Heritage Resources Agency
CRM: Cultural Resource Management	MIA: Middle Iron Age
EIA Practitioner: Environmental Impact Assessment Practitioner	EIA: Environmental Impact Assessment*
EIA: Early Iron Age*	ESA: Early Stone Age
GPS: Global Positioning System	HIA: Heritage Impact Assessment
LSA: Late Stone Age	LIA: Late Iron Age
MSA: Middle Stone Age	PRHA: Provincial Heritage Resource Agency
BIA: Basic Impact Assessment	ECO: Environmental Control Officer

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

GLOSSARY

Archaeological site (remains of human activity over 100 years old)

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 25 000 years ago)

Late Stone Age (~ 25 000 to 500 years ago)

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

1 BACKGROUND INFORMATION

Kind of Study	Archaeological Impact Assessment
Type of development	Solar PV Facility
Rezoning / subdivision of land	Rezoning
Developer:	Inca De Aar Solar (Pty) Ltd
Consultant:	Savannah Environmental
Farm Owner:	Salmon Davids

A Heritage scoping report was conducted by J.A. van Schalkwyk (2011) for the project and Heritage Contracts and Archaeological Consulting CC was subsequently contracted by Savannah Environmental (Pty) Ltd to conduct an Archaeological Impact Assessment for the proposed Inca Solar Facility south east of the town of De Aar Northern Cape. The report forms part of the EIA for the proposed project.

The aim of the study is to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, a review of the heritage scoping report that includes collection from various sources and consultations; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey two heritage sites were identified. General site conditions and features on sites were recorded by means of photographs, GPS locations, and site descriptions. Possible impacts were identified and mitigation measures are proposed in the report following below.

This report must also be submitted to SAHRA provincial office for peer review.

1.1 Terms of Reference

Conduct a field study to:

Systematically survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; to record GPS points of identified as significant areas; to determine the levels of significance of the various types of heritage resources recorded in the project area.

Reporting:

Identify the anticipated impacts, as well as cumulative impacts, of the operational units of the proposed project activity on the identified heritage resources for all 3 phases of the project; i.e., construction, operation and decommissioning phases. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies and results comply with the relevant legislation and the code of ethics and guidelines of the ASAPA.

To assist the developer in managing the discovered heritage resources in a responsible manner, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

1.2. Archaeological Legislation And Best Practice

Phase 1 Archaeological Impact Assessments or Heritage Impact Assessments are a pre-requisite for development in South Africa as prescribed by SAHRA and stipulated by legislation. The overall purpose of a heritage specialist input is to:

- Identify any heritage resources, which may be affected;
- Assess the nature and degree of significance of such resources;
- Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- Assess the negative and positive impact of the development on these resources;
- Make recommendations for the appropriate heritage management of these impacts.

The AIA or HIA, as a specialist sub-section of the EIA, is required under the National Heritage Resources Act NHRA of 1999 (Act 25 of 1999), Section 38(1), Section 38(8) of the National Environmental Management Act (NEMA) and the Mineral and Petroleum Resources Development Act (MPRDA).

The AIA should be submitted, as part of the EIA, BIA or Environmental Management Plan (EMP), to the PHRA if established in the province or to SAHRA. SAHRA will be ultimately responsible for the professional evaluation of Phase 1 AIA reports upon which review comments will be issued. 'Best practice' requires Phase 1 AIA reports and additional development information, as per the EIA, BIA/EMP, to be submitted in duplicate to SAHRA after completion of the study. SAHRA accepts Phase 1 AIA reports authored by professional archaeologists, accredited with ASAPA.

Minimum accreditation requirements include an Honours degree in archaeology or related discipline and 3 years post-university CRM experience (field supervisor level).

Minimum standards for reports, site documentation and descriptions are set by ASAPA in collaboration with SAHRA. ASAPA is a legal body, based in South Africa, representing professional archaeology in the Southern African Development Community [SADC] region. ASAPA is primarily involved in the overseeing of ethical practice and standards regarding the archaeological profession. Membership is based on proposal and secondment by other professional members.

Phase 1 AIA's are primarily concerned with the location and identification of sites situated within a proposed development area. Identified sites should be assessed according to their significance. Relevant conservation or Phase2 mitigation recommendations should be made. Recommendations are subject to evaluation by SAHRA.

Conservation or Phase 2 mitigation recommendations, as approved by SAHRA, are to be used as guidelines in the developer's decision making process.

Phase 2 archaeological projects are primarily based on salvage/mitigation excavations preceding development destruction or impact on a site. Phase 2 excavations can only be conducted with a permit, issued by SAHRA to the appointed archaeologist. Permit conditions are prescribed by SAHRA and includes (as minimum requirements) reporting back strategies to SAHRA and deposition of excavated material at an accredited repository.

In the event of a site conservation option being preferred by the developer, a site management plan, prepared by a professional archaeologist and approved by SAHRA, will suffice as minimum requirement.

After mitigation is conducted on a site, a destruction permit must be applied for from SAHRA before development may proceed.

Human remains older than 60 years are protected by the National Heritage Resources Act, with reference to Section 36. Graves older than 60 years, but younger than 100 years fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36[5]) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in the category located inside a formal cemetery administrated by a local authority, require the same authorisation as set out for graves younger than 60 years, in addition to SAHRA authorisation. If the grave is not situated inside a formal cemetery, but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws set by the cemetery authority must be adhered to.

Human remains that are less than 60 years old are protected under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), as well as the Human Tissues Act (Act 65 of 1983), and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning; or in some cases, the MEC for Housing and Welfare.

Authorisation for exhumation and re-interment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to.

In order to handle and transport human remains the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

1.3 Description of Study Area

1.3.1 Location Data

INCA De Aar Solar (Pty) Ltd proposes to establish a commercial photovoltaic (PV) solar energy facility as well as the associated infrastructure on Remainder of Portion 2 (Bletterman) (Portion of Portion 1) of the farm De Aar 180 and Portion 1 of Farm 4 (Vetlaagte), which lies approximately 8 km southeast of the town of De Aar in the Northern Cape Province.

The geology of the region consists of mudstone and dolerite, and the original vegetation is classified as Eastern Mixed Nama Karoo. Overall the area is very flat, except in the northern and southern sections, where some dolerite hills and outcrops occur. It seems as if the eastern section of the site was previously impacted on by development activities, probably when the Hydra substation was built.

1.3.2. Location Map

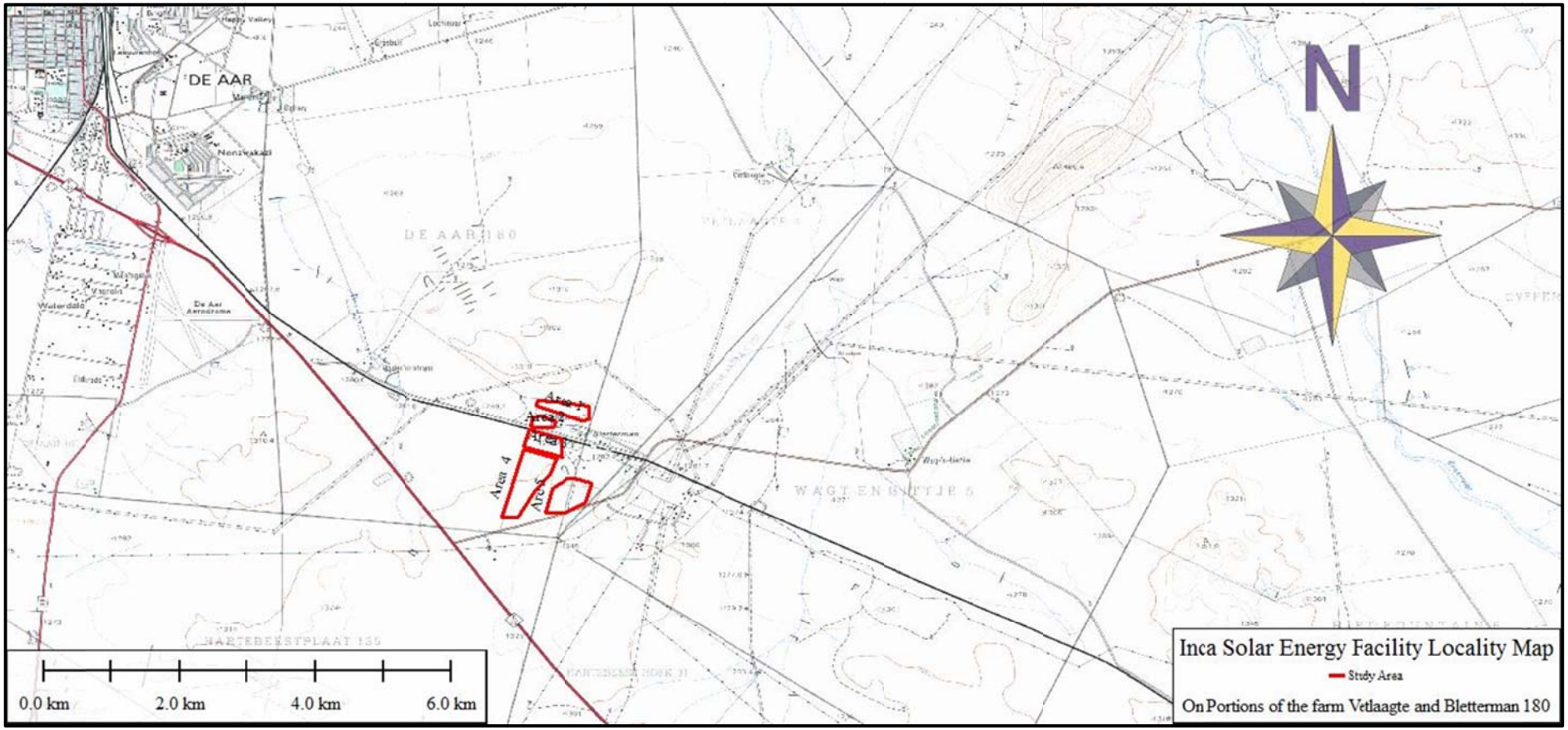

Figure 1: Location map of the proposed project indicating the PV Layout areas that was assessed in red.

1.3.3. Google Maps

Figure 2: Google image showing the study area in red, and track log of the areas that was covered in black, note the dolerite hills outside of the study area indicated in blue.

2. APPROACH AND METHODOLOGY

The aim of the study is to cover archaeological databases and historical sources to compile a background history of the study area followed by field verification; this was accomplished by means of the following phases.

2.1 Phase 1 - Desktop Study

The first phase comprised a desktop study, gathering data to compile a background history of the area in question, looking at archaeological sites, historical sites, graves, architecture, oral history and ethnographical information on the inhabitants of the area. This phase comprised a heritage scoping report completed by J.A. van Schalkwyk (2011).

2.1.1 Literature Search

See Annexure A for the full Heritage Scoping Report. In addition to the information from the scoping study the following actions was taken.

2.1.2 Information Collection

The SAHRA report mapping project (Version 1.0) was consulted to further collect data from CRM practitioners who undertook work in the area to provide the most comprehensive account of the history of the area where possible.

2.1.3 Public Consultation

A Brief consultation with the landowner was conducted during this phase.

2.1.4 Google Earth and Mapping Survey

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where heritage significant sites might be located.

2.1.5 Genealogical Society of South Africa

The database of the genealogical society was consulted to collect data on any known graves in the area.

2.2 Phase 2 - Physical Surveying

Due to the nature of cultural remains, the majority that occurs below surface, a field survey of the study area was conducted, focussing on dolerite hills and outcrops, high lying areas and disturbances in the topography. The study area was surveyed by means of vehicle and extensive surveys on foot.

All sites discovered inside the proposed development area was plotted on 1:50 000 maps and their GPS co-ordinates noted. Digital photographs were taken at all the sites.

2.3. Restrictions

Due to the fact that most cultural remains may occur below surface, the possibility remains that some features or artefacts may not have been discovered/ recorded during the survey. Low ground visibility exists on parts of the study area due to deep sand cover, and the possible occurrence of unmarked graves and other cultural material cannot be excluded. Only the surface infrastructure footprint area was surveyed, as indicated in the location map, and not the entire farm. Although Heritage Contracts and Archaeological Consulting CC surveyed the area as thorough as possible, it is incumbent upon the developer to inform the relevant heritage agency should further cultural remains be unearthed or laid open during the process of development.

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3 NATURE OF THE DEVELOPMENT

INCA De Aar Solar (Pty) Ltd proposes to establish a commercial photovoltaic (PV) solar energy facility as well as the associated infrastructure. The solar energy facility is proposed to accommodate an array of photovoltaic (PV) panels with a generating capacity of up to 30 MW.

Other infrastructure associated with the facility will include:
» An on-site generator transformer and a small substation to facilitate the connection between the renewable energy facility and the Eskom electricity grid;
» Foundations to support the PV panels;
» Cabling between the project components, to be lain underground where practical;
» An overhead power line (132kV) of ~ 100m in length feeding into the Eskom electricity network at the existing Hydra Substation; and
» Internal access roads; and
» Workshop area for maintenance and storage

4. HISTORICAL AND ARCHAEOLOGICAL BACKGROUND OF THE STUDY AREA

4.1 Databases Consulted

Wits and Kimberley Museum Archaeological Data Base

On the 1.50 000 map sheet 3024CA no previously recorded sites exists. Due to the tight deadline for the project it was not possible to consult the Kimberley Museum's database.

SAHRA Report Mapping Project

A survey of the relevant literature was conducted with the aim of reviewing the previous research conducted as part of the scoping report by J. van Schalkwyk, and to determine the potential of finding sites of heritage value in the area: (Morris 2006, 2007; Richardson 2001; Sampson 1985; Van Jaarsveld 2006; Van Schalkwyk 2011). CRM reports on the area by Nel (2008) and Van Jaarsveld (2006) was also consulted.

Genealogical society and Google Earth Monuments

Neither the genealogical society nor the monuments database at Google Earth (Google Earth also include some archaeological sites and historical battlefields) have any recorded sites in the study area.

Public Consultation

During consultation with the landowner no significant heritage sites were mentioned

4.2 Archaeological and Historical Information Available on the Study Area

The town of De Aar was founded in 1881 on the farm by the same name. The farm originally belonged to Jan Vermeulen who sold it for the purpose of developing the town. As a result of railway expansions of, the town became an important station with one of the largest marshaling yards in the country.

Open air sites near stream beds or hills and outcrops indicate occupation by early humans during the MSA (between roughly 300-30 thousand years ago in southern Africa), but ESA sites (that could date to more than 1 million years ago), are also known in the wider region. Raw material sources would have been amongst the foci for Stone Age activities. Population density might have increased during the LSA, and people would have occupied rock shelters where available, as well as open air sites. During this later period they also produced rock engravings, of which some are known to occur on the farm Tafelkop, north of the study area. On the farms Veekraal (to the east of the study area) and Jakkalsfontein (to the north of the study area) rock paintings have been documented (van Schalkwyk 2011:39).

The following heritage sites, features, and objects are known to occur in the larger region (Morris 2011):

» Stone Age sites located near the foot of hills and in rock shelters where these have developed
» Sites with either rock engravings or rock paintings. Dolerite koppies in the region are known to have rock engravings (Fock & Fock 1989; Morris 1988; Parkington *et al*. 2008).
» Stock enclosures constructed of stone
» Burial sites in the vicinity of the Brak River
» Houses and other structures older than 60 years
» Farming infrastructure such as wind mills, etc.
» Alongside the nearby railway line there would be remains of the Anglo-Boer War blockhouse line as well as infrastructure relating to railway construction and maintenance.
» Graves and cemeteries, both formal and informal

The scoping report was compiled by J.A. van Schalkwyk. Please refer to the full report in Annexure A

5. HERITAGE SITE SIGNIFICANCE AND MITIGATION MEASURES

The presence and distribution of heritage resources define a 'heritage landscape'. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed Solar Facility the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface.

This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites. The following criteria were used to establish site significance:

1. The unique nature of a site;
2. The integrity of the archaeological/cultural heritage deposit;
3. The wider historic, archaeological and geographic context of the site;
4. The location of the site in relation to other similar sites or features;
5. The depth of the archaeological deposit (when it can be determined/is known);
6. The preservation condition of the site;
7. Potential to answer present research questions.

Furthermore, The National Heritage Resources Act (Act No 25 of 1999, Sec 3) distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria are:

1. its importance in/to the community, or pattern of South Africa's history; its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
2. its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
3. its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
4. its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
5. its importance in demonstrating a high degree of creative or technical achievement at a particular period;
6. its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
7. its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa;
8. sites of significance relating to the history of slavery in South Africa.

5.1. Field Rating of Sites

Site significance classification standards prescribed by the South African Heritage Resources Agency (2006), and approved by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 9 of this report.

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

5.2 Impact Rating Of Assessment

The following criteria are used to establish the impact rating of a site as provided by the client:

» 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, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):

» 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 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 of 1–5, where 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 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 and can be assessed as low, medium or high; and

» 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 calculated by combining the criteria in the following formula:

S=(E+D+M)P

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).

6. BASELINE STUDY -DESCRIPTION OF SITES

6.1 Site Layout Map

It is important to note that the entire farm was not surveyed, but only the footprint of the proposed PV Layout as indicated in Figure 1.

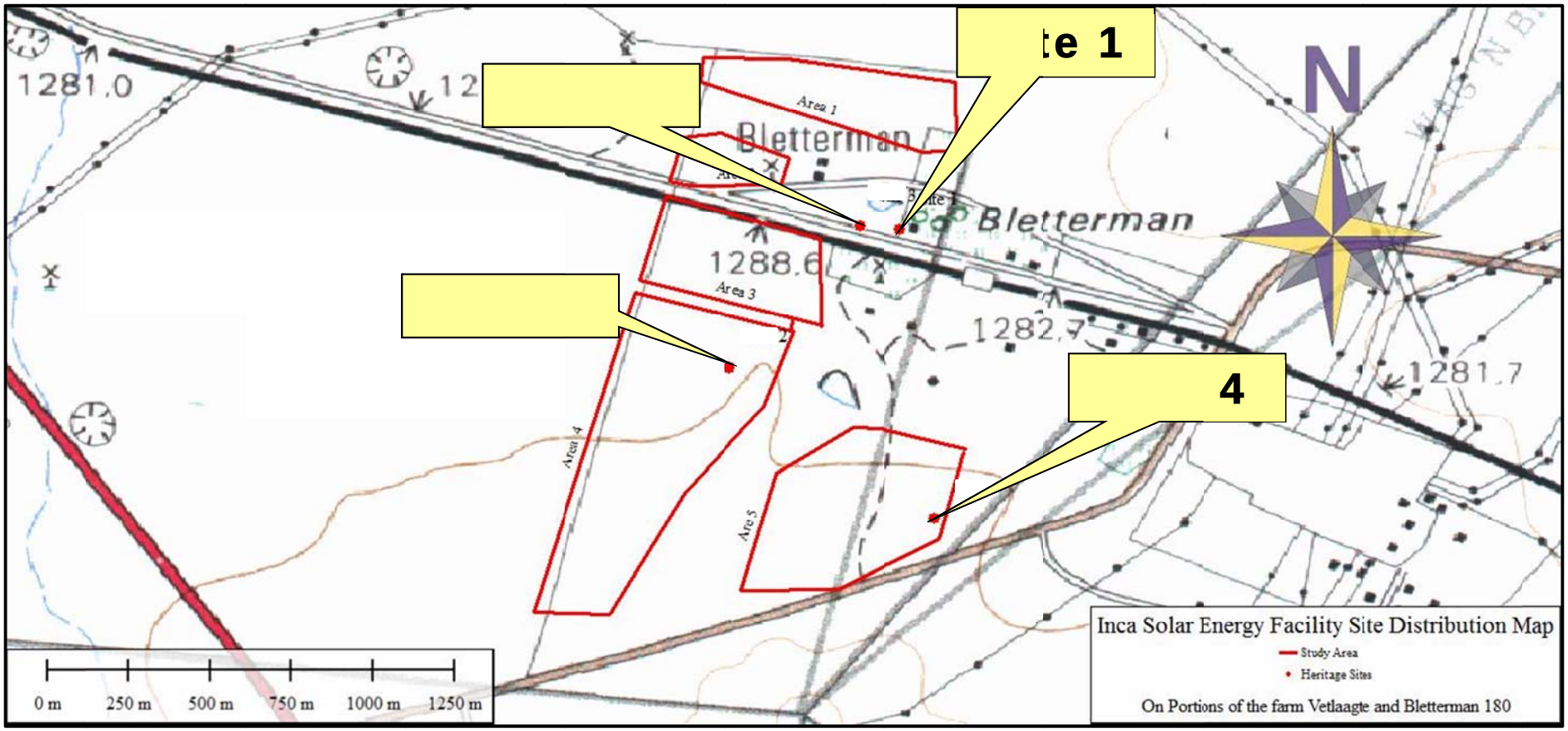

Figure 3: Site distribution map.

6.2. Sites with Coordinates

Four sites were recorded during the survey of the footprint of the proposed development. Of the four sites, Sites 1 and 3 are located outside of the impact areas and a secondary impact is foreseen on these sites. Sites 2 and 4 will be directly impacted on by the proposed development.

Site Number	Landscape	Type Site	Cultural Markers	Co ordinate
Site 1	Archaeological and Cultural Heritage	Historical	Old farm dwelling Relocated grave	S30 42 27.9 E24 04 37.4 S30 42 22.6 E24 04 39.5
Site 2	Archaeological and Cultural Heritage	Middle Stone Age	Stone tools with facets on the striking platform	S30 42 41.7 E24 04 20.4
Site3	Archaeological and Cultural Heritage	Historical	Dilapidated dwelling	S30 42 27.6 E24 04 33.3
Site 4	Archaeological and Cultural Heritage	Middle Stone Age	Stone tools with facets on the striking platform	S30 42 56.6 E24 04 40.9

6.3. Site Descriptions

*6.3. M*ain farm dwelling (Site 1), and labourer dwelling (Site 3) *in the northern areas of the proposed area of development*

Site Number	Site 1 and Site 3	**1:50 000 map nr**	3024 CA
Site Data	**Description:**		
Type of site	Open site		
Site categories	Possible recent or historic		
Context	Site 1 consists of a dilapidated farm house. During the survey it was not possible to arrange access to the house. Associated with the house is an enclosed cemetery consisting of a single grave that was apparently relocated about two years ago by the family. Just to the south west of Site 1 is Site 3. Site 3 consists of almost totally demolished outbuildings. This is presumably old farm labourer accommodation. Both these sites are located outside of the development footprint and will not be directly impacted by the development.		
Cultural affinities, approximate age and significant features of the site;	Based on the architecture of the structures, it is not possible to determine if the sites are older than 60 years. The scoping study also did not reveal the presence or the age of these structures. Site 3 is, however, not indicated on the 1:50 000 map of the area and is presumably more recent and not older than 60 years.		
Description of artefacts	Modern industrial artefacts, such as wire and cans, are scattered over the site.		
Estimation or measurement of the extent	The main farm dwelling (Site 1), and the labourer dwelling (Site 3), cover an area of 0.53 ha.		
Depth and stratification of the site	Not known		

Photographs

Figure 4: Southern view of Site 1.

Figure 5: South western view of Site 1.

Figure 6: Northern view of Site 3.

Figure 7: Close up of Site 3.

Field Rating (Recommended grading or field significance) of the site:	Generally Protected B for Site 1 Generally Protected C for Site 3
Statement of Significance (Heritage Value)	Low to Medium Significance if Site 1 is older than 60 years.

Impact Evaluation

Nature: During the operation of the project an indirect visual impact is expected for the site.

	Without mitigation	**With mitigation**
Extent	Local (2)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	High (8)	Low (2)
Probability	Probable (3)	Probable (3)
Significance	**45 (Medium)**	**24 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	

Mitigation:

The sites are located outside of the development footprint and no further action is necessary but some management actions might be necessary (Please refer to section 9).

Cumulative impacts:

Archaeological sites are non-renewable and impact on any archaeological context or material will be permanent and destructive.

Residual Impacts:

N.A

6.3.2 Artefacts found scattered along a dolerite ridge (*Site 2 and Site 4) in the southern areas of the proposed area of development*

Site Number	Site 2 and Site 4	**1:50 000 map nr**	3024 CA
Site Data	**Description:**		
Type of site	Open scatter		
Site categories	Middle Stone Age (quarry/workshop)		
Context	The site consists of MSA artefacts made of hornfels and scattered along a dolerite outcrop. The artefacts probably gravitated down from further south, where there is a large dolerite mountain (outside of the study area). The readily available raw material (dolerite) in this area resulted in a quarry/workshop site where stone artefacts were manufactured over millennia.		
Cultural affinities, approximate age and significant features of the site;	Approximate age for MSA in this region dates to 30-300 thousand years ago.		
Description of artefacts	The artefacts are patinated and appear orange/brown. Features on the flake tools include facets on the striking platform, a feature considered characteristic of MSA stone tool production. Blades, flakes and cores are present, but also smaller pieces that could be described as bladelets (< 10 mm wide). These are reminiscent of the Howieson's Poort between ~ 66 and 58 thousand years ago (Lombard 2011). These small pieces may also be of more recent LSA origin, but they have the same patination as artefacts with clear MSA characteristics. Artefact ratio is relatively low at 6 artefacts per m^2.		
Estimation or measurement of the extent	Artefacts are found scattered along a dolerite ridge over an approximate area of 2.8 ha.		
Depth and stratification of the site	Not known		

Photographs

Figure 8: General Site conditions at Site 2.

Figure 9: Artefacts found on Site 4.

Figure 10: Eastern view of Site 4.

Figure 11: Ridge that runs from Site 4 to Site 2.

Field Rating (Recommended grading or field significance) of the site:	Generally Protected B
Statement of Significance (Heritage Value)	Low-Medium significance.

Impact Evaluation

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its position Stone Age Material or objects.		
	Without mitigation	**With mitigation**
Extent	Local (2)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	High (7)	Low (2)
Probability	Probable (3)	Probable (3)
Significance	**42 (Medium)**	**24 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation: The artefacts are not *in situ* and are of low significance. No further action is necessary for these sites.		
Cumulative impacts: Archaeological sites are non-renewable and impact on any archaeological context or material will be permanent and destructive.		
Residual Impacts: N.A		

7. RECOMMENDATIONS

Four heritage sites were identified during the survey. The dilapidated buildings of the main farm dwelling (Site 1), and labourer dwelling (Site 3) are located outside the study area approximately 300 m from the closest PV plant areas 1, 2 and 3, and no direct impact is foreseen on these sites. If the site is older than 60 years, it is protected by legislation and forms part of the cultural landscape and sense of place, and a low secondary/visual impact can be expected on the site. The site might have to be mitigated, based on comments from the Northern Cape Heritage Authority, Built Environment Section.

Sites 2 and 4 (Artefacts found scattered along a dolerite ridge) are heavily eroded and represent a low density scatter of MSA material. This material is not *in situ* and is of low significance. MSA artefacts are scattered in low densities over the entire study area and Sites 2 and 4 represent a slightly higher concentration. No further action is necessary for these sites.

8. CONCLUSIONS

The abundance of locally available raw material in the form of hornfels or indurated shale resulted in the use of the landscape over millennia by Stone Age people. Stone Age remains are mostly represented by Middle Stone Age (MSA) artefacts scattered over the study area. Site 2 and Site 4 (Artefacts found scattered along a dolerite ridge) indicate relatively high frequencies of such artefacts.. Erosion of large hills, just outside and to the south of the study area, results in the gravitating of raw material and artefacts towards the gently dipping plains of the study area. Some of these deposits might be covered by the accumulation of clay and sandy soils in the valleys or plains.

Morris (2011) noted that the predominant archaeological component at most documented sites in the area appears to be Pleistocene and early Holocene in age. As a result of prolonged exposure to the elements, most of the artefacts show signs of weathering and/or oxidation and the knapped surfaces are thus highly patinated. . There are, however, also places with a much younger component of tools, probably dating to the late Holocene Later Stone Age (LSA). These assemblages are still relatively fresh-looking (little or no apparent patination – the artefacts are nearly black or gray as opposed to the more heavily patinated orange-brown of older stone tools). It can, therefore, be concluded that MSA and LSA assemblages are present on the landscape (referred to as MSA and LSA), but Earlier Stone Age (ESA) tools may also occur.

Remnants of the farm's history are represented in the form of a dilapidated farm dwelling and more recent labourer housing. These sites are, however, located outside of the development footprint of the project.

From an archaeological point of view, there is no reason why the development cannot commence work, if the developers adhere to the recommendations made under section 7 of this report.

If any possible finds such as tool scatters, bone or fossil remains are exposed or noticed during construction, the operations must be stopped and a qualified archaeologist must be contacted to assess the find.

General

Due to high sand cover, ground visibility was low on portions of the site during survey. The possible occurrence of unmarked or informal graves and subsurface finds can thus not be excluded. If during construction any possible finds are made, operations must be stopped and a qualified archaeologist be contacted for an assessment of the find.

9.MANAGEMENT MEASURES

Here brief consideration is given to measures that would be required during implementation of the proposed Inca solar PV facility No Archaeological mitigation is necessary prior to the start of construction but management measures would need to be taken into account to avoid damage to the local heritage.

OBJECTIVE: prevent unnecessary disturbance and/or destruction of historical structures that has not been mitigated for the development.

Project component/s	All phases of construction and operation		
Potential impact	Damage, disturbance and vandalism to Site 1.		
Activity risk/source	The structure might be used by construction staff for shelter and cooking and be damaged in this process. .		
Mitigation: target/objective	To retain historical structures in undisturbed condition such that future researchers could still work at the sites in their current condition.		
Mitigation: Action/control		Responsibility	Timeframe
Ensure that workers remain within the designated areas for the proposed development and that the structure is not used by workers for any purpose.		ECO	Construction and operation phases.
Performance indicator	Historical structure remains undamaged.		
Monitoring	No development or other activity outside of the development footprint.		

10. PROJECT TEAM

Jaco van der Walt, Project Manager

Dr. Marlize Lombard, Principle Investigator

11. STATEMENT OF COMPETENCY

I (Jaco van der Walt) am a member of ASAPA (no 159), and accredited in the following fields of the CRM Section of the association: Iron Age Archaeology, Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation. This accreditation is also valid for/acknowledged by SAHRA and AMAFA.

Currently, I serve as Council Member for the CRM Section of ASAPA, and have been involved in research and contract work in South Africa, Botswana, Zimbabwe, Mozambique and Tanzania; having conducted more than 300 AIAs since 2000.

Dr Marlize Lombard lectures in the Anthropology Department of the University of Johannesburg, where she also conducts research and publishes on the Stone Age of southern Africa. She is an accredited Stone Age Principal Investigator with ASAPA, SAHRA and AMAFA.

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ANNEXURE A:
HERITAGE SCOPING REPORT

Heritage scoping assessment for the
PROPOSED ESTABLISHMENT OF THE INCA ENERGY PV POWER PLANT, DE AAR REGION, NORTHERN CAPE PROVINCE

HERITAGE SCOPING REPORT FOR THE PROPOSED ESTABLISHMENT OF THE INCA ENERGY PV POWER PLANT, DE AAR REGION, NORTHERN CAPE PROVINCE

Report No: 2011/JvS/029
Status: Draft
Revision No: 0
Date: April 2011

Prepared for:
SAVANNAH Environmental (Pty) Ltd
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E-mail: jvschalkwyk@mweb.co.za

Declaration:

I, J.A. van Schalkwyk, declare that I do not have any financial or personal interest in the proposed development, nor its developers or any of their subsidiaries, apart from the provision of heritage assessment and management services.

J A van Schalkwyk (D Litt et Phil)
Heritage Consultant
April 2011

EXECUTIVE SUMMARY

HERITAGE SCOPING REPORT FOR THE PROPOSED ESTABLISHMENT OF THE INCA ENERGY PV POWER PLANT, DE AAR REGION, NORTHERN CAPE PROVINCE

INCA De Aar Solar (Pty) Ltd proposes to establish a commercial photovoltaic (PV) solar energy facility as well as the associated infrastructure on Remainder of Portion 2 (Bletterman) (Portion of Portion 1) of the farm De Aar 180 and Portion 1 of Farm 4 (Vetlaagte) which lies approximately 8 km southeast of the town of De Aar in the Northern Cape Province.

South Africa's heritage resources, also described as the 'national estate', comprise a wide range of sites, features, objects and beliefs. According to Section 27(18) of the National Heritage Resources Act (NHRA), Act 25 of 1999, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site.

In accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by **Savannah Environmental** to conduct a scoping assessment to determine if there are any fatal flaw issues from a heritage perspective within the boundaries of the proposed development area which would prevent the process from proceeding to a next level of investigation

This scoping study has revealed that a variety of heritage resources occur in the larger region and therefore there is a small likelihood that similar resources would be located in the study area, especially in the northern and southern areas where the hills and outcrops occur. Heritage resources usually manifest in a wide variety of forms, ranging from stone tools found as surface scatters, rock shelters, to stratified sites showing long sequences of occupation, and sites containing structures such as buildings, cemeteries and places to which cultural significance is attached.

Based on current knowledge, the sites, features and objects known to exist or that are expected to exist in the study area are judged to have Grade III significance and therefore would not prevent the project from continuing.

It is therefore recommended that, in accordance of Section 38 of the NHRA a Phase I HIA is undertaken to determine the presence of any heritage resources that may occur in the development area. Such a study would determine the level of significance of the identified resources as well as proposing mitigation measures for those resources that may be affected by the proposed development. The mitigation of heritage resources is referred to as Phase II studies and, depending on the type of resource, may include in depth studies before the impact may take place, or alternatively, that a resource must be avoided and protected.

J A van Schalkwyk
Heritage Consultant
April 2011

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GLOSSARY OF TERMS AND ABBREVIATIONS

TERMS

Study area: Refers to the entire study area as indicated by the client in the accompanying Fig. 1 & 2.

Stone Age: The first and longest part of human history is the Stone Age, which began with the appearance of early humans between 3-2 million years ago. Stone Age people were hunters, gatherers and scavengers who did not live in permanently settled communities. Their stone tools preserve well and are found in most places in South Africa and elsewhere.

Early Stone Age	2 000 000 - 150 000 Before Present
Middle Stone Age	150 000 - 30 000 BP
Late Stone Age	30 000 - until c. AD 200

Iron Age: Period covering the last 1800 years, when new people brought a new way of life to southern Africa. They established settled villages, cultivated domestic crops such as sorghum, millet and beans, and they herded cattle as well as sheep and goats. These people, according to archaeological evidence, spoke early variations of the Bantu Language. Because they produced their own iron tools, archaeologists call this the Iron Age.

Early Iron Age	AD 200 - AD 900
Middle Iron Age	AD 900 - AD 1300
Late Iron Age	AD 1300 - AD 1830

Historical Period: Since the arrival of the white settlers - c. AD 1840 - in this part of the country

ABBREVIATIONS

ADRC	Archaeological Data Recording Centre
ASAPA	Association of Southern African Professional Archaeologists
BP	Before Present
CS-G	Chief Surveyor-General
EIA	Early Iron Age
ESA	Early Stone Age
LIA	Late Iron Age
LSA	Later Stone Age
HIA	Heritage Impact Assessment
MSA	Middle Stone Age
NASA	National Archives of South Africa
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
SAHRA	South African Heritage Resources Agency

HERITAGE SCOPING REPORT FOR THE PROPOSED ESTABLISHMENT OF THE INCA ENERGY PV POWER PLANT, DE AAR REGION, NORTHERN CAPE PROVINCE

1. INTRODUCTION

INCA De Aar Solar (Pty) Ltd proposes to establish a commercial photovoltaic (PV) solar energy facility as well as the associated infrastructure on Remainder of Portion 2 (Bletterman) (Portion of Portion 1) of the farm De Aar 180 and Portion 1 of Farm 4 (Vetlaagte) which lies approximately 8 km southeast of the town of De Aar in the Northern Cape Province.

South Africa's heritage resources, also described as the 'national estate', comprise a wide range of sites, features, objects and beliefs. According to Section 27(18) of the National Heritage Resources Act (NHRA), Act 25 of 1999, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such site.

In accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by **Savannah Environmental** to conduct a scoping assessment to determine if there are any fatal flaw issues from a heritage perspective within the boundaries of the proposed development area which would prevent the process from proceeding to a next level of investigation

2. TERMS OF REFERENCE

The aim of this HIA, broadly speaking, is to determine if any sites, features or objects of cultural heritage significance occur within the boundaries of the area where it is planned to develop the transmission line.

The scope of work for this study consisted of:

- Conducting of a desk-top investigation of the area, in which all available literature, reports, databases and maps were studied.

The objectives were to

- Identify possible archaeological, cultural and historic sites within the proposed development area;
- Evaluate the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources;
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.

Table 1: Applicable category of heritage impact assessment study and report.

Type of study	Aim	SAHRA involved	SAHRA response
Screening	The aim of the screening investigation is to provide an overview of possible heritage-related issues regarding the proposed development by an appropriate heritage specialist. It is based on the review and use of existing heritage data pertaining to the site. The result of this investigation is a brief statement indicating potential heritage impacts/issues and can assist the developer in preliminary planning. This report does grant the developer permission to proceed with the proposed development.	Not necessary	
Scoping (basic assessment)	The aim of the scoping investigation is to provide an informed heritage-related opinion about the proposed development by an appropriate heritage specialist. The objectives are to assess heritage sites and their significance (involving site inspections, existing heritage data); to review the general compatibility of the development proposals with heritage policy and possible heritage features on the site. The result of this investigation is a heritage scoping report indicating the presence/absence of heritage resources and what would be required to manage them in the context of the proposed development. This report does not grant the developer permission to proceed with the proposed development.	Not compulsory	
Heritage Impact Assessment	The aim of a full HIA investigation is to provide an informed heritage-related opinion about the proposed development by an appropriate heritage specialist. The objectives are to identify heritage resources (involving site inspections, existing heritage data and additional heritage specialists if necessary); assess their significances; assess alternatives in order to promote heritage conservation issues; and to assess the acceptability of the proposed development from a heritage perspective. The result of this investigation is a heritage impact assessment report indicating the presence/ absence of heritage resources and how to manage them in the context of the proposed development. Depending on SAHRA's acceptance of this report, the developer will receive permission to proceed with the proposed development, on condition of successful implementation of proposed mitigation measures.	Provincial Heritage Resources Authority SAHRA Archaeology, Palaeontology and Meteorites Unit	Comments on built environ-ment and decision to approve or not Comments and decision to approve or not

3. HERITAGE RESOURCES

3.1 **The National Estate**

The NHRA (No. 25 of 1999) defines the heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations that must be considered part of the national estate to include:

- places, buildings, structures and equipment of cultural significance;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features of cultural significance;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds, including-
    - ancestral graves;
    - royal graves and graves of traditional leaders;
    - graves of victims of conflict;
    - graves of individuals designated by the Minister by notice in the Gazette;
    - historical graves and cemeteries; and
    - other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- sites of significance relating to the history of slavery in South Africa;
- movable objects, including-
    - objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
    - objects to which oral traditions are attached or which are associated with living heritage;
    - ethnographic art and objects;
    - military objects;
    - objects of decorative or fine art;
    - objects of scientific or technological interest; and
    - books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

3.2 **Cultural significance**

In the NHRA, Section 2 (vi), it is stated that ‘‘cultural significance’’ means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This is determined in relation to a site or feature’s uniqueness, condition of preservation and research potential.

According to Section 3(3) of the NHRA, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of

- its importance in the community, or pattern of South Africa's history;
- its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;

- its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
- sites of significance relating to the history of slavery in South Africa.

A matrix was developed whereby the above criteria were applied for the determination of the significance of each identified site (see Appendix 1). This allowed some form of control over the application of similar values for similar sites.

4. STUDY APPROACH AND METHODOLOGY

4.1 **Extent of the Study**

This survey and impact assessment covers the area as presented in Section 5 and as illustrated in Figures 1 - 2.

4.2 **Methodology**

4.2.1 *Preliminary investigation*

4.2.1.1 Survey of the literature
A survey of the relevant literature was conducted with the aim of reviewing the previous research done and determining the potential of the area: (Morris 2006, 2007; Richardson 2001; Sampson 1985; Van Jaarsveld 2006; Van Schalkwyk 2011).

- Information on events, sites and features in the larger region were obtained from these sources.

4.2.1.2 Data bases
The *Heritage Atlas Database,* the *Environmental Potential Atlas*, the *Chief Surveyor General* (CS-G) and the *National Archives of South Africa* (NASA) were consulted.

- Database surveys produced a number of sites located in the larger region of the proposed development.

4.2.1.3 Other sources
Aerial photographs and topocadastral and other maps were also studied - see the list of references below.

- Information of a very general nature was obtained from these sources.

4.3 **Limitations**

- This interpretation is based solely on available information.

5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

5.1 **Site location and description**

The study area is a rectangular shaped section of land located about 8 km southeast of the town of De Aar in the Northern Cape Province. It consists of Remainder of Portion 2 (Bletterman) (Portion of Portion 1) of the farm De Aar 180 and Portion 1 of Farm 4 (Vetlaagte) which lies approximately 8 km southeast of the town of De Aar in the Northern Cape Province (Fig. 1).

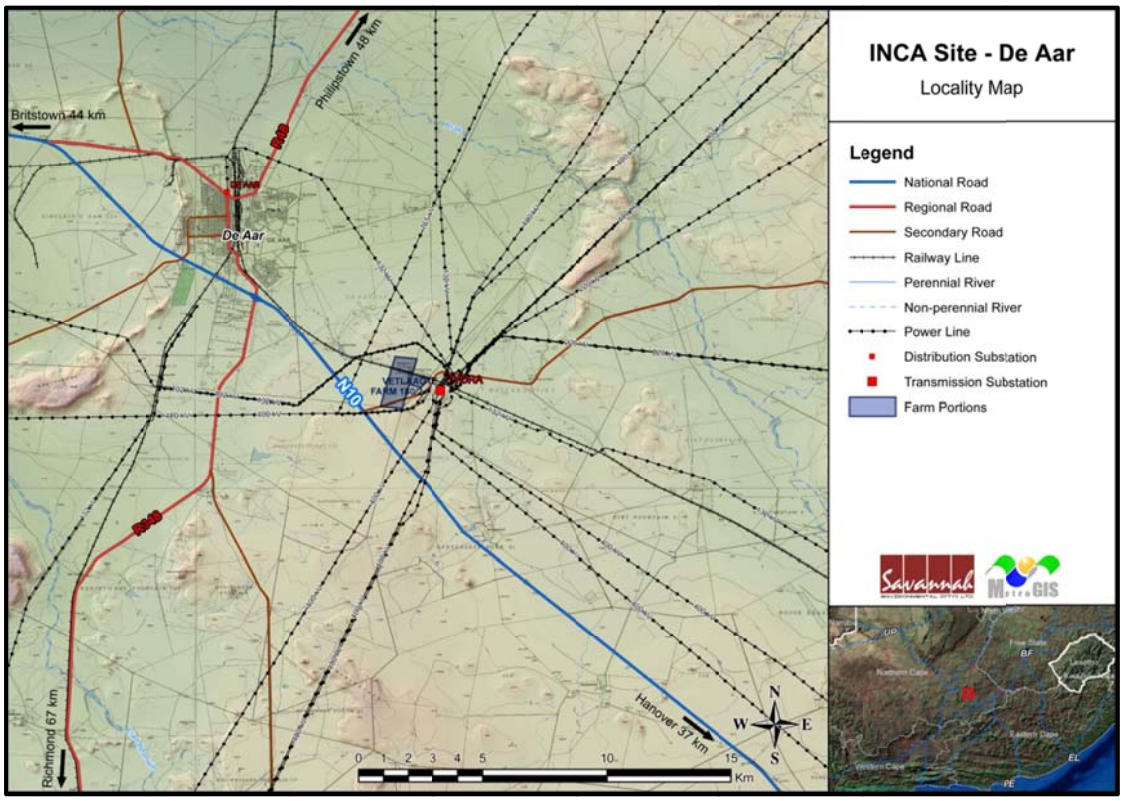

Fig. 1. Location of the study area in regional context.

The geology of the region is made up of mudstone and the original vegetation is classified as Eastern Mixed Nama Karoo. Overall the area is very flat, except in the northern and southern sections where some hills and outcrops occur. From aerial photographs it seems as if the eastern section of the site was previously impacted on by development activities, probably when the Hydra substation was built.

Fig. 2. Aerial view of the site.
(Photo: Google Earth)

5.2 **Regional overview**

Stone Age

Surveys done for example by Sampson (1985) to the south-east of the study area indicated a rich legacy in Stone Age sites in the Karoo. However, the region of the study area seems to have been a bit more marginal as no major sites or traditions have been identified in the region.

Occupation by early humans would probably date to the Middle Stone Age and would consist of open sites in the vicinity of stream beds or hills and outcrops. Population density might have increased during the Later Stone Age and people would have occupied rock shelters where available as well as open sites. During this later period they also produced rock engravings, although none are known from the immediate region.

Historic period

The town of De Aar was founded in 1881 on the farm by the same name. The farm originally belonged to Jan Vermeulen who sold it for the purpose of the development of the town. With the development of railways the town became an important station with one of the biggest marshalling yards in the country.

The famous South African author Olive Schreiner lived and worked in the town.

5.3 **Heritage potential**

The following heritage sites, features and objects are known to occur in the larger region:

- Stone Age sites located near the foot of hills, with an increased likelihood if there are rock shelters in the vicinity;

Historic period

- Houses and other structures older than 60 years;
- Farming infrastructure such as wind mills, etc.;
- Graves and cemeteries, both formal and informal.

Based on the above sources and experience in the region, as well as available information of the development site itself, it is expected that very few if any of the above will occur in the proposed development area.

6. SITE SIGNIFICANCE AND ASSESSMENT

6.1 **Heritage assessment criteria and grading**

The NHRA stipulates the assessment criteria and grading of archaeological sites. The following categories are distinguished in Section 7 of the Act:

- **Grade I**: Heritage resources with qualities so exceptional that they are of special national significance;
- **Grade II**: Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region; and
- **Grade III**: Other heritage resources worthy of conservation on a local authority level.

The occurrence of sites with a Grade I significance will demand that the development activities be drastically altered in order to retain these sites in their original state. For Grade II and Grade III sites, the applicable of mitigation measures would allow the development activities to continue.

6.2 **Statement of significance**

A matrix was developed whereby the above criteria, as set out in Sections 3(3) and 7 of the NHRA, No. 25 of 1999, were applied for each identified site (see Appendix 1). This allowed some form of control over the application of similar values for similar sites. Three categories of significance are recognized: low, medium and high. In terms of Section 7 of the NHRA, all the sites currently known or which are expected to occur in the study area are evaluated to have a grading as identified in the table below.

Table 2. Summary of identified heritage resources in the study area.

Identified heritage resources	
Category, according to NHRA	*Identification/Description*
Formal protections (NHRA)	
National heritage site (Section 27)	None
Provincial heritage site (Section 27)	None
Provisional protection (Section 29)	None
Place listed in heritage register (Section 30)	None
General protections (NHRA)	
structures older than 60 years (Section 34)	None
archaeological site or material (Section 35)	None
palaeontological site or material (Section 35)	None
graves or burial grounds (Section 36)	None
public monuments or memorials (Section 37)	None
Other	
Any other heritage resources (describe)	None

6.3 **Impact assessment**

Based on current information regarding sites in the surrounding area, all heritage sites expected to occur in the study region are judged to have Grade III significance.

7. CONCLUSIONS

This scoping study has revealed that a variety of heritage resources occur in the larger region and therefore there is a small likelihood that similar resources would be located in the study area, especially in the northern and southern areas where the hills and outcrops occur. Heritage resources usually manifest in a wide variety of forms, ranging from stone tools found as surface scatters, rock shelters, to stratified sites showing long sequences of occupation, and sites containing structures such as buildings, cemeteries and places to which cultural significance is attached.

Based on current knowledge, the sites, features and objects known to exist or that are expected to exist in the study area are judged to have Grade III significance and therefore would not prevent the project from continuing.

It is therefore recommended that, in accordance of Section 38 of the NHRA a Phase I HIA is undertaken to determine the presence of any heritage resources that may occur in the development area. Such a study would determine the level of significance of the identified resources as well as proposing mitigation measures for those resources that may be affected by the proposed development. The mitigation of heritage resources is referred to as Phase II studies and, depending on the type of resource, may include in depth studies before the impact may take place, or alternatively, that a resource must be avoided and protected.

8. REFERENCES

8.1 **Data bases**

Chief Surveyor General
Environmental Potential Atlas, Department of Environmental Affairs and Tourism.
Heritage Atlas Database, Pretoria.
National Archives of South Africa
SAHRA Archaeology and Palaeontology Report Mapping Project (2009)

8.2 **Literature**

Acocks, J.P.H. 1975. *Veld Types of South Africa*. Memoirs of the Botanical Survey of South Africa, No. 40. Pretoria: Botanical Research Institute.

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Van Schalkwyk, J.A. 2011. *Heritage impact assessment for the proposed development of a hospital in De Aar, Northern Cape Province*. Unpublished report 2011/JvS/014. Unpublished report.

8.3 **Maps and aerial photographs**

1: 50 000 Topocadastral maps: 3024CA
Google Earth

APPENDIX 1: CONVENTIONS USED TO ASSESS THE IMPACT OF PROJECTS ON HERITAGE RESOURCES

Significance

According to the NHRA, Section 2(vi) the **significance** of heritage sites and artefacts is determined by it aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

Matrix used for assessing the significance of each identified site/feature

1. Historic value			
Is it important in the community, or pattern of history			
Does it have strong or special association with the life or work of a person, group or organisation of importance in history			
Does it have significance relating to the history of slavery			
2. Aesthetic value			
It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group			
3. Scientific value			
Does it have potential to yield information that will contribute to an understanding of natural or cultural heritage			
Is it important in demonstrating a high degree of creative or technical achievement at a particular period			
4. Social value			
Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons			
5. Rarity			
Does it possess uncommon, rare or endangered aspects of natural or cultural heritage			
6. Representivity			
Is it important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects			
Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class			
Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality.			
7. Sphere of Significance	High	Medium	Low
International			
National			
Provincial			
Regional			
Local			
Specific community			
8. Significance rating of feature			
1.	Low		
2.	Medium		
3.	High		

Significance of impact:
- low where the impact will not have an influence on or require to be significantly accommodated in the project design
- medium where the impact could have an influence which will require modification of the project design or alternative mitigation
- high where it would have a “no-go” implication on the project regardless of any mitigation

Certainty of prediction:
- Definite: More than 90% sure of a particular fact. Substantial supportive data to verify assessment
- Probable: More than 70% sure of a particular fact, or of the likelihood of that impact occurring
- Possible: Only more than 40% sure of a particular fact, or of the likelihood of an impact occurring
- Unsure: Less than 40% sure of a particular fact, or the likelihood of an impact occurring

Recommended management action:
For each impact, the recommended practically attainable mitigation actions which would result in a measurable reduction of the impact, must be identified. This is expressed according to the following:

1 = no further investigation/action necessary
2 = controlled sampling and/or mapping of the site necessary
3 = preserve site if possible, otherwise extensive salvage excavation and/or mapping necessary
4 = preserve site at all costs
5 = retain graves

Legal requirements:
Identify and list the specific legislation and permit requirements which potentially could be infringed upon by the proposed project, if mitigation is necessary.

APPENDIX 2. RELEVANT LEGISLATION

All archaeological and palaeontological sites, and meteorites are protected by the National Heritage Resources Act (Act no 25 of 1999) as stated in Section 35:

(1) Subject to the provisions of section 8, the protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority: Provided that the protection of any wreck in the territorial waters and the maritime cultural zone shall be the responsibility of SAHRA.

(2) Subject to the provisions of subsection (8)(a), all archaeological objects, palaeontological material and meteorites are the property of the State. The responsible heritage authority must, on behalf of the State, at its discretion ensure that such objects are lodged with a museum or other public institution that has a collection policy acceptable to the heritage resources authority and may in so doing establish such terms and conditions as it sees fit for the conservation of such objects.

(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.

(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;

(c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or

(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.

In terms of cemeteries and graves the following (Section 36):

(1) Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.

(2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.

(3) 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.

(4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.