HERITAGE IMPACT SCOPING REPORT

Proposed establishment of a Photovoltaic Energy Generation Facility near Prieska in the Northern Cape Province.

Prepared By:

Prepared For:

Credit Sheet

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

Statement of Independence

As the duly appointed representative of G&A Heritage, I Stephan Gaigher, hereby confirm my independence as a specialist and declare that neither I nor G&A Heritage have any interests, be it business or otherwise, in any proposed activity, application or appeal in respect of which the Environmental Consultant was appointed as Environmental Assessment Practitioner, other than fair remuneration for work performed on this project.

Signed off by S. Gaigher

Site name and location: Proposed establishment of the Prieska Photovoltaic Energy Generation Facility as well as the associated grid integration infrastructure, Northern Cape.

Municipal Area: Siyatemba District Municipality.

Developer: Jouren Solar Pty Ltd

Consultant: G&A Heritage, PO Box 522, Louis Trichardt, 0920, South Africa. 38A Vorster Str. Louis Trichardt, 0920

Date of Report: 03 August 2012

Management Summary

The purpose of the management summary is to distil the information contained in the report into a format that can be used to give specific results quickly and facilitate management decisions. It is not the purpose of the management summary to repeat in shortened format all the information contained in the report, but rather to give a statement of results for decision making purposes.

This study focuses on the development of the proposed Prieska Solar Energy Generation Facility.

This study encompasses the Heritage Impact Scoping component of the environmental management process.

The purpose of the heritage impact scoping phase of the study is to determine the possible occurrence of sites with heritage significance within the study area and the evaluation of the significance of these sites as well as the possible impacts on such sites by the proposed developments.

Findings

It is recommended that the site be subjected to a detailed EIA phase investigation to determine if any sensitive heritage resources are located within the development footprint.

Recommendations

It is recommended that the site be subjected to a full EIA phase Heritage Impact Assessment including Palaeontology before the development continues.

Fatal Flaws

No fatal flaws were identified.

Contents

List of Figures

List of Abbreviations

Bp	Before Present
EIA	Early Iron Age
ESA	Early Stone Age
GPS	Geographic Positioning System
HIA	Heritage Impact Assessment
LIA	Late Iron Age
LSA	Late Stone Age
MYA	Million Years Ago
MSA	Middle Stone Age
NHRA	National Heritage Resources Act no 22 of 1999
SAHRA	South African Heritage Resource Agency
S&EIR	Scoping & Environmental Impact Reporting
WGS 84	World Geodetic System for 1984
WHS	World Heritage Site

Heritage Impact Scoping Report for the Proposed Prieska Solar Energy Facility

Introduction

Legislation and methodology

G&A Heritage was appointed by Savannah Environmental (Pty) Ltd to undertake a heritage impact scoping study for the proposed Prieska Solar Energy Facility. Section 27(1) of the South African Heritage Resources Act (25 of 1999) requires that a heritage study is undertaken for:

(a) construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
(b) construction of a bridge or similar structure exceeding 50 m in length; and
(c) any development, or other activity which will change the character of an area of land, or water –
(1) exceeding 10 000 m^2 in extent;
(2) involving three or more existing erven or subdivisions thereof; or
(3) involving three or more erven, or subdivisions thereof, which have been consolidated within the past five years; or
(d) the costs of which will exceed a sum set in terms of regulations; or
(e) any other category of development provided for in regulations.

This study focusses on the following:

(a) places, buildings, structures and equipment;
(b) places to which oral traditions are attached or which are associated with living heritage;
(c) historical settlements and townscapes;
(d) landscapes and natural features;
(e) geological sites of scientific or cultural importance;
(f) archaeological and paleontological sites;
(g) graves and burial grounds, including –
(1) ancestral graves,
(2) royal graves and graves of traditional leaders,
(3) graves of victims of conflict (iv) graves of important individuals,
(4) historical graves and cemeteries older than 60 years, and
(5) other human remains which are not covered under the Human Tissues Act, 1983 (Act No.65 of 1983 as amended);
(h) movable objects, including ;
(1) objects recovered from the soil or waters of South Africa including archaeological and paleontological objects and material, meteorites and rare geological specimens;
(2) ethnographic art and objects;
(3) military objects;
(4) objects of decorative art;
(5) objects of fine art;
(6) objects of scientific or technological interest;
(7) books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings; and
(8) any other prescribed categories, but excluding any object made by a living person;
(i) battlefields;
(j) traditional building techniques.

A '**place**' is defined as:
(a) A site, area or region;
(b) A building or other structure (which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure);
(c) a group of buildings or other structures (which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures);

and (d) an open space, including a public square, street or park; and in relation to the management of a place, includes the immediate surroundings of a place.

'**Structures**' means any building, works, device, or other facility made by people and which is fixed to land and any fixtures, fittings and equipment associated therewith older than 60 years.

'Archaeological' means:
(a) material remains resulting from human activity which are in a state of disuse and are in or on land and are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
(b) rock art, being a form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and is older than 100 years including any area within 10 m of such representation; and
(c) wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land or in the maritime cultural zone referred to in section 5 of the Maritime Zones Act 1994 (Act 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which are older than 60 years or which in terms of national legislation are considered to be worthy of conservation;
(d) features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

'Palaeontological' means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

'Grave' means a place of interment and includes the contents, headstone or other marker of and any other structures on or associated with such place. The South African Heritage Resources Agency (SAHRA) will only issue a permit for the alteration of a grave if it is satisfied that every reasonable effort has been made to contact and obtain permission from the families concerned.

The removal of graves is subject to the following procedures as outlined by the SAHRA:

- Notification of the impending removals (using English, Afrikaans and local language media and notices at the grave site);
- Consultation with individuals or communities related or known to the deceased;
- Satisfactory arrangements for the curation of human remains and / or headstones in a museum, where applicable;
- Procurement of a permit from the SAHRA;
- Appropriate arrangements for the exhumation (preferably by a suitably trained archaeologist) and re-interment (sometimes by a registered undertaker, in a formally proclaimed cemetery);
- Observation of rituals or ceremonies required by the families.

Background Information
Proposed Prieska Solar Energy Facility

Project Description
The proposed facility would have a generating capacity of 75 MW obtained through the use of photovoltaic panels.

Site Location
The project is proposed on Portion 3 of the farm Holsloot 47, which is located in the Siyathemba Local Municipality.

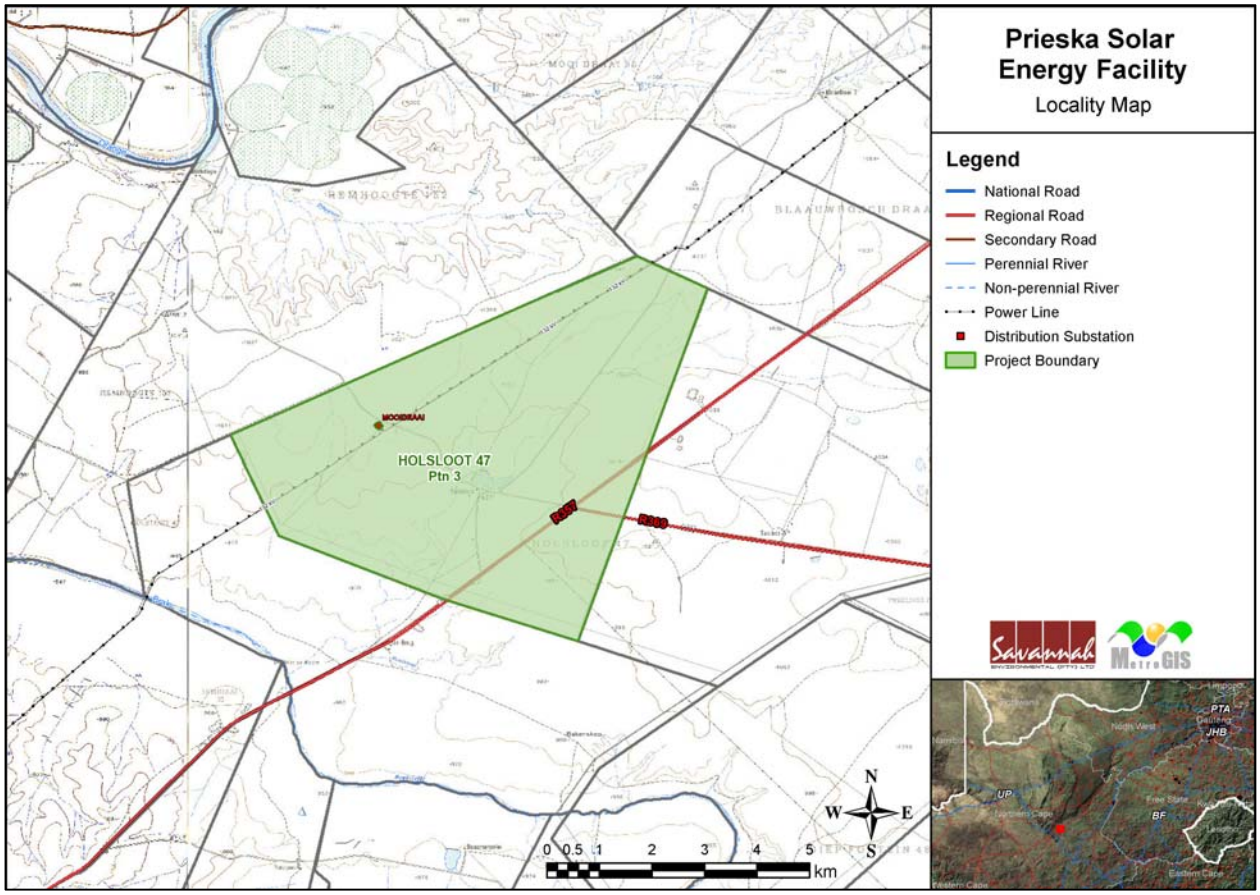

Figure 1. Location of Proposed Development

Figure 2. Aerial view of study area

Methodology

This study defines the heritage scoping component of the Environmental Scoping process being undertaken for the Prieska Solar Energy Facility. It is described as a Heritage Scoping Report. This report attempts to evaluate the accumulated heritage knowledge of the area as well as its heritage sensitivity towards the proposed development.

Evaluating Heritage Impacts

This Scoping Report relies on the analysis of written documents, maps, aerial photographs and other archival sources. Site investigations were not performed as this will be done during the EIA phase of the project.

The following documents were consulted in this study;

- South African National Archive Documents
- SAHRA Database of Heritage Studies
- Prieska Museum Information
- Internet Search
- Historic Maps
- 1936 and 1952 Surveyor General Topographic Map series
- 1952 1:10 000 aerial photo survey
- Google Earth 2011, 2009 & 2003 imagery
- Published articles and books
- JSTOR Article Archive
- Genealogical Society of South Africa
- South African Rock Art Digital Archive (SARADA)
- Rock Art Research Institute (RARI)

Assumptions and Restrictions

- It is assumed that the SAHRA database locations are correct
- It is assumed that the proposed layout as supplied by Savannah Environmental (Pty) Ltd is correct.

Heritage Indicators within the Receiving Environment
Regional Cultural Context

Palaeontology
Beneath the superficial sediment cover, Permo-Carboniferous glacial sediments of **Dwyka Group** (C-Pd, **Karoo Supergroup)** underlie almost the entire Klipgats Pan study area. Dwyka rocks may therefore be intersected by deeper excavations during development. The geology of the Dwyka Group has been summarized by Visser (1989), Visser *et al.* (1990) and Johnson *et al.* (2006), among others.

The Dwyka Group along the north-western margin of the Main Karoo Basin, including the Prieska Subbasin in particular, has been reviewed by Visser (1982, 1985). In Dwyka times the Prieska – Copperton area lay within a basement high region between the Sout River Valley in the west and the Prieska Basin in the east (Fig. 5). This area is referred to as the Kaiing Hills or Kaiing Veld Region by Visser and is characterized by a relatively thin Dwyka succession (normally < 50m). This mainly comprises massive clast-rich diamictites and clast–poor argillaceous diamictites ("boulder shale") overlain by a thin zone of laminated dropstone argillite with outsized clasts composed mainly of quartzite and gneiss (Visser 1985; Fig. 6 below). Note the presence of an isolated peak (monadnock) of Proterozoic basement rocks emerging through the Dwyka cover rocks to the southeast of Copperton (ibid.). Ice transport directions initially towards the south and later towards the southwest are reconstructed by Visser (1985, his Fig. 17). The source area of many of the exotic boulder erratics (e.g. stromatolitic carbonates of Griqualand West succession, amygdaloidal lavas of the Ventersdorp Supergroup) seen in the Dwyka succession near Copperton, as well as the Prieska Basin to the east, is the elevated Ghaap Plateau to the north of Prieska (Visser 1982).

Further detailed observations on the Dwyka beds on the northern edge of the Britstown 1: 250 000 sheet are provided by Prinsloo (1989). Good surface outcrops of the Dwyka beds are rare here due to extensive cover by thin surface gravels. Massive tillites at the base of the Dwyka succession were deposited by dry-based ice sheets in deeper basement valleys. Later climatic amelioration led to melting, marine transgression and the retreat of the ice sheets onto the continental highlands in the north. The valleys were then occupied by marine inlets within which drifting glaciers deposited dropstones onto the muddy sea bed ("boulder shales"). The upper Dwyka beds are typically heterolithic, with shales, siltstones and fine-grained sandstones of deltaic and / or turbiditic origin. These upper successions are typically upwards-coarsening and show extensive soft- sediment deformation (loading and slumping). Varved (rhythmically laminated) mudrocks with gritty to fine gravely dropstones indicate the onset of highly seasonal climates, with warmer intervals leading occasionally even to limestone precipitation (Almond J.E. 2012).

Stone Age
Stone Age sites in the demarcated study area and surrounds is not well known or described. Some open-air sites have been identified, however, despite significant research in the area, very few Stone Age sites have been identified this far west in the Northern Cape. Some Middle Stone Age sites containing flakes and cores are found in open areas while Late Stone Age sites are found in more sheltered sites within river valleys and hills.

Rock Art
Some Khoisan associated rock art sites are found on farms around the town of Prieska.

Iron Age
No Iron Age sites are known from this area.

The Historic Era
Although there is no consensus as to the actual spelling of the original name of this Northern Cape town, varying from Priskab to Prieschap, its meaning is unequivocally “The place of the lost she-goat”. According to the *SA Pleknaamwoordeboek Deel 1*, in Korana *beris* means she-goat while *ga* is dead or lost. Thus, Prieska.

Like most towns along the Orange River, Prieska was a ford across the river long before white settlers arrived. Only in 1878 was it proclaimed a municipality and gained status as a full-fledged town.

Situated on the south bank of the Orange River at the foot of the Doringberg and at the time not much more than a church and a collection of townhouses for the farmers of the district, Prieska played a minor role in the Anglo Boer War. In 1900 the little-known revolt by the Cape Afrikaners took place in and around Prieska and some skirmishes with the British troops resulted. The rebellion lasted until early April and spread throughout the north-western Cape, until a British force under Lord Kitchener’s supervision dispersed most of the Boers and their Cape sympathisers. They retreated to Transvaal.

Other highlights of the Boer War were:
- On the 13th of January 1900 New South Welshmen were attacked at Prieska by Boers.
- Captain Arthur Henry Uhthoff Tindal of the Welsh Regiment died of wounds at Kheis on the 29th of May 1900, aged 42. He was buried at Prieska.
- In March 1900 a skirmish took place at Houwater, Prieska, between British troops and Boer forces.

Utilising the region’s tiger’s eye stones, the British built a fort on top of the Prieska Kopje overlooking the town. This is still a major tourist feature.
The graves of British soldiers who died in the war are maintained in the Memorial Garden.

Built Environment
Most of the study area falls within an undeveloped rural landscape with little or no built structures. The only built structures expected to be encountered in this area would be farm homesteads and their associated infrastructures. It is not anticipated that any of these structures would be affected by the proposed development.

Should the developer decide to utilise any of the existing structures for their operations and this entails alterations to the buildings it is recommended that they subject these to further study before such actions.

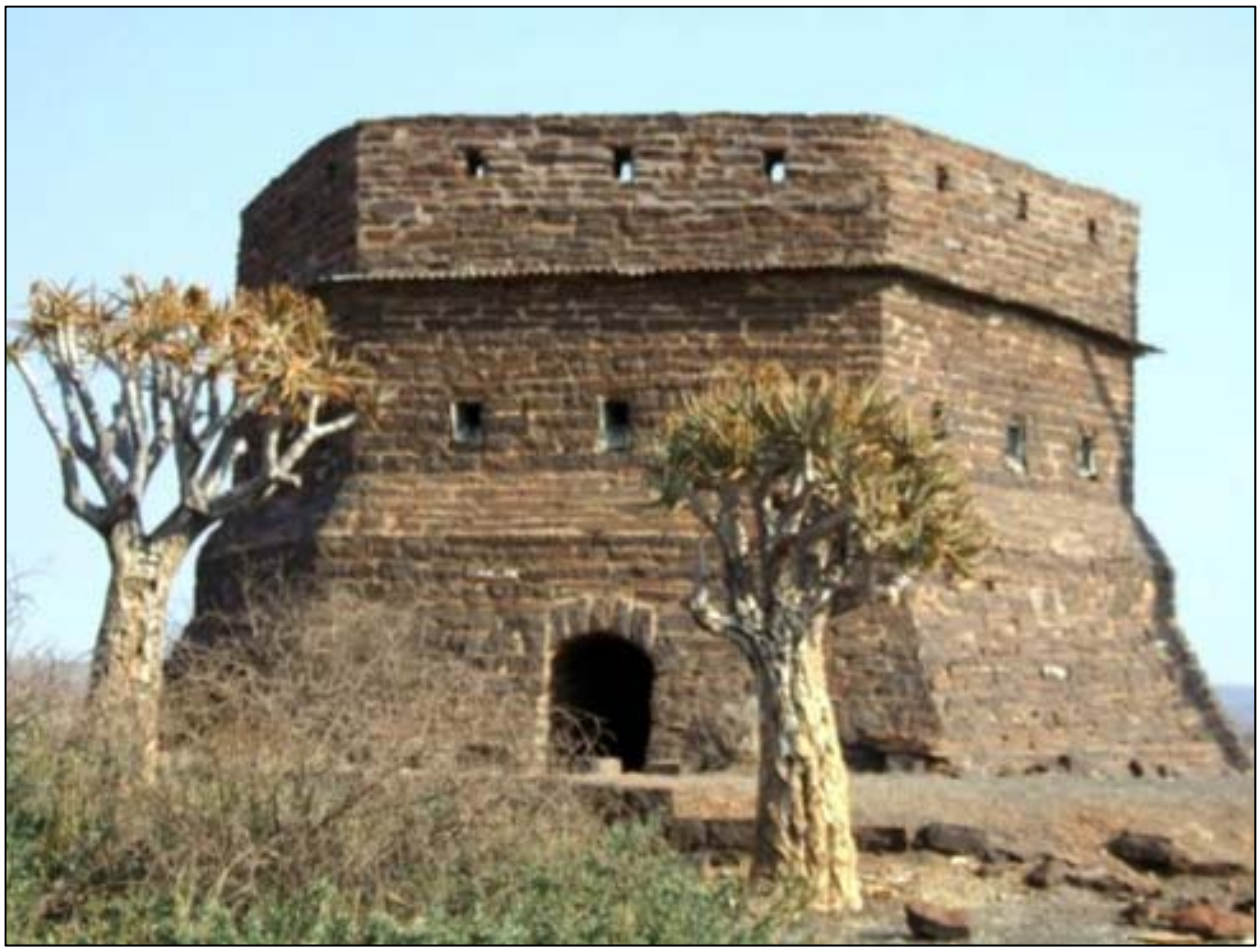

Figure 3. British fort at Prieska

Several skirmish sites related to the South African War is also found in the area and it is expected that indications of these, such as spent cartridges, tin cans etc. could be expected in the study area.

Previous Studies in the Area

Several heritage related studies have recently been performed in this area among these are;

- John E. Almond, 2012. Proposed photovoltaic energy plant on Farm Klipgats Pan (Portion 4 of Farm 117) near Copperton, Northern Cape Province
- J, van Schalkwyk, 2011. Heritage Impact Assessment Report For The Proposed Establishment Of PV Solar Facilities By Mainstream Renewable Power In The Prieska Region, Northern Cape Province

These studies showed the possible occurrence of important Stone Age as well as palaeontological finds in the immediate surrounding areas. This will therefore be applicable to this study.

Recommendations

The area proposed for the development of the Prieska Solar Energy Facility is located in an underdeveloped rural area east of the town of Prieska. This overview study indicated that there is nearly no chance of encountering sites of Iron Age origin or sites within the Built Environment components. More likely will be the occurrence of sites within the Stone Age and Palaeontological as well as the Historic spheres.

It is recommended that the study area be subjected to a full EIA phase heritage investigation including a palaeontological impact assessment. The underground cabling as well as any deep foundations could very well impact on sensitive palaeontological deposits.

Specific areas likely to hold sites of Stone Age origin (including rock art) will be the edge of waterways, water confluences and elevated areas with rock faces that could harbor rock shelter sites.

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APPENDIX A

General Methodology

Methodology

Inventory

Inventory studies involve the in-field survey and recording of archaeological resources within a proposed development area. The nature and scope of this type of study is defined primarily by the results of the overview study. In the case of site-specific developments, direct implementation of an inventory study may preclude the need for an overview.

There are a number of different methodological approaches to conducting inventory studies. Therefore, the proponent, in collaboration with the archaeological consultant, must develop an inventory plan for review and approval by the SAHRA prior to implementation (*Dincause, Dena F., H. Martin Wobst, Robert J. Hasenstab and David M. Lacy 1984)*.

Significance Criteria

There are several kinds of significance, including scientific, public, ethnic, historic and economic, that need to be taken into account when evaluating heritage resources. For any site, explicit criteria are used to measure these values. Checklists of criteria for evaluating pre-contact and post-contact archaeological sites are provided in Appendix B and Appendix C. These checklists are not intended to be exhaustive or inflexible. Innovative approaches to site evaluation which emphasize quantitative analysis and objectivity are encouraged. The process used to derive a measure of relative site significance must be rigorously documented, particularly the system for ranking or weighting various evaluated criteria.

Site integrity, or the degree to which a heritage site has been impaired or disturbed as a result of past land alteration, is an important consideration in evaluating site significance. In this regard, it is important to recognize that although an archaeological site has been disturbed, it may still contain important scientific information.

Heritage resources may be of scientific value in two respects. The potential to yield information which, if properly recovered, will enhance understanding of Southern African human history is one appropriate measure of scientific significance. In this respect, archaeological sites should be evaluated in terms of their potential to resolve current archaeological research problems. Scientific significance also refers to the potential for relevant contributions to other academic disciplines or to industry.

Public significance refers to the potential a site has for enhancing the public's understanding and appreciation of the past. The interpretive, educational and recreational potential of a site are valid indications of public value. Public significance criteria such as ease of access, land ownership, or scenic setting are often external to the site itself. The relevance of heritage resource data to private industry may also be interpreted as a particular kind of public significance.

Ethnic significance applies to heritage sites which have value to an ethnically distinct community or group of people. Determining the ethnic significance of an archaeological site may require consultation with persons having special knowledge of a particular site. It is essential that ethnic significance be assessed by someone properly trained in obtaining and evaluating such data.

Historic archaeological sites may relate to individuals or events that made an important, lasting contribution to the development of a particular locality or the province. Historically important sites also reflect or commemorate the historic socioeconomic character of an area. Sites having high historical value will also usually have high public value.

The economic or monetary value of a heritage site, where calculable, is also an important indication of significance. In some cases, it may be possible to project monetary benefits derived from the public's use of a heritage site as an educational or recreational facility. This may be accomplished by employing established economic evaluation methods; most of which have been developed for valuating outdoor recreation. The objective is to determine the willingness of users, including local residents and tourists, to pay for the experiences or services the site provides even though no payment is presently being made. Calculation of user benefits will normally require some study of the visitor population *(Smith, L.D. 1977)*.

Assessing Impacts

A heritage resource impact may be broadly defined as the net change between the integrity of a heritage site with and without the proposed development. This change may be either beneficial or adverse.

Beneficial impacts occur wherever a proposed development actively protects, preserves or enhances a heritage resource. For example, development may have a beneficial effect by preventing or lessening natural site erosion. Similarly, an action may serve to preserve a site for future investigation by covering it with a protective layer of fill. In other cases, the public or economic significance of an archaeological site may be enhanced by actions which facilitate non-destructive public use. Although beneficial impacts are unlikely to occur frequently, they should be included in the assessment.

More commonly, the effects of a project on heritage sites are of an adverse nature. Adverse impacts occur under conditions that include:

(a) destruction or alteration of all or part of a heritage site;

(b) isolation of a site from its natural setting; and

(c) introduction of physical, chemical or visual elements that are out-of-character with the heritage resource and its setting.

Adverse effects can be more specifically defined as direct or indirect impacts. Direct impacts are the immediately demonstrable effects of a project which can be attributed to particular land modifying actions. They are directly caused by a project or its ancillary facilities and occur at the same time and place. The immediate consequences of a project action, such as slope failure following reservoir inundation, are also considered direct impacts.

Indirect impacts result from activities other than actual project actions. Nevertheless, they are clearly induced by a project and would not occur without it. For example, project development may induce changes in land use or population density, such as increased urban and recreational development, which may indirectly impact upon heritage sites. Increased vandalism of heritage sites, resulting from improved or newly introduced access, is also considered an indirect impact. Indirect impacts are much more difficult to assess and quantify than impacts of a direct nature.

Once all project related impacts are identified, it is necessary to determine their individual level-of-effect on heritage resources. This assessment is aimed at determining the extent or degree to which future opportunities for scientific research, preservation, or public appreciation are foreclosed or otherwise adversely affected by a proposed action. Therefore, the assessment provides a reasonable indication of the relative significance or importance of a particular impact. Normally, the assessment should follow site evaluation since it is important to know what heritage values may be adversely affected.

The assessment should include careful consideration of the following level-of-effect indicators, which are defined in Appendix D:

- magnitude
- severity
- duration
- range
- frequency
- diversity
- cumulative effect
- rate of change

The level-of-effect assessment should be conducted and reported in a quantitative and objective fashion. The methodological approach, particularly the system of ranking level-of-effect indicators, must be rigorously documented and recommendations should be made with respect to managing uncertainties in the assessment. *(Zubrow, Ezra B.A., 1984).*

The study area was surveyed using standard archaeological surveying methods. The area was surveyed using directional parameters supplied by the GPS and surveyed by foot. This technique has proven to result in the maximum coverage of an area. This action is defined as;

'an archaeologist being present in the course of the carrying-out of the development works (which may include conservation works), so as to identify and protect archaeological deposits, features or objects which may be uncovered or otherwise affected by the works' (DAHGI 1999a, 28).

Standard archaeological documentation formats were employed in the description of sites. Using standard site documentation forms as comparable medium, it enabled the surveyors to evaluate the relative importance of sites found. Furthermore GPS (Global Positioning System) readings of all finds and sites were taken. This information was then plotted using a ***Garmin Colorado*** GPS (WGS 84- datum).

Indicators such as surface finds, plant growth anomalies, local information and topography were used in identifying sites of possible archaeological importance. Test probes were done at intervals to determine sub-surface occurrence of archaeological material. The importance of sites was assessed by comparisons with published information as well as comparative collections.

Test excavation is that form of archaeological excavation where the purpose is to establish the nature and extent of archaeological deposits and features present in a location which it is proposed to develop (though not normally to fully investigate those deposits or features) and allow an assessment to be made of the archaeological impact of the proposed development. It may also be referred to as archaeological testing' (DAHGI 1999a, 27).

'Test excavation should not be confused with, or referred to as, archaeological assessment which is the overall process of assessing the archaeological impact of development. Test excavation is one of the techniques in carrying out archaeological assessment which may also include, as appropriate, documentary research, field walking, examination of upstanding or visible features or structures, examination of aerial photographs, satellite or other remote sensing imagery, geophysical survey, and topographical assessment' (DAHGI 1999b, 18).

Scientific Significance

(a) Does the site contain evidence which may substantively enhance understanding of culture history, culture process, and other aspects of local and regional prehistory?

internal stratification and depth

chronologically sensitive cultural items

materials for absolute dating

association with ancient landforms

quantity and variety of tool type

distinct intra-site activity areas

tool types indicative of specific socio-economic or religious activity

cultural features such as burials, dwellings, hearths, etc.

diagnostic faunal and floral remains

exotic cultural items and materials

uniqueness or representativeness of the site

integrity of the site

(b) Does the site contain evidence which may be used for experimentation aimed at improving archaeological methods and techniques?

monitoring impacts from artificial or natural agents

site preservation or conservation experiments

data recovery experiments

sampling experiments

intra-site spatial analysis

(c) Does the site contain evidence which can make important contributions to paleoenvironmental studies?

topographical, geomorphological context

depositional character

diagnostic faunal, floral data

(d) Does the site contain evidence which can contribute to other scientific disciplines such as hydrology, geomorphology, pedology, meteorology, zoology, botany, forensic medicine, and environmental hazards research, or to industry including forestry and commercial fisheries?

Public Significance

(a) Does the site have potential for public use in an interpretive, educational or recreational capacity?

integrity of the site

technical and economic feasibility of restoration and development for public use

visibility of cultural features and their ability to be easily interpreted

accessibility to the public

opportunities for protection against vandalism

representativeness and uniqueness of the site

aesthetics of the local setting

proximity to established recreation areas

present and potential land use

land ownership and administration

legal and jurisdictional status

local community attitude toward development

(b) Does the site receive visitation or use by tourists, local residents or school groups?

Ethnic Significance

(a) Does the site presently have traditional, social or religious importance to a particular group or community?

ethnographic or ethno-historic reference

documented local community recognition or, and concern for, the site

Economic Significance

(a) What value of user-benefits may be placed on the site?

visitors' willingness-to-pay

visitors' travel costs

Scientific Significance

(a) Does the site contain evidence which may substantively enhance understanding of historic patterns of settlement and land use in a particular locality, regional or larger area?

(b) Does the site contain evidence which can make important contributions to other scientific disciplines or industry?

Historic Significance

(a) Is the site associated with the early exploration, settlement, land use, or other aspect of southern Africa’s cultural development?

(b) Is the site associated with the life or activities of a particular historic figure, group, organization, or institution that has made a significant contribution to, or impact on, the community, province or nation?

(c) Is the site associated with a particular historic event whether cultural, economic, military, religious, social or political that has made a significant contribution to, or impact on, the community, province or nation?

(d) Is the site associated with a traditional recurring event in the history of the community, province, or nation, such as an annual celebration?

Public Significance

(a) Does the site have potential for public use in an interpretive, educational or recreational capacity?

visibility and accessibility to the public

ability of the site to be easily interpreted

opportunities for protection against vandalism

economic and engineering feasibility of reconstruction, restoration and maintenance

representativeness and uniqueness of the site

proximity to established recreation areas

compatibility with surrounding zoning regulations or land use

land ownership and administration

local community attitude toward site preservation, development or destruction

present use of site

(b) Does the site receive visitation or use by tourists, local residents or school groups?

Ethnic Significance

(a) Does the site presently have traditional, social or religious importance to a particular group or community?

Economic Significance

(a) What value of user-benefits may be placed on the site?

visitors' willingness-to-pay

visitors' travel costs

Integrity and Condition

(a) Does the site occupy its original location?

(b) Has the site undergone structural alterations? If so, to what degree has the site maintained its original structure?

(c) Does the original site retain most of its original materials?

(d) Has the site been disturbed by either natural or artificial means?

Other

(a) Is the site a commonly acknowledged landmark?

(b) Does, or could, the site contribute to a sense of continuity or identity either alone or in conjunction with similar sites in the vicinity?

(c) Is the site a good typical example of an early structure or device commonly used for a specific purpose throughout an area or period of time?

(d) Is the site representative of a particular architectural style or pattern?

Indicators of Impact Severity

Magnitude

The amount of physical alteration or destruction which can be expected. The resultant loss of heritage value is measured either in amount or degree of disturbance.

Severity

The irreversibility of an impact. Adverse impacts which result in a totally irreversible and irretrievable loss of heritage value are of the highest severity.

Duration

The length of time an adverse impact persists. Impacts may have short-term or temporary effects, or conversely, more persistent, long-term effects on heritage sites.

Range

The spatial distribution, whether widespread or site-specific, of an adverse impact.

Frequency

The number of times an impact can be expected. For example, an adverse impact of variable magnitude and severity may occur only once. An impact such as that resulting from cultivation may be of recurring or on-going nature.

Diversity

The number of different kinds of project-related actions expected to affect a heritage site.

Cumulative Effect

A progressive alteration or destruction of a site owing to the repetitive nature of one or more impacts.

Rate of Change

The rate at which an impact will effectively alter the integrity or physical condition of a heritage site. Although an important level-of-effect indicator, it is often difficult to estimate. Rate of change is normally assessed during or following project construction.