

Archaeological Impact Assessment

FOR THE WATER SUPPLY PIPELINE FOR THE AUTHORISED SOLIS CONCENTRATED SOLAR
POWER (CSP) PLANT, UPINGTON, NORTHERN CAPE PROVINCE

Prepared For
Savannah Environmental (Pty) Ltd

By



HERITAGE

Contracts and Archaeological Consulting

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EXECUTIVE SUMMARY

Site name and location: The proposed Solis water supply pipeline (option 1 & 2) originate from an existing reservoir to the north east of Upington going in a north westerly direction towards the approved Solis CSP facility on the farm Van Rooy's Vlei. Option 1 follows the railway line (approximately 3m outside the servitude) and Option 2 along the N10 (about 60 m from the road for most of the route).

Purpose of the study: Archaeological Impact Assessment of the proposed options to determine the presence of cultural heritage sites and the impact of the proposed pipeline on these non-renewable resources.

1:50 000 Topographic Map: 2821 AC.

EIA Consultant: Savannah Environmental (Pty) Ltd

Developer: Solis Power 1 (Pty) Ltd

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

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Date of Report: 16 April 2014.

Findings of the Assessment:

The impacts to heritage resources by the proposed development are considered to be low. One site was recorded during the assessment for the project. **Site 1** consists of ostrich eggshell fragments, LSA flakes and a bully beef can dating from the late 1800's – early 1900's around a small kopje known as "Seepotkoppie". This kopje is also the only focal point on a relatively featureless landscape. A wide scatter of ex situ isolated MSA material was also recorded on low ridges in the study area.

No direct impacts are foreseen on **Site 1** but a secondary impact is possible through increased activity during the construction phase and excavations might expose buried material in this area that is not visible on the surface. Therefore some recommendations are made to protect the site from accidental damage during the construction phase of the project and are discussed in Section 8 of this report.

Based on the findings of this assessment option 2 is the preferred option, but both options are acceptable if the recommendations in this report are implemented.

If the recommendations made in this report are adhered to and based on the approval from SAHRA the project is viable from an archaeological point of view.

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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- The results of the project;
- The technology described in any report;
- Recommendations delivered to the Client.

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ABBREVIATIONS

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BIA: Basic Impact Assessment
CRM: Cultural Resource Management
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMPR: Environmental Management Programme
ESA: Early Stone Age
GPS: Global Positioning System
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA: National Environmental Management Act
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency
SAHRIS: South African Heritage Resources Information System

**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 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

1 BACKGROUND INFORMATION

Heritage Contracts and Archaeological Consulting CC has been contracted by Savannah Environmental (Pty) Ltd to conduct a phase 1 assessment of the proposed Solis CSP Water Pipe Line. The proposed Solis water supply pipeline (option 1 & 2) originate from an existing reservoir to the north east of Uppington going in a north westerly direction towards the approved Solis CSP facility on the farm van Rooys Vlei. Route 1 follows the railway line (approximately 3m outside the servitude) and Route 2 follows the N10 (about 60 m from the road for most of the route).

The aim of the study is to survey the proposed alignments 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, review of the HIA for the approved Solis CSP facility; Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

During the survey one site of heritage significance were identified as well as a wide scatter of isolated MSA material. 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 following report.

This report must also be submitted to SAHRA for review.

1.1 Terms of Reference

Field study

Conduct a field study to: a) visit the proposed water pipeline alignments to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest; b) record GPS points of identified as significant areas; c) determine the levels of significance of the various types of heritage resources affected by the proposed pipelines.

Reporting

Report on the identification of anticipated and cumulative impacts the operational units of the proposed project activity may have 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 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, an AIA or a HIA is 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 23(2)(b) of the NEMA and Sections 39(3)(b)(iii) of the MPRDA.

The AIA should be submitted, as part of the EIA, BIA or 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 or with a proven ability to do archaeological work.

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 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 AIAs 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 Phase 2 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 of a site, a destruction permit must be applied for from SAHRA by the client 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 this age 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 reinterment 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. 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

Solis Power 1 (Pty) Ltd is proposing the construction and operation of the 125MW Solis Concentrated Solar (CSP) facility and associated infrastructure on the Farm Van Rooys Vlei, near Upington in the Northern Cape. Water for the construction and operational phase of the CSP facility will be sourced from the //Khara Hais Municipality. This water will be supplied via a water pipeline from the reservoir in Upington Industrial (Updustria) area to the facility. Two alternative routes have been identified for this water supply pipeline: **route 1** along the railway line (approximately 3m outside the servitude) and **route 2** along the N10 (about 60 m from the road for most of the route). The preferred route is that following the N10

The study area falls within a Savannah Biome as described by Mucina *et al* (2006) with the vegetation described as Gordonia Duneveld in the west with Kalahari Karroid Shrubland to the east. The study area is characterised by red Kalahari windblown sand.

1.3.2. Location Map

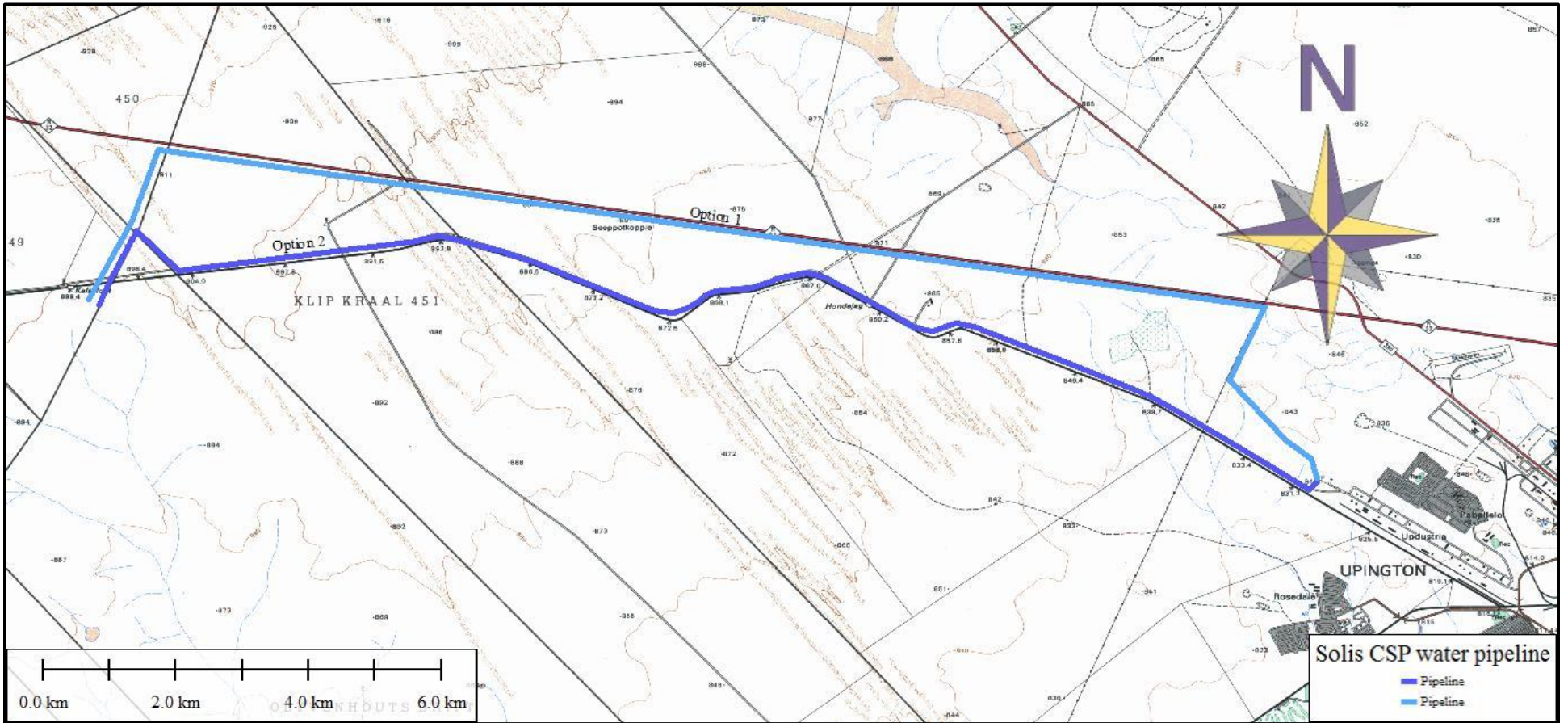


Figure 1: Location of option 1 and option 2.

2. APPROACH AND METHODOLOGY

The methodology used for walk through of linear developments is different to the methodology for projects where AIA's or HIA's are needed. A Phase 1 HIA (Van Vollenhoven 2012) was conducted as part of the EIA for the Solis CSP facility and subsequently as a requirement from SAHRA the walk through is conducted for the proposed water supply line. To understand the heritage context of the study area the following phased approach was utilised for this project.

2.1 Phase 1

Phase 1 included a background study for the area. This was complimented by consulting previous CRM reports (SAHRIS) conducted in the area additional to the report by Van Vollenhoven (2012). The aim of this is to extract data and information on the area in question, looking at archaeological sites, historical sites and graves of the area. Several unpublished CRM projects were conducted in the general study area (Beaumont 2005 & 2008, Van Ryneveld 2007a & 2007b, Dreyer, 2006, van der Walt 2011). These studies identified Early and Middle Stone Age assemblages as well as historical features.

Google Earth and 1:50 000 maps of the area were utilised to identify possible places where sites of heritage significance might be located; these locations were marked and visited during the field work phase. The database of the Genealogical Society was consulted to collect data on any known graves in the area.

2.2 Phase 2 - Physical Surveying

A field survey of the linear development of approximately 20km (for each option) was conducted by a professional archaeologist. The heritage component focussed on drainage lines, hills and outcrops, high lying areas and disturbances in the topography. The proposed options were surveyed on foot and by vehicle during the week of 28 March 2014. Sites recorded was plotted on 1:50 000 maps and their GPS co-ordinates noted. Digital photographs were taken of important sites.

2.3. Restrictions

Due to the fact that most cultural remains may occur below surface, the possibility exists that some features or artefacts may not have been discovered/ recorded during the survey. High grass cover and thick sand cover in certain portions restricted archaeological visibility. Only the proposed pipe line options was surveyed as indicated in the location maps, and not the entire farm that the pipe line options traverses. The survey was impeded by access restrictions to the farm on which the Solis facility is located and all the recommendations made for the Solis HIA is applicable here. The last section of option 2 was also not assessed entirely due to access restrictions. Here the proposed option follows the railway servitude road and little to no impact is foreseen on any heritage resources.

The description of the proposed project, provided by the client, is assumed to be accurate as well as the results of the 2012 HIA for the Solis facility.

Although Heritage Contracts and Archaeological Consulting CC surveyed the area as thoroughly as possible, it is incumbent upon the developer to stop operations and inform the relevant heritage agency should further cultural remains, such as stone tool scatters, artefacts, bones or fossils, be exposed during the process of development.

Any changes or deviations of the line will have to be assessed separately.

3 NATURE OF THE DEVELOPMENT

Specifications of the pipeline are as follows:

- » Diameter: 125 mm uPVC pipeline
- » Installed underground at an average depth of 1.1 m, with a cover of \pm 0.85m:

4. ARCHAEOLOGICAL AND CULTURAL HISTORIC BACKGROUND

4.1 Palaeontology

The geology of the area proposed for development has low to insignificant palaeontological sensitivity and as such, no further palaeontological studies are required (SAHRIS 2014).

4.2. The Stone Age

The Stone Age section is authored by Dr Marlize Lombard, Department of Anthropology and development studies, University of Johannesburg for a previous project in the same area commissioned by Heritage Contracts and Archaeological Consulting CC (2011).

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For Cultural Resources Management (CRM) purposes it is often only expected/ possible to identify the presence of the three main phases. Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable. Such finer-grained identifications may help to highlight the importance of some archaeological sites in a specific region. Table 1 provides a brief overview of the Stone Age phases and sub-phases/industrial complexes of South Africa, based on our current knowledge. The information is aimed at assisting the identification of Stone Age occurrences in the field by providing the main associated characteristics, and it provides the broadly associated age estimates. Users of this document should, however, remember that the outlines are broad, and any field interpretations can only be considered preliminary observations until further research is conducted.

4.2.1 The Later Stone Age

4.2.1.1. Hunters-with-livestock/herders

The region is well-known as one that produced the largest sample (n = 56) of prehistoric skeletons in South Africa (Morris 1995). Excavated in 1936, known as the 'Kakamas Skeletons', and currently housed in the National Museum in Bloemfontein, they are considered the 'type' specimens of Khoi morphology (1992). Grave locations can be expected along the Gariiep (perhaps up to 35 km from its shore), and on the Gariiep Islands between Upington and the Au-grabies Falls. They are often marked with stone burial cairns, dug into the alluvial soil or into degraded bedrock above the alluvial margin. Graves can be isolated or grouped in small clusters, sometimes containing up to eight graves (Morris 1995).

Burial cairns can be elaborately formed, some with upright stones in their centres, but they are often disturbed. Cairns from near the Gariiep Islands are often characterised by their high conical shapes, and the grave shafts filled with stones. Those closer to Au-grabies Falls, however, are low and rounded with ashes in the grave shaft (Dreyer & Meiring 1937; Morris 1984). The placing of specularite or red ochre over the body was common, but other grave goods are rare (Morris 1995).

Where dating was possible, most of the skeletons were dated to the last 200 years-or-so, but association with archaeological material from up to about 1200 years old is possible. The grave sites show parallels to those of recent Khoi populations (Morris 1995).

Apart from the grave locations, archaeological sites of this period in the region have been further divided into Swartkop and Doornfontein sites. Doornfontein sites are mostly confined to permanent water sources. The assemblages contain a consistently large complement of thin-walled, grit-tempered, well-fired ceramics with thickened bases, lugs, bosses, spouts, and decorated necks or rims. Lithics are often produced on quartz, and dominated by coarse irregular flakes with a small or absent retouched component (Beaumont et al. 1995; Lombard & Parsons 2008; Parsons 2008). Late occurrences contain coarser potsherds with some grass temper, a higher number of iron or copper objects, and large ostrich eggshell beads. These assemblages are mostly associated with the Khoi (Beaumont et al. 1995).

Post-Wilton

Swartkop sites can be almost contemporaneous with, or older than, the Doornfontein sites. They are usually characterised by many blades/bladelets and backed blades. Coarse undecorated potsherds, often with grass temper, and iron objects are rare. These sites are remarkably common throughout the region.

They usually occur on pan or stream-bed margins, near springs, bedrock depressions containing seasonal water, hollows on dunes, and on the flanks or crests of koppies (Beaumont et al. 1995; Parsons 2008). Some of these sites are also associated with stone features, such as ovals or circles, that may represent the bases of huts, windbreaks or hunter's hides (Jacobson 2005; Lombard & Parsons 2008; Parsons 2004). These sites are linked to the historic /Xam communities of the area who usually followed a hunter-gatherer lifeway (Deacon 1986, 1988; Beaumont et al. 1995).

Wilton

These assemblages are distinguished by a significant incidence of cryptocrystalline silicates (mainly chalcedony) and contain many formal tools such as small scrapers, backed blades and bladelets. A regional variation of the Wilton in the area is often referred to as the Springbokoog Industry (Beaumont et al. 1995).

Oakhurst

A few heavily patinated Later Stone Age clusters, that include large scrapers, may represent Oakhurst-type aggregates (Beaumont et al. 1995).

4.2.2. The Middle Stone Age

Previous collections of stone tools in the region include artefacts with advanced prepared cores, blades and convergent flakes or points. Most of the scatters associated with the Middle Stone Age have a 'fresh' or un-abraded appearance. They appear to be mostly associated with the post-Howiesons Poort (MSA 3) or MSA 1 sub-phases (Beaumont et al. 1995).

Substantial Middle Stone Age sites seem uncommon. However, where archaeological sites were excavated, such as Zoovoorbij 458, a Middle Stone Age assemblage was excavated beneath Later Stone Age deposits (Smith 1995). This shows that, although not always visible on the surface, the landscape was inhabited during this phase. The large flake component of the lower units of Zoovoorbij Cave has Levallois-type preparation on the striking platforms, reinforcing their Middle Stone Age context.

4.2.3. The Earlier Stone Age

Stone artefacts associated with this phase, based on their morphology, seem moderately to heavily weathered. Scatters may include long blades, cores (mainly on dolerite), and a low incidence of formal tools such as handaxes and cleavers. Clusters with distinct Acheulean characteristics have been recorded

4.3 Cultural and Historic information on the Gordonia area

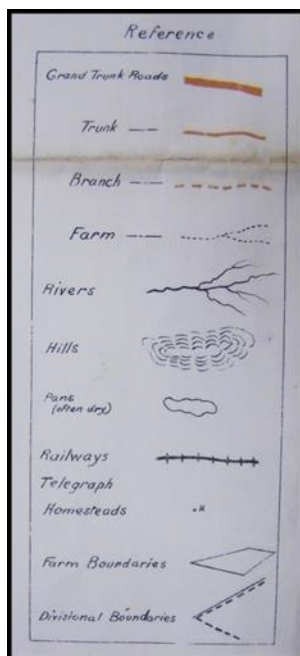
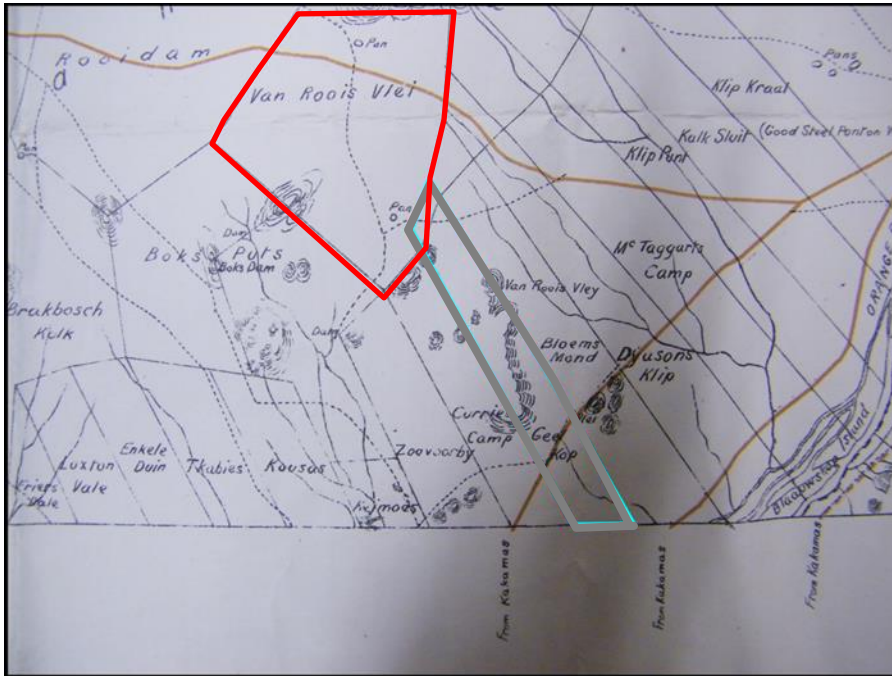


Figure 2: Upington district map dating to 1908

Some of the earliest known people to have lived in the Kakamas region were the Nameiqua people who lived at !Nawabdanas (today known as Renosterkop) during the late eighteenth century. In 1778 Hendrik Jacob Wikar and in 1779 Colonel R.J. Gordon came in contact with these people. The following descriptions of the Nameiqua and other groups of people that lived in this area are based on the accounts of Wikar and Gordon.

Although reference is made to the fact that Europeans started to move into this territory from at least the 1760s onwards, the first literate person to visit and describe the people living along the Orange River was H.J. Wikar. Wikar deserted the service of the Dutch East India Company and fled to the interior in 1775. He presented a report on his findings of the people he encountered in the interior to the Governor of the

Cape with the hope that he would be pardoned and that he could return to live in the colony. In his report, Wikar, referred to the Khoi of the Orange River as Eynikkoa / Eynicqua. He divided them into four separate groups: the Namnykoa / Namikoa, who lived on the islands above the Augrabies Falls, the Kaukoa and the Aukokoa higher up the river close to Kanoneiland and the Gyzikoas in the vicinity near the present day Upington. Although these groups were closely related, the Gyzikoas were intermixed genetically and culturally with Bantu-speaking peoples from the northeast. Wikar also recorded the presence of a group of people who he called the "Klaare Kraal" people. This group of people was apparently "a strong Bushman Kraal of about twenty huts but with no cattle" (Morris, 1992)

Another European traveller that visited the same region was Colonel R.J. Gordon, who met a group of people called the Anoe Eys, roughly translated as "bright kraal" people. Gordon recorded that this group of "Bushman catch fish and live by hunting, digging pits to trap rhinoceros at the side of the river." Morris feels it reasonable that Wikar's "Klaare Kraal" people and Gordon's "bright kraal" people are the same group (Morris, 1992). Gordon went on to describe other people living along the river too and although the spelling of the names of the various group differ between these two early travellers it can be assumed that they are indeed speaking and describing the same groups of people.

In 1813 Reverend John Campbell travelled down the Orange River and met a group of people near the Augrabies Falls but was surprised by the few inhabitants that now lived in the area. This was mainly because of a period of severe drought and there was very little water in the area to support large human settlements. In 1824 another traveller, George Thompson rode through the central Bushmanland and reached the confluence of the Hartebeest and Orange Rivers very close to the modern Kakamas. According to his writings the whole area was deserted except for a small group of !Kora close to the Falls (Morris, 1992).

The Renosterkop settlement was on one of the large islands in the Orange River. Geographically the area that the Orange River flows through from Upington to the Augrabies Falls is characterized by the river splitting into various loops thus forming islands in the river (Moolman, 1946). The settlement consisted of ten mat huts that housed about five to six people each. The Nameiqua herded cattle, sheep and to a lesser extend goats. Cattle were their most prized possession, both economically and ritually. They were also excellent hunters and would display the heads of rhino, hippo and buffalo in the centre of the settlement (Morris & Beaumont, 1991).

The Nameiqua people were not the only people that stayed in the area. Away from the river in areas less suitable for pastoralism lived groups such as the Noeeis, Eieis and the /Xam. These groups lived mainly from hunting and gathering. The relationships between the various groups of people that lived in this area were "peripheral" and involved "varying degrees of clientship during certain seasons, with limited exchange in items such as pots". The Khoi peoples would sometimes also take San wives. Around the area of Upington lived the Geissiqua (Twin-folk) people. This was a mixed group of Korana-BaTlhaping (Tswana) group who were in regular contact with Tswana Iron Age communities to the northeast. This group of people would seemingly once a year trade with the tribes living along the river and who traded in items, such as, tobacco, ivory spoons, bracelets, knives, barbed assegais and smooth axes (Morris & Beaumont, 1991).

In the period leading up to the First Koranna War in 1869 the northwards trek of the Basters and the white farmers into the vicinity of the Orange River provided the Koranna (!Kora) people with opportunistic opportunities to steal cattle from these new settlers and flee to islands located in the river. It was inevitable that this would lead to armed conflict between these groups (De Beer, 1992). The First Koranna War was in 1869 and a second war took place from 1878 to 1879. After the second war many of the Basters went to settle north of the river. Reverend Scröder advocated for the Cape government to allow these Basters to go and settle in the area and from a buffer zone between the white settlers and the black tribes to the north of the Cape Colony (De Beer, 1992).

In 1995 there were only three Baster landowner families remaining in the Keimoes area, namely the Jansen family, the Loxtons and the Spangenberg. This fact can be attributed to the commercialisation of agricultural farming during the twentieth century and also the action taken by the state to support the capitalization of white farmers in the area (Legassick, 1996). It would seem that many of the Basters rather decided to sell their farms to emerging white farmers as their history and tradition was that of

pastoralism and hunting. They were also used to being ousted by whites in the territories that they settled. Many of them did not want to be restricted by the laws and administrative regulations that came with colonial rule in the area. Thus as stated by one observer at the time "the Basters, who are good pioneers, but apparently unable to form of themselves a permanent settled community, will on the first favourable opportunity dispose of their ground and trek to some country where there will be no taxes, ... no boundary lines to farms, but on the contrary scope for unrestricted trekking and hunting, and no shops where they can run into debt and impoverish themselves by improvidence" (Legassick, 1996).

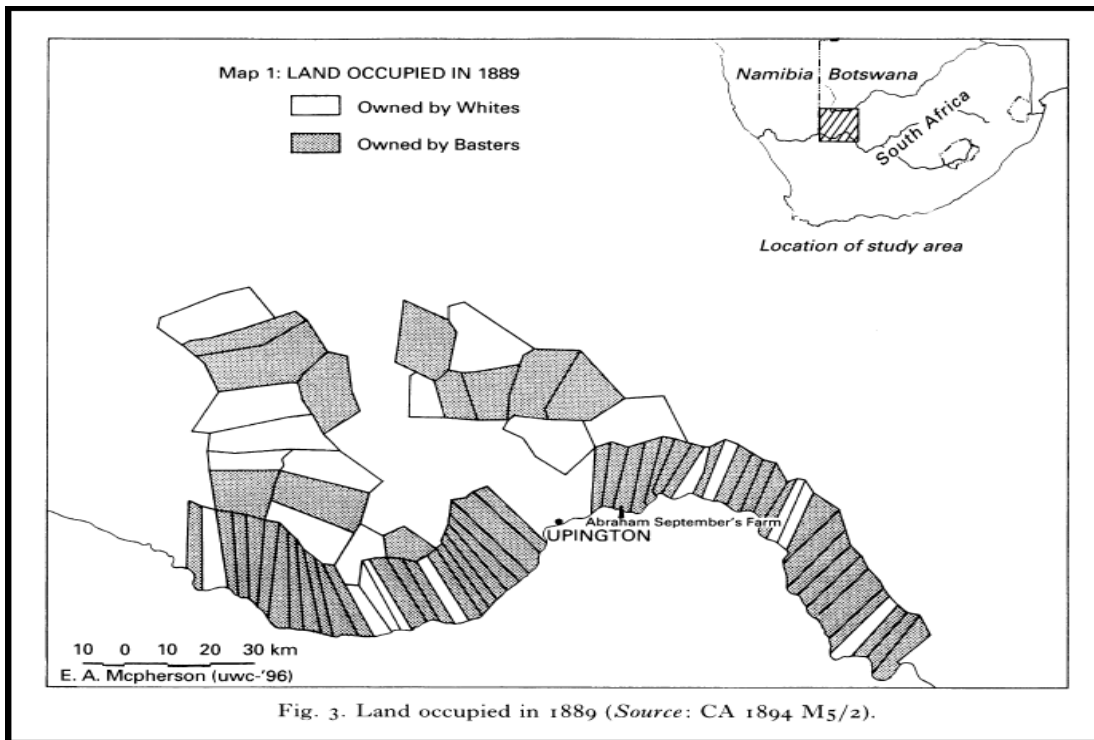


Figure 3: Land occupied in 1889

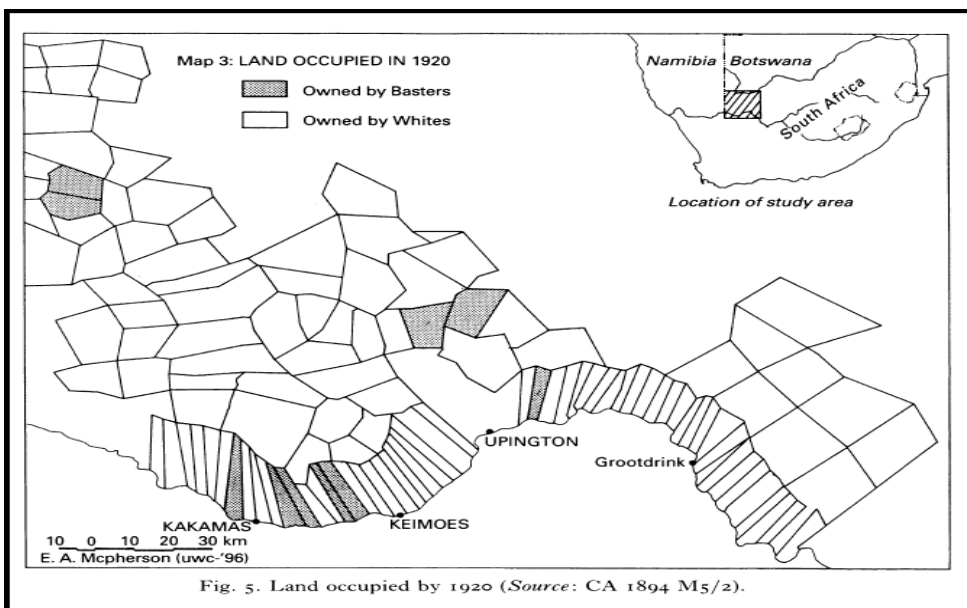


Figure 4: Showing land occupied in 1920

4.3.1. Figure 3 and 4

The above two maps indicate the transfer of land from Baster ownership to white ownership during the period 1889 to 1920. It is evident that the study area was occupied by whites from 1889. It is interesting to note the sudden growth in the number of coloured people who settled in the Gordonia area, and especially in the years between the 1936 and the 1970 census. By 1970, coloured people still made up the vast majority of the population of the Gordonia district, as they had done in 1911. By 1970 the smallest proportion of the population of Gordonia was black people. The following table provides population numbers for the Gordonia Census District between 1911 and 1970 (De Klerk, 1985).

Population group	Area	1911	1921	1936	1946	1951	1960	1970
White	Urban	1096	1935	3194	4095	5258	6755	9288
	Rural	5066	5893	13607	13735	12683	11206	7035
	Subtotal	6162	7828	16801	17830	17941	17961	16323
Black	Urban	235	228	1006	2328	3405	5041	6355
	Rural	597	753	1296	2351	4574	5273	4092
	Subtotal	832	981	2302	4679	7979	10314	10447
Coloured	Urban	2157	1716	3985	5970	7269	11567	31877
	Rural	7595	7788	17059	21778	24390	32886	24770
	Subtotal	9752	9504	21044	27748	31659	44453	56647
Total population		16746	18313	40147	50259	57597	72728	83417

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 pipe line the local extent of its impact necessitates a representative sample. 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:

- » The unique nature of a site;
- » The integrity of the archaeological/cultural heritage deposits;
- » The wider historic, archaeological and geographic context of the site;
- » The location of the site in relation to other similar sites or features;
- » The depth of the archaeological deposit (when it can be determined/is known);
- » The preservation condition of the sites;
- » 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:

- » 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;
- » 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;
- » Sites of significance relating to the history of slavery in South Africa.

5.1. Field Rating of Sites

Site significance classification standards prescribed by SAHRA (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 8 of this report.

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

6. WALK THROUGH FINDINGS-DESCRIPTION OF SITES

This report only deals with the proposed water supply pipe lines to the authorised Solis CSP facility that was assessed by van Vollenhoven (2012). Two options were assessed consisting of option 1 along the N10 (about 60 m from the road for most of the route) and option 2 that follows the railway line (approximately 3m outside the servitude). Both these areas are extensively disturbed, option 1 is impacted on by construction activities (Figure 6) relating to the N10 and a power line with several borrow pits marking the area where the water line is proposed. Construction and sourcing of filling material (Figure 7) for the railway line also impacted on the area marked for option 2. Closer to town and where the reservoir is located illegal dumping and informal settlements impacted on the area (Figure 8 and 9). A track log of the areas covered is included in Annexure A.

The study area is characterised by Aeolian sand (Figure 10) on top of a calcrete layer. In some areas gravel ridges (Figure 11) protrudes through the sand cover that contain isolated MSA flakes on quartzite and CCS (Figure 12). These individual occurrences were not point plotted as artefact densities are lower than 1 artefact per 3m² and does not reflect a knapping, quarry or habitation site. These miscellaneous flakes and chunks are exposed to a high degree of sheet erosion and are not in situ, and therefore, of low significance. The tool scatters in the study area indicate the use of the wider landscape by humans during the MSA period similar to findings made by van Vollenhoven (2012). A single LSA site was recorded just to the south of Option 2 (Figure 13) and is discussed below.



Figure 5. Evidence of earth moving along option 1.



Figure 6. Evidence of earth moving along option 1.



Figure 7. Environment towards the reservoir.



Figure 8: Dumping.



Figure 9. Sand cover at option 2 next to the railway line.



Figure 10. Gravel ridges in the area.



Figure 11: Ventral view of artefacts found in the area showing range of raw material.

6.1. Site Distribution Map

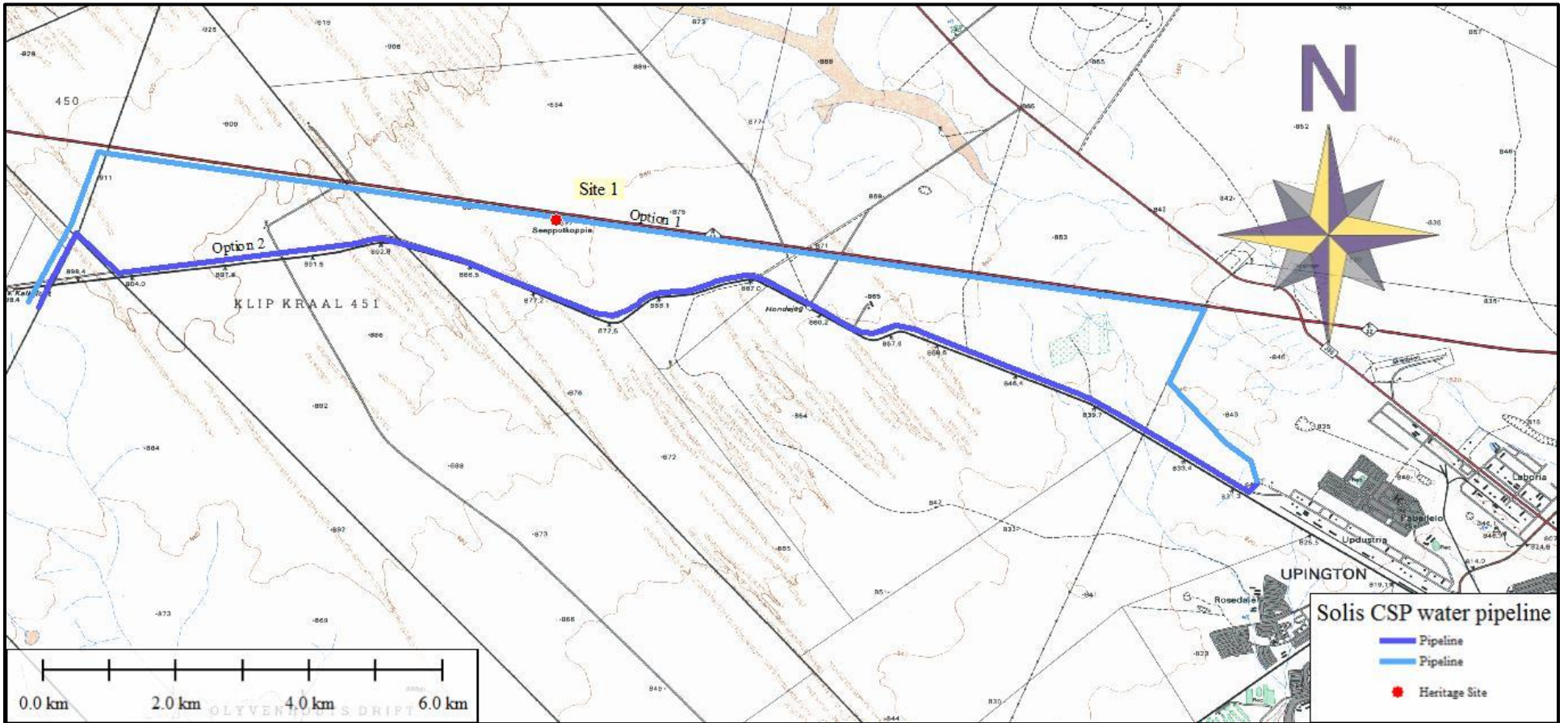


Figure 12: Site 1 in relation to option 1.

6.3. Site Descriptions

6.3.1. Site 1


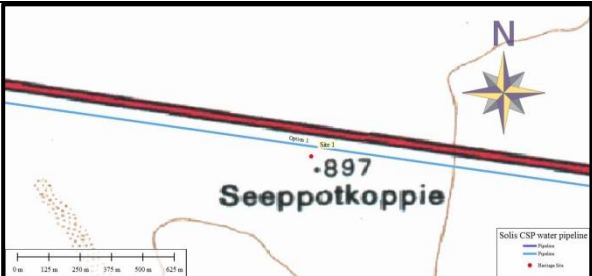
Co-ordinate	S28 24 07.9 E21 06 20.9
Type of Site	Open air
Geographical Setting	Hill (named Seepotkoppie)
Closest Water Source	unknown
Site Components	LSA and historical
Describe any disturbance to the site	Mostly intact with a possible secondary impact from the road construction as is evident from dumped rocks.
Description and type of artefacts, approximate age and significant features of the site (Raw material, source of raw material, density).	Ostrich egg shell fragments and stone flakes are scattered around the base of the hill in low densities. Flakes are micro lithic supporting an ascription to the LSA utilising quartzite as raw material. A Lead sealed bully beef can date to the late 1800's or early 1900's.
Estimation or measurement of site extent	Scattered around the hill measuring approximately 0.4 ha.
Depth and stratification of the site	None visible
	
Figure 13: Site viewed from the north	Figure 14: Site in relation to option 1.



Figure 15: Artefacts from site 1

Statement of Significance	Due to the ephemeral nature of LSA sites, Site 1 is given a Medium to high Significance rating.
Field Rating (Recommended grading or field significance) of the site:	Generally Protected A (GP.A).
Impact Evaluation of development on site	Secondary as the site is located 40 meters to the south of the center of the proposed water line.
Recommendations	Demarcation of area around kopje to restrict movement of workers and machinery during the construction phase. Monitoring of trenching activities in this area by an archaeologist.

7. Potential Impact

7.1. Pre-Construction phase:

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of road infrastructure needed for the construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

7.2. Construction Phase

During this phase the impacts and effects are similar in nature but more extensive than the pre-construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

7.3. Operation Phase:

No impact is envisaged for the recorded heritage resources during this phase.

8. CONCLUSIONS AND RECOMMENDATIONS

The impacts to heritage resources by the proposed development are considered to be low. One site was recorded during the walk through for the project. **Site 1** consist of ostrich eggshell fragments, LSA flakes and a bully beef can dating from the late 1800's – early 1900's around a small kopje known as "Seepotkoppie". This kopje is also the only focal point an a relatively featureless landscape. A wide scatter of ex situ isolated MSA material was also recorded on low ridges in the study area.

No direct impacts are foreseen on **Site 1** but a secondary impact is possible through increased activity during the construction phase and earthworks during the construction phase might expose buried material in this area that is not visible on the surface.

Based on the findings of this assessment option 2 is the preferred option, but both options are acceptable if the recommendations in this report are implemented.

The following recommendations are applicable to protect **site 1** from accidental damage during the construction phase of the project, if option 1 is chosen after the impacts are assessed after the EIA.

- Demarcation of area around kopje with a 30 meter buffer zone to restrict movement of workers and machinery during the construction phase.
- Monitoring of earthworks in this area by an archaeologist.

If the recommendations made in this report are adhered to and based on the approval from SAHRA the project is viable from an archaeological point of view.

Chance finds procedure

This procedure applies contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the construction, operations or closure phases of this project, any person employed by Solis, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area.

- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on mine operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

9. PROJECT TEAM

Jaco van der Walt, Project Manager and Archaeologist

Prof Marelize Lombard, Research – Stone Age

Liesl Bester, Archival Specialist

10. 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.

I have been involved in research and contract work in South Africa, Botswana, Zimbabwe, Mozambique, DRC and Tanzania; having conducted more than 400 AIAs since 2000.

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ANNEXURE C

Track log of areas covered – option 1 in light blue, and option 2 in dark blue and track logs in black. These sometimes overlap and the track logs are not clearly visible on this scale. GPX files of the tracks are available on request.



