

ARCHAEOLOGICAL IMPACT ASSESSMENT

For the proposed bulk water supply development at Onseepkans in the
Northern, Cape Province

Prepared for

EnviroAfrica cc.

BY

UBIQUE HERITAGE CONSULTANTS (PTY) LTD

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Client

EnviroAfrica cc.

Contact Person

Bernard de Witt

Tel: (+ 27) 021- 851 1616

Fax: 086 5120154

Mobile: (+27) 082 448 9991

Email: admin@enviroafrica.co.za

P. O. Box 5367 Helderberg 7135

SIGNATURE _____

Heritage Consultant: Ubique Heritage Consultants (Pty) Ltd

Contact Person

Jan Engelbrecht

Director Ubique Heritage Consultants (Pty) Ltd

Member of the Association of Southern African Professional Archaeologists: Member number: 297

I, Jan Engelbrecht, as Director of Ubique Heritage Consultants (Pty) Ltd, hereby confirm my independence as a heritage specialist and declare that we have no interest in the business of our client, other than fair remuneration for work performed on this project/contract as well as the execution of archaeological sound fieldwork and the submission of a professional report to our client.

J.A.C. ENGELBRECHT

UBIQUE HERITAGE CONSULTANTS (PTY) LTD

DIRECTOR

EXECUTIVE SUMMARY

Site Name and Location:

The proposed development site for the planned bulk water supply, including a solar energy facility, a pump station, a reservoir with pipeline are located at the following GPS coordinates:

SITE DESCRIPTION	LOCATION	REFERENCE
Proposed Reservoir Development	28° 45' 37.52" South 19° 17' 02.06" East	OSK Reservoir
Proposed Solar Farm	28° 45' 03.14" South 19° 16' 57.36" East	OSK Solar
Proposed Pump Station	28° 44' 42" South 19° 16' 28" East	OSK Pump Station
Proposed Pipeline approximately 2km running from north to south	28° 45' 37.52" South 19° 17' 02.06" East	OSK Pipeline

The proposed site is situated near the Onseepkans Settlement and in close proximity to the Orange River, within the Khai-Ma local Municipality and in the greater Namakwa District Municipality in the Northern Cape. The proposed development of the bulk water supply at Onseepkans will be conducted adjacent to the Onseepkans Settlement. The site is situated on the southern bank of the Orange River and covers an area of approximately 5-10 ha. The developer describes the site as follows:

Onseepkans is situated in the Namakwa district along the bank of the Orange River and lies 50km north of Pofadder (28° 44'S; 19° 17'E). Onseepkans is a small settlement with a border post with Namibia for traffic between Pofadder in South Africa and Keetmanshoop in Namibia. It was established in approximately 1916 by missionary settlers and relies today on the approximately 268 ha of irrigated lands which are supplied with irrigation water from the Orange River via a 16.4km long earth canal. In recent years, however the condition of the canal has deteriorated and large portions is overgrown with weeds and reeds. This impacts on the consistent supply of irrigation water and in peak season water availability becomes vulnerable which impacts negatively on production. The situation has reached such a stage where the canal has to be re-constructed in order to ensure security of irrigation water to producers." (Khai-Ma Municipality.2014:3. Draft 1: Proposed Onseepkans Development. Khai-Ma Municipality: Pofadder.)

Image 1: Footprint Location Map: 1:50 000

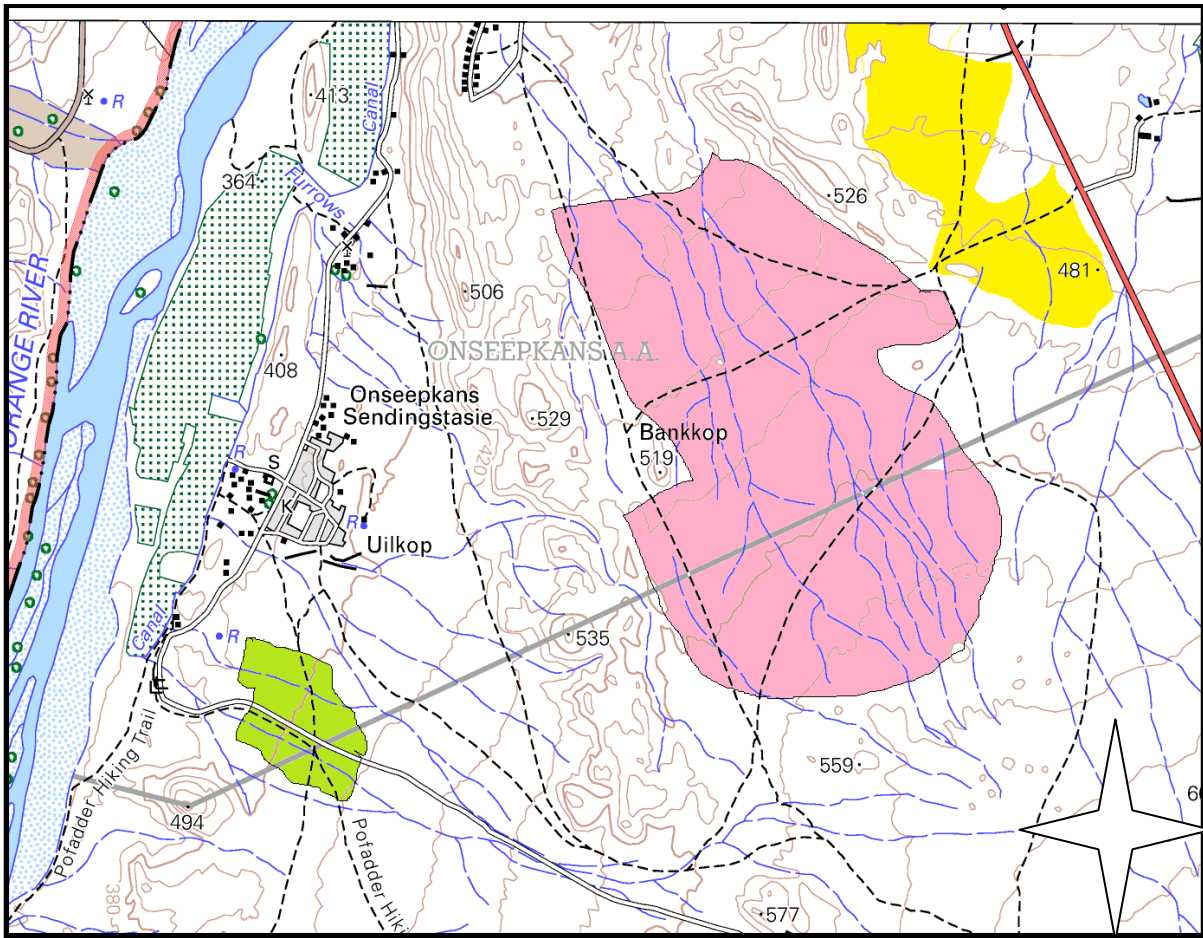


Image 2: Development Footprint 1:22 000

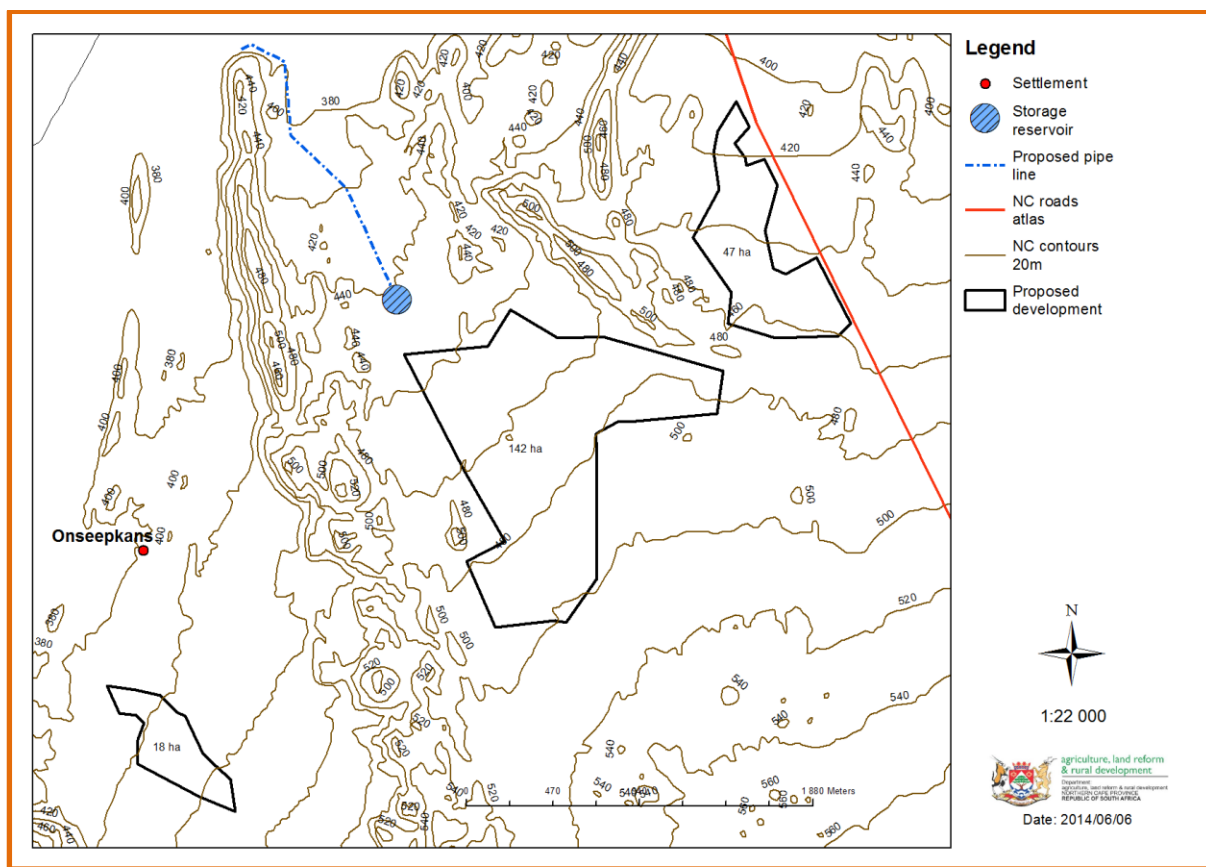


Image 3: Google Map Original Development Footprint (<http://www.googleearth.com>)

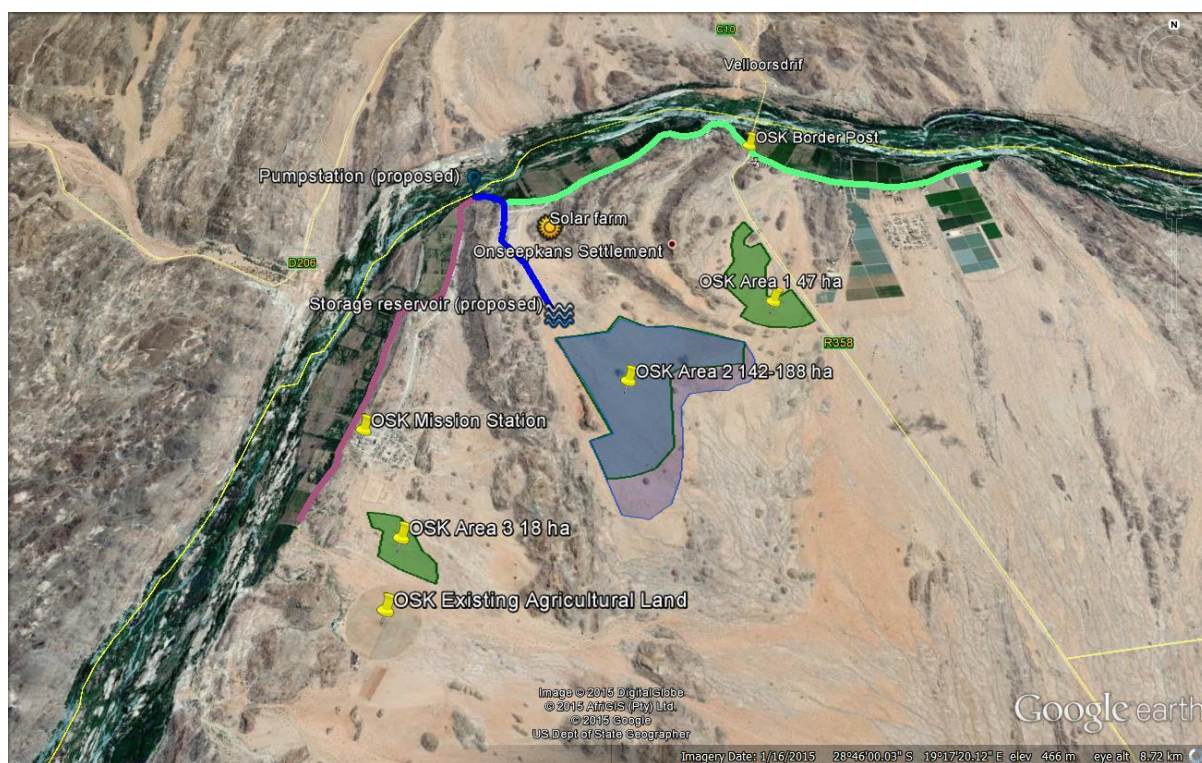
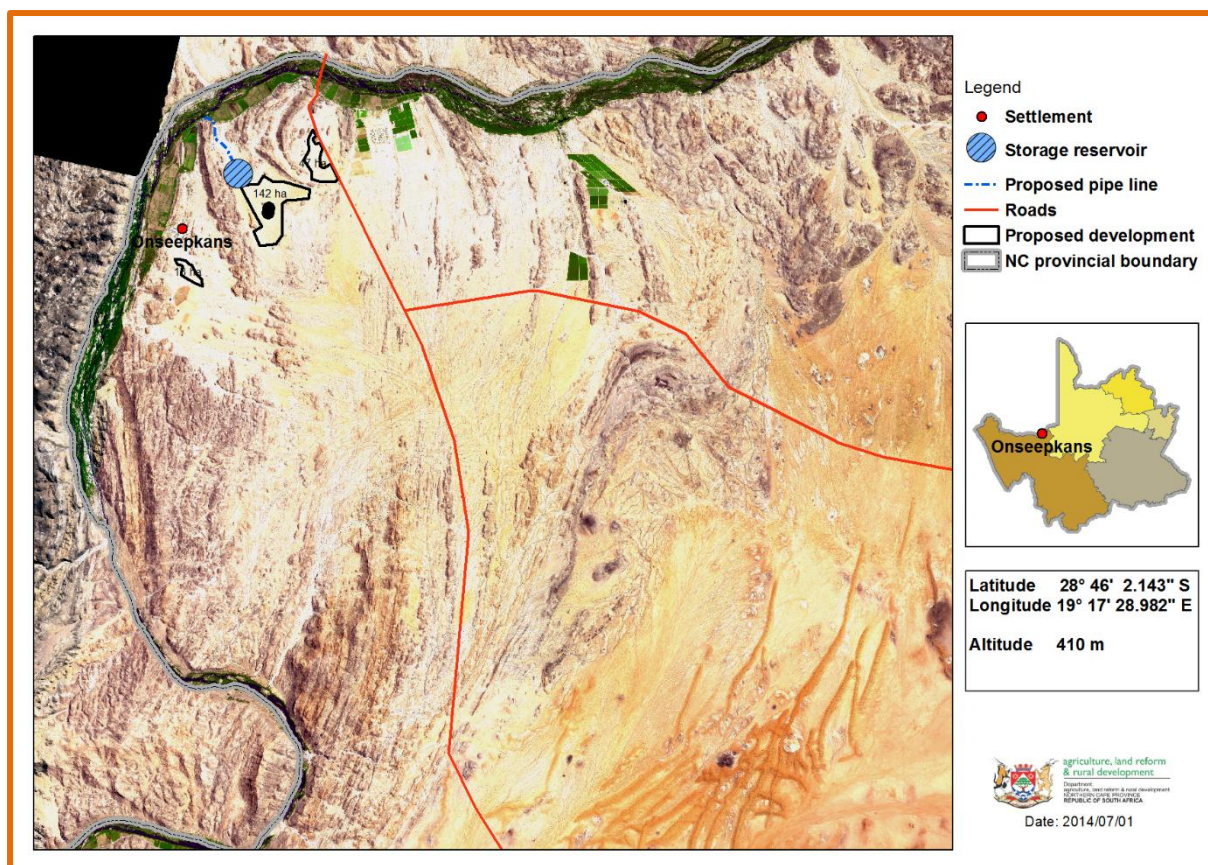


Image 4: Google Image of Location and Footprints of Proposed Development



Proposed Development:

Project description: The proposed bulk water supply development at Onseepkans is within the Namakwa District Municipality and the Khai-Ma local municipality in the Northern Cape Province. The project to be delivered and completed in accordance with Reference Draft 1: Proposed Onseepkans Development dated July 2014, as well as the Terms of Reference supplied by the mentioned client. Therefore a Phase 1 Archaeological Impact Assessment is to be conducted by Ubique Heritage Consultants (Pty) Ltd, as appointed by the client, to identify the impact of development on possible heritage present on the site.

Heritage Recourses Identified:

DESCRIPTION	PERIOD	GRID
Stone tool/Microlith OSK/1/2015	MSA/LSA	28° 45' 45.40" South 19° 18' 04.00" East

Findings and Impacts on Heritage Resources:

The topography of the assessment area (Approximately 5-10 ha) includes an open and level plain, with vegetation present, but the vegetation is frequently interrupted with open dry areas. The topography of the various development footprints is flat, except for the area identified for the proposed solar farm development, which is situated along a ridge of a mountain and extending towards the level plain. To the north of the assessment area, a gravel road runs from west to east towards the Onseepkans border post and it also provides an access route to the Onseepkans settlement. The proposed development footprints are in close proximity (approximately 2 to 5 km) from the Orange River and the Onseepkans Settlement. Previous disturbances on the site were basically absent, except for the existing gravel roads running through the various areas of proposed development. The proposed pipeline will however run through a nearby settlement and along the servitude of an existing gravel road, commencing from the southern banks of the Orange River towards the proposed reservoir to be developed. The site consists of a reasonable level terrain with certain rocky outcrops, steep hills and mountains at places. There are several waterways, mostly non-perennial riverines detected in the surrounding areas of the proposed developments sites. Four proposed development footprints were surveyed, which included a 2km stretch for a proposed development of a water pipeline and an area earmarked for a proposed construction of a reservoir, an area earmarked for the development of a solar facility/farm for the establishment of electrical power, and an area for the construction of a pump station on the southern bank of the Orange river. The river will serve as the source of water for irrigation.

There was only one Stone Age archaeological find within the assessment area, and no living heritage recognised on the proposed development footprints, except for the proposed pipeline development which runs through a nearby settlement. No archaeological remains/objects were detected on the proposed development sites which include the OSK Pump station, OSK Pipeline, OSK Reservoir and the OSK Solar farm. Onseepkans, however, has a rich living heritage in terms of historical Catholic Missionary activities in the area; this was the reason for the establishment of Onseepkans. The assessment area (development footprint) for development has no significant archaeological places or structures. The footprint area is clear and consists of open field, arid Savannah vegetation, and rocky outcrops and surrounding mountains. There are no colonial/historical or pre-historical structures 60 years and older, neither are there any places or equipment of significance on the proposed development footprints. It is likely that places, structures and equipment has low heritage significance at the community specific, local and regional levels at least for its historic values. Since only one Stone Age archaeological artifact was detected on the entire site, which includes the areas of the proposed pipeline, solar farm and reservoir and pump station, archaeological heritage have at least low

heritage significance at the community specific and local levels for its cultural and historic values.

No traditional burial places were recorded in the proposed development site. In addition, consultation with one traditional local inhabitant revealed no oral history or evidence of any traditional graves and burial places within the proposed development footprints. Onseepkans Settlement has two municipal cemeteries of which one might be of historical significance. Both these cemeteries are well outside the proposed development footprint. Traditional burial places have at least low heritage significance for its cultural and historic values.

It is likely that living heritage has medium to high heritage significance at the community specific, local and regional levels at least for its historical, cultural, socio-economical and socio-political values. Living heritage is absent on the development footprint, but surrounding areas like the Catholic Mission Station at Onseepkans Settlement have significant history which makes living heritage a possibility and a fact to be considered throughout the proposed development.

The impact on all heritage resources located within the proposed development site at OSK Pipe line, OSK Reservoir, OSK Pump station and OSK Solar farm is rated as low, due to the low density and low significance of archaeological material on the proposed development site, and the proposed development will possibly have no impact on such resources.

Recommendations:

Ubique Heritage Consultants (Pty) Ltd recommends that the development can proceed.

Furthermore, as reflected in this report, the impact on heritage and archaeological material on the surface within all the proposed areas is low. The SAHRA Minimum Standards for impact assessments and in accordance with the National/Provincial heritage legislation is recommended and the client must keep compliance in mind, prior, during and after development.

General:

Due to extensive sand, rocky outcrops, steep hills and mountains with the presence of mostly arid Savannah vegetation cover, in certain areas on the development footprint, 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 such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find.

Although all possible care is taken to identify sites of cultural importance during the Investigation of assessment areas, it is always possible that hidden or sub-surface sites could be overlooked during the assessment. Ubique Heritage Consultants (Pty) Ltd and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.

CONCLUSION:

We recommend that the development proceed. Ubique Heritage Consultants (Pty) Ltd submitted this report to SAHRA in fulfilment of the requirements of the NHRA. The South African Heritage Resources Agency may be contacted at the SAHRA Head office (South African Heritage Resources Agency 111 Harrington Street Cape Town 8001, Mr Phillip Hine, and Tel: (+27) 21-4624502, E-mail: phine@sahra.org.za, Author: J.A.C. Engelbrecht, Tel: (+27)82 845 6276, E-mail: jangrensman@gmail.com

We thus recommend that permission is granted for development to proceed, the client is reminded that the NHRA requires that a developer cease all work immediately and follow the protocol contained in this report should any heritage resources, as defined in the Act, be discovered during the course of development activities.

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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
 EMP: Environmental Management Plan
 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
 OSK: Onseepkans
 OWC: Orange River Wine Cellars
 PRHA: Provincial Heritage Resource Agency
 SADC: Southern African Development Community
 SAHRA: South African Heritage Resources Agency

**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)

ELABORATION ON GLOSSARY

The Stone Age

No systematic Early and Middle Stone Age research has been undertaken in the proposed development area, hence the general nature of this section. Open air scatters of stone artefacts, probably with low heritage significance, could be expected in areas with minimal environmental disturbance. Previous development and disturbances on the site is evident.

South Africa's prehistory has been divided into a series of phases based on broad patterns of technology. The primary distinction is between a reliance on chipped and flaked stone implements (the Stone Age) and the ability to work iron (the Iron Age). Spanning a large proportion of human history, the Stone Age in Southern Africa is further divided into the Early Stone Age, or Paleolithic Period (about 2 500 000–150 000 years ago), the Middle Stone Age, or Mesolithic Period (about 150 000–30 000 years ago), and the Late Stone Age, or Neolithic Period (about 30 000–2 000 years ago). The simple stone tools found with australopithecine fossil bones fall into the earliest part of the Early Stone Age.

- **The Early Stone Age**

Most Early Stone Age sites in South Africa can probably be connected with the hominin species known as *Homo erectus*. Simply modified stones, hand axes, scraping tools, and other bifacial artifacts had a wide variety of purposes, including butchering animal carcasses, scraping hides, and digging for plant foods. Most South African archaeological sites from this period are the remains of open camps, often by the sides of rivers and lakes, although some are rock shelters, such as Montagu Cave in the Cape region.

- **The Middle Stone Age**

The long episode of cultural and physical evolution gave way to a period of more rapid change about 200 000 years ago. Hand axes and large bifacial stone tools were replaced by stone flakes and blades that were fashioned into scrapers, spear points, and parts for hafted, composite implements. This technological stage, now known as the Middle Stone Age, is represented by numerous sites in South Africa.

Open camps and rock overhangs were used for shelter. Day-to-day debris has survived to provide some evidence of early ways of life, although plant foods have rarely been preserved. Middle Stone Age bands hunted medium-sized and large prey, including antelope and zebra, although they tended to avoid the largest and most dangerous animals, such as the elephant and the rhinoceros. They also ate seabirds and marine mammals that could be found along the shore and sometimes collected tortoises and ostrich eggs in large quantities.

- **The Late Stone Age**

Basic tool making techniques began to undergo additional change about 40 000 years ago. Small finely worked stone implements known as microliths became more common, while the heavier scrapers and points of the Middle Stone Age appeared less frequently. Archaeologists refer to this technological stage as the Late Stone Age. The numerous collections of stone tools from South African archaeological sites show a great degree of variation through time and across the subcontinent.

The remains of plant foods have been well preserved at such sites as Melkhoutboom Cave, De Hangen, and Diepkloof in the Cape region. Animals were trapped and hunted with spears and arrows on which were mounted well-crafted stone blades. Bands moved with the seasons as they followed game into higher lands in the spring and early summer months, when plant foods could also be found. When available, rock overhangs became shelters; otherwise, windbreaks were built. Shellfish,

crayfish, seals, and seabirds were also important sources of food, as were fish caught on lines, with spears, in traps, and possibly with nets.

Dating from this period are numerous engravings on rock surfaces, mostly on the interior plateau, and paintings on the walls of rock shelters in the mountainous regions, such as the Drakensberg and Cederberg ranges. The images were made over a period of at least 25 000 years. Although scholars originally saw the South African rock art as the work of exotic foreigners such as Minoans or Phoenicians or as the product of primitive minds, they now believe that the paintings were closely associated with the work of medicine men, shamans who were involved in the well-being of the band and often worked in a state of trance. Specific representations include depictions of trance dances, metaphors for trance such as death and flight, rainmaking, and control of the movement of antelope herds.

Iron Age

Archaeological evidence shows that Bantu-speaking agriculturists first settled in southern Africa around AD 300. Bantu-speakers originated in the vicinity of modern Cameroon from where they began to move eastwards and southwards, some time after 400 BC, skirting around the equatorial forest. An extremely rapid spread throughout much of sub-equatorial Africa followed: dating shows that the earliest communities in Tanzania and South Africa are separated in time by only 200 years, despite the 3 000 km distance between the two regions. It seems likely that the speed of the spread was a consequence of agriculturists deliberately seeking iron ore sources and particular combinations of soil and climate suitable for the cultivation of their crops.

Metal production was a key activity since it provided the tools of cultivation and hunting. The evidence indicates that people who worked metal lived in almost every village, even those that were considerable distances from ore sources.

Large-scale excavations in recent years have provided data indicating that first-millennium agriculturist society was patrilineal and that men used cattle as bride wealth in exchange for wives. On a political level, society was organised into chiefdoms that, in our region, may have had up to three hierarchical levels. The villages of chiefs tended to be larger than others, with several livestock enclosures, and some were occupied continuously for lengthy periods. Social forces of the time resulted in the concentration of unusual items on these sites. These include artefacts that originated from great distances, ivory items (which as early as AD 700 appear to have been a symbol of chieftainship), and initiation paraphernalia.

This particular way of life came to an end around AD 1000, for reasons that we do not yet fully understand. There was a radical change in the decorative style of

agriculturist ceramics at this time, while the preferred village locations of the last four centuries were abandoned in favour of sites along the coastal littoral. In general, sites dating to between 1050 and 1250 AD are smaller than most earlier agriculturist settlements. It is tempting to see in this change the origin of the Nguni settlement pattern. Indeed, some archaeologists have suggested that the changes were a result of the movement into the region of people who were directly ancestral to the Nguni-speakers of today. Others prefer to see the change as the product of social and cultural restructuring within resident agriculturist communities.

Whatever the case, it seems likely that this new pattern of settlement was in some way influenced by a changing climate, for there is evidence of increasing aridity from about AD 900. A new pattern of economic inter-dependence evolved that is substantially different from that of earlier centuries, and is one that continued into the colonial period nearly 500 years later.

Colonial rule/Historic

By the closing decades of the 18th century, South Africa had fallen into two broad regions: west and east. Colonial settlement dominated the west, including the winter rainfall region around the Cape of Good Hope, the coastal hinterland northward toward the present-day border with Namibia, and the dry lands of the interior. Trekboers took increasingly more land from the Khoekhoe and from remnant hunter-gatherer communities, who were killed, were forced into marginal areas, or became labourers tied to the farms of their new overlords. Indigenous farmers controlled both the coastal and valley lowlands and the Highveld of the interior in the east, where summer rainfall and good grazing made mixed farming economies possible.

As a frontier region, the area was encroached by European farmers, pastoralists and missionaries and the subsequent settlement of European farmers, trekboers and took place from the 18th, 19th and well into the 20th centuries. The region was also populated by Griqua and Nama, Bushmen and Khoi farmers/hunter gatherers, whose descendants reside in the area to the present day. Certain groups were dislocated towards Namaqualand, Western Cape and Namibia. The area of study is in close proximity of Kakamas, Pofadder and Pella and is also known as the "Green Kalahari" due to extensive cultivation and irrigated lands along the Orange River. Onseepkans Settlement can however be described as located on the eastern periphery of Namakwaland and offers good opportunities for agricultural activities along the banks of the Orange River.

It is imperative to keep in mind the contact between the various ethnic groups in the area of study. Development at the site might reveal sub-surface artefacts from any period as described above. The developer should comply with the protocol as described in this report as well as the NHRA.

1. INTRODUCTION

Ubique Heritage Consultants Pty (Ltd) was appointed by EnviroAfrica cc. to undertake a Phase 1 Archaeological Impact Assessment of a proposed bulk water supply development at Onseepkans the Northern Cape Province, in terms of the National Environmental Management Act 107 of 1998 as amended (NEMA), in compliance with Section 38 of the National Heritage Resources Act 25 of 1999, as amended (NHRA).

South Africa's heritage resources are both rich and widely diverse, encompassing sites from all periods of human history. Resources may be tangible, such as buildings and archaeological artefacts, or intangible, such as landscapes and living heritage. Their significance is based upon their aesthetic, architectural, historical, scientific, social, spiritual, linguistic, economic or technological values; their representivity of a particular time period or group; their rarity; and their sphere of influence.

The integrity and significance of heritage resources can be jeopardized by natural (e.g. erosion) and human (e.g. development) activities. In the case of human activities, a range of legislation exists to ensure the timeous and accurate identification and effective management of heritage resources for present and future generations.

This report represents compliance with a full Phase 1 AIA for the proposed development, excluding a specialist social, Palaeontological or meteorite site impact study.

2. TERMS OF REFERENCE

An AIA must address the following key aspects:

- the identification and mapping of all heritage resources in the area affected;
- an assessment of the significance of such resources in terms of heritage assessment criteria set out in regulations;
- an assessment of the impact of the development on heritage resources;
- an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- plans for mitigation of any adverse effects during and after completion of the proposed development.

In addition, the AIA should comply with the requirements of NEMA, including providing the assumptions and limitations associated with the study; the details, qualifications and expertise of the person who prepared the report; and a statement of competency.

2.1. Field study

Conduct a field study to establish and ensure the following:

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

2.2. Reporting

Report on the identification of anticipated and cumulative impacts the development of the proposed project activities may have on the identified heritage resources during the execution of the entire project. Consider alternatives, should any significant sites be impacted adversely by the proposed project. Ensure that all studies, assessments 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).

2.3. Statutory Requirements

2.3.1. General

The Constitution of the Republic of South Africa Act 108 of 1996 is the source of all legislation. Within the Constitution the Bill of Rights is fundamental, with the principle that the environment should be protected for present and future generations by preventing pollution, promoting conservation and practising ecologically sustainable development. With regard to spatial planning and related legislation at national and provincial levels the following legislation may be relevant:

- Physical Planning Act 125 of 1991
- Municipal Structures Act 117 of 1998
- Municipal Systems Act 32 of 2000
- Development Facilitation Act 67 of 1995 (DFA)

The identification, evaluation and management of heritage resources in South Africa is required and governed by the following legislation:

- National Environmental Management Act 107 of 1998 (NEMA)
- KwaZulu-Natal Heritage Act 4 of 2008 (KZNHA)
- National Heritage Resources Act 25 of 1999 (NHRA)
- Minerals and Petroleum Resources Development Act 28 of 2002 (MPRDA)

2.3.2. National Heritage Resources Act 25 of 1999

The NHRA established the South African Heritage Resources Agency (SAHRA) together with its Council to fulfil the following functions:

- co-ordinate and promote the management of heritage resources at national level;
- set norms and maintain essential national standards for the management of heritage resources in the Republic and to protect heritage resources of national significance;
- control the export of nationally significant heritage objects and the import into the Republic of cultural property illegally exported from foreign countries;
- enable the provinces to establish heritage authorities which must adopt powers to protect and manage certain categories of heritage resources; and
- provide for the protection and management of conservation-worthy places and areas by local authorities.

2.3.3. Heritage Impact Assessments/Archaeological Impact Assessments

Section 38(1) of the NHRA of 1999 requires the responsible heritage resources authority to notify the person who intends to undertake a development that fulfils the following criteria to submit an impact assessment report if there is reason to believe that heritage resources will be affected by such development:

- the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- the construction of a bridge or similar structure exceeding 50m in length;
- any development or other activity which will change the character of a site—
 - (i) exceeding 5 000m² in extent; or
 - (ii) involving three or more existing erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- the re-zoning of a site exceeding 10 000m² in extent; or

- any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.

Reports in fulfilment of Section 38(3) of the Act must include the following information:

- the identification and mapping of all heritage resources in the area affected;
- an assessment of the significance of such resources in terms of the heritage assessment criteria set out in regulations;
- an assessment of the impact of the development on such heritage resources;
- an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- plans for mitigation of any adverse effects during and after completion of the proposed development.

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 NEMA and 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 where after 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. The heritage practitioner in consultation with the client is responsible for uploading the full report on SAHRIS, which is the official information system of SAHRA.

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 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.

2.3.4. Definitions of heritage resources

The NHRA defines a heritage resource as any place or object of cultural significance i.e. of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This includes, but is not limited to, the following wide range of places and objects:

- living heritage as defined in the National Heritage Council Act No 11 of 1999 (cultural tradition; oral history; performance; ritual; popular memory; skills and techniques; indigenous knowledge systems; and the holistic approach to nature, society and social relationships);
- ecofacts (non-artefactual organic or environmental remains that may reveal aspects of past human activity; definition used in KwaZulu-Natal Heritage Act 2008);
- places, buildings, structures and equipment;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds;
- public monuments and memorials;
- sites of significance relating to the history of slavery in South Africa;
- movable objects, but excluding any object made by a living person; and
- battlefields.

Furthermore, 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; and
- its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.

‘Archaeological’ means –

- 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;
 - rock art, being any 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;
 - wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation;
 - 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.

A **‘place’** is defined as:

- a site, area or region;
- a building or other structure which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure;
- 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;
- 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.

‘Public monuments and memorials’ means all monuments and memorials—

- erected on land belonging to any branch of central, provincial or local government, or on land belonging to any organisation funded by or established in terms of the legislation of such a branch of government; or
- which were paid for by public subscription, government funds, or a public-spirited or military organisation, and are on land belonging to any private individual;

‘Structures’ means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.

2.3.5. Management of Graves and Burial Grounds

- **Graves younger than 60 years** are protected in terms of Section 2(1) of the Removal of Graves and Dead Bodies Ordinance 7 of 1925 as well as the Human Tissues Act 65 of 1983. Such graves 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 Member of the Executive Council 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. In order to handle and transport human remains the institution conducting the relocation should be authorised under Section 24 of the Human Tissues Act 65 of 1983.

- **Graves older than 60 years situated outside a formal cemetery administered by a local authority** are protected in terms of Section 36 of the NHRA as well as

the Human Tissues Act of 1983. Accordingly, such graves are the jurisdiction of SAHRA. The procedure for Consultation Regarding Burial Grounds and Graves (Section 36(5) of NHRA) is applicable to graves older than 60 years that are situated outside a formal cemetery administered by a local authority. Graves in the category located inside a formal cemetery administered by a local authority will also require the same authorisation as set out for graves younger than 60 years over and above 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.

The **protocol for the management of graves older than 60 years situated outside a formal cemetery administered by a local authority** is detailed in Section 36 of the NHRA:

(3) (a) 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.

(5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection (3)(b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority—

(a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and

(b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.

(6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority—

(a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and

(b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

The Vermillion Accord on Human Remains¹

Adopted in 1989 at WAC Inter-Congress, South Dakota, USA

1. Respect for the mortal remains of the dead shall be accorded to all, irrespective of origin, race, religion, nationality, custom and tradition.
2. Respect for the wishes of the dead concerning disposition shall be accorded whenever possible, reasonable and lawful, when they are known or can be reasonably inferred.
3. Respect for the wishes of the local community and of relatives or guardians of the dead shall be accorded whenever possible, reasonable and lawful.
4. Respect for the scientific research value of skeletal, mummified and other human remains (including fossil hominids) shall be accorded when such value is demonstrated to exist.
5. Agreement on the disposition of fossil, skeletal, mummified and other remains shall be reached by negotiation on the basis of mutual respect for the legitimate concerns of communities for the proper disposition of their ancestors, as well as the legitimate concerns of science and education.
6. The express recognition that the concerns of various ethnic groups, as well as those of science are legitimate and to be respected, will permit acceptable agreements to be reached and honoured.

¹ <http://www.worldarchaeologicalcongress.org/>

3. PROJECT DESCRIPTION

Stakeholders in this project are as follows:

- Department of Agriculture, Land Reform and Rural Development
- Department Rural Development and Land Reform
- Khai-Ma Local Municipality
- DWA
- Namakwa District Municipality (NDM)
- Co-operatives
- Onseepkans Water board
- Onseepkans Commercial & Small Scale Farmers
- ESKOM
- BVI
- Enviroafrica cc.
- Financial Institutions
- Agri-business

Department of Agriculture, Land Reform and Rural Development (Northern Cape Province), Namakwa District Municipality and Khai-Ma Local Municipality, as well as above mentioned stakeholders, are planning agricultural developments at Onseepkans in the Northern Cape Province. The proposed development site is under provincial government management and hence the initiative originated from the said government. EnviroAfrica cc. was appointed as the environmental specialist to complete an Environmental Impact Assessment of the area of proposed development (see location map) in accordance with the National Environmental Management Act (Act 107 of 1998 as amended).

The site is under jurisdiction of Namakwa District Municipality and locally under jurisdiction of the Khai-Ma local Municipality. There are no existing structures, houses, developments in the path of the proposed bulk water supply development which includes the OSK pump station, the OSK solar farm and the OSK reservoir. There is however an existing settlement in the pathway of the proposed development of the OSK pipeline. According to the proposed plan of development from the stakeholders, it seems that the pipeline will be running underground along an existing gravel road and within the servitude of this gravel road, through the existing settlement nearby. There will be no physical or economical displacement of communities, but rather a significant progress in the living conditions of many

members of the community at Onseepkans and surrounding settlements especially in terms of job opportunities and food security. The site initially covers an area of approximately 5-10 ha.

4. PROJECT LOCATION AND ENVIRONMENTAL DESCRIPTION

The project covers the areas within the jurisdictions of Khai-Ma Local Municipality and Namakwa District Municipality. The relevant Surveyor-General 1:50 000 map sheets are as follows:

- i. Onseepkans Settlement Locality Map
- ii. 1:50 000 2819 CB Onseepkans
- iii. 1:50 000 2819 CD Oupvlakte
- iv. Onseepkans Site Development Footprint and Survey track Map
- v. Garmin Maps (Map source) Footprint and Survey tracks
- vi. Satellite Images of proposed development site
- vii. 1:50 000 Survey Tracks on Footprint at Onseepkans

The proposed development site consists of level plains with open sandy areas, with rocky outcrops, steep hills of approximately 5-10 ha. Proposed development is restricted to the level plains and open fields of the site, except for the proposed solar farm to be developed on a ridge of a mountain. The micro- environment of the site is flat; with barely significant contour variation (Approximately 450m above sea level throughout). The biophysical environment can be effectively described as follows:

The area lies in a semi-arid region and fresh water is a scarce resource in the district. It has implications for the types of agricultural activities that can take place, in that the most appropriate crops and the most water-efficient irrigation technologies need to be promoted. The only sustainable source of good quality irrigation water is the Orange River. In terms of biodiversity the area is rich in natural flora which can be harnessed as a unique tourism attraction. The area has a further competitive advantage with its hot and sunny climate with the highest solar radiation intensity in South Africa, making it appropriate for private and large-scale solar energy generation.

Climate

This Namakwa District of the Northern Cape Province is known for its semi-desert climate with extreme temperatures ranging from up to 45°C in summer to - 2°C in winter. The climate is variable due to its position in the transitional area between winter and summer rainfall. The winters are short and the area is well known for its high summer temperatures. Rainfall is erratic with average annual precipitation of 94mm which occurs mainly in the late summer in the form of thunder showers.

Average days with frost per year are only 2 and crops can only be grown under irrigation.

Geology and topography

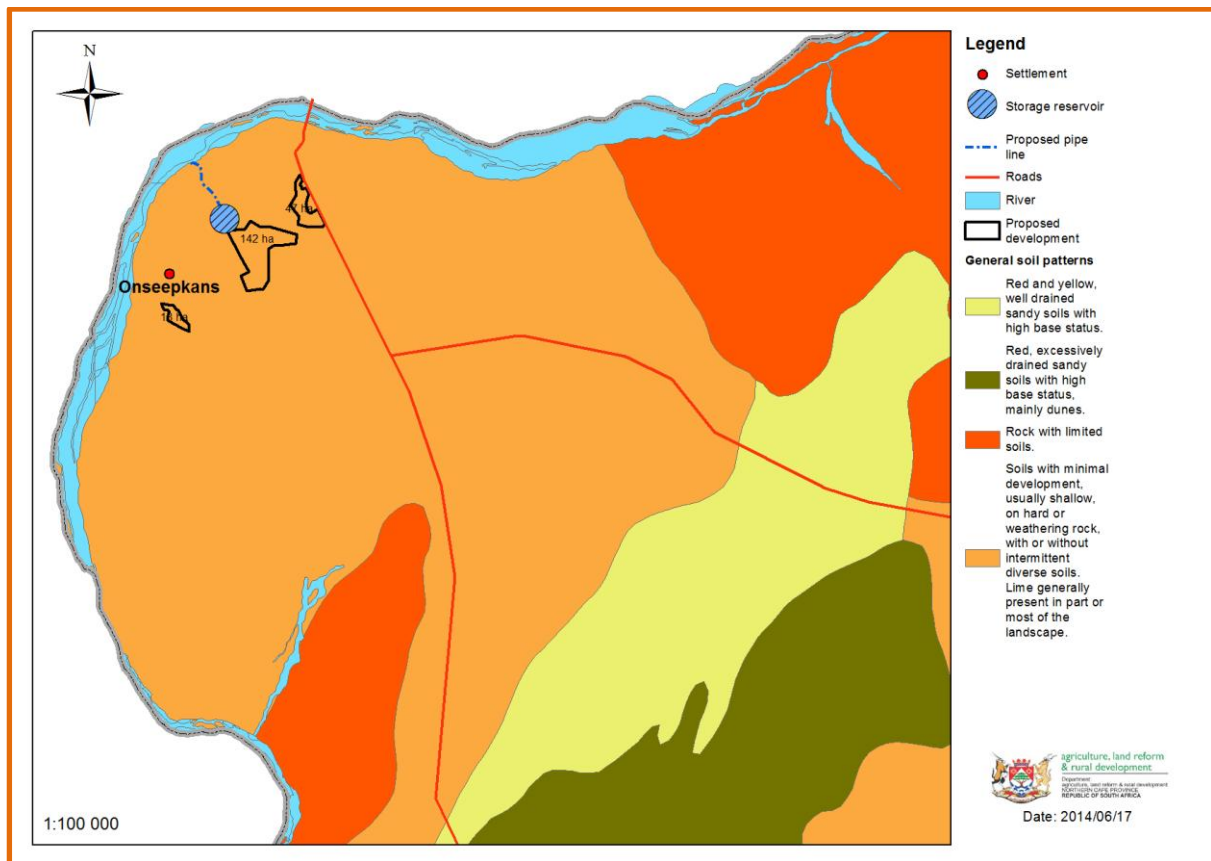
Onseepkans lies in the Namaqua Metamorphic Complex and is composed mainly of pre-Gariep gneisses, granitoids and gabroids. This zone is so large and heterogeneous that it is difficult to generalize on its features apart from the medium to high metamorphic grade. It can however be subdivided into the following three sub-areas on the ground of its geologic evolution.

- 1) *Namaqualand* – Comprises of the Namaqualand highlands and coastal plain.
- 2) *Bushmanland* – Covers the area under investigation.
- 3) *Namibia* – Contains major inliers in the Luderitz and Karasburg districts.

Namaqualand is characterized by gneisses underlying the *Bushmanland* cover sequence in the western part. Underlying gneisses consist of pre-cover layered biotite gneisses and post cover augen granitoid gneisses which intruded into the mother material. The basement character of the layered gneisses is evident from the fact that they contain two structural elements (a folded schistosity) that have not been recognized in either the cover rocks or the augen gneisses that intrude them.

The existing irrigation lies on the flood plain of the Orange River and is characterized by recent alluvial deposits of the Orange River supporting soil forms such as Dundee and Oakleaf. The river cuts through a great variety of pre-Cambrian metamorphic rocks and the area is subject to floods caused by high precipitation in the Highveld during summer. The proposed site for the table grape agricultural development lies south of the alluvial plain on gently sloping pediment slopes. This area is characterized by gneissic rock and coarse grained metamorphic rocks from the Little Namaqualand Suite of the O’Kiep Group. This is interspersed by sedimentary material from the Korannaland Sequence which includes conglomerates, quartzite, schists and mica (Draft 1. Proposed Development at Onseepkans. Khai-Ma Local Municipality: Pofadder).

Figure 1: General Soil Patterns on Site



The area within the Orange River flood plain with its alluvial character consists of fine sand and silt and has a fairly uneven micro-topography due to flood action causing erosion, but also depositing sedimentary material. In contrast the higher terrace appears to consist entirely of wind deposited material or it used to be alluvial material which was totally reworked by wind action. The result is a hummocky micro relief which ranges from fair to severe in other areas.

The last feature contains the alluvial fans which developed from drainage channels which emerge out of the mountains and which merge with the gently sloping pediment where the power of the streams become too low and where the sediment loads are dropped.

The topography of the area of interest around the Onseepkans settlement is generally gentle sloping. It is however bordered by mountainous terrain which might produce flash flooding during thunderstorms from tributaries and mountain streams that might develop.

The R358 secondary road runs east of the proposed development site and links up with minor entrance roads which gives accessibility to the various villages in the area, as well as cultivated farms along the banks of the Orange River in this region.

There is no population density on the sites; neither are there any known commercial farming activities. The sites consist of a typical arid Savannah Desert biome with vegetation as described below.

Vegetation

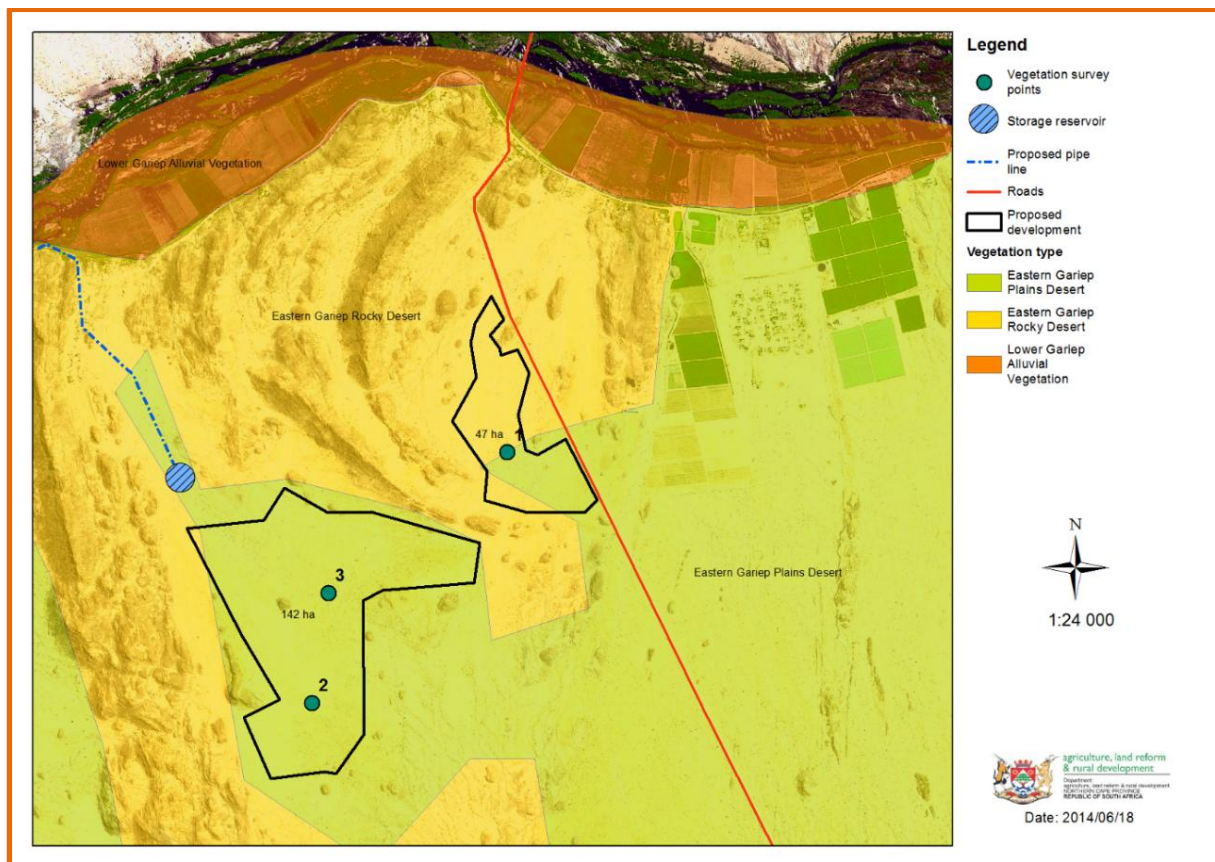
The long-term grazing capacity is very low for the Onseepkans farming area and ranges between 70 ha LSU-1 and 100 ha LSU-1 (Large Stock Unit) (Grazing map, 1993).

Both past and present farming activities on arid rangelands often placed immense pressure on the natural resources, often leading to the overutilization thereof (Esler, et al., 2010). On the communal managed rangelands there are often too many livestock, with only a few water points and not a proper grazing management system in place to allow rest for the rangelands. These non-equilibrium systems as are primarily controlled by various stochastic abiotic factors, such as droughts (Vetter, 2005), while Westoby et al. (1989) consider the high rainfall variability to be the primary driver for vegetation dynamics and claimed that grazing pressure from livestock only plays a marginal role in rangeland condition. Variable rainfall would, therefore, result in highly variable forage production and, accordingly, carrying capacity (Vetter, 2005). Less available forage results in higher mortality rates of livestock or more livestock being marketed.

The Onseepkans farm forms part of the Desert Biome of Southern Africa (Low & Rebelo, 1996; Rutherford et al., 2006). The term desert is roughly defined as an area with a mean annual precipitation of less than 75 mm and a sparse perennial vegetation canopy cover of less than 10%. The diversity of the vegetation in this biome is relatively high compared to the other deserts at the same aridity level globally. The Gariep vegetation types consist of some rocky areas which are dominated by sparse shrubs and leaf succulents. The vegetation within this Desert Biome can be quite sensitive to degradation, e.g. soil loss and changes in the plant species composition are some of the major impacts which resulted due to the mismanagement of livestock (Jürgens, 2006).

The focus area for the new development at Onseepkans is situated in the Eastern Gariep Plains Desert vegetation type and Eastern Gariep Rocky Desert (Draft 1: Onseepkans Proposed Developemnt at Onseepkans. Khai-Ma Local Municipality: Pofadder).

Figure 2: Vegetation types (Jürgens, 2006) of the Onseepkans farming area in the Northern Cape Province of South Africa within the Desert Biome.



The tree layer of this vegetation type is dominated by *Parkinsonia africana*, a small tree species (Jürgens, 2006). The succulent shrub layer consists of species such as *Brownanthus pseudoschlichtianus*, *Euphorbia gregaria*, *Psilocaulon subnodosum* and *Zygophyllum microcarpum*. Other shrub species include *Calicorema capitata*, *Gaillonia crocyllis*, *Hermbstaedtia glauca*, *Monechma spartioides*, *Petalidium setosum* and *Sisyndite spartea*. The grass layer is dominated by perennial grasses such as *Stipagrostis brevifolia*, *S. ciliata* and, *S. obtusa* (Jürgens, 2006). Also present within this vegetation type are the annual grass species *Schmidtia kalihariensis*. The perennial herb species include *Codon royenii* and *Rogeria longiflora* together with the succulent herb; *Mesembryanthemum guerichianum* (Jürgens, 2006).

A poor vegetative cover is present with only eight species that provide a low ground cover protection and little palatable forage for livestock. The grass density is quite low, with a low basal cover of 2.5% and the dominant species being the annual grass plant (*Schmidtia kalihariensis*, Sour grass) and the perennial grass (*Stipagrostis hochstetteriana*). *Schmidtia kalihariensis* and *Stipagrostis hochstetteriana* is commonly found on disturbed gravelly soils. The two perennial, more palatable grasses (e.g. *Stipagrostis ciliata* and *S. obtusa*) which occur at a very low frequency (< 4%) are grazed to ground level (Figure 2). This continuous high grazing intensity

on these more palatable grasses would inevitably result in the replacement thereof by less palatable pioneer species.

Palatable shrubs are heavily grazed; however, the shrub community is mostly dominated by the less palatable species; *Aptosimum spp.*, *Euphorbia gregaria* and *Petalidium setosum* (Namib petal-bush). The invader species; *Prosopis* have been recorded in the survey area. The condition of the vegetation at this monitoring site reflects gross overstocking. The veld condition score of 665.5 for survey area 2 is relatively low and this can mostly be ascribed to the high occurrence of the annual grass species *Schmidtia kalihariensis*. The targeted areas of 142 ha and 47 ha are close by Viljoensdraai and Onseepkans with no fencing and therefore resulting in the movement of many animals through the area each day. Such an area is prone to the invasion by alien, invasive and encroacher species (e.g. the *Prosopis spp.* and *Acacia mellifera*). The two species mentioned have been observed in both the two grazing areas raising concern that the density of these two species will increase and the veld condition will only deteriorate further (Draft 1: Proposed Development at Onseepkans. Khai-Ma Local Municipality: Pofadder).

Figure 3: Northern Cape Location Map of Proposed Development Area

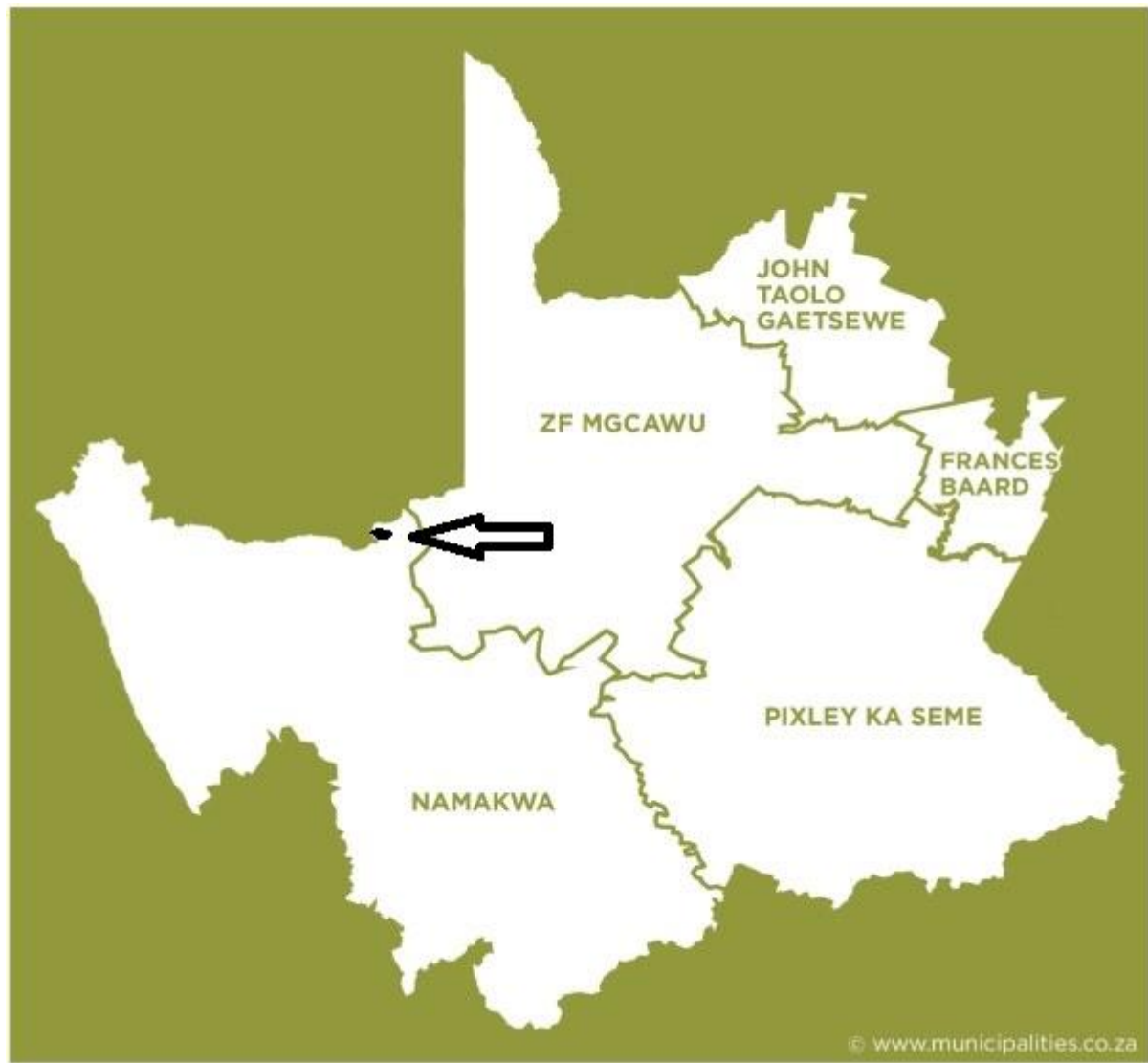


Figure 4: Footprint Location Map of Proposed Development Area

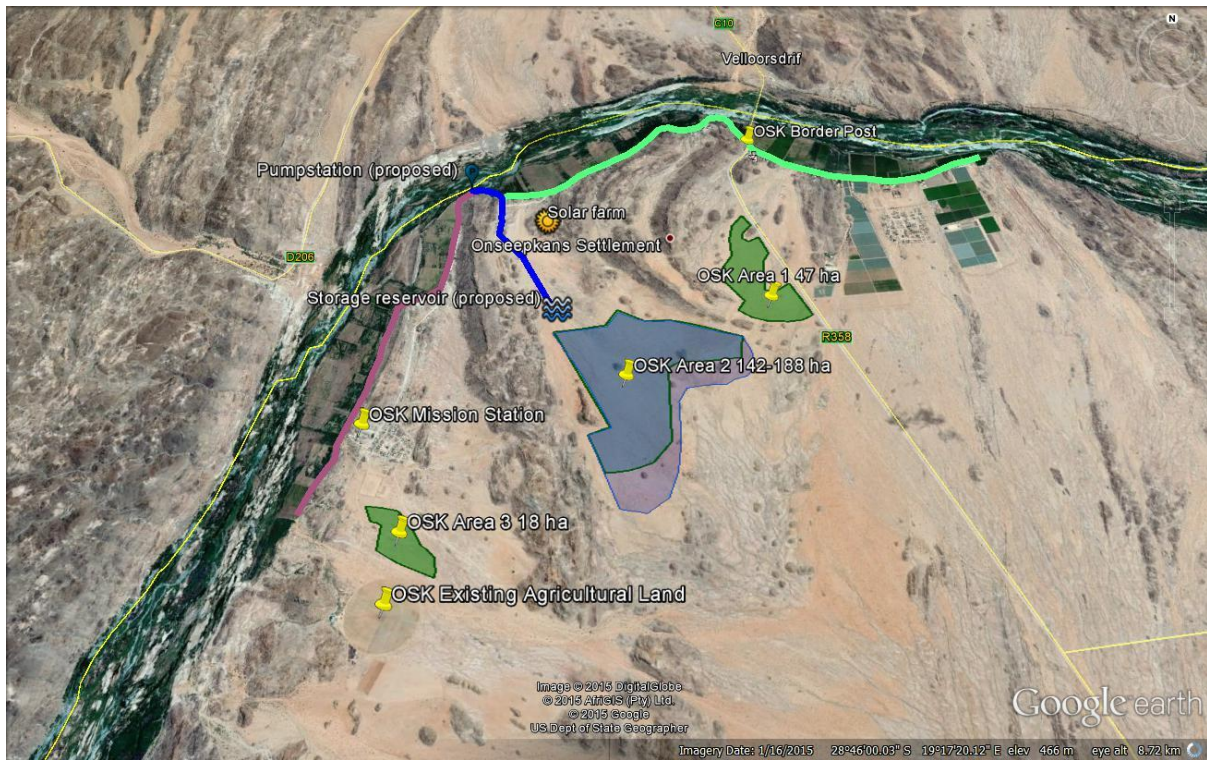


Figure 5: Footprint Location Map of Proposed OSK Solar, OSK Pipeline, OSK Reservoir and OSK Pumpstation (Google Image)



Regarding the surface mineral deposit of the site, there are no mineral deposits observed on the site. Subsurface mineral deposits might be possible, but with a very low probability.

5. METHODOLOGY

5.1. Desktop Study

The first step was to conduct a desktop study of the heritage background of the area and the site of the proposed development. This entailed the scoping and scanning of historical texts/records as well as previous heritage studies and research around the study area.

5.2. Literature Research

By incorporating data from previous CRM reports done in the area and an archival search, the study area is contextualised. The objective of this is to extract data and information on the area in question, looking at archaeological sites, historical sites and graves of the area.

5.3. Data Collection

SAHRIS was consulted to collect data from previously conducted CRM projects in the region to provide a comprehensive account of the history of the study area. Tim Hart and associates (ACO Associates cc.) compiled a thorough AIA report during November 2014, on an assessment done on farm portions south of Pofadder within the Khai- Ma local Municipality. The assessment was for the proposed construction of a wind energy facility in the region. In their report they detected low significant MSA stone tool scatters and one high significant LSA stone tool deposit around a pan. The client, Savannah Environmental also employed them for assessments in the Ageney's region, where low significant MSA stone tool scatters were also recorded. At the Pofadder site, however, the historical built environment brought some limitations in terms of mitigation, for the access road to one site ran through the historical Namies Village ruins which were of high significance. Mitigation was suggested. Another assessment initiated by EnviroAfrica cc. was at Kakamas for the assessment of erfen at Kakamas. Kakamas is historically also of high significance.

Pofadder is situated approximately 50km from the Onseepkans proposed development site. To the west of Onseepkans is the Pella Settlement, which is historically of high significance in terms of Missionary history. No other AIA'S or HIA's could be detected on SAHRIS for proposed developments near Onseepkans. Kakamas is situated approximately 110km from Onseepkans and Ageney's approximately 200km. Other assessments in the region of Kai!Garieb Local Municipality by Nelius Kruger at Eenduin and Avondale farms revealed low significance MSA artefacts. It thus seems that the region is very remote and that archaeological deposits are not in high density on the landscape surface. At Onseepkans the archaeological deposit is almost absent and of low significance, except for its historical values.

5.4. Consultation

A public participation process is facilitated by the Environmental Consultant (EnviroAfrica cc.) for the project.

5.5. Mapping Survey

The GIS and mapping sources were provided by the client as per prior agreement with the client EnviroAfrica cc. (see included in this report).

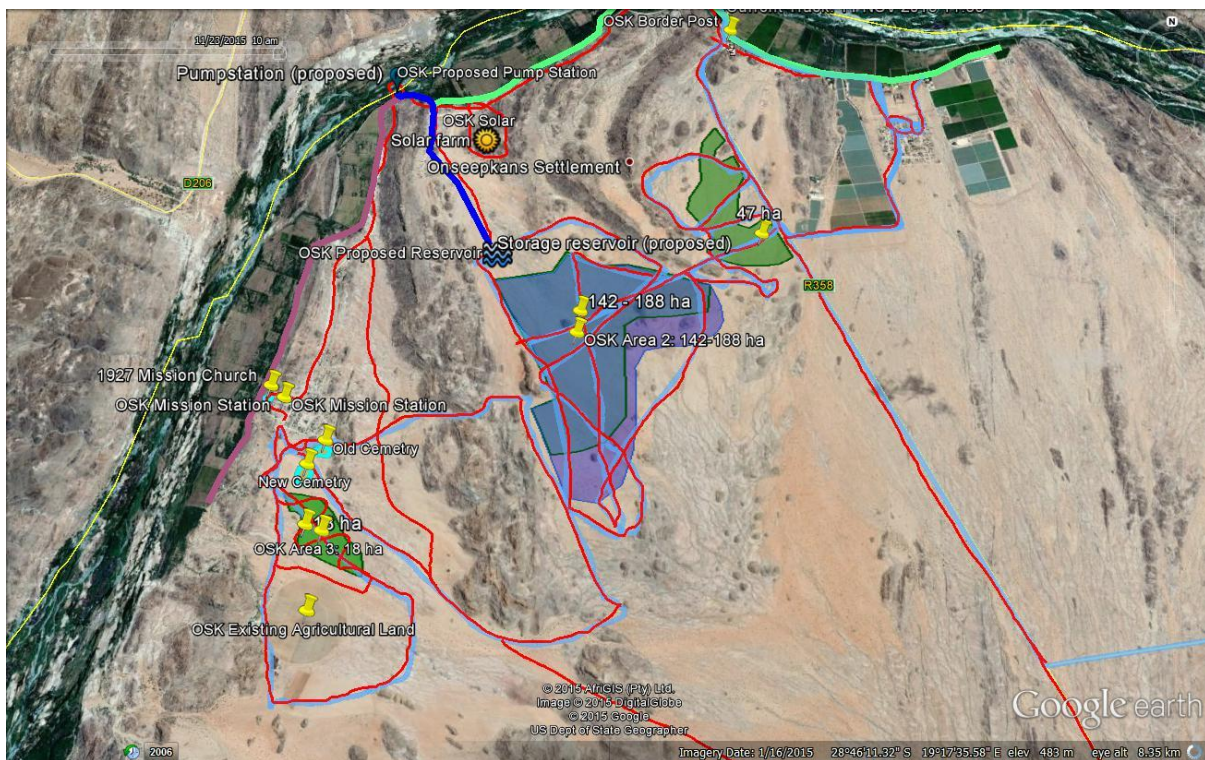
5.6. Site Survey

Heritage specialist from Ubique Heritage Consultants, inspected the proposed development and surrounding areas on 11 to 13 November 2015 and completed a

controlled-exclusive surface survey, where sufficient information exists on an area to make solid and defensible assumptions and judgements about where (heritage resource) sites may and may not be and we conducted an inspection of the ground surface, as far as the surface was visible. This was done with no substantial attempt to clear brush, sand, deadfall, leaves or other material that may cover the surface and with no attempt to look beneath the surface beyond the inspection of rodent burrows, cut banks and other exposures that are observed by accident (King 1978).

The site survey comprised of pre-planned foot patrols along the proposed development site. Photographs were taken with a Samsung Android S5 camera and a representative selection is included in this report. Geographic coordinates were obtained using a handheld Garmin global positioning unit (Garmin eTrex 10).

Figure 6: Google Image of Survey Track



5.7. Database and literature review

No archaeological site data was available for the project area. A concise account of the archaeology and history of the broader study area was compiled from sources including those listed in the bibliography.

5.8. Assessment of heritage resource value and significance

Heritage resources are significant only to the extent that they have public value, as demonstrated by the following guidelines for determining site significance developed by Heritage Western Cape in 2007 and utilised during this assessment.

5.8.1. Grade I Sites (National Heritage Sites)

Regulation 43 Government Gazette no 6820. 8 No. 24893 30 May 2003, Notice No. 694 states that:

Grade I heritage resources are heritage resources with qualities so exceptional that they are of special national significance should be applied to any heritage resource which is:

- a) Of outstanding significance in terms of one or more of the criteria set out in section 3(3) of the NHRA;
- b) Authentic in terms of design, materials, workmanship or setting; and is of such universal value and symbolic importance that it can promote human understanding and contribute to nation building, and its loss would significantly diminish the national heritage. The following assessment guidelines were followed:
 - 1. Is the site of outstanding national significance?
 - 2. Is the site the best possible representative of a national issue, event or group or person of national historical importance?
 - 3. Does it fall within the proposed themes that are to be represented by National Heritage Sites?
 - 4. Does the site contribute to nation building and reconciliation?
 - 5. Does the site illustrate an issue or theme, or the side of an issue already represented by an existing National Heritage Site – or would the issue be better represented by another site?
 - 6. Is the site authentic and intact?
 - 7. Should the declaration be part of a serial declaration?
 - 8. Is it appropriate that this site be managed at a national level?
 - 9. What are the implications of not managing the site at national level?

5.8.2. Grade II Sites (Provincial Heritage Sites)

Regulation 43 Government Gazette no 6820. 8 No. 24893 30 May 2003, Notice No. 694 states that:

Grade II heritage resources are those with special qualities which make them significant in the context of a province or region and should be applied to any heritage resource which -

- a) is of great significance in terms of one or more of the criteria set out in section 3(3) of the NHRA; and
- (b) enriches the understanding of cultural, historical, social and scientific development in the province or region in which it is situated, but that does not fulfil the criteria for Grade I status.

Grade II sites may include, but are not limited to:

- (a) places, buildings, structures and immovable equipment of cultural significance;
- (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 of cultural significance;
- (e) geological sites of scientific or cultural importance;
- (f) archaeological and palaeontological sites; and
- (g) graves and burial grounds.

The cultural significance or other special value that Grade II sites may have, could include, but are not limited to:

- (a) its importance in the community or pattern of the history of the province;
- (b) the uncommon, rare or endangered aspects that it possess reflecting the province's natural or cultural heritage
- (c) the potential that the site may yield information that will contribute to an understanding of the province's natural or cultural heritage;
- (d) its importance in demonstrating the principal characteristics of a particular class of the province's natural or cultural places or objects;
- (e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group in the province;
- (f) its importance in demonstrating a high degree of creative or technical achievement at a particular period in the development or history of the province;
- (g) its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons; and
- (h) its strong or special association with the life or work of a person, group or organization of importance in the history of the province.

5.8.3. Grade III (Local Heritage Resources)

Regulation 43 Government Gazette no 6820. 8 No. 24893 30 May 2003, Notice No. 694 states that:

Grade III heritage status should be applied to any heritage resource which

- (a) fulfils one or more of the criteria set out in section 3(3) of the NHRA; or

- (b) in the case of a site contributes to the environmental quality or cultural significance of a larger area which fulfils one of the above criteria, but that does not fulfill the criteria for Grade II status.

Grade IIIA

This grading is applied to buildings and sites that have sufficient intrinsic significance to be regarded as local heritage resources; and are significant enough to warrant *any* alteration being regulated. The significances of these buildings and/or sites should include at least some of the following characteristics:

- Highly significant association with a
 - historic person
 - social grouping
 - historic events
 - historical activities or roles
 - public memory
- Historical and/or visual-spatial landmark within a place
- High architectural quality, well-constructed and of fine materials
- Historical fabric is mostly intact (this fabric may be layered historically and/or past damage should be easily reversible)
- Fabric dates to the early origins of a place
- Fabric clearly illustrates an historical period in the evolution of a place
- Fabric clearly illustrates the key uses and roles of a place over time
- Contributes significantly to the environmental quality of a Grade I or Grade II heritage resource or a conservation/heritage area

Such buildings and sites may be representative, being excellent examples of their kind, or may be rare: as such they should receive maximum protection at local level.

Grade IIIB

This grading is applied to buildings and/or sites of a marginally lesser significance than grade IIIA; and such marginally lesser significance argues against the regulation of internal alterations. Such buildings and sites may have similar significances to those of a grade IIIA building or site, but to a lesser degree. Like grade IIIA buildings and sites, such buildings and sites may be representative, being excellent examples of their kind, or may be rare, but less so than grade IIIA examples: as such they should receive less stringent protection than grade IIIA buildings and sites at local level and internal alterations should not be regulated (in this context).

Grade IIIC

This grading is applied to buildings and/or sites whose significance is, in large part, a significance that contributes to the character or significance of the environments. These buildings and sites should, as a consequence, only be protected and regulated *if the significance of the environs is sufficient to warrant protective measures*. In other words, these buildings and/or sites will only be protected if they are within declared conservation or heritage areas.

Field Rating IV A

This grading is a field rating used during Phase 1 AIA surveys, labelled as a “General Protection A” rating. This rating requires that a site should be mitigated before destruction and usually has a medium to high significance.

Field Rating IV B

This grading is a field rating used during Phase 1 AIA surveys, labelled as “General Protection B” rating. This rating requires that a site should be recorded before destruction and usually has a medium significance.

Field Rating IV C

This rating is a field rating, more often used after Phase 1 AIA surveys, labelled as a “General Protection C” rating. This rating accepts that a site has been sufficiently recorded during a Phase 1 study and subsequently it requires no further recording before destruction and usually has a low significance. The Onseepkans proposed development falls within this category in our view.

5.9. Assessment of development impacts

A heritage resource impact may be defined broadly as the net change, either beneficial or adverse, between the integrity of a heritage site with and without the proposed development. Beneficial impacts occur wherever a proposed development actively protects, preserves or enhances a heritage resource, by minimising natural site erosion or facilitating non-destructive public use, for example. More commonly, development impacts are of an adverse nature and can include:

- destruction or alteration of all or part of a heritage site;
- isolation of a site from its natural setting; and / or
- introduction of physical, chemical or visual elements that are out of character with the heritage resource and its setting.

Beneficial and adverse impacts can be direct or indirect, as well as cumulative, as implied by the aforementioned examples. Although indirect impacts may be more difficult to foresee, assess and quantify, they must form part of the assessment

process. The following assessment criteria have been used to assess the impacts of the proposed development on possible identified heritage resources (marked in red):

Criteria	Rating Scales	Notes
Nature	Positive	An evaluation of the type of effect the construction, operation and management of the proposed development would have on the heritage resource.
	Negative	
	Neutral	
Extent	Low	Site-specific, affects only the development footprint.
	Medium	Local (limited to the site and its immediate surroundings, including the surrounding towns and settlements within a 10 km radius);
	High	Regional (beyond a 10 km radius) to national.
Duration	Low	0-4 years (i.e. duration of construction phase).
	Medium	5-10 years.
	High	More than 10 years to permanent.
Intensity	Low	Where the impact affects the heritage resource in such a way that its significance and value are minimally affected.
	Medium	Where the heritage resource is altered and its significance and value are measurably reduced.
	High	Where the heritage resource is altered or destroyed to the extent that its significance and value cease to exist.
Potential for impact on irreplaceable resources	Low	No irreplaceable resources will be impacted.
	Medium	Resources that will be impacted can be replaced, with effort.

Criteria	Rating Scales	Notes
	High	There is no potential for replacing a particular vulnerable resource that will be impacted.
Consequence a combination of extent, duration, intensity and the potential for impact on irreplaceable resources).	Low	A combination of any of the following: - Intensity, duration, extent and impact on irreplaceable resources are all rated low. - Intensity is low and up to two of the other criteria are rated medium. - Intensity is medium and all three other criteria are rated low.
	Medium	Intensity is medium and at least two of the other criteria are rated medium.
	High	Intensity and impact on irreplaceable resources are rated high, with any combination of extent and duration. Intensity is rated high, with all of the other criteria being rated medium or higher.
Probability (the likelihood of the impact occurring)	Low	It is highly unlikely or less than 50 % likely that an impact will occur.
	Medium	It is between 50 and 70 % certain that the impact will occur.
	High	It is more than 75 % certain that the impact will occur or it is definite that the impact will occur.
Significance (all impacts including potential	Low	Low consequence and low probability. Low consequence and medium probability. Low consequence and high probability.

Criteria	Rating Scales	Notes
cumulative impacts)	Medium	<p>Medium consequence and low probability.</p> <p>Medium consequence and medium probability.</p> <p>Medium consequence and high probability.</p> <p>High consequence and low probability.</p>
	High	<p>High consequence and medium probability.</p> <p>High consequence and high probability.</p>

5.10. Assumptions and limitations of this AIA

- The description of the proposed project, provided by the client, is assumed to be accurate.
- The public consultation process undertaken as part of the Environmental Impact Assessment is sufficient and adequate and does not require repetition as part of the environmental impact assessment.
- Soil surface visibility was good. Heritage resources might be present below the surface and we remind the client that the NHRA requires that a developer cease all work immediately and observe the protocol in this report should any heritage resources, as defined in the Act, be discovered during the course of development activities.
- No subsurface investigation (including excavations or sampling) were undertaken, since a permit from SAHRA is required to disturb a heritage resource.
- A key concept in the management of heritage resources is that of non-renewability: damage to or destruction of most resources, including that caused by bona fide research endeavours, cannot be reversed or undone. Accordingly, management recommendations for heritage resources in the context of development are as conservative as possible.
- Human sciences are necessarily both subjective and objective in nature. Ubique Heritage Consultants (Pty) Ltd strives to manage heritage resources to the highest standards in accordance with national and international best practice, but recognise that their opinions might differ from those of other heritage practitioners.
- Staff members involved in this project have no vested interest in it; are qualified to undertake the tasks as described in the executive summary and terms of reference in this report and comply at all times with the Codes of Ethics and Conduct of the Association of Southern African Professional Archaeologists.

- Ubique Heritage Consultants staff members take no personal or professional responsibility for the misuse of the information contained in this report, although they will take all reasonable precautions against such misuse.

6. OBSERVATIONS

No development activities associated with the proposed project had begun at the time of our survey. The following table summarises the heritage resource types assessed, and our observations.

6.1. HERITAGE RESOURCES: OBSERVATION AND FINDINGS

Heritage resource type	Observation
Places, buildings, structures and equipment	None of archaeological significance was identified within the proposed development area.
Places associated with oral traditions or living heritage	Living heritage was identified outside the development footprint. The historical Roman Catholic Mission Station was established around 1916 and lives on to operate until this present day.
Landscapes	None were identified within the proposed development area except for several existing two track gravel/sand roads. Several possibilities for entrance routes to the site were surveyed (see map). See also environmental description under paragraph 4.
Natural features	Riverines and waterways (non-perennial) are present on the site. Trenches, developed over time due to erosion are also present. Rocky outcrops, steep hills and mountains are present outside the development footprint. Proposed development is restricted to more accessible plains. See also paragraph 4.

Traditional burial places	None were identified within the proposed development footprint. There are however two cemeteries located near Onseepkans Settlement and the Mission Station. One cemetery seems to be of historical significance.
Ecofacts	None were identified within the proposed development area.
Geological sites of scientific or cultural importance	None were identified within the proposed development area. Orange River in reasonable close proximity. See also paragraph 4.
Archaeological sites	One location was identified with one MSA/LSA stone tool/retouched stone. The tool represents a microlithic flake utilised as a possible scraper or point.
Historical settlements and townscapes	Roman Catholic Mission Station at Onseepkans Settlement with historical graveyard, church and buildings. These settlements are however outside the proposed development footprint and proposed development will not have an effect on such historical heritage resources.
Public monuments and memorials	None were identified within the proposed development footprint, except for the Mission church and buildings dated <i>ca.</i> 1927
Battlefields	None were identified within the proposed development footprint. The nearest battlefield registered from Onseepkans Settlement is Kakamas where 1900-1902 ABW as well as 1914 Rebellion forces had skirmishes.

The following is a summary of archaeological finds:

DESCRIPTION	PERIOD	GRID
Microlith flake. Possible scraper or point. OSK 1/2015	MSA	28° 45' 45.40" South 19° 18' 04.00" East

The proposed development site for the construction of a pipeline, solar farm, reservoir and pump station were surveyed and as indicated above, the impact on heritage resources are rated as low. As indicated below an extended area external in relation to the footprint was surveyed to ensure flexibility of the proposed project as well as eliminating all possibilities of the presence of heritage material on the surface of the proposed development areas.

Figure 7: Survey Track on Footprint 1:50 000

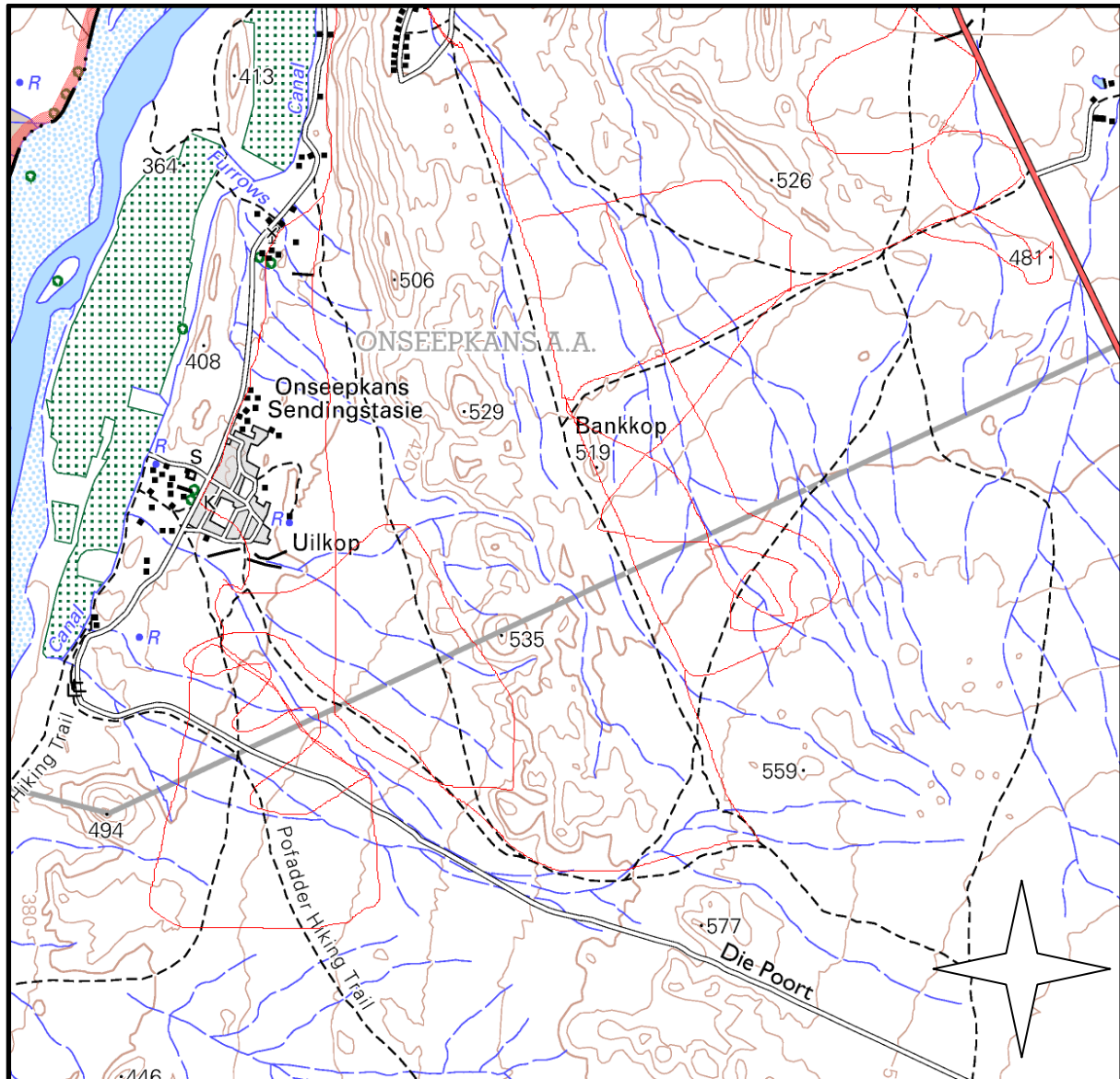


Figure 8: Google Image of Access Routes to Proposed Development Site Surveyed

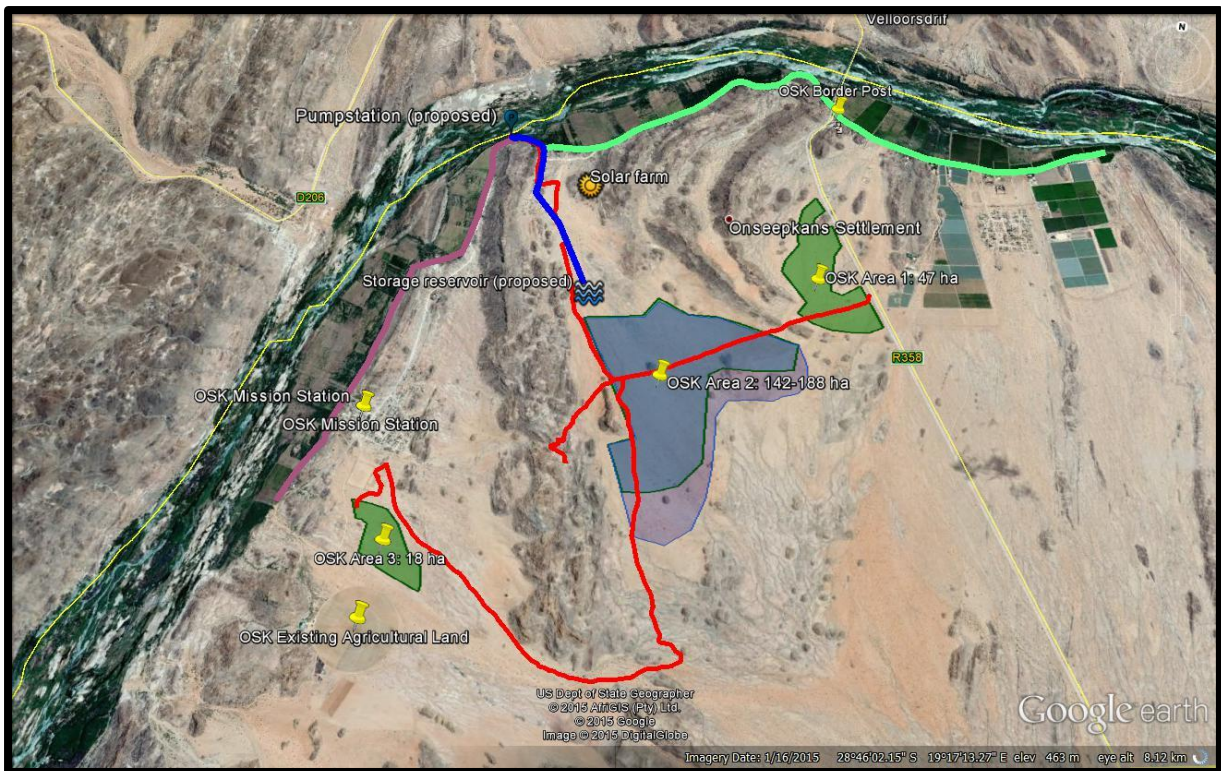


Figure 9: Google Image of Survey Tracks

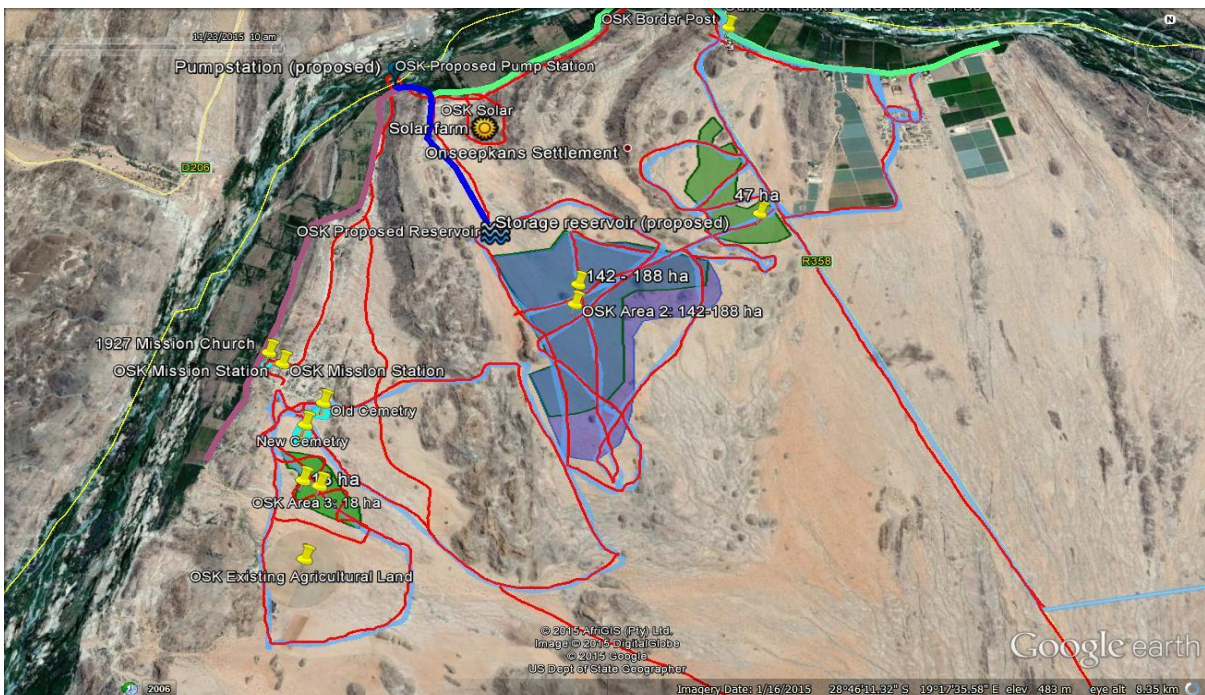


Figure 10: Google Image of Pipeline, Solar and Pumpstation Survey Tracks



Figure 11: Archaeological Finds Indicated in Pink Triangle on Proposed Development Site 1:50 000

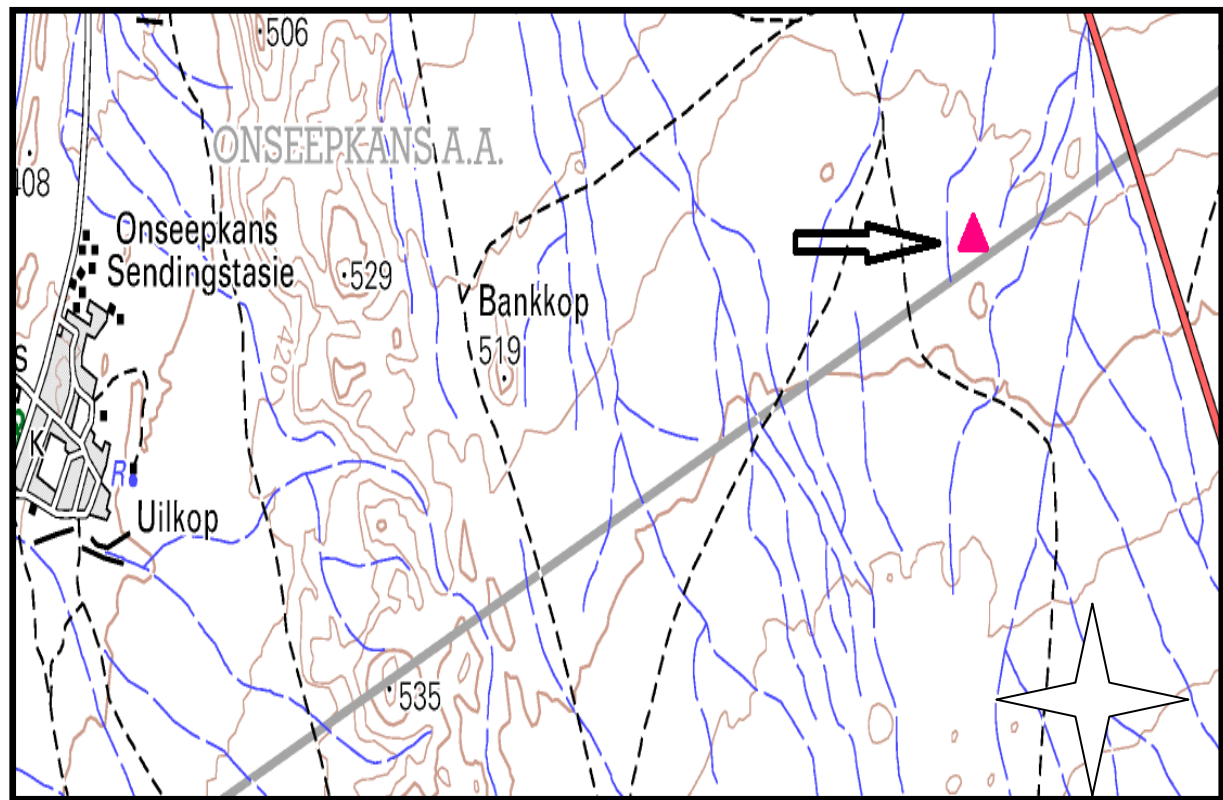


Figure 12: Google Image of Archaeological Finds on Proposed Development Site



Figure 13: Existing Developments on Proposed Development Site

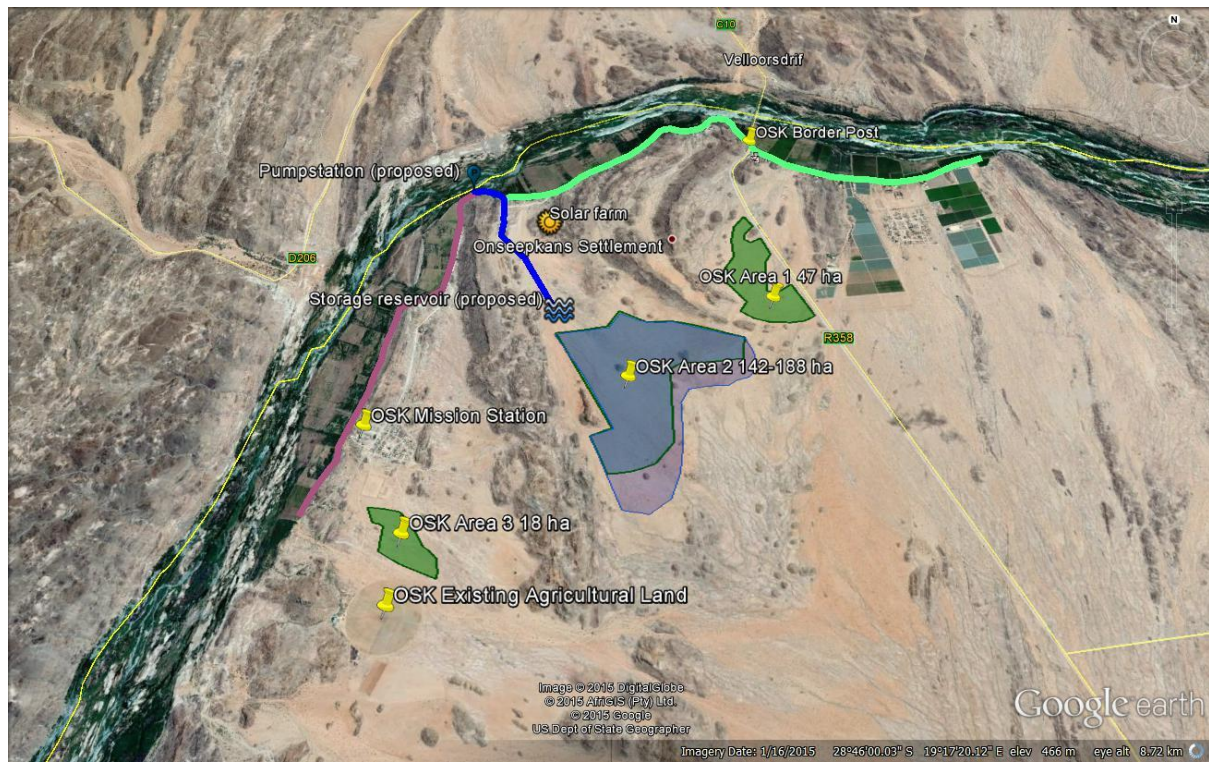


Figure 14: Google Image of Cemeteries/Graveyards and Mission Church



6.2 Photography of Proposed Development Site

Plate 1: Panorama View of Onseepkans Proposed Development Site



Plate 2: Rocky Outcrops and Mountains within the Site



Plate 3: Panorama View of Site – Proposed Solar farm and Reservoir Development in Background



Plate 4: Typical Open Plain Identified for Development



Plate 5: Main Access Road to Site



Plate 6: 1927 Roman Catholic Mission Church at Onseepkans Settlement (Frontal View)



Plate 7: 1927 Roman Catholic Church at Onseepkans Settlement (Diagonal View)



Plate 8: Roman Catholic Parsonage at Onseepkans Settlement



Plate 9: New Municipal Cemetery/Graveyard at Onseepkans Settlement



Plate 10: Historical Cemetery/Graveyard at Onseepkans Settlement



Plate 11: Previous Agricultural Development at Onseepkans



Plate 12: Location for Development of Proposed Pump Station



Plate 13: Panorama View of Location of the Development of Proposed Reservoir, Pipe line and Solar farm (Settlement in Background)



Plate 14: MSA Microlith: Possible Point or Scraper



Plate 15: MSA Microlith



7. ASSESSMENT OF DEVELOPMENT IMPACTS

7.1. Living Heritage

It is likely that living heritage has medium to high heritage significance at the community specific, local and regional levels at least for its historic, social, political, cultural and spiritual values external from the proposed development footprints.

7.2. Places, buildings, structures and Equipment

Within the proposed development footprints, it is likely that places, buildings, structures and equipment related to heritage has a low heritage significance at the community specific, local and regional levels at least for its historic, social, cultural and spiritual values. Outside the proposed development footprint, places, buildings and structures have a medium to high significance in terms of Missionary history.

7.3. Places of Oral Traditions Associated with Living Heritage

Within the Onseepkans community and Settlement, it is likely that places of oral traditions associated with living heritage has a medium to high heritage significance at the community specific, local and regional levels at least for its historic, social, cultural and spiritual values.

7.4. Historical Settlements and Townscapes

It is likely that historical settlements and townscapes related to heritage on the development footprint has a low heritage significance at the community specific, local and regional levels at least for its historic, social, cultural and spiritual values. No historical settlements were recorded on the site. The development will be beneficial to current settlements and enhance social and physical conditions in terms of social development and job creation. Onseepkans Settlement is a historical settlement within the region, but it has no impact on the proposed development. Outside the proposed development footprint in the region, historical settlements and townscapes may have a medium to high significance.

7.5. Landscapes and Natural Features

As noted in this report, an AIA is required to identify all heritage resources, including landscapes and natural features of cultural significance that may be affected by a proposed development, both directly and indirectly. Landscapes and natural features directly affected by the proposed development is evident and consists of riverines, waterways, erosion trenches, access roads, rocky outcrops, steep hills, mountains and minor vegetation in certain areas (Also refer to paragraph 4). It is furthermore possible that adjacent settlements might experience high levels of traffic, noise and dust, and light at night. These areas will possibly also be subject to significant visual and ecosystem changes. Regarding the cultural landscape of the Onseepkans

proposed bulk water supply development site and surrounds; we have not undertaken a specialist Social, Meteorological and Palaeontological assessment of this landscape, since such a study is not within our field of expertise. However, we have observed that the overall topography within the proposed development area is flat and comprises of gravel, sand and rocky outcrops, steep hills and mountains. The entire assessment area is a flat plain with elevated areas in-between, where previous disturbances are basically absent on the proposed development footprints.

7.6. Archaeology

The impact on archaeological remains, material and objects is significantly low as only one stone tool was found, identified and recorded. No archaeological remains/objects were detected on the proposed bulk water supply development footprints which include the OSK Pump station, OSK Pipe line, OSK Solar farm and OSK Reservoir. It is however evident that the archaeological remains have low heritage significance at the community specific, local and regional levels, at least for its historic and, cultural values. Development can thus continue.

8. PALAEONTOLOGY

No Palaeontological Impact Assessment (PIA) was conducted by Ubique Heritage Consultants (Pty) Ltd. According to the client, any Palaeontological studies will be conducted by a specialist appointed by the client if necessary.

9. GRAVES AND BURIAL GROUNDS

The Onseepkans Settlement has two Municipal cemeteries/graveyards. One of the cemeteries is of historical significance. These cemeteries are situated outside the proposed development footprint. No burial grounds or graves were recorded during our survey and consultation with the local community confirmed the absence of any graves on the site. Graves, burial sites and human remains have no heritage significance at all levels for their social, cultural and spiritual values.

10. PUBLIC MONUMENTS AND MEMORIALS

No public monuments or memorials were recorded on the site. Public monuments or memorials have no heritage significance at all levels for their social, cultural and spiritual values within the proposed development footprint. The historical Catholic Mission Station and church at the Onseepkans Settlement is of high historical significance, but it situated well outside the proposed development footprints. Intangible and living heritage might have high significance in this regard.

11. HISTORY

Onseepkans is a small settlement on the banks of the Orange River in the Northern Cape Province. It is a border post for traffic between Pofadder in the RSA and Keetmanshoop in Namibia. The name literally translated from Afrikaans, means “an

opportunity to rinse off soap". Other sources contemplate that the name is either a combination of three Nama words; "toonsiep" (an elbow projecting into the river), "nias" (a rocky surface), and "tcaans" (thorn trees), or it is a derivative of the Nama word meaning "watering place for cattle". Whatever the origin, the name did not deter European prospector, Edwells, settling on the Orange River in 1909. Farmers realising the value of irrigating the area, bought 12 000 ha of land from Edwells in 1916. In the same year 63 plots were surveyed and recorded. A 10km canal serving 70 families was built by Japie Lutz and today irrigated land lends many opportunities in the cultivation of crops such as lucerne, citrus and beans.

The Onseepkans community was however primarily established in approximately 1916 by missionary settlers and still relies to this day on the irrigated lands which are supplied with water from the Orange River. In recent years; table grape farming for export has become the leading type of agricultural cultivation in the area.

Currently the Catholic father from Pofadder is serving the Mission at Onseepkans. The Mission church was built in 1927 and other buildings were soon to follow which include a school and a parsonage. Today the school and Mission station are still operational within the Onseepkans community.

12. MITIGATION AND RECOMMENDATIONS

Regarding the impact on heritage on the proposed Onseepkans bulk water supply development site and footprints, the impact on archaeological material will be significantly low in our professional point of opinion. We see no reason for the development not to continue, as it will improve the socio-economical opportunities and livelihood of the Onseepkans community in the region. It is however important to consider the proximity of the built environment as well as the historical tangible and intangible landscape.

Due to the low impact of development on heritage resources, we thus recommend the bulk water supply development as described by the specifications of the client. The assessment is however subject to the approval of SAHRA.

13. PROTOCOL DURING DEVELOPMENT

It is possible that sub-surface heritage resources might be encountered during the construction phase of this project. The Project Engineer, Environmental Control Officer and all other persons responsible for site management and excavation should be aware that indicators of sub-surface sites could include:

- Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate);
- Bone concentrations, either animal or human;

- Ceramic fragments, including potsherds;
- Stone concentrations that appear to be formally arranged (may indicate the presence of an underlying burial)
- Fossilised remains of fauna and flora, including trees.
- Stone tool concentrations from San origin.

In the event that such indicator(s) of heritage resources are identified, the following actions should be taken immediately:

- All construction within a radius of at least 20m of the indicator should cease. This distance should be increased at the discretion of supervisory staff if heavy machinery or explosives could cause further disturbance to the suspected heritage resource.
- This area must be marked using clearly visible means, such as barrier tape, and all personnel should be informed that it is a no-go area.
- A guard should be appointed to enforce this no-go area if there is any possibility that it could be violated, whether intentionally or inadvertently, by construction staff or members of the public.
- No measures should be taken to cover up the suspected heritage resource with soil, or to collect any remains such as bone, ceramics or stone.
- If a heritage practitioner has been appointed to monitor the project, s/he should be contacted and a site inspection arranged as soon as possible.
- If no heritage practitioner has been appointed to monitor the project, SAHRA or Dr. D. Morris must be contacted at the SAHRA head office or at the McGregor museum.
- The South African Police Services should be notified by a SAHRA staff member or an independent heritage practitioner if human remains are identified. No SAPS official may disturb or exhume such remains, whether of recent origin or not.
- All parties concerned should respect the potentially sensitive and confidential nature of the heritage resources, particularly human remains, and refrain from making public statements until a mutually agreed time.
- Any extension of the project beyond its current footprint involving vegetation and/or earth clearance should be subject to prior assessment by a qualified heritage practitioner, taking into account all information gathered during this initial heritage impact assessment.
- We recommend the appointment of a Stone Age Specialist if any large finds of stone tools are discovered during construction.

14. CONCLUSION

We recommend that the development proceed with the recommended heritage mitigation and have submitted this report to SAHRA in fulfilment of the requirements

of the NHRA. According to Section 38(4) and 38(8) of the Act the report shall be considered timeously by the Council which shall, after consultation with the person proposing the development, decide –

- whether or not the development may proceed;
- any limitations or conditions are to be applied to the development;
- what general protections in terms of this Act apply, and what formal protections may be applied to such heritage resources;
- whether compensatory action shall be required in respect of any heritage resources damaged or destroyed as a result of the development; and
- Whether the appointment of specialists is required as a condition of approval of the proposal.

SAHRA head office may be contacted (South African Heritage Resources Agency, 111 Harrington Street Cape Town 8001; Mr Phillip Hine; E-mail: phine@sahra.org.za; Tel: (+27) 21-4624502.

If permission is granted for development to proceed, we confirm that the client is reminded that the NHRA requires that a developer cease all work immediately and follow the protocol in this report should any heritage resources, as defined in the Act, be discovered during the course of development activities.

15. STATEMENT OF COMPETENCY

15.1. Specialist competency

Jan Engelbrecht is accredited by the Cultural Resources Management section of the Association of Southern African Professional Archaeologists (ASAPA) to undertake Phase1 AIAs and HIAs in South Africa. He is also a member of the Association for Professional Archaeologists (ASAPA). Mr Engelbrecht has an honours degree in archaeology (specialising in the history of early farmers in southern Africa (Iron Age) and Colonial period) from the University of South Africa and has 8 years' experience in heritage management. He has worked on projects as diverse as the Zulti South HIA mineral mining project of Richards Bay Minerals, research on the David Bruce heritage site at Ubombo in Kwa-Zulu Natal and various archaeological excavations and historical projects. He has worked with many rural communities to establish integrated heritage and land use and development plans, and speaks Zulu fluently.

Mr. Engelbrecht established Ubique Heritage Consultants during 2012. The company moved from KZN to the Northern Cape and is currently based at Askham in the Northern Cape under Mier local municipality in the Kgalagadi region. He followed a significant military career as an officer, where after he qualified as an

Animal Health Technician at Technikon RSA and UNISA. He is currently studying for his MA Degree in Archaeology. Experience in heritage related work is as follows:

SUMMARY HERITAGE IMPACT ASSESSMENT EXPERIENCE

Assistant/Technician/Archaeologist

- **Note:** All Heritage related work as well as surveys and other archaeological related work was done under the supervision of a professional archaeologist and in an assisting or technical capacity until 2009.

PERIOD: 2006

- ❖ Hlabayalingana Palaeontological Site Survey and Impact Study under supervision of AMAFA.
- ❖ Pongola Site Survey – Ntshangase Tribal Trust under supervision of AMAFA.
- ❖ Ithala Game Reserve Heritage Impact Assessment under supervision of AMAFA.
- ❖ Isandlwana Site Survey and assistance with Heritage Management Plan under supervision of AMAFA.
- ❖ Border Cave Site Monitoring and assistance with Heritage Management Plan under supervision of AMAFA.
- ❖ Muden (KZN) (eThembeni Heritage) Assisting in Heritage Impact Assessment together with professional archaeologist Mr. Len van Schalkwyk.

PERIOD: 2007

- ❖ Blood River Site Investigation under supervision of professional archaeologist, Ms. E. Becker.
- ❖ Bergville Iron Age Site Survey and Heritage Impact Assessment under supervision of AMAFA.
- ❖ Golela Nature Reserve Heritage Impact Assessment under supervision of AMAFA.
- ❖ Bizana Eastern Cape Heritage Impact Assessment under supervision of professional archaeologist Ms. E. Becker.

- ❖ David Bruce (Ubombo) Historical Heritage Impact Assessment and Site Investigation under supervision of AMAFA.

PERIOD: 2008

- ❖ Sodwana Bay Heritage Impact Assessment under supervision of professional archaeologist Ms. E. Becker.
- ❖ Port Nolloth Local Museum Upgrade – Assistance with research and Anthropological Interviews under supervision of professional archaeologist Ms. E. Becker.
- ❖ Brussels Estate North West Province Site Survey under supervision of professional archaeologist Prof J.C.A Boeyens, Dr. M.M. van der Ryst, Mr. F.P. Coetzee and Ms. E. Becker.
- ❖ Assist with HIA for Eskom line between Volksrust and Ladysmith under supervision of professional archaeologist Ms. E. Becker and Knights Piesold Consulting.

PERIOD: 2010-2015

- ❖ Registration and establishment of Ubique Heritage Consultants
- ❖ Assist eThembeni Heritage with Heritage & Archaeological impact assessment at Richards Bay Minerals (Zulti South region)
- ❖ Rietfontein HIA completed for Enviroafrica cc. – RDP Housing Project
- ❖ AIA for the upgrade of oxidation ponds at Rietfontein Northern Cape – Van Zyl Environmental Consultants cc.
- ❖ AIA for the construction of oxidation ponds at Loubos Northern Cape – Van Zyl Environmental Consultants cc.
- ❖ AIA for the construction of oxidation ponds at Askham Northern Cape – Van Zyl Environmental Consultants cc.
- ❖ AIA for the construction of raisin drier facilities at Blaauwskop erf 151 near Kanoneiland in the Northern Cape- Enviroafrica cc.



J.A.C. ENGELBRECHT

UBIQUE HERITAGE CONSULTANTS Pty (Ltd)

PROFESSIONAL ARCHAEOLOGIST

DATE: 2016-01-09

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