APPENDIX N

Cultural Heritage Assessment

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FIRST PHASE ARCHAEOLOGICAL & HERITAGE ASSESSMENT OF THE PROPOSED BOKPOORT II 300MW COMBINED 2 x 75 PV & 150 MW CSP TOWER SOLAR DEVELOPMENT ON THE REMAINDER OF THE FARM BOKPOORT 390, GROBLERSHOOP, NORTHERN CAPE PROVINCE

EXECUTIVE SUMMARY

ACWA Power Africa Holdings from Grayston Drive, Sandton, is planning a standalone PV and CSP solar instillation on the farm Bokpoort 390 along the Sishen-Saldanha railway line, near the Garona Sub-Station, Groblershoop, Northern Cape. A 20km water pipeline will be installed from the Orange River to the project site. The pipeline will follow the 50m existing buffer zone and will have no further impact on the environment.

Golder Associates Africa (Pty) Ltd, from Halfway House, Gauteng, commissioned the first phase archaeological and heritage impact assessment. The investigation is based on an inspection of the proposed land at the remainder of the farm Bokpoort 390 in the Groblershoop district. The study focuses on the occurrence of archaeological, historical and any other cultural material.

With the exception of the Richtersveld and the Middle Orange River areas, little is known about the archaeology of this specific part along the Orange River. Recent heritage studies at Kathu and at the Garona Sub-station, Bokpoort and Sanddraai, to the north east of the Orange River and along the Ferrum (Kathu) - Nieuwehoop (Kenhardt) transmission power line, added more light. Archaeological material is widespread throughout the Kuruman and Kathu areas and down along the Sishen-Saldanha railway line. These occurrences generally comprise of a background scatter of Middle Stone Age hand axes and Later Stone Age core flakes and flaked cores. The density of the scatters is very low over large areas.

During the present survey, a single widespread scatter of worked stone artefacts occurred in association with a calcrete outcrop.

No other cultural or historical remains or graves were found during the investigation.

Mitigation measures will be necessary in cases where graves or other human skeletal or unidentified heritage resources are found during the construction phase.

Further planning of the proposed project may continue.

INTRODUCTION & DESCRIPTION

DESCRIPTION OF THE PROJECT

ACWA Power Africa Holdings (Pty) Ltd is proposing to construct a solar development on the farm Bokpoort 390, 20km northwest of the town of Groblershoop, Northern Cape Province.

The proposed Bokpoort II project will consist of three (3) applications for environmental authorisation. ACWA Power is applying for environmental authorisation for:

(2) 75 MW photovoltaic (PV) facilities;

(1) 150 MW Concentrated Solar Power (CSP) Tower facility.

The combined power generation capacity of the entire Bokpoort II solar development will be 300 MW (PV: 2 x 75 MW PV and CSP Tower: 150 MW). Each of the solar technologies will have a separate associated infrastructure that will not overlap in footprint.

ACWA Power is proposing to bid to the Department of Energy (DoE) under the Renewable Energy Independent Power Producer Procurement Programme (REIPPP) for two different solar technologies which could be developed on the site. Each of the applications lodged to the DEA, if authorised, will be tendered in the DoE REIPPP. Only successful bids in the REIPPP will be considered for construction. The applicant is proposing to bid for one (2) 75 Mega Watt (MW) Photovoltaic (PV) solar power plant technology applications, and one (1) 150 MW CSP Tower. The combined power generation capacity of the entire Bokpoort II solar development applications is 300 MW (PV: 2 x 75 MW PV and CSP Tower: 150 MW). However, the final technology choice and MW capacity will be determined through the outcome of the REIPPP, based on successful bids awarded to ACWA Power.

Scope and Limitations

The investigation is based on an inspection of the proposed land (Maps 1, 4, 8). The study focuses on the occurrence of archaeological, historical and any other cultural material.

The investigation provided the opportunity to:

- Examine the land proposed for the thermal solar transmission power line.
- Document and plot all sites and features of archaeological, historical and heritage value.
- Evaluate any potential impact on heritage resources caused by construction, operational and maintenance activities.
- Recommend mitigation measures preventing damage to areas of heritage importance.

Methodology

1. Standard archaeological survey and recording methods applied.
2. Survey of literature & previous HIA reports.
3. Site inspection on foot and by vehicle.
4. Layout of the site and features plotted by GPS.
5. Surroundings and features recorded on camera.

6. Preparation of maps & literature.
7. Research on the history, archaeology & heritage remains.
8. Prepare maps with coordinates transferred to Google Earth.

Previous experience includes heritage impact investigations at Kathu and along the Sishen-Saldanha railway line at Garona, Bokpoort and Sanddraai.

The criteria used in the identification of sites, is based on the mere presence of archaeological and/or cultural material. In the present case, it was expected that significant finds of Stone Age material would occur.

INVESTIGATION

The investigation of the Bokpoort II Solar Development site was done on 15 September 2015. At the site I was directed by Elton Julies from Golder Associates Africa.

Quartz and calcrete outcrops were investigated on foot to identify and examine potential sensitive areas. Objects and finds were plotted by GPS while, photographs were taken of specific features and to record the changing environment. The site was examined for possible archaeological and historical material and to establish the potential impact on any cultural material that might be found. The Heritage Impact Assessment (HIA) is done in terms of the National Heritage Resources Act (NHRA), (25 of 1999) and under the National Environmental Management Act, 1998 (Act. 108 of 1998).

The study aimed to locate and evaluate the significance of cultural heritage sites, archaeological material, manmade structures older than 60 years, and sites associated with oral histories and graves, that could be affected by the proposed developments. Planted and self-sown trees and other types of vegetation determine a major part of the historical landscape of human settlements in the Kalahari and in villages and towns, on farmyards or even deserted places in the open veld, show evidence of human activity.

The site is characterised by a repeated pattern of alternating red sand dunes, calcrete scatters and quartzite outcrops. The nature of the site varied from Aeolian (Kalahari) dune veld, visible spreads of calcrete and scatters of quartzite sills. Archaeological material tends to be associated with the calcrete and stone deposits.

Although nothing occurred, it is possible that the physical shifting of the sand dunes could cover or expose archaeological artefacts (Morris 2007, 2012, Beaumont 2007, Dreyer 2006, 2007, 2008, 2010).

Anglo-Boer War (1900-1902) camping and skirmish sites occur in the Northern Cape. Distinctive heavily soldered tin food cans, (Dreyer 2006, Olyvenhouts Drift, Upington), and specific types and calibres of fired cartridge cases dating from the Anglo-Boer War, normally identify these sites. From previous archaeological and heritage assessments, we are aware that ash heaps with remains of Anglo-Boer War material occurs on strategic places (cf. Dreyer 2007, Pampoenpan, Douglas). Conflict sites between early White farmers and Bushmen in the Northern Cape could contain gunflints or fired cartridge cases and should likewise be noted.

ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

The archaeological environment of the Northern Cape Province is rich and diverse, representing a long time span of human occupation. The area around Kathu is exceptionally rich in terms of Stone Age material. Some areas are richer than others and not all the sites are equally significant (Beaumont et al. 1995, Beaumont & Morris 1990). For various reasons, there is still a relative lack in research records. Certain known sites such as Wonderwerk Cave in the Kuruman Hills, several ancient specularite mines near Postmasburg and a number of significant Stone Age sites and the Kathu Archaeological Complex, made substantial contributions to our knowledge (Beaumont 1990, 2007). According to the technology, these artefacts fit in with the later part of the Early Stone Age (Acheulean Industry).

Morris (2007) reported on Pleistocene material at the base of dune sands at borrow pits along the Sishen-Saldanha railway line.

Khoi stock farmers moved into this area between AD 400 and AD 1100 and Black farming communities followed soon into the Northern Cape. This phase known as the Later Iron Age (AD 1300 to about 1840 AD), brought people who cultivated crops, kept livestock, produced an abundance of clay pottery in a variety of shapes and sizes and smelted metals. Extensive stone walled enclosures characterised their semi-permanent settlements. These remnants are known from the prominent Sotho/Tswana settlements at Dithakong, a Bathlaping capital near Kuruman. A number of Korana and Griqua groups, remnants of the Later Stone Age peoples, managed to survive the assimilation by Sotho/Tswana tribes in the region.

Dramatic climate changes resulted in a rapid population growth along the east coast of South Africa. Increased pressure on natural resources and attempts to control trade during the early 19th century brought the emergence of powerful leaders in the area below the escarpment. The subsequent power struggle resulted in a period of instability in the eastern and central parts of Southern Africa. This period of strife or wars of devastation, known as “difaqane” (Sotho/Tswana) or “Mfecane” (Nguni), affected many of the Black tribes in the

interior. Attacks from east of the escarpment initiated by the AmaZulu impis of Chaka in about 1822, were carried on by the AmaNdebele of Mzilikazi and the AmaNgwane of Matiwane into the Free State, thus uprooting among others, the Batlokwa of Sekonyela and Mantatise and various smaller Sotho/Tswana tribes. On their turn, the Batlokwa of Mantatise and Sekonyela drove off the Bafokeng of Sebetoane from Kurutlele (Biddulphsberg) near Senekal (Free State), who, in their effort to escape the pursuit by the AmaNdebele forces, eventually landed up in the Caprivi (Dreyer & Kilby 2003).

This period of unrest also affected the peoples of the Northern Cape, resulting in the displacement of scores of tribesmen, women and children. The stronger tribal groups, such as the AmaNdebele of Mzilikazi, assimilated many of these Batswana and other refugees.

Early European missionaries and travellers ventured into the inland of the country during the 19th century and reached Dithakong as early as 1801. Several of the marauding hordes affected the lives of the Batswana people living at Dithakong near the mission station of Robert and Mary Moffat near Kuruman.

KATHU PAN ARCHAEOLOGICAL SITE

Despite of the fact that Kathu is almost 150km from the project site, the importance of the Kathu Archaeological Complex demands that this occurrence should be part of any investigation in the region.

The proposed nomination of Kathu Archaeological Complex as a National Heritage Site, consisting of the Kathu Pan Sites, Kathu Cemetery Sites, Kathu Town lands and the Bestwood Sites, is pending (Walker, Chazan & Morris 2013).

Kathu Pan archaeological site is situated 5,5km outside the town of Kathu along the R380 road to Deben (Map 2). Peter Beaumont (1990) indicates the centre of the pan at 27°39’50”S 023°00’30”E (Point KP on Map 2). Boundaries of the farms Sacha 468, Kathu 465 and Sims 462 come together here at the only source of permanent natural water in the area. The pan covers about 30ha at an altitude of 1178m above sea level. There is an ancient drainage channel made by the floodwater overflow. Test boreholes revealed a 40m deposit of a combination of calcrete, sand, clays and gravel layers, below the unstable peaty top sediments.

Concerning new developments, major obstacles occur at Kathu Archaeological Complex with specific reference to the extended Stone Age site at Kathu Pan. Excavations have proven that an unusual conjunction of geological circumstances led to the stratified preservation of an exceptional human record, representing three phases of the Early Stone Age, two phases of the Middle Stone Age and about the entire Later Stone Age. The Acheulean evidence from

the site is of particular significance. The information provides a basic typological framework for a large part of the Middle Pleistocene.

Several seasons of excavations by Tony Humphreys and Peter Beaumont had been performed at Kathu Pan. These excavations produced amongst other finds, portions of clay vessels, ostrich eggshell fragments, Middle Stone Age artefacts, prepared cores, long lithic blades, retouched points and material classified as Fauresmith artefacts. Further finds include coarse Acheulean hand axes and a variety of scrapers. The flakes represent the banded ironstone material found in the area. Grass pollen gave an indication of the prehistoric vegetation cover. The investigations at Kathu Pan also produced the remains of large mammals, such as elephant, zebra, rhino, hippo, buffalo and giraffe, together with a variety of antelope and buck.

The Kathu Pan archaeological site is surrounded by several major developments, which are all located within a parameter of about 2km from the pan. The site is located between the end of the runway at the Kathu Airport, the Khai-Appel Recreation and Camping Resort, the Kumba Village, water storage reservoirs and the Mitton Transport yard (Map 2). In reality the archaeological site at Kathu Pan is almost encroached by general developments in the area. Officials at the Kumba Mine and managers at Kathu including the Head Town planner are unaware of the locality and existence of the Kathu Pan archaeological site. Heritage authorities and the relevant officials at McGregor Museum, Kimberley, who did the research for over a decade, in particular, are very concerned about the preservation of the archaeological sites at Kathu.

From other heritage impact assessments, we are aware of a number of significant archaeological deposits in the area around Kathu. Other important finds occur near the cemetery (Beaumont 2007), at Hartnolls (Dreyer 2006) and Bestwood (Dreyer 2007, 2008).

LOCALITY

ACWA Power Africa Holdings (Pty) Ltd is proposing the establishment of the proposed Bokpoort II Solar Development on the Remaining Portion of the farm Bokpoort 390. The is situated 20 km north west of the town of Groblershoop and about 120km south west of Olifantshoek, and falls within the !Kheis Local Municipality in the ZF Mgcawu District Municipality, Northern Cape Province (Map 1).

The site is reached along the Loop 16/Gariep gravel road at a turn-off from the R64 road between Groblershoop and Griquatown (Maps 1&2). The site lies about 17km north east of the Orange River, along the Sishen-Saldanha railway line, adjacent to the Garona Sub-Station and the Bokpoort Phase I Solar Power development. A 20km water pipeline is planned from the Orange River at

Sanddraai 391 along the existing 50m Bokpoort I line route buffer zone (Figs.12-20).

The area is covered by red sand dunes and alternating outcrops of Calcrete and Quartzite scatters. The vegetation cover is part of the Kalahari Thorn Veld, mainly limited to various species of *Eragrostis sp.* (Love grasses) with pods of Bushman Grass (Boesmangras) (*Stipagrostis sp.*) on the red dunes with scatters of thorny shrubs. This includes Swarthaak or Black Thorn (*Acacia mellifera*), Driedoring (*Rhigozum trichotomum*), solitary Witgat or Shepherds Trees (*Boscia albitrunca*) and Mesquite (*Prosopis species*). Cannon Aloes (*Aloe claviflora*) and Sand Aloes (*Aloe hereroensis*) occur in the veld.

The pump station and water inlet structure will be influenced by the water flow and height and will be planned accordingly (Map 10).

Archaeological visibility was good throughout the investigation and no limitations were experienced.

The following GPS coordinates (Cape scale) were taken (Maps 1&8).

E 28°44’16”S 022°00’03”E Altitude 952m (Figs.1&2).

FERNIS 356 Δ 28°43’52”S 022°00’22”E Altitude 953m (Fig.4).

E1 28°43’50”S 022°00’23”E Altitude 954m (Fig.5).

EB1 28°43’26”S 022°00’57”E Altitude 967m (Figs.6-8).

B1 28°43’00”S 022°01’31”E Altitude 979m (Fig.9).

B 28°42’34”S 022°01’39”E Altitude 983m (Fig.10).

A1 28°43’01”S 022°01’03”E Altitude 987m (Fig.11).

P1 28°44’29”S 021°59’29”E Altitude 950m (Figs.12&13).

P2 28°45’03”S 021°57’45”E Altitude 934m (Fig.14).

P3 28°46’41”S 021°56’01”E Altitude 887m (Figs.15&16).

P4 28°46’43”S 021°54’13”E Altitude 867m (Fig.17&18).

P5 28°47’13”S 021°53’17”E Altitude 849m (Figs.19&20).

PUMP 28°48’14”S 021°53’30”E Altitude 869m (Map 10).

RESULTS

FINDS

The site is characterised by a pattern of red sand dunes, calcrete scatters and quartzite outcrops. The nature of the site varied from Aeolian (Kalahari) dune veld, spreads of calcrete and quartz sills. The sparse distribution of vegetation made it relatively easy to spot any archaeological and other heritage resources. During previous investigations in the area (Dreyer 2006, 2014), it became almost predicable to expect archaeological material associated with the calcrete and scatters of stone deposits higher up, against hilly or out crop slopes. The sand dunes tend to be sterile and without any cultural material (Dreyer 2014).

Morris (2007) reported on Middle Stone Age or Fauresmith materials scattered on top of the calcrete surface from the edges of borrow pits along the Loop 16 on the Sishen-Saldanha railway line and during his survey of the farms Sanddraai and Bokpoort (Morris 2012).

During the present survey, a single scatter of worked chalcedony, banded ironstone, quartz and meta-quartzite artefacts (Fig.3) was spotted near Point E in association with a calcrete outcrop (Fig.2). The collection was spread out and no dense concentration occurred. A substantial collection of flakes was found on the slopes along the river during a previous investigation at Sanddraai (Dreyer 2012).

No other cultural or historical remains or graves were found at the proposed site.

Although the red sand dunes seem to be sterile, it is possible that the dune crests and streets between dunes could have been activity and dwelling places during the Later Stone Age (Morris 2012, Webley 2013).

Large rubbing stones, Acheulean hand axes with secondary retouch and scatters of core flakes found during previous investigations (Dreyer 2008, 2013 Revised, 2014), were absent. Heavily soldered Anglo-Boer War (1899-1902) food containers (Dreyer 2006) and fired rifle cartridge shells, found during earlier investigations (Dreyer 2014) were likewise not found during the present site visit.

The investigation did not produce any household middens or ash heaps and no graves or graveyards were found either.

IMPACT ASSESSMENT

The survey showed that Middle Stone Age artefact scatters could be found across the study area and it is likely that material will be disturbed during the construction of the solar panels. The lithic scatters are widespread and are

considered of low significance. It is possible that Later Stone Age settlements could occur along the Orange River. These sites could contribute to our knowledge about hunter-gatherer and early stock-keeping settlements along the River.

From previous experience, it is known that the impact of transmission power lines is minimal. Access to lines and transport of material and equipment along the Eskom servitude and maintenance roads, are expected to be more damaging than the actual placing of the pylons (Webley 2013). The serious amount of destruction of the environment and soil clearance for the extended infrastructure at Bokpoort I, confirms the heavy impact by this kind of developments. I anticipate that disturbance will mainly occur during the construction and maintenance phases of the solar installations, when heavy machinery and trucks will come in.

I conclude, however, that the Middle Stone Age and Later Stone Age material found in the area along the Sishen-Saldanha railway line from Kathu to the Orange River, is typical of the wider area and that the effect of any joint impact would be very low.

The water pipeline from the Orange River will be placed inside the 50m existing buffer zone and will have no further impact on the environment.

MITIGATION

Because of low frequencies, the mixed nature and unstratified context of the archaeological material, the Stone Age finds of this particular region are considered as of little heritage significance. Other archaeologists doing research in these areas (Nilssen 2014) support this assumption.

I anticipate that disturbance will mainly occur during the construction and maintenance phases of the solar installations.

Mitigation measures will be necessary in cases where graves or other human skeletal or unidentified heritage resources are found during the construction phase.

It is important that any finds of human skeltal material or concentrations of stone age material should immediately be roported for investigation by an archaeologist.

RECOMMENDATIONS

Further planning of the proposed project may continue.

ACKNOWLEDGEMENTS

Dr Johan Loock (HC), former senior lecturer at the Geology Department, University of the Free State, Bloemfontein, identified the stone tool material.

I gained from extensive previous archaeological investigations at Kathu and in the Bokpoort and Garona areas.

I owe gratitude to Mohlalefe Seleke for assistance and constant encouragement.

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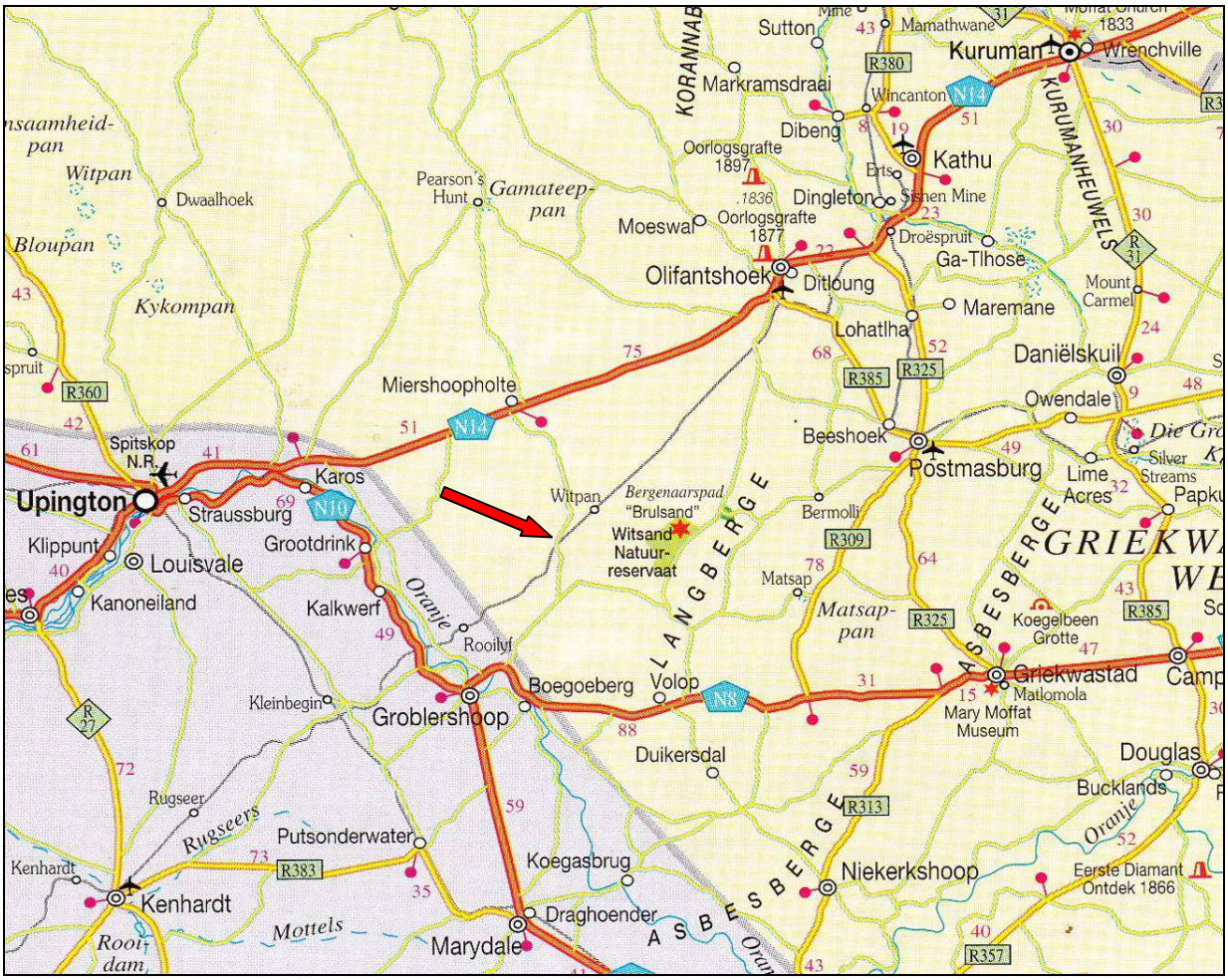
LIST OF ILLUSTRATIONS



Map 1 Locality of Bokpoort near the Garona Sub-station, Groblershoop.

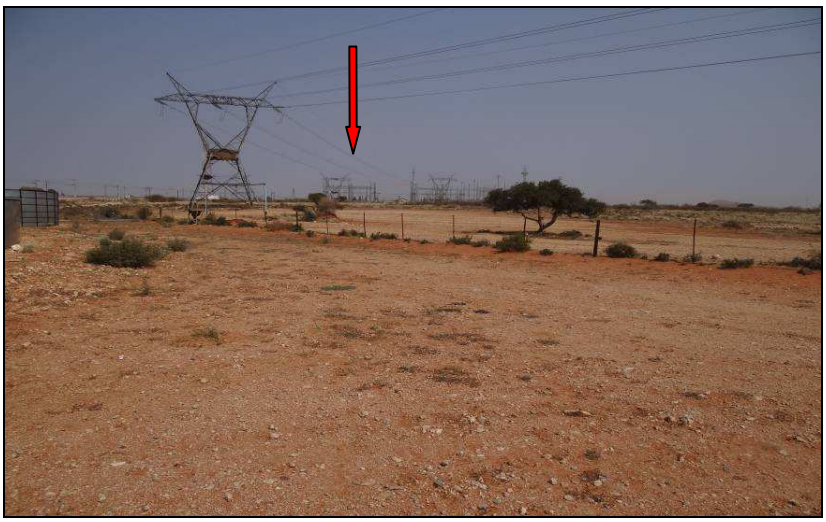
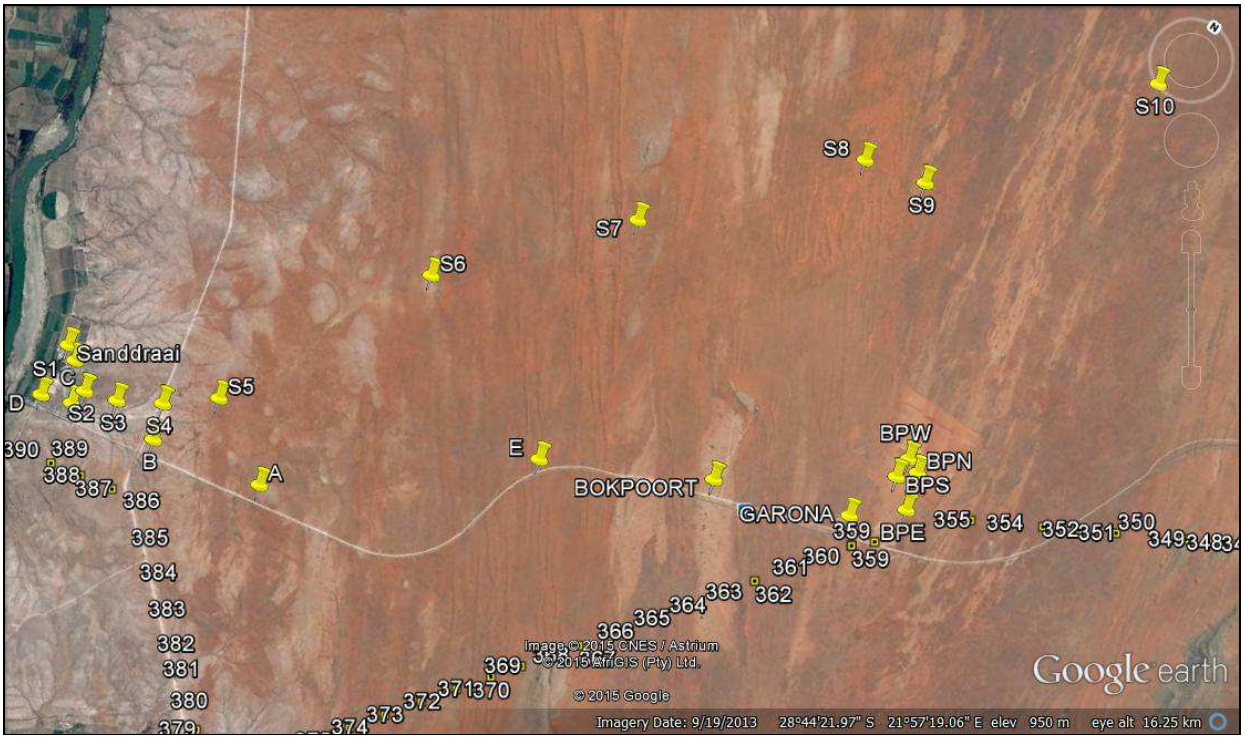
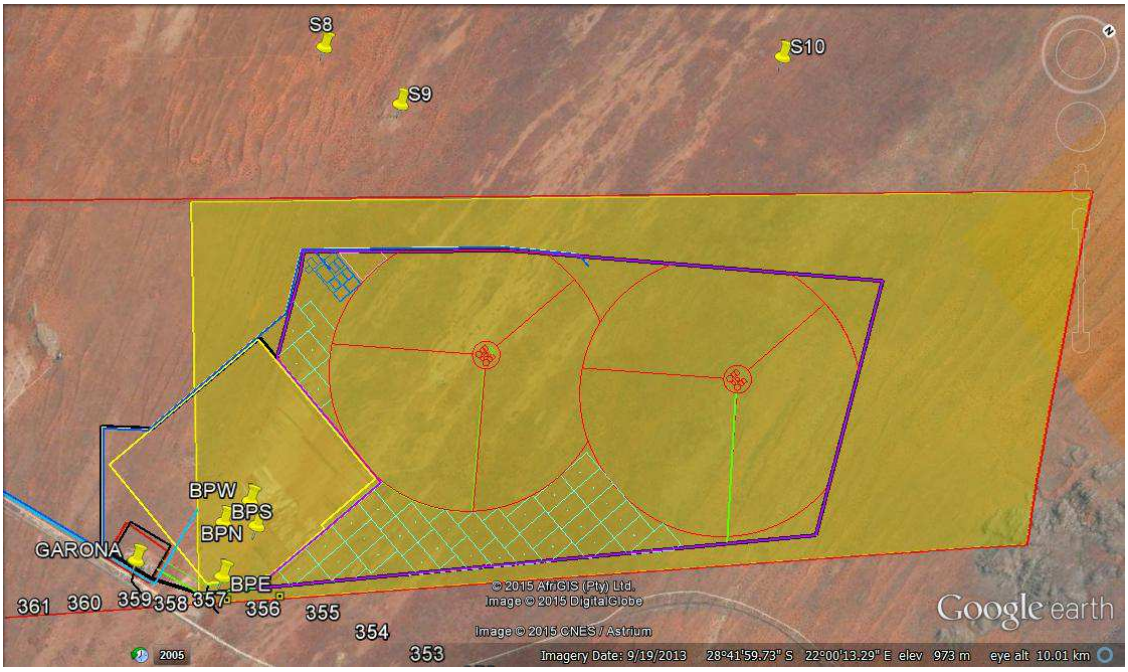


Fig.1 Point E at Bokpoort II, Groblershoop facing Garona Sub-Station.

Map 2 Kathu Pan archaeological site and other surrounding structures. (Amended from Dreyer 2013, 2014).

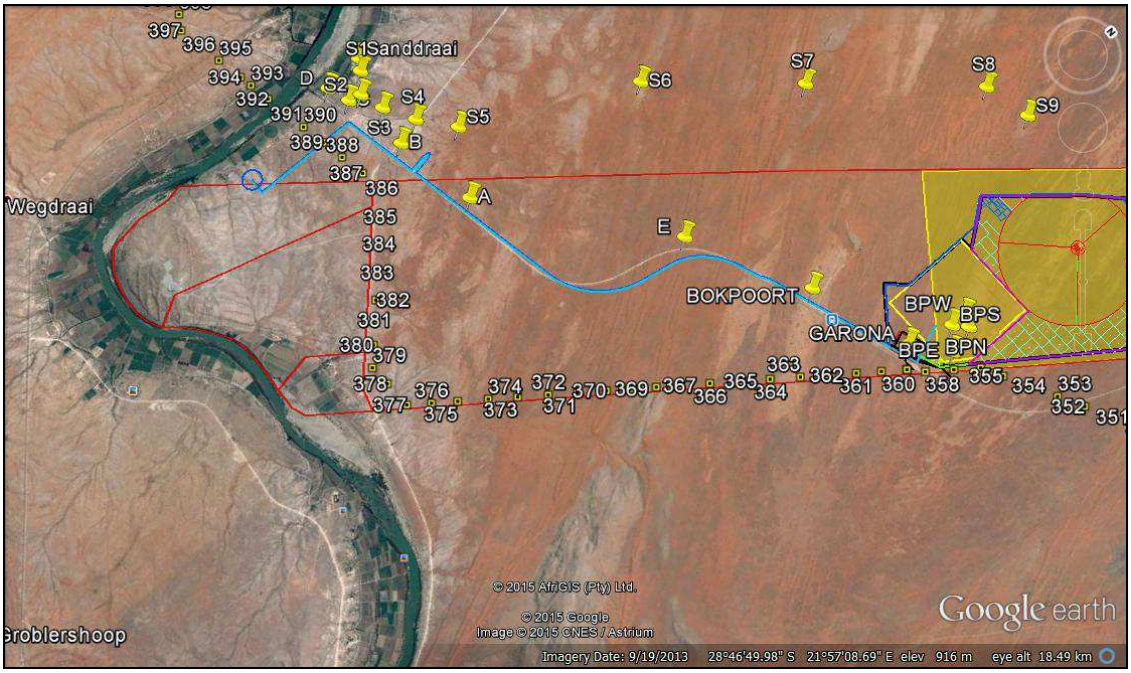


Map 3 New 400Kv power line pylon positions (Pylon 348-390), Garona Sub-Station, Bokpoort I and the proposed Sanddraai developments.

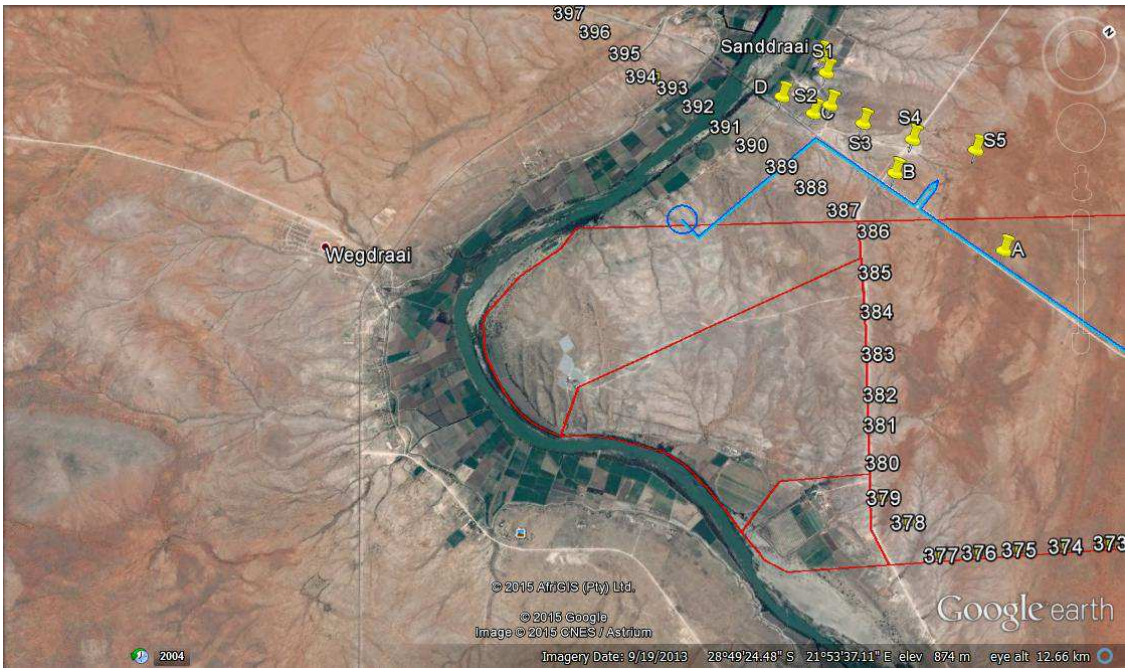


Map 4 Placing of the proposed Bokpoort II PV developments in relation to Garona Sub-station.

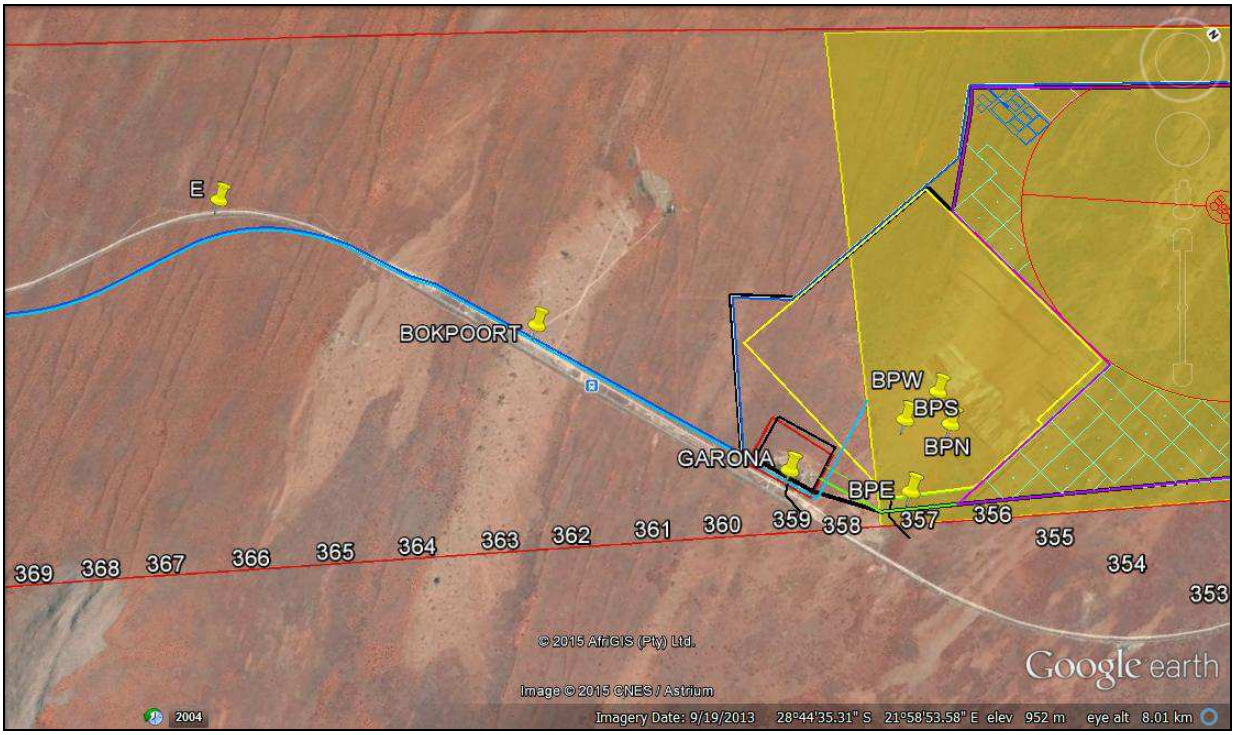
Note: The proposed site layout has changed post compilation of this report. However, the layout change has no bearing on the outcome of this specialist assessment.



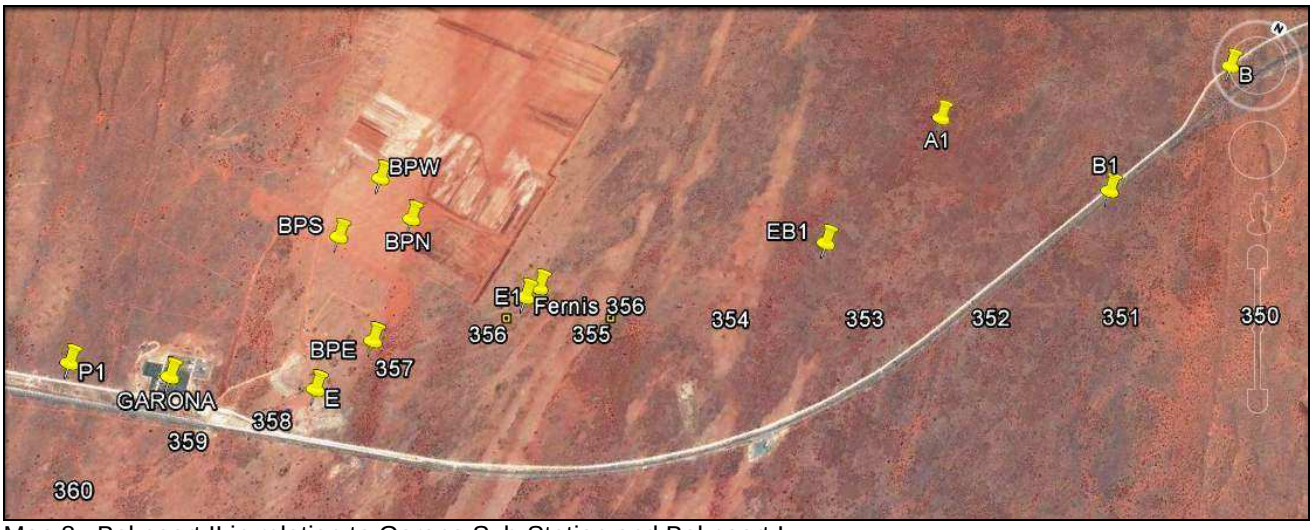
Map 5 Bokpoort II and the planned water pipe system to the Orange River.



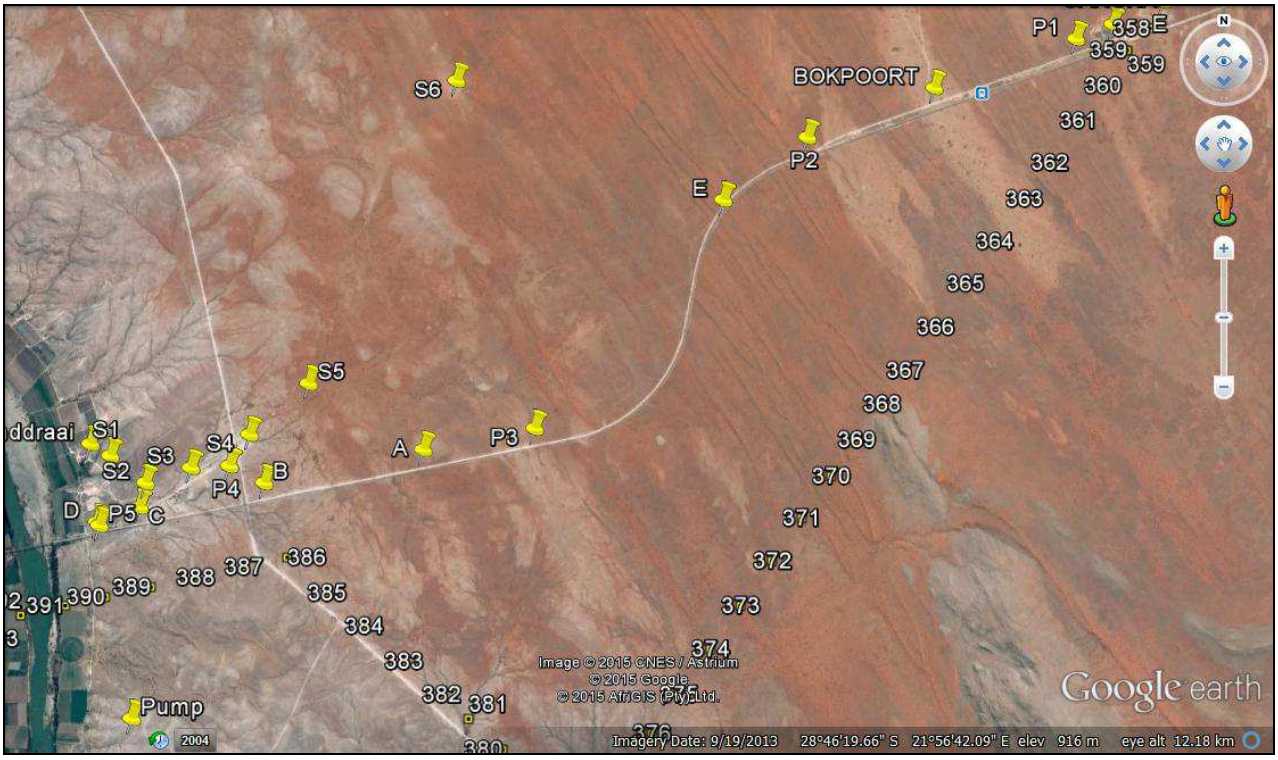
Map 6 Bokpoort II water pipe system in relation to Sanddraai developments.



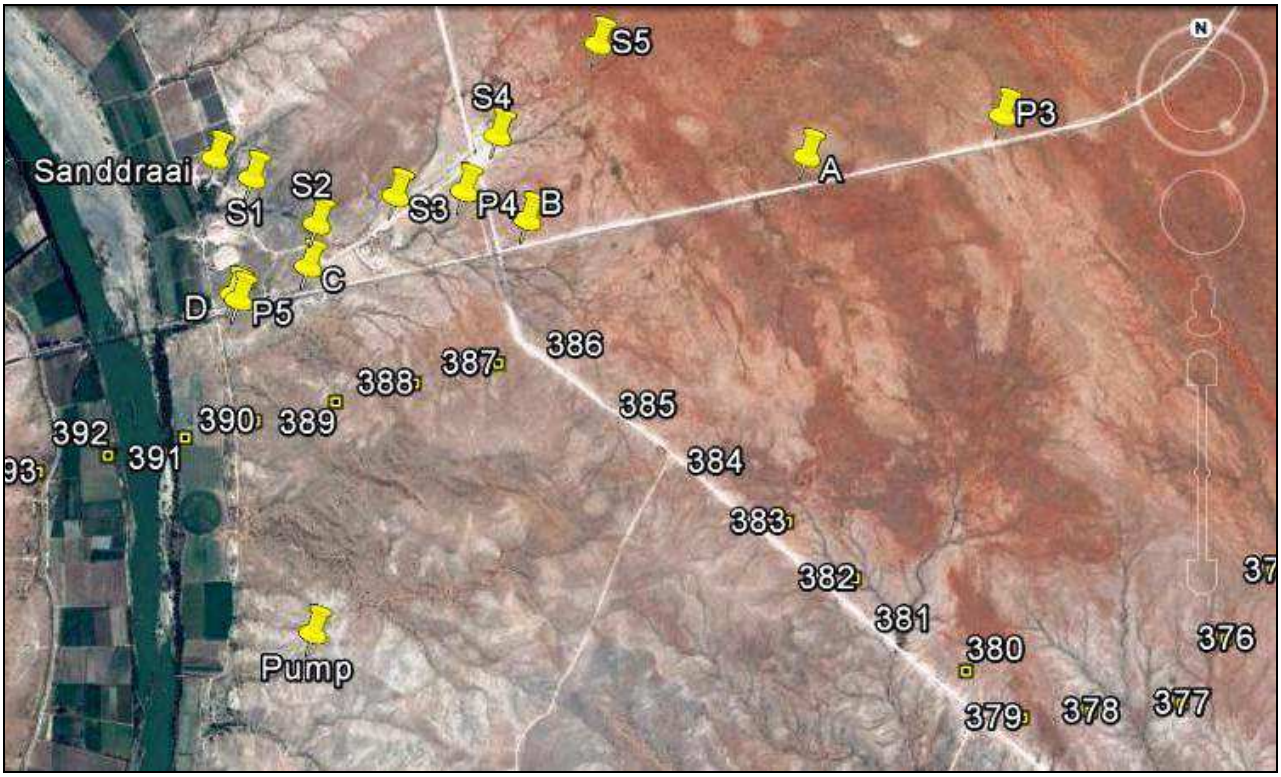
Map 7 Bokpoort II in relation to Garona Sub-Station.



Map 8 Bokpoort II in relation to Garona Sub-Station and Bokpoort I.



Map 9 Water pipeline from the Orange River to Garona Sub-station (P1-P5) in existing corridor.



Map 10 Detail of water pipeline (P3-P5) from the River to Garona Sub-station P1.

Fig.2 Point E at Bokpoort II, Groblershoop. Garona Sub-Station on left of picture.

Fig.3 Stone flakes of chalcedony, banded ironstone, quartz and meta-quartzite Point E Bokpoort II (Pocketknife = 84mm).

Fig.4 FERNIS 356 Δ Bokpoort II. Note Boesmangras cover.

Fig.5 Point E1 Bokpoort II, Boesmangras cover.

Fig.6 Point EB1 Bokpoort II.

Fig.7 Quartz outcrop Point EB1 Bokpoort II.

Fig.8 Boulder outcrop Point EB1 Bokpoort II.

Fig.9 Point B1 Bokpoort II.

Fig.10 Point B Bokpoort II.

Fig.11 Point A1 Bokpoort II.

Fig.12 Point P1 along the existing water pipeline to Garona at Bokpoort.

Fig.13 Point P1 along the existing water pipeline to Garona at Bokpoort.

Fig.14 Point P2 on the existing water pipeline to Garona Sub-station.

Fig.15 Point P3 on the existing water pipeline to Garona.

Fig.16 Point P3 on the existing water pipeline to Garona at Bokpoort.

Fig.17 Point P4 on the existing water pipeline to Garona.

Fig.18 Point P4 on the existing water pipeline at the railway crossing to Garona.

Fig.19 Point P5 on the existing water pipeline to Garona Sub-Station.

Fig.20 Existing water pump station near Point P5 on the pipeline to Garona Sub-Station.

Fig.21 Stone flakes from Bokpoort made out of chalcedony, banded ironstone and meta-quartzite. (Pocketknife = 84mm) (Dreyer 2006).

Fig.22 Cannon Aloe (Aloe claviflora) at Bokpoort II site.

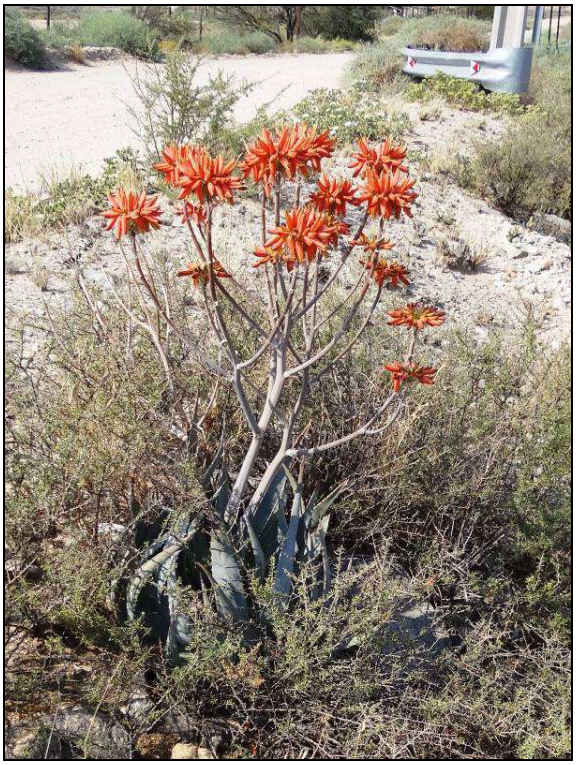


Fig.23 Specimen of a Sand Aloe (Aloe hererohensis) at Bokpoort II site.

Fig.24 Witgat or Shepherds Tree (*Boscia albitrunca*).

Fig.25 Swarthaak or Black Thorn (*Acacia mellifera*) in bloom.