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**FIRST PHASE ARCHAEOLOGICAL & HERITAGE ASSESSMENT
OF THE PROPOSED FERRUM (KATHU) – NIEUWEHOOP
(KENHARDT) 400KV TRANSMISSION LINE, NORTHERN CAPE**

EXECUTIVE SUMMARY

ESKOM is planning a 400KV transmission power line from the Ferrum Sub-Station at Kathu to the new Nieuwehoop Sub-station near Rugseer railway siding along the Sishen-Saldanha line in the Kenhardt district, Northern Cape Province. For a part, the new power line will follow the existing Eskom servitude along the Sishen-Saldanha railway line to the Orange River, from where it will take a new route to the proposed Sub-Station.

Enviroolution Consulting, from Mondeor in Johannesburg, commissioned the first phase archaeological and heritage impact assessment. The investigation is based on a walk down inspection along the total distance of about 260km, which represents the relative positions of 539 individual pylons. The study focuses on the occurrence of archaeological, historical and any other cultural material.

Little is known about the archaeology along the Orange River, with the exception of the Richtersveld and the Middle Orange River areas. Recent heritage studies at Kathu and in the Garona, Bokpoort and Sanddraai region, to the north east of the Orange River added some new light. Archaeological material is widespread throughout the Kuruman and Kathu areas down along the Sishen-Saldanha railway line, which generally comprise of a background scatter of Middle Stone Age core flakes and flaked cores. The density of the scatters is very low over large areas.

During the present survey, scatters of worked stone artefacts were spotted at a number of places mainly in association with calcrete outcrops. The collections were widespread and no dense concentrations occurred. Two Acheulian hand axes of about 11cm and 13cm long were found out of context on the surface.

No other cultural or historical remains or graves were found along the proposed route.

Mitigation measures will be necessary in case 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

Scope and Limitations

ESKOM is planning a 400KV transmission power line from the Ferrum Sub-Station (Kathu), to the new Nieuwehoop Sub-station at Rugseer near Kenhardt, Northern Cape Province (Map 1). Envirolution Consulting, from Mondeor in Johannesburg, commissioned the first phase archaeological and heritage impact assessment of the heritage resources.

The investigation is based on a walk down inspection of the virtual placing of 539 individual pylons over a distance of about 260km (Maps 2-13). The study focuses on the occurrence of archaeological, historical and other cultural material.

The investigation provided the opportunity to:

- Examine the route proposed for the 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. Route inspection on foot and by vehicle.
4. Layout of the route 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 map 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 to be treated with great care.

INVESTIGATION

The investigation of the power line route turned out to be challenging and extensive. The fieldwork took five weeks to complete, depending on weather conditions (sun, heat and rain), the nature of the landscape (thorn bushes, sand dunes, mud or rocky outcrops), access past locked gates to farms on the Eskom servitude and negotiating a maze of gravel roads and farm tracks over long distances. The work proved to be exhausting for man, punishing on vehicles and severe on equipment. Progress was at an average of about 22 pylons per day, giving around 107 pylons per week.

The field investigation lasted from 14 October to 20 November 2014 to complete. I was working in the company of Dr. Johan du Preez, Associate Professor, Plant Sciences, University of the Free State, Bloemfontein, with Dewald Kamffer and Rian Robbeson from Ecocheck Environmental Consultants, Duiwelskloof, Mpumalanga, who acted as informants and project leaders during the Kalahari fieldwork.

Minor obstacles, which caused delay, appeared to be un-informed or misinformed landowners resulting in irritated and unfriendly respondents. The investigation could have benefitted from a concerned and efficient project management, convincing first acquaintances, reliable contact particulars, proficient distribution of information and good rapport building and the arrangement of keys to the relevant private farms. During first contacts, some farm owners seem to be more interested in the prospective 20KV line that will deliver electricity to the farms, than to be concerned about the proposition of future main power line developments.

Pylon points were investigated on foot and where accessible by vehicle, the intersections along the transmission line route were driven 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 along the way. The route 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.

Due to the extent of the study area, the route is characterised by a repeating pattern of alternating calcrete scatters, red sand dunes, quartzite and dolomite and dolerite outcrops. The nature of the route varied from Aeolian (Kalahari) dune veld, vast spreads of calcrete, scatters of quartzite and dolomite and dolerite sills. Archaeological material tends to be associated with the calcrete and stone deposits.

It is possible that the physical shifting of the sand dunes could cover or expose archaeological artefacts (Morris 2012).

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

ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

The archaeological environment of the Northern Cape Province is rich and diverse, representing a long time span of the 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).

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. Black farming communities followed 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 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. Increased pressure on natural resources and attempts to control trade during the early 19th century brought the emergence of powerful leaders in the area. The subsequent power struggle resulted in a period of instability in the 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 AmaNdwane 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 near Senekal, 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

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 about 5,5km outside the town of Kathu along the R380 road to Deben (Map 3). Peter Beaumont (1990) indicates the centre of the pan at 27°39'50”S 023°00'30”E (Map 6). Boundaries of the farms Sacha 468, Kathu 465 and Sims 462 run 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 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. Fieldwork has 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 represented the banded ironstone material found in the area. Grass pollen, which gave an indication of the prehistoric vegetation, had been recovered. 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. Contact with a number of land managers at Kathu including the Head Town planner, revealed that these officials are unaware of the locality and existence of the Kathu Pan archaeological site.

From previous research and other heritage impact assessments, we are aware of many important archaeological deposits in the area around Kathu. Heritage authorities and the relevant officials at McGregor Museum, Kimberley, who did the research over a decade, in particular, are very concerned about the preservation of the archaeological sites at Kathu.

The site at Kathu Pan, in this case, 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. The realisation that the archaeological site at Kathu Pan is almost encroached by general developments in the area came as a shock. Even more upsetting was the fact that officials in decision-making positions at Kathu and at the Kumba Mine, seem to be ignorant about the existence of this unique site.

LOCALITY

ESKOM is planning a 400KV transmission power line from the Ferrum Sub-Station at Kathu to the new Nieuwehoop Sub-station near Rugseer railway siding along the Sishen-Saldanha line in the Kenhardt district, Northern Cape Province (Map 1).

The first seventy (70) pylons will take the power line from the Ferrum Sub-station (Map 2), in a westerly direction along the R380 road (Map 3), then deviates to the south and eventually goes around the Kumba mine to follow the existing Eskom servitude further south (Maps 4&5).

The power line will turn away from the R380 road before reaching Kathu Pan and will have no impact on this protected archaeological heritage site (Map 6).

For some distance, the new power line will follow the Sishen-Saldanha railway line to the Orange River, from where it will take a new route over 76km to the proposed Nieuwehoop Sub-Station for a total of 260km. In the process, the power line will cross the N14 at the brickworks 8km outside Olifantshoek (Map 7). The line is planned to cross the Sishen-Saldanha railway line for the first time about 8km south of Olifantshoek (Pylon 138) (Map 8). It will by-pass the Lewensaar Sub-station at Pylon 194 (Map 9), to cross the railway line for a second time at Garona Sub-Station (Pylon 358) (Map 10). When reaching the Loop 16 entry road, the line will deviate to the west (Pylon 377), before crossing the Orange River near Sanddraai (Pylon 386) (Map 11). The power line will do a mountain crossing at Pylons 419 and 429 (Map 12), before approaching Pylon 539 at the Nieuwehoop Sub-station near Rugseer siding (Map 13) some 30km north east of Kenhardt.

The power line will pass through changing vegetation, described as Kathu Kamel-Thorn Bush veld. The plants mainly consist of Kameeldoring trees (*Acacia erioloba*), Swarthaak (*Acacia mellifera*), Blinkblaar-Wag-'n-Bietjie (Buffalo-thorn, *Ziziphus mucronata*), Driedoring (*Rhigozum trichotomum*), with scatters of solitary Witgat trees (*Boscia albitunca*), significant stands of Sand Geelhout trees (Vaalbos) (*Terminalia sericia*), Vaalkameel (*Acacia haematoxilon*) and irritating impenetrable thickets or clusters of Trassiedoring (*Acacia hebeclada*) shrubs. The surface cover is further mainly limited to various species of *Eragrostis sp.* (Love grasses) and Boesmangras (*Stipagrostis sp.*). South of the Orange River towards Kenhardt, the veld changed into Karoo shrub land. Vegetation is open and sparse and is dominated by Karoo shrubs, grasses and small trees of *Acacia* species.

Archaeological visibility was good throughout the investigation.

The following GPS coordinates (Cape scale) were taken (Maps 2-13).

Ferrum Substation	27°43'49"S 022°03'45"E Altitude 1227m (Fig.2).
Pylon 34	27°40'10"S 022°59'22"E Altitude 1179m (Fig.3).
Pylon 58	27°42'00"S 022°55'00"E Altitude 1153m (Fig.4).
Pylon 114	27°56'00"S 022°48'08"E Altitude 1240m (Fig.5).
Pylon 133	28°00'33"S 022°45'37"E Altitude 1289m (Fig.6).
Pylon 140	28°01'41"S 022°45'50"E Altitude 1309m (Fig.7).
Pylon 193	28°12'41"S 022°36'37"E Altitude 1205m (Fig.8).
Pylon 294	28°33'50"S 022°14'04"E Altitude 1117m (Fig.9).
Pylon 341	28°42'01"S 022°05'54"E Altitude 1048m (Fig.10).
Pylon 360	28°44'41"S 022°59'40"E Altitude 954m (Fig.11).
Pylon 387	28°47'23"S 021°54'01"E Altitude 885m (Fig.12).
Pylon 450	28°52'44"S 021°37'32"E Altitude 1001m (Fig.13).
Pylon 480	28°57'45"S 021°30'53"E Altitude 1019m (Fig.14).
Pylon 510	29°03'46"S 021°24'20"E Altitude 1028m (Fig.15).
Pylon 530	29°08'21"S 021°19'44"E Altitude 974m (Fig.16).
Pylon 539	29°09'01"S 021°20'09"E Altitude 973m (Fig.17).

RESULTS

FINDS

The route is characterised by a repeating pattern of alternating calcrete scatters, red sand dunes, quartzite and dolomite and dolerite outcrops. The nature of the route varied from Aeolian (Kalahari) dune veld, vast spreads of calcrete or quartzite, with dolomite and dolerite sills. 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.

During the present survey, scatters of worked stone artefacts were spotted at a number of places mainly in association with calcrete outcrops. The collections were widespread and no dense concentrations occurred. Two Acheulian hand axes of about 11cm and 13cm long were found out of context on the surface.

No other cultural or historical remains or graves were found along the proposed route.

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

DESCRIPTION OF FINDS:

- EARLY STONE AGE / MIDDLE STONE AGE ACHEULEAN HAND AXES.



Fig.9 A worked hand axe 13cm long showing secondary retouch. Remains of outer core is visible (at left). Found near Pylon 398 (Pocket knife = 84mm).



Fig.20 Hand axe 11cm long with vague secondary retouch. Resembling a polished or weathered specimen. Remains of outer core is visible (at left). Found near Pylon 527 (Pocket knife = 84mm).

- A SIGNIFICANT NUMBER OF SCATTERS OF CORE FLAKES AND FLAKED CORES IN ASSOCIATION WITH DOLOMITE AND DOLERITE AND QUARTZITE OUTCROPS, OR INDIVIDUALLY.

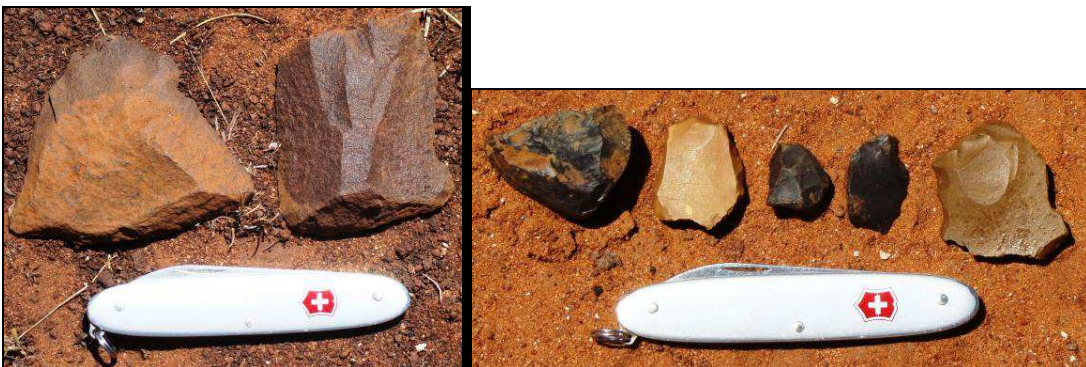


Fig.21 Pylon 20 (Pocket knife = 84mm).



Fig.22 Pylon 30 (Pocket knife = 84mm).



Fig.23 Pylon 33 (Pocket knife = 84mm).



Fig.24 Pylon 34 (Pocket knife = 84mm).



Fig.25 Pylon 35 (Pocket knife = 84mm).



Fig.26 Pylon 36 (Pocket knife = 84mm).



Fig.27 Pylon 38 (Pocket knife = 84mm).



Fig.28 Pylon 39 (Pocket knife = 84mm).



Fig.29 Pylon 41 (Pocket knife = 84mm).



Fig.30 Pylon 112 (Pocket knife = 84mm).



Fig.31 Pylon 114 (Pocket knife = 84mm).

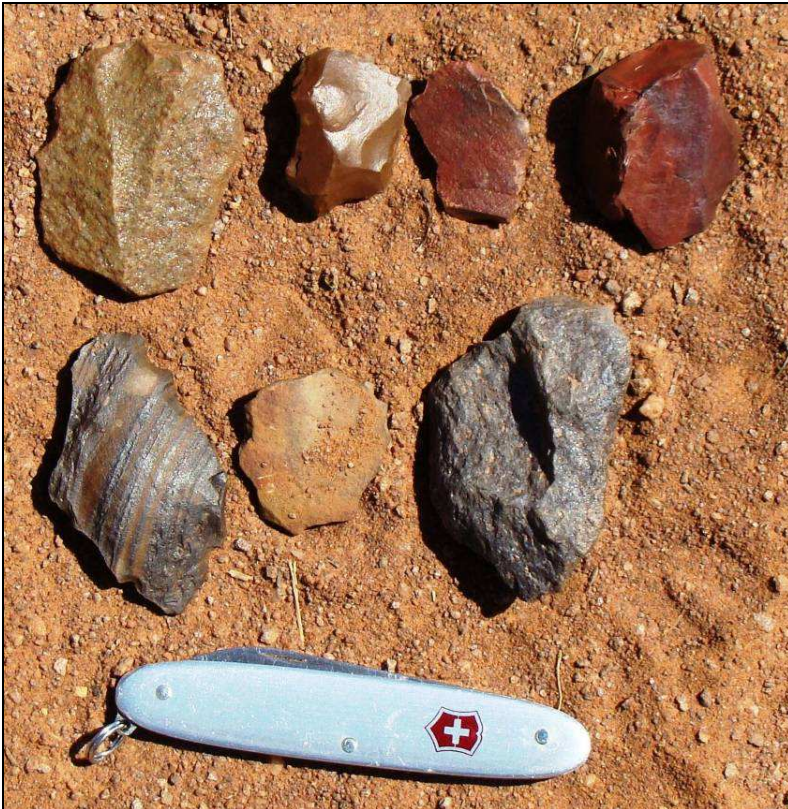


Fig.32 Pylon 124 on rocky outcrop (Pocket knife = 84mm).

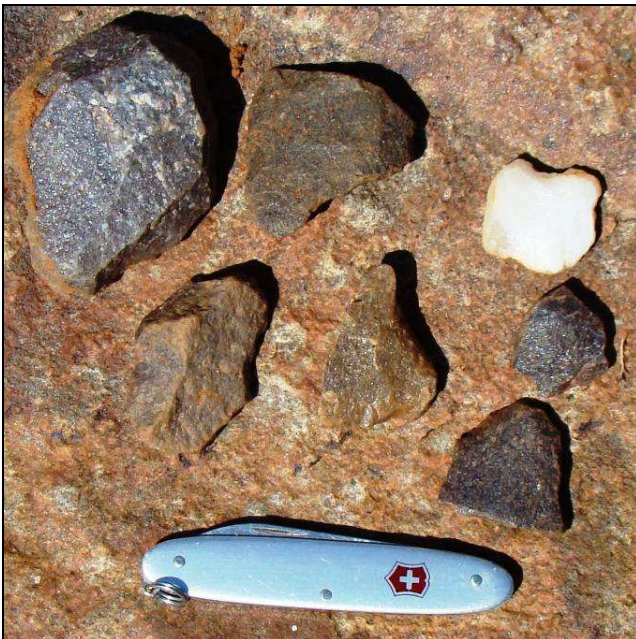


Fig.33 Pylon 151 (Pocket knife = 84mm).



Fig.34 Pylon 294 (Pocket knife = 125mm).



Fig.35 Pylon 298 (Pocket knife = 125mm).



Fig.36 Pylon 360 (Pocket knife = 84mm).



Fig.37 Pylon 363 (Pocket knife = 84mm).



Fig.38 Pylon 375 (Pocket knife = 84mm).



Fig.39 Pylon 376 (Pocket knife = 84mm).



Fig.40 Pylon 378 (Pocket knife = 84mm).



Fig.41 Pylon 380 (Pocket knife = 84mm).

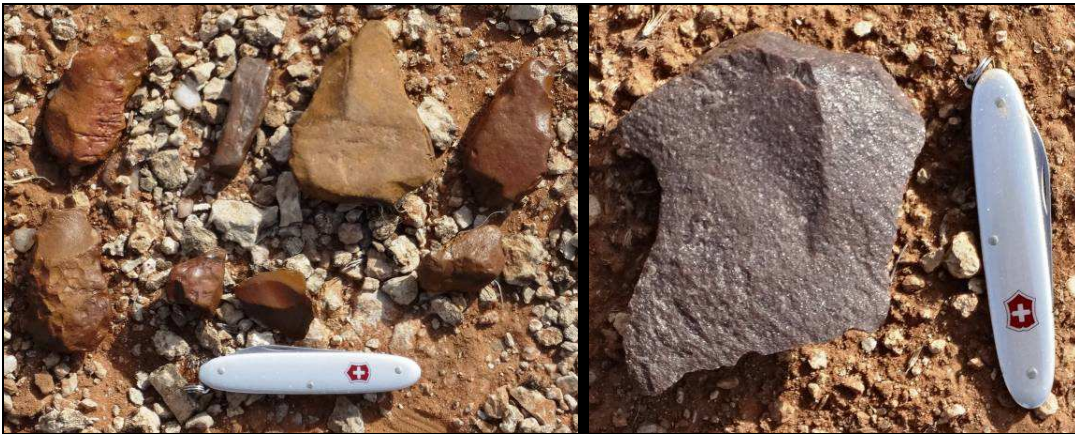


Fig.42 Pylon 381 (Pocket knife = 84mm).



Fig.43 Pylon 382 (Pocket knife = 84mm).



Fig.44 Pylon 386 (Pocket knife = 84mm).



Fig.45 Pylon 392 (Pocket knife = 84mm).



Fig.46 Pylon 405 (Pocket knife = 84mm).



Fig.47 Pylon 406 (Pocket knife = 84mm).



Fig.48 Pylon 429 (Pocket knife = 84mm).



Fig.49 Pylon 440 (Pocket knife = 84mm).



Fig.50 Pylon 450 (Pocket knife = 84mm).



Fig.51 Pylon 459 (Pocket knife = 84mm).



Fig.52 Pylon 459 (Pocket knife = 84mm).



Fig.53 Pylon 510 (Pocket knife = 84mm).



Fig.54 Pylon 525 (Pocket knife = 84mm).



Fig.55 Pylon 526 (Pocket knife = 84mm).



Fig.56 Pylon 527 (Pocket knife = 84mm).



Fig.57 Pylon 529.

- A BUSHMAN “LIVING SITE” WITH REMAINS OF DOMESTIC UTENSILS.



Fig.58 Remains of household utensils from a possible Bushman standing in the shade of a Witgat tree. Ostrich-egg-shell placed at the top, with a single stone flake (centre right). Found near Pylon 496 (Pocket knife = 84mm).

- UPPER GRINDING STONE.



Fig.59 Upper grinding stone from near Pylon 524. Note bruise marks on the ends. (Pocket knife = 84mm).

- PIECE OF GLASS BOTTLE OR DRINKING VESSEL.



Fig.60 An interesting piece of bottle glass from near Pylon 524 (Pocket knife = 84mm).

- ANGLO-BOER WAR (1899-1902) FOOD CONTAINERS.



Fig.61 Anglo-Boer War food container from Pylon 162 (Pocket knife = 84mm).



Fig.62 Anglo-Boer War food container from Pylon 524 (Pocket knife = 84mm).

- LARGE RUBBING STONES.



Fig.63 Several large rubbing stones were found. This specific specimen is from near Pylon 510. Several others are found at Pylon 498.

- FARM HOUSE RUINS.



Fig.64 Inventive closet design at ruined farmyard near Pylon 393.
Note sloping floor inside with external stone built septic tank.



Fig.65 Abandoned farmhouse near Pylon 393 on the Orange River.
Date of occupation is unknown.

- SCRAP YARD CONTAINING MOTOR SPARES FROM WORLD WAR II.



Fig.66 Engine cover (bonnet) of a WWII Ford V8 army truck. Note the military green paint. Found with other spares near Pylon 305.



Fig.67 Ammunition container dating from 1941 (WWII) modified as toolbox. Found near Pylon 305.

- FOUR FIRED RIFLE CARTRIDGE SHELLS AND A SINGLE BULLET PROJECTILE.



Fig.68 Fired rifle cartridge cases and a single bullet point. From left:

308 PMP WIN

270 PMP WIN

303 PMP

303 bullet point found at house ruin near Pylon 393.

MUSKET NO 2 WESTLEY RICHARDS. Found near Pylon 523.

(Pocket knife = 84mm).

The investigation produced no household middens or ash heaps.

No graves or graveyards were found either.

The soil cover predominantly consists of red to orange sterile sand.

IMPACT ASSESSMENT

The survey showed that Middle Stone Age artefact scatters will be found across the study area and it is likely that material will be disturbed during the construction of the pylons. The 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.

The general impression is that the proposed Kathu (Ferrum) to Nieuwehoop (near Kenhardt) transmission line route, will have a very insignificant impact on the heritage remains of the area. There is little concern about the limited impact at the small footprint of each pylon where located excavations will occur. I anticipate that disturbance will mainly occur during the construction and maintenance phases of the transmission line when heavy machinery and trucks will come in. I conclude 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.

From previous experience, it is known that the impact of transmission power lines is minimal, unless the pylons are placed on a specific archaeological site. 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).

MITIGATION

The Stone Age finds of this particular region are considered as of little archaeological significance, because of low frequencies, mixed nature and unstratified context. This assumption is supported by various archaeologists who had been doing research in these areas recently (Nilssen 2014).

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Dewald Kamffer, Rian Robbeson, Dr Johan du Preez and Linde de Jager accompanied me during the fieldwork on the route. Dr Johan Loock (HC), retired senior lecturer from 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 thank Peter Beaumont for his interest and contributions during previous investigations at Kathu cemetery.

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

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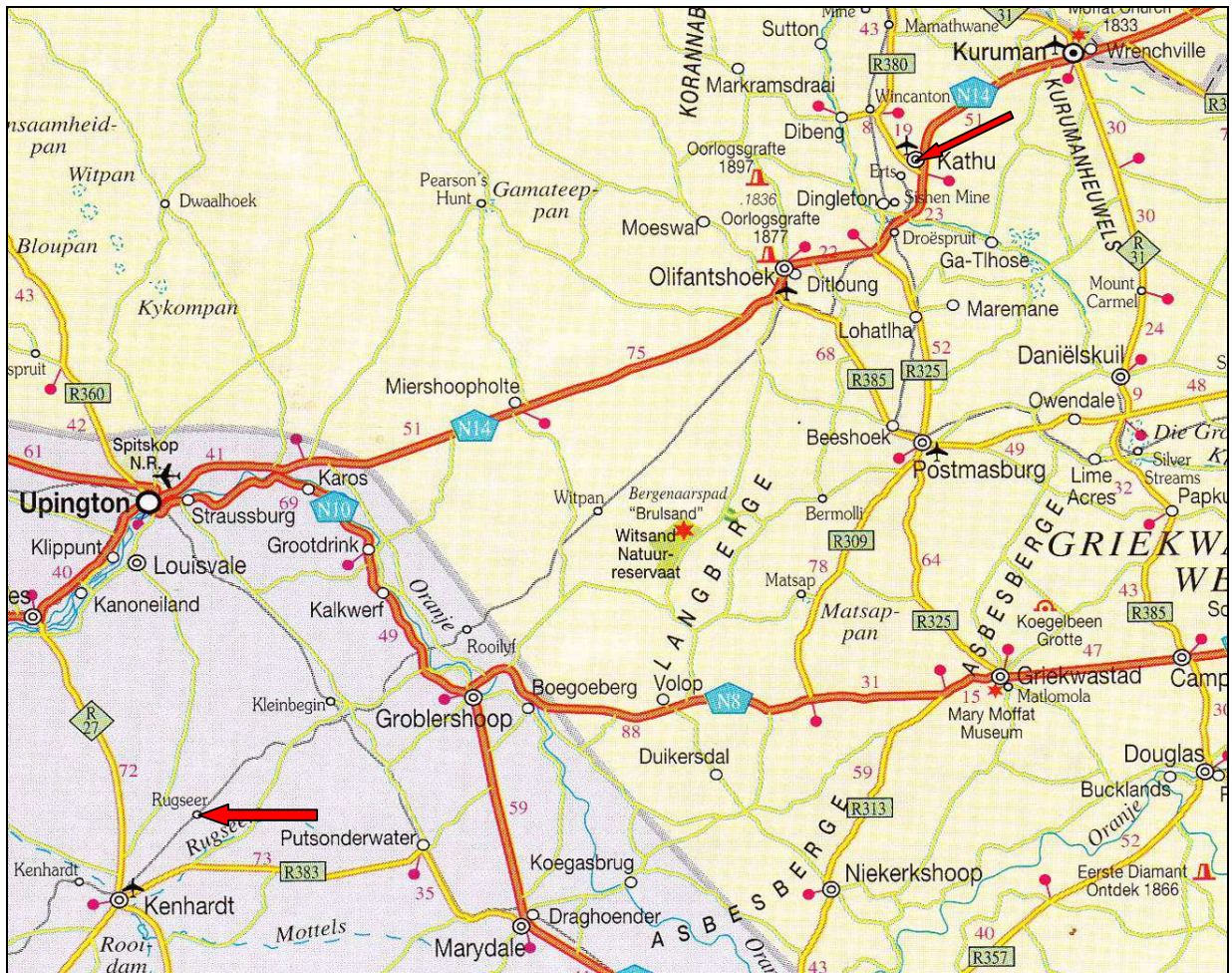
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LIST OF ILLUSTRATIONS



Map 1 Power line route Ferrum Sub-station at Kathu to Nieuwehoop (Rugseer0 near Kenhardt).



Fig.1 Disturbing notice on a farm near Pylon 112.
Fortunately, the farm owner's bark was worse than his bite.



Map 2 Ferrum Sub-station at Kathu showing pylon positions along the power line route.



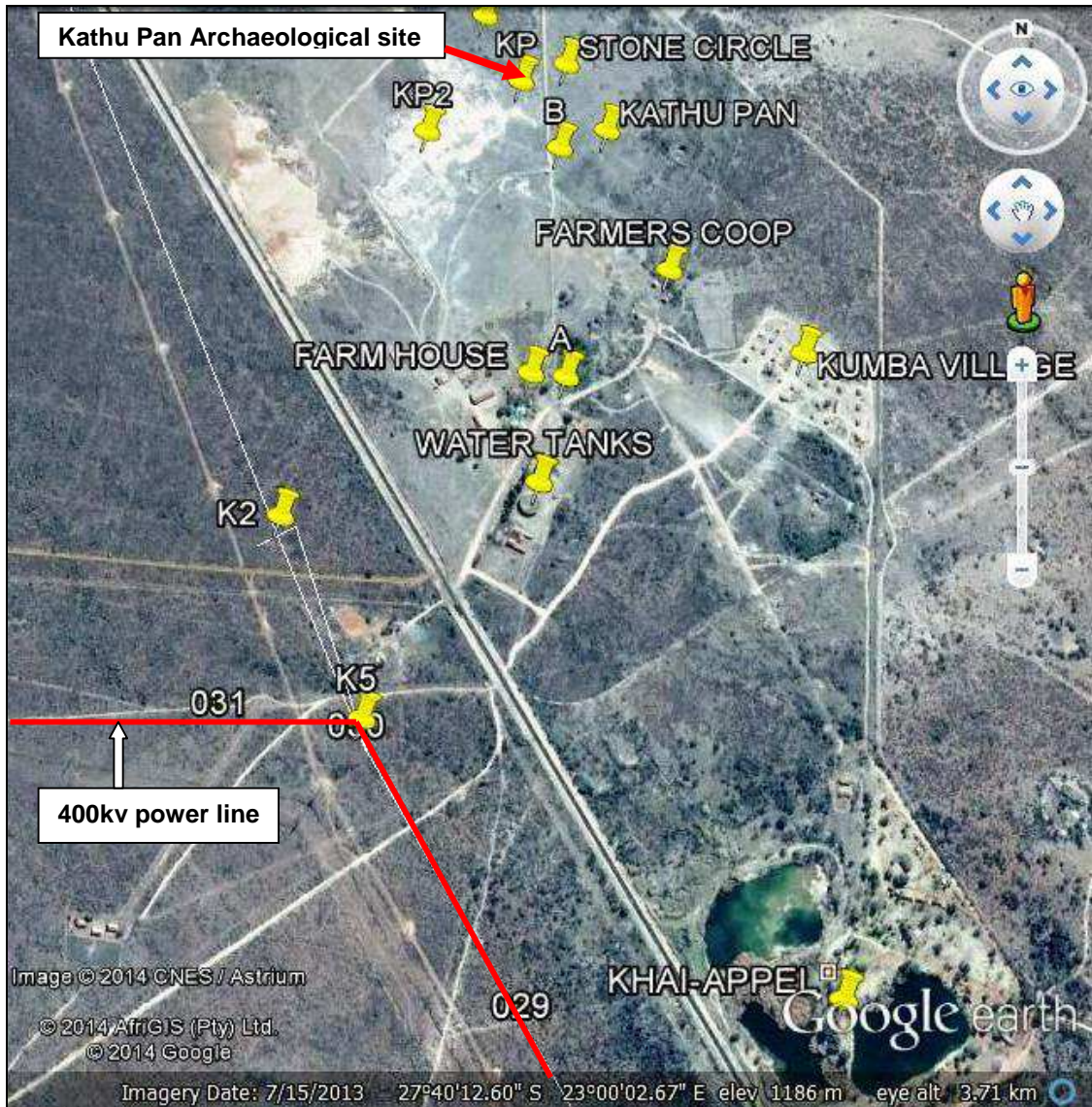
Map 3 Power line route south of the R380 road to Deben running from Ferrum to Point 30.



Map 4 Power line route from Point 30 around the Kumba mine.



Map 5 Power line route from Ferrum around the Kumba mine at Kathu.



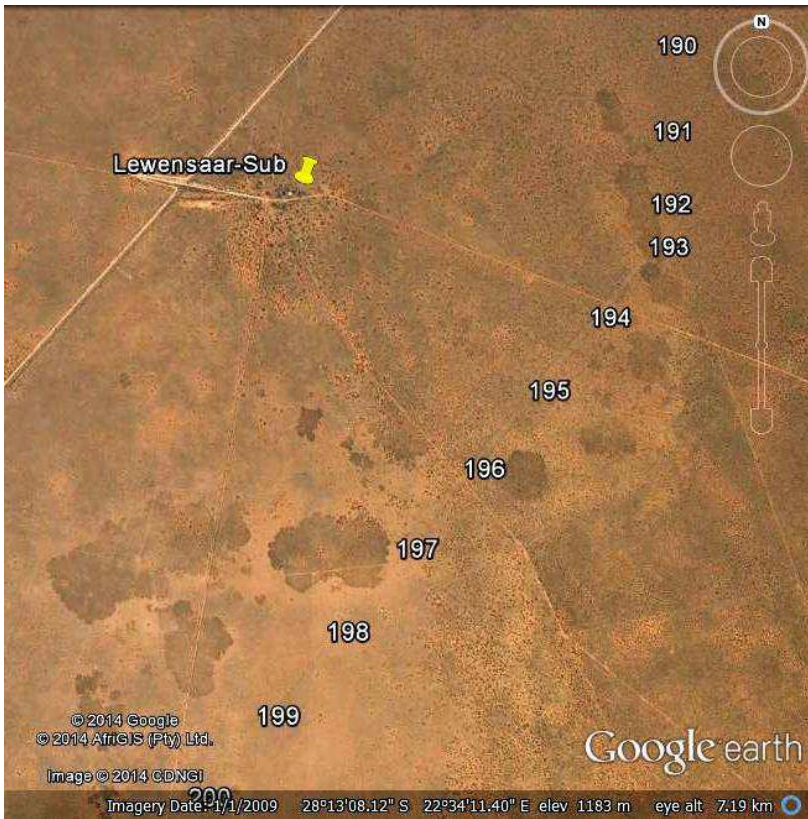
Map 6 Kathu Pan archaeological site and other structures in relation to the new power line.
(Amended from Dreyer 2013).



Map 7 Power line crossing the N14 at the brickworks outside Olifantshoek.



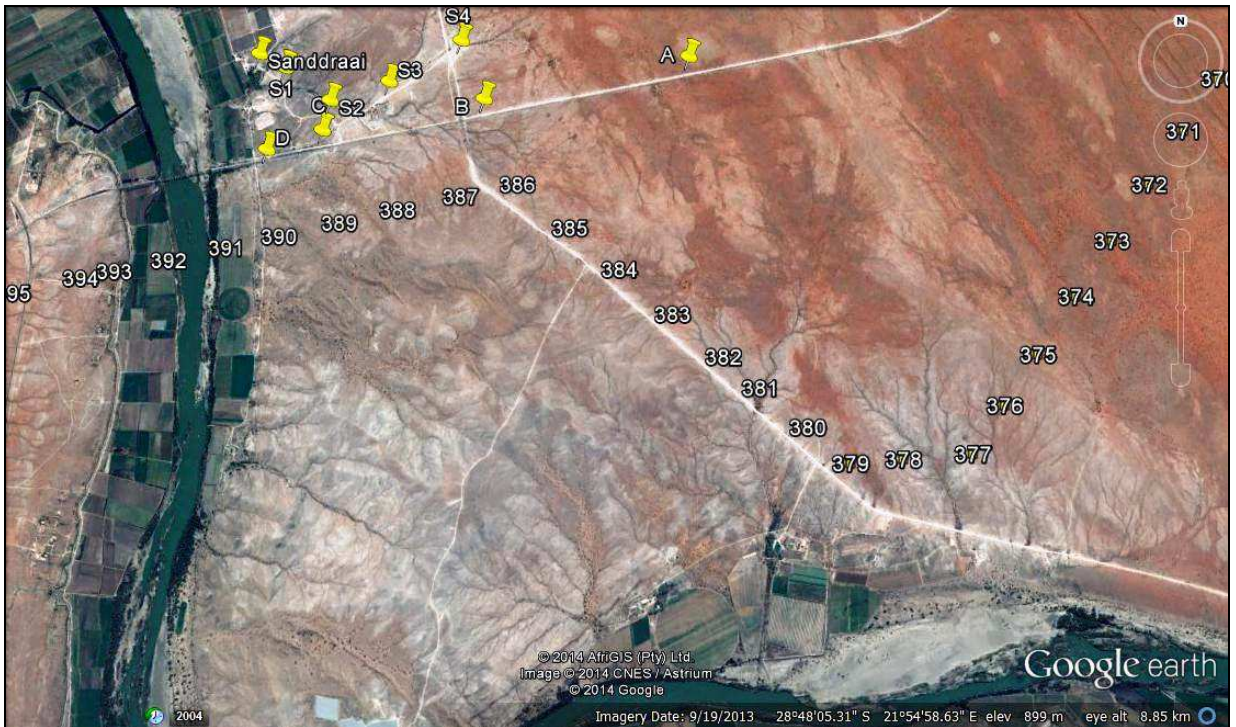
Map 8 Power line & Sishen-Saldanha railway line crossing 8km south of Olifantshoek.



Map 9 Lewensaar Sub-station on the Sishen-Saldanha railway line.



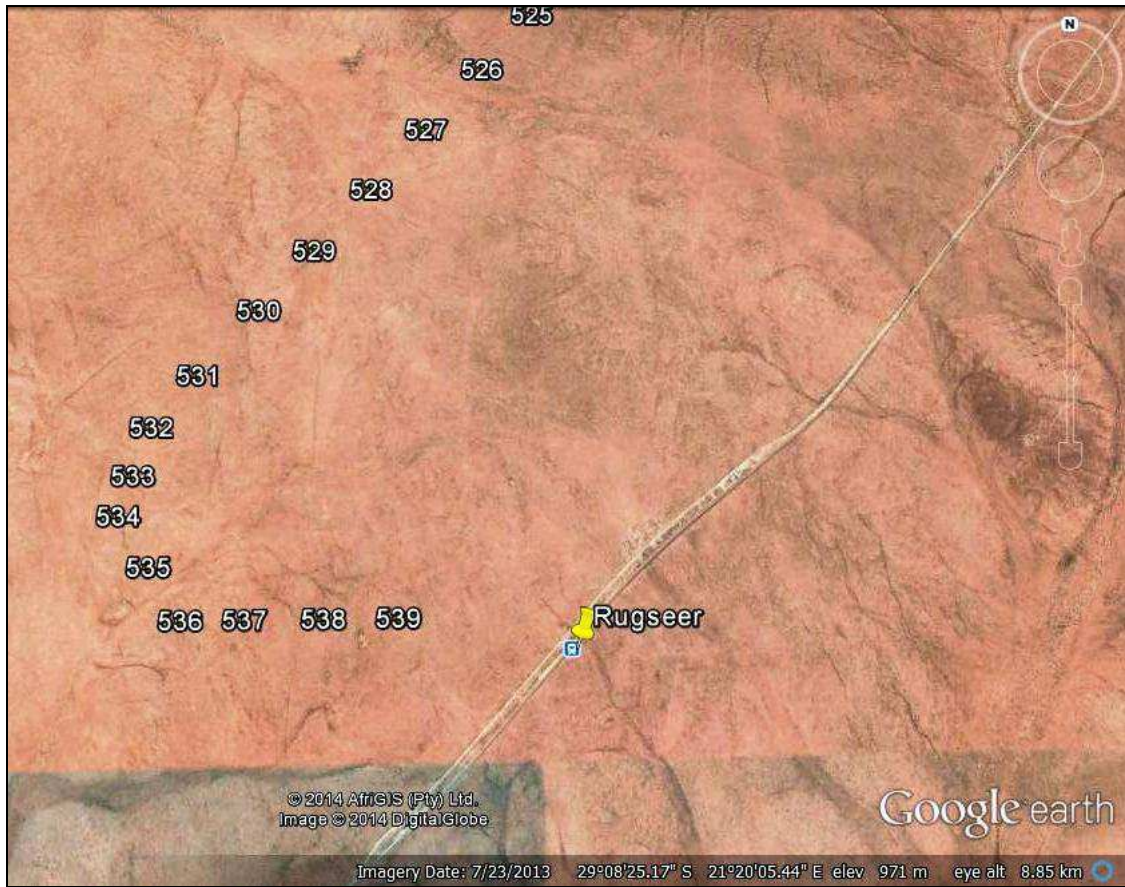
Map 10 Power line Sishen-Saldanha railway line crossing at Garona Sub-Station.



Map 11 Power line route along Loop 16 road before crossing the Orange River near Sanddraai.



Map 12 Power line crossing the mountains at Points 419 & 429.



Map 13 Power line approaching Nieuwehoop Sub-station near Rugseer siding.



Fig.2 Pylon 1 at Ferrum Sub-station near Kathu.



Fig.3 Vegetation at Pylon 34.



Fig.4 Vegetation at Pylon 58.



Fig.5 Position of Pylon 114.



Fig.6 Pylon 133 in the Drie-doring.

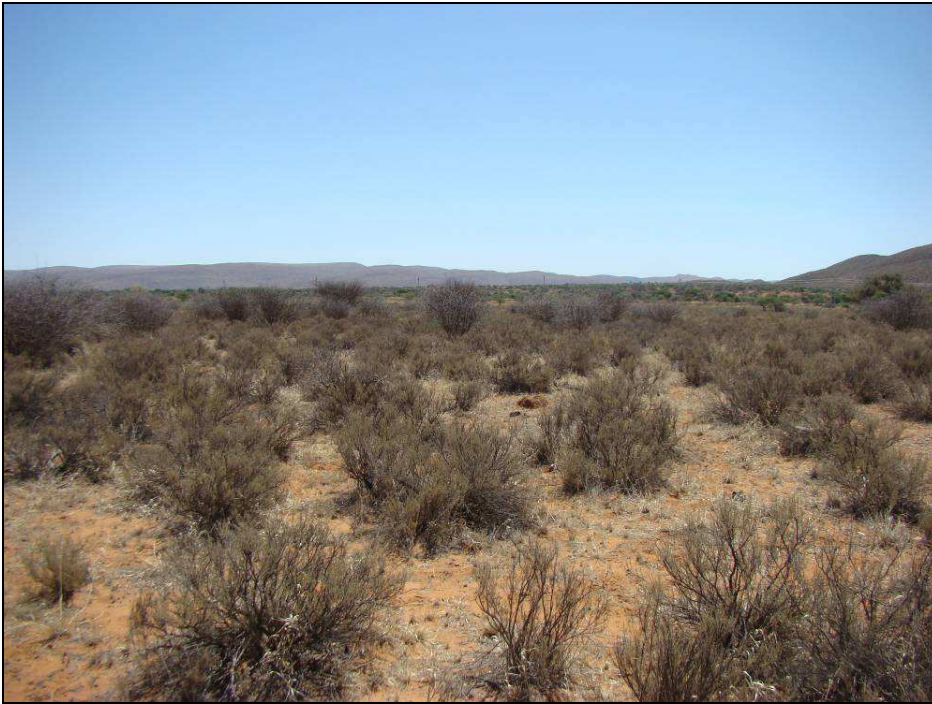


Fig.7 Pylon 140. More Drie-doring.



Fig.8 Boesmangras at Pylon 193.



Fig.9 Quartzite at Pylon 294.



Fig.10 Pylon 341.



Fig.11 Pylon 360. Garona Sub-station at the back.



Fig.12 Pylon 387.



Fig.13 Calcrete at Pylon 450.



Fig.14 Pylon 480.



Fig.15 Pylon 510.



Fig.16 Pylon 530.



Fig.17 Pylon 539 at Nieuwehoop near Rugseer (mast on the horizon).



Fig.18 Stone flakes from Bokpoort made out of chalcedony, banded ironstone and meta-quartzite. (Pocketknife = 84mm) (Dreyer 2006).