## HERITAGE IMPACT ASSESSMENT FOR A PROPOSED 132 kV POWER LINE, KURUMAN MAGISTERIAL DISTRICT, NORTHERN CAPE

Required under Section 38 (8) of the National Heritage Resources Act (No. 25 of 1999).

Report for:

#### Savannah Environmental (Pty) Ltd P.O. Box 148, Sunninghill, 2157 Tel: 011 656 3237 Email: joanne@savannahsa.com

On behalf of:

Kathu Solar (Pty) Ltd



## Dr Jayson Orton & Steven Walker ASHA Consulting (Pty) Ltd

6A Scarborough Road, Muizenberg, 7945 Tel: (021) 788 8425 | 083 272 3225 Email: jayson@asha-consulting.co.za

20 February 2015

#### **EXECUTIVE SUMMARY**

ASHA Consulting (Pty) Ltd was appointed by Savannah Environmental (Pty) Ltd to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed construction of a 132 kV power line some 12 km north-northwest of Kathu, in the Kuruman Magisterial District. The 8.3 km long power line will be required to evacuate electricity produced by the already authorised Kalahari Solar Project and will be accommodated within a 32 m wide servitude. Some 6.0 km of the alignment runs alongside a gravel road.

The present alignment is slightly different to an earlier alignment that was assessed by Gaigher (2014) but his assessment, which included a foot survey, was used as the starting point for the present one. This new Heritage Impact Assessment was produced as a desktop study with a literature survey having provided most of the information on which the impact assessment was based.

The Kathu area is important for the many Early Stone Age (ESA) occurrences already on record and, because of this, the Kathu Complex (as it has become known) has been declared a Grade 1 heritage site. This means it has national significance. The archaeology in the area is under continuous threat from the unrelenting development that is taking place around the town. The present study area is located 6 km north of the Kathu Complex and no significant archaeological heritage resources have yet been documented in close proximity. However, this is probably because of the lack of subsurface excavations and detailed surveys of the landscape.

It is difficult to predict the occurrence of subsurface archaeological deposits in the study area but there is a distinct possibility that such deposits would be found. Because the power line foundation excavations are relatively small (especially compared to the spatial extent of some of the ESA occurrences in the Kathu Complex), it is anticipated that even if a significant deposit is impacted the direct negative impacts will be of medium significance before mitigation. However, because there is a benefit in being able to examine the foundation excavations and document the subsurface geology and archaeology, the significance of impacts after mitigation is adjudged to be of low significance (negative status or possibly even neutral). No fatal flaws have been identified.

No impacts of very high significance are expected and any impacts that might occur can be mitigated. It is therefore recommended that construction of the proposed power line be allowed to continue, but subject to the following recommendations:

- The vicinity of the two pans that lie along the proposed route must be inspected for archaeological resources prior to the start of construction;
- If any sensitive archaeological sites are located around the pans then these must either be protected from harm or rescued by an archaeologist as appropriate;
- The pylon foundations must be inspected by an archaeologist in order to document the subsurface geology and any archaeological deposits that might have been intersected;
- If any highly significant deposits are located in the excavations then these might need very limited sampling in order to document the occurrence;
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

#### Glossary

**Background scatter**: Artefacts whose spatial position is conditioned more by natural forces than by human agency.

**Cosmic landscape**: One of three archetypes of natural place developed by Norberg-Schulz (1980) and generated by the basic relationship between earth and sky. Cosmic landscapes are those with wide open spaces and little topographic relief.

**Early Stone Age**: Period of the Stone Age extending approximately between 2 million and 20 000 years ago.

Hand-axe: A bifacially flaked, pointed stone tool type typical of the Early Stone Age.

**Holocene**: The geological period spanning the last approximately 10-12 000 years.

**Hominin**: a group consisting of modern humans, extinct species of humans and all their immediate ancestors.

**Later Stone Age**: Period of the Stone Age extending over the last approximately 20 000 years.

**Middle Stone Age**: Period of the Stone Age extending approximately between 200 000 and 20 000 years ago.

**Pleistocene**: The geological period beginning approximately 2.5 million years ago and preceding the Holocene.

**Trapvloer**: Historical threshing floor.

#### Abbreviations

<b>ASAPA</b> : Association of Southern African Professional Archaeologists	<b>NEMA:</b> National Environmental Management Act (No. 107 of 1998)		
BAR: Basic Assessment Report	NHRA: National Heritage Resources Act (No. 25) of 1999		
<ul><li>BIF: Banded ironstone formation</li><li>CRM: Cultural Resources Management</li><li>DEA: Department of Environmental Affairs</li></ul>	<b>NID</b> : Notification of Intent to Develop <b>OSL:</b> Optically stimulated luminescence		
EIA: Environmental Impact Assessment	SAHRA: South African Heritage Resources Agency		
ESA: Early Stone Age	<b>SAHRIS</b> : South African Heritage Resources Information System		
GPS: global positioning system			
HIA: Heritage Impact Assessment			
LSA: Later Stone Age			
MSA: Middle Stone Age			

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## **1. INTRODUCTION**

ASHA Consulting (Pty) Ltd was appointed by Savannah Environmental (Pty) Ltd to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed construction of a 132 kV power line some 12 km north-northwest of Kathu, in the Kuruman Magisterial District (Figure 1). The power line will be required to evacuate electricity produced by the already authorised Kalahari Solar Project, a concentrated solar facility.



**Figure 1:** Map showing the location of the proposed power line (red line) some 12 km northnorthwest of the town of Kathu. The blue polygon indicates the already authorised solar energy facility (not part of the present assessment).

## 1.1. Project description

The project entails construction of a 132 kV power line that will link the already authorised but yet to be constructed Kalahari Solar Project solar energy facility to the national grid. The line will be 8.3 km long and will follow a local gravel road, the T25, for 6 km of its length. The western end – and the solar energy facility – lie on the Farm Kathu 465/remainder, while to the west the power line will cross the Farm Marsh 467/remainder and end just inside the eastern edge of March 467/1 at an already authorised but not yet constructed switching station. The power line will likely be built on steel monopole structures of some 20 to 25 m height and the servitude width will be 32 m.

## **1.2. Terms of reference**

ASHA Consulting (Pty) Ltd was asked to prepare a heritage impact assessment (HIA) that would meet the requirement of the South African Heritage Resources Agency (SAHRA) in terms

of its archaeological component. An earlier assessment of a marginally different alignment (Gaigher 2014) had not given adequate consideration to the possibility of impacting significant buried pre-colonial archaeological resources and did not provide suitably motivated recommendations. This may have been largely due to the failure to review the extensive body of literature associated with the area. It was agreed between SAHRA and Savannah Environmental (Pty) Ltd that the new study could be conducted at the desktop level since a ground survey had already been carried out.

Although this study focuses strongly on the archaeological component, it should be noted that, following S.38(3) of the National Heritage Resources Act (No. 25 of 1999), even though certain specialist studies may be specifically requested, <u>all</u> heritage resources should be identified and assessed.

## 1.3. Scope and purpose of the report

An HIA is a means of identifying any significant heritage resources before development begins so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the fragile heritage of South Africa. This HIA report aims to fulfil the requirements of the heritage authorities such that a comment can be issued for consideration by the Department of Environmental Affairs (DEA) who will review the Basic Assessment Report (BAR) and grant or withhold authorisation. The HIA report will outline any mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of authorisation should this be granted.

#### 1.4. The authors

Dr Jayson Orton has an MA (UCT, 2004) and a D.Phil (Oxford, UK, 2013), both in archaeology, and has been conducting Heritage Impact Assessments and archaeological specialist studies in the Western Cape and Northern Cape provinces of South Africa since 2004. He has also conducted research on aspects of the Later Stone Age in these provinces and published widely on the topic. He is accredited with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #233) as follows:

- » Principal Investigator: Stone Age, Shell Middens & Grave Relocation; and
- » Field Director: Colonial Period & Rock Art.

Mr Steven Walker has an MA in Archaeology (University of Reading, UK, 1999) and is a PhD Canidate (UCT, Archaeology Department). He has been conducting applied archaeological specialist studies since 1998. Mr Walker's archaeological research has been focused at Kathu since 2007 and his publications include work from this area. He is a member of ASAPA (Member #291).

#### **1.5.** Declaration of independence

ASHA Consulting (Pty) Ltd and its consultants have no financial or other interest in the proposed development and will derive no benefits other than fair remuneration for consulting services provided.

## 2. HERITAGE LEGISLATION

The National Heritage Resources Act (NHRA) No. 25 of 1999 protects a variety of heritage resources as follows:

- » Section 34: structures older than 60 years;
- » Section 35: palaeontological, prehistoric and historical material (including ruins) more than 100 years old;

- » Section 36: graves and human remains older than 60 years and located outside of a formal cemetery administered by a local authority; and
- » Section 37: public monuments and memorials.

Following Section 2, the definitions applicable to the above protections are as follows:

- » Structures: "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";
- » Palaeontological material: "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";
- Archaeological material: a) "material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures"; b) "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 which is older than 100 years, including any area within 10m of such representation"; c) "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 maritime 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"; and d) "features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found";
- » Grave: "means a place of interment and includes the contents, headstone or other marker of such a place and any other structure on or associated with such place"; and
- » Public monuments and memorials: "all monuments and memorials a) "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 b) "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."

While landscapes with cultural significance do not have a dedicated Section in the NHRA, they are protected under the definition of the National Estate (Section 3). Section 3(2)(c) and (d) list "historical settlements and townscapes" and "landscapes and natural features of cultural significance" as part of the National Estate. Furthermore, Section 3(3) describes the reasons a place or object may have cultural heritage value.

Section 38 (2a) states that if there is reason to believe that heritage resources will be affected then an impact assessment report must be submitted. This report fulfils that requirement.

Under the National Environmental Management Act (No. 107 of 1998; NEMA), as amended, the project is subject to a BAR. Ngwao-Boswa Ya Kapa Bokoni (Heritage Northern Cape; for built environment and cultural landscapes) and SAHRA for archaeology and palaeontology) are required to provide comment on the proposed project in order to facilitate final decision making by the DEA.

## 3. METHODS

## 3.1. Literature survey

A survey of available literature was carried out to assess the general heritage context into which the development would be set. This literature included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS).

#### 3.2. Field survey

The present report relies on the field survey carried out on 23 March 2014 and reported by Gaigher (2014). He notes that the positions of finds were recorded on a hand-held GPS receiver set to the WGS84 datum but does not actually present any finds in his report. One of the present authors (SW) has field experience in the Kathu area and is familiar with the general environment there.

#### **3.3. Impact assessment**

For consistency, the impact assessment was conducted through application of a scale supplied by Savannah Environmental.

#### 3.4. Grading

Section 7 of the NHRA provides for the grading of heritage resources into those of National (Grade 1), Provincial (Grade 2) and Local (Grade 3) significance. Grading is intended to allow for the identification of the appropriate level of management for any given heritage resource. Grade 1 and 2 resources are intended to be managed by the national and provincial heritage resources authorities, while Grade 3 resources would be managed by the relevant local planning authority. These bodies are responsible for grading, but anyone may make recommendations for grading – something that is, at times, required in HIAs. Heritage grading can also be used as a proxy for the extent of any impacts that might occur.

It is intended that the various provincial authorities formulate a system for the further detailed grading of heritage resources of local significance but this is generally yet to happen. Heritage Western Cape (2012), however, uses a system in which resources of local significance are divided into Grade 3A, 3B and 3C. These approximately equate to high, medium and low local significance, while sites of very low or no significance (and generally not requiring mitigation or other interventions) are considered ungradeable.

#### 3.5. Assumptions and limitations

The study as reported by Gaigher (2014) was carried out at the surface only and hence any completely buried archaeological sites would not have been readily located. Gaigher (2014) reports dense vegetation that hampered his ability to conduct the survey and his track path (Gaigher 2014: fig. 11) shows that only parts of the route were examined. No archaeological finds were reported and the present report therefore has to rely heavily on other work in the area in order to establish the likely significance of any impacts that might arise from development along the power line route.

In general, the quality of many of the CRM reports from the Kathu area is poor. This has limited the amount of useful information that could be extracted as well as our overall understanding of the Kathu Complex.

## 4. PHYSICAL ENVIRONMENTAL CONTEXT

#### 4.1. Site context

Kathu is well-known as an iron ore mining town which was established in the early 1970s. Although a large iron ore mine lies to the southwest of Kathu, the general vicinity of the study area is undeveloped rural land.

## 4.2. Site description

Without having visited the site it is not possible to provide a detailed description of the study area. However, Gaigher (2014:13) described the study area as "mainly flat Kalahari type veldt

with occasional calcrete outcrops interspersed with red Kalahari Sand" and noted that vegetation cover was heavy due to recent rains in the area. He provides the images as shown in Figures 2 and 3 below.



Figures 2 & 3: Views of the study area as provided by Gaigher (2014:15).

## **5. CULTURAL HERITAGE CONTEXT**

This section of the report establishes what is already known about heritage resources in the vicinity of the study area. What is found during field surveys may then be compared with what is already known in order to gain an improved understanding of the significance of the newly reported resources.

## 5.1. Archaeological aspects

The vicinity of Kathu has long been known to have highly significant archaeological resources and there is a very large body of literature related to archaeological work and research in the area. The region is perhaps most well-known for the extensive deposits of Early Stone Age (ESA) material that have been described. Most research has been centred on the site of Kathu Pan but Kathu Townlands has also seen considerable attention. It is not possible to review all the literature associated with the Kathu area, but certain relevant papers and reports were consulted in compiling the summary that follows. It should be noted that several Kathu sites, together known as the Kathu Complex, have together been formally graded as a Grade 1 heritage resource meaning that the collection of sites has national significance. The archaeological resources within and beyond the proposed declaration area are under continued threat from development in the vicinity. Several of these archaeological localities are reviewed individually, whereafter some general comments are provided. Figure 4 shows the locations of these sites relative to Kathu and the present study area.



**Figure 4:** Aerial view of the Kathu area showing the locations of previously recorded archaeological occurrences (labelled yellow symbols). The Kathu Pan area is 6 km from the eastern end of the proposed power line (marked in blue). The red polygon indicates the already authorised solar energy facility.

## 5.1.1. Kathu Pan

Kathu Pan (KP1) is the principal site in the area and has the longest history of research. It was discovered in 1974 (Beaumont 1990) and reported in popular literature the following year (Anonymous 1975). The site is centred on a large pan that, under natural conditions, would have filled with water in summer owing to the rising water table during the summer rainy season and become a valuable water supply for prehistoric populations (Van Zinderen Bakker 1995). It has produced a sequence of ESA deposits including some Fauresmith material and evidence for the onset of the MSA some 500 000 years ago (Wilkins 2013). Wilkins *et al.* (2012) have studied fracture patterns on hand-axes from the site and determined that they were used in a hafted manner as spear points. The site has also yielded very early evidence for blade production (Wilkins & Chazan 2012). A special feature of KP1 is the fact that faunal

remains have been preserved. These remains include species such as hippopotamus that point to a far wetter environment than that pertaining in the region today (Klein 1988).

The sequence described by Klein (1988:11), from top to bottom, is as follows:

- » Approximately 1.5 m of organic silty sands containing Iron Age and Later Stone Age (LSA) material;
- » Between 0.9 m and 1.7 m of less organic silty sand containing rare LSA artefacts;
- » Approximately 0.8 m of poorly sorted gravelly sand with many Middle Stone Age (MSA) artefacts and associated faunal remains; and
- » About 3.5 m to 4 m of medium to fine-grained sand containing fossil spring deposits that in turn contain abundant ESA artefacts and associated fauna.

This sequence makes the site one of only a handful in the country to preserve deposits pertaining to all three Stone Ages. Dreyer (2013) notes a circle of standing stones whose function he could not determine. However, his description and illustrations are clearly of a *trapvloer* which serves to add a historical layer to the site. Porat *et al.* (2010: table 4) obtained optically stimulated luminescence and electron spin resonance/U-series dates on the deposits. The Fauresmith ESA was dated to about half a million years ago, while an age of 330 to 250 000 years was obtained for the MSA. Ages of 17 500 to 15 500 years and 10 500 to 9500 years were obtained for the LSA levels. Artefactual material supports quite recent occupation near the surface (Porat *et al.* 2010). On the basis of the presence of the teeth of the extinct elephant *Elephas recki*, Klein (2000) reports that the lowest archaeological layer, containing Acheulean artefacts, is likely to be between 1 million and 500 000 years old. Importantly, the ESA stone artefacts are reported to be fresh and unabraded (Porat *et al.* 2010). This therefore excludes the possibility of water having transported the artefacts to the area and suggests that ESA populations in fact were the direct accumulators in this location.

#### 5.1.2. Kathu Townlands

The Kathu Townlands site lies across the surface of a low hill within the bounds of the town of Kathu. It was first reported in 1980 and had initial excavations carried out by Beaumont in 1982 and 1990 (Beaumont 1990). Due to proposed development on the site, mitigation work was carried out to rescue some data and enable a better understanding of the deposits (Walker *et al.* 2013). The archaeological material was found to occur within a dense accumulation of banded ironstone formation (BIF) rubble within a sandy matrix directly over bedrock. The artefacts lack evidence of water transport, but damage to the artefacts does indicate mechanical damage through redeposition subsequent to the ESA occupation (Walker *et al.* 2014).

## 5.1.3. Bestwood

Archaeological sites were first reported at Bestwood by Dreyer (2008). Further research there has been undertaken by Chazan *et al.* (2012). They report that two sites, designated Bestwood 1 and Bestwood 2, occur in sand quarries, while a third, Bestwood 3, is located on a nearby hilltop. Their initial investigation at Bestwood 1 revealed a lithic industry characterized by well-made hand-axes, well retouched scrapers, occasional blades and a great diversity of core types (Chazan *et al.* 2012:331). They conclude that the site represents an ESA living surface. Again, the artefacts are fresh which militates against extensive transport and long-term exposure.

Walker *et al.* (2013) note that excavations at Bestwood demonstrated that material just like that found on the surface is also present *in situ* in a single horizon beneath the covering sands. Given the nature of the occurrences, it seems likely that archaeological material extends beyond the limits of the quarries. They also noted the presence of ESA material in another quarry to the south. At the western edge of Bestwood, adjacent to Kathu Townlands, however, Beaumont (2008a) only found four artefacts. He interpreted this to mean that no archaeological deposits were present.

#### 5.1.4. Uitkoms

The farm Uitkoms to the northeast of Kathu has also yielded various archaeological occurrences. Beaumont has named them Uitkoms 1, 2, 3 and 4. Uitkoms 1 appears to be similar to Kathu Townlands 1 in terms of artefact density and debitage frequency. Uitkoms 4 appears to be a largely buried site "where bifaces are very similar to those from the quarries, but with a formal tool incidence about a thousand times higher, and like that at a typical occupation site" (Beaumont 2008b:3). No primary reference for the Uitkoms 2 & 3 localities could be traced, but they are said by Walker *et al.* (2013) to comprise of artefacts seen in road cuttings along the N14.

#### 5.1.5. General comments

The above sites show that archaeological materials are fairly widespread around Kathu and the area is best regarded as an archaeological landscape rather than a collection of individual sites.

A large number of impact assessments have been carried out in the Kathu area. Although some have discovered valuable archaeological heritage sites, others report little or nothing. Gaigher (2013) examined a cadastral at the west end of the present power line route but found very little. Further south, Dreyer (2010) examined a new mining area and found nothing. Morris (2014) examined already disturbed areas to the east of Kathu and found nothing except some artefacts and banded ironstone fragments that were in obvious secondary context related to the on-going construction activities. By contrast, surveys on Hartnolls to the northwest of Kathu have revealed extensive archaeological deposits said to be similar to those of Kathu Townlands (Beaumont 2007; Dreyer 2006).

De Jong (2008) reports that rock engravings are also known from the Kathu area but no primary archaeological sources to substantiate this statement could be located.

Humphreys (1976) has considered the evidence for the southern limit of Late Iron Age occupation in the area and concluded that there was likely some occupation of the Kathu area from at least about AD 1700 onwards. However, reliable documentary evidence from the 19<sup>th</sup> century points to Iron Age people not being present much further southwest than Kuruman (Figure 5). Nevertheless, that they did live in the present study area at some point is testified to by the reporting of an Iron Age site 6 km south of the solar plant site and which, Beaumont (2006) says, was excavated in 1989. Unfortunately, he provides no description of further reference. Dreyer (2012) surveyed the same property again and, although he marks the site on a map, he provides no commentary at all – as such no description of this site can be provided here.

#### 5.2. Historical aspects

The modern town of Kathu only dates back to the 1970s when iron ore mining commenced. Aerial photographs from 1957 show no mining and no development of any sort in the town area. Farmsteads were rare. Similarly, the study area for the proposed power line is devoid of development (Figure 6), a state that it large retains today except for the gravel road running along its north side and the extensive farm complex near its eastern end.



**Figure 5:** Map showing the approximate south-western limits of Iron Age settlement in the Northern Cape. Source: Humphreys (1976: fig. 1). The red star indicates the positon of Kathu.



Figure 6: 1957 aerial photograph overlaid on Google Earth in the vicinity of the study area.

The Langeberg Rebellion was an important historical event to have occurred in the area. The following description is taken from Saker and Aldridge (1971). The former Crown Colony of British Bechuanaland was annexed by the Cape Colony on 16th November 1895. Just over a year later, in December 1896 and January 1897, revolts – collectively known as the Langeberg Rebellion – broke out in the area. Over the following months they took root in the Langeberg Mountains, west of modern-day Kathu, and were only suppressed by the Government in August 1897. The discontent among the Tlhaping and Tlharo people had arisen some years earlier when, in 1884, about 75% of their land was taken away from them. Two years later the Land Commission met to settle land claims after the demise of the Boer Republics of Stellaland and Goshen but little was done to help the Tlhaping and Tlharo. Although ten Native Reserves were proclaimed, 1400 square miles of crown land was made available for white settlement – this created further friction and unhappiness. In addition to the loss of their land, the Tswana chiefs were losing their authority. Eventually, on 27 November 1896 seventeen head of cattle strayed out of the Taungs Reserve and were shot. This appears to have been the critical moment when the rebellion began.

The farms Marsh 467 and Kathu 465 were both surveyed in 1898 and were no doubt part of the land taken from the Tlhaping. By contrast, Uitkoms 463 to the east was surveyed in 1893, well before the rebellion.

## 5.3. Natural heritage

The Kathu Forest is a large tract of land with a high density of thorn trees (*Acacia erioloba*) on it. The value of the Kathu Forest was already recognised in 1921 when it was declared a State Forest. However, with the discovery of iron ore and the beginnings of the town of Kathu the forest was deproclaimed. In 2009, under Section 12 (1) (c) of the National Forests Act (No. 84 of 1998 as amended), the Kathu Forest became South Africa's first Protected Woodland (Mans 2011). According to Anderson and Anderson (2007), the Kathu forest was declared a Natural Heritage Site in 2005. The rarity of forest environments in the arid Northern Cape is recognised and this element of our natural heritage needs to be considered during development applications.

## 6. FINDINGS / DISCUSSION

## 6.1. Archaeology

No findings can be reported, since the ground survey carried out by Gaigher (2014) failed to produce anything<sup>1</sup> and also did not adequately describe the surface geology. However, a discussion of the expected archaeological heritage resources can be provided and used as the basis for the impact assessment that follows.

The desktop review in Section 5 above suggests that archaeological material, particularly ESA artefacts, should be commonly encountered in the landscape. Later materials, from the MSA, LSA and Iron Age, might also be present. Because of the relatively late date at which colonial occupation began, the historical layer on this landscape is rather thin.

A significant hindrance to the discovery of archaeological material is the presence beneath the red Kalahari surface sands of beds of calcrete. These have been found to overlie archaeological deposits in some areas and can be up to 30 m thick in places. Archaeological artefacts may even be included within the calcrete. The calcrete seems, generally, to be more common to the south of Kathu. It is also notable that the subsurface geology and archaeology are extremely variable with massive beds of archaeological material present in places, while elsewhere the soil is sterile. The surface geology includes banded iron formation bedrock, calcrete and red

<sup>&</sup>lt;sup>1</sup> It could be, however, that he chose not to mention the occurrence of individual artefacts, since it seems unlikely that none at all would be observed in any survey in this landscape.

sand. The banded iron formation can be overlain by calcrete or sand and the calcrete may also be covered by sand.

The known archaeological exposures are generally thought to be exactly that – exposures of deposits whose lateral extent remains unknown. These exposures are scattered about the northern and eastern edges of the town and may or may not be spatially and/or temporally linked. The sheer scale of the Kathu Complex makes it very difficult to fully understand the archaeological landscape and the lack of any subsurface fieldwork between Kathu Townlands and Kathu Pan compounds this. To the north, in the vicinity of the proposed power line, nothing is known of what might occur subsurface but, given the presence of the red aeolian Kalahari sands in that area, there is a high likelihood of finding buried archaeological deposits.

It is notable that the broader study area around the proposed power line contains many small pans, three of which are in close proximity to the proposed power line. One lies immediately to the north of the gravel road so can be excluded from further study. Gaigher (2014:fig. 11) appears, from his track log, to have examined one side of one of the remaining two pans. The pans are 80 m by 50 m and 95 m by 70 m in size. It is well-known that pans regularly attracted prehistoric settlement and there is thus a good chance that archaeological materials could be found on the surface around these pans, particularly LSA materials. These two areas are likely to be the most sensitive in terms of surface archaeological remains.

#### 6.1.1. Statement of significance

It is difficult to make a statement of significance because we do not currently know what archaeological materials might be present beneath the surface. In terms of Section 2(ii) (vi) of the NHRA, dense accumulations of subsurface ESA archaeological remains or intact LSA occupation sites along the margins of small pans would have high significance for their scientific value. It is possible, however, that no significant archaeological materials occur along the proposed power line route.

#### 6.2. Other heritage resources

Since Gaigher (2014) did not find any heritage resources there is little more that can be said here. However, it is abundantly clear that archaeological heritage is the most significant resource of concern.

The only built structures present in close proximity to the proposed route are those at the farmstead near the western end of the line. These all post-date 1957 and are thus of no heritage significance.

No known graves lie in proximity to the route, but there is always the very small chance that unmarked pre-colonial graves could be unearthed during development in areas where the sand cover is deep enough to have allowed burial to take place. Areas close to pans are likely the most important in this regard, but the chances of impacts are still extremely small.

This part of the interior of the Northern Cape is typified by its lack of significant topography, its big sky and strong sense of remoteness (Figure 7) which are characteristic of a cosmic landscape (*sensu* Norberg-Schultz 1980). Because of the extensiveness and general lack of variety of this landscape it does not have a strong sense of place and can easily absorb such developments as power lines. The local roads cannot be regarded as scenic routes of any significance, although the section of the N14 passing through the Kathu Forest would be somewhat scenic – this is well away from the proposed power line though.



**Figure 7:** View towards the northeast showing the general landscape character at the point where the power line would intersect the R380.

## 6.2.1. Statement of significance

Although graves, if found, would have high social and scientific cultural significance in terms of Section 2(ii) (vi) of the NHRA, the other types of heritage resources discussed here are of very limited significance and do not merit further consideration.

#### 6.3. Summary of heritage indicators and provisional grading

The only potentially significant heritage resources likely to occur are archaeological resources. It is not possible to offer a provisional grading, although the potential exists for finds of any grade to occur.

## 7. ASSESSMENT OF IMPACTS

Archaeological resources are the only important heritage resources likely to be impacted and thus only this aspect of heritage is formally assessed here.

## 7.1. Archaeology

Because of the unknown nature of any subsurface archaeological deposits it has been necessary to adopt the precautionary principle and assume a worst case scenario in the assessment of potential impacts. The worst case scenario means a dense accumulation of ESA material, potentially with associated faunal material. Give the national significance of the Kathu Complex, impacts to such a site would be of regional to national (high) extent (Table 1). With mitigation, however, there would be positive spin-offs for archaeology such that the extent could be reduced to low. Because archaeological resources are unique and irreplaceable, the duration of any impact is always <u>permanent</u>. Magnitude is the most important criterion here. Although there is the potential for sites of very high significance to be disturbed, the nature of the impact (relatively small holes for the pylons) means that the magnitude will only be <u>moderate</u>. With mitigation this would reduce to <u>minor</u>. No fatal flaws have been identified.

The overall significance rating is <u>medium negative</u> but this would be reduced to <u>low negative</u> with mitigation (Table 1). Although some archaeological material might be damaged, this

would be offset by the benefit of gaining knowledge regarding the subsurface geology and archaeological deposits. It may thus even be more appropriate to rate the status after mitigation as neutral.

Nature: Direct damage to and/or destruction of archaeological deposits and/or artefacts that will occur		
through excavation of pylon foundations.		
	Without mitigation	With mitigation
Extent	High (4)	Low (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Minor (2)
Probability	Probable (3)	Probable (3)
Significance	45 (Medium)	24 (Low)
Status (positive or negative)	Negative	Negative
Reversibility	Irreversible	Irreversible
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	
Mitigation: In two areas where pans are present the surface should be protected until such time as they can be		
examined by an archaeologist. Examination of the pylon excavations will be required before the foundations are		
cast. Full details of the required mitigation are provided below.		
Cumulative impacts: Should significant archaeological deposits be located then cumulative impacts will be		
experienced because many impacts to the Kathu Complex have already occurred and there is much pressure on		
archaeological resources from development around the town. The significance of these cumulative impacts		
would vary depending on the nature of any deposits impacted by the power line.		
Residual Impacts: The impacts of the pylon footing excavations cannot be directly mitigated so those impacts will		
remain. However, it is considered that the benefits of understanding the subsurface geology that will be offered		
through examination of the excavations will outweigh the negative impacts.		

Table 1: Assessment of	archaeological	impacts for A	Alternative 1.
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#### 7.1.1. Mitigation and management

# OBJECTIVE: To reduce the impacts to surface archaeological resources prior to the start of construction.

Project component/s	Pylon excavations
Potential Impact	Damage to and/or destruction of archaeological resources
Activity/risk source	Excavations for the pylon foundations could impact on surface archaeological resources, as could any large vehicles driving across sensitive parts of the study area (the two pans)
Mitigation: Target/Objective	Mitigation will aim to document sensitive archaeological sites and either establish a buffer to protect them or recommend sampling prior to construction as appropriate. The surface survey of the pans should be carried out well before the start of construction in order to allow enough time for any further mitigation measures that might become necessary.

Mitigation: Action/control		Responsibility	Timeframe
Surface survey of the pans to identify any sensitive sites that might require protection or rescue work		Archaeologist	Severalmonths prior to the start of construction
Performance Indicator	Archaeological sites arour	nd the pans are either protected	from harm or are successfully mitigated

Monitoring	If any archaeological sites are found and can be protected then a buffer zone should be established
	and the project ECO tasked with ensuring that the buffer are remains a no-go area throughout the
	duration of construction.

OBJECTIVE: To increase our understanding of the subsurface geology in order that better information will be available for future development planning and/or academic archaeological research in the area.

Project component/s	Pylon excavations
Potential Impact	No opportunity to examine the subsurface geology and any potential archaeological deposits
Activity/risk source	Construction of the pylon foundations will obscure the sections that are exposed after excavation of the foundation holes
Mitigation: Target/Objective	Mitigation will aim to create a record of subsurface geology and any potential archaeological deposits that might be present

Mitigation: Action/control	Responsibility	Timeframe
Upon completion of excavation for all pylon foundations, an archaeologist should be called in to inspect and document the subsurface geology and any archaeology that might be present.	Site manager or ECO to keep in contact with archaeologist who will be responsible for documenting the sections in the excavations.	The archaeologist should be notified one to two months prior to commencement of the excavations for planning purposes and then told when to arrive on site for the purposes of carrying out the inspection.

Performance Indicator	An appropriate record of the subsurface geology and any associated archaeological deposits will have been created and will be available for future use.
Monitoring	Once the inspection has taken place, no monitoring will be required unless highly significant deposits are located that require further rescue work prior to casting of foundations.

Based on the desktop review presented above, there is insufficient evidence to motivate for a program of <u>archaeological</u> test excavations prior to commencement of development. The proposed development is located at least 6 km from the nearest known highly significant archaeological deposits. Furthermore we note that SAHRA (2013) did not request any further studies after Gaigher's (2013) low coverage survey of a development site immediately northwest of the proposed power line. However, we do believe that further archaeological input is required for the present project. In recognising that electrical pylons have very limited footprints, this input should involve the following:

- » The two small pans near the eastern end of the proposed power line route are regarded as sensitive and should be inspected by an archaeologist. The sensitive areas are to be defined as circular areas of 400 m diameter centred on:
  - \* S 27 36' 00.5" E 23 01' 23.4" E; and
  - \* S 27 36' 42.7" E 23 01' 37.1" E; and
- » All pylon foundation excavations must be inspected by an archaeologist prior to the beginning of construction in order to document the subsurface geology and any archaeological deposits that may have been revealed. It may be necessary to conduct small excavations to obtain samples from certain areas.

The main purpose of the examination of the pylon foundations is to develop an understanding of the subsurface conditions that exist and to identify any dense archaeological accumulations that might be present. Should the latter be found then it may be necessary to excavate a small sample for the purposes of creating a physical record of that locality. This sample may only need to be a single square metre in extent. The expected size of the subsurface ESA deposits in this region suggests that excavation of a pylon foundation into an archaeological deposit will not result in severe impacts; the opportunity to discover the deposit, on the other hand, may be seen as a positive impact (benefit). Any discovered deposits can then be placed on record for possible future research purposes.

#### 8. CONCLUSIONS

The only significant heritage indicator is the potential for uncovering important buried archaeological resources. While none are known from the immediate area, such resources are very common over several square kilometres to the north and east of Kathu. These archaeological deposits are about 6 to 12 km from the proposed power line alignment.

It is not possible to gauge the impacts at present but there is the possibility of impacts of medium significance occurring. Mitigation will, however, reduce these to low significance. Since no fatal flaws are present, it is concluded that the project may proceed.

#### 9. RECOMMENDATIONS

No impacts of very high significance are expected and any impacts that might occur can be mitigated. It is therefore recommended that construction of the proposed power line be allowed to continue, but subject to the following recommendations:

- The vicinity of the two pans that lie along the proposed route must be inspected for archaeological resources prior to the start of construction;
- If any sensitive archaeological sites are located around the pans then these must either be protected from harm or rescued by an archaeologist as appropriate;
- The pylon foundations must be inspected by an archaeologist in order to document the subsurface geology and any archaeological deposits that might have been intersected;
- If any highly significant deposits are located in the excavations then these might need very limited sampling in order to document the occurrence;
- -If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

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