Heritage scoping assessment for
THE PROPOSED KRONOS-ARIES 765KV TRANSMISSION POWER LINE AND SUBSTATIONS UPGRADE, NORTHERN CAPE PROVINCE

HERITAGE SCOPING ASSESSMENT FOR THE PROPOSED KRONOS-ARIES 765KV TRANSMISSION POWER LINE AND SUBSTATIONS UPGRADE, NORTHERN CAPE PROVINCE

Report No: 2013/JvS/021
Revision No: 1
Status: Updated
Date: July 2015

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Declaration:

I, J.A. van Schalkwyk, declare that I do not have any financial or personal interest in the proposed development, nor its developers or any of their subsidiaries, apart from the provision of heritage assessment and management services.

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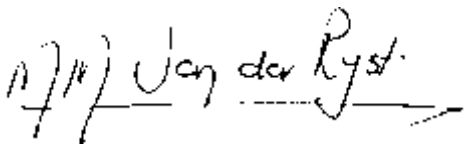


EXECUTIVE SUMMARY

HERITAGE SCOPING ASSESSMENT FOR THE PROPOSED KRONOS-ARIES 765KV TRANSMISSION POWER LINE AND SUBSTATIONS UPGRADE, NORTHERN CAPE PROVINCE

Eskom Holding SOC Limited proposes to construct a 765kV transmission power line for the "Proposed Northern Alignment 2 765kV Power Line Project". A section of this line is to run from the existing Aries Substation southwest of Kenhardt to the Kronos Substation south of the town of Copperton in the Northern Cape Province. The total length of the power line would be approximately 160km. For this purpose three alternative alignments have been identified, one of which will be selected as the most viable proposition.

Power lines on the scale required for a project such as this put particular constraints on heritage resources. It is anticipated that overall the impact of the development would largely be indirect, as it might only pass over or in close proximity of a heritage site or feature. The impact therefore would largely be visual. In other cases the impact will be direct as it would focus on a particular node, i.e. tower positions or access/ inspection roads. This would give rise to the physical disturbance of the material and its context.

In accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by **Mokgope Consulting** on behalf of the applicant, Eskom, to conduct a Heritage Scoping Assessment to determine if there are any fatal flaws that would prevent the proposed development from taking place in any of the three corridors where it is proposed to develop the electricity transmission line.

The cultural landscape qualities of the region essentially consist of a two components. The first is a rural area in which the human occupation is made up of a pre-colonial (Stone Age) occupation and a much later colonial (farmer) component. This rural landscape has always been sparsely populated. The second component is an urban one consisting of a number of smaller towns, most of which developed during the last 150 years or less and much later industrial (mining) activities.

The following heritage sites were identified in the larger region:

- Pre-colonial archaeological sites dating to the Stone Age have been identified to occur in the region of study area. In most known cases the impact of the development would only be indirect, e.g. the power line crossing some distance from the site, thereby having only a visual impact. However, when more detailed information is available, e.g. the exact position of the different towers and access/inspection roads, which will give rise to physical disturbance of the material and its context, it might be determined that specific development aspects might have a direct disturbance, which would result in irreplaceable loss of heritage resources.

- Colonial period or historic period heritage manifest in a wide variety – farmsteads, infrastructure and cemeteries. As the power line is to cross a rural landscape for the most part, the impact would only be indirect, e.g. the power line crossing some distance from the site, thereby having only a visual impact. However, when more detailed information is available, e.g. the exact position of the different towers and access/inspection roads, which will give rise to physical disturbance of the material and its context, it might be determined that specific development aspects might have a direct disturbance, which would result in irreplaceable loss of heritage resources.

As an initial evaluation of the three route alternatives, it can be concluded that the impact of the proposed development on sites, features or objects of cultural heritage would be low. The

reason is that cultural heritage sites are distributed sparsely in the region. Secondly, power lines usually have less of an impact than for example mining developments.

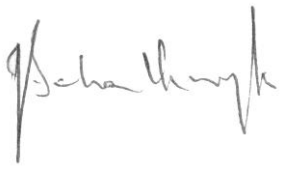
It is our opinion that from a heritage point of view there are no fatal flaws that would prevent the proposed development from taking place in any of the corridors. However, having said that, it must be remembered that heritage sites are not only fixed features in the environment, occurring within specific spatial confines, but they are also finite in number. Avoiding of impacts on sites is therefore the preferred form of mitigation. In areas where a high density of sites occurs, if at all possible, exclusion zones where no development is to take place, should be set aside. If that is not possible, mitigation can only be achieved through archaeological investigation.

As the exact coordinates for the power line and the individual tower structures are not yet available, it is difficult to determine what the final impact of the proposed development would be. Therefore, for the project to continue, we propose the following:

- Mitigation should be based on avoiding of sites rather than anything else. In order to achieve this, a full "walk down" of the selected corridor must be done prior to construction taking place, to document all sites, features and objects, in order to propose adjustments to the routes and thereby to avoid as many impacts as possible.

- In addition, the management measures, as set out in Section 7 of this report should be implemented prior to construction taking place.

- No impact on heritage sites, features or objects can be allowed without a valid permit from SAHRA.



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July 2015

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GLOSSARY OF TERMS AND ABBREVIATIONS

TERMS

Study area: Refers to the entire study area as indicated by the client in the accompanying Fig. 1 & 2.

Stone Age: The first and longest part of human history is the Stone Age, which began with the appearance of early humans between 3-2 million years ago. Stone Age people were hunters, gatherers and scavengers who did not live in permanently settled communities. Their stone tools preserve well and are found in most places in South Africa and elsewhere.

Early Stone Age	2 000 000 - 150 000 Before Present
Middle Stone Age	150 000 - 30 000 BP
Late Stone Age	30 000 - until c. AD 200

Iron Age: Period covering the last 1800 years, when new people brought a new way of life to southern Africa. They established settled villages, cultivated domestic crops such as sorghum, millet and beans, and they herded cattle as well as sheep and goats. As they produced their own iron tools, archaeologists call this the Iron Age.

Early Iron Age	AD 200 - AD 900
Middle Iron Age	AD 900 - AD 1300
Late Iron Age	AD 1300 - AD 1830

Historical Period: Since the arrival of the white settlers - c. AD 1840 - in this part of the country

ABBREVIATIONS

ADRC	Archaeological Data Recording Centre
ASAPA	Association of Southern African Professional Archaeologists
BP	Before Present
CS-G	Chief Surveyor-General
EIA	Early Iron Age
ESA	Early Stone Age
LIA	Late Iron Age
LSA	Later Stone Age
HIA	Heritage Impact Assessment
MSA	Middle Stone Age
NASA	National Archives of South Africa
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Agency
SAHRA	South African Heritage Resources Agency

HERITAGE SCOPING ASSESSMENT FOR THE PROPOSED KRONOS-ARIES 765KV TRANSMISSION POWER LINE AND SUBSTATIONS UPGRADE, NORTHERN CAPE PROVINCE

1. INTRODUCTION

Eskom Holding SOC Limited proposes to construct a 765kV transmission power line for the "Proposed Northern Alignment 765kV Power Line Project". A section of this line is to run from the existing Aries Substation southwest of Kenhardt to the Kronos Substation south of the town of Copperton in the Northern Cape Province. The total length of the power line would be approximately 160km. For this purpose three alternative alignments have been identified, one of which will be selected as the most viable proposition.

South Africa's heritage resources, also described as the 'national estate', comprise a wide range of sites, features, objects and beliefs. According to Section 27(18) of the National Heritage Resources Act (NHRA), No. 25 of 1999, no person may destroy, damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of any heritage site without a permit issued by the heritage resources authority responsible for the protection of such sites.

Power lines on the scale required for a project such as this put particular constraints on heritage resources. It is anticipated that overall the impact of the development would largely be indirect, as it might only pass over or in close proximity of a heritage site or feature. The impact therefore would largely be visual. In other cases the impact will be direct as it would focus on a particular node, i.e. tower positions or access/ inspection roads. This would give rise to the physical disturbance of the material and its context.

In accordance with Section 38 of the NHRA, an independent heritage consultant was appointed by **Mokgope Consulting** on behalf of the applicant, Eskom, to conduct a Heritage Scoping Assessment to determine if there are any fatal flaws that would prevent the proposed development from taking place in any of the three corridors where it is proposed to develop the electricity transmission line.

2. TERMS OF REFERENCE

2.1 **Scope of work**

The aim of this scoping assessment, broadly speaking, is to determine if any sites, features or objects of cultural heritage significance occur within the boundaries of the area where it is planned to develop the transmission line that could be considered as a fatal flaw which would lead to a specific alternative to be eliminated from further investigation.

The scope of work for this study consisted of:

- Conducting of a desk-top investigation of the area, in which available literature, reports, databases and maps were studied.
- A visit to the proposed development area.

The objectives were to

- Identify possible archaeological, cultural and historic sites within the proposed development area;

- Evaluate the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources;
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.

2.2 **Limitations**

The investigation has been influenced by the following factors:

- Large sections of the study area have not yet been subjected to systematic archaeological surveys, creating huge gaps in available knowledge. Furthermore, most information that was generated in specific areas is based on impact assessments done for the purpose of development projects of some sort. It therefore covered these regions only selectively.
- During the field survey, access to the various properties was not possible.
- During the field survey the coordinates for the individual pole structures were not available.
- In some cases the proposed power line will have a visual impact, i.e. an indirect impact, on heritage sites. This is not addressed in this report as a separate report will be dealing with visual impacts.
- The unpredictability of buried archaeological remains.

3. HERITAGE RESOURCES

3.1 **The National Estate**

The NHRA (No. 25 of 1999) defines the heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations that must be considered part of the national estate to include:

- places, buildings, structures and equipment of cultural significance;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features of cultural significance;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds, including-
    - ancestral graves;
    - royal graves and graves of traditional leaders;
    - graves of victims of conflict;
    - graves of individuals designated by the Minister by notice in the Gazette;
    - historical graves and cemeteries; and
    - other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
- sites of significance relating to the history of slavery in South Africa;
- movable objects, including-
    - objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;
    - objects to which oral traditions are attached or which are associated with living heritage;
    - ethnographic art and objects;
    - military objects;

- objects of decorative or fine art;
- objects of scientific or technological interest; and
- books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1(xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996).

3.2 **Cultural significance**

In the NHRA, Section 2 (vi), it is stated that ‘‘cultural significance’’ means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This is determined in relation to a site or feature’s uniqueness, condition of preservation and research potential.
According to Section 3(3) of the NHRA, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of

- its importance in the community, or pattern of South Africa's history;
- its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
- its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
- its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons;
- its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa; and
- sites of significance relating to the history of slavery in South Africa.

A matrix was developed whereby the above criteria were applied for the determination of the significance of each identified site (see Appendix 1). This allowed some form of control over the application of similar values for similar sites.

4. STUDY APPROACH AND METHODOLOGY

4.1 **Extent of the Study**

This survey and impact assessment covers the area as presented in Section 5 and as illustrated in Figures 1 & 2.

4.2 **Methodology**

4.2.1 *Preliminary investigation*

4.2.1.1 Survey of the literature
A survey of the relevant literature was conducted with the aim of reviewing the previous research done and determining the potential of the area. In this regard, various anthropological, archaeological, historical sources and heritage impact assessment reports were consulted – see list of reference below.

- Information on events, sites and features in the larger region were obtained from these sources.

4.2.1.2 Data bases
The *Heritage Atlas Database,* the *Environmental Potential Atlas*, the *Chief Surveyor General* (CS-G) and the *National Archives of South Africa* (NASA) were consulted.

- Database surveys produced a number of sites located in the larger region of the proposed development.

4.2.1.3 Other sources
Aerial photographs and topocadastral and other maps were also studied - see the list of references below.

- Information of a very general nature was obtained from these sources.

4.2.2 *Field survey*

The site visit involved only a cursory overview of the region by accessing the proposed alternative routes by means of existing roads. This took place over a period of five days in May 2013.

5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

5.1 **Site location and description**

Eskom proposes to construct a 765kV transmission power line for the "Proposed Northern Alignment 765kV Power Line Project". A section of this line is to run from the existing Aries Substation southwest of Kenhardt to the Kronos Substation south of the town of Copperton in the Northern Cape Province. The total length of the power line would be approximately 160km. For this purpose three alternative alignments have been identified, one of which will be selected as the most viable proposition.

As can be expected from such a large area the geology and vegetation cover is quite diverse. The geology is made up (from west to east) of tillite, shale and sedimentary material, with smaller occurrences of gneiss and quartzite. The original consists of Bushmanland Nama Karoo, with a small intrusion of Orange River Nama Karoo in the centre section of the route. The topography is classified as slightly irregular plains and pans over most of the area, changing to extremely irregular plains in the north-western section.

The current land use is farming, with grazing making up the largest part of the activities, although some crop production also occurs.

As a result of the above environmental factors the following aspects can be seen to dominate in the environment:

- Plains which make up the largest section of the study area. Water sources and potential shelter is limited.
- A number of rivers cross through the area, some of which are perennial. These would have offered an attractive choice for settlement as the plains were largely denuded of trees, whereas in the vicinity of water trees grew in abundance, offering not only shelter, but firewood as well as material for house construction.

- A few areas where low mountains and ridges occur. These would also have being an attractive choice for settlement as it offered shelter, firewood as well as material for house construction.

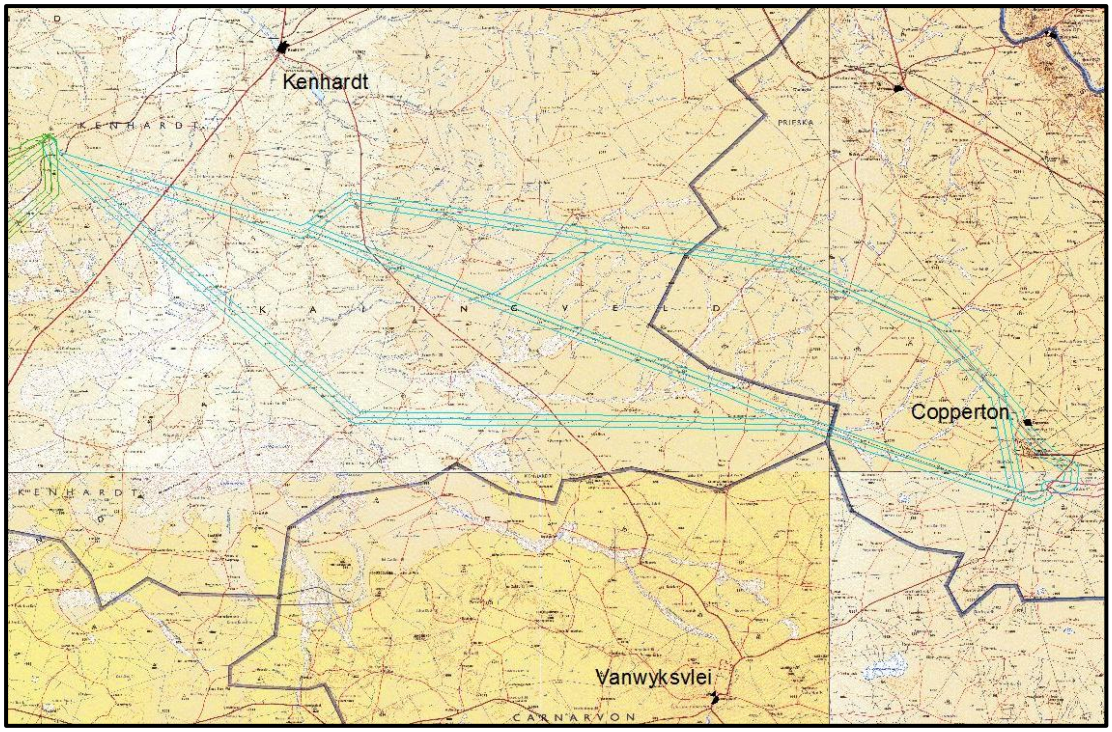

Fig. 1. Location of the study area in regional context.
(Topocadastral maps: Chief Surveyor-General)

5.2 **Regional overview**

The aim of this section is to present an overview of the history of the larger region in order to eventually determine the significance of heritage sites identified in the study area, within the context of their historic, aesthetic, scientific and social value, rarity and representivity – see Section 3.2 and Appendix 1 for more information.

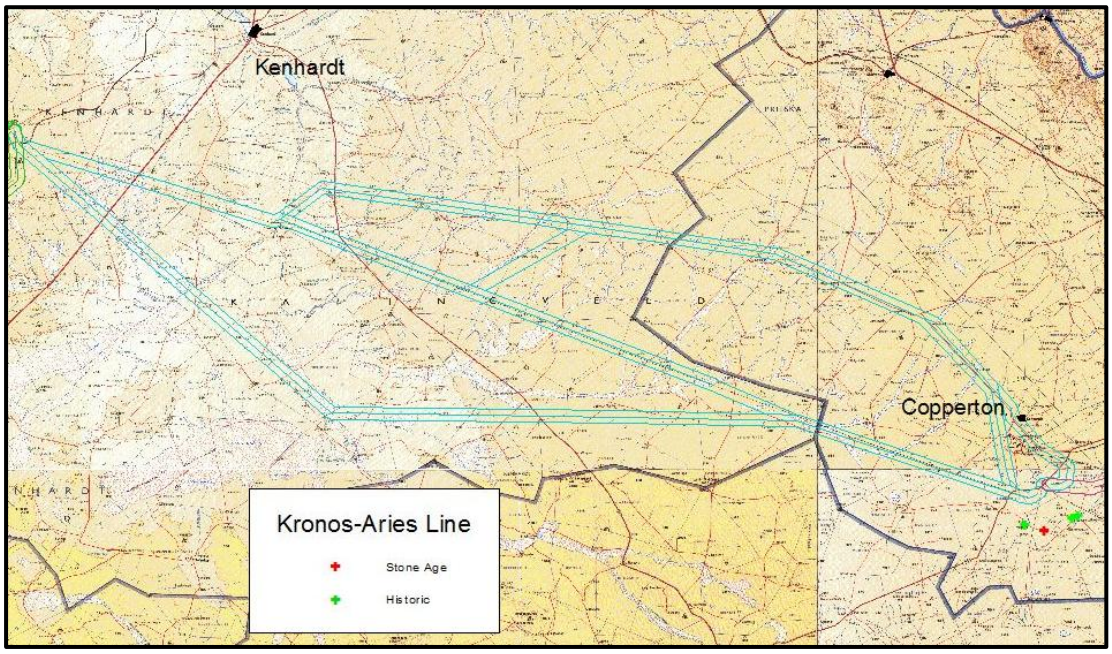

Fig. 2. Map showing the location of identified heritage site in the study area.
(Corridor 1 = bottom; corridor 2 = middle; corridor 3 = top)

Archaeological context for the Stone Age of the Northern Cape, Bushmanland and Namaqualand

The Northern Cape and Namaqualand, that includes the area known as Bushmanland, are arid regions with limited sources of surface water (Mitchell 2002). The territory occupied by Bushmanland broadly lies south of the Orange/Gariep River stretching to the west of Kenhard and east of Springbok in Namaqualand. A widespread presence of hunting-gathering and herder groups within these regions has been documented by early travellers with the data often applied to identify historical territorial ranges (Burchell 1812; Campbell 1815, 1822; Stow 1872, 1910; Bleek & Lloyd 1911; Mossop 1935; Engelbrecht 1936; Arbousset & Daumas 1968; Lye 1975; Dunn 1978; Deacon 1996).

A remarkably large number of archaeological sites have been recorded, researched and published through archaeological impact (AIA) and heritage assessments undertaken in the Northern Cape and Namaqualand regions. Earlier (ESA) and Middle Stone Age (MSA) lithics occur over most of the surface area with a more recent presence of Later Stone Age (LSA) occupations (Beaumont et al. 1995). The region in general contains very numerous small shallow pans, also known as dolines, of 100 to 200 m in diameter but also many larger pans. Areas around pan environments tend to display higher densities of lithics (Morris 2005b; van der Ryst & Küsel 2011, 2012).

Stone circles have also been recorded in this area. These features may represent residential structures being the bases of huts or windbreaks, storage structures, stock enclosures or hunting blinds (Kinahan 1986; Noli & Avery 1987; Parsons 2004; Jacobson 2005; Veldman 2008; Orton 2012a-c). Stone circles in Namiba date to the last 800 years (Veldman 2008).These low structures are not well studied but some research has been undertaken further east along the Orange River (Sampson 1968), in the Seacow Valley in the eastern Karoo (Sampson 1986), at Bloubos northwest of Upington (Parsons 2004) and in Namibia (Veldman 2008). Stone circles have recently also been discovered at De Aar in the central Karoo (Orton 2011c).

Parsons (2003, 2004, 2007, 2008; Lombard & Parsons 2008) used lithic raw material, tool types and non-lithic material culture to assign assemblages from late-Holocene open-air and several shelter sites in the Northern Cape to hunting-gathering or pastoral herding groups. The distinction is, however, not so clear-cut (Orton 2002/3; Sadr 2003; Mitchell & Whitelaw 2005). The hunter-gatherer assemblages termed Swartkop contain grass-tempered ceramics (Beaumont & Vogel 1989; Parsons 2007) and are dominated by hornfels, but with the use of quartz for some lithics. Blades are said to be integral to the Swartkop, with high frequencies of backed blades (Parsons 2007, 2008). Two earlier pulses of occupation are associated with the Springbokoog Industry. Earlier assemblages have proportionally more blades and fewer potsherds (Beaumont & Vogel 1989; Parsons 2007). Nearby sites with engravings such as at Jagt Pan and neighbouring engraved localities are often situated close to water sources. The Doornfontein herder sites are marked by ceramics (sometimes with lugs and spouts). Differences in the geographical spread indicate a preference for the pastoral Doornfontein sites along rivers while Swartkop sites are usually found further from the river (Fauvelle-Aymar 2004; Orton 2012a). This apparent patterning for hunter-gatherer versus herder localities is substantiated by Beaumont et al. (1995). They noted that most of the recorded LSA localities in Bushmanland were ephemeral occupations by small groups 'in the hinterland on both sides of the [Orange] river' (1995:263 as quoted by Morris 2013a).

Pastoralist communities that herded sheep, goat and cattle and speaking Khoe languages were well-established in these regions (Mitchell & Whitelaw 2005). Substantial herder encampments occur along the Orange River floodplain (Morris 2013a). Hendrik Jacob Wikar during his travels in 1778 recorded the names of the Cape-Gariep herder groups who had settlements on both sides of the river (Mossop 1935). Morris and Beaumont (1991) excavated sites at Renosterkop east of Augrabies where they found a herder signature in the more recent occupation levels. Wikar on his visit in 1778/9 gave an account of an island across Renosterkop known as !Nawabdanas, also shown on his map, that was occupied by the ǂNam-//neikwa or Karos-wearers (Mossop 1935: 122-123, 227; Morris & Beaumont (1991). Robert Jacob Gordon on his travels also visited this locality in 1779 (Cullinan 1992). Based on linguistic evidence Ehret (2008) estimates the spread of early Khoekhoe populations east into northern South Africa and south to the Gariep-Vaal confluence at around 2000 years ago or somewhat earlier. Four styles are recognized in the distinctive herder ceramics, and these also serve as rough chronological markers (Sampson 2010). Differences in herder ceramics and the fibre-temper bowls of hunter-herders assist in the identification of a herder or hunting-gathering presence at late Holocene archaeological localities.

One of the best-known sites in the region is the Wonderwerk Cave in the Kuruman Hills. The cave extends horizontally for 139 m and was formed by an ancient solution cavity in the dolomite formation (Beaumont 1990c). The lithic succession at Wonderwerk serves as a benchmark for the Stone Age sequence of the Northern Cape. It comprises an uppermost LSA sequence that contains Ceramic LSA, Wilton and Oakhurst (Humphreys & Thackeray 1983). Some of the cave deposit has been removed by guano diggers, which destroyed several important archaeological levels. The MSA levels that were still intact yielded blades and unifacial MSA points. The ESA sequence contains the usual large cutting tools and includes a transitional Fauresmith assemblage with blades, large scrapers and radially-prepared cores.

Excavations since the 1940s, which became more focussed as from 1976 to 1993, revealed a stratified series of deposits that accumulated up to a depth of about seven metres and are divided into nine Major Units (Beaumont & Vogel 2006).The application of a range of dating methods points to a complex cultural succession. Dates for the following cultural stages have been established at Wonderwerk: an LSA at 1-12.5 kyr (kyr = thousand years ago), the MSA at around ~70 to >220 kyr, the Fauresmith to ~270-500 kyr and an ephemeral Acheulean at >0.78 myr BP (Beaumont & Vogel 2006). An interdisciplinary project initiated in 2004 aims at dating the ESA deposits in particular, using a range of radiometric techniques, and will also focus on analysing the lithic faunal and botanical remains recovered from these strata (Chazan et al. 2008). The Wonderwerk deposits also contain portable stone slabs with anthropogenic markings (Chazan & Horwitz 2010; Jacobson et al. 2012; Beaumont & Bednarik 2013).

The paintings at Wonderwerk are in a poor state of preservation. While the region has some good painted sites, the Northern Cape is particularly known for its wealth of open-air rock engraving sites (Morris 1988, 2002, 2012a).The landscape settings of the engraved sites include the glaciated andesite pavements at Driekopseiland and also koppies and rock outcroppings surrounded by extensive plains, often in close proximity to pans or springs such as Wildebeest Kuil, Driekopseiland and Rooipoort (Morris 1988, 1990, 2002, 2012) and the remarkable nested geometrics at Rooipoort/Klipfontein where thousands of engravings are clustered around a major spring (Morris 1990; Dowson 1992; Mitchell 2002). Differences in style are attributed to different time periods. Incised finelines are the oldest, while pecked and scraped engravings occur within the last 2000 years (Morris 1988). Scraped engravings occur between Kenhardt, Beaufort West and De Aar (Orton 2012a). The engraved locality Springbokoog constitutes a significant landscape where three stone circles cluster among the >80 boulders with fineline engravings (Deacon 1986, 1988, 1996). Other major engraved sites in the area are Keurfontein at Vosburg to the east of Springbok Oog (Morris 1990). The testimonies of the /Xam from Bushmanland underlie much of our interpretation of the beliefs and customs as expressed in the rock art of the Bushmen (Bleek & Lloyd 1911).

The Kathu sites contain significant ESA Acheulean and Fauresmith assemblages, and also a well-represented MSA (Beaumont 1990b, 2004; Chazan et al. 2012; Wilkins & Chazan 2012). Kathu Pan is formed by a shallow depression with an internal drainage and a high water table. Archaeological and palaeoenvironmental data from Kathu Pan and Kathu Townlands were used to reconstruct changes over time in the prehistoric environment (Beaumont 2004). Biostratigraphy or faunal correlation is often used to date the southern African sites and gives some indication of the approximate age of some of the associated assemblages. Associated faunal remains with some of the Acheulean include *Elephas recki recki.* These animals disappeared at sites in East Africa such as at Olorgesailie, Kenya, at around 600 000/800 000 years ago (Beaumont 2004; McNabb et al. 2004). The transitional Fauresmith at Kathu Pan has been dated to ca. 500 000 BP (Porat et al. 2010). A current research project at Kathu Pan 1 established a date of 500 000 years for a Fauresmith blade assemblage where blades were systematically removed from prepared cores (Porat et al. 2010; Wilkens & Chazan 2012).

The LCT's from this area often contain very fine handaxes with some superb symmetrical examples produced on banded ironstone in c. 0.8–1.3-Ma-old stratum 4b at Kathu Pan 1 (Beaumont & Bednarik 2013). Lithics in some of the Acheulean deposits, but also in MSA levels, display a shiny silica skin. At Kathu Townlands an outcropping of banded ironstone that covers a large area of around 25 km contains enormous quantities of flaked items. This phenomenon is ascribed to the use of the high-grade bedrock jasper and ironstone as a source for raw materials and is supported by the high incidence of handaxe roughouts (Beaumont 2004). The prepared core technique was used to produce the spectacular small handaxes, long blades, convergent flakes/points and scrapers found in Fauresmith collections. MSA tools were also recovered from the Kathu localities (Beaumont 2004). Surface sites around Kathu exhibit a palimpsest of prehistoric utilization and may contain lithics from all periods in the Stone Age succession.

North-east of Kathu newly-found ESA sites with LCT's and an associated range of tools occur in sand quarries and on a hilltop at Uitkoms Farm and the Bestwood locality (Chazan et al. 2012). The new residential and commercial developments at Bestwood demonstrate the importance of Phase 2 heritage studies in the Kathu region.

Cave and shelter sites are not abundant in the region. An early MSA occupation and a more recent LSA utilization were recorded at Zoovoorbij Cave close to the Orange River 64 km east of Augrabies (Kaplan 2012a; Orton & Webley 2013). Rock shelters along the escarpment mostly contain LSA and herder occupation deposits (Humphreys & Thackeray 1983; Herries et al. 2007). The LSA of the Northern Cape is well researched (Humphreys & Thackeray 1983; Herries et al. 2007). A few of the small rock shelters with occupations dating to the Holocene along the Ghaap Escarpment have been excavated, including Burchell's Shelter (Humphreys 1975) and Dikbosch I and II (Humphreys & Thackeray 1983).

Burchell's Shelter has been occupied during historic times and travellers such as Burchell himself observed some of the Bushmen then present within this region (Humphreys 1975). Burchell, in describing their dress, wrote that they wore sandals and that their skin karosses were reddened with ochre (Humphreys 1975). It is evident from the archaeological investigations at Burchell's Shelter that only small groups occupied this locality and the artefacts and food remains demonstrate that they exploited a wide range of animals and collected plant foods, snakes and lizards, ostrich eggshell (OES) eggs and harvested termite eggs. Empty ostrich eggs were used as containers for substances such as ochre and specularite, but in particular as water flasks. In the Northern Cape OES flasks are sometimes found with mastic-attached spouts (Morris 2005a; Humphreys 2006).

The shelters of Dikbosch I and the smaller locality of II are located on the edge of the Ghaap escarpment (Humphreys & Thackeray 1983). To the north of Dikbosch I is a stream bed below a waterfall that would have represented a good water source during prehistoric times. The occupational sequence at the bigger shelter shows a regular use of this locality throughout the major part of the Holocene. The preservation of organic materials is good and the artefactual remains demonstrate a range of hunting and gathering and also probably ritual activities. The excavations at Dikbosch II suggest intermittent and ephemeral occupations (Humphreys & Thackeray 1983). Excavations at two shelters at Limerock on the Ghaap Plateau uncovered deposits with LSA occupation materials including lithics, numerous decorated OES fragments and other decorative pieces as well as ceramics (Humphreys & Thackeray 1983).

In addition to the well-known Taung localities some important fossiliferous and lithic-bearing breccias have recently been found on the Ghaap Plateau (Johnson et al. 1997; Herries et al. 2007). A multi-disciplinary project involving Australian, British and South African researchers has been initiated to investigate the palaeoanthropological potential of the Ghaap escarpment (Herries et al. 2007; Curnoe 2012).

The use of earth pigments, and in particular ochre and specular haematite, is universal (Watts 2002). Pigments and the exceptional pieces of engraved and ground incised pieces of ochre from MSA contexts at sites such as Wonderwerk attest to the time-depth of such practices (Mitchell 2002). Soft red haematite manuports were found in association with an Acheulean ESA assemblage At Kathu Pan I in deposits that have been dated to ~540 ka ago (Beaumont 1990b, 2004; Porat et al. 2010; Beaumont & Bednarik 2013). At Wonderwerk, Kathu Pan and Canteen Koppie unmodified specularite and ochre lumps have been found in levels with transitional ESA/MSA Fauresmith lithics (Beaumont & Bednarik 2013).

Quarrying of ore bodies often destroy earlier evidence for the utilization of the resource. Extensive mining of specular haematite by at least 40 000 BP has been documented at for example Ngwenya Mines, Swaziland (Nkambula 2011; Beaumont & Bednarik 2013). Investigations at Tsantsabane/Blinkklipkop established a date of AD 800 for the utilization of this particular rich source (Thackeray et al. 1983; Beaumont & Morris 1990). The specularite mines at Tsantsabane/Blinkklipkop and Doornfontein 1 near Postmasburg were rich and well-known ore sources that were quarried extensively over a long period of time (Beaumont & Thackeray 1981; Beaumont & Morris 1990; Mitchell 2002; Morris 2004). Dunn (1931:110) was told that 'it was from here that the Bushmen and other natives for hundreds of miles obtained their supplies of specular iron ore, which becomes red when burnt'. The pigment was bartered and exchanged for goods such as iron knives, assegais, axes, tobacco, copper and iron, and copper ornaments and beads (Campbell 1822 (Vol II); Burchell 1967; Arbousset & Daumas 1968). The mainly late Holocene lithic sequences at the mining localities are characterised by informal tool types with low frequencies of formal tools. Some of these were most likely to have been used in the mining and processing of pigments. Ceramics and items of European origin have also been recovered (Morris 1990; Couzens & Sadr 2010).

Namaqualand, a winter rainfall area, occupies the north-western corner of South Africa between the Olifants and Gariep rivers and extends along the Atlantic coast. The territory occupied by Bushmanland includes parts of Namaqualand east of Springbok. It is an open undulating landscape with isolated koppies (inselbergs) and several generally low mountain

ranges. The Knersvlakte is a large open plain to the north of the Olifants River and the uplands of Matsikammaberg and to the west of the Bokkeveld Escarpment (Mackay et al. 2010). Quartz gravelly patches and heuweltjies occur over large parts of the Knersvlakte. Heuweltjies are circular mounds associated with hardpan that show different vegetation patterns than the surrounding soils. They are a characteristic feature of the Succulent Karoo biome of Namaqualand. Heuweltjies are most likely old termitaria of the harvester termite *Microhodotermes viator* (Francis et al. 2012; Halkett 2012; Kunza et al. 2012). Lithics are often found at heuweltjies but this phenomenon has not yet been researched in enough detail.

The arid landscape with sparse vegetation ensures that heritage remains are highly visible. The archaeology of Namaqualand is dominated by millions of stone tools that derived from the utilization of the resources of the region by hunter-gatherers and herders until the recent past. The west coast is particularly important for the study of pastoralism as it is one of the proposed routes of entry for herder groups into southern Africa (Orton et al. 2011). Early dates of more than 2000 years ago for sheep were acquired from directly-dated sheep bone from Spoeg River Cave in this region (Webley 1992). Some 1500 LSA, 90 MSA (that include both sealed and open living sites as well as quarries) and 50 ESA localities have been documented in Namaqualand (Dewar & Stewart 2012). Some of these represent important MSA and LSA open and shelter sites on the Knersvlakte in the southern part of Namaqualand that have been the focus of current research.

The ESA is usually represented by isolated examples of handaxes in Namaqualand. The MSA in sealed shelter sites has received particular attention (Dewar & Stewart 2012). Conversely, there is a lack of detail on open-air and surface MSA sites in Namaqualand (van der Ryst & Küsel 2012, 2013b). This is beginning to change with the publication of current research projects aimed at the collection of MSA material in both the northern and southern regions of Namaqualand (Mackay et al. 2010; Dewar & Stewart 2012). This period is of particular significance as the origins of modern culture and language are associated with the emergence of anatomically modern humans, *Homo sapiens*, during the MSA. The upland savannas of southern Africa are seen as a focal region of biological and cultural evolution during this time (Beaumont & Vogel 2006).

A recent project that is focussed on human adaptations in low-productivity environments known as Adaptations to Marginal Environments in the MSA (AMEMSA) aims to investigate the economics, technologies and social organization that populations in Namaqualand developed to cope with the stress of marginal environments (Dewar & Stewart 2012). The research project aims to test the hypothesis that pre-modern humans exhibit a pattern of mosaic settlement that is directly related to favourable climatic periods. According to these premises physical and cultural modernity were required to cope with the demands of marginal ecozones to enable *Homo sapiens* populations to maintain settlement in harsh environments on a more constant basis (Dewar & Stewart 2012). Subsistence resources are unpredictable and patchy in marginal environments so that flexible social and technological strategies with innovative behaviour were required to successfully cope with environmental constraints (van der Ryst & Küsel 2012, 2013b).

Research at Spitzkloof A (28°51.79' S; 17°04.65'E) in the Richtersveld documented deep MSA deposits, while LSA lithics were recorded on the talus slopes of the shelters (Dewar & Stewart 2012). Current research includes investigations at Spitzkloof B. Investigations at the inland locality of Swartkop Hill near Garies recorded extensive raw material extraction at a quarry site during the MSA (Webley, L & Halkett 2010; van der Ryst & Küsel 2012, 2013b). Morris (2013a) also found a MSA extraction quarry near Gamsberg.

During the LSA the resources of the region were more intensively utilized. Both terrestrial and marine resources were actively sourced and shell middens are conspicuous along the Namaqualand coast line (Orton et al. 2005; Orton 2007). The more recent occupations of the region are also better documented and understood as a great many shell middens, deflated open-air localities and some rock shelters sites have been recorded through research projects but in particular on account of the numerous AIA's undertaken prior to mining activities. The many AIA's since undertaken in the region by archaeologists such as Lita Webley, Genevieve

Dewar, Tim Hart, Jason Orton and Dave Halkett documented deep stratified cave deposits and open-air sites for the MSA. The data show a particular strong presence for San hunter-gatherers during the Holocene, and Khoekhoe pastoralists (ancestor of Nama-speakers) for >2000 years, along shores but also at inland open and shelter sites.

Hart (2006) in his review of the Vredendal region also notes that abundant and important heritage resources have been recorded over the last decade. An assessment undertaken in 1991 by Parkington and Poggenpoel in the Brandsebaai area established intensive utilization of coastal resources within the last 2000 years. This is demonstrated by the ubiquitous Holocene shell middens on rocky shoreline areas. They also found much rarer MSA shell middens at Brandsebaai, Liebenbergsbaai and Boegoeberg (Hart 2006). Numerous sites dating to the last 2000 have been recorded in the Richtersveld. Recent excavations at Jakkalsberg on the bank of the Orange River in the north-western Richtersveld, where fish was a key resource, yielded dates from the mid- to late Holocene (Orton & Halkett 2010).

Surveyed areas in Bushmanland exhibited a markedly low incidence of artefactual material. Morris (2011a-c) points out the reduced archaeological visibility away from landscape features such as hills and rock outcrops. Morris (2011b) noted a general background noise of lithic elements but few sites. According to Morris (1999, 2000a-c, 2001, 2010b, 2011a-c) late Holocene lithics constitute the most common archaeological occurrences within the Aggeneys-Pofadder region. LSA lithics often occur in association with ceramics and OES fragments. OES containers served as water flasks and fragments from broken flasks were used to make beads.

Beaumont et al. (1995), as discussed above, found differences in the geographical distribution of LSA hunter-gatherer localities and the herder sites of pastoral groups. Beaumont et al. (1995) were of the opinion that increasing pressure brought about by the presence of herders in the Orange/Gariep River Basin resulted in the displacement of hunters to marginal areas such as Bushmanland. This came about largely in the last millennium when the archaeological remains of hunting and gathering settlements are commonly found near water sources (Morris 2011c). Notwithstanding, it is clear that there was also a herder presence in this region is suggested by ceramics near Aggeneys and, east of Pofadder, at Schuitdrift South (Morris 1999), grinding hollows on rock outcrops in the Aggeneys/Gamsberg area (Morris 2011a) and attested by herder rock paintings present on a boulder alongside the Aggeneys/Black Mountain aggregate quarry (Morris 2011a).

Such rock art sites are uncommon in some parts of Busmanland. Janette Deacon documented finger paintings on a boulder next to the Aggregate Quarry at Black Mountain Mine, Aggeneys (29°15’26” S; 18°48’12”E) (Morris 2011a, 2011c, 2013b). The rock art site comprises a boulder with a finger-painted star motif as well as an image of an indented oval shape. Morris (2013a: 38) also refers to a description by Dunn (1931) in his book, *The Bushman*. Dunn (1931: 46) wrote that ‘near N’Ghaums [Gams], I saw an engraving of a hippopotamus being dragged across the dry veldt by several Bushman people by means of a rope attached to its nose.’ Rock art research demonstrated that images of large mammals were metaphors for rain animals. The location of the engraving has not yet been established.

The MSA is widespread across Bushmanland but usually in low densities (Beaumont et al. 1995; Morris 2013a). An extensive MSA workshop was recorded at Gamsberg (GI 1) where the raw material, gossan, was extensively sourced (Morris 2013a). The site has been afforded a high rating of significance. A project near Garies in Namaqualand (Van der Ryst & Küsel 2012, 2013b) found a similar focus on a preferred source of quality toolstone at a MSA quarry site.

ESA Acheulean workshop locales (Gamsberg Sites GI 4 and 5) with handaxes and Victoria West cores were recorded at raw material sources on the western side of the Gamsberg basin. They represent some of the rare known ESA Acheulean sites that have been recorded in Bushmanland, and are therefore of regional significance (Morris 2013a).

1:50 000 Topocadastral Map Survey

- **2920BD GROOTRIET:** No data found.

- **2920DB SONDERHUIS**

According to Pelser (2011) the Olyvenkolk contains fairly large numbers of ESA and MSA tools over a large area with some concentrations of medium to high significance, e.g. GPS Location: S 29 29 38.1; E 20 47 20.6. Mitigation measures suggested in the 2011 report for sites that would be impacted upon by the development were undertaken during February 2012 during a Phase 2 (Lombard & Pelser 2012). Pelser (2012) subsequently assessed another part of the farm, Klein Zwart Bast 188. According to Pelser (2012: 17) *'[t]The assessment of the new expanded area for the Photo-Voltaic Solar Power Generation Plant on Klein Zwart Bast revealed that the whole area covered by the dwyka tillite material can be viewed as one Stone Age landscape, and that the area is generally homogenous in this sense. Individual sites cannot really be discerned, and it is clear that the area was utilized from the Early right through to Later Stone Age periods'*.

Halkett and Orton (2011a) found several weathered bifaces at Olyvenkolk whereas most of the other lithic occurrences were MSA. Morris noted in 2006 that the Dwyka tillites near Olyvenkolk and Klein Zwart Bast were sources of raw materials for ESA tools (Webley & Halkett 2012a). Whereas some weathered ESA tools on hornfels were recorded by Webley and Halkett (2012a), most of the lithics are from the MSA. Flaked products included flakes and blades (some with retouch), chunks and cores, were made on quartzite, banded ironstone and CCS. Morris (2013a) also mentions MSA sites from Olyvenkolk, southwest of Kenhardt and Maans Pannen, east of Gamoep. The ESA lithics at these localities are weathered Victoria West cores on dolerite, long blades and a very low numbers of handaxes and cleavers.

- **2921CA Kokerberg:** No data found.
- **2921CC Verneukpan (Noord):** No data found
- **2921CB Latrivier:** No data found.
- **2921CD Nooitgedact:** No data found.
- **2921DA AngelierspaN:** No data found.
- **2921DB Arcadia:** No data found.
- **2921DC Sondagspan:** No data found.
- **2921DD Springbokpan:** No data found.
- **2922CA Kraanvoëlpan:** No data found**.**

- **2922CC Kielder**

Kaplan & Wiltshire (2011) conducted an AIA on this locality and the adjoining map area. At 2922CC Kielder lithic knapping was recorded at the Smous Pan locality. (Refer to Kaplan & Wiltshire 2011: Figure 2 landing strip, for the Smouspan sites that were impacted). Mainly MSA lithics, accompanied by evidence for *in situ* knapping, were recorded at Smouspan. On the SAHRIS website is a reference to SMOUS1 where 'a dark quartzite rock and associated flakes were found relatively *in situ* on top of a hard packed Aeolian surface. It was possible to refit some of these flakes onto the core'. According to the report (Kaplan & Wiltshire 2011:21) *'[a]lmost every single quartzite outcrop on both Smous Pan 105 and Struisbult had evidence of flake scarring. No engravings were found on any of these outcrops. These quarries have not been set aside from development as they are ubiquitous and sufficient quantities of similar examples will be retained where the turbines are not placed and on neighbouring properties. These sites have been rated as 3B: Local – medium significance*'. A permit for development is pending (SAHRIS 2013-04-30).

- **2922CD Copperton**

This is an important area where care should be taken in the positioning of future infrastructural development. Several AIAs recorded heritage resources (Kaplan 2010; Van Schalkwyk 2011a; Orton 2012a, 2012b).

Kaplan (2010) found mainly LSA lithics in low-density and some diffuse scatters. No workshops were identified. He was of the opinion that sufficient recordings were made during the AIA of the lithics. These comprised mainly large flakes, cores, chunks, end scrapers, large utilized and retouched blade tools, and utilized and retouched flakes in fine grained quartzite, highly weathered hornfels and indurated shale. Several formal tool types such as adzes, scrapers, retouched and utilized flakes, bladelets were recorded.

Van Ryneveld (2006) found no heritage resources on portions of the 2922CD and 3022AB maps during her investigation for the reopening of the old Copperton Mine. Orton (2012a-c) observed good visibility for archaeological features during his surveys of the generally flat area with uphill slopes, pan sites and silty deflation hollows that fill with water after rains.

Kaplan and Wiltshire (2011) documented ESA with weathered handaxes and some MSA and LSA sites near pan environments. At Modderpan on Struisbult densities of up to 50 artefacts and more per square were documented. The site has been graded as 3A – local, high significance. The MSA includes large flakes, radial and bipolar cores, points, end scrapers, large utilized and retouched blade tools with utilized and retouched flakes on quartzite, hornfels, banded ironstone, haematite, gneiss and vein quartz. The LSA exhibits lower densities. Direct manufacturing activities for LSA lithics were recorded at exposures of quartzitic bedrock and on boulders of vein quartz (Kaplan & Wiltshire 2011). Similar findings were noted in the AIA report for Nelspoortje (Farm 103, Portions 4 and 5 and Hoekplaas 146) near Copperton where significant MSA and LSA lithic occurrences and also lithic quarries were identified during the survey for the Garob to Kronos line (Van der Walt 2013).

Van Schalkwyk (2011a) documented surface MSA and LSA lithics on or at the foot of small hills. He proposed the avoidance of such areas through buffer zones. In the event that the localities are impacted upon by proposed development, Phase 2 mitigation should be undertaken under a permit from SAHRA.

The following extract from a report by Kaplan and Wiltshire (2011: 9) on the SAHRIS website illustrates the intensity of development for solar and wind energy facilities in this particular region:
'*A recent heritage impact study by van Schalkwyk (2011) dealt with the scoping phase of four wind farms across the Northern Cape and the Eastern Cape. One of these lies about 25km east of Struisbult. Another three energy projects are planned on Vogelstruisbult 104 (F. Gresse, pers. Comm. 2011) and therefore this application on Struisbult is one of at least six possible energy related projects (wind and/or solar). SAHRA needs to take cognisance of the cumulative impact of these applications on the heritage resources documented in the area thus far and clear recommendations to all the relevant stakeholders will be required from SAHRA in the decision-making process'*. Subsequently Orton (2012a-c) and others undertook several AIA's.

On Vogelstruis Bult 104 Orton (2012a) recorded discrete sites with LSA occupations and with a background noise of ESA and MSA lithics. Several dense scatters of lithics have also been recorded. The author assigns low significance to most occurrences but recommend that some of the LSA with high significance should be mitigated in the case of future impact (Orton 2012a). The LSA localities tend to focus on pan environments, for example Perdepan (Orton 2012a). An engraving site along the road between Copperton and Van Wyksvlei was recorded. The rock art comprises scraped engravings of eland and ostrich as well as very recent (historical) images of horses with riders, a chariot and some writing (Orton 2012a).

At Hoekplaas (Orton 2012b) notes background scatters of ESA and MSA artefacts that he rated of very low archaeological significance. There are three pans with several discrete LSA sites around the central pan. Gravel has been quarried at the pan, revealing a buried MSA deposit. In view of this observation Orton (2012b) points out the probability of other important subsurface material close to pan environments.

At Klipsgat Pan (Orton 2012c) again recorded scatters of ESA and MSA artefacts that he rated of very low archaeological significance. For the large number of discrete LSA sites

recorded around ephemeral pans and the hill Orton (2012c) suggested mitigation measures in the event that they are impacted by future developments.

Kiberd (2006) excavated at Bundu Pan (29°45'05"S; 22°12'25"E) on the eastern edge of Bushmanland approximately 25 to 30 km northwest of Copperton and to the east of Prieska. Stratified ESA, MSA and LSA deposits were found. A range of Pleistocene fauna include some extinct species such as a giant hartebeest (Kiberd 2006).

- **3022AA Halfweg:** No data found.

Farm names such as Boschmans Kop 197 suggest a previous presence of San groups. There are several pan localities.

- **3022AB Springbokpoortje:** No data found.

In view of the numerous archaeological occurrences to the north there should be Stone Age sites.

NOTE: Whereas very little archaeological data have been found for the above maps, there are many pan environments where a survey will probably record Stone Age lithics. This may be in low densities, as found by Webley and Halkett 2010c on 2921AB Witdorp.

- Archaeological sites

NHRA Category	Archaeological and palaeontological sites
Protection status	
General Protection - Section 35: Archaeology, palaeontology and meteorites	

Significance	High on a regional level – Grade III

Fig. 3. Stone tool typology and some tools and flakes found in the region.
The stone tools (on the left) are not from the region and are only used to illustrate the difference between Early (left), Middle (middle) and Later Stone Age (right) technology.
Historic period

Historic period

By the early 19th century some Dutch speaking trekboers moved into the region, grazing their stock. As they depended on water for their live-stock, these farmers would have stuck close to available water sources and it was only during the wetter parts of the rain season that they might have accessed other areas for short periods of time. Even today, people migrate with their stock on a seasonal basis, moving between winter and summer grazing. In the past this was done by following the sheep by means of wagons and donkey carts, but in recent times this is done by means of trucks.

An investigation of the Title Deeds of some of the farms under consideration indicated that they were surveyed during the latter part of the nineteenth century, implying that they would have been occupied since then.

Due to the sparse population, infrastructural development in this part of the world has always been low. The roads are gravel and graded occasionally. As there are no major rivers, river crossings remained informal.

The town of Prieska developed from a place to which farmers migrated when the pans were full of water after rains. It attained municipal status in 1892. The name is derived from Korana and means “place of a lost she-goat”.

The one industrial activity that is practised in the region on a commercial basis is the mining of copper at nearby Copperton. The history of the development of mining activities at Copperton is graphically described by Hocking (n.d.). Although the existence of copper on the farm Vogelstruisbult was known since the early 20th century, little was done to exploit it. It was only during the late 1960s that the potential importance of the deposit was realised and a number of shafts were sunk: the Marais and Hutchings shafts. To house the workers at the mine a residential area was developed and named Copperton. The mine was closed down in 1991.

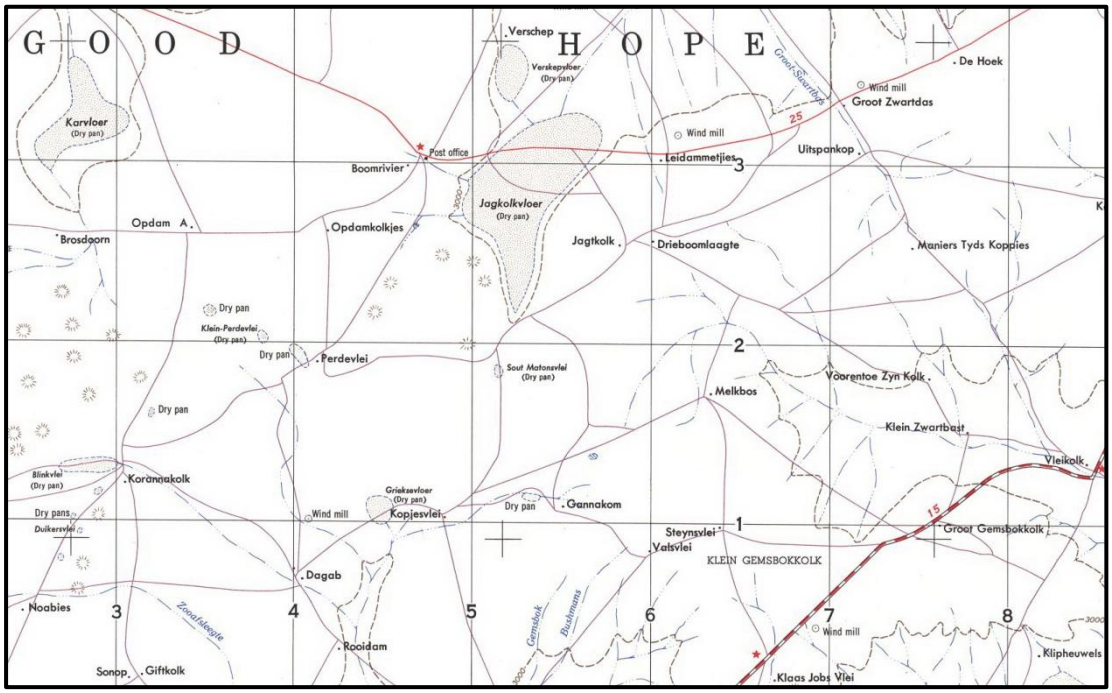

Fig. 4. Section of the 1950 1:250 000 cadastral map.

The map in Fig. 4, based on information dating to the early 1940s, indicate the occurrence of features such as farmsteads, windmills, mining areas and roads. The implication is that as this map is older than 60 years the indicated features are also older than 60 years, meaning that they enjoy general protection under the heritage act. Although it is not certain what the qualities of each particular feature is, it is expected that at least some of it would have unique vernacular characteristics.

- Built environment

These are complex features in the landscape, being made up of different yet interconnected elements. Fortunately transmission lines do not usually impact on towns. Most towns in the region have, according to various databases, about 20 buildings that are listed to be of provincial heritage significance.

NHRA Category	Buildings, structures, places and equipment of cultural significance
Protection status	
General Protection - Section 34: Structures older than 60 years	

Significance	High on a regional level – Grade III

Fig. 5. Buildings found in an urban environment.

- Farmsteads

Farmsteads are complex features in the landscape, being made up of different yet interconnected elements. Typically these consist of a main house, gardens, outbuildings, sheds and barns, with some distance from that labourer housing and various cemeteries. In addition roads and tracks, stock pens and wind mills complete the setup. An impact on one element therefore impacts on the whole.

NHRA Category	Buildings, structures, places and equipment of cultural significance
Protection status	
General Protection - Section 34: Structures older than 60 years	

Significance	High on a regional level – Grade III

Fig. 6. Examples of farmsteads and farming related features identified in the region.

- Cemeteries

Most of these cemeteries, irrespective of the fact that they are for land owner or farm labourers (with a few exceptions where they were integrated), are family orientated. They therefore serve as important 'documents' linking people directly by name to the land.

NHRA Category	Graves, cemeteries and burial grounds
Protection status	
General Protection - Section 36: Graves or burial grounds	

Significance	High on a local level – Grade III

Fig. 7. Local cemeteries.

- Public monuments

Although most of these usually occur in urban areas, some also occur in rural areas where some event of significance took place.

NHRA Category	Buildings, structures, places and equipment of cultural significance
Protection status	
General Protection - Section 37: Public Monuments and Memorials	

Significance	Medium on a regional level – Grade III

Fig. 8. Monuments in town and the rural area.

- Infrastructure and industrial heritage

In many cases this aspect of heritage is left out of surveys, largely due to the fact that it is taken for granted. However, the land and its resources could not be accessed and exploited without the development of features such as roads, bridges, railway lines, electricity lines and telephone lines.

NHRA Category	Buildings, structures, places and equipment of cultural significance
Protection status	
General Protection - Section 34: Structures older than 60 years	

Significance	Medium on a regional level – Grade III

6. SITE SIGNIFICANCE AND ASSESSMENT

6.1 **Heritage assessment criteria and grading**

The NHRA stipulates the assessment criteria and grading of archaeological sites. The following categories are distinguished in Section 7 of the Act:

- **Grade I**: Heritage resources with qualities so exceptional that they are of special national significance;
- **Grade II**: Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region; and
- **Grade III**: Other heritage resources worthy of conservation on a local authority level.

The occurrence of sites with a Grade I significance will demand that the development activities be drastically altered in order to retain these sites in their original state. For Grade II and Grade III sites, the applicable of mitigation measures would allow the development activities to continue.

6.2 **Statement of significance**

A matrix was developed whereby the above criteria, as set out in Sections 3(3) and 7 of the NHRA, No. 25 of 1999, were applied for each identified site (see Appendix 1). This allowed

some form of control over the application of similar values for similar sites. Three categories of significance are recognized: low, medium and high.

Table 2. Summary of identified heritage resources in the study area.

Identified heritage resources	
Category, according to NHRA	*Identification/Description*
Formal protections (NHRA)	
National heritage site (Section 27)	None
Provincial heritage site (Section 27)	Yes
Provisional protection (Section 29)	Yes
Place listed in heritage register (Section 30)	None
General protections (NHRA)	
structures older than 60 years (Section 34)	Yes
archaeological site or material (Section 35)	Yes
palaeontological site or material (Section 35)	None
graves or burial grounds (Section 36)	Yes
public monuments or memorials (Section 37)	Yes
Other	
Any other heritage resources (describe)	None

In terms of Section 7 of the NHRA, the sites currently known or which are expected to occur in the study area are evaluated to have the following significance:

- Stone Age sites are viewed to have medium significance on a regional level and have Grade III significance;
- Rock art sites (Stone Age) are viewed to have high significance on a regional level and have Grade II significance;
- Farmsteads are viewed to have medium significance on a regional level and have Grade III significance;
- Graves and cemeteries are viewed to have high significance on a local level and have Grade III significance;
- Industrial and infrastructural heritage sites are viewed to have medium significance on a regional level and have Grade III significance.

6.3 **Impact assessment**

Impact analysis of cultural heritage resources under threat of the proposed development, are based on the present understanding of the development.

Environmental Parameter	**Pre-colonial: Stone Age sites**

Issue/Impact/Environmental Effect/Nature	Many sites are still unknown. Their potential and significance therefore unknown. The impact will be the physical disturbance of the material and its context. Impact will be focused on a particular node, i.e. tower positions or access/ inspection roads
Extent	Local
Probability	Can occur
Reversibility	Irreversible
Magnitude	High
Duration	Permanent
Significance Rating	Sites have a medium significance on a region level – viewed as NHRA Grade III sites. Distinguish from find spots, which have low significance. Rock art sites are viewed to have high significance on a regional level – viewed as NHRA Grade II sites.
Mitigation measures	All of these sites should be avoided as far as possible. Mitigation should take the form of isolating known sites and declare them as no-go zones with sufficient large buffer zones around them for protection. Sites that cannot be avoided should be excavated in full by an archaeologist qualified in Stone Age archaeology.

Environmental Parameter	**Colonial Period - farmsteads**
Issue/Impact/Environmental Effect/Nature	The various features are subject to damage. Easier to identify and therefore easier to avoid. Variety of interconnected elements makes up the whole. Impact on part therefore implies an impact on the whole
Extent	Local
Probability	Unusual but possible
Reversibility	Reversible with human intervention
Magnitude	Low
Duration	Medium term
Significance Rating	Sites have a medium significance on a region level – viewed as NHRA Grade III sites.
Mitigation measures	All of these sites should be avoided as far as possible. Mitigation should take the form of isolating known sites and declare them as no-go zones with sufficient large buffer zones around them for protection. In exceptional cases mitigation can be implemented after required procedures have been followed.

Environmental Parameter	**Colonial Period - cemeteries**
Issue/Impact/Environmental Effect/Nature	The various features are subject to damage. Easier to identify and therefore easier to avoid. Variety of interconnected elements makes up the whole. Impact on part therefore implies an impact on the whole
Extent	Local
Probability	Unusual but possible
Reversibility	Reversible with human intervention
Magnitude	Moderate
Duration	Medium term

Significance Rating	Sites have a medium significance on a region level – viewed as NHRA Grade III sites.
Mitigation measures	All of these sites should be avoided as far as possible. Mitigation should take the form of isolating known sites and declare them as no-go zones with sufficient large buffer zones around them for protection. In exceptional cases mitigation can be implemented after required procedures have been followed.

Environmental Parameter	**Colonial Period – industrial heritage**
Issue/Impact/Environmental Effect/Nature	Different features are subject to damage. Some might be unique – no alternatives or second examples. Easy to identify and therefore easy to avoid
Extent	Site
Probability	Unusual but possible
Reversibility	Reversible with human intervention
Magnitude	Marginal loss of resources
Duration	Medium term
Significance Rating	Sites have a medium significance on a region level – viewed as NHRA Grade III sites.
Mitigation measures	All of these sites should be avoided as far as possible. Mitigation should take the form of isolating known sites and declare them as no-go zones with sufficient large buffer zones around them for protection. In exceptional cases mitigation can be implemented after required procedures have been followed, but only as last case scenario.

Significance assessments for the three alternative routes are presented in the table below – see Appendix 3 for the methodology used.

At present there are no grounds, based on heritage resources, for deciding between the alternative routes. From this it is deduced that all three of the alternative routes would be equally suitable for development of the power line.

Potential Heritage Impacts and Mitigations

Scoring Without Mitigation = **(NM)**
Scoring With Mitigation = **(WM)**
Analysis of the Significance of Potential Heritage Impacts (Kronos to Aries – for all three route corridors)

Environmental Parameter	Nature of Impact	Magnitude	Reversibility	Extent	Duration	Probability of occurrence	Ranking	Significance	
								Without Mitigation	With Mitigation
Pre Colonial Stone Age Sites	Many sites are still unknown. Their potential and significance therefore unknown. The impact will be the physical disturbance of the material and its context. Impact will be focused on a particular node, i.e. tower positions or access/ inspection roads	3 2	3 3	2 2	5 5	3 3	39 36	High	High
Colonial Period - farmsteads	The various features are subject to damage. Easier to identify and therefore easier to avoid. Variety of interconnected elements makes up the whole. Impact on part therefore implies an impact on the whole	3 3	3 3	2 2	3 3	2 2	22 22	Moderate	Moderate
Colonial Period - cemeteries	The various features are subject to damage. Easier to identify and therefore easier to avoid. Variety of interconnected elements makes up the whole. Impact on part therefore implies an impact on the whole	2 2	3 3	3 3	3 3	2 2	22 22	Moderate	Moderate

7. RECOMMENDED MANAGEMENT MEASURES

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the proposed development can be excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, whence they can be avoided or cared for in the future.

7.1 **Objectives**

- Protection of archaeological, historical and any other site or land considered being of cultural value within the project boundary against vandalism, destruction and theft.
- The preservation and appropriate management of new discoveries in accordance with the NHRA, should these be discovered during construction activities.

The following shall apply:

- Known sites should be clearly marked in order that they can be avoided during construction activities.
- The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;
- All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken;
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).

7.2 **Control**

In order to achieve this, the following should be in place:

- A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage sites and should be held accountable for any damage.
- Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above.
- In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.

8. CONCLUSIONS

The aim of the survey was to evaluate potential heritage resources that would occur within the boundaries of a proposed electricity transmission corridor and to determine if there are any

fatal flaws that would prevent the proposed development from taking place in any of the three corridors where it is proposed to develop the electricity transmission line.

The cultural landscape qualities of the region essentially consist of a two components. The first is a rural area in which the human occupation is made up of a pre-colonial (Stone Age) occupation and a much later colonial (farmer) component. This rural landscape has always been sparsely populated. The second component is an urban one consisting of a number of smaller towns, most of which developed during the last 150 years or less and much later industrial (mining) activities.

The following heritage sites were identified in the larger region:

- Pre-colonial archaeological sites dating to the Stone Age have been identified to occur in the region of study area. In most known cases the impact of the development would only be indirect, e.g. the power line crossing some distance from the site, thereby having only a visual impact. However, when more detailed information is available, e.g. the exact position of the different towers and access/inspection roads, which will give rise to physical disturbance of the material and its context, it might be determined that specific development aspects might have a direct disturbance, which would result in irreplaceable loss of heritage resources.

- Colonial period or historic period heritage manifest in a wide variety – farmsteads, infrastructure and cemeteries. As the power line is to cross a rural landscape for the most part, the impact would only be indirect, e.g. the power line crossing some distance from the site, thereby having only a visual impact. However, when more detailed information is available, e.g. the exact position of the different towers and access/inspection roads, which will give rise to physical disturbance of the material and its context, it might be determined that specific development aspects might have a direct disturbance, which would result in irreplaceable loss of heritage resources.

As an initial evaluation of the three route alternatives, it can be concluded that the impact of the proposed development on sites, features or objects of cultural heritage would be low. The reason is that cultural heritage sites are distribute sparsely in the region. Secondly, power lines usually have less of an impact than for example mining developments.

It is our opinion that from a heritage point of view there are no fatal flaws that would prevent the proposed development from taking place in any of the corridors. However, having said that, it must be remembered that heritage sites are not only fixed features in the environment, occurring within specific spatial confines, but they are also finite in number. Avoiding of impacts on sites is therefore the preferred form of mitigation. In areas where a high density of sites occurs, if at all possible, exclusion zones where no development is to take place, should be set aside. If that is not possible, mitigation can only be achieved through archaeological investigation.

As the exact coordinates for the power line and the individual tower structures are not yet available, it is difficult to determine what the final impact of the proposed development would be. Therefore, for the project to continue, we propose the following:

- Mitigation should be based on avoiding of sites rather than anything else. In order to achieve this, a full “walk down” of the selected corridor must be done prior to construction taking place, to document all sites, features and objects, in order to propose adjustments to the routes and thereby to avoid as many impacts as possible.

- In addition, the management measures, as set out in Section 7 of this report should be implemented prior to construction taking place.

- No impact on heritage sites, features or objects can be allowed without a valid permit from SAHRA.

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9.3 **Maps and aerial photographs**

1: 50 000 Topocadastral maps
Google Earth

APPENDIX 1: CONVENTIONS USED TO ASSESS THE SIGNIFICANCE OF HERITAGE RESOURCES

Significance

According to the NHRA, Section 2(vi) the **significance** of heritage sites and artefacts is determined by it aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

Matrix used for assessing the significance of each identified site/feature

1. Historic value			
Is it important in the community, or pattern of history			
Does it have strong or special association with the life or work of a person, group or organisation of importance in history			
Does it have significance relating to the history of slavery			
2. Aesthetic value			
It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group			
3. Scientific value			
Does it have potential to yield information that will contribute to an understanding of natural or cultural heritage			
Is it important in demonstrating a high degree of creative or technical achievement at a particular period			
4. Social value			
Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons			
5. Rarity			
Does it possess uncommon, rare or endangered aspects of natural or cultural heritage			
6. Representivity			
Is it important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects			
Importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class			
Importance in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality.			
7. Sphere of Significance	High	Medium	Low
International			
National			
Provincial			
Regional			
Local			
Specific community			
8. Significance rating of feature			
1. Low			
2. Medium			
3. High			

APPENDIX 2. RELEVANT LEGISLATION

All archaeological and palaeontological sites, and meteorites are protected by the National Heritage Resources Act (Act no 25 of 1999) as stated in Section 35:

(1) Subject to the provisions of section 8, the protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority: Provided that the protection of any wreck in the territorial waters and the maritime cultural zone shall be the responsibility of SAHRA.

(2) Subject to the provisions of subsection (8)(a), all archaeological objects, palaeontological material and meteorites are the property of the State. The responsible heritage authority must, on behalf of the State, at its discretion ensure that such objects are lodged with a museum or other public institution that has a collection policy acceptable to the heritage resources authority and may in so doing establish such terms and conditions as it sees fit for the conservation of such objects.

(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.

(4) No person may, without a permit issued by the responsible heritage resources authority-

(a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;

(b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;

(c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or

(d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

In terms of cemeteries and graves the following (Section 36):

(1) Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.

(2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.

(3) No person may, without a permit issued by SAHRA or a provincial heritage resources authority-

(a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

(b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or

(c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

(4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.

APPENDIX 3. METHODOLOGY FOR THE ASSESSMENT OF POTENTIAL IMPACTS

All impacts identified during Scoping and EIA stages of the study will be classified in terms of their significance. The broad significance categories are as follows:

- The **Nature** of the impact: This will describe the cause and the effect, what will be affected and how it will be affected.

- **Mitigation level:** The degree at which the impact can be mitigated.

- The **Extent** of the impact: This will be categorised as local, regional or national.

- The **Magnitude** of the impact: This will be quantified as:
    - Low: Will cause a low impact on the environment;
    - Moderate: Will result in the process continuing but in a controllable manner;
    - High: Will alter processes to the extent that they temporarily cease; and
    - Very High: Will result in complete destruction and permanent cessation of processes.

- The **Probability:** which shall describe the likelihood of impact occurring and will be rated as follows:
    - Extremely remote: Which indicates that the impact will probably not happen;
    - Can Occur: there is a possibility of occurrence;
    - Unusual but Possible: Distinct possibility of occurrence;
    - Almost Certain: Most likely to occur; and
    - Certain/ Inevitable: Impact will occur despite any preventative measures put in place.

- **The duration (Exposure)**: wherein it will be indicated whether:

    - The impact will be of a immediate;
    - The impact will be of a short tem (between 0-5 years);
    - The impact will be of medium term (between 5-15 years);
    - The impact will be long term (15 and more years); and
    - The impact will be permanent.

- **Reversibility/ Replaceability:** The degree at which the impact can be **reversible or the lost resource can be replaced.**

To determine the significance ranking, the following ranking (or similar) will be applied to each impact identified:

The Significance of the impact is calculated as follows:

Significance= **Consequence** (Magnitude+ Duration+ Extent + Reversibility) **X Probability**

Table 1: Significance ranking (Savahanna Environmental, 2008)

RANKING	MAGNITUDE	REVERSIBILITY	EXTENT	DURATION	PROBABILITY
5	Very high/ don't know	Irreversible	International	Permanent	Certain/inevitable
4	High		National	Long term (impact	Almost certain

				ceases after operational life of asset)	
3	Moderate	Reversibility with human intervention	Provincial	Medium term	Can occur
2	Low		Local	Short term	Unusual but possible
1	Minor	Completely reversible	Site bound	Immediate	Extremely remote
0	None		None		None

RANKING	100-65	64-36	35-16	15-5	4-1
SIGNIFICANCE	Very High	High	Moderate	Low	Minor

APPENDIX 4. SPECIALIST COMPETENCY

Johan (Johnny) van Schalkwyk

J A van Schalkwyk, D Litt et Phil, heritage consultant, has been working in the field of heritage management for more than 30 years. Based at the National Museum of Cultural History, Pretoria, he has actively done research in the fields of anthropology, archaeology, museology, tourism and impact assessment. This work was done in Limpopo Province, Gauteng, Mpumalanga, North West Province, Eastern Cape, Northern Cape, Botswana, Zimbabwe, Malawi, Lesotho and Swaziland. Based on this work, he has curated various exhibitions at different museums and has published more than 60 papers, many in scientifically accredited journals. During this period he has done more than 2000 impact assessments (archaeological, anthropological, historical and social) for various government departments and developers. Projects include environmental management frameworks, road-, pipeline-, and power line developments, dams, mining, water purification works, historical landscapes, refuse dumps and urban developments.

Maria Magdalena van der Ryst

M M van der Ryst, PhD, is a Senior Lecturer Archaeology Division, Department of Anthropology and Archaeology, College of Human Sciences, University of South Africa, where she has been working since 1988. Her field of interest is the Stone Age and both her MA and PhD studies dealt with different aspects of this phase of the southern African past. In this regard, she has published nearly 20 papers in internationally accredited journals and chapters in books. She also has extensive experience in Iron Age archaeology as well as the recent historic past. During the last 10 years she has done 50 impact assessments on projects in different parts of the country and well is neighbours states.