A PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) FOR THE PROPOSED EXTENSION OF THE EXISTING KOMSBERG SUBSTATION (TWO ALTERNATIVE AREAS) AND WIDENING OF THE ACCESS ROAD, NEAR SUTHERLAND, NORTHERN CAPE PROVINCE.

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NOTE: The phase 1 archaeological impact assessment was conducted as a requirement of the National Heritage Resources Act 25 of 1999, Section 38 (1)(c)(i):

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as –
(a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
(c) any development or other activity which will change the character of the site –
(i) exceeding 5000 m^2 in extent

This report follows the minimum standard guidelines required by the South African Heritage Resources Agency (SAHRA) for compiling a Phase 1 Archaeological Impact Assessment (AIA).

1. EXECUTIVE SUMMARY

1.1. Purpose of the Study

The purpose of the study was to conduct a phase 1 archaeological impact assessment (AIA) for the proposed extension of the existing Komsberg Substation (two alternative areas) and widening of the access road to the substation, near Sutherland, Northern Cape Province. The survey was conducted to establish the range and importance of the exposed and *in situ* archaeological heritage material remains, sites and features; to establish the potential impact of the development; and to make recommendations to minimize possible damage to the archaeological heritage.

1.2. Brief Summary of Findings

No archaeological heritage remains were observed within the area proposed for the extension of the existing Komsberg Substation. Archaeological visibility was relatively good over the proposed extension area.

1.3. Recommendations

The overall area is considered as having a low archaeological significance, therefore, the development may proceed as planned. As no archaeological heritage remains were observed within both the site alternatives (Alternative 1 and Alternative 2) nor within the vicinity for the widening of the access road during the survey there is no preferential alternative site. The developer may continue development on the Preferred Site

(Alternative 2). The following recommendations must be considered before development continues:

1. If the current layout is changed, an archaeological walk-through survey of the changes must be conducted and further mitigatory recommendations may be made if necessary.
2. If concentrations of historical and pre-colonial archaeological heritage material and/or human remains (including graves and burials) are uncovered during construction, all work must cease immediately and be reported to the South African Heritage Resources Agency (SAHRA) and/or the MacGregor Museum, Kimberly, so that systematic and professional investigation/excavation can be undertaken. Phase 2 mitigation in the form of test-pitting/sampling or systematic excavations and collections of the pre-colonial shell middens and associated artefacts will then be conducted to establish the contextual status of the sites and possibly remove the archaeological deposit before development activities continue.
3. A person must be trained as a site monitor to report any archaeological sites found during the development. Construction managers/foremen and/or the Environmental Control Officer (ECO) should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.

1.4. Declaration of Independence and Qualifications

This section confirms a declaration of independence that archaeological heritage specialist, Ms Celeste Booth, has no financial or any other personal interests in the project for the extension of the existing Komsberg Substation. Ms Celeste Booth was appointed on a strictly professional basis to conduct a Phase 1 Archaeological Impact Assessment in line with the South African national heritage legislation, the National Heritage Resources Act 25 of 1999 (NHRA 25 of 1999) and in response to the recommendations provided by the Department of Environmental Affairs and Tourism and according to the environmental impact assessment regulations.

Ms Celeste Booth (BSc Honours: Archaeology) is an archaeologist who has had almost eight years (October 2015) of full time Cultural Resource Management in the Eastern Cape and sections of the Northern Cape and Western Cape. Ms Booth has conducted several Archaeological Desktop Studies and Phase 1 Archaeological Impact Assessments within the Eastern Cape and in the Karoo region across the Eastern Cape, Northern Cape and Western Cape.

2. BACKGROUND INFORMATION

The proposed development will entail expanding the existing Komsberg Substation. The expansion area (approximately 19.8ha), will fit within the Eskom property and is located next to and between the positions of the existing capacitor banks installation. The existing capacitor banks will form part of the expanded substation footprint. The total footprint of

the expanded Komsberg MTS including both alternatives is likely to be 440m x 450m, all on Eskom property.

Two alternative sites have been proposed for the extension of the substation. Alternative one (orange outline, Figures 3-5) is located immediately to the east within the footprint (fence line) of the existing substation and extends east to cover an area of approximately 19.8 ha. Alternative two (blue outline, Figures 3-5) is located within the existing substation footprint between the positions of the existing capacitor banks installation. The existing capacitor banks will form part of the expanded substation footprint. Alternative 2 is the developer's Preferred Site for the extension of the substation.

Two alternative sites have been proposed for the extension of the substation. Alternative one (orange outline, Figures 3-5) is located immediately to the east within the footprint (fence line) of the existing substation and extends east to cover an area of approximately 19.8 ha. Alternative two (blue outline, Figures 3-5) is located within the existing substation footprint between the positions of the existing capacitor banks installation. The existing capacitor banks will form part of the expanded substation footprint.

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2.3. Terms of reference

The purpose of the study was to conduct a phase 1 archaeological impact assessment (AIA) for the proposed extension of the existing Komsberg Substation, near Sutherland, Northern Cape Province. The Terms of Reference (ToR) are as follows:

- Conduct a literature review of known archaeological resources within the area with a view to determining which of these resources are likely to occur within the development footprint;
- Indicate the methodology used in determining the significance of potential archaeological impacts;

- Describe all archaeological heritage issues that were identified during the environmental impact assessment process;
- Assess the significance of direct, indirect and cumulative impacts;
- Describe and make a comparative assessment of all alternatives identified during the archaeological impact assessment process;
- Make recommendations regarding practical mitigation measures for potentially significant impacts, for inclusion in the *Environmental Management Programme (EMP)*;
- Indicate to what extent to which the issue could be addressed by the adoption of mitigation measures;
- Describe any assumptions, uncertainties and gaps in knowledge; and
- An environmental impact statement.

3. HERITAGE LEGISLATIVE REQUIREMENTS

Parts of sections 3(1)(2)(3), 34(1), 35(4), 36(3) and 38(1)(8) of the National Heritage Resources Act 25 of 1999 apply:

S3. National estate

3. (1) For the purposes of this Act, those heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of heritage resources authorities.
3. (2) Without limiting the generality of subsection (1), the national estate may include –
(a) places, buildings, structures and equipment of cultural significance;
(b) places to which oral traditions are attached or which are associated with living heritage;
(c) historical settlements and townscapes;
(d) landscapes and natural features of cultural significance;
(e) geological sites of scientific or cultural importance;
(f) archaeological and palaeontological sites;
(g) graves and burial grounds, including –
(i) ancestral graves;
(ii) royal graves and graves of traditional leaders;
(iii) graves and victims of conflict;
(iv) graves of individuals designated by the Minister by notice in the Gazette;
(v) historical graves and cemeteries; and
(vi) other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983);
(h) sites of significance relating to the history of slavery in South Africa;
(i) movable objects, including –
(i) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological specimens;
(ii) objects to which oral traditions are attached or which are associated with

living heritage;
(iii) ethnographic art and objects;
(iv) military objects;
(v) objects of decorative or fine art;
(vi) objects of scientific or technological interest; and
(vii) 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 (Act No. 43 of 1996).

3. (3) Without limiting the generality of subsections (1) and (2), a place or object is to be considered part of the national estate if it has cultural significance or other special value because of –
(a) its importance in the community, or pattern of South Africa's history;
(b) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage;
(c) its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
(d) its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
(e) its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
(f) its importance in demonstrating a high degree of creative or technical achievement at a particular period;
(g) 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
(i) sites of significance relating to the history of slavery in South Africa.

S34. Structures

34. (1) No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

S35. Archaeology, palaeontology and meteorites

35 (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;
(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.

S36. Burial grounds and graves

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

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

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

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

S38. Heritage resources management

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as –

(a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;

(b) the construction of a bridge or similar structure exceeding 50 m in length;

(c) any development or other activity which will change the character of the site –

(i) exceeding 5 000 m^2 in extent, or

(ii) involving three or more erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA, or a provincial resources authority;

(d) the re-zoning of a site exceeding 10 000 m^2 in extent; or

(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must as the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

4. ARCHAEOLOGICAL BACKGROUND

No systematic archaeological research has been conducted within this region of the Northern Cape, therefore little is known about the archaeology of the immediate area proposed for the extension of the existing Komsberg Substation and widening of the access the road. However, heritage impact assessments have been conducted to south of Sutherland (Hart 2005; Hart *et al.* 2010; Hart & Kendrick 2014; Hart & Webley 2013;

Rossouw 2007) and within the Witteberg region near to Matjiesfontein (Hart, 2007; Hart and Miller nd), and a mitigation phase excavation (Evans *et al.* 1985) has been undertaken at two small rock shelters in the grounds of the South African Astronomical Observatory near Sutherland during November 1983 and March 1984. The wider Karoo landscape has been occupied by humans since the Early Stone Age (ESA), spanning an occupation period of about 1.5 million years. Archaeological evidence is usually observed as surface scatters and is widely dispersed across the landscape. Caves are uncommon in the Karoo and open sites (Early Stone Age to the last 2 000 years) generally consist of single-level occupations near sources of water such as rivers, streams and springs. Rock engravings are widespread over the Karoo landscape, substantial research has been conducted within the Northern and Western Cape areas of the Karoo (Parkington *et al.* 2008). Early travellers and *trekboere* (Dutch farmers) started entering this part of the Northern Cape towards the end of the 18th century and colonial settlement increased towards the second half of the 19th century.

The following sections describe the possible archaeological encounters that may be expected within the proposed area for development and includes topics such as the Early Stone Age (ESA) and the Middle Stone Age (MSA), the Later Stone Age (LSA) and pastoralism within the last 2000 years, rock art (paintings and engravings), human remains, and the historical period.

4.1. Early Stone Age (ESA) - 1.5 million to 250 000 years ago

The Early Stone Age from between 1.5 million and 250 000 years ago refers to the earliest that *Homo sapiens sapiens* predecessors began making stone tools. The earliest stone tool industry was referred to as the Olduwan Industry originating from stone artefacts recorded at Olduvai Gorge, Tanzania. The Acheulian Industry, the predominant southern African Early Stone Age Industry, replaced the Olduwan Industry approximately 1.5 million years ago, is attested to in diverse environments and over wide geographical areas. The hallmark of the Acheulian Industry is its large cutting tools (LCTs or bifaces), primarily handaxes and cleavers. Bifaces emerged in East Africa more than 1.5 million years ago (mya) but have been reported from a wide range of areas, from South Africa to northern Europe and from India to the Iberian coast. The end products were similar across the geographical and chronological distribution of the Acheulian techno-complex: large flakes that were suitable in size and morphology for the production of handaxes and cleavers perfectly suited to the available raw materials (Sharon 2009).

The most well know Early Stone Age Acheulean site in southern Africa is Amanzi Springs, situated about 10km north-east of Uitenhage, near Port Elizabeth (Deacon 1970). In a series of spring deposits a large number of stone tools were found *in situ* to a depth of 3-4m. Wood and seed material preserved remarkably very well within the spring deposits, and possibly date to between 800 000 to 250 000 years old. Other Early Stone Age sites that contained preserved bone and plant material include Wonderwerk Cave in the Northern Province, near Kimberly (Binneman & Beaumont 1992) and Montagu Cave in the

Western Cape, near the small town of Montagu (Mitchell 2007). Early Stone Age sites have also been reported in the foothills of the Sneeuberge Mountains (in Prins 2011). A few Early Stone Age handaxes were also reported from the site near Victoria West (Binneman *et al.* 2011a).

A few surface scatters of Early Stone Age stone artefacts had been documented on the site to the west of Matjiesfontein (Hart & Miller, nd) and to the site south of Sutherland (Hart *et al*. 2010).

4.2. Middle Stone Age (MSA) – 250 000 – 30 000 years ago

The Middle Stone Age spans a period from 250 000 - 30 000 years ago and focuses on the emergence of modern humans through the change in technology, behaviour, physical appearance, art and symbolism. Various stone artefact industries occur during this time period, although less is known about the time prior to 120 000 years ago, extensive systemic archaeological research is being conducted on sites across southern Africa dating within the last 120 000 years (Thompson & Marean 2008). The large handaxes and cleavers were replaced by smaller stone artefacts called the Middle Stone Age flake and blade industries. Surface scatters of these flake and blade industries occur widespread across southern Africa although rarely with any associated botanical and fauna remains. It is also common for these stone artefacts to be found between the surface and approximately 50-80cm below ground. Fossil bone may in rare cases be associated with Middle Stone Age occurrences (Gess 1969). These stone artefacts, like the Earlier Stone Age handaxes are usually observed in secondary context with no other associated archaeological material.

From as early as 1915, stone artefacts which were of a "peculiar character", referred to as hand-axes and tortoise-cores by Reginald A. Smith, were plentiful within the Victoria West district. The latter were only found in certain areas and the hand-axes occurred in conjunction with the cores or without them (Smith 1919). During the 1920's, A.H.J. Goodwin (1926, 1946), identified the Victoria West stone artefact industry, presumably referring to those artefacts with a "peculiar character" found within the district, the wider Karoo region, as well as along the Vaal River. They comprised mainly of stone tools that had been manufactured using a prepared core technique, and were regarded as being transitional between the Early Stone Age and Middle Stone Age. Recent research has established that the Victoria West cores were the "evolutionary step" towards the Levallois prepared core industry, indicating an outward spread of this technological change (Lycett 2009).

The Middle Stone Age is distinguished from the Early Stone Age by the smaller-sized and distinctly different stone artefacts and *chaîne opératoire* (method) used in manufacture, the introduction of other types of artefacts and evidence of symbolic behaviour. The prepared core technique was used for the manufacture of the stone artefacts which display a characteristic facetted striking platform and includes mainly unifacial and bifacial flake

blades and points. The Howiesons Poort Industry (80 000 - 55 000 years ago) is distinguished from the other Middle Stone Age stone artefacts: the size of tools are generally smaller, the range of raw materials include finer-grained rocks such as silcrete, chalcedony, quartz and hornfels, and include segments, backed blades and trapezoids in the stone toolkit which were sometimes hafted (set or glued) onto handles. In addition to stone artefacts, bone was worked into points, possibly hafted, and used as tools for hunting (Deacon & Deacon 1999).

Other types of artefacts that have been encountered in archaeological excavations include tick shell (*Nassarius kraussianus*) beads, the rim pieces of ostrich eggshell (OES) water flasks, ochre-stained pieces of ostrich eggshell and engraved and scratched ochre pieces, as well as the collection of materials for purely aesthetic reasons. Although Middle Stone Age artefacts occur throughout the Eastern Cape, the most well-known Middle Stone Age sites include the type-site for the Howiesons Poort stone tool industry, Howiesons Poort (HP) rock shelter, situated close to Grahamstown and Klasies River Mouth Cave (KRM), situated along the Tsitsikamma coast. Middle Stone Age sites are located both at the coast and in the interior across southern Africa.

Surface scatters of Middle Stone Age stone artefacts are widely distributed across the Karoo landscape and have been reported from the site to the west of Matjiesfontein (Hart & Miller nd) and at the site to the south of Sutherland (Hart *et al.* 2010).

4.3. Later Stone Age (LSA) – 30 000 years ago – recent (100 years ago)

The Later Stone Age (LSA) spans the period from about 30 000 years ago until the colonial era, although some communities continue making stone tools today. The period between 30 000 and 20 000 years ago is referred to as the transition from the Middle Stone Age to Later Stone Age; although there is a lack of crucial sites and evidence that represent this change. By the time of the Later Stone Age the genus *Homo*, in southern Africa, had developed into *Homo sapiens sapiens*, and in Europe, had already replaced *Homo Neanderthalensis*.

The Later Stone Age is marked by a series of technological innovations, new tools and artefacts, the development of economic, political and social systems, and core symbolic beliefs and rituals. The stone toolkits changed over time according to time-specific needs and raw material availability, from smaller microlithic Robberg (20/18 000-14 000ya), Wilton (8 000-the last 500 years) Industries and in between, the larger Albany/Oakhurst (14 000-8 000ya) and the Kabeljous (4 500-the last 500 years) Industries. Bored stones used as part of digging sticks, grooved stones for sharpening and grinding and stone tools fixed to handles with mastic also become more common. Fishing equipment such as hooks, gorges and sinkers also appear within archaeological excavations. Polished bone tools such as eyed needles, awls, linkshafts and arrowheads also become a more common occurrence. Most importantly bows and arrows revolutionized the hunting economy. It was only within the last 2000 years that earthenware pottery was introduced, before then

tortoiseshell bowls were used for cooking and ostrich eggshell (OES) flasks were used for storing water. Decorative items like ostrich eggshell and marine/fresh water shell beads and pendants were made.

Hunting and gathering made up the economic way of life of these communities; therefore, they are normally referred to as hunter-gatherers. Hunter-gatherers hunted both small and large game and gathered edible plantfoods from the veld. For those that lived at or close the coast, marine shellfish and seals and other edible marine resources were available for the gathering. The political system was mainly egalitarian, and socially, hunter-gatherers lived in bands of up to twenty people during the scarce resource availability dispersal seasons and aggregated according to kinship relations during the abundant resource availability seasons. Symbolic beliefs and rituals are evidenced by the deliberate burial of the dead and in the rock art paintings and engravings scattered across the southern African landscape.

Later Stone Age sites occur both at the coast (caves, rock shelters, open sites and shell middens) and in the interior (caves, rock shelters and open sites) across southern Africa. The majority of archaeological sites found in the area would date from the past 10 000 years where San hunter-gatherers inhabited the landscape living in rock shelters and caves as well as on the open landscape. These latter sites are difficult to find because they are in the open veld and often covered by vegetation and sand. Sometimes these sites are only represented by a few stone tools and fragments of bone. The preservation of these sites is poor and it is not always possible to date them (Deacon and Deacon 1999). Caves and rock shelters, however, in most cases, provide a more substantial preservation record of pre-colonial human occupation.

The Later Stone Age archaeology of the Great Karoo stretching across the Eastern Cape, and Western Cape and Northern Cape is rich and varied. Various studies (Beaumont & Morris 1990, Beaumont & Vogel 1984, Morris & Beaumont 1990), have shown that the general area surrounding the proposed area for the development has been relatively marginal regarding pre-colonial human settlement, but is in fact exceptionally rich in archaeological sites and rock art (paintings and engravings [to be discussed in the following section]). Garth Sampson has conducted thirty years of extensive research within the Seacow River Valley and provides valuable insight on the distribution of both Later Stone Age and pastoralist/herder sites across the landscape. Unfortunately no such similar studies have yet been conducted within the area. Sampson has produced innumerable publications on the area (Sampson 1985) including further studies on Later Stone Age artefacts (Close & Sampson 1998, 1999) and in-depth analysis on the ceramics assemblages (Sampson 1988; Sampson et al. 1989 1997; Sampson & Vogel 1996), to name a few.

Substantial Later Stone Age research has been conducted in the surrounding Northern Cape region in the Richtersveld within the Orange River Valley, to the north near around the Carnarvon area, Bushmanland and the areas surrounding Kimberly, as well to the

south of the proposed area for development in the Klein Karoo at site called Boomplaas near Oudtshoorn. The research conducted provides considerable evidence of Later Stone Age occupation within the wider region of the proposed area for development. Scatters of Later Stone Age stone artefacts were documented at the site to the south-west of Matjiesfontein (Hart & Miller nd) and at the site to the south of Sutherland (Hart et al. 2010). The rescue excavations conducted at the two Observatory Shelters near Sutherland yielded a collection of Later Stone Age stone artefacts made predominantly on ironstone raw materials as well as shale, chert, hornfels, chalcedony, quartz, and quartzite. The stone artefact collection comprised a variety of lithic varients including cores, utilized flakes, blades and chunks, as well as formal tools such as scrapers, adzes, backed blades, points and miscellaneous retouched pieces. In addition, fragments of ostrich eggshell (OES) and ostrich eggshell beads, faunal remains and fresh water molluscs were documented (Evans *et al*. 1985).

4.4. Last 2 000 years – Khoekhoen Pastoralism

Until 2 000 years ago, hunter-gatherer communities traded, exchanged goods, encountered and interacted with other hunter-gatherer communities. From about 2 000 years ago the social dynamics of the southern African landscape started changing with the immigration of two 'other' groups of people, different in physique, political, economic and social systems, beliefs and rituals. Relevant to the study area, one of these groups, the Khoekhoe pastoralists or herders entered southern Africa with domestic animals, namely fat-tailed sheep and goats, travelling through the south towards the coast. They also introduced thin-walled pottery common in the interior and along the coastal regions of southern Africa. Their economic systems were directed by the accumulation of wealth in domestic stock numbers and their political make-up was more hierarchical than that of the hunter-gatherers.

There are two main suggestions on the migration routes of the Khoekhoen pastoralists into South Africa within the last 2000 years that have been based on linguistic comparisons and archaeological evidence. The first route, based on rock art and oral traditions suggest that the pastoralists groups entered from Namibia moved down the west coast into the south-western Cape and then spread to the east along the southern Cape coast (Stow 1905; Cooke 1965). The second route, based on linguistic evidence, suggests that the pastoralist groups entered from Botswana with one branching to the west along the Orange River to the Atlantic west coast and groups branching down the central plateau, through the Karoo (via the Seacow River Valley), down the escarpment into the Eastern Cape (Elphick 1977; 1985). Extensive pastoralist research has yielded evidence from sites along the suggested routes within the Northern Cape, Karoo, Orange River Valley, along the Namaqualand and west coast and into the southern and south-eastern Cape.

Circular dry stone piled wall enclosures up to half a metre high and 3-4 m and 9 m in diameter situated on the leeward slopes of low ridges were documented on the site south of Sutherland (Hart *et al*. 2010). These enclosures were arranged in complexes of up to

13 interlocking enclosures with adjoining 'lammerkraals' (lamb pens). Archaeological remains associated with these enclosures included fine thin red burnished pottery and ostrich eggshell fragments (OES). In addition, open Khoekhoen encampments situated among the *Kameeldoring* trees along dry river beds in the bottom of valleys were documented on the site south of Sutherland. These encampments are rare and have only been recorded in the Richtersveld area (Hart *et al*. 2010). These sites are relative extensive, approximately 80 -80m in diameter. The archaeological material remains associated with these encampments included very fine thin wall burnished Cape coastal pottery, numerous informal stone artefacts, stone features, grinding surfaces, discreet ash middens, animal bone, and a number of graves that have broken grinding stones placed on top. Nineteenth century glass and ceramics were documented at two of the sites. A few small plain body sherds of fine-grained pottery, about 5mm thick, and probably from the same pot, were documented on a talus slope of one of the two Observatory Shelters near Sutherland (Evans *et al*. 1985).

4.5. Human Remains

It is difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface. Human remains are usually observed when they are exposed through erosion or construction activities for development. Several human remains have been rescued eroding out of the dunes along this coastline. In some instances packed stones or rocks may indicate the presence of informal pre-colonial burials. Cultural Resource Management practitioners whilst conducting archaeological heritage impact assessments have also recorded formal historical cemeteries and informal burials.

4.6. Rock Art (Paintings and Engravings)

Rock art is generally associated with the Later Stone Age period mostly dating from the last 5000 years to the historical period. It is difficult to accurately date the rock art without destructive practices. The southern African landscape is exceptionally rich in the distribution of rock art which is determined between paintings and engravings. Rock paintings occur on the walls of caves and rock shelters across southern Africa. Rock engravings, however, are generally distributed on the semi-arid central plateau, with most of the engravings found in the Orange-Vaal basin, the Karoo stretching from the Eastern Cape (Cradock area) into the Northern Cape as well as the Western Cape, and Namibia. At some sites both paintings and engravings occur in close proximity to one another especially in the Karoo and Northern Cape. The greatest concentrations of engravings occur on the andesite basement rocks and the intrusive Karoo dolerites, but sites are also found on about nine other rock types including dolomite, granite, gneiss, and in a few cases on sandstone (Morris 1988). Substantial research has also been conducted in the Western Cape Karoo area around Beaufort West (Parkington 2008), in the northern parts of the Northern Cape between Springbok, Calvinia, Carnarvon, Kimberly, Kuruman, Pomfret and Upington as the outline of the area.

It is possible that rock shelters and caves containing rock painting images and rock engravings on boulders and flat bedrock may be encountered within the proposed area for development.

4.7. Historical Background

Historical archaeology refers to the last 500 years when European settlers and colonialism entered into southern Africa. In the early days of colonialism the Karoo was still a sparse and unknown area. It was only until the early travellers and pioneer Dutch *trekboere* (trek farmers or migrant farmers) ventured into this harsh landscape and documented their encounters with the San hunter-gatherers and Khoekhoen who had originally inhabited the landscape. Various trade goods exchanged between these pioneering Europeans, the San hunter-gatherers, and Khoenkhoen have been recorded in travellers' diaries, historical documents and archaeological excavations within the wider region of the proposed area for development. These include glass beads that documentary evidence suggests were first given to the local Bushmen in the upper Seacow Valley during the Sneeuberg War (c. AD 1770-1795) and later by travellers, missionaries, and resident farmers (Saitowitz & Sampson 1992). This may be a similar situation at Highlands Rock Shelter (Deacon 1976). In addition, rare instances of ammunition and firearm paraphernalia have been excavated from sites in the upper Seacow Valley. Historical records show that the first Dutch farmers transferred their firearms to the Bushmen as early as the 1770's.
Evidence of the remains of historical buildings, stone cairns and features, as well as European ceramic ware has been recorded in one of the specialist studies. Stone packed foundations of a rectangular cottages and associated dumping (waste) area, as well as stone packed kraals positioned on the bottom half of slight-gradient *koppies* may be encountered during the survey. Broken and fragmented pieces of iron implements, glass bottles and European ceramic wares including stoneware, transfer print and willow pattern ceramic types are included. It is likely that these features may be associated with early farming activities where shepherds would have lived with their flocks and herds of domesticated stock (cattle, sheep, and goats).

It is likely that a variety of historical features and artefacts will be encountered within the proposed area for development owing to early farming activities, the region's historical settlements, movements and migrations through the area, as well as the remnants of the Anglo-Boer war.

5. DESCRIPTION OF THE PROPERTY

5.1. Location data

The area for the proposed extension of the Komsberg Substation is situated on Eskom-owned land on the Farm Standvastigheid 210. The site is located approximately 50 km south of Sutherland and 22 km north of Matjiesfontein within the Karoo Hoogland Local

Municipality, Namakwa District Municipality, Northern Cape Province, east of the R354 regional road that runs between Matjiesfontein in the Western Cape and Sutherland in the Northern Cape.

Two alternative sites have been proposed for the extension of the substation. Alternative one (orange outline, Figures 3-5) is located immediately to the east within the footprint (fence line) of the existing substation and extends east to cover an area of approximately 19.8 ha. Alternative two (blue outline, Figures 3-5) is located within the existing substation footprint between the positions of the existing capacitor banks installation. The existing capacitor banks will form part of the expanded substation footprint.

The proposed development site is situated on a relatively flat piece of land, however, the surrounding landscape is hilly and mountainous with the western section of the Klein Roggeveld Berge situated to the north. Several perennial rivers such as the Portugals, Komberg and Meintjiesplaas flow within the wider region. The vegetation cover falls within the Western Mountain Karoo ecogeographic subregion, comprising of the typical Karoo grasses and scrubland.

5.2. Maps

1:50 000 Maps: 3220 DC SWARTLAND

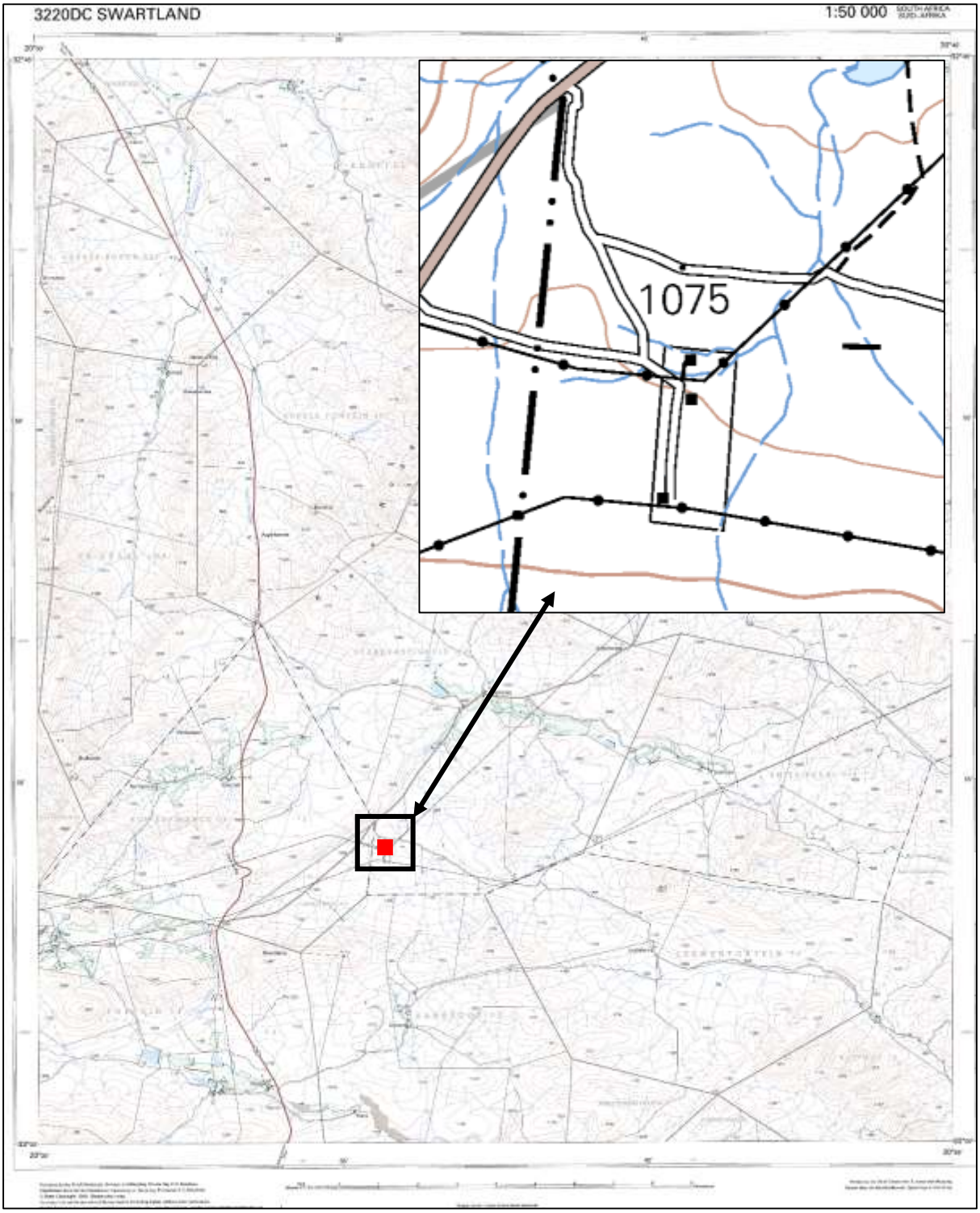

Figure 1. 1: 50 000 topographic map 3320 DC SWARTLAND showing the location of the proposed extension of the existing Komsberg Substation and widening of the access road.

Figure 2. Aerial view showing the location of the proposed extension of the existing Komsberg Substation and widening of the access road.

Figure 3. Aerial view showing the location of the proposed extension of the existing Komsberg Substation (two alternative areas) and widening of the access road situated on Eskom owned land on the farm Standvastigheid 210.

Figure 4. Close-up aerial view showing the location of the proposed extension of the existing Komsberg Substation (Alternative 1 and Alternative 2) and general GPS co-ordinates (KSS1 and KSS2).

6. ARCHAEOLOGICAL INVESTIGATION

6.1. Methodology

An archaeological desktop literature review was conducted and has been included within this report. Very little systematic archaeological research has been conducted within the immediate area of the proposed extension of the existing Komsberg Substation.

The archaeological investigation was conducted on foot by surveying proposed development site. Archaeological visibility was relatively good during the survey and if archaeological heritage sites, features and remains were present these would have been observed. The GPS co-ordinate readings and photographs were taken using a Garmin Oregon 550 unit.

6.2. Results of the Archaeological Investigation

The proposed area for the extension of the Komsberg Substation is covered in Karoo vegetation comprising shrubs and grasses. Overall, the archaeological visibility was relatively good except where dense clumps of Karoo vegetation occurred (Figures 6-9).

No heavily disturbed or eroded areas occurred within the Alternative 1 proposed development area. Only the area around the substation has been disturbed in the past with its construction and continued maintenance. Alternative 2 has been disturbed by the construction and associated activities with the establishment of the existing substation. The access gravel roads adjacent to existing substation proposed for the widening was investigated for the occurrence of possible archaeological remains, stone artefacts are often observed within the surface disturbed gravel roads.

No archaeological heritage remains were observed during the investigation. It is possible that stone artefacts may occur below the vegetation cover between the surface and 50 – 80 cm below the ground. However, it is unlikely that archaeological heritage sites, features and remains occur *in situ* or should be encountered during the proposed construction of the development.

Figure 5. View of the general landscape of the proposed area of the existing Komsberg Substation facing south west with the existing substation and power lines in the background.

Figure 6. View of the general landscape of the proposed area of the existing Komsberg Substation facing north west with the existing substation and power lines in the background.

Figure 7. View of the general landscape of the proposed area within the boundaries of the existing Komsberg Substation facing south west.

Figure 8. View of the general landscape of the proposed area within the boundaries of the existing Komsberg Substation facing west.

Figure 9. View of the access road to be widened facing west.

Figure 10. View of the access road to be widened facing east.

7. DESCRIPTION OF SITES

No archaeological or historical heritage sites, features or remains were observed within the proposed extension of the existing Komsberg Substation.

8. COORDINATES AND SITES FOR THE PROPOSED EXTENSION OF THE EXISTING KOMSBERG SUBSTATION FOR THE KARUSA WIND ENERGY FACILITY, NEAR SUTHERLAND, NORTHERN CAPE PROVINCE.

TABLE 1. COORDINATES AND SITES FOR THE PROPOSED EXTENSION OF THE EXISTING KOMSBERG SUBSTATION, NEAR SUTHERLAND, NORTHERN CAPE PROVINCE.

REFERENCE	DESCRIPTION	CO-ORDINATE	HERITAGE GRADING
KSS1	GPS Co-ordinate for Alternative 1 (Preferred)	32°56'01.50"S; 20°35'41.22"E	N/A
KSS2	GPS Co-ordinate for Alternative 2	32°56'02.40"S; 20°35'46.80"E	N/A

9. CONCLUSION AND SUMMARY OF THE TERMS OF REFERENCE

- Conduct a literature review of known archaeological resources within the area with a view to determining which of these resources are likely to occur within the development footprint:

A literature review of known archaeological resources within the area was conducted with a view to determining which of these resources are likely to occur within the development footprint. No systematic archaeological research has been conducted within this region of the Northern Cape, therefore little is known about the archaeology of the immediate area proposed for the extension of the existing Komsberg Substation. Therefore, heritage impact assessments conducted within the region and a mitigation phase excavation nearer to Sutherland assist in determine heritage resources that are likely to occur on the landscape.

- Indicate the methodology used in determining the significance of potential environmental (archaeological) impacts:

The methodology used in determining the significance of potential archaeological heritage impacts included the literature review of known archaeological resources, as mentioned above, and by conducting a survey of the area on foot to identify and documented archaeological and other heritage resources that occurred within the proposed development area. Archaeological visibility was relatively good during the survey and if archaeological heritage sites, features and remains were present these would have been observed. The GPS co-ordinate readings and photographs were taken using a Garmin

Oregon 550 unit. No heavily disturbed or eroded areas occurred within the proposed development area. Only the area around the substation has been disturbed in the past with its construction and continued maintenance. The access gravel roads adjacent to existing substation was investigated for the occurrence of possible archaeological remains, stone artefacts are often observed within the surface disturbed gravel roads.

The documented archaeological and other heritage resources would then establish the significance of the archaeological sensitivity of the area.

- Describe all environmental (archaeological heritage) issues that were identified during the archaeological impact assessment process:

No archaeological heritage remains were observed during the investigation. It is, however, possible that stone artefacts and possibly associated cultural material and informal burials may occur below the vegetation cover between the surface and 50 – 80 cm below the ground. However, it is unlikely that archaeological heritage sites, features and remains occur *in situ* or should be encountered during the proposed construction of the development.

The proposed area for development is considered as having a *low archaeological significance.*

- Assess the significance of direct, indirect and cumulative impacts:

The nature of the impact is the proposed construction of the extension of the existing Komsberg Substation. No archaeological and historical heritage remains or exposed informal burials were identified on the surface within the proposed development area, therefore, all impacts (direct, indirect and cumulative) will be low. The extent of the impact is expected to be local, limited to the immediate area / site of development. Although no archaeological heritage remains were identified within the proposed development area the impact is permanent especially if heritage resources are uncovered during the construction process. It is improbable that archaeological heritage remains will be uncovered during the construction process. If so, this would have a negative and irreversible impact on the subsurface archaeological heritage, which is currently unknown, and unlikely, as none were documented on the surface. If archaeological material is uncovered during the construction the finds can be appropriately mitigated for protection and conservation. The archaeological significance is considered to be low as no archaeological heritage material was identified during the investigation.

The proposed development could have negative implications on the archaeological heritage remains that are not visible at the surface within the proposed area during all phases of the development. The negative implications include the destruction of archaeological material culture occurrences that are not immediately visible. The recommendations must be considered as appropriate mitigation measures to protect and

conserve the archaeological heritage remains observed within the proposed development area and further archaeological remains that may occur and are not immediately visible on the surface.

- Describe and make a comparative assessment of all alternatives identified during the environmental (archaeological) impact assessment process:

Two alternative areas have been proposed for the extension of the existing Komsberg Substation, with Alternative 1 being the preferred area to extend the site. These areas are located immediately adjacent to each other within the land owned by Eskom. No archaeological or other heritage resources were identified during the investigation, therefore, no alternatives or no-go areas are necessary. The proposed development may proceed as planned.

- Make recommendations regarding practical mitigation measures for potentially significant impacts, for inclusion in the *Environmental Management Programme (EMP)*:

Standard recommendations have been made in the section below which suggest that if the current layout of the proposed development changes that an archaeological walkthrough be conducted to investigate any additional areas to the proposed development, provides the process to follow if concentrations of archaeological heritage remains including historical material and informal burials may be uncovered during the development process and suggests that the environmental control officer and the developer as well as the employees be well informed of the possible archaeological and other heritage resources that may be uncovered during the proposed development.

- Indicate to what extent to which the issue could be addressed by the adoption of mitigation measures:

No archaeological or other cultural heritage resources were identified during the investigation within the proposed development area, therefore, it is necessary that the mitigation measures (recommendations) be adopted as it is accordance with the National Heritage Resources Act (NHRA 25 of 1999) and the South African Heritage Resources Agency (SAHRA) guidelines for the protection and conservation of archaeological and other cultural heritage resources that may be uncovered during the proposed development.

In the event of such archaeological heritage being uncovered (such as during any phase of construction activities), archaeologists or the relevant heritage authority must be informed immediately so that they can investigate the importance of the sites and excavate or collect material before it is destroyed. The onus is on the developer to ensure that this agreement is honoured in accordance with the National Heritage Resources Act No. 25 of 1999 (NHRA 25 of 1999).

- Describe any assumptions, uncertainties and gaps in knowledge:

It must be emphasized that the conclusions and recommendations expressed in this phase 1 archaeological impact assessment (AIA) are based on the visibility of archaeological remains, features and, sites and may not reflect the true state of affairs. Archaeological remains, features and, sites may be covered by soil and vegetation and will only be located once this has been removed.

- An environmental (archaeological) impact statement:

No archaeological or other cultural heritage resources were identified during the investigation within the proposed development area, therefore, the area is considered as having a low archaeological significance. Development may proceed as planned, however, the mitigation measures (recommendations) must be included in the proposed development's Environmental Management Plan (EMP) to protect any archaeological sites, features and remains that may be uncovered during the proposed development.

Table 2. ASSESSMENT OF THE SIGNIFICANCE THE PROPOSED EXTENSION OF THE EXISTING KOMSBERG SUBSTATION AND WIDENING OF THE ACCESS ROAD: Archaeological and Historical Heritage Remains including Formal and Informal Burials

Nature: Archaeological and Historical Heritage Remains including Formal and Informal Burials		
	Without mitigation	**With mitigation**
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (4)	Low (4)
Probability	Highly Probable (2)	Probable (2)
Significance	Low (12)	Low (12)
Status (positive or negative)	Negative	Neutral unless archaeological heritage remains are uncovered during the construction which would then be Negative
Reversibility	None	Low
Irreplaceable loss of resources?	Low	Low
Can impacts be mitigated?	No	Yes
Mitigation: • If the current layout is changed, an archaeological walk-through survey of the changes must be conducted and further mitigatory recommendations may be made if necessary. • If concentrations of historical and pre-colonial archaeological heritage material and/or human remains (including graves and burials) are uncovered during construction, all work must cease immediately and be reported to the South African Heritage Resources Agency (SAHRA) so that systematic and professional investigation/excavation can be undertaken. Phase 2 mitigation in the form of test-pitting/sampling or systematic excavations and		

collections of the pre-colonial shell middens and associated artefacts will then be conducted to establish the contextual status of the sites and possibly remove the archaeological deposit before development activities continue. • A person must be trained as a site monitor to report any archaeological sites found during the development. Construction managers/foremen and/or the Environmental Control Officer (ECO) should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.
Cumulative impacts: • Irreplaceable loss of archaeological heritage resources.
Residual impacts: • Irreplaceable loss of archaeological heritage resources.

The OBJECTIVE of the Phase 1 Archaeological Impact Assessment was to establish the range and importance of the exposed and *in situ* archaeological heritage material remains, sites and features; to establish the potential impact of the development; and to make recommendations to minimize possible damage to the archaeological heritage.

Project component/s	• Extension of the existing Komsberg Substation • The proposed footprint is approximately 19.8 ha (440 m x 450 m)
Potential Impact	Physical destruction of archaeological heritage resources not visible at the surface.
Activity/risk source	Construction of the substation extension
Mitigation: Target/objective	Protection and conservation of possible archaeological heritage resources occurring below the surface not visible on the surface.

Mitigation: Action /control	Responsibility	Timeframe
• If the current layout is changed, an archaeological walk-through survey of the changes must be conducted and further mitigatory recommendations may be made if necessary.	Contracted archaeologist	Prior to construction as part of the EMP.
• If concentrations of historical and pre-colonial archaeological heritage material and/or human remains (including graves and burials) are uncovered during construction, all work must cease immediately and be reported to the South African Heritage Resources Agency (SAHRA) so that systematic and professional	Environmental control officer (ECO), developer and construction workers Contracted archaeologist	During construction of the proposed development.

investigation/excavation can be undertaken. Phase 2 mitigation in the form of test-pitting/sampling or systematic excavations and collections of the pre-colonial shell middens and associated artefacts will then be conducted to establish the contextual status of the sites and possibly remove the archaeological deposit before development activities continue. • A person must be trained as a site monitor to report any archaeological sites found during the development. Construction managers/foremen and/or the Environmental Control Officer (ECO) should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.	Environmental control officer, construction managers and foremen	Prior to construction as part of the EMP.

Performance Indicator	Preservation of possible subsurface archaeological heritage sites, features and sites.
Monitoring	A person must be trained as a site monitor to report any archaeological sites found during the development. Construction managers/foremen and/or the Environmental Control Officer (ECO) should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.

10. RECOMMENDATIONS

The overall area is considered as having a low archaeological significance, therefore, the development may proceed as planned. As no archaeological heritage remains were observed within both the site alternatives (Alternative 1 and Alternative 2) nor within the vicinity for the widening of the access road during the survey there is no preferential alternative site. The developer may continue development on the Preferred Site

(Alternative 1). The following recommendations must be considered before development continues:

1. If the current layout is changed, an archaeological walk-through survey of the changes must be conducted and further mitigatory recommendations may be made if necessary.

2. If concentrations of historical and pre-colonial archaeological heritage material and/or human remains (including graves and burials) are uncovered during construction, all work must cease immediately and be reported to the South African Heritage Resources Agency (SAHRA) and/or the MacGregor Museum, Kimberly, so that systematic and professional investigation/excavation can be undertaken. Phase 2 mitigation in the form of test-pitting/sampling or systematic excavations and collections of the pre-colonial shell middens and associated artefacts will then be conducted to establish the contextual status of the sites and possibly remove the archaeological deposit before development activities continue.

3. A person must be trained as a site monitor to report any archaeological sites found during the development. Construction managers/foremen and/or the Environmental Control Officer (ECO) should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.

11. REFERENCES

Beaumont, P. B. & Morris, D. 1990. Guide to archaeological sites in the Northern Cape. Kimberly: McGregor Museum.

Beaumont, P.B. & Vogel, J.C. 1984.Spatial patterning of the Ceramic Later Stone Age in the Northern Cape Province, South Africa. In: Hall, M.; Avery, G.; Avery, D. M.; Wilson, M. L. & Humphreys, A. J. B. *Frontiers: southern African archaeology today*. Oxford: BAR International Series 207.

Beaumont, P. B. & Vogel, J. C. 1989.Patterns in the age and context of rock art in the Northern Cape. *South African Archaeological Bulletin* 44 (150):73-81.

Beinart, W. 2003.*The rise of conservation in South Africa*. Oxford University Press.

Binneman, J. 2004/2005. Archaeological Research along the south-eastern Cape coast part 1: open-air shell middens. *Southern African Field Archaeology* 13 and 14:49-77.

Binneman, J. & Beaumont, P. 1992. Use-wear analysis of two Acheulean handaxes from Wonderwerk Cave, Northern Cape. *Southern African Field Archaeology*, 1:92-97.

Close A. E. & Sampson, C. G. 1998. Backed microlith clusters in Late Holocene rock shelters of the Upper Karoo. *South African Archaeological Bulletin* 53 (186):63-72.

Close, A. E. & Sampson, C. G. 1999. Tanged arrowheads from Later Stone Age sites in the Seacow River Valley. *South African Archaeological Bulletin* 54 (170):81-89.

Deacon. H. J. 1967. Two radiocarbon dates from Scott's Cave, Gamtoos Valley. *South African Archaeological Bulletin* 22:51-2.

Deacon, H.J. 1970. The Acheulian occupation at Amanzi Springs, Uitenhage District, Cape Province. *Annals of the Cape Provincial Museums*. 8:89-189.

Deacon, H. J. 1976.*Where Hunters Gathered: A Study of Holocene Stone Age People in the Eastern Cape*. South African Archaeological Society Monograph Series No. 1.

Deacon, H. J. 1979.A sequence through the Upper Pleistocene and Holocene in South Africa. *World Archaeology*, 10 (3):241-257.

Deacon, H. J. & Deacon, J. 1999.*Human Beginnings in South Africa*. Cape Town: David Philip.

Deacon, H. J.; Deacon, J.; Brooker, M. B. & Wilson, M. L. 1978.The evidence for herding at Boomplaas Cave in the Southern Cape, South Africa. *South African Archaeological Bulletin*, 33 (127): 39-65.

Deacon, J. 1988.The power of a place in understanding southern San rock engravings. *World Archaeology*, 20 (1):129-140.

Derricourt, R. M. *Prehistoric Man in the Ciskei and Transkei.* 1977. Cape Town: C. Struik Publishers.

Gess, W.H.R. 1969. Excavations of a Pleistocene bone deposit at Aloes near Port Elizabeth.

South African Archaeological Bulletin 24:31-32.

Goodwin, A. J. H. 1926. The Victoria West Industry. In: Goodwin, A.J.H. & van Riet Lowe, C. (eds). *The South African Cultures of South Africa*. Annals of the South African Museum.

Goodwin, A.J.H. 1946. Earlier, Middle and Later. *South African Archaeological Bulletin*, Vol. 3 (1): 74-76.

Hall, M. & Parkington, J. 1987. Patterning in recent radiocarbon dates from Southern Africa as a reflection of prehistoric settlement and interaction. *The Journal of African History*, 28 (1):1-25.

Lycett, S.J. 2009. Are Victoria West cores "proto-Levallois"? A phylogenetic assessment. *Journal of Human Evolution*, Vol 56: 175-199.

Morris, D. 1988. Engraved in place and time: a review of variability in the rock art of the Northern Cape and Karoo. *South African Archaeological Bulletin*, Vol. 43: 109-121.

Parkington, J.; Morris, D. & Rusch, N. 2008.*Karoo Rock Engravings*. Cape Town: Creda Communications.

Ridings, R. & Sampson, C. G. 1990. There's no percentage in it: inter site spatial analysis of Bushman (San) pottery decorations. *American Antiquity*, 55 (4):766-780.

Saitowitz, S. J. & Sampson, C. G. 1992. Glass trade beads from rock shelters in the Upper Karoo. *South African Archaeological Bulletin* 47:94-103.

Sampson, C. G. 1985. *Atlas of Stone Age Settlement in the Central and Upper Seacow Valley*. Memoirs van die Nasionale Museum Bloemfontein, Vol. 20: 1-116.

Sampson, C. G. 1986. Model of a prehistoric herder-hunter contact zone: a first approximation. *South Africa Archaeological Society Goodwin Series*, 5:50-56.

Sampson, C. G. 1988. *Stylistic Boundaries among Mobile Hunter-Foragers*. Smithsonian.

Sampson, C. G.; Bailiff, I. & Barnett, S. 1997. Thermoluminescence dates from Later Stone Age pottery on surface sites in the Upper Karoo. *South African Archaeological Bulletin* 52 (165):38-42.

Sampson, C. G.; Hart, T. J. G.; Wallsmith, D. L. & Blagg, J. D. 1989. The ceramic sequence in the Upper Seacow Valley: problems and implications.

Sampson, C. G. & Vogel, J. C. 1996.Fibretember in Later Stone Age ceramics from the Upper Karoo. *South African Archaeological Bulletin,* 51 (164):99-105.

Sealy, J. 2006. Diet, mobility, and settlement pattern among Holocene hunter-gatherers in Southernmost Africa. *Current Anthropology*, 47 (4):569-595.

Sharon, G. 2009. Acheulian Giant-Core Technology. *Current Anthropology*, 50 (3): 335-367.

Smith, R. A. 1919. Recent finds of the Stone Age in Africa. *Man*, Vol. 19: 100-106.
The London Gazette, February 18, 1902: 1036.

Thompson, E. & Marean, C. W. 2008. The Mossel Bay lithic variant: 120 years of Middle Stone Age Research from Cape St. Blaize Cave to Pinnacle Point. *South Africa Archaeological Society Goodwin Series*, 10: 90-104.

Von Den Driesch, A. & Deacon, H. J. 1985. Sheep remains from Boomplaas Cave, South Africa. *South African Archaeological Bulletin,* 40 (141):39-44.

Westbury, W. & Sampson, G. C. 1993. To strike the necessary fire: acquisition of guns by the Seacow Valley Bushmen. *South African Archaeological Bulletin,* 48:26-31.

12. RELEVANT ARCHAEOLOGICAL AND HERITAGE IMPACT ASSESSMENTS

Binneman, J.; Booth, C. & Higgitt, N. 2011a.A phase 1 archaeological impact assessment (AIA) for the proposed Karoo Renewable Energy Facility on a site South of Victoria West, Northern and Western Cape Province on the Farms Nobelsfontein 227, Annex Nobelsfontein 234, Ezelsfontein 235, Rietkloofplaaten 239, Modderfontein 228 and Phaisantkraal 1.

Fourie, D. & Shand, L. 2011.Petrolium Exploration Right – Environmental Management Programme Report: Seismic Survey, Southern Karoo Basin. Prepared for Falcon Oil and Gas Limited.

Hart, T. 2005. Heritage Impact Assessment of a proposed Sutherland Golf Estate, Sutherland, Northern Cape Province.

Hart, T. 2007. Heritage Impact Assessment of Elandskloof 160, Witteberg. Prepared for Witteberg Private Nature Reserve.

Hart, T.; Bluff. K.; Halkett, D. & Webley, L. 2010. Heritage Impact Assessment: Proposed Suurplaat WEF near Sutherland, Western Cape and Northern Cape. Prepared for Savannah Environmental (Pty) Ltd.

Hart, T. & Miller, D. nd. Proposed Witteberg Wind Farm (Alternative Layout 3): Jantjiesfontein (Farm RE / 164), Besten Weg (Farm 1 / 150 and Farm RE / 150), Tweedside (Farm RE /151) and Elandsberg (Farm RE / 269 and Farm 1 / 269), Laingsburg, Western Cape Province. Prepared for ERM, Southern Africa.

Hart, T. T. & Kendrick, N. 2014. Heritage Impact Assessment. Kareebosch Wind Farm (Phase 2 of Roggeveld Wind Farm).

Hart, T. & Webley, L. 2011. Heritage Impact Assessment: Kraal RE/199 Northern Cape, Bon Esperance RE/73 Western Cape, Wilgebosch Rivier 188 Northern Cape, Rietfontein 197 Northern Cape, Karreebosch RE/200 Norther Cape, Ek Kraal 2/199

Northern Cape, Klipbanks Fontein RE/198 Northern Cape, Klipbanks Fontein 1/198 Northern Cape, Barendskraal 1/76 Western Cape, Barenskraal RE/76 Western Cape, Fortuin 1/74 Western Cape, Brandvalley RE/75 Western Cape, Hartjies Kraal 1/77 Western Cape, Brandvalley 1/75 Western Cape, Fortuin 3/74 Western Cape, Fortuin RE/74 Western Cape, Hartjies Kraal RE/77 Western Cape.

Hart, T. & Webley, L. 2013. Heritage Impact Assessment: Revised Report on Phase 1 of the Roggeveld Wind Farm: Remainder of the Farm Appelsfontein 201, Remainder of the Farm Ekkraal 199, Portion 1 of the Farm Ekkraal 199, Remainder of Farm Roetfontein 197, Remainder of Farm Esperange 73, Portion 1 of Farm Bon Esperange 73, Remainder of Farm Aprils Kraal 105, Remainder of Farm Fortuin 74, Portion 3 of Farm Fortuin 74, Remainder of Farm Brandvalley 75, Portion 1 of Farm Ou Mure 74, Remainder of Farm Nuwerus 284, Portion 2 of Farm Standvastigheid 210.

Prins, F. 2011. Technical Report in support of the EMP for the South Western Karoo Basin Gas Exploration Application Project, Cultural Heritage, Eastern Precinct.Prepared for Golder Associates Africa.

Rossouw, L. 2007. Phase 1 Archaeological Impact Assessment and Palaeontological Impact Assessment of 30 Gravel Quarries in the R354 between Calvinia and Sutherland, Northern Cape Province.

Tusenius, M.L. 2014. Phase 1 Archaeological Impact Assessment of the Proposed Construction of Tourism Units at Elandsberg Rest Camp and Staff Village near the Roodewerf Park Office, Tankwa Karoo National Park, Hantam Local Municipality, Northern Cape.

13. GENERAL REMARKS AND CONDITIONS

NOTE: This report is a phase 1 archaeological impact assessment (AIA) only and does not include or exempt other required specialist assessments as part of the heritage impact assessments (HIAs).

The National Heritage Resources Act (Act No. 25 of 1999, Section 35 [Brief Legislative Requirements]) requires a full Heritage Impact Assessment (HIA) in order that all heritage resources including all places or objects of aesthetics, architectural, historic, scientific, social, spiritual, linguistic, or technological value or significance are protected. Thus any assessment should make provision for the protection of all these heritage components including archaeology, shipwrecks, battlefields, graves, and structures older than 60 years, living heritage, historical settlements, landscapes, geological sites, palaeontological sites and objects.

It must be emphasized that the conclusions and recommendations expressed in this phase 1 archaeological impact assessment (AIA) are based on the visibility of archaeological remains, features and, sites and may not reflect the true state of affairs. Many archaeological remains, features and, sites may be covered by soil and vegetation and will only be located once this has been removed. In the event of such archaeological heritage

being uncovered (such as during any phase of construction activities), archaeologists or the relevant heritage authority must be informed immediately so that they can investigate the importance of the sites and excavate or collect material before it is destroyed. The onus is on the developer to ensure that this agreement is honoured in accordance with the National Heritage Resources Act No. 25 of 1999 (NHRA 25 of 1999).

Archaeological Specialist Reports (desktops and AIA's) will be assessed by the relevant heritage resources authority. The final comment/decision rests with the heritage resources authority that may confirm the recommendations in the archaeological specialist report and grant a permit or a formal letter of permission for the destruction of any cultural sites.

APPENDIX A: GRADING SYSTEM

The National Heritage Resources Act 25 of 1999 stipulates the assessment criteria and grading of archaeological sites. The following categories are distinguished in Section 7 of the Act and the South African Heritage Resources Agency:

- National: This site is suggested to be considered of Grade 1 significance and should be nominated as such. Heritage resources with qualities so exceptional that they are of special national significance.
- Provincial: This site is suggested to be considered of Grade II significance and should be nominated as such. 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
- Local: This site is suggested to be Grade IIIA significance. This site should be retained as a heritage register site (High significance) and so mitigation as part of the development process is not advised.
- Local: This site is suggested to be Grade IIIB significance. It could be mitigated and (part) retained as a heritage register site (High significance).
- 'General' Protection A (Field Rating IV A): This site should be mitigated before destruction (usually High/Medium significance).
- 'General' Protection B (Field Rating IV B): This site should be recorded before destruction (usually Medium significance).
- 'General' Protection C (Field Rating IV C): This site has been sufficiently recorded (in the Phase 1). It requires no further recording before destruction (usually Low significance).

APPENDIX B: IDENTIFICATION OF ARCHAEOLOGICAL FEATURES AND MATERIAL FROM INLAND AREAS: guidelines and procedures for developers

1. Human Skeletal material

Human remains, whether the complete remains of an individual buried during the past, or scattered human remains resulting from disturbance of the grave, should be reported. In general the remains are buried in a flexed position on their sides, but are also found buried in a sitting position with a flat stone capping and developers are requested to be on the alert for this.

2. Freshwater mussel middens

Freshwater mussels are found in the muddy banks of rivers and streams and were collected by people in the past as a food resource. Freshwater mussel shell middens are accumulations of mussel shell and are usually found close to rivers and streams. These shell middens frequently contain stone tools, pottery, bone, and occasionally human remains. Shell middens may be of various sizes and depths, but an accumulation which exceeds 1 m^2 in extent, should be reported to an archaeologist.

3. Stone artefacts

These are difficult for the layman to identify. However, large accumulations of flaked stones which do not appear to have been distributed naturally should be reported. If the stone tools are associated with bone remains, development should be halted immediately and archaeologists notified

4. Fossil bone

Fossil bones may be found embedded in geological deposits. Any concentrations of bones, whether fossilized or not, should be reported.

5. Large stone features

They come in different forms and sizes, but are easy to identify. The most common are roughly circular stone walls (mostly collapsed) and may represent stock enclosures, remains of wind breaks or cooking shelters. Others consist of large piles of stones of different sizes and heights and are known as *isisivane.* They are usually near river and mountain crossings. Their purpose and meaning is not fully understood, however, some are thought to represent burial cairns while others may have symbolic value.

6. Historical artefacts or features

These are easy to identified and include foundations of buildings or other construction features and items from domestic and military activities.