BASIC ASSESSMENT REPORT

Appendix D.3:
Heritage Impact Assessment
(Archaeology and Cultural Landscape)

HERITAGE IMPACT ASSESSMENT FOR A PROPOSED POWER LINE (KENHARDT PV 3 – TRANSMISSION LINE) ON FARMS 168/REM, 169/2, 169/REM and 120/3, KENHARDT MAGISTERIAL DISTRICT, NORTHERN CAPE

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

Report for:

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On behalf of:

Scatec Solar SA 370 (Pty) Ltd

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First Draft: 10 November 2015
Final Report: 03 February 2016

EXECUTIVE SUMMARY

ASHA Consulting (Pty) Ltd was appointed by the Council for Scientific and Industrial Research (CSIR) to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed construction of electrical infrastructure (including transmission lines) stretching over parts of the remainder of farm Onder Rugzeer 168, the Remainder of Boven Rugzeer 169, Portion 2 of Boven Rugzeer 169 and Portion 3 of farm Gemsbok Bult 120, in the Kenhardt Magisterial District. The proposed infrastructure will serve to link the proposed Kenhardt PV 3 solar energy facility (being assessed under a separate Environmental Impact Assessment (EIA) Process) with the Eskom Nieuwehoop Substation presently under construction on Gemsbok Bult 120/3. This Heritage Impact Assessment (HIA) is being undertaken as part of the Basic Assessment (BA) for a transmission corridor that would accommodate the proposed electrical infrastructure (referred to as the Kenhardt PV 3 – Transmission Line project).

The area is relatively flat, although gently undulating terrain occurs in places. A pan occurs at the northern end of the proposed corridor, while a small rocky koppie occurs in the southern part of the corridor. Vegetation is low and sparse with ground visibility being excellent.

Archaeological material in the form of background scatter was located across much of the general area but impacts to this material would be of very low significance. No archaeological sites or graves were found along the alignment of the proposed transmission line corridor but sites may be expected in association with the pan and koppie which, because of a change to the project, were not covered by the survey. Although sites of high significance are unlikely to occur, these two areas should be avoided with buffers of 75 m radius from the centre of the pan and 120 m radius from the summit of the koppie as a precautionary measure. The landscape was identified as a heritage resource but, because of the presence of electrical and other infrastructure in the area, the significance of new impacts is considered to be very low and no mitigation is suggested.

The significance of the potential impacts to archaeological resources and graves was rated as being very low, while the impacts to the landscape are also rated with a very low significance (without the implementation of mitigation measures). Aside from avoiding the pan and koppie, no mitigation measures are suggested.

The proposed project should be allowed to proceed but subject to the following conditions:

- The pan and koppie should be avoided with buffers of 75 m from the centre of the pan and 120 m from the summit of the koppie;
- The construction crew should be informed of the possibility of encountering graves and should be encouraged to report any suspicious-looking stone features prior to disturbance; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

Glossary

Background Scatter: Artefacts whose spatial position is conditioned more by natural forces than by human agency

Early Stone Age: Period of the Stone Age extending approximately between 2 million and 200 000 years ago.

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

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

Abbreviations

ASAPA: Association of Southern African Professional Archaeologists

BAR: Basic Assessment Report

CRM: Cultural Resources Management

CSIR: Council for Scientific and Industrial Research

EMPr: Environmental Management Programme

ESA: Early Stone Age

GPS: Global Positioning System

HIA: Heritage Impact Assessment

LSA: Later Stone Age

MSA: Middle Stone Age

NEMA: National Environmental Management Act (No. 107 of 1998)

NHRA: National Heritage Resources Act (No. 25) of 1999

NID: Notification of Intent to Develop

SAHRA: South African Heritage Resources Agency

SAHRIS: South African Heritage Resources Information System

COMPLIANCE WITH THE APPENDIX 6 OF THE 2014 EIA REGULATIONS

Requirements of Appendix 6 – GN R982	**Addressed in the Specialist Report**
1. (1) A specialist report prepared in terms of these Regulations must contain- a) details of- i. the specialist who prepared the report; and ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	Section 1.4 & Appendix 1
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Section 1.5 & Appendix 2
c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 1.3
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 3.2
e) a description of the methodology adopted in preparing the report or carrying out the specialised process;	Section 3
f) the specific identified sensitivity of the site related to the activity and its associated structures and infrastructure;	Section 6.2
g) an identification of any areas to be avoided, including buffers;	Sections 7 & 11
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Section 11
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 3.5
j) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment;	Sections 7 & 8
k) any mitigation measures for inclusion in the EMPr;	Section 11
l) any conditions for inclusion in the environmental authorisation;	Sections 11 & 13
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 11
n) a reasoned opinion- i. as to whether the proposed activity or portions thereof should be authorised; and ii. if the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	Sections 12 & 13
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	Section 6.1
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Section 6.1
q) any other information requested by the competent authority.	n/a

Contents

1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by the Council for Scientific and Industrial Research (CSIR) to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed construction of electrical infrastructure (including transmission lines) stretching over parts of the remainder of farm Onder Rugzeer 168, the Remainder of Boven Rugzeer 169, Portion 2 of Boven Rugzeer 169 and Portion 3 of farm Gemsbok Bult 120, in the Kenhardt Magisterial District (Figures 1 & 2). The proposed infrastructure will serve to link the proposed Kenhardt PV 3 solar energy facility (being assessed under a separate Environmental Impact Assessment (EIA) Process) with the Eskom Nieuwehoop Substation presently under construction on Gemsbok Bult 120/3. This Heritage Impact Assessment (HIA) is being undertaken as part of the Basic Assessment (BA) for a transmission corridor that would accommodate the proposed electrical infrastructure (referred to as the Kenhardt PV 3 – Transmission Line project).

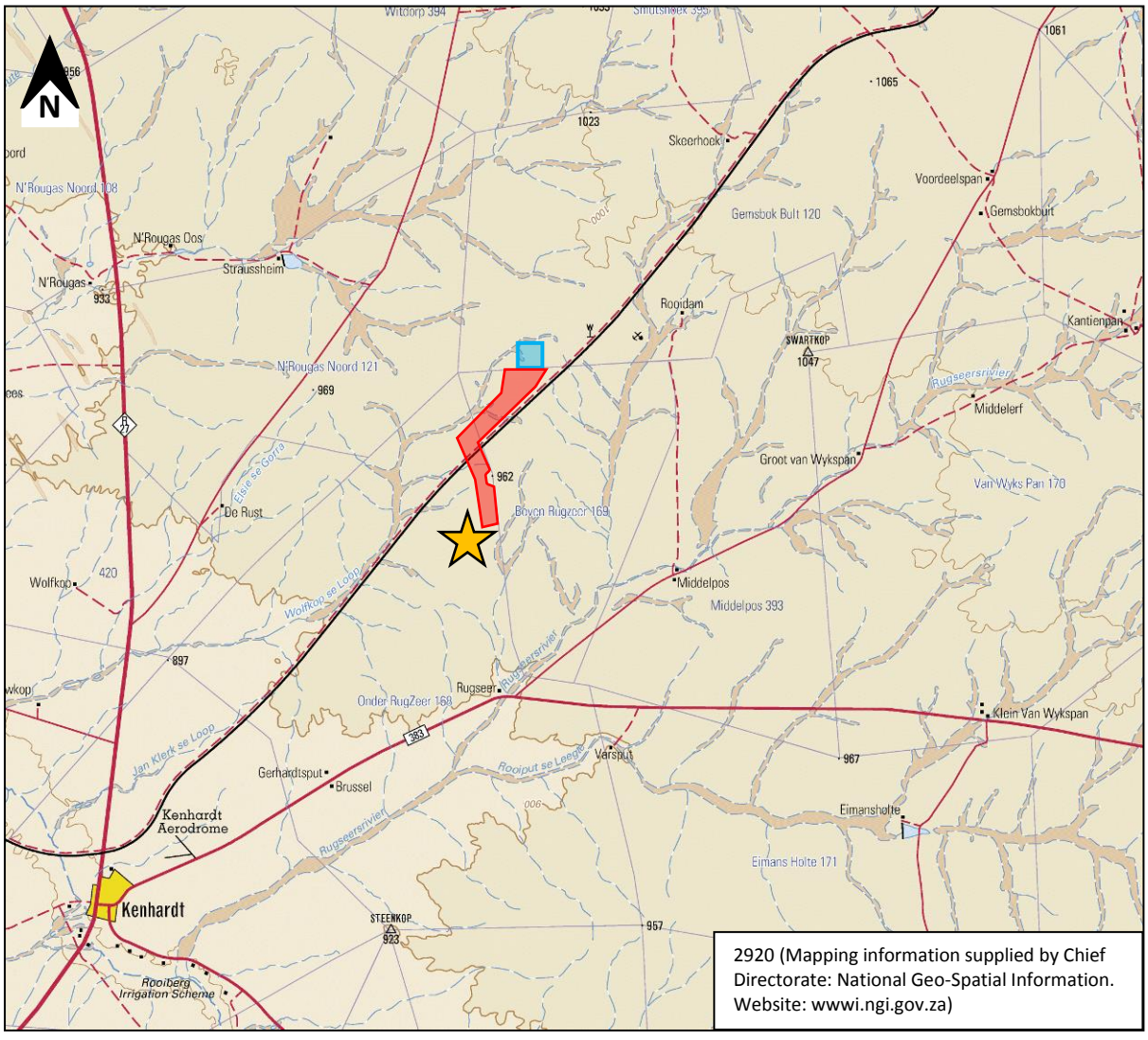


Figure 1: *Map showing the location of the proposed transmission line corridor (red) as well as the PV facility (orange star) and substation (blue polygon) that it would link to.*

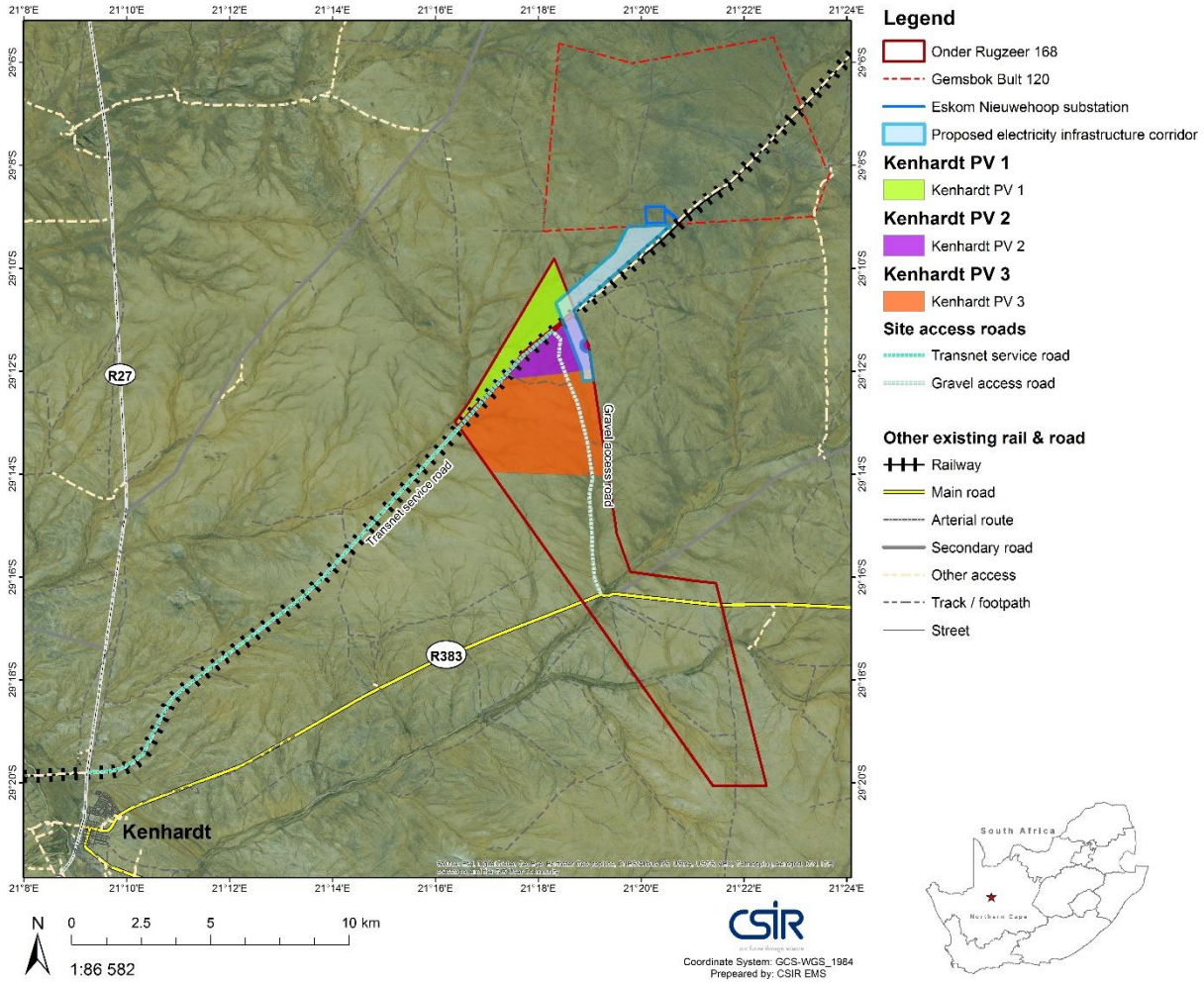


Figure 2: *Map showing the location of the proposed transmission line corridor (blue) in relation to the three proposed PV facilities and the Eskom Nieuwehoop Substation.*

1.1. Project Description

The following proposed transmission line and electrical infrastructure connectivity options have been considered in the BA Processes for the three transmission line projects:

- Each PV facility will be connected by a separate short 132 kV transmission line to the Eskom Nieuwehoop Substation that is currently being constructed on Farm Gemsbok Bult (remaining extent of Portion 3 of Farm 120); or
- Connect the Kenhardt PV 2 and Kenhardt PV 3 projects via separate 22/33 kV transmission lines to the proposed Kenhardt PV 1 on-site substation which will link via a 132 kV line to the Eskom Nieuwehoop Substation; or
- Construct one 132 kV transmission line from the Kenhardt PV 1 project to the Eskom Nieuwehoop Substation and connect the Kenhardt PV 2 and Kenhardt PV 3 facilities together via medium voltage transmission lines to either the on-site substation of Kenhardt PV 2 or PV 3, followed by the construction of one 132 kV transmission line from the on-site substation to the Eskom Nieuwehoop Substation.

All transmission lines and connectivity options (as described above) for the Kenhardt PV 1, PV 2 and PV 3 transmission line projects will be constructed within an electrical infrastructure corridor (as shown in Figure 1), which has been assessed in this report.

The proposed transmission lines are expected to be overhead, with concrete foundations and steel tower structures. The BA Process also includes the construction of associated electrical infrastructure at the Eskom Nieuwehoop Substation (including but not limited to an additional feeder bay, Busbars, transformer bay and extension to the platform at the substation).

A detailed project description is provided in Section A of the BA Report. Any aspect of the development as proposed might have a negative impact on heritage resources and thus the entire project is relevant to the HIA.

1.2. Terms of Reference

ASHA Consulting (Pty) Ltd was requested to conduct a field study and produce a HIA that would meet the requirements of the heritage authorities.

The HIA was based on the following broad Terms of Reference:

- Describe the affected environment and determine the status quo in terms of its heritage sites, heritage features and archaeology.
- Undertake a desktop study on the archaeology, cultural landscape and heritage sites within the proposed project area. Highlight any gaps in the baseline data.
- Based on the project description, define the environmental risks to the archaeology and heritage features.
- Undertake a detailed field examination of the archaeological sites and heritage features within or in the region of the development area. Record sites of archaeological relevance (photos, maps, aerial or satellite images, Global Positioning System (GPS) co-ordinates, and stratigraphic columns).
- Provide a sensitivity map indicating the presence of sensitive areas, “no-go” areas, setbacks/buffers, as well as the identification of red flags or risks associated with heritage and archaeological impacts.
- Evaluate the potential for occurrence of archaeological features within the study area.
- Identify relevant protocols, legal and permit requirements relating to heritage and archaeological impacts likely to be generated as a result of the proposed project.
- Identify and rate potential direct, indirect and cumulative impacts of the proposed project on the archaeological heritage during the construction, operational and decommissioning phases of the project.
- Comply with the requirements of the relevant heritage authority in order to obtain a letter of approval, in terms of the National Heritage Resources Act (Act 25 of 1999).
- Compile a report providing a review of heritage resources within the study area based on the desktop study and data from fieldwork and analysis.
- Provide input to the Environmental Management Programme (EMPr), including mitigation and monitoring requirements to ensure that the impacts on the

archaeological features and heritage features are limited. Provide recommendations and suggest appropriate mitigation measures (if required), for the recording, sampling and dating of any archaeological sites that could potentially be destroyed as a result of the proposed project.

1.3. Scope and Purpose of the Report

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

1.4. The Author

Dr Jayson Orton has an MA (UCT, 2004) and a D.Phil (Oxford, UK, 2013), both in archaeology, and has been conducting HIAs and archaeological specialist studies in the Western Cape and Northern Cape provinces of South Africa since 2004 (Please refer to the Curriculum Vitae included as Appendix 1 of this report). He has also conducted research on aspects of the Later Stone Age in these provinces and published widely on the topic. He is accredited with the Association of Southern African Professional Archaeologists (ASAPA) Cultural Resources Management (CRM) section (Member #233) as follows:

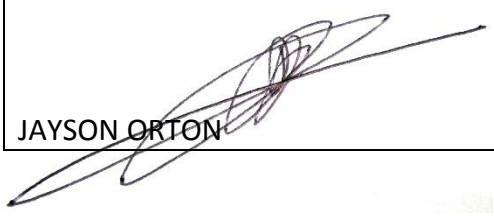
- Principal Investigator: Stone Age, Shell Middens & Grave Relocation; and
- Field Director: Colonial Period & Rock Art.

1.5. Declaration of Independence

The declaration of independence by the specialist is provided below with a full declaration included in Appendix 2 of this HIA Report.

DECLARATION OF INDEPENDENCE

I, Dr Jayson Orton, declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed Kenhardt PV 3 – Transmission Line Project, application or appeal in respect of which I was appointed, other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of my performing such work.



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2. HERITAGE LEGISLATION AND PREMIT REQUIREMENTS

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

- Section 34: structures older than 60 years;
- Section 35: palaeontological, prehistoric and historical material (including ruins) more than 100 years old;
- Section 36: graves and human remains older than 60 years and located outside of a formal cemetery administered by a local authority; and
- Section 37: public monuments and memorials.

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

- Structures: “any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith”;
- Palaeontological material: “any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace”;
- Archaeological material: a) “material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures”; b) “rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10m of such representation”; c) “wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic, as defined respectively in sections 3, 4 and 6 of the Maritime Zones Act, 1994 (Act No. 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation”; and d) “features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found”;
- Grave: “means a place of interment and includes the contents, headstone or other marker of such a place and any other structure on or associated with such place”; and
- Public monuments and memorials: “all monuments and memorials a) “erected on land belonging to any branch of central, provincial or local government, or on land belonging to any organisation funded by or established in terms of the legislation of such a branch of government”; or b) “which were paid for by public subscription, government funds, or a public-spirited or military organisation, and are on land belonging to any private individual.”

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

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

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

3. METHODS

3.1. Literature Survey and Information Sources

A survey of available literature was carried out to assess the general heritage context into which the development would be set. This literature included published material, unpublished commercial reports and online material, including reports sourced from the South African Heritage Resources Information System (SAHRIS). The 1:250 000 map was sourced from the Chief Directorate: National Geo-Spatial Information.

3.2. Field Survey

The corridor was surveyed in the field along with the proposed PV facilities on 28 to 31 October 2015. This was during late Spring, although in this dry area seasonality has no effect on the visibility of heritage resources – visibility was excellent. The survey sought to conduct a landscape survey where certain landscape features known to be more sensitive were located and searched. During the survey, the positions of finds were recorded on a hand-held GPS receiver set to the WGS84 datum. Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the proposed development.

The survey was conducted by the author in the company of Mr Matthew Shaw, an archaeology Masters student.

3.3. Impact Assessment

For consistency, the impact assessment was conducted through application of a scale supplied by the CSIR as shown in Section D of the BA Report.

3.4. Grading

Section 7 of the NHRA provides for the grading of heritage resources into those of National (Grade 1), Provincial (Grade 2) and Local (Grade 3) significance. Grading is intended to allow for the identification of the appropriate level of management for any given heritage resource. Grade 1 and 2 resources are intended to be managed by the national and provincial heritage resources authorities, while Grade 3 resources would be managed by the relevant local planning authority. These bodies are responsible for grading, but anyone may make recommendations for grading.

It is intended that the various provincial authorities formulate a system for the further detailed grading of heritage resources of local significance but this is generally yet to happen. Heritage Western Cape (2012), however, uses a system in which resources of local significance are divided into Grade 3A, 3B and 3C. These approximately equate to high, medium and medium-low local significance, while sites of low or very low significance (and generally not requiring mitigation or other interventions) are referred to as ungradeable. For convenience, the Heritage Western Cape system is employed here.

3.5. Assumptions and Limitations

The study is carried out at the surface only and hence any completely buried archaeological sites will not be readily located. Similarly, it is not always possible to determine the depth of archaeological material visible at the surface. Another limitation was introduced by a change to the project description after the fieldwork had been completed. This meant that only part of the currently proposed corridor was surveyed. Given the nature of the surface geology, and types of heritage resources typically encountered in the landscape, none of these limitations are likely to have significantly affected the outcome of the report.

With regards to cumulative impacts, various other solar energy facilities, electrical transmission lines have been proposed in the immediate area. A new substation is presently under construction, while three solar energy facilities have been granted Environmental Authorisation, although it is unknown when/if they will be built. The list of developments considered in the cumulative impact assessment is provided in Section D of the BA Report.

4. PHYSICAL ENVIRONMENTAL CONTEXT

4.1. Site Context

The site is located in a remote area some 23 km northeast of Kenhardt. It is located along the Sishen-Saldanha Railway Line and its gravel service road. Although major power lines are not currently present in the area, a large substation is currently under construction at the north-eastern end of the proposed electrical corridor – this is the Eskom Nieuwehoop Substation (Figure 3). Three PV facilities have already been granted authorisation in close proximity to the substation setting a precedent for electrical development in the area, although it is unknown when/if they will be built. The land is otherwise generally

undeveloped and used for small stock grazing. Farm tracks and fences criss-cross the general area and occasional wind pumps occur.

Figure 3: *View towards the northeast of the Eskom Nieuwehoop Substation currently under construction at the northern end of the electrical corridor.*

4.2. Site Description

The site is generally quite flat with occasional very low rocky outcrops. The vegetation is sparse and largely less than knee-high; trees are rare. The surface is coated mostly with fine gravel which is a product of the weathering bedrock. Very ephemeral stream beds cross the site, but these are generally only evident because of the elevated vegetation density and slightly larger bushes along their alignments. Figures 4 to 6 show examples of the landscape in the broader study area as seen on the remainder of Onder Rugzeer Farm 168.

Figure 4: *View of an ephemeral stream bed with its slightly elevated vegetation density.*

5. CULTURAL HERITAGE CONTEXT

This section of the HIA contains the desktop study and establishes what is already known about heritage resources in the vicinity of the study area. What was found during the field survey as presented below may then be compared with what is already known in order to gain an improved understanding of the significance of the newly reported resources.

Figure 5: *Example of overgrazed land with very sparse vegetation.*

Figure 6: *Example of gravel surface and one of the few trees in the study area.*

5.1. Archaeological Aspects

Bushmanland is well known for the vast expanses of gravel that occur in places and which frequently contain stone artefacts in varying densities (Beaumont *et. al* 1995). Such material is referred to as 'background scatter' and is invariably of very limited significance. At times, however, the scatter can become very dense and mitigation work is occasionally called for. The artefacts located in these contexts are largely Early Stone Age (ESA) and Middle Stone Age (MSA) and are not associated with any other archaeological materials – these would have long since decomposed and disappeared. Previous experience immediately east of the present site suggests that such dense accumulations of artefacts are unlikely to occur in this area.

Of potentially more significance, however, are Later Stone Age (LSA) sites which are commonly located along the margins of water features in Bushmanland. These features include both pans and ephemeral drainage lines. Such sites were identified to the east of the present study area in association with pans but artefact scatters associated with drainage lines were rare (Orton 2014a, 2014b, 2014c). The drainage lines on the present site, however, are more prominent and perhaps more likely to reveal LSA camp sites. These sites would typically contain mostly stone artefacts, but fragments of ostrich eggshell (used as water containers and also as a food source) and pottery are also found at times, while bone is rare and likely confined to sites that are very recent. Similar LSA sites can also be found in association with rocky outcrops but none appear to occur within the present study area. Because of their positions along water courses and adjacent to rocky areas, such sites are often avoided by development proposals because of the need to avoid the relevant natural features. Despite the increased likelihood of locating archaeology along streams, Morris (2009) noted that a search along the banks of the Hartebeest River close to Kenhardt, where he expected elevated frequencies of archaeological material, revealed virtually nothing.

Another kind of archaeological site fairly commonly encountered in Bushmanland is small rock outcrops that have been quarried as a source of stone material for making stone tools.

Several such occurrences were noted to the east where quartz outcrops where frequently flaked (Orton 2014a, 2014b, 2014c).

Rock engravings are known from the broader area (Louw Roux Bushmanland 2013). From the limited information available, these appear to be naturalistic images produced by the Bushmen. Geometric images, produced by the Khoekhoen, are not well known from the area (Orton 2013), although David Morris (pers. comm. 2015) has seen examples in the region. Painted art is also very rare but again, examples are known, particularly on large granite boulders.

5.2. Historical Aspects

The Anglo-Boer War was fought across the Northern Cape, but information on the role of Kenhardt appears difficult to locate. The town was occupied by the Boers in late February 1900 after they convinced the magistrate that they had a large gun and would fire on the town if it did not surrender. They later surrendered to the British who occupied the town on 31st March 1900. By mid-1900 there were perhaps 100 Cape Rebels detained in a camp outside of Kenhardt (Grobler 2004). The British raised a local force known as the Border Scouts in Upington in May 1900. Many were mixed-race individuals, some local farmers, others Kalahari hunters, but all disliked the Boers. The scouts were responsible for a large area of the north-western Cape Colony centred on Upington and Kenhardt. They eventually numbered 786 by January 1901 and were under the command of Major John Birbeck (AngloBoerWar.com 2015; Rodgers 2011). At the beginning of 1902 there were 150 Border Scouts stationed at Kenhardt. Two boers, H.L. Jacobs and A.C. Jooste, were accused of treason and executed in the town on 24 July 1901 (Grobler 2004). A memorial stands there to their honour (Green Kalahari n.d.).

No major action appears to have taken place around Kenhardt, although the Boers are known to have attacked a patrol on 17th May 1901, while the British attacked a Boer position on 25th June 1901 (AngloBoerWar.com 2015).

5.3. Built Environment

The built environment is sparsely represented in Bushmanland because the farms tend to be so large. The vast majority of structures appear to be quite recent in age (20th century) and are of very limited heritage significance. In any case, the development will not affect any buildings.

5.4. Graves

Graves are also very rare. Some older farms may have small graveyards located close to their farm buildings but, again, these are highly unlikely to be included within the areas proposed for development. Unmarked pre-colonial graves can, in theory, be located anywhere, although they are generally more common in sandy areas where excavation of graves was easier and in more productive areas where population densities would have

been higher. It is highly unlikely that pre-colonial graves would be encountered in the study area.

5.5. Other Aspects

The cultural and natural landscape is also of concern. However, the cultural landscape is very poorly developed in this area with fences, water troughs and wind pumps being the primary features. The natural landscape lacks visually interesting and sensitive features. In addition, the proposed site is a long distance from any important roads (it is 11 km from the R27) and is highly unlikely to be visible to anyone other than local residents making use of the gravel road along the railway line. Solar PV facilities are not very tall and, if an earthy coloured paint is used for the buildings, they can be almost invisible from as little as 1 km away.

6. IDENTIFICATION OF KEY ISSUES

6.1. Key Issues Identified

Only one potentially significant heritage issue was identified prior to commencement of the BA Process. This was:

- The potential damage to or destruction of Stone Age archaeological sites occurring in proximity to water courses and pans.

The following comment was also received from the SAHRA on 22 September 2015 (via SAHRIS) based on the review of the Background Information Document. It is important to note that only the points relating to Archaeology and Heritage aspects have been extracted from the SAHRA comment and noted below:

> *In terms of the National Heritage Resources Act, no 25 of 1999, heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years, structures older than 60 years are protected. They may not be disturbed without a permit from the relevant heritage resources authority. This means that prior to development it is incumbent on the developer to ensure that a Heritage Impact Assessment is done. This must include the archaeological component (Phase 1) and any other applicable heritage components. Appropriate (Phase 2) mitigation, which involves recording, sampling and dating sites that are to be destroyed, must be done as required.*
>
> *The quickest process to follow for the archaeological component is to contract an accredited specialist (see the web site of the Association of Southern African Professional Archaeologists www.asapa.org.za) to provide a Phase 1 Archaeological Impact Assessment Report. This must be done before any large development takes place.*
>
> *The Phase 1 Impact Assessment Report will identify the archaeological sites and assess their significance. It should also make recommendations (as indicated in section 38) about the process to be followed. For example, there may need to be a mitigation phase (Phase 2) where the specialist will collect or excavate material and date the site. At the end of the process the heritage authority may give permission for destruction of the sites.*

Any other heritage resources that may be impacted such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or viewscapes must also be assessed.

The present HIA meets the requirements of SAHRA in that it aims to satisfy Section 38(3) of the NHRA, the author is an appropriately accredited CRM Section member of ASAPA and recommendations for further studies as may be required are presented.

6.2. Sensitivity of the site in relation to proposed activity

The broader site is sensitive for the many archaeological artefacts and sites on its surface that could be damaged or destroyed through construction related activities. These include site preparation and all works related to installation of the project components.

6.3. Identification of Potential Impacts

The potential impacts identified during the BA are:

6.3.1. Construction Phase

- Damage to or destruction of archaeological resources and graves; and
- Impacts to the cultural and natural landscape.

6.3.2. Operational Phase

- Impacts to the cultural and natural landscape

6.3.3. Decommissioning Phase

- Impacts to the cultural and natural landscape

6.3.4. Cumulative Impacts

- Damage to or destruction of archaeological resources and graves; and
- Impacts to the cultural and natural landscape.

7. FINDINGS OF THE HERITAGE STUDY

Heritage resources were found to be very sparsely distributed across the broader landscape and only two areas (neither of which were actually covered by the survey) are likely to be sensitive. The first is the rocky koppie that occurs on the eastern margin of the corridor near its southern end (Figure 7). Fieldwork for another project nearby revealed the presence of Stone Age scatters, a possible grave and a few low stone-built structures on the eastern side of the koppie and which have low-medium heritage significance (Orton 2016). The second area is the small pan that occurs close to the Nieuwehoop Substation at the northern end of the transmission corridor, although just outside its mapped extent. It is generally the case

that Stone Age artefacts scatters occur around the vast majority of water sources in the area. Isolated artefacts attributable to the background scatter will also be present but are of no concern. Figure 8 shows the location of the two sensitive landscape features.

The only other heritage resource is the cultural landscape which, in this area, is weakly developed. Because of the other infrastructure already present in the area (substation, railway line), it is already compromised and will not be significantly impacted.

Figure 7: *View of the rocky koppie as seen from the northeast.*

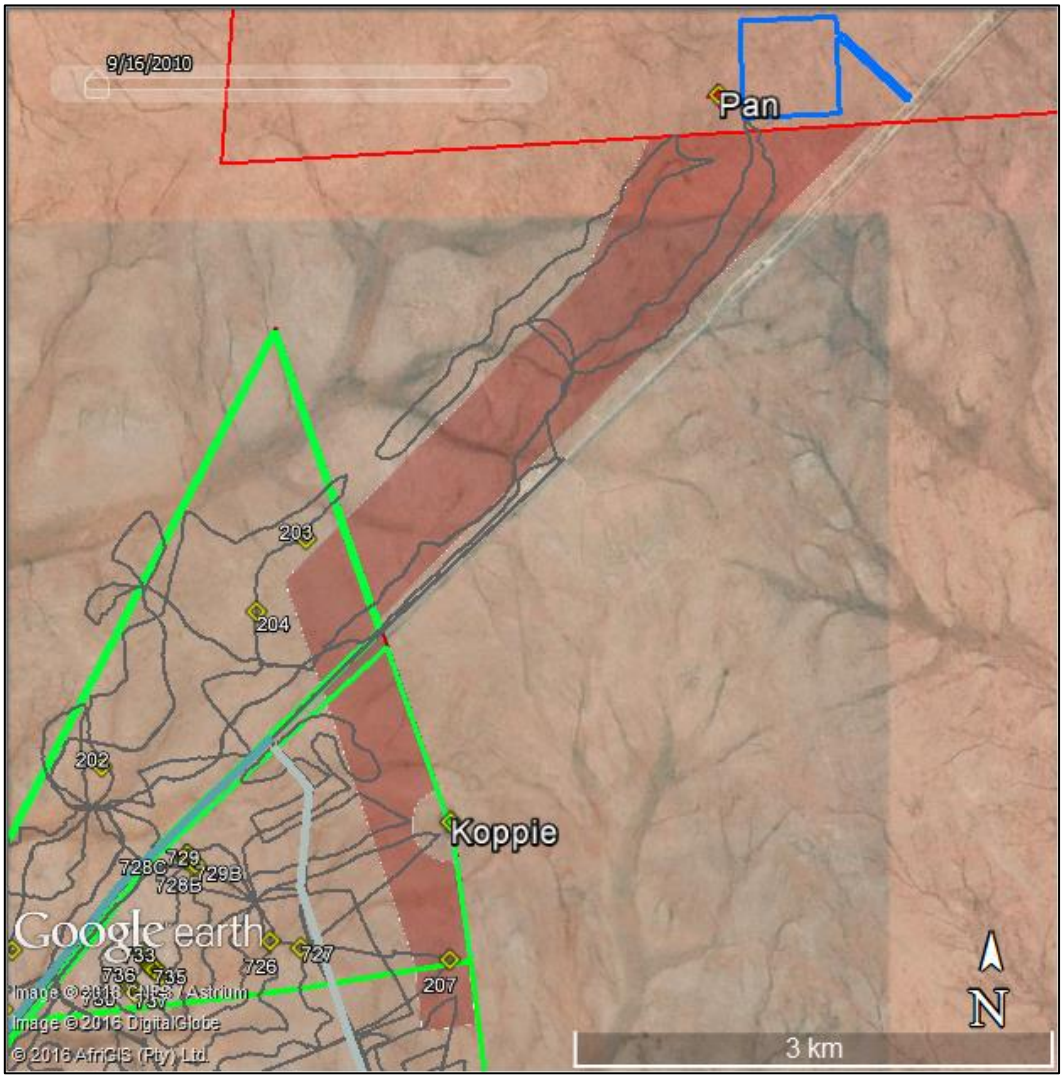

Figure 8: *Aerial view of the study area showing the locations of the proposed transmission corridor (shaded red), the finds in the broader area and GPS tracks (grey lines). The green lines show the proposed PV facilities and the blue square the Eskom Nieuwehoop Substation. The pan and koppie of concern are indicated.*

7.1. Statement of Significance

Section 38(3)(b) of the NHRA requires an assessment of the significance of all heritage resources. In terms of Section 2(vi), ‘‘cultural significance’’ means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

Although no archaeological resources were recorded in the areas of the corridor surveyed, it is anticipated that resources of low-medium significance for their scientific value will likely be present around the pan and on the rocky koppie. The landscape has low significance for its aesthetic value.

7.2. Summary of Heritage Indicators and Provisional Grading

No significant heritage resources were recorded along the proposed corridor route but it is anticipated that any that may occur in association with the pan or koppie will not be worth anything more than a provisional 3C grading (i.e. medium-low local significance).

8. ASSESSMENT OF IMPACTS AND IDENTIFICATION OF MANAGEMENT ACTIONS

8.1. Damage to and Destruction of Archaeological Resources and Graves (Construction Phase)

Although no such resources were recorded during the survey, this assessment assumes that resources would be present at the pan and koppie. The potential impact of damage to and destruction of archaeological resources and graves is predicted to be a negative, direct impact. The impact is rated with a site specific spatial extent and a permanent duration. The consequence for graves would be extreme, while for archaeology it would be moderate. Because power lines have such a small surface footprint, the probability of any impact is rated as extremely unlikely (although note that the probability relates to the probability of impacting significant archaeological resources since it is guaranteed that at least some archaeological resources (isolated artefacts) will be directly impacted). The reversibility of the impact and irreplaceability of the resource are respectively rated as non-reversible and high.

Although no archaeological sites or graves were noted along the proposed transmission line corridor, it is possible that sites in surrounding areas could be disturbed during the construction phase if vehicles do not remain within the construction footprint. Archaeological mitigation is not suggested but all activities and vehicles should be confined to the approved footprint so as to minimise impacts to heritage resources in surrounding areas. The significance of the potential impact is expected to be very low (without the implementation of mitigation measures).

8.2. Impacts to the Natural and Cultural Landscape (Construction, Operational and Decommissioning Phases)

The impact of the proposed project on the natural and cultural landscape is expected to occur during the construction, operational and decommissioning phases. These potential impacts are predicted to be negative and direct, with a local spatial extent, and a long-term duration for the construction and operational phases and a short-term duration for the decommissioning phase. The consequence and probability of the impact are respectively rated as slight and very likely. The reversibility of the impact and irreplaceability of the resource are respectively rated as high and moderate for the construction, operational and decommissioning phases.

The addition of new transmission lines (and associated structures) to the landscape will alter its character from a rural landscape to one more strongly characterized by electrical infrastructure. Given that the precedent has already been set for electrical development, the significance of the potential impact is considered to be very low (without the implementation of mitigation measures). No mitigation is suggested.

8.3. Cumulative Impacts to Archaeological Resources and Graves

All the electrical development in the area will result in many archaeological artefacts and sites and possibly some graves being disturbed and /or destroyed over a wide area. Few of the sites recorded in the region have high cultural significance and it is likely that the vast majority of those that do would be protected from harm because of their proximity to water courses and pans. The locations of graves cannot be predicted and they are difficult to assess. As such, because graves can be very difficult to identify and many may well continue to exist beneath any developments, it is difficult to evaluate any cumulative impacts. The nature of graves as individual and generally isolated heritage resources is such that, although each is significant, the disturbance of multiple examples will not result in a significant cumulative impact. The potential negative cumulative impacts on archaeological resources and graves would occur at a site specific level and would be permanent in duration.

Because no sites of high archaeological significance or graves were found within the present study area, the cumulative impact consequence is rated as moderate with the probability of impacts being extremely unlikely (for the destruction of archaeological resources) and extreme and extremely unlikely (for the destruction of graves). These combine to provide a significance rating of very low for this project (without the implementation of mitigation measures – none have been recommended). The impacts are irreversible and the irreplaceability of archaeological resources and graves is high.

8.4. Cumulative Impacts to the Natural and Cultural Landscape

Given the large amount of other electrical infrastructure planned for the area, the addition of this relatively short transmission line is not expected to make any significant contribution to the cumulative impacts on the landscape. The potential impact is rated with a local spatial extent and a long-term duration. The consequence and probability of the impact are respectively rated as slight and very likely. The reversibility of the impact and irreplaceability of the resource are respectively rated as high and moderate. The impact significance is rated as being very low and no mitigation is suggested.

9. IMPACT ASSESSMENT SUMMARY

The assessment of potential impacts and recommendation of mitigation measures as discussed above are collated in Tables 1 to 4 below. Note that indirect impacts are not assessed because the nature of the identified heritage resources is such that significant indirect impacts are highly unlikely to occur.

Table 1 Impact assessment summary table for the Construction Phase

Construction Phase													
Direct Impacts													
Aspect/ Impact Pathway	**Nature of Potential Impact/ Risk**	**Status**	**Spatial Extent**	**Duration**	**Consequence**	**Probability**	**Reversibility of Impact**	**Irreplaceability**	**Potential Mitigation Measures**	**Significance of Impact and Risk**		**Ranking of Residual Impact/ Risk**	**Confidence Level**
										Without Mitigation/ Management	**With Mitigation/ Management (Residual Impact/ Risk)**		
Construction of the proposed power lines	Destruction of archaeological resources	Negative	Site	Permanent	Moderate	Extremely unlikely	Non-reversible	High	Vehicles to remain within construction corridor	Very low	Very low	5	High
Construction of the proposed power lines	Destruction of graves	Negative	Site	Permanent	Extreme	Extremely unlikely	Non-reversible	High	Vehicles to remain within construction corridor	Very low	Very low	5	High
Construction of the proposed power lines	Impacts to the natural and cultural landscape	Negative	Local	Long term	Slight	Very likely	High	Moderate	None	Very low	Very low	5	High

Table 2 Impact assessment summary table for the Operational Phase

Operational Phase													
Direct Impacts													
Aspect/ Impact Pathway	**Nature of Potential Impact/ Risk**	**Status**	**Spatial Extent**	**Duration**	**Consequence**	**Probability**	**Reversibility of Impact**	**Irreplaceability**	**Potential Mitigation Measures**	**Significance of Impact and Risk**		**Ranking of Residual Impact/ Risk**	**Confidence Level**
										Without Mitigation/ Management	**With Mitigation/ Management (Residual Impact/ Risk)**		
Construction of the proposed power lines	Impacts to the natural and cultural landscape	Negative	Local	Long term	Slight	Very likely	High	Moderate	None	Very low	Very low	5	High

Table 3 Impact assessment summary table for the Decommissioning Phase

Decommissioning Phase													
Direct Impacts													
Aspect/ Impact Pathway	**Nature of Potential Impact/ Risk**	**Status**	**Spatial Extent**	**Duration**	**Consequence**	**Probability**	**Reversibility of Impact**	**Irreplaceability**	**Potential Mitigation Measures**	**Significance of Impact and Risk**		**Ranking of Residual Impact/ Risk**	**Confidence Level**
										Without Mitigation/ Management	**With Mitigation/ Management (Residual Impact/ Risk)**		
The presence of construction vehicles	Impacts to the natural and cultural landscape	Negative	Local	Short term	Slight	Very likely	High	Moderate	None	Very low	Very low	5	High

Table 4 Cumulative impact assessment summary table

Cumulative Impacts													
Aspect/ Impact Pathway	**Nature of Potential Impact/ Risk**	**Status**	**Spatial Extent**	**Duration**	**Consequence**	**Probability**	**Reversibility of Impact**	**Irreplaceability**	**Potential Mitigation Measures**	**Significance of Impact and Risk**		**Ranking of Residual Impact/ Risk**	**Confidence Level**
										Without Mitigation/ Management	**With Mitigation/ Management (Residual Impact/ Risk)**		
Construction of the proposed power lines	Destruction of archaeological resources	Negative	Site	Permanent	Moderate	Extremely unlikely	Non-reversible	High	None	Very low	Very low	5	High
Construction of the proposed power lines	Destruction of graves	Negative	Site	Permanent	Extreme	Extremely unlikely	Non-reversible	High	None	Very low	Very low	5	High
Construction of the proposed power lines	Impacts to the natural and cultural landscape	Negative	Local	Long term	Slight	Very likely	High	Moderate	None	Very low	Very low	5	High

10. PERMIT REQUIREMENTS

The NHRA does not require the developer to obtain permits prior to construction. However, any archaeological mitigation work (i.e. test excavations, sampling etc.) that may be required (in the event of archaeological resources of significance being found within the development footprint during construction) would need to be conducted under a permit issued to, and in the name of, the appointed archaeologist. The permit application process allows the heritage authorities to ensure that a suitably qualified and experienced archaeologist undertakes the work and that the proposed excavation/sampling methodology is acceptable.

11. INPUT TO THE ENVIRONMENTAL MANAGEMENT PROGRAMME

11.1. For inclusion in the EMPr

The pan and koppie should be excluded from physical impacts and cordoned off to protect any heritage resources that might be present as shown in Figure 9. Suggested buffers are 75 m radius from the centre of the pan and 120 m radius from the summit of the koppie.

The Environmental Control Officer (ECO) (or Environmental Officer) should meet with workers on site at the start of the construction phase to explain the possibility that graves might be present. During construction all personnel should be vigilant for any unusual stone features and these should be reported to the ECO who should then report the find(s) to an archaeologist.

It should be ensured that all vehicles and construction activities are restricted to within the approved footprint in order to minimise the chances of impacts to other heritage resources located outside of the transmission corridor.

11.2. For inclusion in the Environmental Authorisation

The following points should be included as conditions of authorisation:

- The pan and koppie should be avoided with buffers of 75 m from the centre of the pan and 120 m from the summit of the koppie;
- The construction crew should be informed of the possibility of encountering graves and should be encouraged to report any suspicious-looking stone features prior to disturbance; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

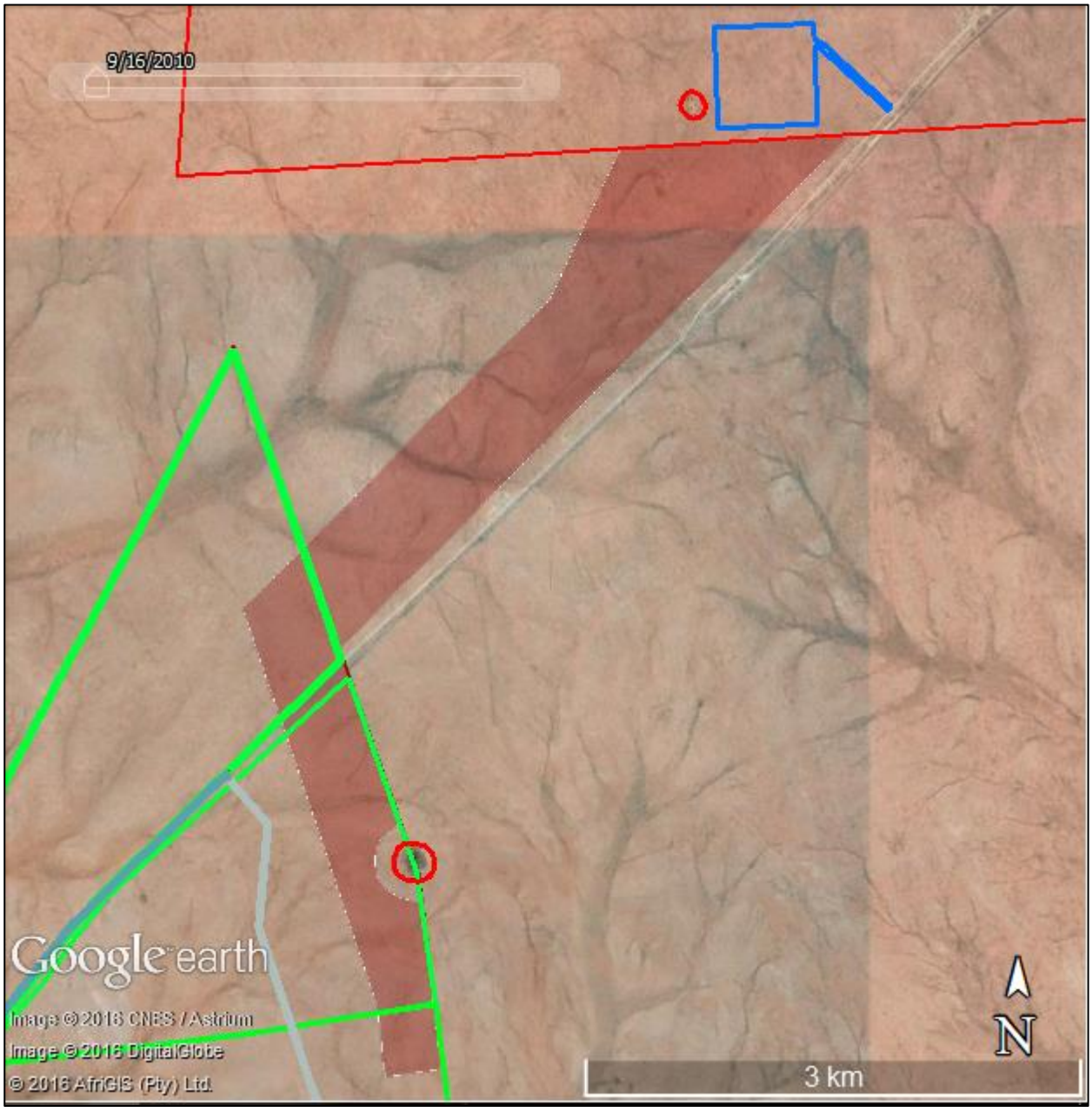

Figure 9: *Aerial view of the study area showing the two areas to be avoided (red circles) in relation to the proposed transmission line corridor (shaded red).*

12. CONCLUSIONS

So long as the buffers around the pan and the koppie are respected, no significant impacts to heritage resources are expected from the proposed electrical infrastructure in its presently proposed corridor and no archaeological mitigation is suggested. There is therefore no heritage-related reason to not authorise the project.

13. RECOMMENDATIONS

The proposed project should be allowed to proceed but subject to the following conditions:

- The pan and koppie should be avoided with buffers of 75 m from the centre of the pan and 120 m from the summit of the koppie;
- The construction crew should be informed of the possibility of encountering graves and should be encouraged to report any suspicious-looking stone features prior to disturbance; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

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15. APPENDIX 1 – Curriculum Vitae

Curriculum Vitae

Jayson David John Orton

ARCHAEOLOGIST AND HERITAGE CONSULTANT

Contact Details and personal information:

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

Birth date and place: 22 June 1976, Cape Town, South Africa
Citizenship: South African
ID no: 760622 522 4085
Driver's License: Code 08
Marital Status: Married to Carol Orton
Languages spoken: English and Afrikaans

Education:

SA College High School	Matric	1994
University of Cape Town	B.A. (Archaeology, Environmental & Geographical Science)	1997
University of Cape Town	B.A. (Honours) (Archaeology)*	1998
University of Cape Town	M.A. (Archaeology)	2004
University of Oxford	D.Phil. (Archaeology)	2013

*Frank Schweitzer memorial book prize for an outstanding student and the degree in the First Class.

Employment History:

Spatial Archaeology Research Unit, UCT	Research assistant	Jan 1996 – Dec 1998
Department of Archaeology, UCT	Field archaeologist	Jan 1998 – Dec 1998
UCT Archaeology Contracts Office	Field archaeologist	Jan 1999 – May 2004
UCT Archaeology Contracts Office	Heritage & archaeological consultant	Jun 2004 – May 2012
School of Archaeology, University of Oxford	Undergraduate Tutor	Oct 2008 – Dec 2008
ACO Associates cc	Associate, Heritage & archaeological consultant	Jan 2011 – Dec 2013
ASHA Consulting (Pty) Ltd	Director, Heritage & archaeological consultant	Jan 2014 –

Memberships and affiliations:

South African Archaeological Society Council member	2004 –
Assoc. Southern African Professional Archaeologists (ASAPA) member	2006 –
ASAPA Cultural Resources Management Section member	2007 –
UCT Department of Archaeology Research Associate	2013 –
Heritage Western Cape APM Committee member	2013 –
UNISA Department of Archaeology and Anthropology Research Fellow	2014 –
Fish Hoek Valley Historical Association	2014 –

Professional Accreditation:

ASAPA membership number: 233, CRM Section member

Principal Investigator:	Coastal shell middens (awarded 2007)
	Stone Age archaeology (awarded 2007)
	Grave relocation (awarded 2014)
Field Director:	Rock art (awarded 2007)
	Colonial period archaeology (awarded 2007)

Fieldwork and project experience:

Extensive fieldwork as both Field Director and Principle Investigator throughout the Western and Northern Cape, and also in the western parts of the Free State and Eastern Cape as follows:

Phase 1 surveys and impact assessments:

- Project types
  - Notification of Intent to Develop applications (for Heritage Western Cape)
  - Heritage Impact Assessments (largely in the Environmental Impact Assessment or Basic Assessment context under NEMA and Section 38(8) of the NHRA, but also self-standing assessments under Section 38(1) of the NHRA)
  - Archaeological specialist studies
  - Phase 1 test excavations in historical and prehistoric sites
  - Archaeological research projects
- Development types
  - Mining and borrow pits
  - Roads (new and upgrades)
  - Residential, commercial and industrial development
  - Dams and pipe lines
  - Power lines and substations
  - Renewable energy facilities (wind energy, solar energy and hydro-electric facilities)

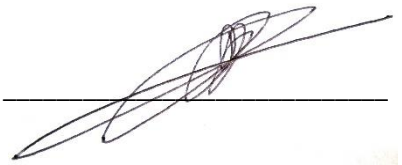
Phase 2 mitigation and research excavations:

- ESA open sites
  - Duinefontein, Gouda
- MSA rock shelters
  - Fish Hoek, Yzerfontein, Cederberg, Namaqualand
- MSA open sites
  - Swartland, Bushmanland, Namaqualand
- LSA rock shelters
  - Cederberg, Namaqualand, Bushmanland
- LSA open sites (inland)
  - Swartland, Franschhoek, Namaqualand, Bushmanland
- LSA coastal shell middens
  - Melkbosstrand, Yzerfontein, Saldanha Bay, Paternoster, Dwarskersbos, Infanta, Knysna, Namaqualand
- LSA burials
  - Melkbosstrand, Saldanha Bay, Namaqualand, Knysna
- Historical sites
  - Franschhoek (farmstead and well), Waterfront (fort, dump and well), Noordhoek (cottage), variety of small excavations in central Cape Town and surrounding suburbs
- Historic burial grounds
  - Green Point (Prestwich Street), V&A Waterfront (Marina Residential), Paarl

APPENDIX 2 - Specialist Declaration

I, Jayson Orton, as the appointed independent specialist, in terms of the 2014 EIA Regulations, hereby declare that I:

- I act as the independent specialist in this application;
- I perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I have no vested interest in the proposed activity proceeding;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- I have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- all the particulars furnished by me in this specialist input/study are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the specialist: 

Name of Specialist: JAYSON ORTON

Date: 01 FEBRUARY 2016