ARCHAEOLOGICAL WALK-DOWN SURVEY FOR

THE PROPOSED HELIOS 50KV POWER LINE NEAR LOERIESFONTEIN, HANTAM LOCAL MUNICIPALITY OF THE NAMAKWA DISTRICT, NORTHERN CAPE

(Required as a condition of authorisation).

Type of development:

Power Line

Client:

Aecom

Client info:

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Project Reference:
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Project Name	**Helios Power Line**
Report Title	Heritage walk down Helios Power Line
Authority Reference Number	DEA 14/12/16/3/3/1/1247
Report Status	Final Report
Applicant Name	**Transnet SOC and Eskom Holdings SOC Limited (Eskom)**

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EXECUTIVE SUMMARY

An Archaeological Impact Assessment (Magoma 2014) was conducted for the proposed Helios power line. HCAC was subsequently appointed by Aecom to conduct a Heritage Walk Down of the proposed power line in fulfilment of the conditions of the EMPr.

At the start of the survey a marked paucity of Stone Age material was noticed and is consistent with the observations made for the area (van Schalkwyk 2011, Fourie 2011, van der Walt 2011 & 2012, Morris 2013; and Orton 2014). The study area is characterised by highly eroded undulating surfaces and plains that lack features that might have focused past human activity. A contrast to this type of environment is noted to the north, west and south of the current study area where numerous small hills and pans occur. On the crests of these small hills several LSA sites are recorded (van Schalkwyk 2011, Webley and Halkett 2012, Orton 2014, van der Walt 2015). Further away, in the area around Klawervlei and Waterkuil (Morris 2013) Later Stone Age sites on dunes at the fringes of pans are plentiful. From these studies, it is clear that the distribution of sites may be highly structured relative to resources, principally water (e.g. Beaumont *et al*. 1995) and on the crests of small hills.

Previous studies by van Schalkwyk (2011), Morris (2013) and Orton (2014) also cover sections of the power line, mostly close to the Helios substation and recorded no sites of significance impacted on by the proposed power line although some Stone Age artefacts and farm steads have been recorded. During the walkthrough for the project that focussed on the proposed tower positions widely and highly weathered Middle Stone Age artefacts were recorded as well as a farmstead located 120 meters to the east of the proposed power line. The Stone Age artefacts are ascribable to background scatter and are of low significance. The farmstead forms part of the cultural landscape which, in the immediate vicinity of the study area, has been compromised by the construction of railway lines, gravel roads, power lines and the Helios Substation.

The impact of the proposed project on heritage resources is considered low and it is recommended that the proposed project can commence (subject to approval from SAHRA) on the condition that a chance find procedure is implemented.

Abbreviations

AIA: Archaeological Impact Assessment
ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
BIA: Basic Impact Assessment
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRR: Comments and Response Report
CRM: Cultural Resource Management
DEA: Department of Environmental Affairs
EA: Environmental Authorisation
EAP: Environmental Assessment Practitioner
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment*
EIA: Early Iron Age*
EIA Practitioner: Environmental Impact Assessment Practitioner
EMP: Environmental Management Programme
ESA: Early Stone Age
ESIA: Environmental and Social Impact Assessment
GIS Geographical Information System
GPS: Global Positioning System
GRP Grave Relocation Plan
HIA: Heritage Impact Assessment
LIA: Late Iron Age
LSA: Late Stone Age
MEC: Member of the Executive Council
MIA: Middle Iron Age
MPRDA: Mineral and Petroleum Resources Development Act
MSA: Middle Stone Age
NEMA National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NID Notification of Intent to Develop
NoK Next-of-Kin
PRHA: Provincial Heritage Resource Agency
SADC: Southern African Development Community
SAHRA: South African Heritage Resources Agency

**Although EIA refers to both Environmental Impact Assessment and the Early Iron Age both are internationally accepted abbreviations and must be read and interpreted in the context it is used.*

Glossary

Archaeological site (remains of human activity over 100 years old)

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

The Iron Age (~ AD 400 to 1840)

Historic (~ AD 1840 to 1950)

Historic building (over 60 years old)

Contents

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1. INTRODUCTION

HCAC was appointed by Aecom to conduct a Heritage Walk Down for the Helios power line in the Northern Cape (Figure 1 – 3). This is in fulfilment of the requirements of one of the Environmental Authorisation conditions. The aim of the study is to survey the proposed development footprint to identify cultural heritage sites, document, and assess their importance within local, provincial and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the developer in managing the discovered heritage resources in a responsible manner. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

The report outlines the approach and methodology utilized before and during the survey, which includes: Phase 1, review of the HIA/AIA for the Helios power line by Magoma (2014); Phase 2, the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

General site conditions and features on sites were recorded by means of photographs, GPS locations, and site descriptions.

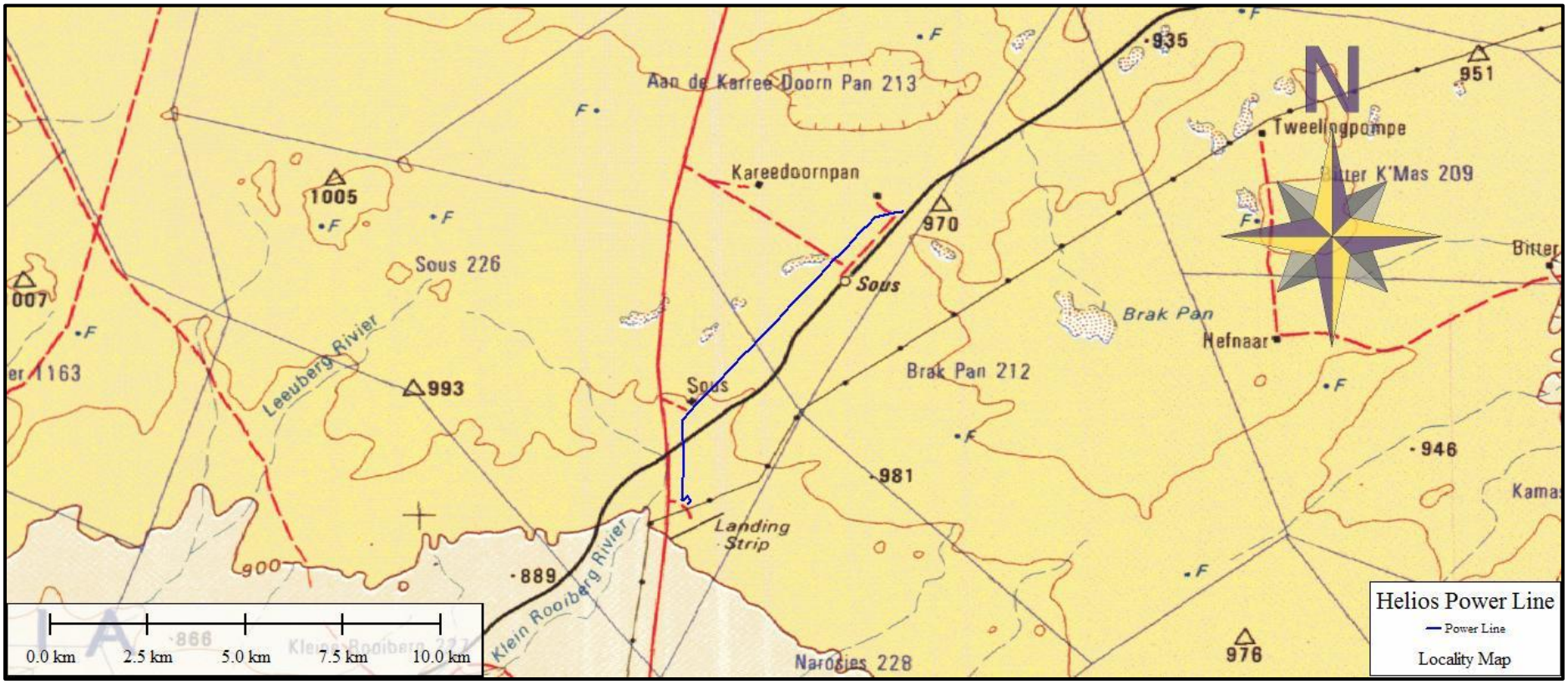

Figure 1: Provincial locality map.

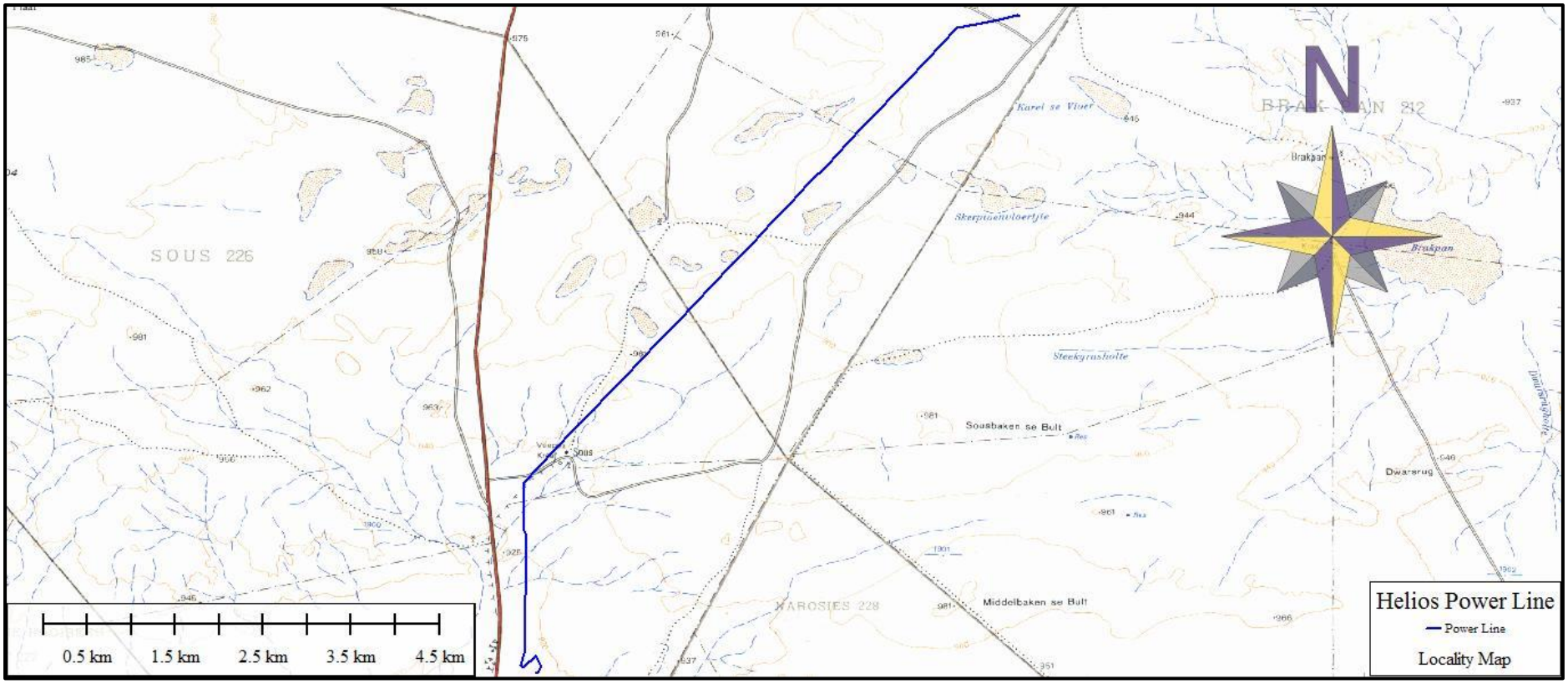

Figure 2. Regional locality map indicating the study area in blue.

Figure 3. Google Earth image indicating the study area in blue.

2. PROJECT DESCRIPTION

It is proposed to construct a 50-kV power line that will run in a north-easterly to south-westerly direction for approximately 9km between the Helios Substation, north of Loeriesfontein, and the proposed Transnet Helios Traction Feeder Substation to be located alongside the Sishen-Saldanha Railway Line. Excluding structures within the limits of the existing Helios Substation, the proposed line would require a total of forty pylon structures.

2.1. Terms of reference

This Heritage Walk Down report was compiled by HCAC for the proposed development and construction of the Helios Power Line based on the requirements of the NHRA (no 25 of 1999) and the National Environmental Management Act (NEMA) (no 107 of 1998).

The process consisted of three phases:

- Phase 1, review of the existing HIA/AIA for the Helios power line;
- Phase 2, the physical surveying of the area on foot and by vehicle;
- Phase 3, reporting the outcome of the study.

2.2. Scope and purpose of the report

The report is intended to report on any heritage resources that might occur within the final footprint of the proposed power line and make recommendations for any mitigation measures that may need to be implemented prior to construction.

2.3. Specialist Qualifications

Jaco van der Walt has been practising as a CRM archaeologist for 15 years. He obtained an MA degree in Archaeology from the University of the Witwatersrand focussing on the Iron Age in 2012 and is a PhD candidate at the University of Johannesburg focussing on Stone Age Archaeology with specific interest in the Middle Stone Age (MSA) and Later Stone Age (LSA). Jaco is an accredited member of ASAPA (#159) and have conducted more than 500 impact assessments in Limpopo, Mpumalanga, North West, Free State, Gauteng, KZN as well as he Northern and Eastern Cape Provinces in South Africa.

Jaco has worked on various international projects in Zimbabwe, Botswana, Mozambique, Lesotho, DRC Zambia and Tanzania. Through this he has a sound understanding of the IFC Performance Standard requirements, with specific reference to Performance Standard 8 – Cultural Heritage.

2.4. Physical surveying

The proposed power line measures approximately 9km. Due to the nature of cultural remains, with the majority of artefacts occurring below surface, an intensive foot-survey that covered the study area was conducted (Figure 4 & 5). A non-intrusive pedestrian survey was conducted during the week of 19th June by a professional archaeologist. Identified sites are plotted on 1:50 000 maps and their GPS co-ordinates documented. In addition, digital photographs were used to document the area.

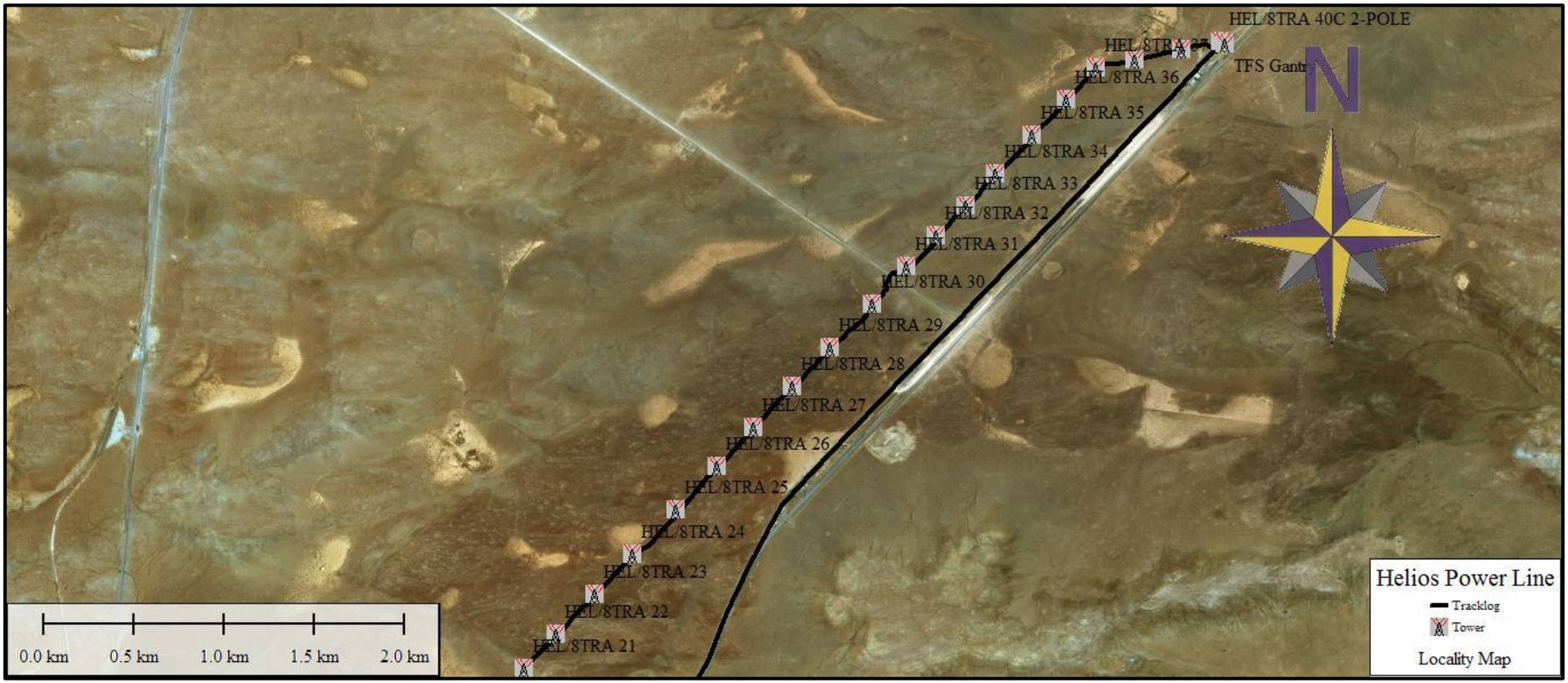

Figure 4. Track logs of the survey.

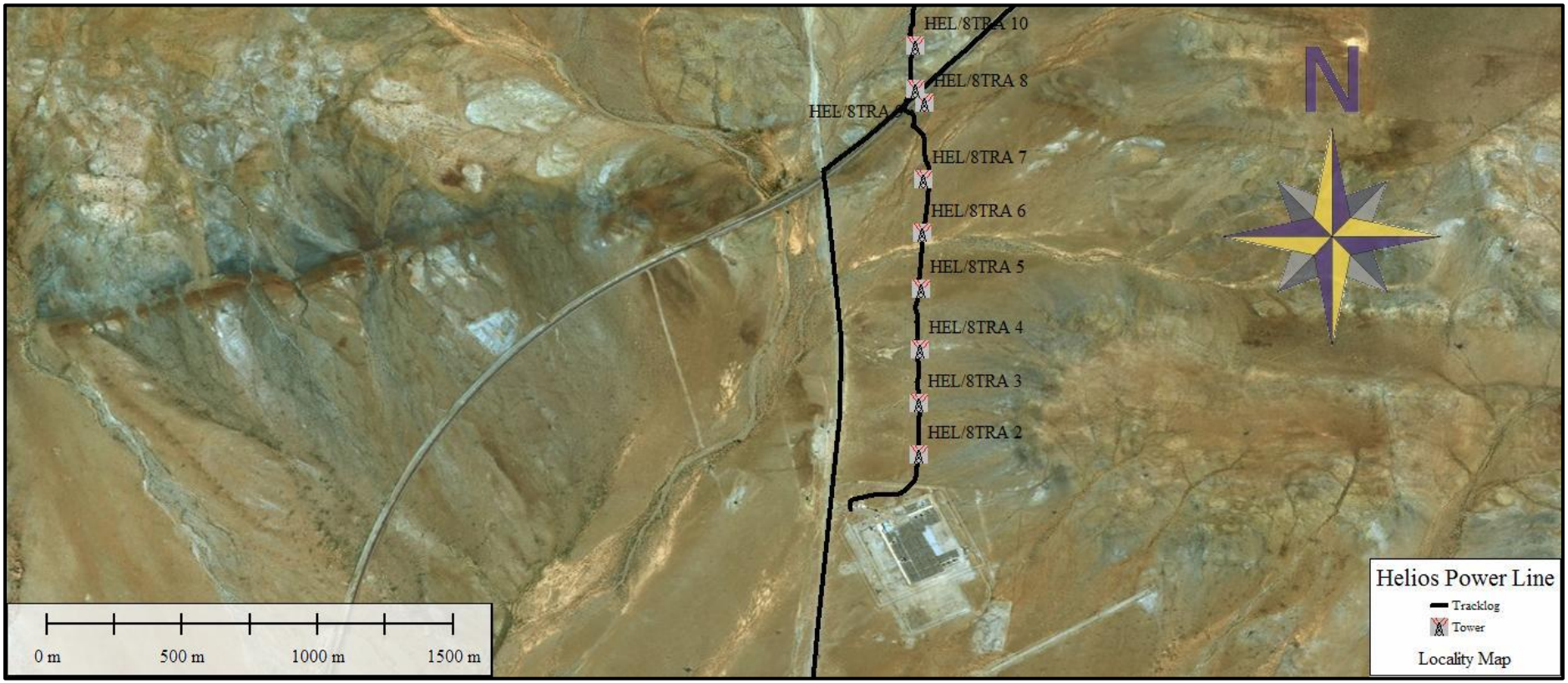

Figure 5: Track logs of the survey.

3. HERITAGE LEGISLATION

The identification, evaluation and assessment of any cultural heritage site, artefact or find in the South African context is required and governed by the following legislation:

i. National Environmental Management Act (NEMA), Act 107 of 1998
ii. National Heritage Resources Act (NHRA), Act 25 of 1999
iii. Mineral and Petroleum Resources Development Act (MPRDA), Act 28 of 2002

The following sections in each Act refer directly to the identification, evaluation and assessment of cultural heritage resources.

i. National Environmental Management Act (NEMA) Act 107 of 1998:
    a. Basic Environmental Assessment (BEA) – Section (23) (2)(d)
    b. Environmental Scoping Report (ESR) – Section (29) (1)(d)
    c. Environmental Impact Assessment (EIA) – Section (32) (2)(d)
    d. Environmental Management Plan (EMP) – Section (34) (b)
ii. National Heritage Resources Act (NHRA) Act 25 of 1999:
    a. Protection of Heritage Resources – Sections 34 to 36; and
    b. Heritage Resources Management – Section 38
iii. Mineral and Petroleum Resources Development Act (MPRDA) Act 28 of 2002:

3.1. Site Significance and Field Rating

Section 3 of the NHRA distinguishes nine criteria for places and objects to qualify as ‘part of the national estate’ if they have cultural significance or other special value. These criteria are:

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

The presence and distribution of heritage resources define a ‘heritage landscape’. In this landscape, every site is relevant. In addition, because heritage resources are non-renewable, heritage surveys need to investigate an entire project area, or a representative sample, depending on the nature of the project. In the case of the proposed project the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all initial investigations, however, the specialists are responsible only for the identification of resources visible on the surface. This section describes the evaluation criteria used for determining the significance of archaeological and heritage sites.

The following criteria were used to establish site significance with cognisance of Section 3 of the NHRA:

- The unique nature of a site;
- The integrity of the archaeological/cultural heritage deposits;
- The wider historic, archaeological and geographic context of the site;
- The location of the site in relation to other similar sites or features;
- The depth of the archaeological deposit (when it can be determined/is known);
- The preservation condition of the sites; and
- Potential to answer present research questions.

In addition to this criteria field ratings prescribed by SAHRA (2006), and acknowledged by ASAPA for the SADC region, were used for the purpose of this report. The recommendations for each site should be read in conjunction with section 10 of this report.

FIELD RATING	***GRADE***	***SIGNIFICANCE***	***RECOMMENDED MITIGATION***
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP. A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP. B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

3.2. Impact Assessment Methodology

The criteria below are used to establish the impact rating on sites:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- The **duration**, wherein it will be indicated whether:
  - the lifetime of the impact will be of a very short duration (0-1 years), assigned a score of 1;
  - the lifetime of the impact will be of a short duration (2-5 years), assigned a score of 2;
  - medium-term (5-15 years), assigned a score of 3;
  - long term (> 15 years), assigned a score of 4; or
  - permanent, assigned a score of 5;
  - The **magnitude**, quantified on a scale from 0-10 where; 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
  - The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5 where; 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
  - The **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
  - the **status**, which will be described as either positive, negative or neutral.
  - the degree to which the impact can be reversed.
  - the degree to which the impact may cause irreplaceable loss of resources.
  - the *degree* to which the impact can be mitigated.

The **significance** is calculated by combining the criteria in the following formula:
S=(E+D+M) P
S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

4. PROJECT HISTORY

This section of the report relates to the brief 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 may then be compared with what is already known in order to gain an improved understanding of the significance of the newly reported resources.

An AIA (Magoma 2014) was conducted for the Helios Power Line In the report the author describes several Stone Age occurrences although some of the photographs in the report are not stone tools. The farmstead on Sous was recorded as well as a possible grave. This possible grave feature is located outside of the impact area of the powerline. A Heritage Walk Down of the final power line and specifically the pylon positions prior to construction was recommended.

4.1. Stone Age

South Africa has a long and complex Stone Age sequence of more than 2 million years. The broad sequence includes the Later Stone Age, the Middle Stone Age and the Earlier Stone Age. Each of these phases contains sub-phases or industrial complexes, and within these we can expect regional variation regarding characteristics and time ranges. For Cultural Resources Management (CRM) purposes it is often only expected/ possible to identify the presence of the three main phases.

Yet sometimes the recognition of cultural groups, affinities or trends in technology and/or subsistence practices, as represented by the sub-phases or industrial complexes, is achievable (Lombard 2011). The three main phases can be divided as follows:

- Later Stone Age: associated with Khoi and San societies and their immediate predecessors. Recently to ~30 thousand years ago
- Middle Stone Age: associated with Homo sapiens and archaic modern humans. 30-300 thousand years ago.
- Earlier Stone Age: associated with early Homo groups such as Homo habilis and Homo erectus. 400 000-> 2 million years ago.

A marked paucity of Stone Age material is evident for the study area (Morris 2013; van der Walt 2011 & 2012 and Fourie 2011). The study area is characterised by highly eroded undulating surfaces and plains that lack features that might have focused past human activity. A contrast to this type of environment is noted to the west of the current study area where numerous small hills and pans occur. On the crests of these small hills several LSA sites is recorded (van Schalkwyk 2011, Webley and Halkett 2012, Orton 2014, van der Walt 2015). Further away, in the area around Klawervlei and Waterkuil (Morris 2013) Later Stone Age sites on dunes at the fringes of pans are plentiful. From these studies, it is clear that the distribution of sites may be highly structured relative to resources, principally water (e.g. Beaumont *et al*. 1995) and on the crests of small hills.

5. FINDINGS OF THE WALK DOWN SURVEY

The proposed line will follow an existing line (Figure 6) between the Helios substation (Figure 7) and the Transnet railway line. The area is rugged and falls within the bioregion described by Mucina et al (2006) as the Bushmanland Bioregion with the vegetation described as Bushmanland basin shrub land. The knee high bushy vegetation is sparse (Figure 8) and archaeological visibility is high. Apart from widespread occurrences of Stone Age material and the single farmstead no other heritage resources were noted (Table 1).

Figure 6: Existing power line.

Figure 7: Helios substation.

Figure 8: General site conditions.

Figure 9: General site conditions.

Table 1: Tower locations and observations

Tower/Feature No	Longitude	Latitude	Observation
HEL/8TRA 2	19° 33' 37.0817" E	30° 29' 44.3315" S	Sandy matrix
HEL/8TRA 3	19° 33' 37.1856" E	30° 29' 38.1960" S	Sandy matrix
HEL/8TRA 4	19° 33' 37.2949" E	30° 29' 31.7457" S	Shale and sandy matrix, no artefacts noted
HEL/8TRA 5	19° 33' 37.4156" E	30° 29' 24.6244" S	Shale and sandy matrix, no artefacts noted
HEL/8TRA 6	19° 33' 37.5289" E	30° 29' 17.9380" S	Shale and sandy matrix, no artefacts noted
HEL/8TRA 7	19° 33' 37.6375" E	30° 29' 11.5238" S	Shale exposures subject to considerable sheet erosion, no artefacts noted
HEL/8TRA 8	19° 33' 37.7921" E	30° 29' 02.3986" S	Shale exposures subject to considerable sheet erosion, no artefacts noted
HEL/8TRA 9	19° 33' 36.7200" E	30° 29' 00.7137" S	Shale exposures subject to considerable sheet erosion, no artefacts noted
HEL/8TRA 10	19° 33' 36.6798" E	30° 28' 55.5738" S	Shale exposures subject to considerable sheet erosion, no artefacts noted
HEL/8TRA 11	19° 33' 36.6276" E	30° 28' 48.9107" S	Shale exposures subject to considerable sheet erosion, no artefacts noted
HEL/8TRA 12	19° 33' 36.5835" E	30° 28' 43.2859" S	Shale exposures subject to considerable sheet erosion, no artefacts noted
HEL/8TRA 13	19° 33' 42.4133" E	30° 28' 37.1780" S	Sandy matrix with some shale
HEL/8TRA 14	19° 33' 48.6480" E	30° 28' 30.6456" S	Sandy matrix with some shale
HEL/8TRA 15	19° 33' 55.0069" E	30° 28' 23.9826" S	Shale exposures subject to considerable sheet erosion, no artefacts noted
HEL/8TRA 16	19° 34' 01.7847" E	30° 28' 16.8805" S	Shale exposures subject to considerable sheet erosion with some gravel, no artefacts noted r
HEL/8TRA 17	19° 34' 07.7915" E	30° 28' 10.5858" S	Shale exposures subject to considerable sheet erosion with some gravel, no artefacts noted
HEL/8TRA 18	19° 34' 13.6139" E	30° 28' 04.4841" S	Shale exposures subject to considerable sheet erosion with some gravel, no artefacts noted
HEL/8TRA 19	19° 34' 19.5922" E	30° 27' 58.2187" S	Sandy matrix with some fine calcrete nodules
HEL/8TRA 20	19° 34' 26.3627" E	30° 27' 51.1228" S	Sandy matrix with some fine calcrete nodules
HEL/8TRA 21	19° 34' 33.2595" E	30° 27' 43.8941" S	Calcrete substrata (nodular) with some gravel no tools
HEL/8TRA 22	19° 34' 39.0871" E	30° 27' 37.7857" S	Calcrete substrata (nodular) with some gravel no tools
HEL/8TRA 23	19° 34' 45.9247" E	30° 27' 30.6183" S	Shale exposures subject to considerable sheet erosion no artefacts noted
HEL/8TRA 24	19° 34' 52.8081" E	30° 27' 23.4025" S	Calcrete substrata (nodular) with some gravel no tools
HEL/8TRA 25	19° 35' 00.4034" E	30° 27' 15.4400" S	Calcrete substrata (nodular) with some gravel no tools
HEL/8TRA 26	19° 35' 07.8100" E	30° 27' 07.6748" S	Calcrete substrata (nodular) with some gravel no tools
HEL/8TRA 27	19° 35' 14.3692" E	30° 27' 00.7976" S	Calcrete substrata (nodular) with some gravel no tools
HEL/8TRA 28	19° 35' 21.3380" E	30° 26' 53.4907" S	Calcrete substrata (nodular) with some gravel no tools
HEL/8TRA 29	19° 35' 28.0826" E	30° 26' 46.4184" S	Calcrete substrata (nodular) with some gravel no tools

HEL/8TRA 30	19° 35' 35.5115" E	30° 26' 38.6281" S	Shale exposures subject to considerable sheet erosion no artefacts noted
HEL/8TRA 31	19° 35' 41.7700" E	30° 26' 32.0649" S	Shale exposures subject to considerable sheet erosion no artefacts noted
HEL/8TRA 32	19° 35' 47.0691" E	30° 26' 26.5075" S	Shale exposures subject to considerable sheet erosion no artefacts noted
HEL/8TRA 33	19° 35' 52.2354" E	30° 26' 21.0891" S	Shale exposures subject to considerable sheet erosion no artefacts noted
HEL/8TRA 34	19° 35' 57.5445" E	30° 26' 15.5208" S	Shale exposures subject to considerable sheet erosion no artefacts noted
HEL/8TRA 35	19° 36' 04.2585" E	30° 26' 08.4785" S	Shale exposures subject to considerable sheet erosion no artefacts noted
HEL/8TRA 36	19° 36' 10.3138" E	30° 26' 02.1269" S	Shale exposures subject to considerable sheet erosion no artefacts noted
HEL/8TRA 37	19° 36' 15.6795" E	30° 25' 56.4983" S	Shale exposures subject to considerable sheet erosion no artefacts noted
HEL/8TRA 38	19° 36' 22.6103" E	30° 25' 55.0024" S	Shale exposures subject to considerable sheet erosion no artefacts noted
HEL/8TRA 39	19° 36' 30.9514" E	30° 25' 53.2018" S	Shale exposures subject to considerable sheet erosion no artefacts noted
HEL/8TRA 40	19° 36' 37.9097" E	30° 25' 51.6996" S	Calcrete nodules no artefacts noted
Sous Farmstead	19° 33' 52.5131" E	30° 28' 32.2610" S	Structure older than 60 years. Will not be directly impacted

5.1. Built Environment (Section 34 of the NHRA)

A single standing structure older than 60 years occurs in the study area. This vernacular building that is currently occupied was recorded as **Sous Farmstead**. This same feature was recorded by Orton (2014) and Magoma (2014). Artefacts like glass and metal fragments are scattered over the site and at least two middens with historical debris are located to the north west of the house. The house consists of a flat roof with wooden windows but was later added onto. The site is located approximate 122 meters to the east of the proposed power line and will not be directly impacted on. The existing power line has already impacted on the sense of place and the additional power line will not significantly impact further.

Figure 10: Existing power line adjacent to the farmstead marked in red.

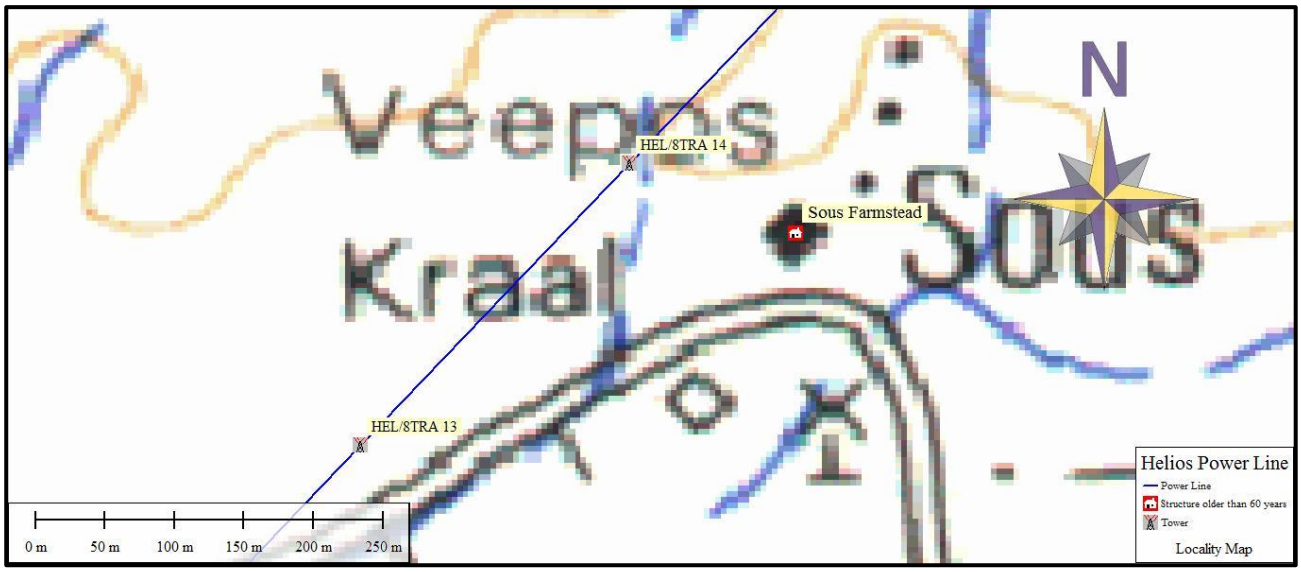

Figure 11: Location of Sous farmstead in relation to the proposed powerline.

5.2. Archaeological and Palaeontological Resources (Section 35 of the NHRA)

A marked paucity of Stone Age material is evident for the study area (Morris 2013; van der Walt 2011 & 2012 and Fourie 2011). The study area is characterised by highly eroded undulating surfaces and plains that lack features that might have focused past human activity. A contrast to this type of environment is noted to the north, west and the south of the current study area where numerous small hills and pans occur. On the crests of these small hills several LSA sites are recorded (van Schalkwyk 2011, Webley and Halkett 2012, Orton 2014, van der Walt 2015). Further away, in the area around Klawervlei and Waterkuil (Morris 2013) Later Stone Age sites on dunes at the fringes of pans are plentiful. From these studies, it is clear that the distribution of sites may be highly structured relative to resources, principally water (e.g. Beaumont et al. 1995) and on the crests of small hills.

A low-density scatter of mostly weather Middle Stone Age artefacts was noted in the area but will not be directly impacted on by the construction of the pylon positions. These isolated artefacts are ascribed as background scatter and was not point plotted. These artefacts consist mostly of flakes on Hornfells and CCS. These artefacts are scattered too sparsely to be of any significance apart from noting their presence which had been done in this report.

Figure 12. Dorsal view of artefacts found in the study area.

The site lies within an area of moderate to high palaeontological sensitivity (Figure 13). The study area is underlain by marine to freshwater sediments of the Ecca Group (Karoo Supergroup) that are of Early to Mid-Permian age.

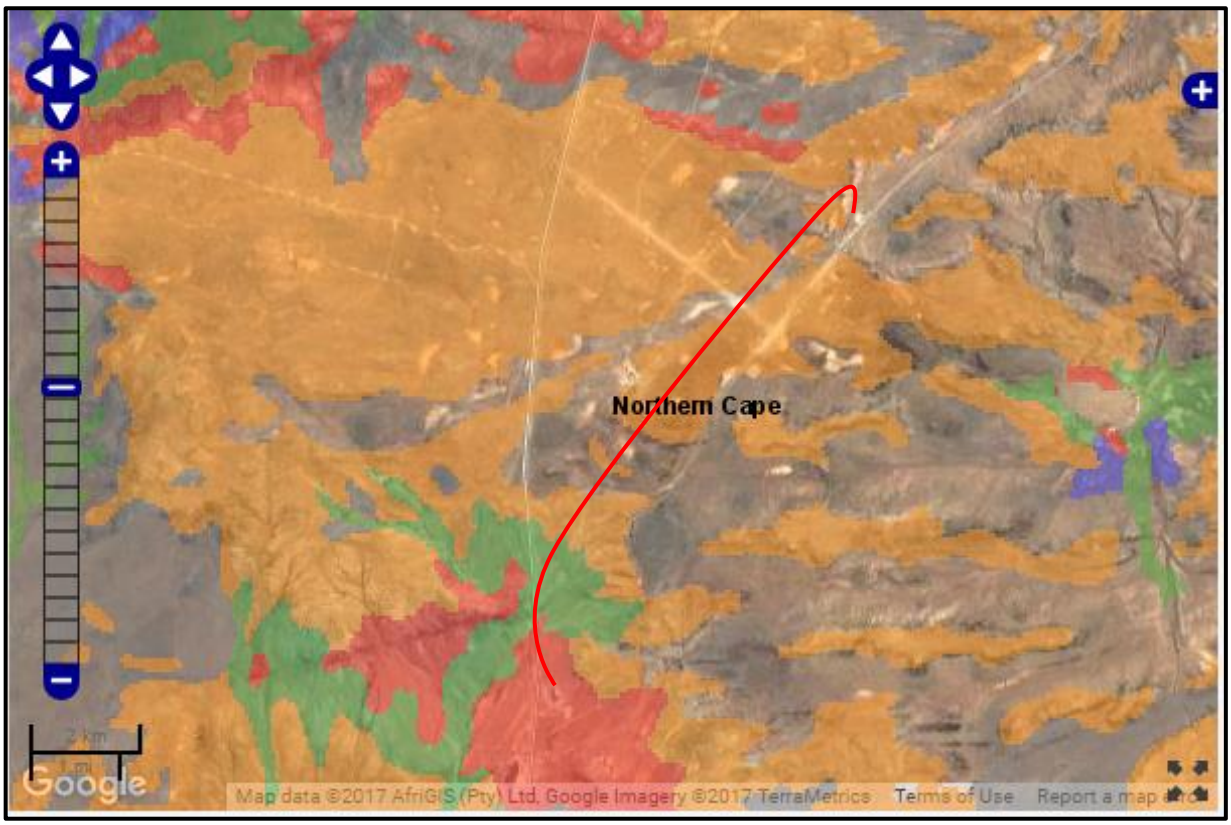

Figure 13: Extract from the SAHRIS Palaeontological sensitivity map showing the study area (red line) to be of moderate and high palaeontological sensitivity (green shading & orange shading).

5.3. Burial Grounds and Graves (Section 36 of the NHRA)

In terms of Section 36 of the Act no burial sites were recorded.

5.4. Cultural Landscapes, Intangible and Living Heritage.

The landscape in the immediate area is largely natural and has been fallow for a number of years, possibly used for grazing in the past. Several intrusive modern infrastructural components (gravel roads, railway lines, power lines, substation) occur and the new line will run parallel to an existing line as well as a wind farm. This landscape is not sensitive and therefore long-term impact on the cultural landscape is considered to be negligible.

5.5. Battlefields and Concentration Camps

There are no battlefields or concentration camp sites close to the study area.

6. ASSUMPTIONS AND LIMITATIONS

Due to the subsurface nature of archaeological artefacts, the possibility exists that some features or artefacts may not have been discovered/recorded during the survey and the possible occurrence of unmarked graves and other cultural material cannot be excluded. Similarly, the depth of the deposit of heritage sites cannot be accurately determined due its subsurface nature. This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on palaeontology, medicinal plants and intangible heritage as it is assumed that these components would have been highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of this Impact Assessment.

7. IMPACT ASSESSMENT

7.1. Potential Impact

The chance of impacting on unknown archaeological sites in the study area is considered to be negligible. Any direct impacts that did occur would be during the construction phase only and would be of low significance. Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. In the case of the development, it will, with the recommended mitigation measures and management actions, not impact any heritage resources directly. However, this and other projects in the area could have an indirect impact on the larger heritage landscape. The lack of any heritage resources in the immediate area and the extensive railroad activities minimises additional impact on the landscape.

7.1.1. Pre-Construction phase:
It is assumed that the pre-construction phase involves the removal of topsoil and vegetation as well as the establishment of infrastructure needed for the construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

7.1.2. Construction Phase
During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. These activities can have a negative and irreversible impact on heritage sites. Impacts include destruction or partial destruction of non-renewable heritage resources.

7.1.3. Operation Phase:
No impact is envisaged during this phase.

Table 2.Impact Assessment table.

Nature: During the construction phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects.		
	Without mitigation	**With mitigation (Preservation/ excavation of site)**
Extent	Local (1)	Local (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Low (2)	Low (2)
Probability	Not probable (2)	Not probable (2)
Significance	**16 (Low)**	**16 (Low)**
Status (positive or negative)	Negative	Negative
Reversibility	Not reversible	Not reversible
Irreplaceable loss of resources?	No resources were recorded	No resources were recorded.
Can impacts be mitigated?	Yes, a chance find procedure should be implemented.	Yes
Mitigation: A Chance Find Procedure should be implemented for the project should any stratified deposits be exposed during the construction process.		

8. CONCLUSION AND RECOMMENDATIONS

At the start of the survey a marked paucity of Stone Age material was noticed and is consistent with the observations made for the area (van Schalkwyk 2011, Fourie 2011, van der Walt 2011 & 2012, Morris 2013; and Orton 2014). The study area is characterised by highly eroded undulating surfaces and plains that lack features that might have focused past human activity. A contrast to this type of environment is noted to the north, west and south of the current study area where numerous small hills and pans occur. On the crests of these small hills several LSA sites have been recorded (van Schalkwyk 2011, Webley and Halkett 2012, Orton 2014, van der Walt 2015). Further away, in the area around Klawervlei and Waterkuil (Morris 2013) Later Stone Age sites on dunes at the fringes of pans are plentiful. From these studies, it is clear that the distribution of sites may be highly structured relative to resources, principally water (e.g. Beaumont et al. 1995) and on the crests of small hills.

Previous studies by van Schalkwyk (2011), Morris (2013) and Orton (2014) also cover sections of the power line, mostly close to the Helios substation and recorded no sites of significance impacted on by the proposed power line although some Stone Age artefacts and farm steads have been recorded. During the walkthrough for the project that focussed on the proposed tower positions widely and highly weathered Middle Stone Age artefacts were recorded as well as a farmstead located 120 meters to the east of the proposed power line, that will not be impacted on directly. The Stone Age artefacts are ascribable to background scatter and are of low significance. The farmstead forms part of the cultural landscape which, in the immediate vicinity of the study area, has been compromised by the construction of railway lines, gravel roads, power lines and the Helios Substation. This vernacular building was also recorded by Orton (2014) and Magoma (2014).

According to the SAHRIS palaeontological sensitivity map the area is of moderate to high palaeontological sensitivity. Palaeontological impact assessments for the area (e.g., Almond 2011) recommended that a chance find procedure should be implemented for the construction phase.

In terms of Section 36 of the Act no burial sites were recorded. However, if any graves are located in future they should ideally be preserved *in-situ* or alternatively relocated according to existing legislation. No public monuments are located within or close to the study area. The study area is surrounded by gravel roads, power lines and railroad infrastructure and the proposed development will not impact negatively on significant cultural landscapes or viewscapes.

The impact of the proposed project on heritage resources is considered low and it is recommended that the proposed project can commence (subject to approval from SAHRA) on the condition that a chance find procedure is implemented.

8.1. Chance Find Procedures

The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find and therefor chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below.

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

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Webley,L. and Halkett, D. 2012. Heritage Impact Assessment Proposed Loeriesfontein Photo Voltaic Plant on Portion 5 of the farm Klein Rooiberg 227. Northern Cape Province. Unpublished report.

APPENDIX 1 – Curriculum Vitae

Jaco van der Walt
Archaeologist

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Education:

Particulars of degrees/diplomas and/or other qualifications:

Name of University or Institution:		University of Pretoria
Degree obtained	**:**	BA Heritage Tourism & Archaeology
Year of graduation	**:**	2001
Name of University or Institution:		University of the Witwatersrand
Degree obtained	**:**	BA Hons Archaeology
Year of graduation	**:**	2002
Name of University or Institution	**:**	University of the Witwatersrand
Degree Obtained	**:**	MA (Archaeology)
Year of Graduation	:	2012
Name of University or Institution	**:**	University of Johannesburg
Degree	**:**	PhD
Year	:	Currently Enrolled

EMPLOYMENT HISTORY:

2011 – Present:	**Owner – HCAC (Heritage Contracts and Archaeological Consulting CC)**.
2007 – 2010 :	**CRM Archaeologist,** Managed the Heritage Contracts Unit at the University of the Witwatersrand.
2005 - 2007:	**CRM Archaeologist**, Director of Matakoma Heritage Consultants
2004:	**Technical Assistant**, Department of Anatomy University of Pretoria
2003:	**Archaeologist**, Mapungubwe World Heritage Site
2001 - 2002:	**CRM Archaeologists,** For R & R Cultural Resource Consultants, Polokwane
2000:	**Museum Assistant**, Fort Klapperkop.

Countries of work experience include:

Republic of South Africa, Botswana, Zimbabwe, Mozambique, Tanzania, The Democratic Republic of the Congo, Lesotho and Zambia.

SELECTED PROJECTS INCLUDE:

Archaeological Impact Assessments (Phase 1)

Heritage Impact Assessment Proposed Discharge Of Treated Mine Water Via The Wonderfontein Spruit Receiving Water Body. Specialist as part of team conducting an Archaeological Assessment for the Mmamabula mining project and power supply, Botswana

Archaeological Impact Assessment Mmamethlake Landfill

Archaeological Impact Assessment Libangeni Landfill

Linear Developments

Archaeological Impact Assessment Link Northern Waterline Project At The Suikerbosrand Nature Reserve

Archaeological Impact Assessment Medupi – Spitskop Power Line,

Archaeological Impact Assessment Nelspruit Road Development

Renewable Energy developments

Archaeological Impact Assessment Karoshoek Solar Project

Grave Relocation Projects

Relocation of graves and site monitoring at Chloorkop as well as permit application and liaison with local authorities and social processes with local stakeholders, Gauteng Province.

Relocation of the grave of Rifle Man Maritz as well as permit application and liaison with local authorities and social processes with local stakeholders, Ndumo, Kwa Zulu Natal.

Relocation of the Magolwane graves for the office of the premier, Kwa Zulu Natal

Relocation of the OSuthu Royal Graves office of the premier, Kwa Zulu Natal

Phase 2 Mitigation Projects

Field Director for the Archaeological Mitigation For Booysendal Platinum Mine, Steelpoort, Limpopo Province. Principle investigator Prof. T. Huffman

Monitoring of heritage sites affected by the ARUP Transnet Multipurpose Pipeline under directorship of Gavin Anderson.

Field Director for the Phase 2 mapping of a late Iron Age site located on the farm Kameelbult, Zeerust, North West Province. Under directorship of Prof T. Huffman.

Field Director for the Phase 2 surface sampling of Stone Age sites effected by the Medupi – Spitskop Power Line, Limpopo Province

Heritage management projects

Platreef Mitigation project – mitigation of heritage sites and compilation of conservation management plan.

MEMBERSHIP OF PROFESSIONAL ASSOCIATIONS:

- Association of Southern African Professional Archaeologists. Member number 159

  Accreditation:
  - Field Director Iron Age Archaeology
  - Field Supervisor Colonial Period Archaeology, Stone Age Archaeology and Grave Relocation
- Accredited CRM Archaeologist with SAHRA
- Accredited CRM Archaeologist with AMAFA
- Co-opted council member for the CRM Section of the Association of Southern African Association Professional Archaeologists (2011 – 2012)

PUBLICATIONS AND PRESENTATIONS

- A Culture Historical Interpretation, Aimed at Site Visitors, of the Exposed Eastern Profile of K8 on the Southern terrace at Mapungubwe.
  - J van der Walt, A Meyer, WC Nienaber
  - Poster presented at Faculty day, Faculty of Medicine University of Pretoria 2003
- 'n Reddingsondersoek na Anglo-Boereoorlog-ammunisie, gevind by Ifafi, Noordwes-Provinsie. South-African Journal for Cultural History 16(1) June 2002, with A. van Vollenhoven as co-writer.
- Fieldwork Report: Mapungubwe Stabilization Project.
  - WC Nienaber, M Hutten, S Gaigher, J van der Walt
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2004
- A War Uncovered: Human Remains from Thabantšho Hill (South Africa), 10 May 1864.
  - M. Steyn, WS Boshoff, WC Nienaber, J van der Walt
  - Paper read at the 12th Congress of the Pan-African Archaeological Association for Prehistory and Related Studies 2005
- Field Report on the mitigation measures conducted on the farm Bokfontein, Brits, North West Province .
  - J van der Walt, P Birkholtz, W. Fourie
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2007
- Field report on the mitigation measures employed at Early Farmer sites threatened by development in the Greater Sekhukhune area, Limpopo Province. J van der Walt
  - Paper read at the Southern African Association of Archaeologists Biennial Conference 2008
- Ceramic analysis of an Early Iron Age Site with vitrified dung, Limpopo Province South Africa.
  - J van der Walt. Poster presented at SAFA, Frankfurt Germany 2008

- Bantu Speaker Rock Engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga (*In Prep)*
    - J van der Walt and J.P Celliers
- Sterkspruit: Micro-layout of late Iron Age stone walling, Lydenburg, Mpumalanga. W. Fourie and J van der Walt. A Poster presented at the Southern African Association of Archaeologists Biennial Conference 2011
- Detailed mapping of LIA stone-walled settlements' in Lydenburg, Mpumalanga. J van der Walt and J.P Celliers
    - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Bantu-Speaker Rock engravings in the Schoemanskloof Valley, Lydenburg District, Mpumalanga. J.P Celliers and J van der Walt
    - Paper read at the Southern African Association of Archaeologists Biennial Conference 2011
- Pleistocene hominin land use on the western trans-Vaal Highveld ecoregion, South Africa, Jaco van der Walt.
    - J van der Walt. Poster presented at SAFA, Toulouse, France.
      Biennial Conference 2016

REFERENCES:

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