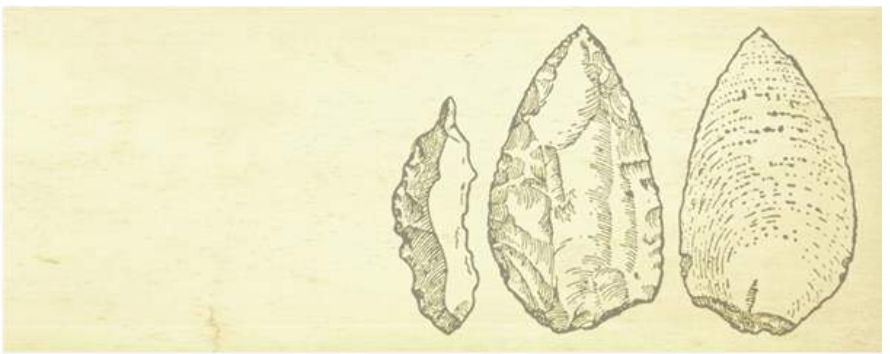




CTS HERITAGE

## APPENDICES

### APPENDIX 1: Specialist Archaeology Assessment



## PHASE 1 AIA FIELD REPORT PROPOSED DEVELOPMENT OF 132KV POWERLINE NEAR OLIFANTSHOEK, NORTHERN CAPE PROVINCE

PROPOSED DEVELOPMENT OF 132KV POWERLINE FROM THE EMIL SUBSTATION TO  
THE SOON-TO-BE CONSTRUCTED OLIFANTSHOEK SUBSTATION NEAR THE TOWN OF  
OLIFANTSHOEK, GAMAGARA LOCAL MUNICIPALITY, JOHN TAOLO GAETSEWE  
DISTRICT MUNICIPALITY, NORTHERN CAPE

### PREPARED FOR:

CTS HERITAGE

### PREPARED BY:

JAN ENGELBRECHT & HEIDI FIVAZ

UBIQUE HERITAGE CONSULTANTS

12 FEBRUARY 2020

**Client:** CTS HERITAGE

16 Edison Way, Century City  
Tel: +27 (0)87 073 5739, Cell: +27 (0)83 619 0854  
info@ctsheritage.com \* www.ctsheritage.com

**Contact Person:** Jenna Lavin  
E-mail: jenna.lavin@ctsheritage.com

**Heritage Consultant:** UBIQUE Heritage Consultants

**Contact Person:** Jan Engelbrecht (archaeologist and lead CRM specialist)  
Member of the Association of Southern African Professional  
Archaeologists: Member number: 297  
Cell: (+27) 0828456276  
E-mail: jan@ubiquecrm.com

Heidi Fivaz (archaeologist)  
Member of the Association of Southern African Professional  
Archaeologists: Member number: 433  
Cell: (+27) 0721418860  
E-mail: heidi@ubiquecrm.com

For this project, Mr Engelbrecht was responsible for the field survey of the development footprint, identification of heritage resources, and recommendations. Ms Fivaz was responsible for report compilation.

**Declaration of independence:**

We, Jan Engelbrecht and Heidi Fivaz, partners of UBIQUE Heritage Consultants, hereby confirm our independence as heritage specialists and declare that:

- we are suitably qualified and accredited to act as independent specialists in this application;
- we do not have any vested interests (either business, financial, personal or other) in the proposed development project other than remuneration for the heritage assessment and heritage management services performed;
- the work was conducted in an objective and ethical manner, in accordance with a professional code of conduct and within the framework of South African heritage legislation.



**Signed:**  
J.A.C. Engelbrecht & H. Fivaz  
UBIQUE Heritage Consultants

**Date:** 2020-02-12

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## ABBREVIATIONS

AIA:	Archaeological Impact Assessment
ASAPA:	Association of South African Professional Archaeologists
BIA:	Basic Impact Assessment
CRM:	Cultural Resource Management
ECO:	Environmental Control Officer
EIA:	Environmental Impact Assessment*
EIA:	Early Iron Age*
EMP:	Environmental Management Plan
ESA:	Earlier Stone Age
GPS:	Global Positioning System
HIA:	Heritage Impact Assessment
LIA:	Late Iron Age
LSA:	Later 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
NHRA:	National Heritage Resources Act
OWC:	Orange River Wine Cellars
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 it must be read and interpreted in the context it is used.*

## GLOSSARY

**Archaeological:** material remains, resulting from human activity, which is in a state of disuse and is in or on land and is older than 100 years, including artefacts, human and hominid remains and artificial features and structures;

- 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 is older than 100 years (as defined and protected by the National Heritage Resources Act (NHRA) (Act No. 25 of 1999) including any area within 10 m of such representation;
- wrecks, being any vessel or aircraft, or any part thereof, which were wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the 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;

- features, structures and artefacts associated with military history, which are older than 75 years and the sites on which they are found.

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

**Earlier Stone Age:** >2 000 000 - >200 000 years ago  
**Middle Stone Age:** <300 000 - >20 000 years ago  
**Later Stone Age:** <40 000 - until the historical period

**Iron Age:** (Early Farming Communities). The period covering the last 1800 years, when immigrant African farmer groups brought a new way of life to southern Africa. They established settled villages, cultivated domestic crops such as sorghum, millet and beans, and herded cattle as well as sheep and goats. As they produced their iron tools, archaeologists call this the Iron Age.

**Early Iron Age:** AD 200 - AD 900  
**Middle Iron Age:** AD 900 - AD 1300  
**Later Iron Age:** AD 1300 - AD 1850

**Historic:** Period of the arrival of white settlers and colonial contact.  
AD 1500 to 1950

**Historic building:** Structures 60 years and older.

**Fossil:** Mineralised bones of animals, shellfish, plants and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

**Heritage:** That which is inherited and forms part of the National Estate (historic places, objects, fossils as defined by the National Heritage Resources Act 25 of 1999).

**Heritage resources:** These mean any place or object of cultural significance, tangible or intangible.

**Holocene:** The most recent geological period that commenced 10 000 years ago.

**Palaeontology:** 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 that contains such fossilised remains or traces

**Cumulative impacts:** “Cumulative Impact”, in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity that may not be significant, but may become significant when added to existing and reasonably foreseeable impacts eventuating from similar or diverse activities.

**Mitigation:** Anticipating and preventing negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.

- A 'place':
- a site, area or region;
  - a building or other structure which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure;
  - a group of buildings or other structures which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures;
  - an open space, including a public square, street or park; and
  - in relation to the management of a place, includes the immediate surroundings of a place.
- 'Public monuments and memorials': mean all monuments and memorials—
- 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
  - 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;
- 'Structures': any building, works, device or other facility made by people and which are fixed to land, and include any fixtures, fittings and equipment associated therewith.

# 1. INTRODUCTION

UBIQUE Heritage Consultants were appointed by CTS Heritage as independent heritage specialists to conduct the Phase 1 field surveys for the Archaeological Impact Assessment of the proposed development of a 132kV powerline near Olifantshoek, in the Gamagara Local Municipality, John Taolo Gaetsewe District Municipality, Northern Cape, as required by Section 38 of the NHRA and the National Environmental Management Act 107 of 1998 (NEMA).

The proposed project involves the construction and operation of a grid connection infrastructure between the existing Emil substation and the soon-to-be constructed Olifantshoek substation near the town of Olifantshoek in the Northern Cape Province. The grid infrastructure will be used to strengthen the grid network in the area to ensure an adequate supply of electricity for the residents within the Municipality's jurisdictional area. The grid connection infrastructure will only include a single circuit power line with a capacity of up to 132kV. The power line is being assessed within a 300m wide and 36km long corridor which will allow for the optimisation of the infrastructure to be developed and to avoid identified environmental sensitivities. The height of the power line pylons will be up to 20m. The servitude of the power line will be 31m in width.

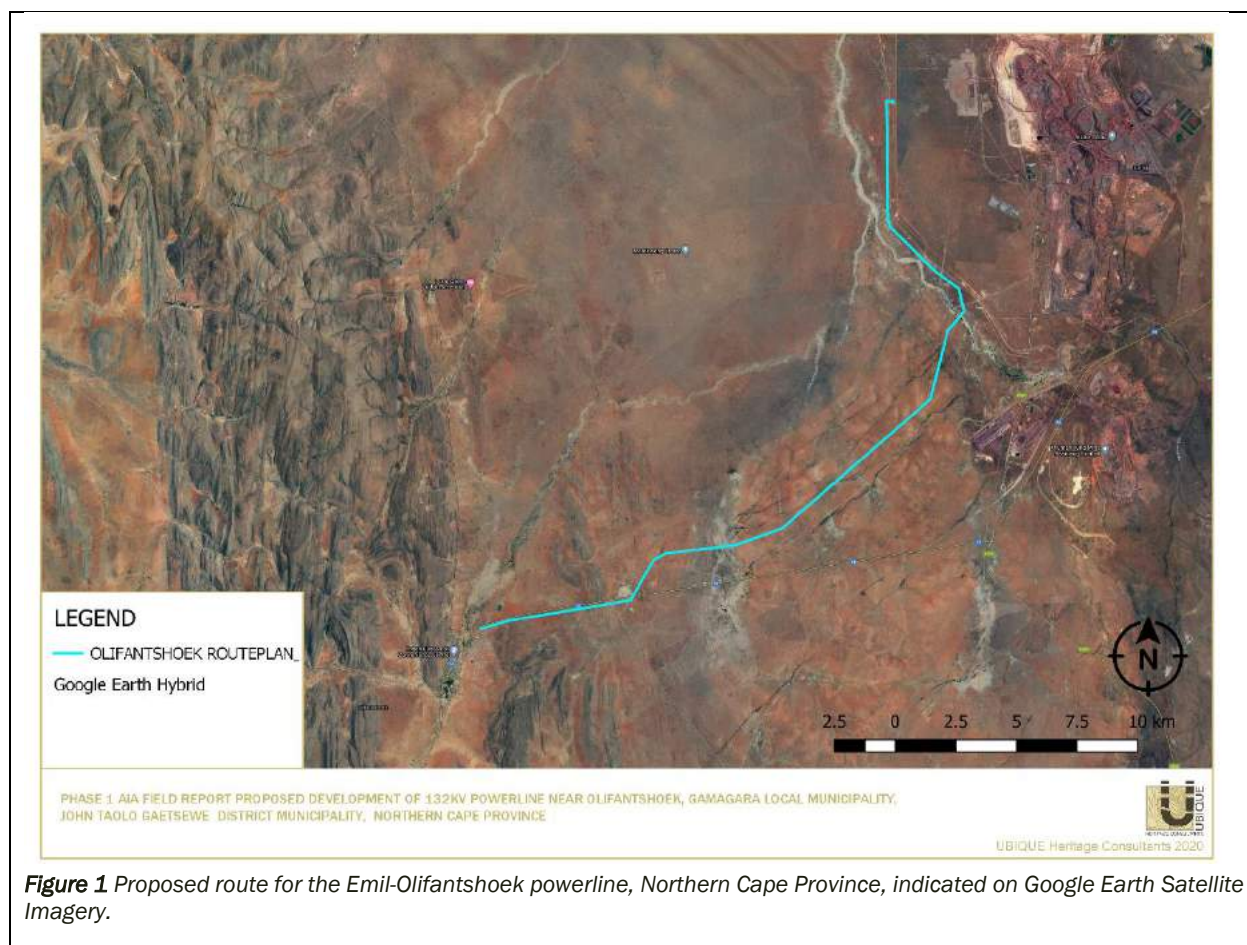
The identified heritage resources and anticipated, and cumulative impacts that the development of the proposed project may have on the identified heritage resources are presented objectively in this report. Alternatives, should any significant sites be impacted adversely by the proposed project, are offered. All effort will be made to ensure that all studies, assessments and results comply with the relevant legislation and the code of ethics and guidelines of the Association of South African Professional Archaeologists (ASAPA). The report aims to assist the developer in responsibly managing the documented heritage resources, and to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999).

## 1.1 Technical information

Project description	
Project name	PROPOSED DEVELOPMENT OF 132kV POWERLINE NEAR OLIFANTSHOEK, NORTHERN CAPE PROVINCE
Description	The development of a 132kV powerline near Olifantshoek, in the Gamagara Local Municipality, John Taolo Gaetsewe District Municipality, Northern Cape
Developer	
Gamagara Local Municipality	
Development type	Electrical Infrastructure
Property details	
Province	Northern Cape
District municipality	John Taolo Gaetsewe
Local municipality	Gamagara
Topo-cadastral map	1:50 000 2722DD
Farm name	Remaining Extent of the Farm Fritz 540, Portion 1 of the Farm Fritz 540,



	Portion 2 of the Farm Fritz 540, Portion 4 of the Farm Fritz 540, Portion 5 of the Farm Fritz 540, Portion 10 of the Farm Fritz 540, Remaining Extent of the Farm Gamagara 541, Portion 1 of the Farm Gamagara 541, Portion 7 of the Farm Gamagara 541, Portion 2 of the Farm Dingle 565, Remaining Extent of the Farm Dingle 565, Remaining Extent of the Farm Smythe 566, Remaining Extent of the Farm Murray 570, Portion 2 of the Farm Murray 570, Remaining Extent of the Farm Cox 571, Portion 1 of the Farm Cox 571, Portion 3 of the Farm Cox 571, Portion 4 of the Farm Cox 571, Remaining Extent of the Farm Hartley 573, Remaining Extent of the Farm Diegaart's Heuvel 765, Portion 1 of the Farm Neylan 574	
Closest town	Olifantshoek, Kathu	
GPS Co-ordinates	27° 55'52.67"S 22° 44'55.33"E	
Property size		
Development footprint	300m wide and 36km long corridor	
<b>Land use</b>		
Previous	Agriculture	
Current	Agriculture	
Rezoning required	No	
Sub-division of land	No	
<b>Development criteria in terms of Section 38(1) NHRA</b>		<b>Yes/No</b>
Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length.		Yes
Construction of bridge or similar structure exceeding 50m in length.		No
Construction exceeding 5000m <sup>2</sup> .		Yes
Development involving three or more existing erven or subdivisions.		No
Development involving three or more erven or divisions that have been consolidated within the past five years.		No
Rezoning of site exceeding 10 000m <sup>2</sup> .		No
Any other development category, public open space, squares, parks, recreation grounds.		No



**Figure 1** Proposed route for the Emil-Olifantshoek powerline, Northern Cape Province, indicated on Google Earth Satellite Imagery.

## 2. FIELD ASSESSMENT

### 2.1 Methodology

#### 2.1.1 Systematic survey

A systematic survey of the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest, was completed.

UBIQUE Heritage Consultants inspected the proposed development corridors and surrounding areas on the 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> of February 2020. The areas surveyed for the impact assessment was dictated by the Google Earth maps of the development footprints provided by the client, as well as the Heritage Screener compiled by CTS Heritage. The powerline route was surveyed from Olifantshoek town at the location for the new proposed substation, towards the Emil substation. The starting point for the survey was 27° 55' 53.6" S; 22° 44' 50.5" E. All the study areas were surveyed in transects of approximately 30 - 50m where possible. The development corridor was surveyed on foot and by 4x4 vehicle by a team of two experienced surveyors.

We conducted an inspection of the surface of the ground, wherever the surface was visible. The archaeological survey was done with no substantial attempt to clear brush, sand, deadfall, leaves or other material that may cover the surface and with no attempt to look beneath the surface beyond the inspection of rodent burrows, cut banks and other exposures fortuitously observed.

### 2.1.2 Recording significant areas

GPS points of identified significant areas were recorded with handheld Garmin global positioning units (Garmin eTrex 10) and Android Locus Maps application on Hisense U605 smartphone. Photographs were taken with a Canon Ixus 190 20-megapixel camera. Detailed field notes were taken to describe observations (Appendix B).

### 2.1.3 Determining significance

Levels of the significance of the various types of heritage resources observed and recorded in the project area have been determined according to criteria set out in Appendix A.

### 2.1.4 Assumptions and limitations

It is assumed that the description of the proposed project, as provided by the client, is accurate. Furthermore, it is assumed that the public consultation process undertaken as part of the Environmental Impact Assessment (EIA) is comprehensive and does not have to be repeated as part of the heritage impact assessment.

The significance of the sites, structures and artefacts is determined through their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. The various aspects are not mutually exclusive, and the evaluation of any site is done with reference to any number of these aspects. Cultural significance is site-specific and relates to the content and context of the site.

Although all possible care has been taken during the comprehensive field survey and intensive desktop study to identify sites of cultural importance within the development areas, it is essential to note that some heritage sites may have been missed due to their subterranean nature, or due to dense vegetation cover. No subsurface investigation (i.e. excavations or sampling) were undertaken since a permit from SAHRA is required for such activities. Furthermore, access to the various farms was impeded by gates locked by farmers or Eskom. Contact details provided for relevant landowners proved unhelpful in some instances, as several farmers do not reside on the affected properties. Some farmers were not available on their mobile phones due to bad cell service or were busy and unable to assist, while others were unwilling to provide access due to general negativity towards the development on their farms. All effort has been made to cover as much ground as possible in the circumstances.

Therefore, should any heritage features and/or objects such as architectural features, stone tool scatters, artefacts, human remains, or fossils be uncovered or observed during construction, operations must be stopped, and a qualified archaeologist contacted for an assessment of the find. Observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that the heritage specialist has been able to assess the significance of the site (or material) in question.



**Figure 2** Recorded tracks of the survey along the proposed development footprint

## 2.2 Description of the affected environment

The landscape of the study area is typical Olifantshoek Plains Thornveld and Kathu Bushveld (Mucina & Rutherford 2006). It ranges from wide plains with open trees and shrub layers and sparse grass layers, to medium-tall tree layers, with extensive shrub and variable grass cover. Flat red aeolian sand plains with minor dunes interspersed with gravel pavements constitute the majority of the terrain. Vegetation noted across the development footprint include Camel Thorn trees (*Acacia erioloba*), Black Thorn trees (*Acacia mellifera*), Three Thorn/Driedoring (*Rhigozum trichotomum*), Skaapbossie (*Aizoon schellenbergii*), Shepherd tree (*Boscia albitrunca*), Suurgras (*Enneapogon desvauxii*), Tall Bushman grass (*Stipagrostis hirtigluma*), Silky Bushman grass (*Stipagrostis uniplumis*), Kortbeen Boesmangras (*Stipagrostis obtuse*), Pencil milk bush (*Euphorbia lignose*) and Hereroland aloe (*Aloe hereroensis*). The Langeberg mountain range is visible towards the western horizon. Several dry riverine beds are present on the site flowing from north to south and from west to east, but no perennial rivers or riverine were crossed.

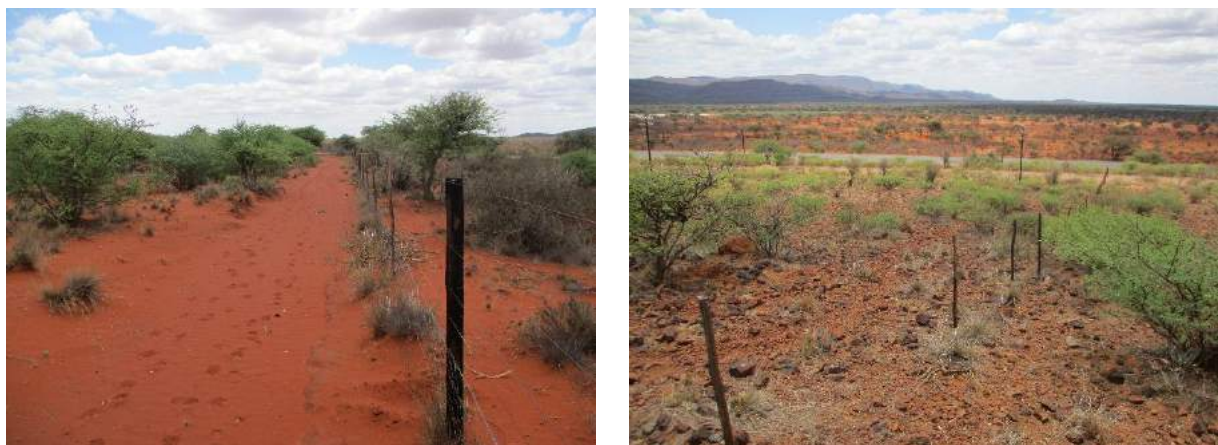
The development footprint is bounded in the north by mine activities (Khumani/Sishen/Dingleton) mines and the existing Emil Eskom substation, and in the south by the N14 National road and open farmland. The Olifantshoek townscape and Langeberg mountain range frame the development in the west, while the N14 National road and mining activities bound the development in the east. Anthropogenic disturbances occur predominantly along existing roads within the development footprint, at the new substation location at Olifantshoek, and near Emil substation, where some trenches traverse the footprint.



**Figure 3.** Panoramic view of the proposed Olifantshoek substation site and access road to the site.



**Figure 4.** Human-made furrow and existing powerlines on the development footprint close to Olifantshoek.



**Figure 5.** Panoramic view of the proposed powerline route south of the N14, from north-west to south-east.



**Figure 6.** Panoramic view of Emil substation and servitude road.



**Figure 7.** Formal cemeteries situated at Welgelee and Ditlouw informal settlements.



**Figure 8.** Formal cemetery situated at Diepkloof informal settlement and Olifantshoek municipal cemetery.

### 2.3 Archaeological resources identified

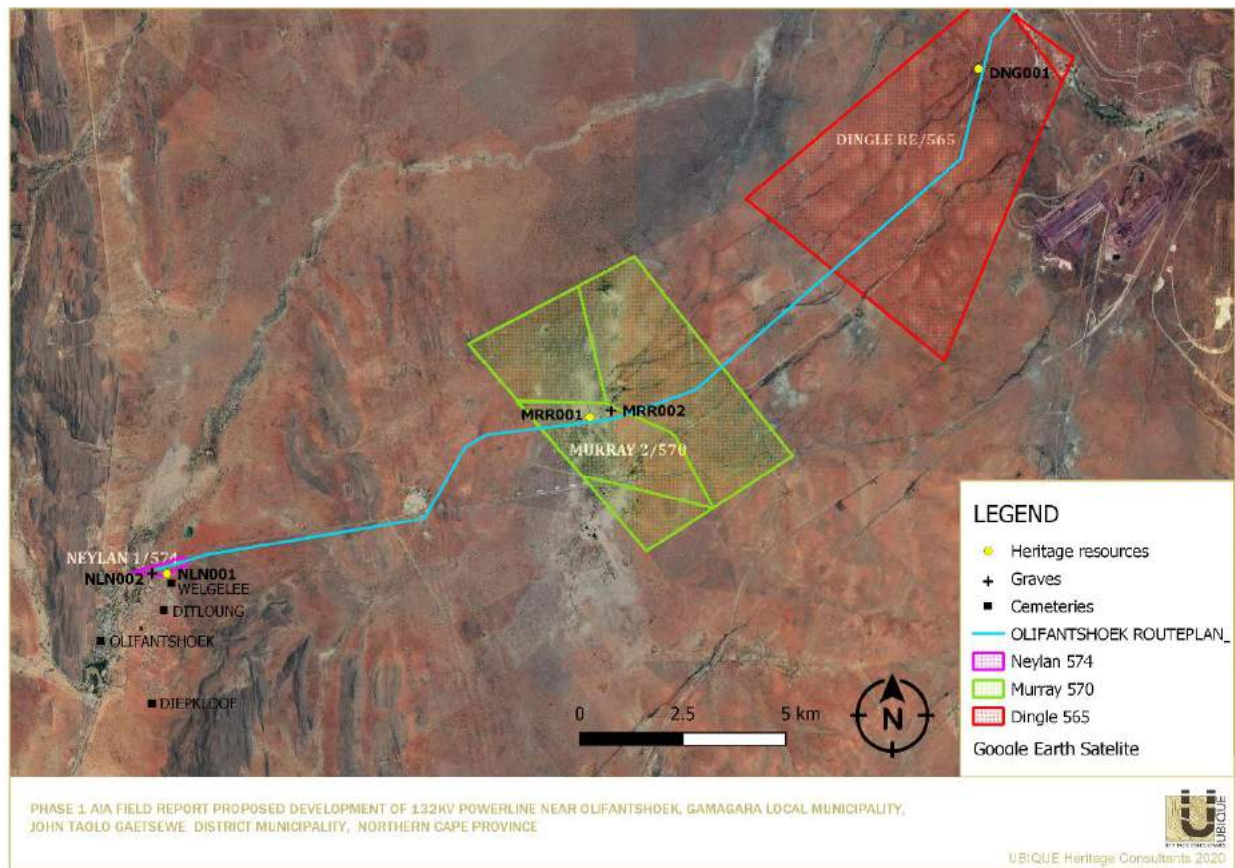


Figure 9. Recorded heritage resources across the development alternatives.

Point ID	Site No.	Site name	Description	Co-ordinates	Grading	Mitigation
<b>Archaeological resources within the development footprint</b>						
002	NLN002	Neylan No. 574/1-002	Two unmarked graves in the vicinity of a proposed new substation at Olifantshoek	27° 55' 52.6" S 22° 44' 51.4" E	IIIA	The site should be included in the heritage register and not be mitigated (high significance)
003	NLN001	Neylan No. 574/1-002	Collapsed stone wall orientation east to west. Approximately 100m in length. Possible fencing wall, linear without any angles or kraal shaped.	27° 55' 54.6" S 22° 45' 03.6" E	NCW	Phase 1 is seen as sufficient recording, and it may be demolished (low significance)
017	MRR001	Murray No. 570/2-001	Colonial/historical settlement ca. 1910-1950. Next to a natural water source, currently dry. Evidence of stone walls, crib, possible kraal, old Fig tree ( <i>Ficus carica</i> ) and material culture such as glass, ceramics and metal objects. Multiple occupations are evident. Disturbed by natural erosion.	27° 53' 58.7" S 22° 51' 00.0" E	IIIC	Phase 1 is seen as sufficient recording, and it may be demolished (low significance)

020	MRR002	Murray No. 570/2-002	Two unmarked graves on "Murray" farm. Possibly older than 100 years. Soldered tin and ammunition rest found in superficial association with the burials.	27° 53' 50.2" S 22° 51' 18.4" E	IIIA	The site should be included in the heritage register and not be mitigated (high significance)
019	DNG001	Dingle No. 565/RE/001	Isolated LSA CCS bladelet. N=1 in 100m².	27° 49' 37.9" S 22° 56' 29.3" E	NCW	Phase 1 is seen as sufficient recording, and it may be demolished (low significance)
Point ID	Site No.	Site name	Description	Co-ordinates	Grading	Mitigation
<b>Other (outside development footprint)</b>						
006	OFH006	Welgelee cemetery	Welgelee informal settlement official municipal cemetery	27° 55' 52.6" S 22° 44' 51.4" E	IIIA	The site should be included in the heritage register and not be mitigated (high significance)
007	OFH007	Ditloug cemetery	Ditloug informal settlement official municipal cemetery	27° 56' 01.9" S 22° 45' 07.6" E	IIIA	The site should be included in the heritage register and not be mitigated (high significance)
008	OFH008	Diepkloof cemetery	Diepkloof informal settlement official municipal cemetery	27° 56' 22.0" S 22° 45' 01.0" E	IIIA	The site should be included in the heritage register and not be mitigated (high significance)
009	OFH009	Olifantshoek cemetery	Olifantshoek town official municipal cemetery	27° 57' 31.7" S 22° 44' 51.2" E	IIIA	The site should be included in the heritage register and not be mitigated (high significance)

### 2.3.1 Heritage resources within the development corridor

Only five incidences of heritage resources were documented along the 36km development corridor. NLN001 and NLN002 are situated on the Farm Neylan No. 574 Portion 1 in the vicinity of the proposed location of the new to-be-constructed substation at Olifantshoek, MRR001 and MRR002, are located to the east on the farm Murray No. 570 Portion 2, and DNG001 is situated towards the north-east on the Remainder of the farm Dingle No. 565.

#### 2.3.1.1 Archaeological

Recorded at NLN001 is the remains of a collapsed stone wall, approximately 100m in length and orientated east to west, without archaeological context and of low significance.



MRR001 is the remains of an early 20<sup>th</sup>-century settlement, ca. 1910-1950, located next to naturally occurring springs. Evidence of stone walls, a crib, possible kraal, two old Fig trees (*Ficus carica*), and surface material such as glass, ceramics and metal objects were recorded. Multiple occupation events are evident at this site and this site could've served as a livestock post/overnight camp while moving with the stock between farms or regions. The site has been partially disturbed and eroded during the recent past.

DNG001 is the occurrence of an isolated LSA CCS bladelet/trimmed flake, with no further archaeological matrix. These archaeological samples are small, without sufficient context, and therefore of low significance.

#### 2.3.1.2 Graves

The surveyors documented four informal graves beside the development footprint. MRR002 comprises of two adult-sized graves, possibly older than 100 years, defined by stone cairns remains and unmarked stone headstones. Hand-soldered tin fragments and ammunition rests were found close to these graves. These graves are situated far enough north of the proposed powerline route to be outside of the impact of the development.

NLN002, however, lies less than 100m to the west of the area earmarked for the construction of the new Olifantshoek substation. Two adult-sized graves were documented at this location. One was marked by a stone cairn and stone headstone, and the adjacent one with a cement border. None of these graves is inscribed. These graves may fall within the development impact zone.

All graves are of high significance and care should be taken to protect them. The graves are of Local significance with Field Rating/Grade IIIC.

#### 2.3.2 Other

Four formal municipal cemeteries are located to the south and south-west of the proposed Olifantshoek substation, well outside the development footprint. These include the Welgelee, Ditlounge and Diepkloof settlements' and the Olifantshoek town cemeteries.

2.3.3 Selected photographic record



NLN001



DNG001



MRR001



MRR001



MRR001



NLN002



NLN002



MRR002



MRR002



MRR002

Figure 10 Heritage recorded within the development footprint.

### 3. ASSESSMENT OF THE IMPACT OF THE DEVELOPMENT

Description	Development Impact		Mitigation	Field rating/ Significance
1. NLN001 Historical stone-wall	Nature	Negative	No mitigation required	Field Rating of Local Grade IVC or NCW  (low significance)
	Extent	Low		
	Duration	High		
	Intensity	Low		
	Potential of impact on irreplaceable resource	Low		
	Consequence	Low		
	Probability of impact	Medium		
	Significance	Low		
2. MRR001 Late-19 <sup>th</sup> -century to mid-20 <sup>th</sup> -century settlement/livestock camp at natural spring.	Nature	Negative	No mitigation required	Field Rating of Local Grade IVC, IIIC  (low significance)
	Extent	Low		
	Duration	Low		
	Intensity	Medium		
	Potential of impact on irreplaceable resource	Low		
	Consequence	Low		
	Probability of impact	Medium		
	Significance	High		

3. DNG001 Isolated LSA lithic without archaeological context.	Nature	Negative	No mitigation required	Field Rating of Local Grade IVC or NCW  (low significance)
	Extent	Low		
	Duration	High		
	Intensity	High		
	Potential of impact on irreplaceable resource	Low		
	Consequence	Low		
	Probability of impact	Low		
4. NLN002 Two graves situated close to the development footprint of the Olifantshoek substation.	Nature	Negative	Sites should be included in the heritage register and may not be mitigated	Field Rating of Local Grade IIIA  (high significance)
	Extent	High		
	Duration	High		
	Intensity	High		
	Potential of impact on irreplaceable resource	High		
	Consequence	High		
	Probability of impact	Medium		
5. MRRO02 Two graves situated north, and just outside the development corridor.	Nature	Negative	Sites should be included in the heritage register and may not be mitigated	Field Rating of Local Grade IIIA  (high significance)
	Extent	Medium		
	Duration	Low		
	Intensity	Low		
	Potential of impact on irreplaceable resource	Low		
	Consequence	High		
	Probability of impact	Medium		
<b>Other</b>				
6. Four local cemeteries situated at Welgelee, Ditloug and Diepkloof settlements and Olifantshoek town.	Nature	Negative	Sites should be included in the heritage register and may not be mitigated	Field Rating of Local Grade IIIA  (high significance)
	Extent	High		
	Duration	High		
	Intensity	High		
	Potential of impact on irreplaceable resource	Low		
	Consequence	High		
	Probability of impact	Low		
	Significance	High		

The proposed development will have a negative impact on the heritage resources situated on the proposed powerline route. The effect will be either inconsequential as the heritage resources are deemed of low significance and not conservation worthy (NCW) (sites: NLN001, DNG001, and MRRO01); or it is possible to mitigate the impact with a buffer no-go zone (NLN002 and MMRO02). From a heritage point of view, the development can continue, taking into consideration the recommended mitigatory actions.

## 4. RECOMMENDATIONS AND CONCLUSIONS

Based on the assessment of the potential impact of the development on the identified heritage, the following recommendations are made, taking into consideration any existing or potential sustainable social and economic benefits:

1. Archaeologically speaking, there are no objections to the proposed development proceeding along the projected route.

2. It is recommended that a no-go buffer of 50 m from the edge of each site extent, be implemented for sites graded as IIIC. A buffer zone is of particular importance for site NLN002.
3. If it is not possible to avoid the sites mentioned above, they must be mitigated by a qualified archaeologist. A permit in terms of section 35 of the NHRA and Chapter II and IV of the NHRA Regulations must be applied for from SAHRA via SAHRIS before construction.
4. Although all possible care has been taken to identify sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the assessment. If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be alerted as per section 35(3) of the NHRA.
5. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Mimi Seetelo 012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contacted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;
6. UBIQUE Heritage Consultants and its personnel will not be held liable for such oversights or costs incurred as a result of such omissions.

## 5. REFERENCES

Mucina, L. & Rutherford, M.C. (eds) 2006. *The vegetation of South Africa, Lesotho and Swaziland*. Strelitzia 19. SANBI: Pretoria.

# APPENDIX A

## Determining significance and development impacts

Levels of the significance of the various types of heritage resources observed and recorded in the project area will be determined to the following criteria:

### *Cultural significance:*

- Low                      A cultural object being found out of context, not being part of a site or without any related feature/structure in its surroundings.
- Medium                 Any site, structure or feature being regarded as less important due to several factors, such as date and frequency. Likewise, any important object found out of context.
- High                     Any site, structure or feature regarded as important because of its age or uniqueness. Graves are always categorised as of high importance. Likewise, any principal object found within a specific context.

### *Heritage significance:*

- Grade I                 Heritage resources with exceptional qualities to the extent that they are of national significance
- Grade II                Heritage resources with qualities giving it provincial or regional importance although it may form part of the national estate
- Grade III               Other heritage resources of local importance and therefore worthy of Conservation

### *Field ratings:*

- i.        National Grade I                      significance should be managed as part of the national estate
- ii.       Provincial Grade II                    significance should be managed as part of the provincial estate
- iii.      Local Grade IIIA                        should be included in the heritage register and not be mitigated (high significance)
- iv.      Local Grade IIIB                        should be included in the heritage register and may be mitigated (high/ medium significance)
- v.       General protection A (IV A)            site should be mitigated before destruction (high/ medium significance)

- |      |                             |  |
|------|-----------------------------|--|
| vi.  | General protection B (IV B) | site should be recorded before destruction (medium significance)                     |
| vii. | General protection C (IV C) | phase 1 is seen as sufficient recording, and it may be demolished (low significance) |

*Heritage value, statement of significance:*

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

### Assessment of development impacts

A heritage resource impact may be defined broadly as the net change, either beneficial or adverse, between the integrity of a heritage site with and without the proposed development. Beneficial impacts occur wherever a proposed development actively protects, preserves or enhances a heritage resource, by minimising natural site erosion or facilitating non-destructive public use, for example. More commonly, development impacts are adverse and can include:

- destruction or alteration of all or part of a heritage site;
- isolation of a site from its natural setting; and/or
- introduction of physical, chemical or visual elements that are out of character with the heritage resource and its setting.

Beneficial and adverse impacts can be direct or indirect, as well as cumulative, as implied by the examples. Although indirect impacts may be more difficult to foresee, assess and quantify, they must form part of the assessment process. The following assessment criteria have been used to assess the impacts of the proposed development on possible identified heritage resources:

Criteria	Rating Scales	Notes
Nature	Positive	An evaluation of the type of effect the construction, operation and management of the proposed development would have on the heritage resource.
	Negative	
	Neutral	
Extent	Low	Site-specific affects only the development footprint.
	Medium	Local (limited to the site and its immediate surroundings, including the surrounding towns and settlements within a 10 km radius);
	High	Regional (beyond a 10 km radius) to national.
Duration	Low	0-4 years (i.e. duration of construction phase).
	Medium	5-10 years.
	High	More than 10 years to permanent.
Intensity	Low	Where the impact affects the heritage resource in such a way that its significance and value are minimally affected.
	Medium	Where the heritage resource is altered, and its significance and value are measurably reduced.
	High	Where the heritage resource is altered or destroyed to the extent that its significance and value cease to exist.
Potential for impact on irreplaceable resources	Low	No irreplaceable resources will be impacted.
	Medium	Resources that will be impacted can be replaced, with effort.
	High	There is no potential for replacing a particularly vulnerable resource that will be impacted.
Consequence, (a combination of extent, duration, intensity, and the potential for impact on irreplaceable resources).	Low	A combination of any of the following: - Intensity, duration, extent and impact on irreplaceable resources are all rated low. - Intensity is low and up to two of the other criteria are rated medium. - Intensity is medium, and all three other criteria are rated low.
	Medium	Intensity is medium, and at least two of the other criteria are rated medium.
	High	Intensity and impact on irreplaceable resources are rated high, with any combination of extent and duration. Intensity is rated high, with all the other criteria being rated medium or higher.
Probability (the likelihood of the impact occurring)	Low	It is highly unlikely or less than 50 % likely that an impact will occur.
	Medium	It is between 50 and 70 % certain that the impact will occur.



Criteria	Rating Scales	Notes
	High	It is more than 75 % certain that the impact will occur, or it is definite that the impact will occur.
Significance (all impacts including potential cumulative impacts)	Low	Low consequence and low probability. Low consequence and medium probability. Low consequence and high probability.
	Medium	Medium consequence and low probability. Medium consequence and medium probability. Medium consequence and high probability. High consequence and low probability.
	High	High consequence and medium probability. High consequence and high probability.

# APPENDIX B

Fieldnotes



# FIELD NOTES

## Phase 1 Archaeological/Heritage Impact Assessment

Site ID: The proposed development of a 132 kV powerline from Emil substation to Olifantshoek town in the Gamagara Local Municipality and within the John Taolo Gaetsewe District Municipality in the Northern Cape Province.

Phase 1 survey conducted				
CRM Archaeologist	Jan Engelbrecht		Date/s	2020-02-06 To 2020-02-08
Additional surveyors	N. Titus.			
Type of survey	Pedestrian/Vehicular		Transects	30m to 50m where possible
Technical equipment	GPS	Etracks 10 Garmin Hisense Mobile Locus maps	Camera	Canon IXUS Digital Camera

### Technical information

Project description	
Project name	The proposed development of a 132kV powerline from Emil substation to Olifantshoek in the Gamagara local municipality and within the John Taolo Gaetsewe District municipality in the Northern Cape Province.
Description	The Gamagara Local Municipality proposes the construction and operation of a grid connection infrastructure between the existing Emil Substation and the soon-to-be constructed Olifantshoek Substation near the town of Olifantshoek in the Northern Cape Province. The grid infrastructure will be used to strengthen the grid network in the area to ensure an adequate supply of electricity for the residents within the Municipality's jurisdictional area. The grid connection infrastructure will only include a single circuit power line with The capacity of up to 132kV. The power line is being assessed within a 300m wide and 36km long corridor which will allow for the optimisation of the infrastructure to be developed and to avoid identified environmental sensitivities. The height of the power line pylons will be up to 20m. The servitude of the power line will be 31m in width.
Developer	
Gamagara Local Municipality	
Contact information	053 723 6000
Development type	Powerline
Landowner	
Contact information	Various (See contact list)
Consultants	

Environmental	Savannah Environmental
Heritage and archaeological	UBIQUE Heritage Consultants
Paleontological	N/A
<b>Property details</b>	
Province	Northern Cape
District municipality	John Taolo Gaetsewe
Local municipality	Gamagara
Topo-cadastral map	1:50 000 2720DD
Farm name	The grid connection corridor traverses the following affected properties: Remaining Extent of the Farm Fritz 540, Portion 1 of the Farm Fritz 540, Portion 2 of the Farm Fritz 540, Portion 4 of the Farm Fritz 540, Portion 5 of the Farm Fritz 540, Portion 10 of the Farm Fritz 540, Remaining Extent of the Farm Gamagara 541, Portion 1 of the Farm Gamagara 541, Portion 7 of the Farm Gamagara 541, Portion 2 of the Farm Dingle 565, Remaining Extent of the Farm Dingle 565, Remaining Extent of the Farm Smythe 566, Remaining Extent of the Farm Murray 570, Portion 2 of the Farm Murray 570, Remaining Extent of the Farm Cox 571, Portion 1 of the Farm Cox 571, Portion 3 of the Farm Cox 571, Portion 4 of the Farm Cox 571, Remaining Extent of the Farm Hartley 573, Remaining Extent of the Farm Diegaart's Heuwel 765, Portion 1 of the Farm Neylan 574
Closest town	Olifantshoek and Kathu
GPS Co-ordinates	27° 55'52.67"S 22° 44'55.33"E
Property size	10ha
Development footprint size	Approximately 10-20ha
<b>Land use</b>	
Previous	Agriculture
Current	Agriculture
Rezoning required	No
Sub-division of land	No
<b>Development criteria in terms of Section 38(1) NHRA</b>	
	Yes/No
Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length.	Yes
Construction of bridge or similar structure exceeding 50m in length.	No
Construction exceeding 5000m <sup>2</sup> .	Yes
Development involving three or more existing erven or subdivisions.	No
Development involving three or more erven or divisions that have been consolidated within the past five years.	No
Rezoning of site exceeding 10 000m <sup>2</sup> .	No
Any other development category, public open space, squares, parks, recreation grounds.	No

## Site description

<b>Description of the general area affected by development</b>	
Type of environment	Typical Kalahari arid landscape
Terrain description	Typical Kalahari arid landscape with flat sandy areas, minor dunes, klipveld, rocky outcrops and surrounding mountainous areas. Mountainous areas especially towards Olifantshoek town and along the N14 National road from Olifantshoek towards Kathu located to the south of the N14.

<b>Geology</b>	
The terrain varies between Quartzite, Quartz, Dolomite and Calcrete visible on the surface. There are several Dolomite outcrops on the landscape. The klipveld consist mostly of Dolomite and quartzite with BIF to a lesser degree. Mostly igneous stones, shale and calcrete sedimentary rocks.	
<b>Vegetation</b>	
The site footprint is covered by various types of vegetation: Camel Thorn trees ( <i>Acacia erioloba</i> ), Black Thorn trees ( <i>Acacia mellifera</i> ), Three Thorn/Driedoring ( <i>Rhigozum trichotomum</i> ), Skaapbossie ( <i>Aizoon schellenbergii</i> ), Shepherd tree ( <i>Boscia albitrunca</i> ), Suurgras ( <i>Enneapogon desvauxii</i> ), Tall Bushman grass ( <i>Stipagrostis hirtigluma</i> ), Silky Bushman grass ( <i>Stipagrostis uniplumis</i> ), Kortbeen Boesmangras ( <i>Stipagrostis obtuse</i> ), Pencil milk bush ( <i>Euphorbia lignose</i> ) and Hereroland aloe ( <i>Aloe hereroensis</i> ).	
<b>Waterways/sources</b>	
Several dry riverine beds are present on the site flowing from north to south and from west to east – no perennial rivers or riverine on site.	
<b>Site boundaries</b>	
<b>North:</b> Bordered by mine activities (Khumani/Sishen/Dingleton) mines and the existing Emil Eskom Substation. <b>South:</b> N14 National road and open farmland and agricultural landscape. <b>West:</b> Olifantshoek townscape and mountain range. <b>East:</b> N14 National road and mine activities.	
<b>Site access</b>	<b>GPS Co-ordinates</b>
Access to the proposed powerline site was entered from Olifantshoek town at the location for the new proposed Sub-station at Olifantshoek.	27° 55' 53.6" South 22° 44' 50.5" East
<b>Disturbances</b>	
<b>Natural erosion</b>	
The only natural disturbances detected were the minor dry riverine (non-perennial) flowing in various directions on the site at several areas on the site footprint.	
<b>Human-made</b>	
Existing roads. At the new substation location and near Emil substation several man-made trenches are crossing through the site footprint.	
<b>Notes</b>	
None	

## Environmental recording/Panorama

Way point	Site Name	Description	Location	Field rating/ Significance	Photo No.
Site-specific points of interest/ natural significance					
001	OFH 01	The entry point to the site.	27° 55' 53.6" South 22° 44' 50.5" East	N/A	N/A
N/A	N/A	Contextual images/panorama view of the location of a proposed new substation at Olifantshoek.	N/A	N/A	09-17
004	OFH 04	A sizeable human-made furrow is running through the site, orientation north to south.	27° 55' 54.2" South 22° 45' 05.4" East	N/A	23-24
005	OFH 05	Existing Eskom power line running through the site, orientation NE to SW.	27° 55' 48.8" South 22° 45' 06.6" East	N/A	25-27
N/A	N/A	Access road towards proposed sub-station at Olifantshoek and contextual/panorama view images.	N/A	N/A	28-34

N/A	N/A	Contextual images/panorama view of site footprint along the N14 National road from Oloifantshoek, south of the N14. Images were taken towards various directions NE-SW.	N/A	N/A	52-74
015	OFH 010	A recently disturbed area in the vicinity of the development footprint. Possible abandoned construction camp.	27° 55' 45.4" South 22° 45' 25.8" East	N/A	75-79
016	OFH 011	Existing Emil sub-station.	27° 44' 10.0" South 22° 55' 12.8" East	N/A	80-83
N/A	N/A	Contextual images/panorama view of site footprint south of existing Emil sub-station. Existing Eskom powerline and previously disturbed areas such as trenches.	N/A	N/A	84-90
N/A	N/A	Contextual images/ panorama view of the site footprint on the farm "Murray" with existing powerline present nearby.	N/A	N/A	91-95
N/A	N/A	Contextual images/panorama view of site footprint on "Murray" farm.	N/A	N/A	104-106
018	OFH 013	Small substation near the site footprint.	27° 48' 55.1" South 22° 56' 53.2" East	N/A	110-111
N/A	N/A	Contextual images/panorama view of site footprint west and south of Sishen mine.	N/A	N/A	112-116

## Heritage recording

### STONE AGE

Way Point Site No.	Photo No.	Description	Period	Location	Field rating/ Significance	
<b>HERITAGE FINDS ON PIPELINE DEVELOPMENT FOOTPRINT</b>						
019 DNG001	Photo: 117-119	Type lithic/s	Bladelet	LSA	27° 49' 37.9" South 22° 56' 29.3" East	IIIC/NCW
		Raw material	CCS			
		N in m <sup>2</sup> .	1/ 100sqm			
		Context	None/random			
		Additional	LSA bladelet			

### HISTORICAL /COLONIAL FINDS

Waypoint And Site No.	Photo No.	Description	Period	Location	Field Rating
003 NLN001	18-22	Collapsed stone wall orientation east to west. Approximately 100m in length. Possible fencing wall, linear without any angles or kraal shaped.	1900's	27° 55' 54.6" South 22° 45' 03.6" East	IIIC/NCW
017 MRR001	96-103  As well as  107-109	Colonial/historical settlement ca. 1910-1950. Next to water source (fountains). Evidence of stone walls, crib, possible kraal, old Fig tree ( <i>Ficus carica</i> ) and material culture such as glass, ceramics and metal objects. Multiple occupations are evident. Disturbed by natural erosion.	Ca 1910 to 1950>	27° 53' 58.7" South 22° 51' 00.0" East	IIIC

### GRAVES

Waypoint And Site No.	Photo No.	Description	Period	Location	Field Rating
002 NLN002	01-08	Two unmarked graves in the vicinity of proposed new sub-station at Olifantshoek.	Historical	27° 55' 52.6" South 22° 44' 51.4" East	IIIA
006 OFH 06	35-38	Welgelee informal settlement official municipal cemetery.	Historical	27° 56' 01.9" South 22° 45' 07.6" East	IIIA
007 OFH 07	39-43	Ditloug informal settlement official municipal cemetery.	Historical	27° 56' 22.0" South 22° 45' 01.0" East	IIIA
008 OFH 08	44-47	Diepkloof informal settlement official municipal cemetery.	Historical	27° 57' 31.7" South 22° 44' 51.2" East	IIIA
009 OFH 09	48-51	Olifantshoek town official municipal cemetery.	Historical	27° 56' 44.9" South 22° 44' 07.9" East	IIIA
020 MRR002	122-131	Two unmarked graves on "Murray" farm. Possibly older than 100 years. Soldered tin and ammunition rest found in context with the burials.	Ca. 1890>	27° 53' 50.2" South 22° 51' 18.4" East	IIIA

## Discussion

Stone Age finds
Stone age material was very scarce, and no artefacts were recorded except for one LSA bladelet/trimmed flake. Higher concentrations of Stone Age (predominantly ESA/MSA) material are located at Kathu Pan and surrounding areas. The presence of subsurface Stone Age material is always possible, but during our survey, no stone tools or the like were located on the surface of the ground.

<b>Historical finds</b>
An interesting Historical occupation site was discovered at a location with two fountains on Murray farm. Cultural material resembles such material found at other Historical sites throughout RSA and can relatively be dated to 1890, 1910 and later. It is a high possibility that this site had multiple occupations and that it served as a livestock post/overnight camp while moving with the stock between farms or regions. It might even have served as a source of water during the ABW. The site has however been disturbed during the recent past.
<b>Identified graves</b>
Official municipal cemeteries were recorded. Two unmarked graves at Olifantshoek close to the proposed Olifantshoek substation were identified which is of high significance. Another two unmarked graves on Murray farm were identified and is similarly of high relevance. The graves on Murray farm are however not located on, or very near the site footprint and they are relatively safe from construction.

## Recommendation

<b>Stone Age finds</b>
The project can continue. Only one find of field rating Grade IIIC/NCW significance. Sufficiently recorded during Phase 1. No further action.
<b>Historical finds</b>
The project can continue. It is sufficiently recorded during Phase 1 – no further action.
<b>Identified graves</b>
With regards to all identified graves, especially graves located close to the site footprint: a 50m buffer zone should apply around said graves and graves should be fenced off and identified to prevent accidental construction damage. All legislation will apply to ensure the safety of graves and the developer must comply. The project can continue following existing legislation on burials.
<b>Other</b>
None

## Additional notes

Access to the various farms was challenging due to locked gates by farmers and/or Eskom. Contact details provided for farmers to assist us is not always successful because several farmers do not reside on the farms but live in other towns such as Schweizer-Reneke and even Cape Town. Some farmers are not available on their mobile phones due to poor, or no signal as well as general negativity towards Eskom and other Government developments on their farms. Farmers generally are reluctant to assist due to previous Eskom projects where such projects left much damage on the farms and due to non-payments of compensation previously promised by Eskom. I recommend that an Eskom or municipal official (with the necessary keys to open locks) to be present in future projects of this nature, to ensure effective and easier access to our place of work.
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**Declaration of independence:**

I, Jan Engelbrecht, hereby confirm my independence as a heritage specialist and declare that:

- I am suitably qualified and accredited to act as an independent specialist in this application;
- I do not have any vested interests (either business, financial, personal or other) in the proposed development project other than remuneration for the heritage assessment and heritage management services performed;
- the work was conducted in an objective and ethical manner, in accordance with a professional code of conduct and within the framework of South African heritage legislation.



A handwritten signature in black ink, appearing to read 'Jan Engelbrecht'.

Signed:  
J.A.C. Engelbrecht

Date: 2020-02-10  
UBIQUE Heritage Consultants