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17 June 2022

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**PROPOSED CONSTRUCTION AND OPERATION OF A RADIO MAST, 132KV POWERLINE AND 400KV LOOP IN LOOP OUT (LILO) POWERLINE LOCATED NEAR DEALESVILLE IN THE TOKOLOGO LOCAL MUNICIPALITY, LEJWELEPUTSWA DISTRICT IN THE FREE STATE PROVINCE – ADDENDUM TO HERITAGE IMPACT ASSESSMENT**

Dear Liandra

Thank you for providing the updated project description for the above project. The revised description is as follows (Figure 1 shows the layout):

South Africa Mainstream Renewable Power Developments (Pty) Ltd ('Mainstream') is proposing the development of one (1) Radio Mast, two (2) x 400kV powerlines and one (1) x 132kV powerline that will connect to the authorised 132kV/400kV Main Transmission Substation (MTS) ([14/12/16/3/3/1/2460/AM1](#)) as well as to the approved 100MW Kentani Solar Photovoltaic (PV) Energy Facility ([14/12/16/3/3/2/724/AM3](#)) respectively. The Kentani Solar PV Energy Facility is one (1) of eleven (11) solar PV projects collectively known as the Kentani Cluster located near the town of Dealesville, within the Tokologo Local Municipality (Lejweleputswa District) in the Free State Province.

The Kentani Cluster consists of eleven (11) solar PV projects and associated electrical infrastructure (including a powerline), each of which received their own Environmental Authorisation (EA) in 2016 from the Department of Environmental Affairs (DEA) [now referred to as the Department of Forestry, Fisheries and the Environment (DFFE)].

It should be noted that on 28 October 2021, the Minister of Mineral Resources and Energy announced the Preferred Bidders of the Round 5 Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) and six (6) of the Solar Energy Facilities, collectively referred to as the "Kentani Cluster" received Preferred Bidder status. These are:

- Kentani Solar PV ([14/12/16/3/3/2/724/AM3](#))
- Sonobloomo Solar PV ([14/12/16/3/3/2/723/AM2](#))
- Klipfontein Solar PV ([14/12/16/3/3/2/722/AM2](#))
- Klipfontein 2 Solar PV ([14/12/16/3/3/2/726/1/AM1](#))
- Leliehoek Solar PV ([14/12/16/3/3/2/728/AM2](#))
- Braklaagte Solar PV ([14/12/16/3/3/2/727/1](#))

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These Solar Energy Facilities have now become Strategic Infrastructure Projects i.e., SIPs 8 and 10. SIPs 8 and 10 target the development of green energy in support of the South African economy and the provision of electricity transmission and distribution respectively.

- SIP 8 supports sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP2010) and support bio-fuel production facilities.
- SIP 10 Expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity

The approved MTS and associated infrastructure will service eleven (11) of Mainstream's solar PV projects authorised as part of the Kentani Cluster.

It should be noted that the 132kV/400kV MTS development footprint and the 132kV and 400kV corridors (in which the respective powerlines which form part of this application / BA process would be situated) were granted authorisation by the DFFE in April 2022 (DFFE Reference Number: 14/12/16/3/3/1/2460/AM1). However, due to technical consideration, the approved 132kV and 400kV corridors are not suited to connect the approved MTS to the National grid nor the authorised Kentani Solar PV (DFFE Reference Number: 14/12/16/3/3/2/724/AM3) to the MTS, and as such slight changes to the corridors were required. It is these changes that are the subject of the present letter.

The powerlines are located within the Kimberly Renewable Energy Development Zone (REDZ) (namely REDZ 4) and Central Strategic Transmission Corridor, as defined and in terms of the procedures laid out in Government Notices No. 113 and No. 145 which were formally gazetted on 16 February 2018 and 26 February 2021 respectively.

The powerlines proposed as part of this application and BA process are as follows:

1. Two (2) 400kV overhead powerlines (approx. 700m in length) are being proposed and will connect the approved MTS (14/12/16/3/3/1/2460/AM1) to the existing Eskom 400kV powerline, located approximately west of the approved MTS site, via a Loop-In-Loop Out (LILO) connection; and
2. One (1) 132kV powerline (approx. 5km in length) is being proposed and will connect the approved MTS to the authorised Kentani on-site substation (14/12/16/3/3/2/724/AM3), located approx. 4.85km north-west of the approved MTS site.
3. One (1) Radio Mast (approx. 90m height) will be situated within the approved MTS site.

A road in the servitude under the proposed powerlines as well as an access road (approx. 4-8m wide) to the R64 provincial route will also be required.

As part of the BA process, powerline corridors with widths of 300m (150m on either side of centre line) are being proposed and assessed for the 400kV and 132kV powerlines. This is to allow flexibility when routing the powerlines within the authorised corridor (should the EA be granted).

In terms of the EIA Regulations, 2014 (as amended), various aspects of the proposed powerline development may have an impact on the environment and trigger certain listed activities in Listing Notice 1 of the EIA Regulations, 2014 (as amended) (Government Notice No. 983, as amended). These activities require authorisation from the National Competent Authority (CA), namely the Department of Forestry, Fisheries and the Environment (DFFE), prior to the commencement thereof. A Basic Assessment will be submitted to the DFFE in terms of the EIA Regulations, 2014 (as amended). To inform the assessment, specialist studies are required.

### Terms of Reference

ASHA Consulting was asked to review the changes and conduct a new site visit to survey areas not covered by the original survey. The new site visit was conducted on 15 June 2022. Figures 2 and 3 show the study area and survey tracks upon which the present letter is based. The existing surveys were sufficient to cover the alteration of the LILO connections and no new survey was needed for the mast since it would be within the authorised MTS. As such, the new survey focused on the section of the 132 kV corridor that had not been covered before.

For ease of reference, the main changes since the compilation of the Heritage Impact Assessment (HIA; Orton 2021) are:

1. The rerouting of the 132 kV powerline in order to cross the existing high voltage lines at 90 degrees (the portion of the 132kV powerline outside of the existing approved corridors and Eskom servitudes is approximately 550 m long);
2. The rerouting of the 400 kV LILO connections (the portion of each of the 400kV powerlines outside of the existing approved corridors and Eskom servitudes is approximately 100 m long); and
3. The addition of a 90 m high radio mast to the MTS.

### Findings

The new survey followed the same methods as per the original survey (see section 3.2 of the HIA). The general baseline environment as described in Section 4.2 of the HIA showed no obvious changes since the previous survey, aside from the fact that the grass cover was somewhat denser owing to the good summer rains.

One new waypoint (1153) was recorded in the farm road at the southern edge of the archaeological site already on record (i.e as indicated by waypoints 286 to 289). Figure 4 shows an unusually small biface recorded at this point, but other artefacts were also present and are no doubt part of the same archaeological site. This finding is in keeping with the finds reported in Orton (2021) and does not change the nature of the archaeology already on record. The site is still worthy of a GPB grading. The remainder of the survey revealed no further heritage resources.

### Impact assessment

No new heritage resources were found. The newly recorded waypoint is part of the existing known archaeological site. The radio mast is very tall up to 90 m and will protrude well above the authorised MTS but given the extensive network of high voltage powerlines already present in the area and the many solar facilities due to be constructed, it is concluded that the landscape will be strongly dominated by electrical

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infrastructure with a precedent already set for vertically oriented features (i.e. powerline pylons and various substation components). There is also an existing telecommunications mast a short distance to the west. The newly proposed mast is thus not considered to be of heritage concern.

The assessments below are copied directly from Sections 6.1 and 6.2 of the original HIA. There have been no changes to this assessment

### Impacts to archaeological resources

Archaeological resources may be damaged during the construction period when grubbing and/or excavations for foundations, roads and other infrastructure occurs. The impacts are direct and will occur during the construction phase only. Because of the limited cultural significance of the archaeological materials, the intensity is medium and the extent limited to the site. The calculated impact significance is **medium negative** before mitigation (Table 1). Mitigation is possible and easily effected through collection, recording and analysis of the stone artefacts. Only the larger scatter at waypoints 286 to 289 is suggested for mitigation. With mitigation the impact significance calculates to **low negative**. It should be noted that this is strongly influenced by the permanent duration of the impact and that a significance of very low negative would be more appropriate after mitigation. No other management measures are required because once the mitigation is carried out there will be no further archaeological concerns. There are no fatal flaws in terms of archaeology.

**Table 1: Assessment of archaeological impacts.**

<b>Issue</b>	Destruction of archaeological resources	
<b>Description of Impact</b>		
Archaeological resources are damaged, destroyed or moved from their context.		
<b>Type of Impact</b>	Direct	
<b>Nature of Impact</b>	Negative	
<b>Phases</b>	Construction	
<b>Criteria</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Intensity</b>	Medium	Very Low
<b>Duration</b>	Permanent	Permanent
<b>Extent</b>	Site	Site
<b>Consequence</b>	Medium	Low
<b>Probability</b>	Probable	Unlikely / improbable
<b>Significance</b>	Medium -	Low -
<b>Degree to which impact can be reversed</b>	Low – archaeological resources are non-renewable and cannot be recreated on site.	
<b>Degree to which impact may cause irreplaceable loss of resources</b>	High - archaeological resources are non-renewable and irreplaceable.	
<b>Degree to which impact can be mitigated</b>	High – mitigation is easy to apply and will effectively capture archaeological data before development proceeds.	
<b>Mitigation actions</b>		
<b>The following measures are recommended:</b>	Recording and sampling of artefacts from the site (waypoints 286 to 289).	
<b>Monitoring</b>		

The following monitoring is recommended:	None.	
<b>Cumulative impacts</b>		
Nature of cumulative impacts	Direct	
Rating of cumulative impacts	Without Mitigation	With Mitigation
	Medium -	Very Low -

Given that the area where the archaeology occurs was previously ploughed, it is suggested that a large grid of squares measuring perhaps 3x3 m could be laid over the surface with all materials collected from these squares. A number of squares could then be selected for subsurface testing because ploughing would have distributed the material throughout the ploughzone. This mitigation work should preferably be carried out in the dry season in order to ensure efficient sieving of the soil and maximum recovery of finds.

### Impacts to the cultural landscape

Impacts to the cultural landscape relate to the visual intrusion of the new electrical infrastructure into the rural cultural landscape. In this instance, however, it must be noted that a large amount of electrical infrastructure is already present in the landscape. This infrastructure includes many powerlines and two large substations, one of which lies close to the proposed development area. As a result, the intensity of the new impact is rated as low. The impacts will occur for as long as the power line and substation remain present (i.e. long term). Because they will be visible from beyond the development area, the extent is rated as local. The position of the MTS alongside the R64 is notable in this instance because it will be very much in the public eye. During the construction and decommissioning phases the significance would be driven more by the amount of activity on site, while during operation it is driven mostly by the long-term duration of the impact. Before mitigation the impact significance is rated as being **medium negative** (Table 2). The proposed infrastructure cannot be meaningfully hidden and the landscape already has much similar infrastructure present. As such, only best practice measures related to minimising disturbance footprint and rehabilitating all areas not required during operation can be suggested. The impacts post-mitigation will remain **medium negative**. There are no fatal flaws in terms of the cultural landscape.

**Table 2: Assessment of impacts to the cultural landscape.**

Issue	Impacts to the cultural landscape	
<b>Description of Impact</b>		
Visual intrusion of electrical infrastructure into the rural cultural landscape.		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Construction, Operation, Decommissioning	
Criteria	Without Mitigation	With Mitigation
Intensity	Low	Low
Duration	Long-term	Long-term
Extent	Local	Local
Consequence	Medium	Medium
Probability	Definite / Continuous	Definite / Continuous
Significance	Medium -	Medium -

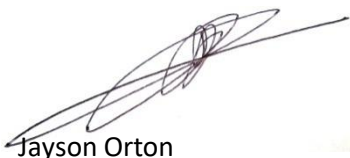
Degree to which impact can be reversed	High – With removal of all infrastructure and rehabilitation of the site, the current status quo could be recreated.	
Degree to which impact may cause irreplaceable loss of resources	Low – the grasslands of the South African interior are extensive and similar landscapes occur elsewhere.	
Degree to which impact can be mitigated	Low – There is nothing that can be done to hide the substation and powerlines.	
<b>Mitigation actions</b>		
The following measures are recommended:	Minimise disturbance footprint. Rehabilitate all areas not required during operation. Minimise size of access track.	
<b>Monitoring</b>		
The following monitoring is recommended:	None	
<b>Cumulative impacts</b>		
Nature of cumulative impacts	Direct	
Rating of cumulative impacts	<b>Without Mitigation</b>	<b>With Mitigation</b>
	Low -	Low -

## Conclusion

It is thus concluded that the newly proposed changes to the project as listed above do not have any effect on the existing impact assessment contained in the previous HIA (Orton 2021) and as presented above. The proposed amended project layout should thus be authorised in its entirety but it is essential that all existing conditions be carried over to the new environmental authorisation, should one be issued. For clarity, these conditions are as follows (with the new waypoint added in):

- The archaeological materials located in the scatter at waypoints 286 to 289 and 1155<sup>1</sup> should be sampled by an archaeologist prior to construction; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

Yours sincerely



Jayson Orton

## Reference:

Orton, J. 2021. Heritage Impact Assessment: proposed 132kv/400kv on-site Main Transmission Substation (MTS) And Associated Infrastructure near Dealesville, Boshof Magisterial District, Free State. Report prepared for SLR Consulting (South Africa) (Pty) Ltd. Muizenberg: ASHA Consulting (Pty) Ltd.

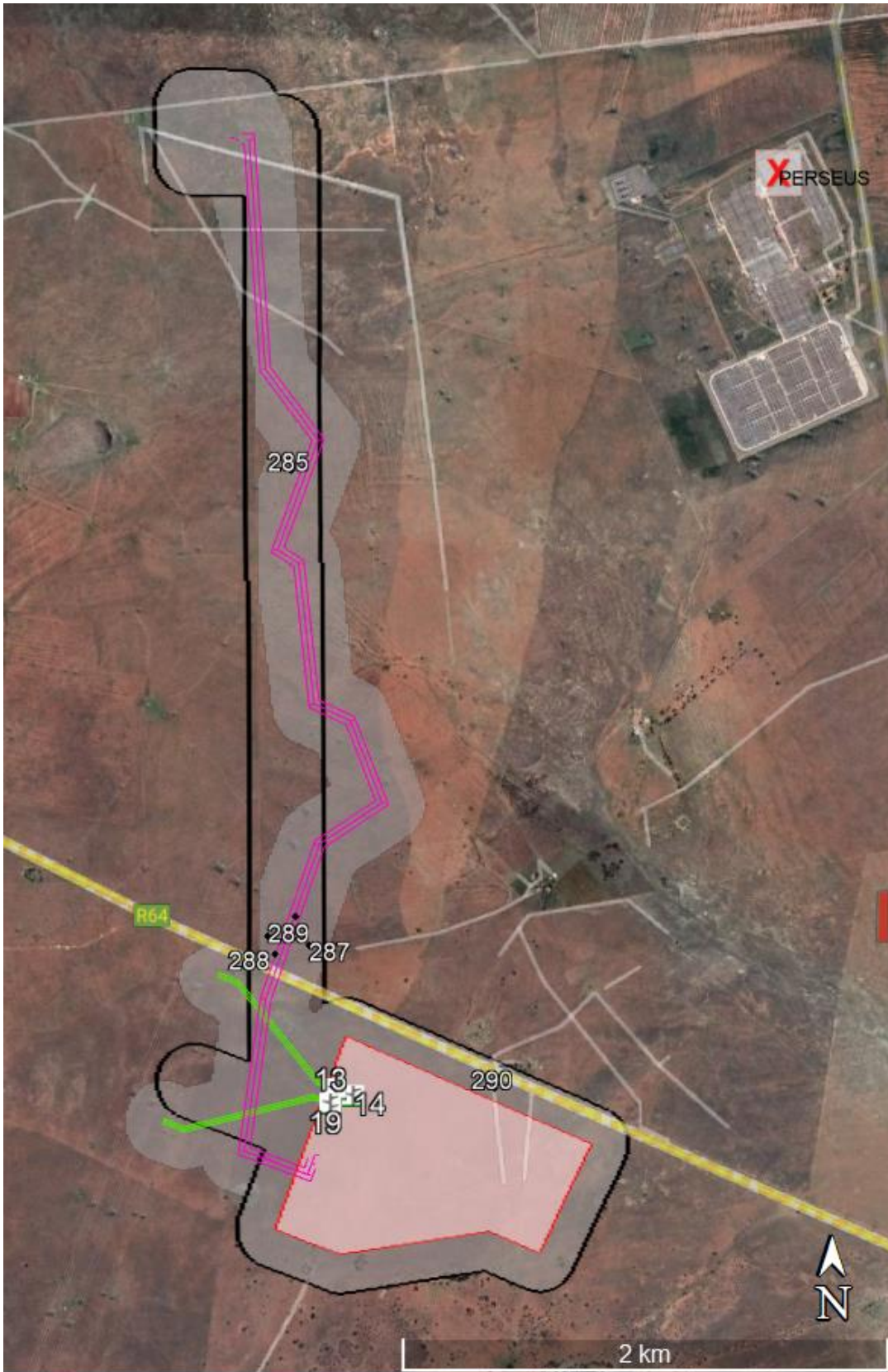
<sup>1</sup> 28 39'41.91S, 25 43'26.26E

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**Figure 1:** Aerial view of the study area showing the current proposal in grey and the previously assessed corridors and MTS site in black.

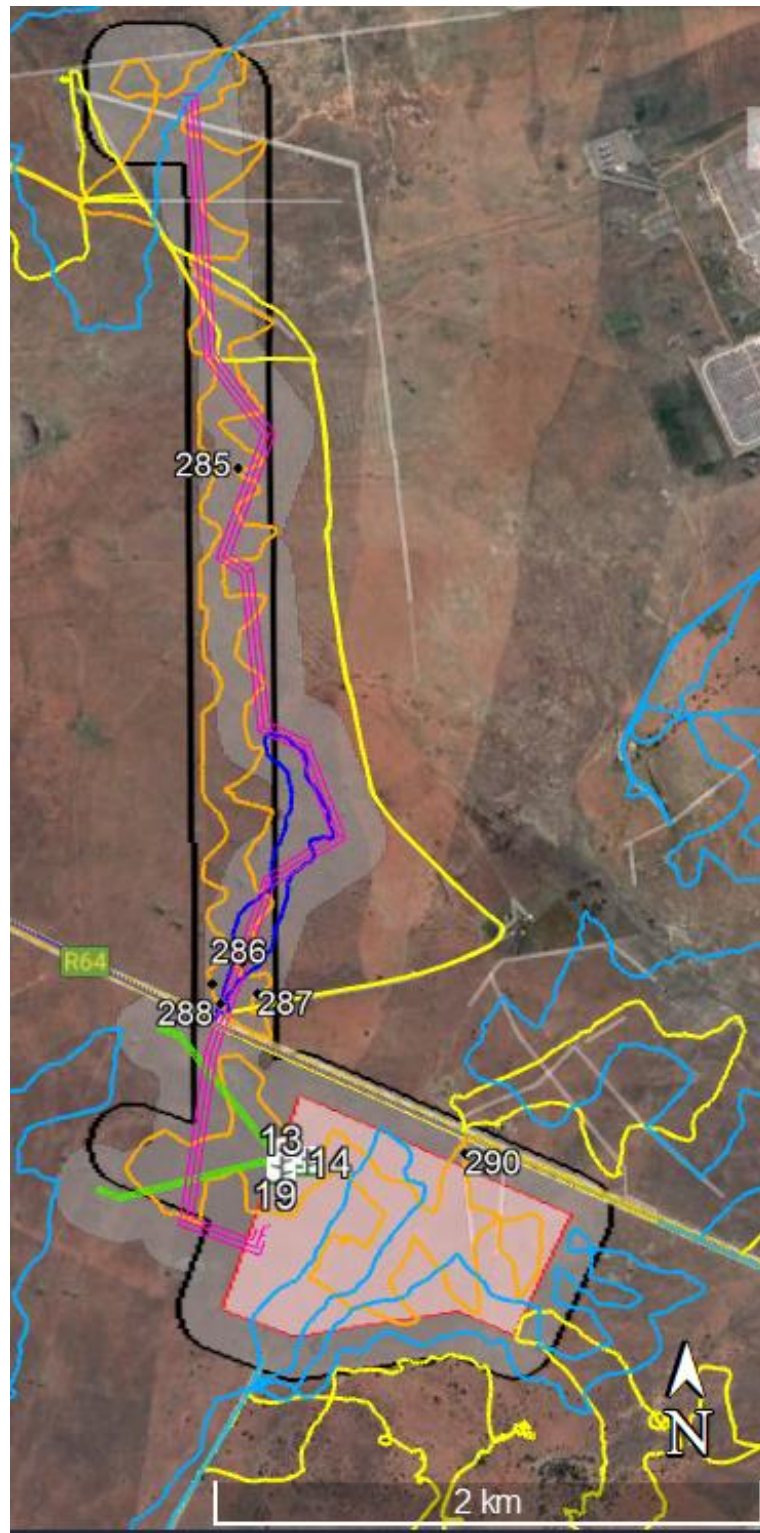
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**Figure 2:** Aerial view of the study area showing the accumulated survey tracks from the broader Kentani Cluster project. Yellow = 2014, Orange = 2021, blue = 2022 with the dark blue being the 15 June survey.



**Figure 3:** Smaller scale view of the above map but with archaeological findings included (numbered waypoints). The archaeological site (including the new waypoint 1155) is shown by the white shaded polygon.



**Figure 4:** *The very small biface recorded in the farm road at waypoint 1155.*

**HERITAGE IMPACT ASSESSMENT:  
PROPOSED 132KV/400KV ON-SITE MAIN TRANSMISSION  
SUBSTATION (MTS) AND ASSOCIATED INFRASTRUCTURE  
NEAR DEALESVILLE,  
BOSHOF MAGISTERIAL DISTRICT, FREE STATE**

Required under Section 38(8) of the National Heritage Resources Act (No. 25 of 1999)  
as part of a Heritage Impact Assessment.

*Report for:*

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*On behalf of:*

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1<sup>st</sup> draft: 12 October 2021  
Final report: 09 November 2021

## SUMMARY

ASHA Consulting (Pty) Ltd was appointed by SLR Consulting (South Africa) (Pty) Ltd to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed development of a Main Transmission Substation (MTS), Battery Energy Storage System (BESS), and associated powerlines just northwest of Dealesville, Free State. The northern and southern ends of the development are located at S28° 37' 54.5" E25° 43' 21.9" and S28° 40' 19.4" E25° 44' 05.4" respectively. The MTS and BESS would be located on the Remaining Extent of the Farm Klipfontein No. 305, while the powerlines would be on the Remaining Extent of the Farm Oxford 1030 and Farm Leliehoek 748.

The study area is comprised of relatively flat grasslands but with a gentle rise towards the south. The soil is dolerite-derived and small exposures of this rock were noted from time to time in the northern two-thirds of the development area. Stone artefacts dating to the Middle Stone Age were found to occur in some areas with one patch being of low-medium cultural significance and will require sampling. The cultural landscape was also identified as a heritage resource but its significance is low given the large amount of electrical infrastructure in the area. In addition, many other electrical facilities have already been authorised but not yet constructed. The proposed land use will thus not be out of place and the impact to the landscape is acceptable.

It is recommended that the proposed MTS, BESS and associated 132 kV and 400 kV powerlines should be approved but subject to the following recommendations:

- The archaeological materials located in the scatter at waypoints 286 to 289 should be sampled by an archaeologist prior to construction; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

## Glossary

**Acheulean (also Acheulian):** An archaeological name for the period comprising the later part of the Early Stone Age. This period started about 1.7-1.5 million years ago and ended about 250-200 thousand years ago.

**Background scatter:** Artefacts whose spatial position is conditioned more by natural forces than by human agency.

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

**Handaxe:** A bifacially flaked, pointed stone tool type typical of the Early Stone Age Acheulian Industry. It is also referred to as a large cutting tool.

**Holocene:** The geological period spanning the last approximately 10-12 000 years.

**Hominid:** a group consisting of all modern and extinct great apes (i.e. gorillas, chimpanzees, orangutans and humans) and their ancestors.

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

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

**Pleistocene:** The geological period beginning approximately 2.5 million years ago and preceding the Holocene.

## Abbreviations

**APHP:** Association of Professional Heritage Practitioners

**ASAPA:** Association of Southern African Professional Archaeologists

**BA:** Basic Assessment

**CRM:** Cultural Resources Management

**DEA&DP:** Department of Environmental Affairs and Development Planning

**DFFE:** Department of Forestry, Fisheries and the Environment

**EA:** Environmental Authorisation

**ECO:** Environmental Control Officer

**EGI:** Electricity Grid Infrastructure

**EIA:** Environmental Impact Assessment

**EMPr:** Environmental Management Program

**ESA:** Early Stone Age

**GP:** General Protection

**GPS:** global positioning system

**HIA:** Heritage Impact Assessment

**LCT:** large cutting tool

**LSA:** Later Stone Age

**MSA:** Middle Stone Age

**MTS:** Main Transmission Substation

**NBKB:** Ngwao-Boswa Ya Kapa Bokoni

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

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

**PPP:** Public Participation Process

**PV:** Photo-voltaic

**REDZ:** Renewable Energy Development Zone

**SAHRA:** South African Heritage Resources Agency

**SAHRIS:** South African Heritage Resources Information System

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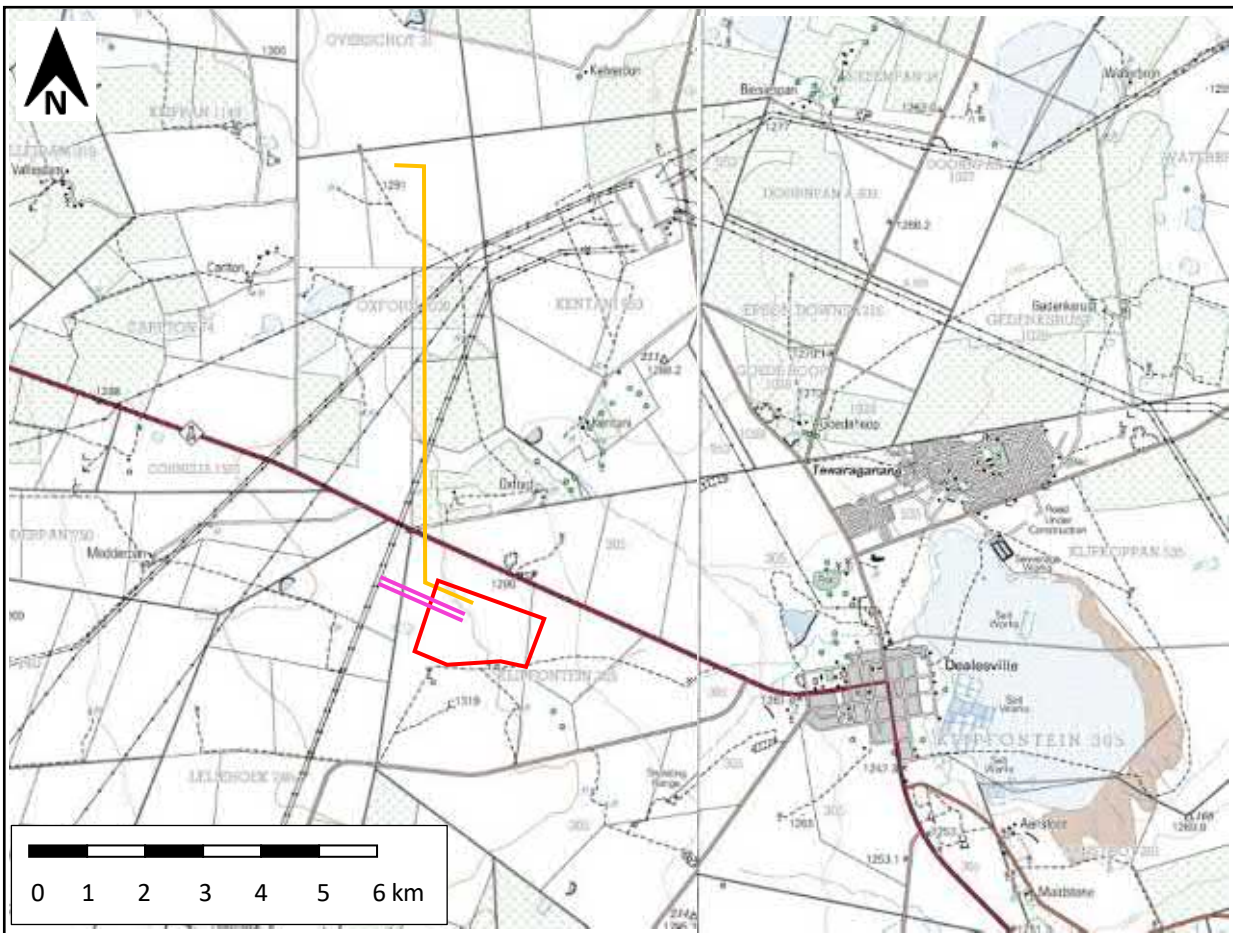
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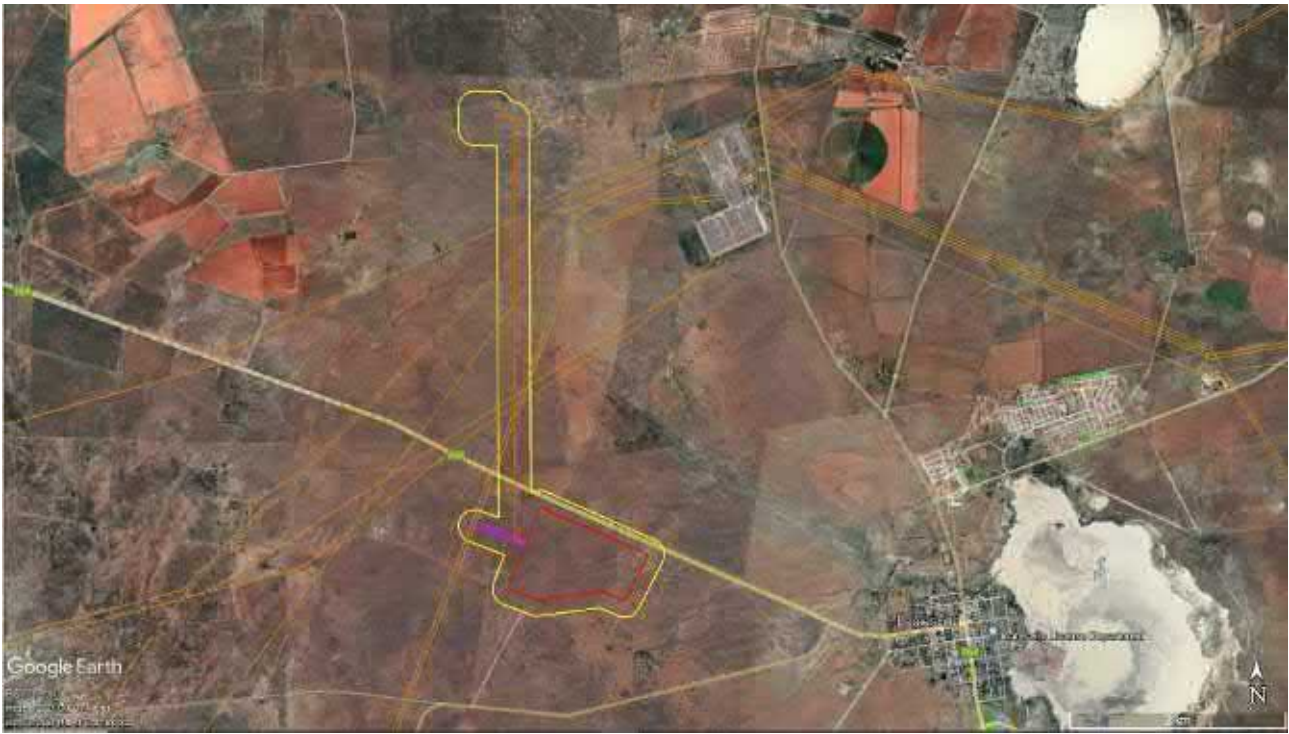
# 1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by SLR Consulting (South Africa) (Pty) Ltd to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed development of one (1) Main Transmission Substation (MTS) and three (3) powerlines (namely 1 x 132kV powerline and 2 x 400kV powerlines) and Li-Ion Battery Energy Storage System to their authorised Kentani Cluster of solar photovoltaic (PV) developments near the town of Dealesville in the Free State Province (Figure 1). The northern and southern ends of the development are located at  $S28^{\circ} 37' 54.5'' E25^{\circ} 43' 21.9''$  and  $S28^{\circ} 40' 19.4'' E25^{\circ} 44' 05.4''$  respectively. The MTS and BESS would be located on the Remaining Extent of the Farm Klipfontein No. 305, while the powerlines would be on the Remaining Extent of the Farm Oxford 1030 and Farm Leliehoek 748.



**Figure 1:** Extract from 1:50 000 topographic map 2825DA & 2825DB showing the location of the site relative to Dealesville. MTS site = red; powerlines = orange and pink. Source of basemap: Chief Directorate: National Geo-Spatial Information. Website: [www.ngi.gov.za](http://www.ngi.gov.za).

The proposed infrastructure is part of a larger solar energy development consisting of eleven photovoltaic facilities and associated infrastructure which have already been authorised. The newly proposed infrastructure is required to connect the eleven PV facilities to the national electricity grid and falls outside of the already authorised powerline corridor.



**Figure 2:** Aerial view of the development area and surrounds showing the landscape around the site with Dealesville to the southeast. MTS site = red; powerlines = orange and pink, development corridor = yellow.

## 1.1. The proposed project

### 1.1.1. Project description

South Africa Mainstream Renewable Power Developments (Pty) Ltd ('Mainstream') is proposing to add one MTS, BESS and four powerlines to their authorised Kentani Cluster of solar photovoltaic (PV) developments near the town of Dealesville in the Free State Province. The proposed development will also involve the re-routing of eight already authorised 132 kV powerlines within the grid connection corridor authorised as part of the Kentani Cluster and making provision for this routing in the new proposed MTS.

It should be noted that on 28 October 2021, the Minister of Mineral Resources and Energy, Gwede Mantashe announced the Preferred Bidders of the Round 5 Renewable Energy Independent Power

Producer Procurement Programme (REIPPPP) (See Section 2.2.7 for explanation on the REIPPPP) and six (6) of the aforementioned Solar Energy Facilities received Preferred Bidder status i.e.:

- Kentani Solar PV
- Klipfontein Solar PV
- Klipfontein 2 Solar PV
- Leliehoek Solar PV
- Sonoblomo Solar PV
- Braklaagte Solar PV

These Solar Energy Facilities have now become Strategic Infrastructure Projects i.e. SIPs 8 and 10. SIPs 8 and 10 target the development of green energy in support of the South African economy and the provision of electricity transmission and distribution respectively.

- SIP 8 supports sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP2010) and support bio-fuel production facilities.
- SIP 10 Expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity

The proposed MTS will occupy a footprint of approximately 64 hectares (ha) (i.e., 800m x 800m) and the proposed Lithium-Ion Battery Energy Storage System (BESS) will occupy up to 4 ha. The area occupied by the proposed power lines is unknown at this stage. In addition, the proposed MTS will have a capacity of 132/400 kilovolt (kV), while the associated powerlines will have capacities of up to 400kV, 132kV and 33kV respectively. The powerlines and BESS associated with the MTS and which are being proposed as part of this application and BA process are as follows:

1. Two (2) 400kV overhead powerlines (approx. 2km in length) that will connect the proposed MTS to the existing Eskom 400kV powerline, located approx. 1km west of the proposed MTS site, via a Loop-In-Loop Out (LILO) connection;
2. One (1) 132kV powerline (approx. 4.5km in length) that will connect the proposed MTS to the authorised Kentani on-site substation (14/12/16/3/3/2/724), located approx. 4km north-west of the proposed MTS site; and
3. Li-Ion Battery Energy Storage System (BESS) up to 4 ha in extent within the assessed site footprint

Additionally, there is one (1) 33kV powerline (approx. 2km in length) being proposed and will connect the authorised 75MW Sonoblomo PV facility (14/12/16/3/3/2/723), which is located approximately 5km north of the proposed MTS site, to the authorised Kentani on-site substation (14/12/16/3/3/2/724) (approx. 4km north-west of proposed MTS site). This powerline is not subject to the Basic Assessment study as it does not trigger the need for an Application for Environmental Authorisation, however, the powerline has been considered by the specialist team.

As mentioned above, the proposed development will also involve the re-routing of eight (8) 132kV powerlines within the grid connection corridor authorised as part of the Kentani Cluster and making provision for this routing in the new proposed MTS. The remaining two (2) 400kV powerlines and

one (1) 132kV powerline fall outside of the authorised corridor and will be assessed as part of the BA process for the MTS (i.e., this application).

It is important to note that this 33 kV powerline is not a listed activity and therefore does not require authorisation. It is not reported on here. Because it does still trigger the National Heritage Resources Act (No. 25) of 1999 (NHRA) it will be reported on separately for the South African Heritage Resources Agency (SAHRA) to issue a decision.

A service road within the servitude under the proposed powerlines as well as an access road (approx. 4-8m wide) to the R64 provincial route will also be required.

As part of the BA process, powerline corridors with widths of 300m (150m on either side of centre line) are being proposed and assessed for the 400kV and 132kV powerlines. This is to allow flexibility when routing the powerlines within the authorised corridor.

#### 1.1.2. Identification of alternatives

No alternative locations have been identified for the project since the infrastructure is required to support a suite of authorised solar energy facilities and other locations and technologies would not provide the required support. However, corridors have been assessed for the powerlines which allows micro-siting within the corridors should sensitive receptors be identified.

#### 1.1.3. Aspects of the project relevant to the heritage study

All aspects of the proposed development are relevant, since excavations for foundations and/or services may impact on archaeological and/or palaeontological remains, while all above-ground aspects create potential visual (contextual) impacts to the cultural landscape and any significant heritage sites that might be visually sensitive.

### 1.2. Terms of reference

ASHA Consulting was provided with the following terms of reference for the study:

- Review the Department of Environment, Forestry and Fisheries (DFFE) online screening tool in order to assess the site sensitivity;
- Prepare a Site Sensitivity Verification and Impact Assessment Report in line with Appendix 6 of the 2014 EIA Regulations (as amended) and Heritage Authority Requirements for the Free State Province;
- Undertake a desktop study for initial data collection;
- Conduct a field survey for ground truthing and additional data collection; and
- Compile a report (including updates thereto) at BA level to comply with the latest regulations regarding specialist studies (i.e. site verification report and impact assessment report<sup>1</sup>).

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<sup>1</sup> GN 320 (20 March 2020): Procedures for The Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation.

### **1.3. Scope and purpose of the report**

A heritage impact assessment (HIA) is a means of identifying any significant heritage resources before development begins so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the fragile heritage of South Africa. This HIA report aims to fulfil the requirements of the heritage authorities such that a comment can be issued by them for consideration by the National Department of Forestry, Fisheries and Environment (DFFE) who will review the Basic Assessment (BA) and grant or refuse authorisation. The HIA report will outline any management and/or mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of authorisation should this be granted.

### **1.4. The author**

Dr Jayson Orton has an MA (UCT, 2004) and a D.Phil (Oxford, UK, 2013), both in archaeology, and has been conducting Heritage Impact Assessments and archaeological specialist studies in South Africa (primarily in the Western Cape and Northern Cape provinces) since 2004 (please see curriculum vitae included as Appendix 1). He has also conducted research on aspects of the Later Stone Age in these provinces and published widely on the topic. He is an accredited heritage practitioner with the Association of Professional Heritage Practitioners (APHP; Member #43) and also holds archaeological accreditation with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #233) as follows:

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

### **1.5. Declaration of independence**

ASHA Consulting (Pty) Ltd and its consultants have no financial or other interest in the proposed development and will derive no benefits other than fair remuneration for consulting services provided.

## **2. LEGISLATIVE CONTEXT**

### **2.1. National Heritage Resources Act (NHRA) No. 25 of 1999**

The NHRA protects a variety of heritage resources as follows:

- Section 34: structures older than 60 years;
- Section 35: prehistoric and historical material (including ruins) more than 100 years old as well as military remains more than 75 years old, palaeontological material and meteorites;
- Section 36: graves and human remains older than 60 years and located outside of a formal cemetery administered by a local authority; and
- Section 37: public monuments and memorials.

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

- Structures: “any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith”;

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

Section 3(3) describes the types of cultural significance that a place or object might have in order to be considered part of the national estate. These are as follows:

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

While landscapes with cultural significance do not have a dedicated Section in the NHRA, they are protected under the definition of the National Estate (Section 3). Section 3(2)(c) and (d) list “historical settlements and townscapes” and “landscapes and natural features of cultural

significance” as part of the National Estate. Furthermore, some of the points in Section 3(3) speak directly to cultural landscapes.

Section 38(8) of the NHRA states that if an impact assessment is required under any legislation other than the NHRA then it must include a heritage component that satisfies the requirements of S.38(3). Furthermore, the comments of the relevant heritage authority must be sought and considered by the consenting authority prior to the issuing of a decision. Under the National Environmental Management Act (No. 107 of 1998; NEMA), as amended, the project is subject to an BA. The present report provides the heritage component. Ngwao-Boswa Ya Kapa Bokoni (Heritage Northern Cape; for built environment and cultural landscapes) and SAHRA (for archaeology and palaeontology) are required to provide comment on the proposed project in order to facilitate final decision making by the DFFE.

### 3. METHODS

#### 3.1. Literature survey and information sources

A survey of available literature was carried out to assess the general heritage context into which the development would be set. The information sources used in this report are presented in Table 1. Data were also collected via a field survey.

**Table 1: Information sources used in this assessment.**

Data / Information	Source	Date	Type	Description
Maps	Chief Directorate: National Geo-Spatial Information	Various	Spatial	Historical and current 1:50 000 topographic maps of the study area and immediate surrounds
Aerial photographs	Chief Directorate: National Geo-Spatial Information	Various	Spatial	Historical aerial photography of the study area and immediate surrounds
Aerial photographs	Google Earth	Various	Spatial	Recent and historical aerial photography of the study area and immediate surrounds
Cadastral data	Chief Directorate: National Geo-Spatial Information	Various	Survey diagrams	Historical and current survey diagrams, property survey and registration dates
Background data	South African Heritage Resources Information System (SAHRIS)	Various	Reports	Previous impact assessments for any developments in the vicinity of the study area
Palaeontological sensitivity	South African Heritage Resources Information System (SAHRIS)	Current	Spatial	Map showing palaeontological sensitivity and required actions based on the sensitivity.
Background data	Books, journals, websites	Various	Books, journals, websites	Historical and current literature describing the study area and any relevant aspects of cultural heritage.



### 3.2. Field survey

The site was subjected to a detailed foot survey on 2<sup>nd</sup> October 2021. This was during spring and before the onset of the rainy season. This meant that ground visibility for archaeological resources was about as good as it could get. Other heritage resources are not affected by seasonality. During the survey the positions of finds and survey tracks were recorded on a hand-held Global Positioning System (GPS) receiver set to the WGS84 datum (Figure 3). Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the proposed development.

It should be noted that amount of time between the dates of the field inspection and final report do not materially affect the outcome of the report.



**Figure 3:** Aerial view of the development area (key as per Figure 2) showing the survey tracks (blue lines).

### 3.3. Specialist studies

No specialist studies were produced as part of this HIA, but a palaeontological specialist study was commissioned and will be submitted as a free-standing report (Butler 2021) to be read in conjunction with this HIA.

### 3.4. Impact assessment

For consistency among specialist studies, the impact assessment was conducted through application of a scale supplied by SLR.

### **3.5. Grading**

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

It is intended under S.7(2) that the various provincial authorities formulate a system for the further detailed grading of heritage resources of local significance but this is generally yet to happen. SAHRA (2007) has formulated its own system<sup>2</sup> for use in provinces where it has commenting authority. In this system sites of high local significance are given Grade IIIA (with the implication that the site should be preserved in its entirety) and Grade IIIB (with the implication that part of the site could be mitigated and part preserved as appropriate) while sites of lesser significance are referred to as having 'General Protection' (GP) and rated as GP A (high/medium significance, requires mitigation), GP B (medium significance, requires recording) or GP C (low significance, requires no further action).

### **3.6. Consultation**

The NHRA requires consultation as part of an HIA but, since the present study falls within the context of a BA, which includes a public participation process (PPP), no dedicated consultation was undertaken as part of the HIA. Interested and affected parties would have the opportunity to provide comment on the heritage aspects of the project during the PPP.

### **3.7. Assumptions and limitations**

The field study was carried out at the surface only and hence any completely buried archaeological sites would not be readily located. Similarly, it is not always possible to determine the depth of archaeological material visible at the surface. The grass cover over most of the site meant that visibility, although good at close range, was limited to within 2-3 m. The survey was based on the project layout provided before the fieldwork which means that later alterations may not be fully covered. It is assumed, however, that the observations made provide a good understanding of the distribution of heritage resources in the development area.

## **4. PHYSICAL ENVIRONMENTAL CONTEXT**

### **4.1. Site context**

The development area is in a rural area dominated by the rearing of livestock, although some arable land is also present. The R64 which connects Dealesville and Boshof runs through the southern part of the development area with the proposed MTS being immediately south of the R64. Most visually prominent on the landscape, however, are the very large Eskom Perseus Substation which lies 3.5 km east of the northern part of the proposed powerline corridor (Figure 4) and the many existing high voltage powerlines (both 400 kV and 700 kV) that cross the proposed corridor. The

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<sup>2</sup> The system is intended for use on archaeological and palaeontological sites only.

development area lies wholly within the Kimberley Renewable Energy Development Zone (REDZ) and within the Central Electricity Grid Infrastructure (EGI) corridor.



**Figure 4:** View towards the east from the development area showing the existing Eskom Perseus Substation and associated powerlines.

#### **4.2. Site description**

The site is comprised almost exclusively of grassland. The only exceptions are occasional small outcrops of dolerite and the R64 road. Aerial photography reveals that some areas have been ploughed in the recent past but there was absolutely no trace of this practice on the ground. The site slopes gently uphill towards the south, while the MTS site slopes downhill towards the east. Figures 5 to 13 show views of the development area. In the north the surface was exclusively sandy and animal burrows showed that below the surface was also sandy (Figure 14). Further south where gravel was seen animal burrows showed that the gravel was more dense just below the surface (Figure 15).



**Figure 5:** View towards the southeast through the northern end of the development area.



**Figure 6:** View towards the south directly along the proposed powerline corridor from its northern end. Puddles had formed on the very flat surface after recent rains.



**Figure 7:** View towards the north through the northern part of the proposed powerline corridor.



**Figure 8:** View towards the north through the central part of the proposed powerline corridor.



**Figure 9:** View towards the south through the southern part of the proposed powerline corridor.



**Figure 10:** View towards the northwest through the centre of the MTS site.



**Figure 11:** View towards the northeast through the MTS site from near its south-western corner.



**Figure 12:** View towards the southwest from the western edge of the MTS site showing a series of small dolerite boulders on the surface.



**Figure 13:** View towards the southwest from the point where the proposed powerline corridor crosses the R64.



**Figure 14:** An animal burrow showing no stone under the ground in the northern part of the development area.



**Figure 15:** A small excavation showing the presence of hornfels gravel beneath the surface.

## 5. FINDINGS OF THE HERITAGE STUDY

This section describes the heritage resources recorded in the development area during the course of the project. Please note that the palaeontological findings are presented in a separate specialist report (Butler 2021).

### 5.1. Archaeology

#### 5.1.1. Desktop study

Stone Age material occurs widely across southern Africa, while the Iron Age, which only occurred within the last 2000 years, is present only in the eastern parts where summer rainfall allowed for

the cultivation of summer crops. Stone-walled settlements dating to the Iron Age have been widely documented in parts of the Free State and adjacent Northern Cape (Maggs 1976a, 1976b) but the Iron Age appears to be absent from the vicinity of Dealesville. Later Stone Age stone-built dwellings are known from along the Riet River about 100 km to the southwest (Humphreys 1972, 2009). With the exception of the rich MSA deposits of Florisbad (Kuman *et al.* 1999) and the MSA and LSA stone artefact assemblages from Erfkroon (Churchill *et al.* 2000), significant archaeological resources appear to be quite rare in this flat, open and well-grassed landscape. Archaeological material is, however, more common along the major rivers where artefacts are revealed in the river terrace gravels.

Webley (2010) surveyed an area to the southeast of the present development area and reported a complete absence of archaeological material. She further noted that stone suitable for the manufacture of flaked tools was not present and that the quantity of other rock available on the surface was insufficient to allow for the construction of stone dwellings. Hutten's (2011) survey of land to the north of Boshoff showed similar results but in that case a pan was present with a large scatter of MSA and LSA artefacts present alongside it. The same applied to a survey immediately west of the present development area where many thousands of artefacts were found adjacent to a pan (Orton 2016a). This demonstrates the preference to settle close to water sources that is prevalent across much of the relatively dry interior of southern Africa. Orton's (2015) survey of large areas surrounding and to the south of the present development area showed heritage resources to be quite common. They included built structures, artefact scatters and a number of rock engravings. The vast majority of resources were located in close proximity to the rock outcrop areas closer to Dealesville, while further south into the grasslands the archaeology dropped off significantly. The majority of artefacts located by Orton (2015) were attributable to Pleistocene-aged Middle Stone Age (MSA) background scatter and were associated with gravel exposures. They did not constitute *in situ* living sites. However, some artefacts dating to the Holocene Later Stone Age (LSA) were also noted. To the north of the present development area, Kaplan (2020, 2021) found similar artefacts ascribable to the MSA, with higher densities being present alongside pans.

Rock engravings occur widely in the interior of South Africa where suitable rock exists. Many sites are located in the Free State with the National Museum, Bloemfontein (2014) listing numerous examples that may be visited by the public. However, no sites seemed to be on record for the Dealesville area prior to Orton's (2015; see also Orton 2016b) survey. He located engravings dating within the last 2000 years and attributable by their geometric style to the Khoekhoe as well as figurative engravings done by the San. The former were found on a small dolerite hill 2 km west of the southern end of the present development area where flaked stone artefacts and ground patches on the dolerite were also recorded. Dolerite rocks with shallow grinding grooves and ground cupules have also been recorded in the area (Orton 2016a, b).

The remains of a historical stone-walled kraal also occur alongside the engraved outcrop described above (Orton 2015). Another stone-walled kraal and house ruin were recorded by Orton (2016a, b) to the west of the proposed MTS footprint, while Kaplan (2020) found stone-walled ruins to the north of the proposed powerline corridor.

#### 5.1.2. Site visit

The northernmost 1.1 km of the proposed powerline corridor were found to be free of gravel and stone artefacts. However, from this point southwards, ephemeral gravel patches and occasional



stone artefacts attributable to background scatter were noted. The northernmost occurrence of gravel is indicated in Figure 16, along with all other recorded finds. A few background scatter finds are shown in Figure 17. An interesting observation was made within the MTS site. Here, an old excavation was found that showed the presence of a hornfels gravel lag deposit beneath the present soily surface (Figures 18 & 19). There were relatively few gravel clasts on the surface away from this excavation showing that their origin, at least in this area, is a buried layer beneath the surface. Very few artefacts were located within this area (Figure 19) suggesting that the density of artefacts within this gravel lag is low at this point. It is impossible to extend this prediction over a wider area because there are other factors (e.g. past hornfels gravel exposures) affecting artefact density that cannot be accounted for.



**Figure 16:** Aerial view of the development area showing the distribution of finds recorded during the survey. “First gravel” marks the place where the first clasts were seen while moving towards the south.



**Figure 17:** Selection of background scatter artefacts found during the survey. 1 = MSA proximal blade. 2 = MSA point with broken tip. 3 = flake. 4 = flake showing black hornfels in recent break at tip. 5, 6, 8 = cores. 7 = handaxe with broken tip.



**Figure 18:** View of the section of an excavation in the centre of the MTS site. A gravel lag deposit is evident beneath the surface (arrowed), while in the grassy area above there were minimal clasts present.



**Figure 19:** Close-up of the subsurface hornfels gravel lag deposit. Beneath the gravel is dolerite. Scale in 1 cm and 5 cm intervals.



**Figure 20:** Stone artefacts found in the gravels in the excavation. Scale in 1 cm and 5 cm intervals.

Five locations were recorded as Stone Age sites because they had sufficiently high artefact densities to not be purely the result of background scatter. While they do not reflect *in situ* living sites, it is likely that they were originally deposited in this area but have been redistributed by natural processes and ploughing over time. All were located in close proximity to the R64, four of them to its north within the powerline corridor and one of them to the south just outside of the MTS site (Figure 16). The four to the north are best regarded as points demarcating a single larger scatter of material. The locations and descriptions of these sites are provided in Table 2.

**Table 2:** List of sites recorded during the survey.

Waypoint	Location	Description	Significance (Grade)
285	S28 38 38.7 E25 43 28.8	A possible stone feature with 10 rocks that are almost submerged beneath the surface. A few other rocks are also present in the vicinity. The orientation of the rocks in approximately NE-SW. The location is within an old ploughed field. All these factors together suggest that the site is not a grave mound and can safely be ignored.	None
286	S28 39 36.0 E25 43 29.3	A large and quite widespread scatter of heavily weathered and patinated hornfels stone artefacts. The scatter includes flakes, blades, cores and bifacial artefacts. The artefacts are likely mostly MSA, but some ESA pieces are also present. The latter include a very large flake of about 19 cm and some bifacial artefacts.	Low-medium (GPB)
287	S28 39 39.6 E25 43 31.2	A scatter of heavily weathered and patinated hornfels stone artefacts including various flakes, blades and cores.	Low (GPC)
288	S28 39 40.8 E25 43 26.3	A scatter of heavily weathered and patinated hornfels stone artefacts including various flakes and blades.	Low (GPC)
289	S28 39 38.5 E25 43 25.2	A scatter of heavily weathered and patinated hornfels stone artefacts including various flakes and blades.	Low (GPC)
290	S28 39 58.3 E25 43 58.9	A scatter of heavily weathered and patinated hornfels stone artefacts including various flakes, blades and cores as well as one probable LCT.	Low (GPC)

The largest scatter was at waypoint 286 (Figure 21), although it is likely that the material at waypoint 286 to 289 simply reflects patches of a larger occurrence, since artefacts were present thinly throughout this area. At waypoint 286 a variety of flakes, blades, cores and some bifacial artefacts

were found. It is likely that all the bifacial pieces were handaxes (also known as large cutting tools [LCTs]) but breakage and weathering make a definitive ascription difficult. The small size of the bifacial artefacts (Figure 22 shows a distinctive one) may suggest an ascription to the so-called Fauresmith. Herries (2011:17) states that “LCTs are not distinctive only of the Acheulian and their persistence in some assemblages should not be used to equate them with the Acheulian but [should be seen] simply as a surviving ESA [Early Stone Age] element in an otherwise MSA assemblage.” This works well in the present context where the majority of diagnostic artefacts are clearly from the MSA. These include blades and points, although the characteristic faceted platforms are not visible due to the amount of surface weathering and patination present. In a general sense, many of the artefacts appear similar to those illustrated from Kanteen Kopje and ascribed there to the Fauresmith (Kuman *et al.* 2020).



**Figure 21:** Stone artefacts from waypoint 286. Scale in 1 cm and 5 cm intervals.



**Figure 22:** A small LCT from waypoint 286 showing both faces and both edges. Scale in 1 cm and 5 cm intervals.

Waypoints 287 to 289 showed similar artefacts but in smaller numbers and with fewer bifacial items. Figure 23 shows two artefacts from waypoint 287, while Figure 24 shows the ground surface at nearby waypoint 288 with flakes present amongst the surface gravel.



**Figure 23:** Two artefacts from waypoint 287. On the left is a very large flake with marks originating from being ploughed over and to the right is a small probable LCT. Scales in 1 cm and 5 cm intervals.



**Figure 24:** View of the surface at waypoint 288 with flakes and gravel clasts visible.

The last site was a scatter located further to the southeast at waypoint 290. This scatter was fairly similar in content to those described above but of lower density. Figure 25 shows a selection of finds from this scatter.



**Figure 25:** *Artefacts from waypoint 290. On the left is a probable LCT and some flakes and blades, while a core is shown to the right. Scale in 1 cm and 5 cm intervals.*

## 5.2. Graves

Orton (2015, 2016a, 2016b) has located several farm graveyards in the area as well as one isolated grave. No graves were seen during the present survey.

## 5.3. Historical aspects and the Built environment

### 5.3.1. Desktop study

Historical resources will be primarily associated with farmsteads, although most are likely to be fairly recent, perhaps dating to the late 19<sup>th</sup> or early 20<sup>th</sup> centuries. Several such resources – buildings, ruins and artefact scatters (the latter two both covered under archaeology) were located in the area by Orton (2015). The town of Dealesville is relatively recent, dating to 1899 (Raper n.d.). It was laid out on the farm Klipfontein belonging to John Henry Deale and was awarded municipal status in 1914.

The second Anglo-Boer War (1899-1902) played a significant role in South African History, particularly in the interior of the country. Many battles were fought between the British and Boer forces. Significant battles in proximity to the present development area include the Battles of Modder River and Magersfontein 100 km to the southwest and west respectively, the Battle of Paardeberg 60 km to the southwest and the Battle of Driefontein just outside Bloemfontein, some 60 km to the southeast. Graves, graveyards and memorials across the central interior of South Africa serve as reminders of the war.

### 5.3.2. Site visit

No historical sites were located in or close to the development area. The MTS would be located some 2.4 km west of the western edge of Dealesville. The town has few, if any, significant historical structures.

#### 5.4. Cultural landscapes and scenic routes

The grasslands of the central interior of South Africa do have a particular character but this landscape type is very widespread and the Dealesville area is not special for any particular reason. In addition, it is noted that the landscape in and around the development area is visually very strongly dominated by electrical infrastructure. The R64 which links (from west to east) Kimberley, Boshof, Dealesville and Bloemfontein is the primary road traversing the area. The road is not a tourist route and, because it does not cross an especially scenic landscape, is not regarded as a scenic route of any significance.

#### 5.5. Statement of significance and provisional grading

Section 38(3)(b) of the NHRA requires an assessment of the significance of all heritage resources. In terms of Section 2(vi), “cultural significance” means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. The reasons that a place may have cultural significance are outlined in Section 3(3) of the NHRA (see Section 2 above).

The archaeological resources are deemed to have up to low-medium cultural significance at the local level for their scientific value.

The cultural landscape is largely a rural landscape with minimal aesthetic value. It is of low cultural significance at the local level.

#### 5.6. Summary of heritage indicators

Archaeological materials are non-renewable and easily disturbed heritage resources.

- Indicator: Significant archaeological materials should not be disturbed without appropriate study.

The landscape in this instance is dominated by electrical infrastructure. Nevertheless, new infrastructure provides further visual intrusion into the cultural landscape.

- Indicator: The proposed project should not dominate views from multiple directions.

## 6. ASSESSMENT OF IMPACTS

### 6.1. Impacts to archaeological resources

Archaeological resources may be damaged during the construction period when grubbing and/or excavations for foundations, roads and other infrastructure occurs. The impacts are direct and will occur during the construction phase only. Because of the limited cultural significance of the archaeological materials, the intensity is medium and the extent limited to the site. The calculated impact significance is **medium negative** before mitigation (Table 3). Mitigation is possible and easily effected through collection, recording and analysis of the stone artefacts. Only the larger scatter at waypoints 286 to 289 is suggested for mitigation. With mitigation the impact significance calculates to **low negative**. It should be noted that this is strongly influenced by the permanent duration of the impact and that a significance of very low negative would be more appropriate after mitigation. No

other management measures are required because once the mitigation is carried out there will be no further archaeological concerns. There are no fatal flaws in terms of archaeology.

**Table 3: Assessment of archaeological impacts.**

<b>Issue</b>	Destruction of archaeological resources	
<b>Description of Impact</b>		
Archaeological resources are damaged, destroyed or moved from their context.		
<b>Type of Impact</b>	Direct	
<b>Nature of Impact</b>	Negative	
<b>Phases</b>	Construction	
<b>Criteria</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Intensity</b>	Medium	Very Low
<b>Duration</b>	Permanent	Permanent
<b>Extent</b>	Site	Site
<b>Consequence</b>	Medium	Low
<b>Probability</b>	Probable	Unlikely / improbable
<b>Significance</b>	Medium -	Low -
<b>Degree to which impact can be reversed</b>	Low – archaeological resources are non-renewable and cannot be recreated on site.	
<b>Degree to which impact may cause irreplaceable loss of resources</b>	High - archaeological resources are non-renewable and irreplaceable.	
<b>Degree to which impact can be mitigated</b>	High – mitigation is easy to apply and will effectively capture archaeological data before development proceeds.	
<b>Mitigation actions</b>		
<b>The following measures are recommended:</b>	Recording and sampling of artefacts from the site (waypoints 286 to 289).	
<b>Monitoring</b>		
<b>The following monitoring is recommended:</b>	None.	
<b>Cumulative impacts</b>		
<b>Nature of cumulative impacts</b>	Direct	
<b>Rating of cumulative impacts</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>
	Medium -	Very Low -

Given that the area where the archaeology occurs was previously ploughed, it is suggested that a large grid of squares measuring perhaps 3x3 m could be laid over the surface with all materials collected from these squares. A number of squares could then be selected for subsurface testing because ploughing would have distributed the material throughout the ploughzone. This mitigation work should preferably be carried out in the dry season in order to ensure efficient sieving of the soil and maximum recovery of finds.

## 6.2. Impacts to the cultural landscape

Impacts to the cultural landscape relate to the visual intrusion of the new electrical infrastructure into the rural cultural landscape. In this instance, however, it must be noted that a large amount of electrical infrastructure is already present in the landscape. This infrastructure includes many powerlines and two large substations, one of which lies close to the proposed development area.



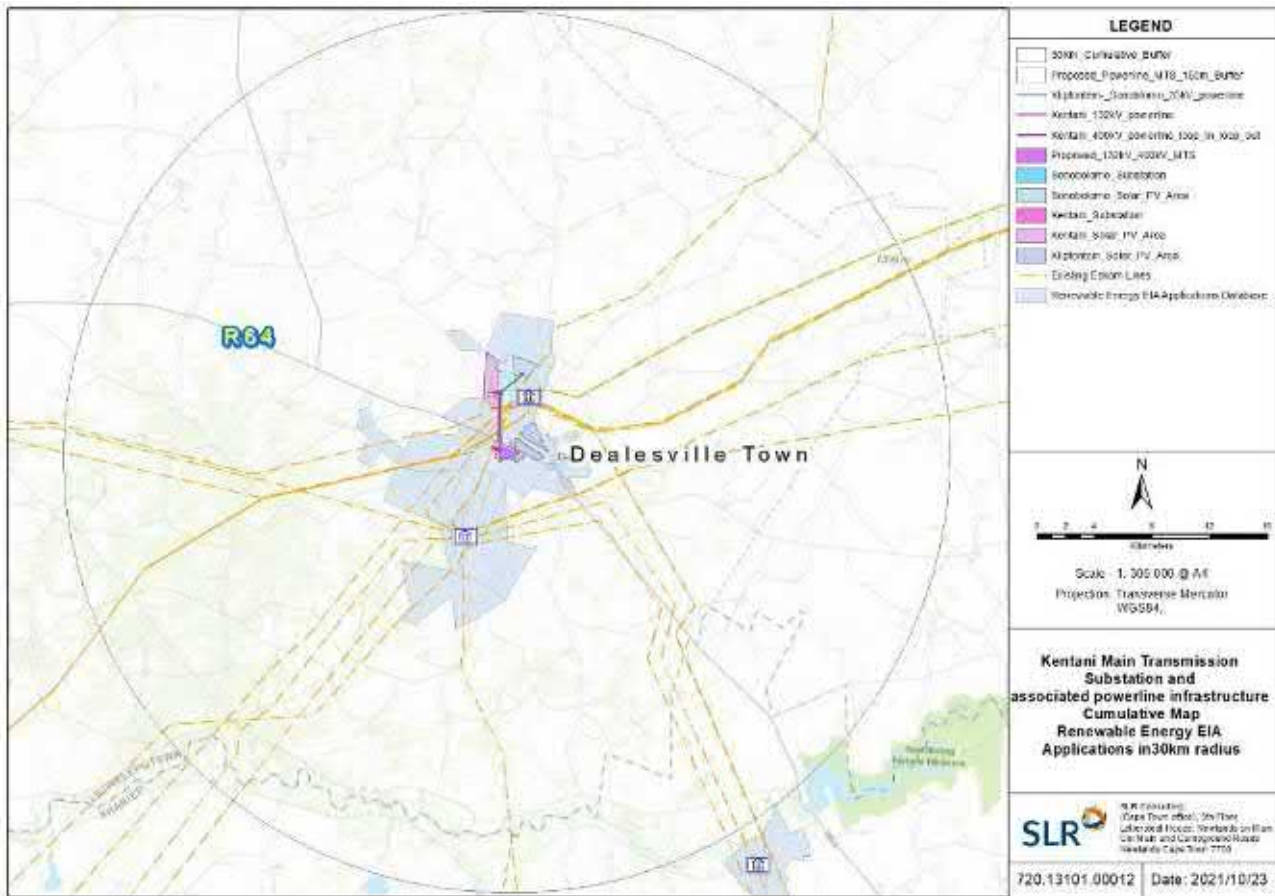
As a result, the intensity of the new impact is rated as low. The impacts will occur for as long as the power line and substation remain present (i.e. long term). Because they will be visible from beyond the development area, the extent is rated as local. The position of the MTS alongside the R64 is notable in this instance because it will be very much in the public eye. During the construction and decommissioning phases the significance would be driven more by the amount of activity on site, while during operation it is driven mostly by the long-term duration of the impact. Before mitigation the impact significance is rated as being **medium negative** (Table 4). The proposed infrastructure cannot be meaningfully hidden and the landscape already has much similar infrastructure present. As such, only best practice measures related to minimising disturbance footprint and rehabilitating all areas not required during operation can be suggested. The impacts post-mitigation will remain **medium negative**. There are no fatal flaws in terms of the cultural landscape.

**Table 4: Assessment of impacts to the cultural landscape.**

<b>Issue</b>	Impacts to the cultural landscape	
<b>Description of Impact</b>		
Visual intrusion of electrical infrastructure into the rural cultural landscape.		
<b>Type of Impact</b>	Direct	
<b>Nature of Impact</b>	Negative	
<b>Phases</b>	Construction, Operation, Decommissioning	
<b>Criteria</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Intensity</b>	Low	Low
<b>Duration</b>	Long-term	Long-term
<b>Extent</b>	Local	Local
<b>Consequence</b>	Medium	Medium
<b>Probability</b>	Definite / Continuous	Definite / Continuous
<b>Significance</b>	Medium -	Medium -
<b>Degree to which impact can be reversed</b>	High – With removal of all infrastructure and rehabilitation of the site, the current status quo could be recreated.	
<b>Degree to which impact may cause irreplaceable loss of resources</b>	Low – the grasslands of the South African interior are extensive and similar landscapes occur elsewhere.	
<b>Degree to which impact can be mitigated</b>	Low – There is nothing that can be done to hide the substation and powerlines.	
<b>Mitigation actions</b>		
<b>The following measures are recommended:</b>	Minimise disturbance footprint. Rehabilitate all areas not required during operation. Minimise size of access track.	
<b>Monitoring</b>		
<b>The following monitoring is recommended:</b>	None	
<b>Cumulative impacts</b>		
<b>Nature of cumulative impacts</b>	Direct	
<b>Rating of cumulative impacts</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>
	Low -	Low -

### 6.3. Cumulative impacts

Cumulative impacts occur through the implementation of many developments in the surrounding area. This assessment includes all approved electrical facilities within a 30 km radius of the project site (Figure 26).



**Figure 26:** Map showing the locations of other electrical infrastructure applications in the area.

### 6.4. Evaluation of impacts relative to sustainable social and economic benefits

Section 38(3)(d) of the NHRA requires an evaluation of the impacts on heritage resources relative to the sustainable social and economic benefits to be derived from the development.

The proposed project is intended to support eleven solar energy facilities. These facilities will produce electricity for South Africa. With the country having a shortage of reliable electricity supply which leads to frequent load-shedding, any new generation capacity will be a benefit to society. Aside from this obvious benefit, the currently proposed project will provide jobs, especially during the construction phase. Given the relatively limited heritage impacts, these socio-economic benefits can be seen to outweigh the impacts.

### 6.5. Existing impacts to heritage resources

There are currently no obvious threats to heritage resources on the site aside from the natural degradation, weathering and erosion that will affect the archaeological materials. Trampling from

grazing animals and/or farm/other vehicles could also occur. These impacts would be of **negligible negative** significance. The cultural landscape has already been affected by electrical development through the construction of substations and many powerlines. This existing impact is considered to be of **medium negative** significance.

## 6.6. The No-Go alternative

If the project were not implemented then the site would stay as it currently is. Although the heritage impacts with implementation would be greater than the existing impacts (specifically the archaeological impacts), the loss of socio-economic benefits through not being able to connect the eleven solar energy facilities to the national grid is more significant and suggests that the No-Go option is less desirable.

## 6.7. Levels of acceptable change

Any impact to an archaeological or palaeontological resource or a grave is deemed unacceptable until such time as the resource has been inspected and studied further if necessary. Impacts to the landscape are difficult to quantify but in general a development that visually dominates the landscape from many vantage points is undesirable. Although the presently proposed substation would dominate views along the R64, it would be seen in the context of many existing powerlines. While its placement immediately alongside the road is perhaps unfortunate, the existing infrastructure will help the new substation fit in and makes it more acceptable.

# 7. INPUT TO THE ENVIRONMENTAL MANAGEMENT PROGRAM

The actions recorded in Table 5 should be included in the environmental management program (EMPr) for the project.

**Table 5:** Heritage considerations for inclusion in the EMPr.

Impact	Mitigation / management objectives & outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>Impacts to archaeology and graves</b>					
Damage or destruction of archaeological sites	Avoid impacts (preferred) or sample sites before disturbance	Pre-construction mitigation	Appoint archaeologist to conduct mitigation well before construction	Once-off	Project developer
Damage or destruction of archaeological sites or graves	Rescue information, artefacts or burials before extensive damage occurs	Reporting chance finds as early as possible, protect <i>in situ</i> and stop work in immediate area	Inform staff and carry out inspections of excavations	Ongoing basis	Construction Manager or Contractor
				Whenever on site (at least weekly)	ECO
<b>Impacts to the cultural landscape</b>					
	Minimise landscape scarring	Ensure disturbance is kept to a minimum	Monitoring of surface clearance	Ongoing basis	Construction Manager or Contractor

Visible landscape scarring		and does not exceed project requirements. Rehabilitate areas not needed during operation.	relative to approved layout	As required	ECO
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## 8. CONCLUSIONS

The only heritage issues for this project are the destruction of archaeological materials and the visual intrusion of the infrastructure into the cultural landscape. However, neither of them is a significant concern for the approval of the project because the archaeology can very easily be mitigated, while the landscape is now largely an electrical landscape and, in conjunction with all the other existing and approved (but not yet constructed) electrical facilities in the immediate area, the new substation and powerline would not be overly out of place. A location for the substation somewhat further from the R64 would have been better, but it is understood that many other engineering and design considerations went into the location decision. Table 6 lists the heritage indicators and shows how they are met.

**Table 6:** Heritage indicators and project responses.

Indicator	Project Response
Significant archaeological materials should not be disturbed without appropriate study.	Archaeological mitigation has been suggested to meet this indicator.
The proposed project should not dominate views from multiple directions.	On its own the substation would dominate views along the R64 but it must be understood that it will not be constructed without the eleven authorised solar energy facilities which it is intended to support.

Since the 132 kV powerline route and associated access track goes right through the middle of the Stone Age artefact scatter, buffering the area is not possible. It is also possible that other archaeological materials will be present beneath the surface in other parts of the development area but sampling this scatter will provide a good representative sample of the type of materials present in the vicinity. Note that a permit application must be submitted to SAHRA by the appointed archaeologist in order to conduct the work. The purpose of this application is to ensure that an appropriately experienced archaeologist will do the work and that an appropriate methodology has been proposed.



**Figure 26:** Aerial view showing the four waypoints making up the larger scatter considered to be of low-medium cultural significance (orange polygon).

### 8.1. Reasoned opinion of the specialist

Given that the archaeological material located within the development area is of low-medium cultural significance and the impacts can be easily mitigated, and that the landscape is essentially an electrical one in which the proposed new infrastructure would not be out of place, it is the opinion of the heritage specialist that the proposed project should be authorised in full.

## 9. RECOMMENDATIONS

It is recommended that the proposed substation and associated 132 kV and 400 kV powerlines should be approved but subject to the following recommendations:

- The archaeological materials located in the scatter at waypoints 286 to 289 should be sampled by an archaeologist prior to construction; and
- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

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## APPENDIX 1 – Curriculum Vitae



*Curriculum Vitae*

**Jayson David John Orton**

ARCHAEOLOGIST AND HERITAGE CONSULTANT

### Contact Details and personal information:

**Address:** 23 Dover Road, Muizenberg, 7945  
**Telephone:** (021) 788 1025  
**Cell Phone:** 083 272 3225  
**Email:** jayson@asha-consulting.co.za

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

### Education:

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

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

### Employment History:

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

### Professional Accreditation:

Association of Southern African Professional Archaeologists (ASAPA) membership number: 233

CRM Section member with the following accreditation:

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

Association of Professional Heritage Practitioners (APHP) membership number: 43

- Accredited Professional Heritage Practitioner

### ➤ **Memberships and affiliations:**

South African Archaeological Society Council member	2004 – 2016
Assoc. Southern African Professional Archaeologists (ASAPA) member	2006 –
UCT Department of Archaeology Research Associate	2013 –
Heritage Western Cape APM Committee member	2013 –
UNISA Department of Archaeology and Anthropology Research Fellow	2014 –
Fish Hoek Valley Historical Association	2014 –
Kalk Bay Historical Association	2016 –
Association of Professional Heritage Practitioners member	2016 –

### **Fieldwork and project experience:**

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

#### Feasibility studies:

- Heritage feasibility studies examining all aspects of heritage from the desktop

#### Phase 1 surveys and impact assessments:

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

#### Phase 2 mitigation and research excavations:

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

### **Awards:**

Western Cape Government Cultural Affairs Awards 2015/2016: Best Heritage Project.

## APPENDIX 2 – Site Sensitivity Verification

A site sensitivity verification was undertaken in order to confirm the current land use and environmental sensitivity of the proposed project area. The details of the site sensitivity verification are noted below:

<b>Date of Site Visit</b>	02 October 2021
<b>Specialist Name</b>	Dr Jayson Orton
<b>Professional Registration Number</b>	ASAPA: 233; APHP: 043
<b>Specialist Affiliation / Company</b>	ASHA Consulting (Pty) Ltd

- Provide a description on how the site sensitivity verification was undertaken using the following means:

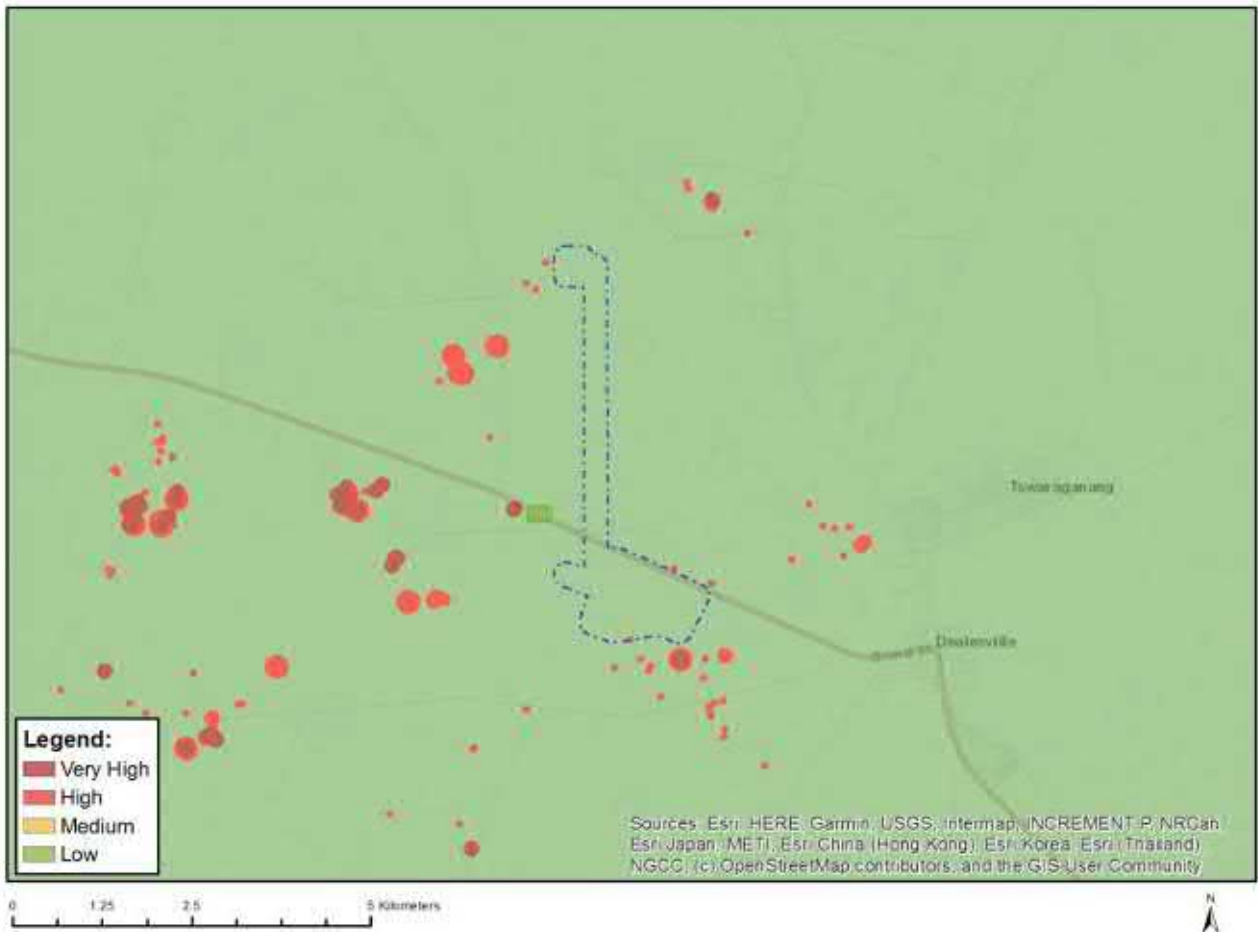
- (a) desk top analysis, using satellite imagery;
- (b) preliminary on -site inspection; and
- (c) any other available and relevant information.

Initial work was carried out using satellite aerial photography in combination with the author's accumulated knowledge of the local landscape. This was used to determine whether any areas were potentially sensitive and should be targeted during fieldwork. No specific sensitive areas were identified, but it was known from previous experience that artefacts were more likely to be found on the high ground in the south. Subsequent fieldwork served to ground truth the site. Desktop research was also used to inform on the heritage context of the area. This information is presented in the report (Sections 5.1.1 and 5.1.1).

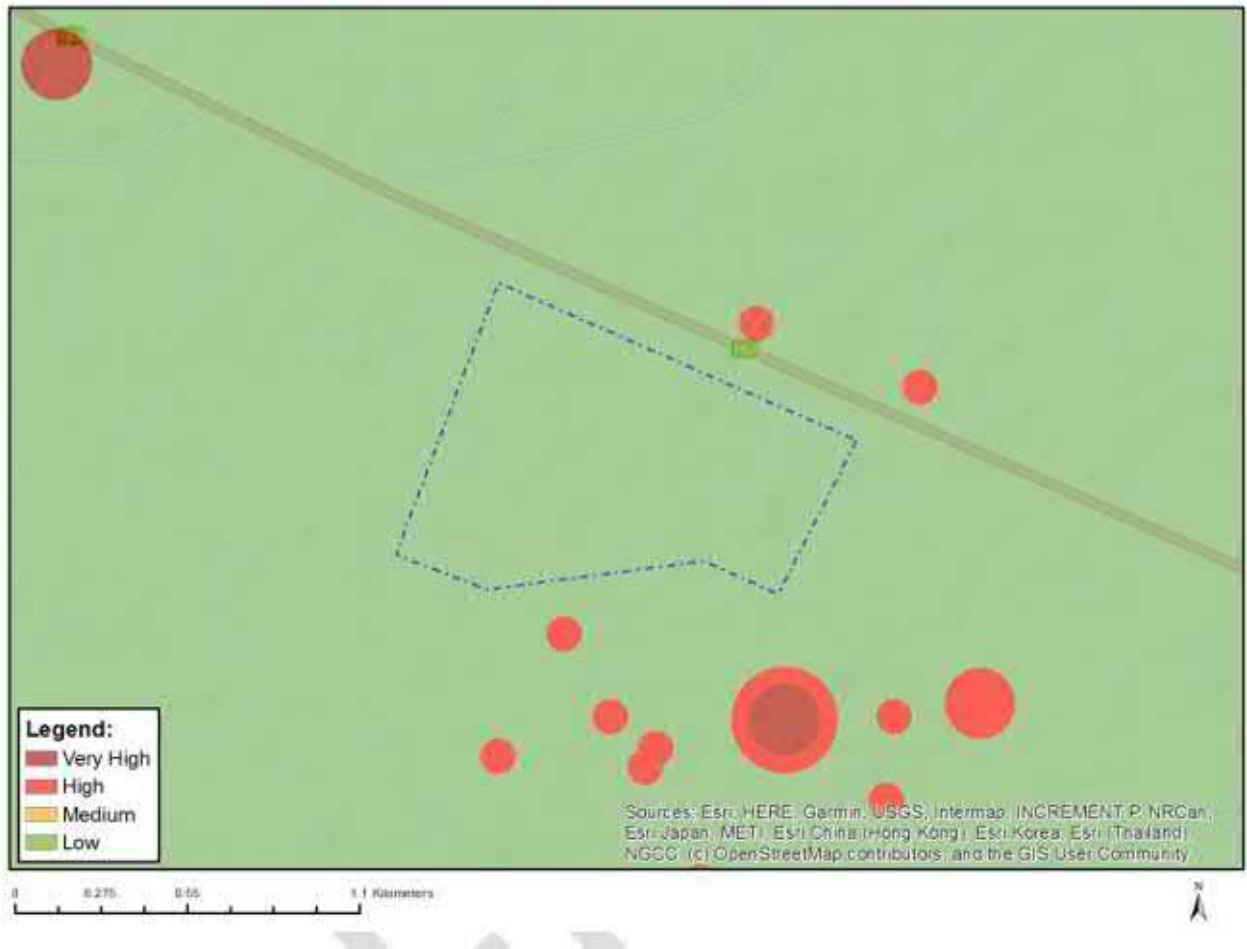
- Provide a description of the outcome of the site sensitivity verification in order to:

- (a) confirm or dispute the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.; and
- (b) include a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity.

The maps in Figures A2.1 and A2.2 are extracted from the screening tool reports and show the archaeological and heritage sensitivity to be low. The site visit confirmed that in fact the majority of the site is of low sensitivity with only one small pocket (where archaeological resources were found) considered to be of medium sensitivity. Figure A2.3 shows the area considered to be archaeologically sensitive. Since the site was not of high cultural significance, it can be considered as a medium sensitivity area. A photographic record and description of the relevant heritage resource is contained within the impact assessment report. Briefly, the site contains Middle Stone Age (MSA) artefacts that include small bifacial tools likely ascribable to the Fauresmith period which is considered to represent the earliest MSA.



**Figure A2.1:** Screening tool map showing the powerline development area (blue dashed polygon) to be of low sensitivity (green shading).



**Figure A2.1:** Screening tool map showing the MTS development area (blue dashed polygon) to be of low sensitivity (green shading).



**Figure A2.3:** Aerial view of the development area (black polygon) and proposed project (blue, purple and red) showing the single area of medium sensitivity (orange polygon).

## APPENDIX 3 – Specialist Declaration



### environmental affairs

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

#### DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

#### PROJECT TITLE

**PROPOSED CONSTRUCTION AND OPERATION OF THE 132KV/400KV ON-SITE MAIN TRANSMISSION SUBSTATION (MTS) AND ASSOCIATED INFRASTRUCTURE LOCATED NEAR DEALESVILLE IN THE TOKOLOGO LOCAL MUNICIPALITY, LEJWELEPUTSWA DISTRICT IN THE FREE STATE PROVINCE**

#### Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at <https://www.environment.gov.za/documents/forms>.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

#### Departmental Details

##### Postal address:

Department of Environmental Affairs  
Attention: Chief Director: Integrated Environmental Authorisations  
Private Bag X447  
Pretoria  
0001

##### Physical address:

Department of Environmental Affairs  
Attention: Chief Director: Integrated Environmental Authorisations  
Environment House  
473 Steve Biko Road  
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:  
Email: [EIAAdmin@environment.gov.za](mailto:EIAAdmin@environment.gov.za)

**1. SPECIALIST INFORMATION**

Specialist Company Name:	ASHA Consulting (Pty) Ltd		
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition
			0
Specialist name:	Dr Jayson Orton		
Specialist Qualifications:	D.Phil (Archaeology, Oxford, UK) MA (Archaeology, UCT)		
Professional affiliation/registration:	ASAPA CRM member No. 233 APHP member No. 043		
Physical address:	23 Dover Road, Muizenberg, 7945		
Postal address:	23 Dover Road, Muizenberg		
Postal code:	7945	Cell:	083 272 3225
Telephone:	021 788 1025	Fax:	n/a
E-mail:	jayson@asha-consulting.co.za		

**2. DECLARATION BY THE SPECIALIST**

I, JAYSON ORTON, declare that -

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist 

Name of Company: ASHA CONSULTING (PTY) LTD


Date: 18-10-2021

Details of Specialist, Declaration and Undertaking Under Oath



3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, JAYSON ORTON, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

  
\_\_\_\_\_  
Signature of the Specialist

ASHA CONSULTING (PTY) LTD.  
\_\_\_\_\_  
Name of Company

18-10-2021  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Signature of the Commissioner of Oaths

2021.10.18  
\_\_\_\_\_  
Date



# **HERITAGE IMPACT ASSESSMENT: PROPOSED 33 kV POWERLINE NEAR DEALESVILLE, BOSHOF MAGISTERIAL DISTRICT, FREE STATE**

Required under Section 38(8) of the National Heritage Resources Act (No. 25 of 1999)  
as part of a Heritage Impact Assessment.

*Report for:*

**SLR Consulting (South Africa) (Pty) Ltd**  
1 Old Main Road, Kloof, Durban, 3640  
Email: lscottshaw@slrconsulting.com

*On behalf of:*

**South Africa Mainstream Renewable Power Developments (Pty) Ltd**



**Dr Jayson Orton**  
**ASHA Consulting (Pty) Ltd**  
23 Dover Road, Muizenberg, 7945  
Tel: (021) 788 1025 | 083 272 3225  
Email: jayson@asha-consulting.co.za

16 October 2021

## SUMMARY

ASHA Consulting (Pty) Ltd was appointed by SLR Consulting (South Africa) (Pty) Ltd to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed development of a 33 kV powerline just northwest of Dealesville, Free State. The north-eastern and south-western ends of the development are located at  $S28^{\circ} 37' 13.5'' E25^{\circ} 44' 17.7''$  and  $S28^{\circ} 37' 54.6'' E25^{\circ} 43' 21.8''$  respectively. The powerline would be located on the Remaining Extent of the Farm Walkerville 1031, Portion 1 of Walkerville 1031, Farm Overschot 31 and the Remaining Extent of the Farm Oxford 1030.

The study area is comprised of flat grasslands. Stone artefacts dating to the Middle Stone Age are known from the area and can be expected in very low densities throughout the area. The cultural landscape was also identified as a heritage resource but its significance is low given the large amount of electrical infrastructure in the area. In addition, many other electrical facilities have already been authorised but not yet constructed. The proposed land use will thus not be out of place and the impact to the landscape is acceptable.

It is recommended that the proposed 33 kV powerline should be approved but subject to the following recommendation:

- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

## Glossary

**Acheulean (also Acheulian):** An archaeological name for the period comprising the later part of the Early Stone Age. This period started about 1.7-1.5 million years ago and ended about 250-200 thousand years ago.

**Background scatter:** Artefacts whose spatial position is conditioned more by natural forces than by human agency.

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

**Handaxe:** A bifacially flaked, pointed stone tool type typical of the Early Stone Age Acheulian Industry. It is also referred to as a large cutting tool.

**Holocene:** The geological period spanning the last approximately 10-12 000 years.

**Hominid:** a group consisting of all modern and extinct great apes (i.e. gorillas, chimpanzees, orangutans and humans) and their ancestors.

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

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

**Pleistocene:** The geological period beginning approximately 2.5 million years ago and preceding the Holocene.

## Abbreviations

**APHP:** Association of Professional Heritage Practitioners

**ASAPA:** Association of Southern African Professional Archaeologists

**BA:** Basic Assessment

**CRM:** Cultural Resources Management

**DEA&DP:** Department of Environmental Affairs and Development Planning

**DFFE:** Department of Forestry, Fisheries and the Environment

**EA:** Environmental Authorisation

**ECO:** Environmental Control Officer

**EGI:** Electricity Grid Infrastructure

**EIA:** Environmental Impact Assessment

**EMPr:** Environmental Management Program

**ESA:** Early Stone Age

**GP:** General Protection

**GPS:** global positioning system

**HIA:** Heritage Impact Assessment

**LCT:** large cutting tool

**LSA:** Later Stone Age

**MSA:** Middle Stone Age

**MTS:** Main Transmission Substation

**NBKB:** Ngwao-Boswa Ya Kapa Bokoni

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

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

**PPP:** Public Participation Process

**PV:** Photo-voltaic

**REDZ:** Renewable Energy Development Zone

**SAHRA:** South African Heritage Resources Agency

**SAHRIS:** South African Heritage Resources Information System

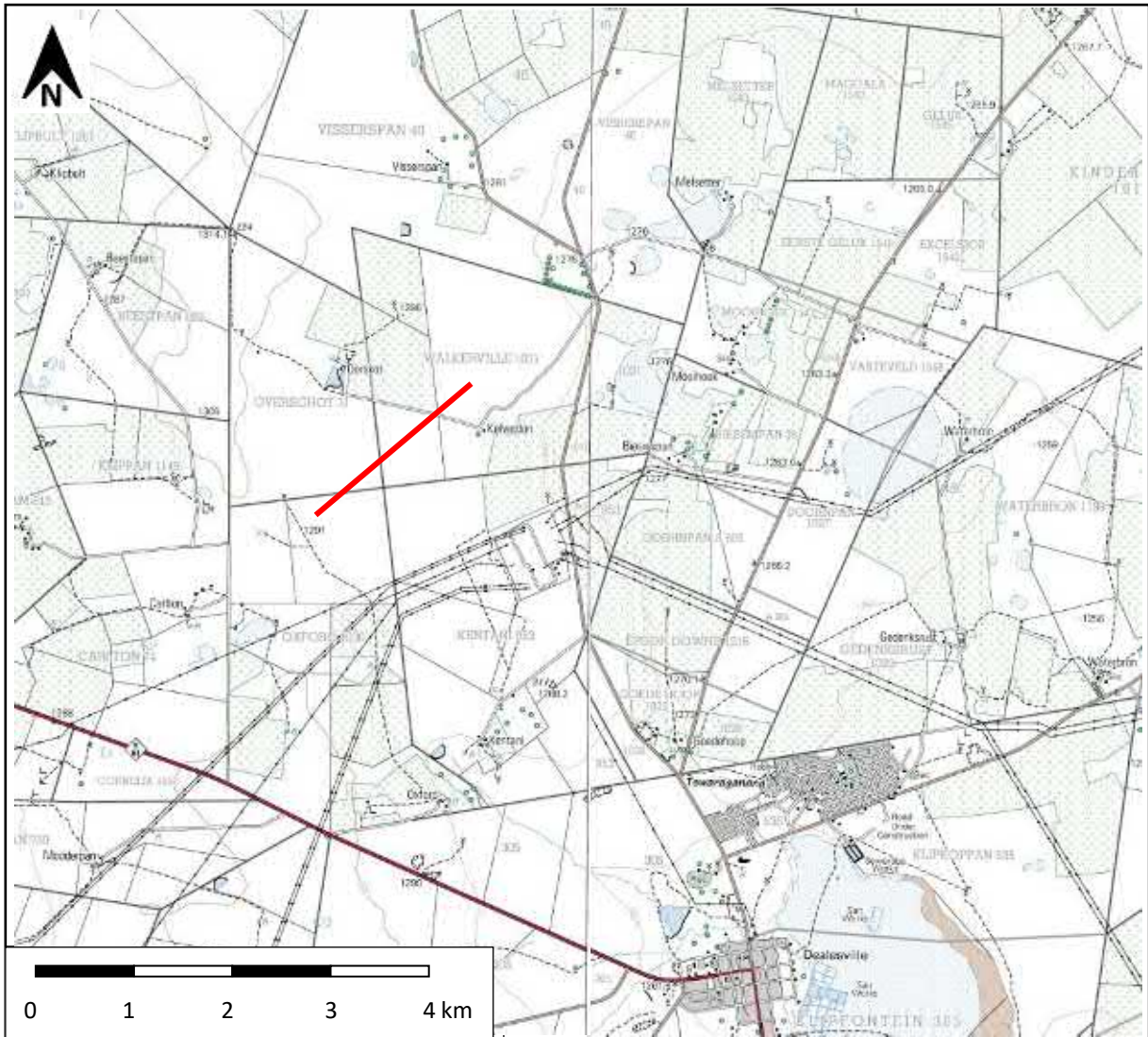
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# 1. INTRODUCTION

ASHA Consulting (Pty) Ltd was appointed by SLR Consulting (South Africa) (Pty) Ltd to conduct an assessment of the potential impacts to heritage resources that might occur through the proposed development of a 33 kV powerline just northwest of Dealesville, Free State (Figure 1). The north-eastern and south-western ends of the development are located at  $S28^{\circ} 37' 13.5'' E25^{\circ} 44' 17.7''$  and  $S28^{\circ} 37' 54.6'' E25^{\circ} 43' 21.8''$  respectively. From northeast to southwest, the powerline would be located on the Remaining Extent of the Farm Walkerville 1031, Portion 1 of Walkerville 1031, Farm Overschoot 31 and the Remaining Extent of the Farm Oxford 1030.



**Figure 1:** Extract from 1:50 000 topographic map 2825DA & 2825DB showing the location of the proposed powerline (red line) relative to Dealesville. Source of basemap: Chief Directorate: National Geo-Spatial Information. Website: [www.ngi.gov.za](http://www.ngi.gov.za).

The proposed infrastructure is part of a larger solar energy development consisting of eleven photovoltaic facilities and associated infrastructure which have already been authorised. The newly proposed infrastructure is required to connect the Sonoblomo PV facility to the Kentani PV facility substation, thereby facilitating the former's connection to the national electricity grid.





**Figure 2:** Aerial view of the development area and surrounds showing the landscape around the site (red line) with Dealesville to the southeast.

## 1.1. The proposed project

### 1.1.1. Project description

South Africa Mainstream Renewable Power Developments (Pty) Ltd ('Mainstream') is proposing to add one MTS, a Battery Energy Storage System (BESS) and four powerlines to their authorised Kentani Cluster of solar photovoltaic (PV) developments near the town of Dealesville in the Free State Province. The proposed development will also involve the re-routing of eight already authorised 132 kV powerlines within the grid connection corridor authorised as part of the Kentani Cluster and making provision for this routing in the new proposed MTS. A Basic Assessment (BA) Process is being followed for this proposed development. However, one of the four powerlines does not constitute a listed activity under the National Environmental Management Act (No. 107 of 1998; NEMA) and was therefore not included in the terms of reference for the BA. Being longer than 300 m, it does still trigger the provisions of S.38(1) of the National Heritage Resources Act No. 25 of 1999 (NHRA) and the present report thus assesses the potential heritage Impacts from this powerline on its own.

The 33kv powerline (approx. 2km in length) will connect the authorised 75MW Sonoblomo PV facility (14/12/16/3/3/2/723) to the authorised Kentani on-site substation (14/12/16/3/3/2/724).

A service track within the servitude under the proposed powerline will also be required.

### 1.1.2. Identification of alternatives

No alternative locations have been identified for the project since the infrastructure is required to support one of a suite of authorised solar energy facilities and other locations and technologies would not provide the required support. However, the no-go alternative will be considered.

### 1.1.3. Aspects of the project relevant to the heritage study

All aspects of the proposed development are relevant, since excavations for foundations and/or services may impact on archaeological and/or palaeontological remains, while all above-ground aspects create potential visual (contextual) impacts to the cultural landscape and any significant heritage sites that might be visually sensitive.

## 1.2. Terms of reference

ASHA Consulting was provided with the following terms of reference for the study:

- Compile a desktop heritage impact assessment (HIA) that would meet the requirements of the National Heritage Resources Act (No. 25 of 1999) (NHRA).
- Consider all relevant aspects of heritage including archaeology, graves and the cultural landscape. (Palaeontology was to be covered by a separate specialist.)

## 1.3. Scope and purpose of the report

An HIA is a means of identifying any significant heritage resources before development begins so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the fragile heritage of South Africa. This HIA report aims to fulfil the requirements of the heritage authorities such that a decision can be issued by them. The HIA report will outline any management and/or mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of approval.

## 1.4. The author

Dr Jayson Orton has an MA (UCT, 2004) and a D.Phil (Oxford, UK, 2013), both in archaeology, and has been conducting Heritage Impact Assessments and archaeological specialist studies in South Africa (primarily in the Western Cape and Northern Cape provinces) since 2004 (please see curriculum vitae included as Appendix 1). He has also conducted research on aspects of the Later Stone Age in these provinces and published widely on the topic. He is an accredited heritage practitioner with the Association of Professional Heritage Practitioners (APHP; Member #43) and also holds archaeological accreditation with the Association of Southern African Professional Archaeologists (ASAPA) CRM section (Member #233) as follows:

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

## 1.5. Declaration of independence

ASHA Consulting (Pty) Ltd and its consultants have no financial or other interest in the proposed development and will derive no benefits other than fair remuneration for consulting services provided.

## 2. LEGISLATIVE CONTEXT

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

The NHRA protects a variety of heritage resources as follows:

- Section 34: structures older than 60 years;
- Section 35: prehistoric and historical material (including ruins) more than 100 years old as well as military remains more than 75 years old, palaeontological material and meteorites;
- Section 36: graves and human remains older than 60 years and located outside of a formal cemetery administered by a local authority; and
- Section 37: public monuments and memorials.

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

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

Section 3(3) describes the types of cultural significance that a place or object might have in order to be considered part of the national estate. These are as follows:

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

While landscapes with cultural significance do not have a dedicated Section in the NHRA, they are protected under the definition of the National Estate (Section 3). Section 3(2)(c) and (d) list “historical settlements and townscapes” and “landscapes and natural features of cultural significance” as part of the National Estate. Furthermore, some of the points in Section 3(3) speak directly to cultural landscapes.

Section 38(1) of the NHRA provides categories of development that require submission of notification to the relevant heritage authorities where they are the consenting authority. Section 38 (2a) states that if there is reason to believe that heritage resources will be affected then an impact assessment report meeting the requirements of S38(3) must be submitted for decision-making. This report fulfils that requirement.

### 3. METHODS

#### 3.1. Literature survey and information sources

A survey of available literature was carried out to assess the general heritage context into which the development would be set. The information sources used in this report are presented in Table 1. Data were also collected via a field survey.

**Table 1: Information sources used in this assessment.**

Data / Information	Source	Date	Type	Description
Maps	Chief Directorate: National Geo-Spatial Information	Various	Spatial	Historical and current 1:50 000 topographic maps of the study area and immediate surrounds
Aerial photographs	Chief Directorate: National Geo-Spatial Information	Various	Spatial	Historical aerial photography of the study area and immediate surrounds

Aerial photographs	Google Earth	Various	Spatial	Recent and historical aerial photography of the study area and immediate surrounds
Cadastral data	Chief Directorate: National Geo-Spatial Information	Various	Survey diagrams	Historical and current survey diagrams, property survey and registration dates
Background data	South African Heritage Resources Information System (SAHRIS)	Various	Reports	Previous impact assessments for any developments in the vicinity of the study area
Palaeontological sensitivity	South African Heritage Resources Information System (SAHRIS)	Current	Spatial	Map showing palaeontological sensitivity and required actions based on the sensitivity.
Background data	Books, journals, websites	Various	Books, journals, websites	Historical and current literature describing the study area and any relevant aspects of cultural heritage.

### 3.2. Field survey

The site was not specifically surveyed, although small parts of it have been covered by the present author during the course of other assessments. These other surveys were on 23<sup>rd</sup> August 2014 and 2<sup>nd</sup> October 2021. These were during winter and spring, before the onset of the rainy season. This meant that ground visibility for archaeological resources was good. Other heritage resources are not affected by seasonality. During the surveys the positions of finds and survey tracks were recorded on a hand-held Global Positioning System (GPS) receiver set to the WGS84 datum (Figure 3). Photographs were taken at times in order to capture representative samples of both the affected heritage and the landscape setting of the proposed development.

It should be noted that amount of time between the dates of the field inspection and final report do not materially affect the outcome of the report.



**Figure 3:** Aerial view of the proposed powerline (red line) showing the survey tracks recorded during surveys for other projects (blue lines).

### **3.3. Specialist studies**

No specialist studies were produced as part of this HIA, but a palaeontological specialist study was commissioned and will be submitted as a free-standing report (Butler 2021) to be read in conjunction with this HIA.

### **3.4. Impact assessment**

The impact assessment was conducted through application of a scale supplied by SLR.

### **3.5. Grading**

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

It is intended under S.7(2) that the various provincial authorities formulate a system for the further detailed grading of heritage resources of local significance but this is generally yet to happen. SAHRA (2007) has formulated its own system<sup>1</sup> for use in provinces where it has commenting authority. In this system sites of high local significance are given Grade IIIA (with the implication that the site should be preserved in its entirety) and Grade IIIB (with the implication that part of the site could be mitigated and part preserved as appropriate) while sites of lesser significance are referred to as having 'General Protection' (GP) and rated as GP A (high/medium significance, requires mitigation), GP B (medium significance, requires recording) or GP C (low significance, requires no further action).

### **3.6. Assumptions and limitations**

The actual footprint was not examined in the field. The very limited quantity of archaeological materials known from the surrounding area and their low significance suggests that the chances of significant resources being present are extremely low. The previous studies were carried out at the surface only and hence any completely buried archaeological sites would not be readily located. Similarly, it is not always possible to determine the depth of archaeological material visible at the surface. The grass cover over most of the site meant that visibility, although good at close range, was limited to within 2-3 m.

## **4. PHYSICAL ENVIRONMENTAL CONTEXT**

### **4.1. Site context**

The development area is in a rural area dominated by the rearing of livestock, although some arable land is also present. The R64 which connects Dealesville and Boshof runs through the southern part of the development area with the proposed MTS being immediately south of the R64. Most visually

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<sup>1</sup> The system is intended for use on archaeological and palaeontological sites only.

prominent on the landscape, however, are the very large Eskom Perseus Substation which lies 1.4 km southeast of the proposed powerline (Figure 4) and the many existing high voltage powerlines (both 400 kV and 700 kV) that enter and exit this substation to the south of the study area. The development area lies wholly within the Kimberley Renewable Energy Development Zone (REDZ) and within the Central Electricity Grid Infrastructure (EGI) corridor.



**Figure 4:** View towards the east from the south-western end of the proposed powerline showing the existing Eskom Perseus Substation and associated powerlines.

#### **4.2. Site description**

The site is comprised almost exclusively of grassland. Figures 5 to 8 show views of the development area. The surface is generally sandy with minimal gravel clasts.



**Figure 5:** View towards the southeast in the south-western end of the study area (23.10.2021).



**Figure 6:** View towards the south across the route of the proposed powerline in its south-western part. Puddles had formed on the very flat surface after recent rains (23.10.2021).



**Figure 7:** View towards the north looking towards the proposed powerline (23.10.2021).



**Figure 8:** View towards the north through the northern part of the proposed powerline alignment (23.08.2014).



## 5. FINDINGS OF THE HERITAGE STUDY

This section describes the heritage resources recorded in the development area during the course of the project. Please note that the palaeontological findings are presented in a separate specialist report (Butler 2021).

### 5.1. Archaeology

#### 5.1.1. Desktop study

Stone Age material occurs widely across southern Africa, while the Iron Age, which only occurred within the last 2000 years, is present only in the eastern parts where summer rainfall allowed for the cultivation of summer crops. Stone-walled settlements dating to the Iron Age have been widely documented in parts of the Free State and adjacent Northern Cape (Maggs 1976a, 1976b) but the Iron Age appears to be absent from the vicinity of Dealesville. Later Stone Age stone-built dwellings are known from along the Riet River about 100 km to the southwest (Humphreys 1972, 2009). With the exception of the rich MSA deposits of Florisbad (Kuman *et al.* 1999) and the MSA and LSA stone artefact assemblages from Erfkroon (Churchill *et al.* 2000), significant archaeological resources appear to be quite rare in this flat, open and well-grassed landscape. Archaeological material is, however, more common along the major rivers where artefacts are revealed in the river terrace gravels.

Webley (2010) surveyed an area to the southeast of the present development area and reported a complete absence of archaeological material. She further noted that stone suitable for the manufacture of flaked tools was not present and that the quantity of other rock available on the surface was insufficient to allow for the construction of stone dwellings. Hutten's (2011) survey of land to the north of Boshoff showed similar results but in that case a pan was present with a large scatter of MSA and LSA artefacts present alongside it. The same applied to a survey immediately west of the present development area where many thousands of artefacts were found adjacent to a pan (Orton 2016a). This demonstrates the preference to settle close to water sources that is prevalent across much of the relatively dry interior of southern Africa. Orton's (2015) survey of large areas surrounding and to the south of the present development area showed heritage resources to be quite common. They included built structures, artefact scatters and a number of rock engravings. The vast majority of resources were located in close proximity to the rock outcrop areas closer to Dealesville, while further south into the grasslands the archaeology dropped off significantly. The majority of artefacts located by Orton (2015) were attributable to Pleistocene-aged Middle Stone Age (MSA) background scatter and were associated with gravel exposures. They did not constitute *in situ* living sites. However, some artefacts dating to the Holocene Later Stone Age (LSA) were also noted. To the north of the present development area, Kaplan (2020, 2021) found similar artefacts ascribable to the MSA, with higher densities being present alongside pans.

Rock engravings occur widely in the interior of South Africa where suitable rock exists. Many sites are located in the Free State with the National Museum, Bloemfontein (2014) listing numerous examples that may be visited by the public. However, no sites seemed to be on record for the Dealesville area prior to Orton's (2015; see also Orton 2016b) survey. He located engravings dating within the last 2000 years and attributable by their geometric style to the Khoekhoe as well as figurative engravings done by the San. The former were found on a small dolerite hill 2 km west of the southern end of the present development area where flaked stone artefacts and ground patches

on the dolerite were also recorded. Dolerite rocks with shallow grinding grooves and ground cupules have also been recorded in the area (Orton 2016a, b).

The remains of a historical stone-walled kraal also occur alongside the engraved outcrop described above (Orton 2015). Another stone-walled kraal and house ruin were recorded by Orton (2016a, b) to the west of the proposed MTS footprint, while Kaplan (2020) found stone-walled ruins to the north of the proposed powerline corridor.

### 5.1.2. Site visit

The two site visits that covered parts of the powerline did not locate any heritage materials within the footprint. It is clear from aerial photography that no landscape features like rocky hills or outcrops, or groves of trees (or any trees) occur within the proposed footprint and its immediate surrounds. Nevertheless, a few heritage resources are known from the wider area (within 1 km of the proposed footprint) and these are listed and described in Table 2. All are archaeological resources.

**Table 2:** List of sites recorded during the surveys within 1 km of the proposed powerline. Source: Orton (2015: Appendix 1).

Waypoint	Location	Description	Significance (Grade)
126	S28 37 28.8 E25 44 20.5	Ruined farmhouse of 11 m by 8 m with an external hearth and chimney stack, looks like it was Victorian. The external walls and chimney (which was a later addition) were made of red clay bricks with frogs, while other walls were made from locally manufactured sun-baked bricks made from local soil and organic matter. The house had six rooms. There is plaster rustication around the openings. Barbed wire has been built into the walls for strengthening. The kitchen has a cement floor but the rest of the house would have had a wooden floor. The house has stone foundations under every wall.	Medium (GPA) <b>AVOID</b>
127	S28 37 30.5 E25 44 20.5	Stone foundation with the remains of brick walls above. Structure was 6 m by 8 m. Floor is cement. There are frog bricks present.	
128	S28 37 24.4 E25 44 09.8	Old stock post, twentieth century artefacts present, but the site may have had its roots in the 19 <sup>th</sup> century. Most artefacts lying about are glass and metal, including parts of an old cast iron single bed.	Very low (GPC)
129	S28 37 21.8 E25 44 08.9	Stone foundation located some 70- 80 m south of the stock post area but probably related to it. Also some Coronation bricks here.	
173	S28 37 53.7 E25 43 05.3	Small dam with walls lined with packed dolerite cobbles and boulders.	Very low (GPC)
174	S28 38 04.4 E25 43 00.9	Scatter of MSA hornfels artefacts eroding out of a farm road.	Very low (GPC)
175	S28 38 01.8 E25 42 56.5	Scatter of MSA hornfels artefacts in a deflated area that has gravel present in it as well.	Very low (GPC)

Stone Age resources were seen in one area (waypoints 174 and 175) and comprised of background scatter artefacts of low density and low significance (Figure 10). Such finds have been widely recorded in the area.



**Figure 9:** Map showing the locations of finds.



**Figure 10:** Stone artefacts from waypoint 174.

All other records are of historical features. They include a small dam lined with dolerite cobbles (Figure 11), a ruined farm complex (Figures 12 to 14) and the ephemeral remains of a stock post (Figures 15 and 16). While the am and stock post are of low significance, the house preserves a number of architectural details (see Table 2) and is of more concern. It is in very poor condition though, having been stripped of its joinery, presumably for reuse elsewhere. None of these finds will be impacted by the proposed powerline.



**Figure 11:** The small dolerite-lined dam at waypoint 173.



**Figure 12:** The setting of the farm complex at waypoints 126 and 127.



*Figure 13: The farmhouse ruin at waypoint 126.*



*Figure 14: Stone and brick foundations at waypoint 127.*



**Figure 15:** Very low density artefact scatter at an old stock post at waypoint 128.



**Figure 16:** The ephemeral remains of a structure at waypoint 129.

## **5.2. Graves**

Orton (2015, 2016a, 2016b) has located several farm graveyards in the wider area as well as one isolated grave. No graves were seen during the survey in the present study area and none are expected to occur.

## **5.3. Historical aspects and the Built environment**

### **5.3.1. Desktop study**

Historical resources will be primarily associated with farmsteads, although most are likely to be fairly recent, perhaps dating to the late 19<sup>th</sup> or early 20<sup>th</sup> centuries. Several such resources – buildings, ruins and artefact scatters (the latter two both covered under archaeology with some having been described above) were located in the area by Orton (2015). The town of Dealesville is relatively recent, dating to 1899 (Raper n.d.). It was laid out on the farm Klipfontein belonging to John Henry Deale and was awarded municipal status in 1914.

The second Anglo-Boer War (1899-1902) played a significant role in South African History, particularly in the interior of the country. Many battles were fought between the British and Boer forces. Significant battles in proximity to the present development area include the Battles of Modder River and Magersfontein 100 km to the southwest and west respectively, the Battle of Paardeberg 60 km to the southwest and the Battle of Driefontein just outside Bloemfontein, some 60 km to the southeast. Graves, graveyards and memorials across the central interior of South Africa serve as reminders of the war.

### **5.3.2. Site visit**

Aside from the archaeological materials already described, no historical sites were located in or close to the development area. Dealesville has few, if any, significant historical structures.

## **5.4. Cultural landscapes and scenic routes**

The grasslands of the central interior of South Africa do have a particular character but this landscape type is very widespread and the Dealesville area is not special for any particular reason. In addition, it is noted that the landscape in and around the development area is visually very strongly dominated by electrical infrastructure. The R64 which links (from west to east) Kimberley, Boshof, Dealesville and Bloemfontein is the primary road traversing the area. The road is not a tourist route and, because it does not cross an especially scenic landscape, is not regarded as a scenic route of any significance.

## **5.5. Statement of significance and provisional grading**

Section 38(3)(b) of the NHRA requires an assessment of the significance of all heritage resources. In terms of Section 2(vi), “cultural significance” means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. The reasons that a place may have cultural significance are outlined in Section 3(3) of the NHRA (see Section 2 above).

Although no significant archaeological resources are known from the study area and a dedicated survey has not been carried out, it is unlikely that anything other than background scatter might be present. Such material would be of no more than low cultural significance at the local level for its scientific value.

The cultural landscape is largely a rural landscape with minimal aesthetic value. It is of low cultural significance at the local level.

## 5.6. Summary of heritage indicators

Archaeological materials are non-renewable and easily disturbed heritage resources.

- Indicator: Significant archaeological materials should not be disturbed without appropriate study.

The landscape in this instance is dominated by electrical infrastructure. Nevertheless, new infrastructure provides further visual intrusion into the cultural landscape.

- Indicator: The proposed project should not dominate views from multiple directions.

## 6. ASSESSMENT OF IMPACTS

### 6.1. Impacts to archaeological resources

Archaeological resources may be damaged during the construction period when grubbing and/or excavations for powerline foundations and the adjoining access track occurs. None are known, but there is a high likelihood that a few background scatter artefacts will be present within the surface soil. The impacts are direct and will occur during the construction phase only. Because of the very low cultural significance of the archaeological materials, the intensity is very low and the extent limited to the site. The calculated impact significance is **low negative** before mitigation (Table 3). Mitigation is not suggested since no significant artefact scatters are known or likely to occur and the project footprint is very minor which will mean only minimal impacts. The post-mitigation impact significance thus remains **low negative**. It should be noted that the ratings are strongly influenced by the permanent duration of the impact and that a significance of very low negative would be more appropriate after mitigation. No other management measures are required and there are no fatal flaws in terms of archaeology.

**Table 3: Assessment of archaeological impacts.**

<b>Issue</b>	Destruction of archaeological resources	
<b>Description of Impact</b>		
Archaeological resources are damaged, destroyed or moved from their context.		
<b>Type of Impact</b>	Direct	
<b>Nature of Impact</b>	Negative	
<b>Phases</b>	Construction	
<b>Criteria</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Intensity</b>	Very low	Very Low
<b>Duration</b>	Permanent	Permanent
<b>Extent</b>	Site	Site



Consequence	Low	Low
Probability	Unlikely / improbable	Unlikely / improbable
Significance	Low -	Low -
Degree to which impact can be reversed	Low – archaeological resources are non-renewable and cannot be recreated on site.	
Degree to which impact may cause irreplaceable loss of resources	High - archaeological resources are non-renewable and irreplaceable.	
Degree to which impact can be mitigated	High – mitigation is easy to apply and would effectively capture archaeological data before development proceeds.	
<b>Mitigation actions</b>		
The following measures are recommended:	No mitigation is suggested.	
<b>Monitoring</b>		
The following monitoring is recommended:	None.	
<b>Cumulative impacts</b>		
Nature of cumulative impacts	Direct	
Rating of cumulative impacts	Without Mitigation	With Mitigation
	Very low -	Very Low -

## 6.2. Impacts to the cultural landscape

Impacts to the cultural landscape relate to the visual intrusion of the new electrical infrastructure into the rural cultural landscape. In this instance, however, it must be noted that a large amount of electrical infrastructure is already present in the landscape. This infrastructure includes many powerlines and two large substations, one of which lies close to the proposed development area. The proposed powerline is substantially smaller than most of those existing. As a result, the intensity of the new impact is rated as very low. The impacts will occur for as long as the powerline remains present (i.e. long term). Because of the small size of the powerline, the extent is rated as site. Before mitigation the impact significance is rated as being **low negative** (Table 4). The proposed infrastructure cannot be meaningfully hidden and the landscape already has much similar infrastructure present. As such, only best practice measures related to minimising disturbance footprint and rehabilitating all areas not required during operation can be suggested. The impacts post-mitigation will remain **low negative**. There are no fatal flaws in terms of the cultural landscape.

**Table 4: Assessment of impacts to the cultural landscape.**

Issue	Impacts to the cultural landscape	
<b>Description of Impact</b>		
Visual intrusion of electrical infrastructure into the rural cultural landscape.		
Type of Impact	Direct	
Nature of Impact	Negative	
Phases	Construction, Operation, Decommissioning	
Criteria	Without Mitigation	With Mitigation
Intensity	Very low	Very low
Duration	Long-term	Long-term
Extent	Site	Site
Consequence	Low	Low

Probability	Definite / Continuous	Definite / Continuous
Significance	Low -	Low -
Degree to which impact can be reversed	High – With removal of all infrastructure and rehabilitation of the site, the current status quo could be recreated.	
Degree to which impact may cause irreplaceable loss of resources	Low – the grasslands of the South African interior are extensive and similar landscapes occur elsewhere.	
Degree to which impact can be mitigated	Low – There is nothing that can be done to hide the powerline.	
<b>Mitigation actions</b>		
The following measures are recommended:	Minimise disturbance footprint. Rehabilitate all areas not required during operation. Minimise size of access track.	
<b>Monitoring</b>		
The following monitoring is recommended:	None	
<b>Cumulative impacts</b>		
Nature of cumulative impacts	Direct	
Rating of cumulative impacts	Without Mitigation	With Mitigation
	Low -	Low -

### 6.3. Cumulative impacts

Cumulative impacts occur through the implementation of many developments in the surrounding area. This assessment includes all approved electrical facilities within a 30 km radius of the project site. Because of the strongly electrical nature of the area currently, the cumulative impacts are rated as low negative.

### 6.4. Evaluation of impacts relative to sustainable social and economic benefits

Section 38(3)(d) of the NHRA requires an evaluation of the impacts on heritage resources relative to the sustainable social and economic benefits to be derived from the development.

The proposed project is intended to connect a solar energy facility to the national electricity grid. The facility will produce electricity for South Africa. With the country having a shortage of reliable electricity supply which leads to frequent load-shedding, any new generation capacity will be a benefit to society. Aside from this obvious benefit, the currently proposed project will provide a small number of jobs during the construction phase. Given the relatively limited heritage impacts, these socio-economic benefits can be seen to outweigh the impacts.

### 6.5. Existing impacts to heritage resources

There are currently no obvious threats to heritage resources on the site aside from the natural degradation, weathering and erosion that will affect the archaeological materials. Trampling from grazing animals and/or farm/other vehicles could also occur. These impacts would be of **negligible negative** significance. The cultural landscape has already been affected by electrical development through the construction of substations and many powerlines. This existing impact is considered to be of **medium negative** significance.

## 6.6. The No-Go alternative

If the project were not implemented then the site would stay as it currently is. The heritage impacts with implementation are of little to no concern. There would be a loss of socio-economic benefits through not being able to connect the solar energy facility to the national grid. The No-Go option is thus slightly less desirable.

## 6.7. Levels of acceptable change

Any impact to an archaeological or palaeontological resource or a grave is deemed unacceptable until such time as the resource has been inspected and studied further if necessary. Such impacts are not expected. Impacts to the landscape are difficult to quantify but in general a development that visually dominates the landscape from many vantage points is undesirable. The presently proposed powerline is a small one and, in the context of the many existing large powerlines in the area, it will result in negligible change to the visual character of the area.

## 7. INPUT TO THE ENVIRONMENTAL MANAGEMENT PROGRAM

The actions recorded in Table 5 should be included in the environmental management program (EMPr) for the project<sup>2</sup>.

**Table 5:** Heritage considerations for inclusion in the EMPr.

Impact	Mitigation / management objectives & outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>Impacts to archaeology and graves</b>					
Damage or destruction of archaeological sites	Avoid impacts (preferred) or sample sites before disturbance	Report any dense concentrations of artefacts discovered during construction	Inform staff and carry out inspections of excavations	Ongoing basis	Project developer
				Whenever on site (at least weekly)	ECO
Damage or destruction of archaeological sites or graves	Rescue information, artefacts or burials before extensive damage occurs	Reporting chance finds as early as possible, protect <i>in situ</i> and stop work in immediate area	Inform staff and carry out inspections of excavations	Ongoing basis	Construction Manager or Contractor
				Whenever on site (at least weekly)	ECO
<b>Impacts to the cultural landscape</b>					
Visible landscape scarring	Minimise landscape scarring	Ensure disturbance is kept to a minimum and does not exceed project requirements. Rehabilitate areas not needed during operation.	Monitoring of surface clearance relative to approved layout	Ongoing basis	Construction Manager or Contractor
				As required	ECO

<sup>2</sup> This would be the EMPr for the larger project discussed in Section 1.1.1.

## 8. CONCLUSIONS

The only heritage issues for this project are the potential destruction of archaeological materials and the visual intrusion of the infrastructure into the cultural landscape. However, neither of them is a significant concern for the approval of the project because no known archaeological materials occur – or are expected to occur – on site, and the landscape is now largely an electrical landscape. In conjunction with all the other existing and approved (but not yet constructed) electrical facilities in the immediate area, the new powerline would not be out of place. Table 6 lists the heritage indicators and shows how they are met. There are no remaining heritage issues.

**Table 6:** Heritage indicators and project responses.

Indicator	Project Response
Significant archaeological materials should not be disturbed without appropriate study.	No significant materials are known or expected to occur within the development footprint.
The proposed project should not dominate views from multiple directions.	The proposed powerline is small and will not be visually prominent in the landscape.

### 8.1. Reasoned opinion of the specialist

Given that the archaeological material likely to occur within the footprint would be of very low cultural significance, and that the landscape is essentially an electrical one in which the proposed new infrastructure would not be out of place, it is the opinion of the heritage specialist that the proposed project should be approved in full.

## 9. RECOMMENDATIONS

It is recommended that the proposed 33 kV powerline should be approved but subject to the following recommendation:

- If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

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# APPENDIX 1 – Curriculum Vitae



*Curriculum Vitae*

**Jayson David John Orton**

ARCHAEOLOGIST AND HERITAGE CONSULTANT

## Contact Details and personal information:

**Address:** 23 Dover Road, Muizenberg, 7945  
**Telephone:** (021) 788 1025  
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**Email:** jayson@asha-consulting.co.za

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

## Education:

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

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

## Employment History:

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

## Professional Accreditation:

Association of Southern African Professional Archaeologists (ASAPA) membership number: 233

CRM Section member with the following accreditation:

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

Association of Professional Heritage Practitioners (APHP) membership number: 43

- Accredited Professional Heritage Practitioner

### ➤ **Memberships and affiliations:**

South African Archaeological Society Council member	2004 – 2016
Assoc. Southern African Professional Archaeologists (ASAPA) member	2006 –
UCT Department of Archaeology Research Associate	2013 –
Heritage Western Cape APM Committee member	2013 –
UNISA Department of Archaeology and Anthropology Research Fellow	2014 –
Fish Hoek Valley Historical Association	2014 –
Kalk Bay Historical Association	2016 –
Association of Professional Heritage Practitioners member	2016 –

### **Fieldwork and project experience:**

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

#### Feasibility studies:

- Heritage feasibility studies examining all aspects of heritage from the desktop

#### Phase 1 surveys and impact assessments:

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

#### Phase 2 mitigation and research excavations:

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

### **Awards:**

Western Cape Government Cultural Affairs Awards 2015/2016: Best Heritage Project.