

**ARCHAEOLOGICAL IMPACT ASSESSMENT  
PROPOSED VISSERSPAN GRID CONNECTION ON THE FARMS  
VISSERSPAN NO. 40, MOOIHOEK NO. 1547, VASTEVELD NO.  
1548 AND KINDERDAM NO. 1685, NEAR DEALESVILLE,  
TOKOLOGO LOCAL MUNICIPALITY, FREE STATE PROVINCE**

***SAHRA CASE ID 15046***

Prepared for

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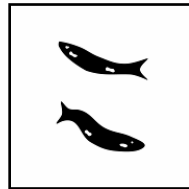
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**SEPTEMBER  
2021**

## **Declaration of independence**

I, Jonathan Kaplan, declare that I am an independent consultant and have no business, financial, personal, or any other interest in the proposed development project, application, or appeal in respect of which I was appointed other than fair remuneration, for work performed in connection with the activity or appeal. There are no circumstances that compromise the objectivity of my performing such work.

A handwritten signature in purple ink, appearing to be 'JK' followed by a flourish.

Jonathan Kaplan  
Archaeologist  
Agency for Cultural Resource Management

13 September, 2021

## **Executive summary**

### *1. Introduction*

ACRM was appointed by Enviroafrica to conduct an Archaeological Impact Assessment (AIA) for the proposed Visserspan Grid Connection on the farms Visserspan No. 40, Mooihoek No. 1547, Vasteveld No. 1548, and Kinderdam No. 1685, near Dealesville, Tokologo Local Municipality, in the Free State Province.

Visserspan is located  $\pm 10$ kms northwest of Dealesville, and about 70kms northwest of Bloemfontein. The farm is located about 1.5kms from the Eskom Perseus Substation, one of the largest substations in South Africa, and a suitable connection point for any solar PV plant that may be built in the area.

### *2. The development proposal*

The proposed development is primarily a linear development and includes the construction of two new substations located at each end of the grid connection line. A combined switching station and high voltage substation on the Farm Visserspan 40 will serve as the collection point for electricity generated from the proposed Visserspan Solar PV Facility (Kaplan 2020). From the switching station, electricity will be fed via overhead powerlines to the east, turning north east to trace the northern boundary of the Farms Mooihoek No. 1547 and Vasteveld No. 1548, before turning north east and running along the southern boundary of the Farm Kinderdam No. 1685, finally connecting to the proposed new Kinderdam main transmission substation (MTS). From the Kinderdam MTS, electricity will feed into the existing Eskom Perseus/Theseus 400kV overhead powerline that runs adjacent the site. The estimated total length of the grid connection line is about 6km and will be either via 132kV steel monopole, or 400kV pylon overhead powerlines. The servitude for the proposed grid connection will be  $\pm 55$ m wide. Existing farm roads and farm maintenance roads will be used, and no new roads will need to be constructed.

The topography of the receiving environment is flat and featureless and is for the most part, covered in dry grassland vegetation on a substrate of compact dark brown/orange-coloured sands. There is virtually no stone covering the surface area of the farms. The current land use is mostly cattle grazing, with mielies and paprika planted on the farms Mooihoek and Kinderdam.

Enviroafrica is the appointed independent Environmental Assessment Practitioner responsible for facilitating the Environmental Basic Assessment (BA) process for Environmental Authorisation.

### *2. Aim*

The purpose of this study is to assess the sensitivity of archaeological resources in the proposed route for the Visserspan Grid Connection, to determine the potential impacts on such resources, and to avoid and/or minimise such impacts by means of management and/or mitigation measures.

### *3. Constraints and limitations*

Much of the proposed route corridor is covered in dry grassland vegetation resulting in very poor archaeological visibility. However, the results of the study indicate that the route for the proposed Visserspan Grid Connection is not a sensitive archaeological landscape.

### *4. Findings*

A walk down survey of the proposed Visserspan Grid Connection took place on the 8<sup>th</sup> and 9<sup>th</sup> September 2021, in which the following observations were made.

- One weathered Middle Stone Age (MSA) flake was recorded in the proposed powerline corridor, on the Farm Vasteveld No. 1548.
- A thin scatter of weathered and burnished MSA flakes and chunks were recorded on the edge of a small, dry pan in the 'potential alternate route', on the Farm Walkerville.

#### *4.1 Grading of archaeological resources*

The very small numbers, isolated and disturbed context in which they were found, mean that the archaeological remains have been rated as having *LOW* (Grade IVC) significance.

No evidence of any Late Iron Age archaeological heritage were noted during the field assessment, which appears to be absent from the study area.

No evidence of any Anglo-Boer War battlefield sites (1899-1904), war graves or memorials were encountered during the study.

No graves or formal graveyards were encountered in the proposed grid connection route corridor

The cultural landscape, primarily agriculture (i. e. grazing), with farm fences, tracks, small concrete dams, windmills, woodlots, being the main tangible evidence of the landscape, has low heritage significance.

#### *4.2 Palaeontology*

According to consulting palaeontologist, Dr John Almond (2020), 'the palaeontological sensitivity of the solar PV project areas on Farm Visserspan No. 40 near Dealesville is low'. This applies to the proposed Visserspan Grid Connection as well (Almond pers. comm. 2021). Almond notes that, 'substantial direct impacts on fresh, potentially fossiliferous Tierberg Formation (Ecca Group, Karoo Supergroup) bedrocks during the construction phase of the proposed PV solar projects are considered unlikely'.

Anticipated impacts on local palaeontological heritage resources from the construction phase of the developments are accordingly, of low significance.



### *5. Potential impacts*

MSA resources may be buried below the coversands, but overall, the impact of the proposed Visserspan Grid Connection on pre-colonial archaeological resources is rated as being very low/negligible.

### *6. Conclusion*

The survey has shown that the archaeological landscape is dominated by a few isolated and dispersed scatters of mostly MSA lithics of *LOW* (Grade IVC) significance.

The assessment has shown that the proposed route corridor for the Visserspan Grid Connection is not a sensitive archaeological landscape.

The overall impact significance of the proposed project on archaeological heritage is assessed as *LOW* and therefore there are no objections to the proposed development proceeding

### *7. Recommendations:*

Regarding the proposed Visserspan Grid Connection on the Farms Visserspan No. 40, Mooihoek No. 1547, Vasteveld No. 1548, and Kinderdam No. 1685, near Dealesville, Tokologo Local Municipality, Free State Province, the following recommendations are made:

1. No mitigation of archaeological resources is required is required prior to construction activities commencing.
2. If any human burials are uncovered or intercepted during construction activities then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and will require inspection by a professional archaeologist.
3. The above recommendations must be included in the Environmental Management Plan (EMP) for the proposed development.

Table of Contents	Page
Executive summary	2
1. INTRODUCTION	5
2. THE DEVELOPMENT PROPOSAL	8
3. HERITAGE LEGISLATION	9
4. TERMS OF REFERENCE	9
5. DESCRIPTION OF THE RECEIVING ENVIRONMENT	9
6. STUDY APPROACH	23
6.1 Method of survey	23
6.2 Constraints and limitations	24
6.3 Identification of potential risks	24
6.4 Archaeological context	24
7. RESULTS	25
7.1 Grading	25
7.2 Palaeontology	28
7.3 Graves	28
7.4 Cultural landscape	28
8. IMPACT STATEMENT	28
8.1 Archaeology	28
8.2 Palaeontology	28
9. CONCLUSION	28
10. RECOMMENDATIONS	29
11. REFERENCES	30

## 1. INTRODUCTION

ACRM was appointed by Enviroafrica, on behalf of Ventura Renewable Energy (Pty) Ltd to conduct an Archaeological Impact Assessment (AIA) for the proposed Visserspan Grid Connection on the farms Visserspan No. 40, Mooihoek No. 1547, Vasteveld No. 1548, and Kinderdam No. 1685, near Dealesville, Tokologo Local Municipality, in the Free State Province (Figures 1-3).

Visserspan is located  $\pm 10$ kms northwest of Dealesville, and about 70kms northwest of Bloemfontein. The farm is located 1.5kms north of the Eskom Perseus Substation, one of the largest substations in South Africa, and a suitable connection point for any solar PV plant that may be built in the area.

The topography of the receiving environment is flat and is for the most part covered in dry grassland vegetation. The current land use is mostly cattle grazing, with some mielies and paprika planted on the farms Mooihoek 1547 and Kinderdam 1685.

Enviroafrica is the appointed independent Environmental Assessment Practitioner responsible for facilitating the Environmental Basic Assessment (BA) process for Environmental Authorisation.

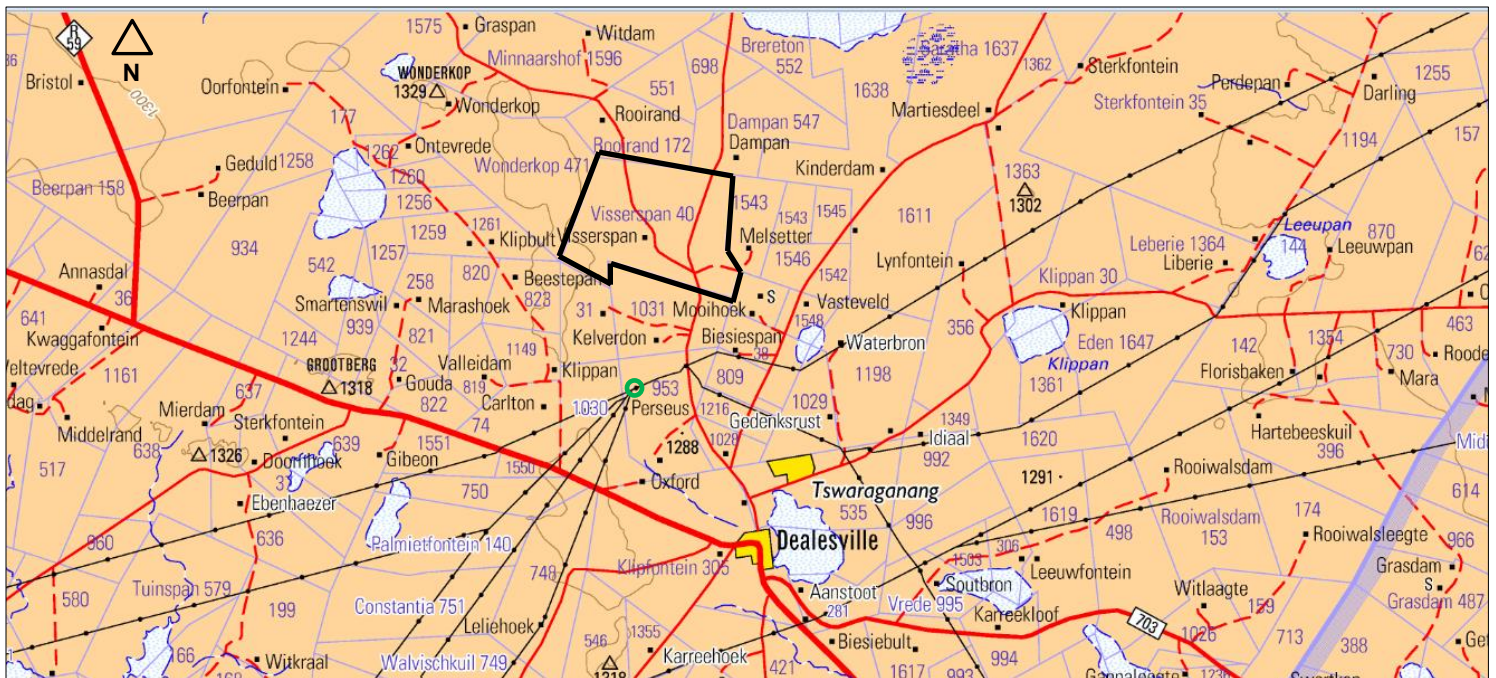


Figure 1. 1:250 000 map sheet (2824 Kimberley) showing the location (black polygon) of the proposed Visserspan Solar PV facility, northwest of Dealesville. The small green polygon south of the black polygon indicates the location of the Eskom Perseus substation



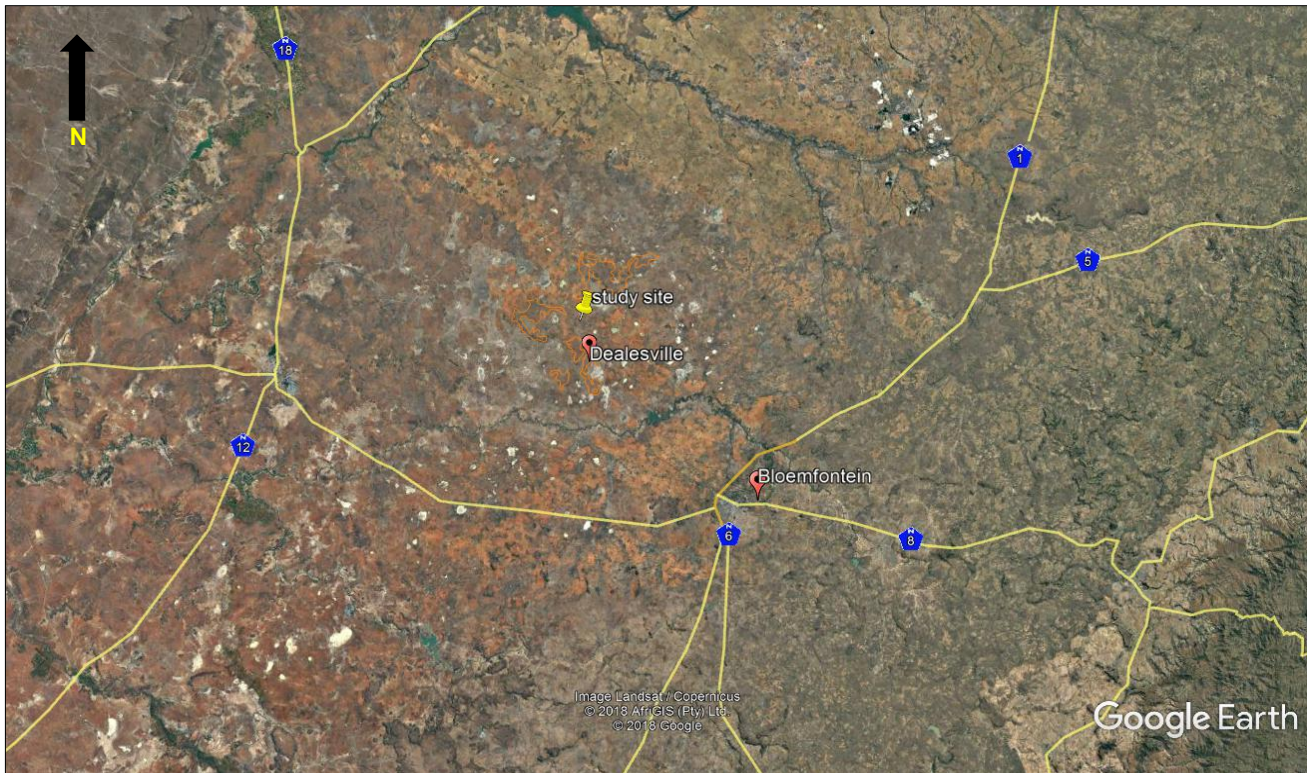


Figure 2. Google satellite map indicating the location of the proposed Visserspan Solar PV facility (yellow pin) near Dealesville (regional context)

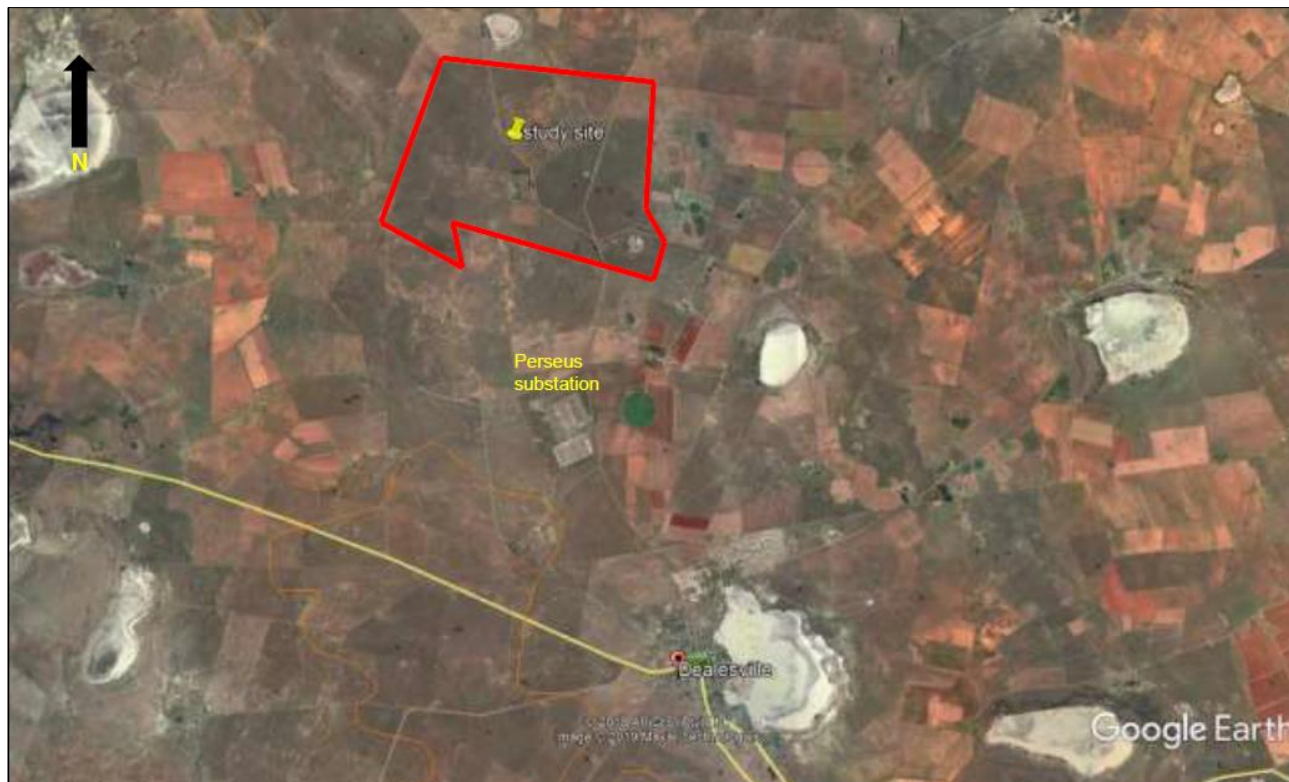


Figure 3. Google satellite map indicating the location of the proposed Visserspan Solar PV facility (red polygon) near Dealesville (local context)



## 2. THE DEVELOPMENT PROPOSAL

The proposed development is primarily a linear development and includes the construction of two new substations located at each end of the grid connection line. A combined switching station and high voltage substation on the Farm Visserspan 40 will serve as the collection point for electricity generated from the proposed Visserspan Solar PV Facility. From the switching station, electricity will be fed via overhead powerlines to the east, turning north east to trace the northern boundary of the Farms Mooihoek No. 1547 and Vasteveld No. 1548, before turning north east and running along the southern boundary of the Farm Kinderdam No. 1685, finally connecting to the proposed Kinderdam main transmission substation (MTS). From the Kinderdam MTS, electricity will feed into the existing Eskom Perseus/Theseus 400kV overhead powerline that runs adjacent the site. The estimated total length of the grid connection line is about 6km and will be either via 132kV steel monopole, or 400kV pylon overhead powerlines (Figure 4). The servitude for the proposed grid connection will be  $\pm 55\text{m}$  wide. Existing farm roads and farm maintenance roads will be used, and no new roads will need to be constructed.

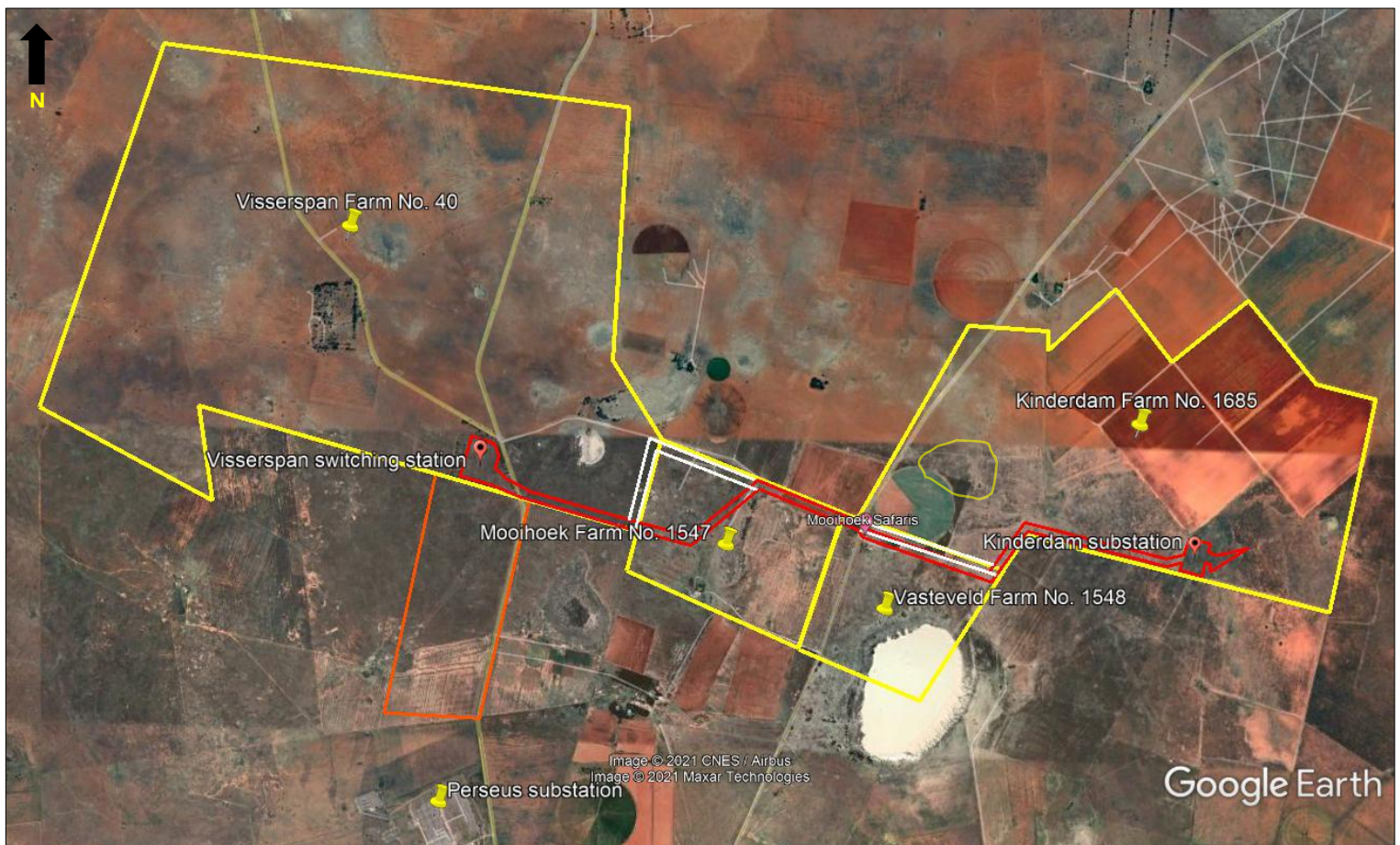


Figure 4. The proposed Visserspan Grid Connection (red & white lines), north of the town of Dealesville in the Free State Province. The Eskom Perseus substation is located approximately 2kms south of Visserspan Farm No. 40. The orange line is the proposed alternate powerline on the Farm Walkerville.

### **3. HERITAGE LEGISLATION**

The National Heritage Resources Act (NHRA No. 25 of 1999) protects archaeological and palaeontological sites and materials, as well as graves/cemeteries, battlefield sites, public monuments and buildings, structures and features over 60 years old. The South African Heritage Resources Agency (SAHRA) administers this legislation nationally, with Heritage Resources Agencies acting at provincial level.

According to the Act (Sect. 35), it is an offence to destroy, damage, excavate, alter or remove from its original place, or collect, any archaeological, palaeontological and historical material or object, without a permit issued by the South African Heritage Resource Agency (SAHRA) or applicable Provincial Heritage Resources Agency.

Notification of SAHRA is required for proposed developments exceeding certain dimensions (Sect. 38), upon which they will decide whether or not the development must be assessed for heritage impacts (an HIA) that may include an assessment of archaeological (a AIA) or palaeontological heritage (a PIA).

### **4. TERMS OF REFERENCE**

The terms of reference for the study were to:

- Identify and map archaeological heritage resources that might be impacted by proposed development activities;
- Assess the sensitivity of archaeological resources within the proposed route corridor;
- Assess the significance of any impacts resulting from the proposed development, and
- Identify measures to protect any valuable archaeological heritage resources that may exist within the proposed development site.

### **5. DESCRIPTION OF THE RECEIVING ENVIRONMENT**

Visserspan is located about 10kms northwest of the small farming town of Dealesville, in the Free State Province. The topography of the surrounding area is generally flat and covered in open dry grassland on a substrate of compact dark brown/orange-coloured sands. Termite mounds are a characteristic feature of the landscape. Burrowing is also quite extensive.. There is virtually no stone covering the surface areas of the affected farms, but a thin scatter of calcrete was noted in mielie fields in the proposed route corridor on the Farm Mooihoek 1547. There are no significant landscape features on any of the affected farms. Apart from shallow pans/depressions, there are no springs, streams, wetlands, or any other source of natural water on the surrounding farms. Existing infrastructure comprises gravel farm roads and tracks, farm fencing, windmills and small concrete dams.

Figures 5-31 illustrated the receiving environment for the proposed Visserspan Grid Connection.





Figure 5. Proposed Visserspan switching station on the Farm Visserspan No. 40. View facing north west



Figure 6. Proposed powerline route on the Farm Visserspan No. 40. View facing east





Figure 7. Proposed powerline route on the Farm Visserspan No. 40. View facing east



Figure 8. Proposed powerline route on the Farm Mooihoek No. 1547. View facing east





Figure 9. Proposed powerline route on the Farm Mooihoek No. 1547. View facing north east



Figure 10. Proposed powerline route on the Farm Mooihoek No. 1547. View facing east





Figure 11. Proposed powerline route on the Farm Vasteveld No. 1548. View facing north east



Figure 12. Proposed alternative powerline route on the Farm Vasteveld No. 1548. View facing north east. Note the burnt paprika field in the foreground





Figure 13. Proposed alternative powerline route on the Farm Vasteveld No. 1548. View facing north east.



Figure 14. Proposed alternative powerline route on the Farm Vasteveld No. 1548. View facing north east.





Figure 15. Proposed powerline route on the Farm Kinderdam No. 1685. View facing north east.



Figure 16. Proposed powerline route on the Farm Vasteveld No. 1548. View facing north east.





Figure 17. Proposed powerline route on the Farm Kinderdam No. 1685. View facing north east.



Figure 18. Proposed powerline route on the Farm Kinderdam No. 1685. View facing north east.





Figure 19. Proposed powerline route on the Farm Kinderdam No. 1685. View facing north east.



Figure 20. Proposed powerline route on the Farm Kinderdam No. 1685. View facing north east.





Figure 21. Proposed Kinderdam sub station on the Farm Kinderdam No. 1685. View facing north east. Note the existing 400kV overhead powerlines alongside the site



Figure 22. Proposed alternative powerline route on the Farm Mooihoek No. 1547. View facing north east





Figure 23. Proposed alternative powerline route on the Farm Mooihoek No. 1547.  
View facing north east



Figure 24. Proposed alternative powerline route on the Farm Visserspan No. 40.  
View facing north east





Figure 25. Proposed alternative powerline route on the Farm Visserspan No. 40.  
View facing north east



Figure 26. Proposed potential alternate powerline route on the Farm Walkerville.  
View facing south. Note the Eskom Perseus substation in the background of the plate





Figure 27. Proposed potential alternate powerline route on the Farm Walkerville. View facing south. Note the Eskom Perseus substation in the background of the plate



Figure 28. Proposed potential alternate powerline route on the Farm Walkerville. View facing south. Note the Eskom Perseus substation in the background of the plate





Figure 29. Proposed potential alternate powerline route on the Farm Walkerville. View facing south. Note the Eskom Perseus substation in the background of the plate. The R64 is to the right of the plate



Figure 30. Proposed potential alternate powerline route on the Farm Walkerville. View facing south. The R64 is to the right of the plate.





Figure 31. Proposed potential alternate powerline route on the Farm Walkerville. View facing south. The R64 is to the right of the plate.

## **6. STUDY APPROACH**

### **6.1 Method**

The purpose of the study is to assess the sensitivity of archaeological resources in the study area, to determine the potential impacts on such resources, and to avoid and/or minimize such impacts by means of management and/or mitigation measures.

The significance of archaeological remains was assessed in terms of their content and context. Attributes considered in determining significance include artefact and/or ecofact types, rarity of finds, exceptional items, organic preservation, potential for future research, density of finds, and the context in which archaeological traces occur.

A walk down survey of the proposed powerline route, the proposed alternative powerline route, and the potential (orange) powerline route, was undertaken on the 8<sup>th</sup> and 9<sup>th</sup> September, 2021.

The position of identified archaeological resources, were plotted using a handheld GPS device set on the map datum wgs 84. A track path of the survey was also captured.

A desktop study was carried out to assess the heritage context surrounding the proposed development site. The literature survey included unpublished commercial reports sourced primarily from the South African Heritage Resources Information System (SAHRIS).

## **6.2 Constraints and limitations**

The extensive grass cover posed a severe limitation during the survey and it is likely that isolated artefacts could have gone unnoticed. However, such material is unlikely to be of high significance.

## **6.3 Identification of potential risks**

The results of the study, as well as information generated from the literature survey indicate that the proposed Visserspan Grid Connection will not impact on significant archaeological resources.

MSA flake tools may be buried below the coversands, but overall, the impact of the proposed development on pre-colonial archaeological remains is rated as being very low.

## **6.4 Archaeological context**

Until 2015, no archaeological work had been undertaken in the Dealesville area. However, with the emergence of a growing alternative energy industry, a number of Heritage Impact Assessments (HIAs) have been conducted on farms surrounding Dealesville. Orton (2015, 2016a, b, c, d, e) has undertaken 16 HIAs for proposed PV Solar projects in the Dealesville area, to the west, north west and south west of the small town. Four of these proposed solar farms are located immediately to the south of Visserspan 40, with three bordering the property on its southern boundary. The work carried out by Orton has shown that across all 16 projects, the archaeological landscape is dominated by tools assigned to the Middle Stone Age (MSA), with few Later Stone Age (LSA) elements occurring. No Early Stone Age (ESA) tools were recorded. The majority of remains comprise, dispersed (i. e. low density) scatters of weathered hornfels, encountered on eroded patches of soil below the thin coversands (see also Kaplan 2020). Larger scatters of tools were recorded on the edges of shallow seasonal pans (see also Hutton 2011; Kaplan 2020). Webley (2010) has also noted that archaeological resources appear to be absent or rare in the flat, dry, open landscapes of the norther Orange Free State, where raw materials for making tools appear to be quite limited.

Orton (2015) notes that archaeological resources appear to be quite rare in these flat, open and well-grassed landscapes, where such material is more common along the major rivers where artefacts are revealed in river terrace gravels. Orton (2016a, b, c, d, e) survey of numerous farms in the Dealesville area also showed that the majority of archaeological resources were located in close proximity to the rock outcrops, while archaeology 'dropped off massively' in the open grasslands. Where rocky outcrops of dolerite occur (near Dealesville), rock engravings have also been recorded (Orton 2015).

According to Orton (2015), the Late Iron Age, which documents the history of Black farming communities in South Africa within the last 1000 years, is absent from the study area.

The second Anglo-Boer War (1899-1902) also played a significant role in South African History, particularly in the interior of the country, where many battles were fought

between the British and Boer forces. Significant battles in proximity to Dealesville include the Battles of Modder River and Magersfontein some 100kms to the southwest and west respectively, the Battle of Paardeberg 60km to the southwest and the Battle of Driefontein just outside Bloemfontein, some 60km to the southeast (Orton 2015). Graves, graveyards and memorials across the central interior of South Africa also serve as reminders of the war.

## 7. RESULTS

A detailed walk down survey of the proposed Visserspan Grid Connection was undertaken on the 8<sup>th</sup> and 9<sup>th</sup> September 2021. Trackpaths and waypoints of archaeological resources recorded during the study are illustrated in Figure 32.

An isolated, weathered MSA flake in indurated shale (Point 0051) was recorded on a patch of trampled ground in the route corridor, on the Farm Mooihoek 1547.

A small, dispersed scatter of a few weathered MSA flakes and chunks (Point 0041) in hornfels/indurated shale were recorded on the edge of small dry pan, about 12m from the potential alternate powerline route on the Farm Walkerville, south of Visserspan 40.

No archaeological resources were recorded in the footprint area of the proposed Visserspan Switching Station. This area was extensively searched during the field assessment of the proposed Visserspan PV Solar Energy Facility (Kaplan 2020).

No archaeological heritage resources were encountered in the footprint area of the proposed Kinderdam substation. The proposed site is covered in dense, knee-high grassland vegetation (refer to Figure 21).

No evidence of any Late Iron Age heritage such as stone walling, cattle dung floors, pottery, metal items such as spears or hoes, smelting furnaces, or slag, etc, were noted during the field assessment. According to Orton (2015) Later Iron Age traces appear to be absent from the surrounding area.

No evidence of any Anglo-Boer War battlefield sites, war graves, or memorials were encountered during the study.

### 7.1 Grading

The small numbers and mostly isolated and disturbed context, in which they were found, mean that the archaeological remains have been rated as having *low* (Grade IVC) significance.

Indications are that the remains recorded most likely represent discarded flakes and flake tools. Dispersed scatters of a few tools (i. e Point 0041) alongside the small dry pan in the potential alternate route, may represent an activity area, or brief settlement site but the remains occur in a severely disturbed and degraded context.

A collection of implements and the context in which they were found is illustrated in Figures 33-35.





Figure 32. Track paths in blue and waypoints of archaeological finds

GPS Point	Name of Farm	Lat/Long	Description of finds	Grading	Mitigation
0041	Walkerville	28°37'18.47"S 25°44'27.79"E	Thin scatter of weathered and burnished MSA tools on edge of small dry pan, heavily trampled.	Low IVC	None required
0051	Mooihoek 1547	28°36'54.74"S 25°45'40.35"E	Single, isolated weathered indurated shale MSA flake	Low IVC	None required

Table 1. Spreadsheet of waypoints and description of archaeological finds





Figure 33. Point 041. Context in which the remains were found



Figure 34. Collection of tools (Point 041) Ruler scale is in cm



Figure 35. MSA flake (Point 051). Ruler scale is in cm



## **7.2 Palaeontology**

According to consulting palaeontologist, Dr John Almond (2020:20), 'the palaeontological sensitivity of the solar PV project areas on Farm Visserspan No. 40 near Dealesville is low'. This applies to the proposed Visserspan Grid Connection as well (Almond pers. comm. September 2021). Almond (2020:20) notes that 'substantial direct impacts on fresh, potentially fossiliferous Tierberg Formation (Ecca Group, Karoo Supergroup) bedrocks during the construction phase of the proposed PV solar projects are considered unlikely'. Anticipated impacts on local palaeontological heritage resources from the construction phase of the developments are according to Almond (2020: 20), 'also of low significance'.

## **7.3 Graves**

No graves or formal graveyards were encountered in the proposed grid connection route corridor

## **7.4 Cultural landscape**

The cultural landscape, primarily agriculture (i. e. grazing), with farm fences, tracks, small concrete dams, windmills, woodlots, being the main tangible evidence of the landscape, has low heritage significance.

# **8. IMPACT STATEMENT**

## **8.1 Archaeology**

The results of the study indicate that the proposed Visserspan Grid Connection on Farm Visserspan No. 40, Mooihoek No. 1547, Vasteveld No. 1548, and Kinderdam No. 1685, near Dealesville will not have an impact of great significance on pre-colonial archaeological heritage.

## **8.2 Palaeontology**

According to Almond (2020 & pers. comm. September, 2021), anticipated impacts on local palaeontological heritage resources from the construction phase of the developments are of low significance.

# **9. CONCLUSION**

The study has identified no significant impacts to pre-colonial archaeological heritage that will need to be mitigated prior to proposed construction activities commencing. The field survey has shown that the archaeological landscape is dominated by a few isolated and dispersed scatters of MSA lithics of *LOW* (Grade IVC) archaeological significance. Scatters of tools tend to cluster around pans/depressions which show a preference for Stone Age people to settle close to water sources in this dry interior region of the country (Kaplan 2020).

The assessment has shown that the proposed route corridor for the Visserspan Grid Connection is not a sensitive archaeological landscape.

The overall impact significance of the proposed Visserspan Solar PV facility, including the proposed Visserspan Grid Connection on local archaeological heritage is assessed as LOW and therefore there are no objections to the development proceeding.

## **10. RECOMMENDATIONS**

Regarding the proposed Visserspan Grid Connection on the Farms Visserspan No. 40, Mooihoek No. 1547, Vasteveld No. 1548, and Kinderdam No. 1685, near Dealesville, Tokologo Local Municipality, Free State Province, the following recommendations are made:

1. No mitigation of archaeological resources is required is required prior to construction activities commencing.
2. If any human burials are uncovered or intercepted during construction activities then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and will require inspection by a professional archaeologist.
3. The above recommendations must be included in the Environmental Management Plan (EMP) for the proposed development.

## 11. REFERENCES

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