

ARCHAEOLOGICAL HERITAGE IMPACT ASSESSMENT

PROPOSED DEVELOPMENT OF A 165 MW PHOTOVOLTAIC SOLAR FARM ON PORTION 0 OF THE FARM KOPJE ALLEEN NO. 81 AND PORTION 1 OF THE FARM KOPJE ALLEEN NO. 81, KHAUTA NORTH SOLAR PV FACILITY NEAR RIEBEECKSTAD, MATJHABENG LOCAL MUNICIPALITY FREE STATE PROVINCE

Prepared for:

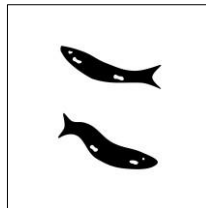
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**AUGUST
2022**

Executive summary

1. Introduction

ACRM was appointed by King's Landing Trading 507 (Pty) Ltd t/a Enviroworks (hereafter referred to as Enviroworks), to conduct an Archaeological Heritage Impact Assessment for the proposed 165MW Khauta North Solar PV Facility on Portion 1 and Rem Portion 0 of the Farm Kopje Alleen No. 81, near Riebeeckstad (Matjhabeng Local Municipality) near Welkom, in the Free State Province.

Riebeeckstad is located about 15kms north of Welkom, and about 155kms north east of Bloemfontein. Combined the two farm portions measure 515ha in extent, while approximately 273ha has been set aside for the proposed Solar PV facility including associated infrastructure.

The topography of the farm is fairly level and covered in dense grassland vegetation. There are no significant landscape features such as rocky kopjes, outcrops, rivers or pans, in the application area, although some surface bedrock occurs in places. The current land use is grazing. A few small earth dams also occur outside the application area. There is virtually no surface stone covering the area. Existing infrastructure comprises farm roads, fencing and several isolated windmills. A farm house (labourers cottage) and a metal shed at the entrance to the farm will not be impacted by the proposed project.

2. The development proposal

The infrastructure associated with the proposed 165MW Khauta North Solar PV Facility includes the following:

- PV modules and mounting structures with fixed, single or double axis tracking mounting structures;
- Battery Energy Storage System (BESS);
- Site and internal access roads (up to 6 m wide);
- Auxiliary buildings (offices, parking etc.);
- Temporary laydown area (and a latter permanent laydown area for BESS);
- Facility Substation;
- Grid connection infrastructure, includes (underground cabling where practical) medium voltage cabling between the project components and the facility substation;
- Perimeter fencing, and
- Rainwater and/or groundwater storage tanks and associated water transfer infrastructure.

Enviro Works is the appointed Environmental Assessment Practitioner (EAP) responsible for facilitating the Environmental Impact Assessment (EIA) process for Environmental Authorisation.

3. Aim

The overall purpose of the study is to assess the sensitivity of archaeological resources on the affected farm portions; namely Portion 0 Farm No. 81 (Kopje Alleen) and Portion 1 of Farm No. 81 (Kopje Alleen), to determine the potential impacts of the development on such resources, and to avoid and/or minimise such impacts by means of management and/or mitigation measures.

A field based Palaeontological Impact Assessment (PIA) for the proposed development was also conducted by consulting palaeontologist, Dr John Almond of Natura Viva cc.

4. Constraints and limitations

The proposed development site is covered in extremely thick grassland vegetation, resulting in poor archaeological visibility. However, the results of the study indicate that the two farm portions of Kopje Alleen is not a sensitive archaeological landscape.

5. Findings

A field assessment of the proposed Khauta North Solar PV Facility took place on the 13th of April 2022, in which the following observations were made.

5.1 Archaeology

- No pre-colonial Stone Age, or historical archaeological heritage resources were recorded in the application area.

5.2 Late Iron Age

- No evidence of any Late Iron Age archaeological heritage was encountered during the study, which appears to be absent from the area.

5.3 Anglo Boer War

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

According to Mr Louis Venter of the War Museum in Bloemfontein (pers. comm. May 2022), there are no references to any Anglo Boer War skirmishes in the area.

5.4 Graves

- No graves occur in the application area.

5.5 Built environment

A farm house/labourers cottage, and a large metal shed at the entrance to the Farm Kopje Alleen on Portion 0 of Farm 81 are located outside the development footprint and will not be impacted by the proposed development.

5.6 Palaeontological heritage

According to Almond (2022), 'no fossil remains of any kind were recorded from the Permian bedrocks and Late Caenozoic superficial sediments that underly the study area, and that no palaeontological High Sensitivity or No-Go areas were identified'.

Almond (2022) concludes that the 'site is in practice of Low to Very Low palaeo-sensitivity'.

6. Potential impacts

Stone Age archaeological resources may be buried below the coversands, but overall, the impact of the proposed Khauta North Solar PV Facility on pre-colonial archaeological resources is rated as being Low.

7. Conclusions

The study has identified no impacts to archaeological heritage resources that will need to be mitigated prior to construction activities commencing.

The field assessment has shown that the site for the proposed 165MW Khauta North Solar PV Facility on Portion 0 and Portion 1 of the Farm Kopje Alleen No. 81 near Riebeeckstad, is not a sensitive archaeological landscape.

The assessment is supported by the literature study, including several recent studies conducted in Riebeeckstad, which have shown that no Stone Age archaeological resources have been recorded in Riebeeckstad, or in the surrounding area.

The overall impact significance of the proposed 165MW Khauta North Solar PV Facility on archaeological heritage is assessed as LOW, and therefore there are no objections, to the development proceeding.

Almond (2022) has also shown that that the site is of 'Low to Very Low palaeosensitivity'.

The cultural landscape, primarily agriculture, with farm fences, tracks, and isolated windmills being the main tangible evidence of the landscape, has low heritage significance.

The study has shown that there are no fatal flaws in the development proposal.

8. Recommendations

8.1 Archaeology

1. It is recommended that the proposed development should be authorised.
2. No mitigation of archaeological resources is required is required prior to construction activities commencing.
3. If any unmarked human burials are uncovered during construction excavations then work in the immediate area must be halted. The find would need to be reported to the heritage authorities and will require inspection by a professional archaeologist.

8.2 Palaeontology

1. Provided that the Chance Fossil Finds Protocol tabulated in Appendix 1 of the PIA is incorporated into the EMPr and fully implemented during the construction phase, there are no objections on palaeontological heritage grounds to their authorisation (Almond 2022).

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1. INTRODUCTION

ACRM was appointed by Enviroworks, on behalf of Khauta North Solar PV Facility (Pty) Ltd, to conduct an Archaeological Heritage Impact Assessment for the proposed 165 MW Khauta North Solar PV Facility on Portion 0 and Portion 1 of the Farm Kopje Alleen No. 81, near Riebeeckstad (Matjhabeng Local Municipality) near Welkom, in the Free State Province (Figures 1 & 2).

Riebeeckstad is located about 15kms north of Welkom, and about 155kms north east of Bloemfontein.

Combined, the two farms measures 515ha in extent, while \pm 273ha has been set aside for the proposed Solar PV facility including associated infrastructure.

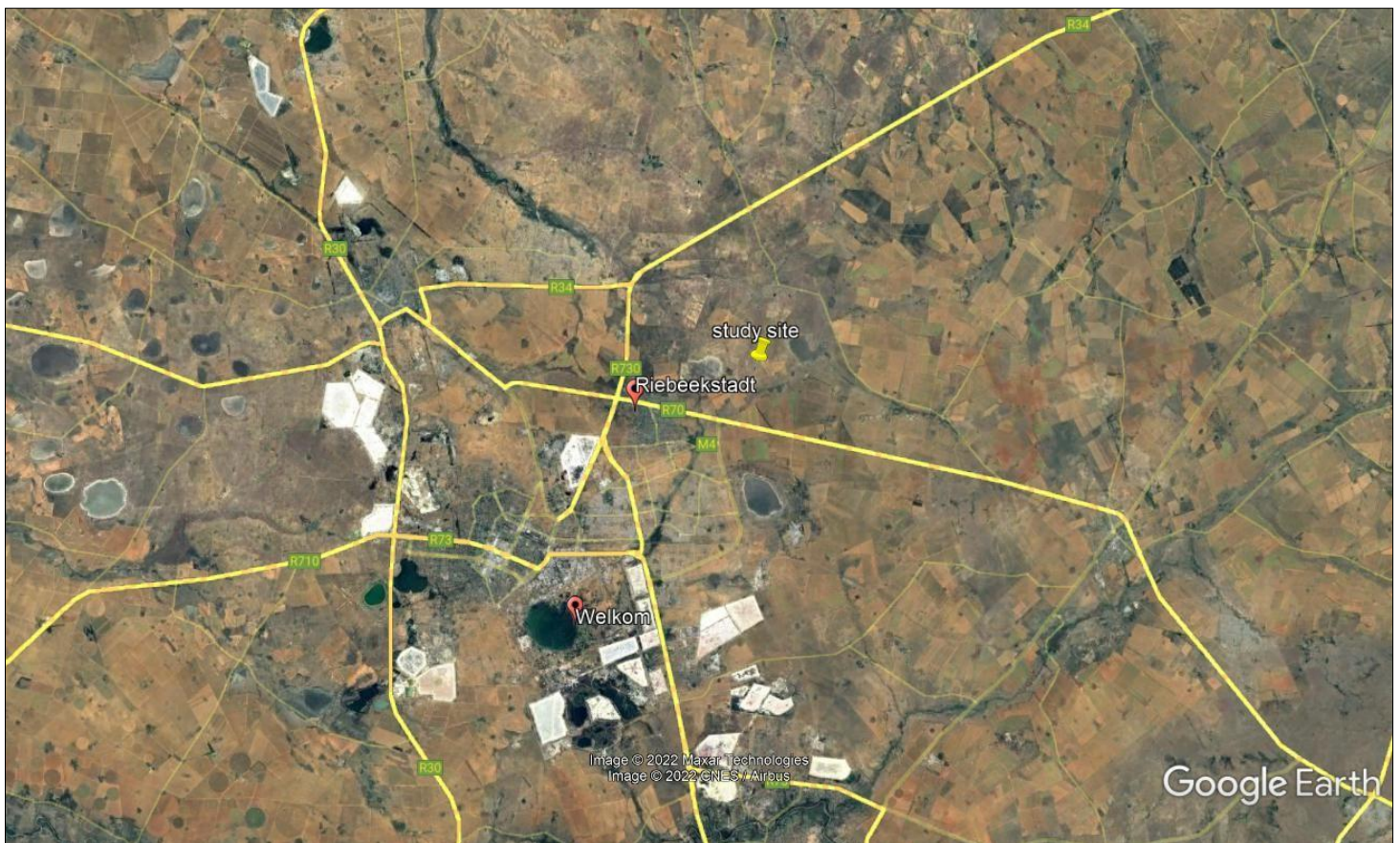


Figure 1. Google Earth satellite map indicating the location of the proposed Khauta North Solar PV Facility (yellow pin) near Riebeeckstad in the Free State Province (regional context).

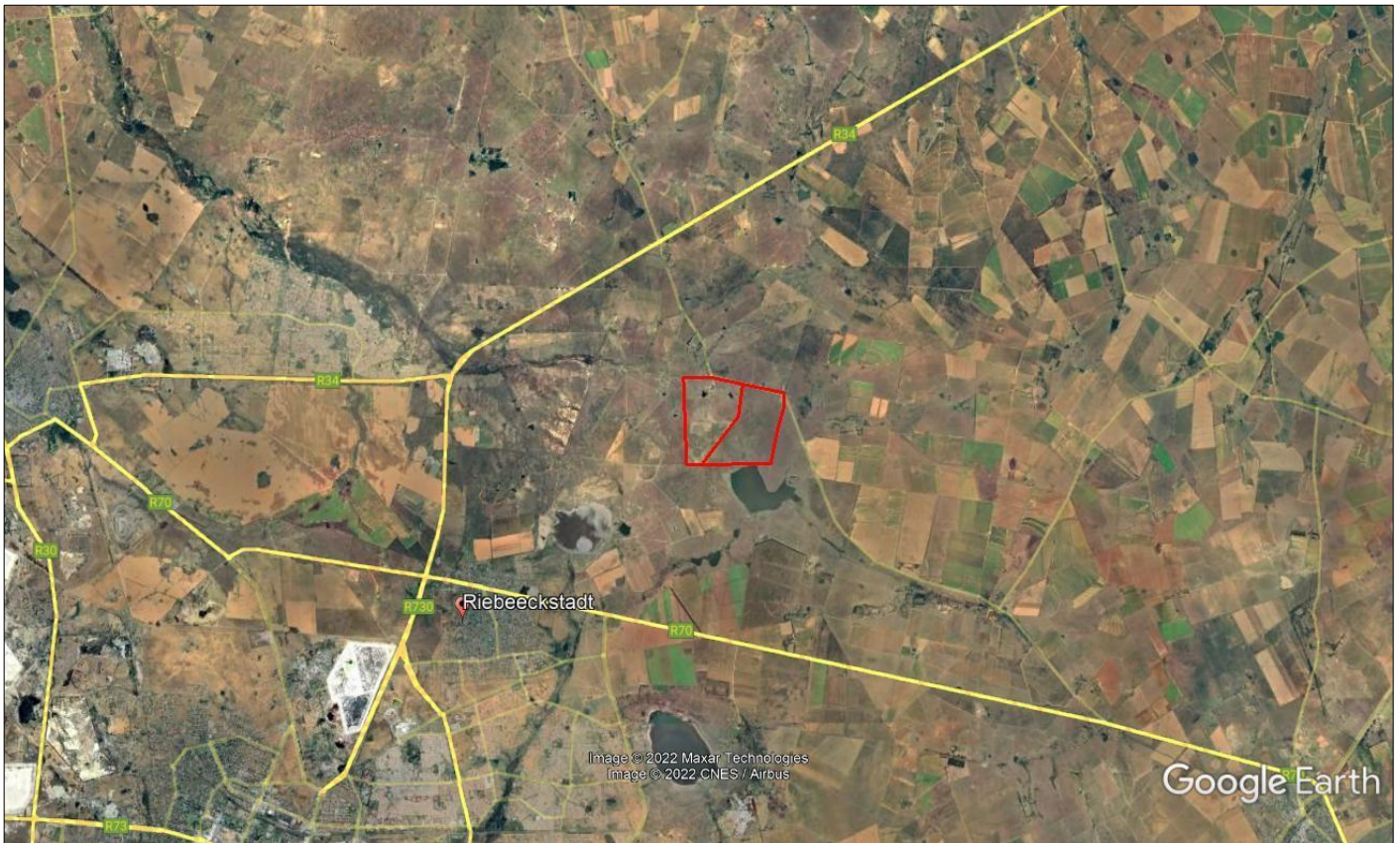


Figure 2. Google Earth satellite map indicating the application area (red polygon) for the proposed Khauta North Solar PV Facility, near Riebeeckstad.

2. THE DEVELOPMENT PROPOSAL

The infrastructure associated with the proposed 110MW Khauta South Solar PV Facility near Riebeeckstad includes the following:

- PV modules and mounting structures with fixed, single or double axis tracking mounting structures;
- Battery Energy Storage System (BESS);
- Site and internal access roads (up to 6 m wide);
- Auxiliary buildings (offices, parking etc.);
- Temporary laydown area (and a latter permanent laydown area for BESS);
- Facility Substation;
- Grid connection infrastructure, includes (underground cabling where practical) medium voltage cabling between the project components and the facility substation;
- Perimeter fencing, and
- Rainwater and/or groundwater storage tanks and associated water transfer infrastructure.

A proposed Site Layout Plan is presented in Figure 3.

Enviro Works is the appointed independent Environmental Assessment Practitioner (EAP) responsible for facilitating the Environmental Impact Assessment (EIA) process for Environmental Authorisation.

Regarding powerline grid connections, the route selection for the overhead powerline has not been finalized and that reports for the powerline will be commissioned once the final route options have been decided.

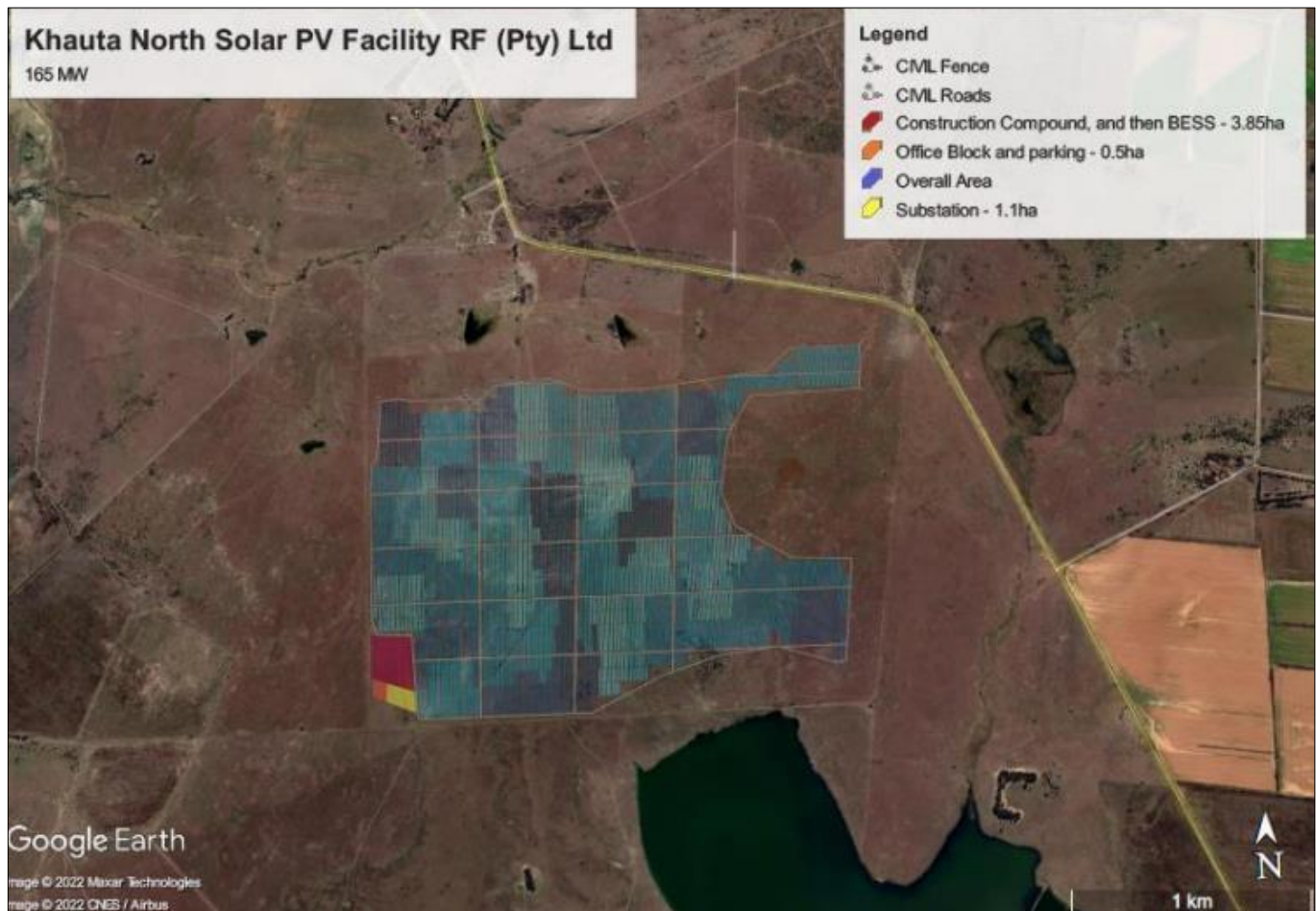


Figure 3. Proposed 165W Khauta North Solar PV Facility. Preliminary layout of the proposed development

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

5. THE STUDY SITE

The site for the proposed Khauta North Solar PV facility is located about six kilometres north east of Riebeeckstad. The topography of the farm is fairly level and covered in dense grassland vegetation (Figures 4-10). There are no significant landscape features such as rocky kopjes, outcrops, streams or pans in the application area, although some surface bedrock occurs in places. There is virtually no surface stone covering the area. A few small earth dams occur in the study area. The current land use is grazing. Existing infrastructure comprises farm roads, fencing, and isolated windmill. No erosion gullies, or any excavations were noted during the field study.

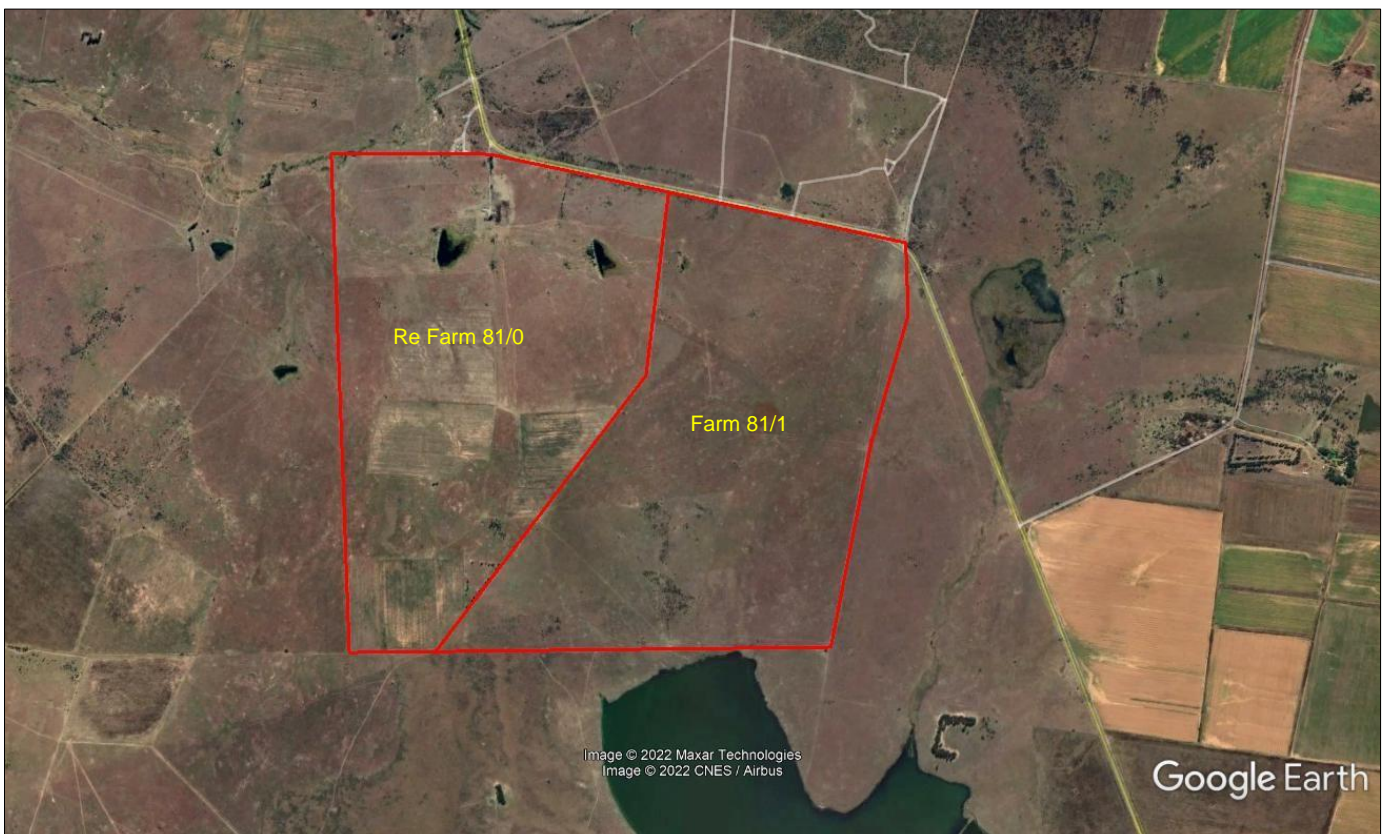


Figure 4. Close up Google satellite map of the 165MW Khauta South Solar PV Facility application area (red polygon).



Figure 5. View of the site facing north



Figure 6. View of the site facing east



Figure 7. View of the site facing north east



Figure 8. View of the site facing north

6. STUDY APPROACH

6.1 Method of survey

The purpose of the study is to assess the sensitivity of archaeological resources in the Kopje Alleen No. 81 study area, to determine the potential impacts of the development on such resources, and to avoid and/or minimize such impacts by means of management and/or mitigation measures.

A field assessment was undertaken on 12th of April 2022.

The survey was carried, out on foot. A track path of the survey was also captured.

A desktop study was conducted 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).

The heritage practitioner consulted with Ms Loudine Philip, Head of the Department of Archaeology, National Museum of Bloemfontein, as well as with Dr Johan van Zyl Head Human Science War Museum in Bloemfontein.

A field based Paleontological Impact Assessment (PIA) was conducted by consulting palaeontologist, Dr John Almond of Natura viva cc (Almond 2022).

6.2 Constraints and limitations

The extensive grass cover posed a severe limitation during the survey (refer to Figures 5-8), and it is likely that isolated artefacts could have gone unnoticed. However, indications are that that such material is unlikely to be of high significance.

6.3 Identification of potential risks

The results of the field assessment, supported by the literature study, including several recent studies conducted in Riebeeckstad (Kaplan 2022a, b, c), indicate that the proposed 165MW

Khauta North Solar PV Facility in Riebeeckstad will not impact on important Stone Age archaeological resources.

Middle Stone Age resources may be buried below the coversands (Kaplan 2022a), but overall, the impact of the proposed development on pre-colonial archaeological resources is rated as being Low.

6.4 Archaeological and heritage context

The primary source of information was the South African Heritage Resources Information System (SAHRIS) national database.

The Free State has a rich archaeological and historical history going back millions of years and includes significant aspects such as Later Stone Age rock art, Anglo Boer War Battlefields and Iron Age stonewalled enclosures.

The general surroundings of the area became a melting pot of contact and conflict as it represents one of many frontiers where San/Bushman hunter gatherers, Nguni and Sotho-Tswana agro-pastoralists, Dutch Voortrekkers and British Colonists all came together. The ravages of war also swept across these plains, and in particular the South African War (1899-1902), as well as the Boer Rebellion (1914-1915) (Birkholtz 2017).

The town of Welkom was laid out on a farm of the same name after gold was discovered in the region, and officially proclaimed a town in 1948. Riebeeckstad is named after Jan van Riebeeck and was established as an upper-class suburb void of mine shafts for people working in Welkom and on the Free State goldfields.

The archaeological history of the area can broadly be divided into a Stone Age, Iron Age and Historic Period. Both the Stone Age and Iron Age form part of what is referred to as the Pre-Colonial Period, whereas the Historic Period is referred to as the Colonial Period.

It is interesting to note that no, or very little archaeological or cultural heritage resources were recorded during the majority of the CRM¹ project reports consulted (Coetzee 2008; Dreyer 2011, 2008, 2004; Prins 2013; Van der Walt 2020, 2015), aside from Colonial Period farming infrastructure and cemeteries (Dreyer 2007; Van Ryneveld 2009) – giving the impression of a generally low archaeological and cultural heritage significance to the area. Google satellite imagery also indicates that the surrounding area has been quite heavily impacted on by social housing development, construction of powerlines, roads, agriculture and mining, which have likely impacted on surface indicators of heritage resources.

Heritage resources were recorded during a field study of the Thabong Solar Farm, on the Farm Uityk 509, directly to the east of the proposed Khauta Solar PV Cluster (Van Ryneveld 2013). These included several Colonial Period sites including a ruined homestead, a barn and adjoining livestock enclosure. The remains were graded as having Low significance. Three historic cemeteries were also recorded on the 867ha farm. Cemeteries are graded as having High local significance. Two cemeteries were recorded on the adjacent Farm Helderwater 494 (Van Ryneveld 2013).

No pre-colonial Stone Age archaeological heritage resources were recorded during the Thabong study (Van Ryneveld 2013).

Van Ryneveld (2009) also conducted an Archaeological Impact Assessment for the Thandanani Residential Development south west of Riebeeckstad. Heritage sites recorded

¹ Cultural Resource Management

included one Historical Period farming site, graded as Low significance (Van Ryneveld 2009). No pre-colonial archaeological Stone Age resources were identified across the 180ha study site. No graves, cemeteries, buildings, or historic period middens were encountered either (Van Ryneveld 2009).

Very little therefore is, known about the Stone Age archaeology of Riebeeckstad and its immediate surroundings. Middle Stone Age (MSA) and Later Stone Age (LSA) implements associated with mammal fossil remains have been recorded in erosion gullies along the Sand, Doring and Vet Rivers between Virginia and Theunissen 20kms south of Riebeeckstad (Birkholtz 2017; Loudine Philip National Museum Bloemfontein, pers. comm.), but no Stone Age resources have yet been recorded in Welkom or Riebeeckstad.

The arrival of early Black farming communities during the first millennium, heralded in the start of the Iron Age for South Africa. The Iron Age is that period in South Africa's archaeological history associated with pre-colonial farming communities associated with agricultural and pastoralist farming activities, and metal production.

7. RESULTS

7.1 Archaeology

No pre-colonial Stone Age, or historical archaeological resources were recorded in the application area for the proposed 165MW Khauta North Solar PV Facility (Figure 9).

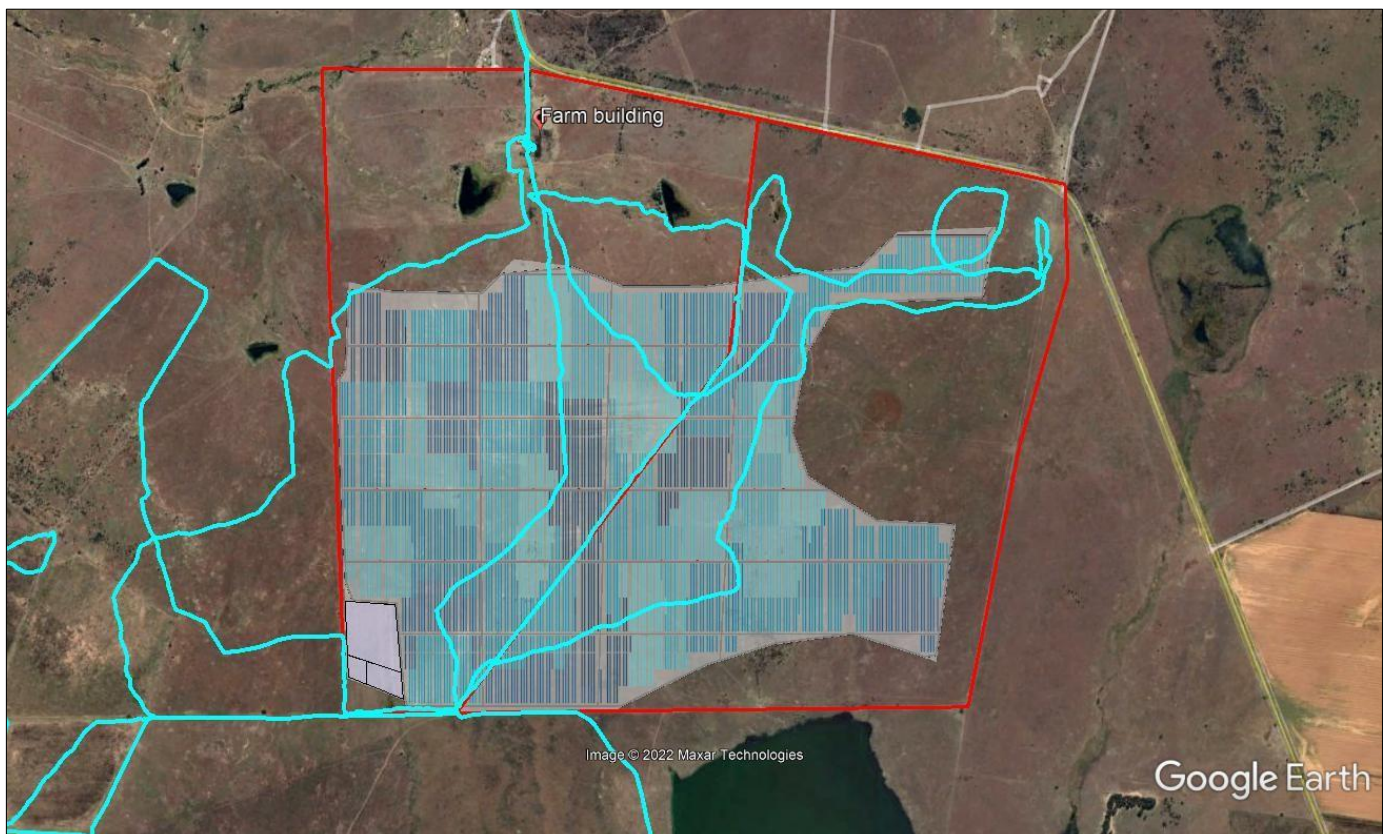


Figure 9. Trackpaths (in blue).

7.2 Late Iron Age

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

According to the distribution map for Iron Age settlements on the Southern Highveld as published in Maggs (1976), the Khauta SPV Cluster area is located to the west of the known distribution of Late Iron Age sites. It is therefore unlikely for any such sites to be located within the study area, or its immediate surroundings.

7.3 Anglo Boer War

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

According to Mr Louis Venter of the War Museum in Bloemfontein (email correspondence dated May 2022), there are no references to any Anglo Boer War skirmishes in the area.

7.4 Graves

No graves or graveyards were recorded during the field assessment

7.5 Built Environment

A farmhouse/labourer cottage (Figures 10-12), and a large metal shed (Figure 13) at the entrance to the farm Kopje Alleen No. 81 is located outside the proposed development footprint and will not be impacted by proposed construction activities.



Figure 10. Farmhouse/labourer cottage on Portion 0 of Farm 81 Kopje Alleen.



Figure 11. Farmhouse/labourer cottage on Portion 0 of Farm 81 Kopje Alleen.



Figure 12. Farmhouse/labourer cottage on Portion 0 of Farm 81 Kopje Alleen.



Figure 13. Metal shed on Portion 0 of Farm 81 Kopje Alleen.

7.6 Palaeontology

According to consulting palaeontologist, Dr John Almond (2022), 'no fossil remains of any kind were recorded from the Permian bedrocks and Late Caenozoic superficial sediments that underly the study area', during a site visit conducted in May 2022, and that 'no palaeontological High Sensitivity or No-Go areas were identified'.

Almond (2022) concludes 'that the site is in practice of Low to Very Low palaeosensitivity'

8. IMPACT ASSESMENT AND DESCRIPTION

Tables 1 and 2, assesses the overall impacts to archaeological heritage resources.

8.1 Summary of assessment of potential impact of the proposed activities

Potential impact on archaeological resources	
Nature of impact	Damage to, or destruction of archaeological & heritage resources
Extent and duration of impact	Localized short term
Intensity of impact	Low
Probability of occurrence	Improbable
Degree to which impact can be reversed	Reversible
Irreplaceability of resources	Low
Cumulative impact prior to mitigation	Low
Significance of impact pre-mitigation	Low
Degree of mitigation possible	High
Proposed mitigation	None required
Cumulative impact post mitigation	Low
Significance after mitigation	Insignificant

Table 1. Assessment of archaeological impacts: Construction Phase

Potential impact on archaeological resources	
Nature of impact	Damage to, or destruction of archaeological & heritage resources
Extent and duration of impact	Insignificant
Intensity of impact	Very Low
Probability of occurrence	Very Low
Degree to which impact can be reversed	Very Low
Irreplaceability of resources	Very Low
Cumulative impact prior to mitigation	Very Low
Significance of impact pre-mitigation	Very Low
Degree of mitigation possible	Very Low
Proposed mitigation	None required
Cumulative impact post mitigation	Low
Significance after mitigation	Insignificant

Table 2. Assessment of archaeological impacts: Operational Phase

9. CONCLUSION

The study has identified no impacts to Stone Age, or historical archaeological heritage resources that will need to be mitigated prior to construction activities commencing.

The assessment has shown that the site for the proposed 165MW Khauta North Solar PV Facility on Portion 0 and Portion 1 of Farm Kopje Alleen No. 81 near Riebeeckstad, is not a sensitive archaeological landscape.

The assessment is supported by the literature study, including several recent studies conducted near Riebeeckstad (Kaplan 2022a, b, c), which has shown no Stone Age archaeological resources have previously been recorded in Riebeeckstad, or in the surrounding area.

The overall impact significance of the proposed 165MW Khauta North Solar PV Facility on archaeological heritage is assessed as LOW and therefore there are no objections to the development proceeding.

Almond (2022:1) has also shown that that the proposed site 'is in practice of Low to Very Low palaeo-sensitivity'.

The cultural landscape, primarily agriculture, with farm fences, windmills, tracks, and small dams being the main tangible evidence of the landscape, has low heritage significance.

The study has shown that there are no fatal flaws in the development proposal.

10. RECOMMENDATIONS

Regarding the proposed 165MW Khauta North Solar PV Facility on Portion 0 and Portion 1 of the Farm Kopje Alleen No. 81 in Riebeeckstad, the following recommendation are made

10.1 Archaeology

1. It is recommended that the proposed development should be authorised.
2. No mitigation of archaeological resources is required.

3. If any human burials are uncovered 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.

10.2 Palaeontology

1. Provided that the Chance Fossil Finds Protocol tabulated in Appendix 1 of the PIA is incorporated into the EMPr and fully implemented during the construction phase, there are no objections on palaeontological heritage grounds to their authorisation (Almond 2022).

11. REFERENCES

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