

# **ARCHAEOLOGICAL IMPACT ASSESSMENT OF A PROPOSED WIND ENERGY FACILITY NEAR DE AAR NORTHERN CAPE**

Prepared for:

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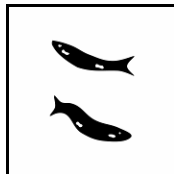
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On behalf of:

## **Mulilo Renewable Energy (Pty) Ltd**

By



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## Executive summary

DJ Environmental Consultants appointed the Agency for Cultural Resource Management to conduct an Archaeological Impact Assessment for a proposed wind energy farm near De Aar in the Northern Cape Province.

Initially, the applicant (Mulilo Renewable Energy) proposed to construct a 300 Mega Watt (MW) wind energy farm (over 2 Phases) comprising up to 150 wind turbines, access roads and an overhead powerline linking to the national transmission grid via Hydra substation in De Aar.

An Archaeological Scoping Study of the proposed project was undertaken in March 2010, which focussed specifically on Phase 1 of the development. The project has, however, been scaled down considerably, to a 100 MW wind farm comprising 67 wind turbines, including associated infrastructure.

Phase 2 of the proposed project has been screened out and is no longer being considered.

The following archaeological findings were made during the initial Scoping Study:

- Relatively large numbers of Middle Stone Age and Later Stone Age tools were documented during the study. A few diffuse scatters of tools were also noted. The tools comprised mainly highly weathered, unmodified flakes, chunks, blade tools, a few cores and retouched flakes on the raw material known as hornfels, that are spread very thinly and unevenly over the surrounding environment. No other cultural remains such as pottery or ostrich eggshell were found. No evidence of any factory or workshop site was identified, but a thin scatter of tools associated with the remains of a possible stone circle was found on the farm Zwartkoppies. Most of the finds have been recorded with a GPS waypoint and photographed.
- A historic well (or water pit) on the Farm Smouspoort. The pit apparently dates to the time of the South African War (1899-1904). This feature will not be impacted by the proposed project.
- About 100 m of dry stone walling on the Farm Smouspoort. It is claimed (by the farmer) that the walling (the remains of a kraal) was built by impoverished Black farmers after the period of the great Cattle Killing in the Eastern Cape in 1856, following the prophecy of Nongqawuse. While this has not been confirmed by the archaeologist, these remains will not be impacted by the proposed project.

Overall, it was maintained that the proposed development of the wind energy farm will not have an impact of great significance on these and potentially other archaeological remains, as (overall), the numbers are quite small and their distribution very widespread. It was also maintained that the Phase 1 Scoping Study captured good information on the archaeological heritage present.

The following recommendations were, however, made

1. Archaeological Scoping must be done in Phase 2 of the proposed project.
2. An Archaeological Impact Assessment (AIA) of proposed access roads must be done.
3. An Archaeological Impact Assessment of the proposed transmission line must be done.
4. The location of the proposed construction site camp must be assessed by the archaeologist.

The South African Heritage Resources Agency (SAHRA) issued a Review Comment on the Archaeological Impact Scoping Study (SAHRA file no. 9/2/025/0001), dated 24 August, 2010, which supported the findings and recommendations of the archaeological study.

The Agency for Cultural Resource Management undertook a further visit to De Aar in September, 2010, in order to fulfill the recommendations contained in the SAHRA Review Comment.

The Archaeological Impact Assessment entailed the following:

- A 3-day site visit that included a survey of the proposed transmission line, proposed access roads to the wind locations sites, and the final position of the construction camp site.

Archaeological Scoping of Phase 2 of the wind energy facility was not done, as it has now been screened out of the proposed development.

The following (new) findings and observations were made:

**Proposed Transmission Line:** More than 70 archaeological occurrences, numbering several hundred tools, were documented during the survey of the proposed 13.5 km, overhead transmission line. These included mainly Middle and Later Stone Age (LSA) tools. A few diffuse scatters of tools were also found, but most of the finds are spread very thinly and unevenly within (and outside) the proposed powerline servitude. The Middle Stone Age (MSA) tools are all in highly weathered hornfels/lydianite, and comprise mainly thick chunky flakes, chunks, flaked chunks, blade tools and a few retouched flakes, while the LSA tools are (thinner) in un-weathered hornfels, comprising mostly unmodified, utilized and retouched flakes, chunks and cores. A few formal tools such as scrapers were also found, while several of the LSA tools appear to have been made on older MSA flakes. All the archaeological occurrences have been mapped using a hand held GPS unit.

Their isolated and dispersed distribution, and the fact that most of the occurrences occur in a disturbed context, means that the archaeological remains located during the survey of the transmission line are rated as having low significance. All the tools occur in an open context with no associated organic remains or other cultural remains such as pottery or ostrich eggshell. No evidence of any factory or workshop site was identified.

It is maintained that the survey of the proposed transmission line has captured good information on the archaeological heritage present.

The ruined remains of a modern veewagterhuis (or shepherds) hut was also documented in the proposed powerline servitude.

**Proposed Construction Camp Site:** A few Middle and Later Stone Age tools were found in the proposed construction camp site which is located at the base of the Swartkoppies Mountain. The site is flat and covered in long winter grass. The finds have been rated as having low local significance and no mitigation is required.

**Proposed Access Roads:** Several access roads to the wind turbine location sites are proposed. A partial survey of the proposed new access road on the farm Swartkoppies did not locate any archaeological remains. It is maintained that the receiving environment for the proposed Swartkoppies access road is not a sensitive archaeological landscape.

A proposed access road up Goenmanskloof on the Farm Smouspoort is no longer an alternative as the geometrics of the road are not suitable for the transport of heavy load equipment. This road was previously assessed during the initial Archaeological Scoping Study of Phase 1 of the proposed project.

The preferred access road (an existing gravel road) to the wind turbine location sites on the Farm Smauspoort will impact negatively on a site of high local significance. The site (known as zwk95), near the top of the Kasarmberge is located on a flat escarpment directly alongside the road. The site includes at least one (and possibly three) graves, large numbers of Later Stone Age tools (including scrapers, adzes and cores), several round upper grindstones, ostrich eggshell and bone. Activity areas on the site are also clearly visible. Of particular importance is a finding of a fragment of portable (or mobile) art that comprises finely scratched vertical, and cross hatched lines on a slab of dolerite. According to David Morris of the McGregor Museum in Kimberley, such a find is extremely rare, and coupled with the associated finds (particularly the graves), ranks the site as highly significant and conservation worthy.

Indications are that:

- Archaeological remains in the proposed 13.5 km long transmission line will be impacted by the proposed construction, but due to their dispersed distribution, and the fact that most of the occurrences occur in a disturbed context, means that the archaeological remains are rated as having low significance. The survey has however, captured most of the archaeological heritage present in the proposed powerline servitude.
- Archaeological remains will be impacted by the development of the construction camp site but their dispersed context and very low numbers means that the remains are rated as having low significance.
- An archaeological site of high local significance will be impacted by the proposed upgrading of the existing access road on the Farm Smauspoort. Several graves occur on the site, which also contains large numbers of stone tools, as well as a rare piece of portable art.

The following recommendations are made:

1. No archaeological mitigation in the proposed transmission line is required.
2. No archaeological mitigation in the proposed construction camp site is required.
3. The proposed access road to the wind turbine location sites on the Farm Smouspoort (on the Kasarmberge) must avoid the very important site known as zwk95, that contains several graves, stone artefacts, ostrich eggshell and a rare fragment of portable engraved art. The affected section of the road must be moved at least 10-15 m away from the site. If this cannot be achieved, the site will have to be mitigated. In addition, the site must be fenced off during the proposed upgrading of the road and the for the entire construction phase of the project. The fencing must be undertaken under the supervision of the consulting archaeologist. A gate should also be included that will provide access to the site. The site must not be disturbed in any way. No plant equipment must be stored, or left on the escarpment, either. The integrity of the site must be maintained at all times. The applicant must also establish a contingency fund that will secure the long term management and protection of this very important site.

SPECIALIST STUDY

DECLARATION OF INDEPENDENCE IN ACCORDANCE WITH REGULATION 33 (b) OF THE NEMA EIA  
REGULATIONS, AS AMENDED

I, Jonathan Michael Kaplan., as the appointed Heritage specialist hereby declare that I:

- am independent in this application;
- regard the information contained in my report as true and correct;
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2006.
- have and will not have vested interest in the proposed activity proceeding;
- have no, and will not engage in, conflicting interests in the undertaking of the activity;
- undertake to disclose, to the competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the Environmental Impact Assessment Regulations.
- am fully aware of my responsibilities in terms of the National Environmental Management Act of 1989 ("NEMA") (Act No. 107 of 1998), the Environmental Impact Assessment Regulations ("EIA Regulations") in terms of NEMA (Government Notice No. R. 385, R. 386, and R. 387 in the Government Gazette of 21 April 2006 refer).



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Signature of the Specialist

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Agency for Cultural Resource Management

Name of company

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04 October, 2010

Date

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## 1. INTRODUCTION

DJ Environmental Consultants, on behalf of Mulilo Renewable Energy (Pty) Ltd, appointed the Agency for Cultural Resource Management to conduct an Archaeological Impact Assessment for a proposed wind energy farm on Portions of the Farms Smauspoort 130 and Zwartjekopjes 131 near De Aar in the Northern Cape Province. De Aar is located about 755 kms north east of Cape Town on the N1.

The renewable energy industry is currently experiencing an explosive growth worldwide. In South Africa, while such energy sources are not expected to replace the country's traditional reliance and dependency on coal-generated power, the National Energy Regulator of South Africa (NERSA) has published a favourable feed-in tariff structure for renewable energy that allows for independent clean energy producers to invest in renewable energy resources. Several such wind and solar energy facilities are currently in advanced planning stages country-wide in South Africa. The growing wind farm industry is considered to be of national importance in anticipation of its contribution to electricity supply and reduced reliance of non-renewable energy sources.

Initially, the applicant (Mulilo Renewable Energy) proposed to construct a 300 Mega Watt (MW) wind energy farm (over 2 Phases) comprising 150 wind turbines, access roads and an overhead powerline linking to the national transmission grid via Hydra substation (refer to Figure A in Appendix). The electricity that will be generated from the proposed project will be fed directly into the national grid at Hydra in De Aar.

An Archaeological Scoping Study of the proposed project was undertaken in March 2010, which focussed specifically on Phase 1 of the project (Kaplan 2010). The intention then was to develop the wind farm over 2 Phases. The project has since been scaled down considerably, to a 100 MW wind farm comprising now 67 wind turbines, including associated infrastructure such as access roads, and overhead transmission line (refer to Figure B in Appendix).

Phase 2 of the proposed project has now been screened out and is no longer being considered.

The following archaeological findings were made during the Phase 1 Scoping Study:

- Relatively large numbers of Middle Stone Age and Later Stone Age tools were documented during the study. A few diffuse scatters of tools were also noted. The tools comprised mainly highly weathered, unmodified flakes, chunks, blade tools, a few cores and retouched flakes on the raw material known as hornfels, that are spread very thinly and unevenly over the surrounding environment. No other cultural remains such as pottery or ostrich eggshell were found. No evidence of any factory or workshop site was identified. One site of note included the remains of a possible stone circle on the farm Zwartkoppies (Kaplan 2010).
- A historic well (or water pit) on the Farm Smouspoort. The pit apparently dates to the time of the South African War (1899-1904). This feature will not be impacted by the proposed project.



- About 100 m of dry stone walling on the Farm Smouspoort. It is claimed (by the farmer) that the walling (the remains of a kraal) was built by impoverished Black farmers after the period of the great Cattle Killing in the Eastern Cape in 1856, following the prophecy of Nongqawuse. While this has not been confirmed by the archaeologist, these remains will not be impacted by the proposed project.

Overall, it was maintained that the proposed development of the wind energy farm will not have an impact of great significance on these and potentially other archaeological remains, as (overall), the numbers are quite small and their distribution very widespread.

It was also maintained that the Phase 1 Scoping Study captured good information on the archaeological heritage present.

The Scoping Study argued that a detailed Archaeological Impact Assessment (AIA) of the proposed location sites for the wind turbines was not required.

The following recommendations were, however, made (refer to Kaplan 2010)

1. Archaeological Scoping must be done in Phase 2 of the proposed project
2. An AIA of proposed access roads to the wind turbine location sites must be done.
3. An AIA of the proposed transmission line must be done.
4. An AIA of the proposed construction site camp must be done.

The South African Heritage Resources Agency (SAHRA) issued a Review Comment on the Archaeological Impact Scoping Study (SAHRA file no. 9/2/025/0001), dated 24 August, 2010, which supported the findings and recommendations of the archaeological study.

In compliance with the above, the Agency for Cultural Resource Management undertook another visit to De Aar in September, 2010, in order to fulfill the recommendations contained in the SAHRA Review Comment.

The final Archaeological Impact Assessment of the proposed wind energy farm forms part of the Environmental Impact Assessment (EIA) process that is being conducted by independent environmental consultants DJ Environmental Consultants.

Dr Johan Almond of Nature Viva cc has already done a Paleontological Impact Assessment (PIA) desk-top study, of the proposed project, while Ms Melanie Atwell has been commissioned to undertake a Heritage Impact Assessment of the proposed wind energy facility.

The infrastructure associated with the proposed De Aar Wind Energy Farm includes the following:

- 67 wind turbines;
- Underground cables between turbines;

- A 13.5 km overhead power line linking into the Hydra substation at De Aar
- Access roads to the wind turbine location sites, including internal access roads
- Construction camp site

The Archaeological Impact Assessment entailed the following:

- A 3-day site visit that included a detailed survey of the proposed transmission line, the proposed access roads to the wind turbine location sites, and the position of the construction camp site.

Archaeological Scoping of Phase 2 of the proposed wind energy facility was not done, as this has now been screened out of the proposed project.

## **2. TERMS OF REFERENCE**

The terms of reference for the Archeological Impact Assessment are to:

- Determine whether there are likely to be any important archaeological resources that may potentially be impacted by the proposed project, including specifically the construction of the proposed 13.5 km overhead transmission line, the proposed access roads to the wind turbine location sites and the proposed construction camp site.
- Identify and map any archaeological heritage resources that may be impacted by the proposed activities;
- Determine the importance of archaeological heritage resources that may be impacted by the proposed activities;
- Determine and assess the potential impacts of the proposed project on archaeological heritage resources, and
- Recommend measures to minimise impacts associated with the proposed project.

## **3. THE STUDY SITE**

The study area includes the mountains to the east of De Aar, as well as the mountain ranges to the west; namely the Maanhaarberge and Kombuisfonteinberge, which are located about 20 kms south west of the town of De Aar (Figure 1). A Google aerial photograph of the proposed study area is illustrated in Figure 2. The proposed site for the wind energy farm is very rugged, remote and accessible only via 2 x 4 or 4 x 4, vehicle. The site is located within an existing farm that is zoned Agriculture, but due to its high elevation, no agricultural activity, apart from some marginal sheep grazing, occurs. The two principal farms within the study area include Smouspoort 130 and Zwartkoppies 131.



Figure 1. Garmin MapSource Locality Map



Figure 2. Google aerial photograph of the original study site

## **4. METHODOLOGY FOR THE STUDY**

### **4.1 Method of survey**

The approach followed in the Archaeological Impact Assessment entailed a 3-day survey of the proposed activities, namely the 13.5 km long, 132 kV overhead powerline route (Figures 3-6), the proposed construction camp site (Figures 7 & 8) and proposed access roads to the wind turbine location sites (Figures 9-12).

It is important to note that the distance between powerline footings is about 250 m, while the proposed servitude is approximately 100 m wide.

The AIA was conducted on the 13<sup>th</sup> and 14<sup>th</sup> of September, 2010.

A large number of digital photographs of the site was taken, which have been saved to DVD.

A GPS track path of the archaeological survey was created. The track path contains all the archaeological occurrences documented during the study.

Nearly 100 archaeological occurrences were mapped during the study. All the archaeological occurrences documented during the study were plotted using a Garmin Oregon 300 GPS unit set on map datum wgs 84.

### **4.2 Constraints and limitations**

There were no constraints or limitations associated with the proposed study.

### **4.2 Identification of potential risks**

The following risk sources have been identified:

The proposed upgrading of the access road to the wind turbine location sites on the Kasarmberge will impact negatively on a hilltop site of very high local significance. This site, known as zwk95 contains several graves, large numbers of stone tools (that include activity areas), ostrich eggshell, several grindstones and some bone. Of particular importance is the finding of a rare piece of portable fine lined engraved art.





Figure 3. View of the proposed transmission line facing south. The proposed line will come over the Kasarmberge to the left of the plate, crossing the flatlands and floodplain of the Elandsrivier. The Elandsrivier can be seen in the foreground.



Figure 5. View of the proposed transmission line facing south. The proposed line follows a route along the rocky slopes of the Zwartkoppies Mountains, before crossing the plains alongside the existing 400 Kv transmission line



Figure 4. View of the proposed transmission line facing north. The proposed line will cross the flatlands and follow a route alongside the Zwartkoppies Mountains in the background of the plate



Figure 6. View of the proposed transmission line facing south. The proposed line follows a route along the rocky slopes of the Zwartkoppies Mountains, before crossing the plains alongside the existing 400 Kv transmission





Figure 7. View of the proposed construction camp site and the access road up the Swartkoppies. The construction camp site is in the foreground

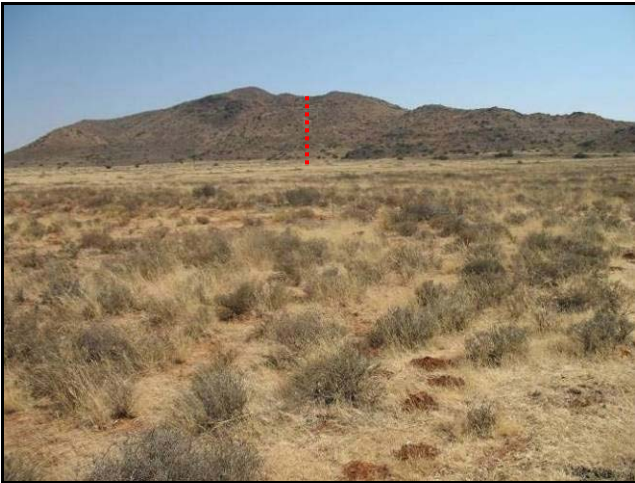


Figure 8. View of the proposed access road up the Swartkoppies



Figure 9. View of the proposed access road up to the Kasarmberge.



Figure 10. View of the proposed access road up to the Kasarmberge.



Figure 11. View of the proposed access road up to the Kasarmberge.



Figure 12. View of the proposed access road from the top of the Kasarmberge.

## 5. ARCHAEOLOGICAL RESOURCES IN THE KAROO

The archaeology of the Northern Cape is rich and varied covering long spans of human history. Some areas are richer than others, and not all areas are equally significant. According to Humphreys (1987:117), 'the amount of archaeological research that has been undertaken in the Karoo is in no way proportional to its importance in terms of area in South Africa'. The regions remoteness accounts for this. While it is true to say that this part of the Karoo has probably been relatively marginal to human settlement for most of its history, it is in fact exceptionally rich in terms of Stone Age and rock art (Beaumont & Morris 1990; Morris and Beaumont 2004). Archaeologists from the McGregor Museum in Kimberley have focussed much of their attention on the Upper Karoo region and the northern periphery of the Karoo, where most of their academic research has been done. A few Archaeological Impact Assessments have been undertaken (as part of the EIA process) in Victoria West and De Aar (Morris 2000, 2004, 2006, 2007), where these have been required.

What is known is that, despite the Karoo's bleak appearance and challenging winters, the area had a relatively high carrying capacity and teemed with game long before European colonization. Hunter gatherers (mainly San) successfully occupied the central interior of South Africa during the last 4500 years, subsisting on the large herds of grazing animals that occurred during that time (Sampson 1985; Sampson et al 1989). Late Stone Age archaeological sites dating to the late Holocene (within the last 4000 years) are surprisingly common. Although the Karoo is presently more suited to the keeping of small stock such as sheep and goats, research in the Eastern Karoo has revealed that, at about 1200 – 1400 AD, a climatic fluctuation (known as the mini-ice age) may well have caused an increased rainfall in the central Karoo resulting in the area being more suitable for grazing of cattle and occupation by Khoekhoen pastoralist groups. They left behind an archaeological legacy that consists of stone *kraal* complexes of which several hundred have been recorded in the Zeekoe Valley in the eastern Karoo and the Riet River area in the Northern Cape (Hart 1989).

The indigenous people of Karoo waged a bitter war against colonial expansion as they gradually lost control of their traditional land. With the implementation of the commando system in the late 18<sup>th</sup> and early 19<sup>th</sup> centuries, the Karoo "Bushmen" were eventually destroyed or indentured into farm labour (Hart 1989).

## 6. RESULTS OF THE ARCHAEOLOGY STUDY

### 6.1 Proposed Transmission Line

More than 70 archaeological occurrences, numbering several hundred tools, were documented during the survey of the proposed 13.5 km, overhead transmission line. The line runs from a proposed substation on top of the Kasarmberge, across the flatlands and floodplain of the Elandsrivier (on the Farm Zwartkoppies), at the edge and eastern hill slopes of the Swartkoppies Mountains (alongside an existing 400 Kv line), where it finally connects with an existing 132 Kv overhead transmission line (refer to Figures 3-6 and Figure B in Appendix). These occurrences included mainly Middle and Later Stone Age (LSA) tools. Several diffuse scatters of tools were also found, but most of the finds are spread very thinly and unevenly within (and outside) the proposed 100 m wide powerline servitude.



The MSA tools are all in highly weathered hornfels/lydianite, and comprise mainly triangular and convergent flakes and blades (with faceted or prepared platforms), a few retouched flakes and chunks, while the LSA tools are all in un-weathered hornfels, comprising mostly thin, unmodified, utilized and retouched flakes, chunks and a few cores. Very few formal tools such as scrapers and adzes were found. Several of the LSA tools appear to have been made on older MSA flakes, for example an end scraper on a long, weathered MSA blade (zwc42 on the GPS track path). Most of the finds occur in a disturbed or degraded context, however, either as a result of construction work during the 400 Kv transmission line, or trampling and grazing.

No evidence of any factory or workshop site was identified. There is no patterning in the distribution of the finds either, but a few, small, dispersed scatters of tools were found. For example, a diffuse scatter of mostly LSA flakes and some weathered MSA flakes (zwc4) were found in heavily trampled and grazed lands alongside a fence line on the Farm Zwartkoppies (Figure 13), while a very thin scatter of LSA flake tools (zwc14) including several utilized flakes, and one snapped blade and a few weathered MSA flakes was documented on a hill slope alongside the existing 400 Kv line (Figure 14). A thin scatter of weathered MSA flakes (zwc50 and zwc61) was also documented alongside the existing servitude (Figure 15).

The ruined remains of collapsed veewagterhuis (or shepherds hut) (zwc46) were found about 75 west of the existing 400 Kv powerline servitude (Figure 16). With a single entrance, measuring about 3.5 x 3.5 m and built out of undressed sandstone blocks, this is clearly a modern structure, as glass, rusted metal fragments, nails, wire fencing, a rusted bucket, fragments of ceramics and pieces of cut (sheep) bone were found scattered about in a wide area. Some older fragments of a late 19<sup>th</sup> century case bottle and one fragment of earthenware were also found. Circumstantial evidence for a possible stock enclosure was also noted where the ground has been heavily trampled and some domestic items (rusted metal, bone, glass and clay bricks) was found lying about. Not surprisingly, a few weathered MSA tools were also found scattered about.



Figure 13. zwc4. Scale is in cm



Figure 14. zwc14. Scale is in cm





Figure 16. zwk61: Scale is in cm



Figure 17. zwk46. Not the 400 Kv transmission line

### 6.1.1 Significance of archaeological finds

Their isolated and dispersed distribution, and the fact that most of the occurrences occur in a disturbed context, means that the archaeological remains located during the study of the proposed transmission line are rated as having low significance. All the tools occur in an open context with no associated organic remains or other cultural remains such as pottery or ostrich eggshell. No evidence of any factory or workshop site was identified. It is maintained that the survey of the transmission line has captured good information on most of the archaeological heritage present.

## 6.2 Proposed Construction camp site

A few LSA hornfels flakes (zwk35) and several weathered MSA flake tools (zwk36) were found in the footprint of the proposed 400 x 200 m construction camp site, which is located at the base of the Swartkoppies Mountain, alongside the Swartkoppies access road (refer to Figure 7). A thin scatter of LSA flakes (zwk34) was also found on the south eastern edge of the proposed construction camp. The site is flat and compact and covered in long winter grass.

### 6.2.1 Significance of archaeological finds

The very isolated distribution means that the archaeological occurrences located during the study of the proposed construction camp site are rated as having low significance.

## 6.3 Proposed Access Roads

Several access roads to the wind turbine location sites are proposed (refer to Figure B in Appendix).

### 6.3.1 Proposed Swartkoppies access road

A survey of the proposed new access road to the wind turbines at Swartkoppies, on the farm Swartkoppies (refer to Figure 7) did not locate any important archaeological remains, although a few LSA and MSA flake tools were documented in the construction camp site that is situated alongside the road. The final section of the route for the proposed road is up a steep, narrow kloof which is very rocky and covered in thick long

grass. It is maintained that the receiving environment for the proposed Zwartkoppies access road is not a sensitive archaeological landscape.

Several very weathered MSA flakes (zwk37-zwk39) were, however documented in a small existing track (to be upgraded) in the wide grassy plains alongside Swartkoppies, while a diffuse scatter of MSA flakes including blades and chunks (zwk40) was also documented in a large open trampled patch of ground alongside the same small track (Figure 18), where the proposed new 132 Kv transmission line tees in. The significance of these finds is rated as being low.



Figure 17. zwk40. Scale is in cm

### 6.3.2 Proposed Goenmanskloof access road

The proposed access road up Goenmanskloof on the Farm Smouspoort is no longer an alternative as the geometrics of the road are not suitable for the transport of heavy load, equipment. This road was previously assessed during the Archaeological Scoping Study, where a historic water pit was documented (Kaplan 2010).

### 6.3.3. Proposed Kasarmberge access road

Zwk95 is situated directly alongside the proposed access road to the wind turbine location sites on the Kasarmberge on the Farm Smouspoort (refer to Figures 9-12). The hilltop site, about 150 m from the top of the Kasarmberge is located on a wide, flat escarpment alongside the existing road. The site includes at least one (and possibly three) raised graves, large numbers of Later Stone Age tools, ostrich eggshell and some adagnostic bone (Figures 18-22). Of particular significance is a fragment of a rare piece of portable art that comprises finely scratched vertical and cross hatched lines on a small slab of dolerite (Figure-23). Similar finds (or portable art) have been made at Springbok Oog more than 300 kms to the northwest, near Vanwyksvlei (Morris & Beaumont 2004).

The stone artefacts comprise large numbers of flakes, chips, chunks and cores, while formal tools such as end scrapers, convex scrapers and a woodworking adze was also found. All the tools are in locally available lydianite, but one small cryptocrystalline (CCS) flake was also found. CCS is an exotic very fine grained raw material that must have been introduced onto the site from some distance away. Very clear activity areas were noted on the site, where fabrication of tools took place (refer to Figures 21 & 22).

The one very obvious grave (Figure 20) is located just a few metres from the road and comprises a mound of packed stone. One small upper grindstone was found next to the grave, as well as several stone flakes. The other possible graves are less obvious, where these comprise raised mounds of sand, covered by bush, with a few rocks and slabs. The extent of the site has been mapped (refer to zwk95a-zwk95d in GPS track path).



#### 6.3.4 Significance of archaeological finds

Zwk95 is rated as having very high local significance. This has been confirmed by the archaeologist David Morris (pers. comm.) at the McGregor Museum in Kimberley.



Figure 18. zwk95 is located directly alongside the road near the large bush in the background



Figure 21. zwk95. Scatter of tools indicating an activity area

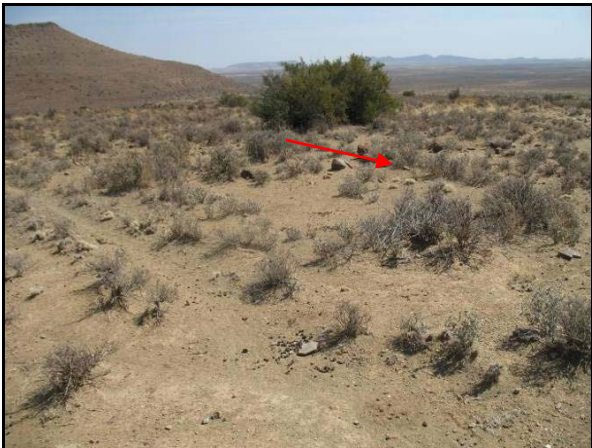


Figure 19. zwk95. The arrow indicates Grave # 1



Figure 22. zwk95. Scatter of tools indicating an activity area



Figure 20. zwk95. Grave # 1. Scale is 1.0 m



Figure 23. zwk95. Engraved portable art. Scale in cm

## 6.4 Other finds

Several other notable finds were documented during the AIA, but these sites will not be impacted (directly or indirectly) by the proposed wind energy farm. There are, however, exciting opportunities to develop some of these archaeological sites as public viewing sites, so as to enable tourists or visitors to the region to appreciate some of the rich archaeological (and natural heritage) of the surrounding area.

These finds include the following:

- Several rock engravings (zwc64, zwc65 and zwc66) were documented on the Swartkoppies Mountains (refer to Figure C in Appendix). Access to the engravings is via the Eskom servitude on the Farm Vaalbank. These include the pecked engravings of an Eland (Figure 24), a possible ostrich (Figure 25) a scratched/fine line engravings of several antelope species (Figures 26 and 27), as well as some recent fine line engravings (including an antelope and a bus) which are most probably the work of local farm children. The engraving of the Eland was visited by David Morris of the McGregor Museum and Dr Dora Fock in 1988. (David Morris pers. comm.), and are in good condition, but there is some residual damage to the 'site'. The different technique of engraving (i.e. pecked, scratched and fine line) most likely signifies age-related differences (Morris n.d.).
- A collapsed shelter (zwc1) was located alongside the gravel road between the Farms Vaalbank and Swartkoppies (Figure 28 and Figure C in Appendix). No archaeological deposits occur inside the shelter, but some very faded and barely visible art occurs on the walls of the overhang (Figure 29). Large numbers of stone flakes, as well as a few fragments of ostrich eggshell and a tiny piece of undecorated pottery were however, documented below the shelter, inside the fence line directly alongside the road (Figure 30). The artefacts included many flake and blade, chunks, utilized and retouched pieces, a convex scraper and several round cores and flaked chunks, all in black hornfels.
- An extensive scatter of stone tools (zwc70), representing the remains of a Later Stone Age camp site was also documented (Figure 31). The scatter, numbering perhaps several thousand tools occurs north of the Elands River and at the base of the Kasarmberge on the Farm Swartkoppies. The site is situated about 300 m west of the proposed 132 Kv transmission line. Several activity areas were noted, that included flakes, cores, anvils and grindstone fragments. Formal tools such as end scrapers and convex scrapers were also found, as well as many retouched and utilized blade tools and flakes (Figure 32). The extent of the site has been mapped with a GPS (refer to zwc70a-zwc70g in GPS track path). The remains of a stone feature that comprised a line of stones were also documented at the foot of the Kasarmberge (Figure 33), but it is unclear whether the stones have been moved around as a result of flooding, which is quite clear in the surrounding area, or were deliberately arranged.
- The development of tourist related heritage products could also, potentially, include the historic (water) well and stone walling on Kasarmberge, and the remains of a stone feature on Swartkoppies, that were documented during the Phase 1 Scoping Study (Kaplan 2010 and refer to Figure C in Appendix).





Figure 24. zwk64 – engraving of an eland. Scale in cm



Figure 25. zwk66 – engraving of unidentified antelope



Figure 26. zwk66 – engraving of unidentified antelope



Figure 27. zwk66 – engraving of a possible ostrich. Scale in cm





Figure 28. zwk1. Collapsed shelter alongside farm road



Figure 31. zwk70. View facing south east



Figure 29. zwk1. Art inside the shelter



Figure 32. zwk70. Collection of tools. Scale is in cm



Figure 30. zwk1. Collection of tools. Scale is in cm



Figure 33. zwk70. line of stone in the sand. Scale is 1.0 m

## 7. SUMMARY OF ARCHAEOLOGICAL IMPACTS

A summary of the archaeological impacts associated with the proposed De Aar Wind Energy Farm are illustrated below

<b>Nature of impact:</b> The potential impact of the construction of the overhead transmission line on above and below ground pre-colonial archaeology		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent of impact</b>	Local	Local
<b>Duration of impact</b>	Permanent	Permanent
<b>Intensity</b>	High	Low
<b>Probability</b>	Definite	Improbable
<b>Significance</b>	Low	Low
<b>Degree of confidence</b>	High	High
<b>Mitigation:</b> No mitigation is proposed as the heritage resources are of low significance. Mitigation will not materially contribute to our understanding of the MSA and LSA in the Northern Cape. The AIA has captured most of the archaeological heritage present in the proposed transmission line.		

**Table 1**

<b>Nature of impact:</b> The potential impact of the construction of the construction camp site on above and below ground pre-colonial archaeology		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent of impact</b>	Local	Local
<b>Duration of impact</b>	Short term	Short term
<b>Intensity</b>	Low	Low
<b>Probability</b>	Probable	Improbable
<b>Significance</b>	Low	Low
<b>Degree of confidence</b>	High	High
<b>Mitigation:</b> No mitigation is proposed as the heritage resources are of low significance. Mitigation will not materially contribute to our understanding of the MSA and LSA in the Northern Cape.		

**Table 2**

<b>Nature of impact:</b> The potential impact of the construction of the proposed Swartkoppies access road on above and below ground pre-colonial archaeology		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent of impact</b>	Local	Local
<b>Duration of impact</b>	Short term	Short term
<b>Intensity</b>	Low	Low
<b>Probability</b>	Improbable	Improbable
<b>Significance</b>	Low	Low
<b>Degree of confidence</b>	High	High
<b>Mitigation:</b> No mitigation required		

**Table 3**

<b>Nature of impact:</b> The potential impact of the construction of the proposed Goenmanskloof access road on above and below ground pre-colonial archaeology		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent of impact</b>	Local	Local
<b>Duration of impact</b>	Short term	Short term
<b>Intensity</b>	Low	Low
<b>Probability</b>	Improbable	Improbable
<b>Significance</b>	Low	Low
<b>Degree of confidence</b>	High	High
<b>Mitigation:</b> No mitigation required. The proposed access road is no longer an alternative.		

**Table 4**

<b>Nature of impact:</b> The potential impact of the construction of the proposed Kasarmberge access road on above and below ground pre-colonial archaeology		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent of impact</b>	Local	Local
<b>Duration of impact</b>	Permanent	Permanent
<b>Intensity</b>	High	Low
<b>Probability</b>	Definite	Highly probable
<b>Significance</b>	High	Low
<b>Degree of confidence</b>	High	High
<b>Mitigation:</b> zwk95 is a site of very high local significance. The affected section of the road must be moved at least 10-15 m away from the archaeological site. If this cannot be achieved, the site will have to be mitigated. The site must also be permanently fenced off during the proposed upgrading of the road. The site must not be disturbed in any way.		

**Table 5**

## **8. RECOMMENDATIONS AND MITIGATION ACTION**

With regard to the proposed De Aar Wind Energy project on the Farms Zwartkoppies 131 and Smauspoort 130, the following recommendations are made:

1. The receiving environment for the proposed transmission line is not considered to be archaeologically sensitive and no mitigation of important archaeological resources is required. It is maintained that the proposed transmission line will not have an impact of great significance on these (and other) archaeological remains within the powerline servitude, as the numbers are quite small and their distribution fairly widespread. Most of the finds also occur in a disturbed context. Recording of archaeological occurrences, including GPS waypoints and photography has been undertaken and it is maintained that the survey of the transmission line and servitude has captured good information on most of the archaeological heritage present.

2. The receiving environment for the proposed construction camp is not considered to be archeologically sensitive and no mitigation of archaeological resources is required. Only A few implements were found on the site, which occur in a disturbed context.



3. The proposed access road to the wind turbine location sites on the Kasarmberge on the Farm Smauspoort must avoid the very important site known as zwk95 that contains graves, stone artefacts and rare portable art. The affected section of the road must be moved at least 10-15 m away from the archaeological site. If this cannot be achieved, the site will have to be mitigated. In addition, the site must also be fenced off during the proposed upgrading of the road and the entire construction phase of the project. The fencing must be undertaken in consultation and under supervision of the archaeologist. A gate must also be included that will provide access to the site. Access to the site must be prohibited. The site must not be disturbed in any way. No plant equipment must be stored, or left on the escarpment, either. The integrity of the site must be maintained at all times. The applicant must also establish a contingency fund that will secure the long term management and protection of this very important site.

4. There are opportunities for developing some of the archeological heritage resources such as the rock engravings (zwk65-zwk66) and the cave (zwk1), as public interest viewing sites. However, the development of public heritage sites would need to be done in consultation with the South African Heritage Resources Agency (SAHRA), the McGregor Museum and relevant landowners. The development of any, heritage sites for tourism purposes would also need to be subject to the development and implementation of a Heritage Management and Conservation Plan.

## **9. CONCLUSION**

With regard to the proposed De Aar Wind Energy Facility on the Farms Zwartkoppies 130 and Smauspoort 131, indications are that in terms of historical and archaeological heritage, the proposed project is viable.

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## Appendix

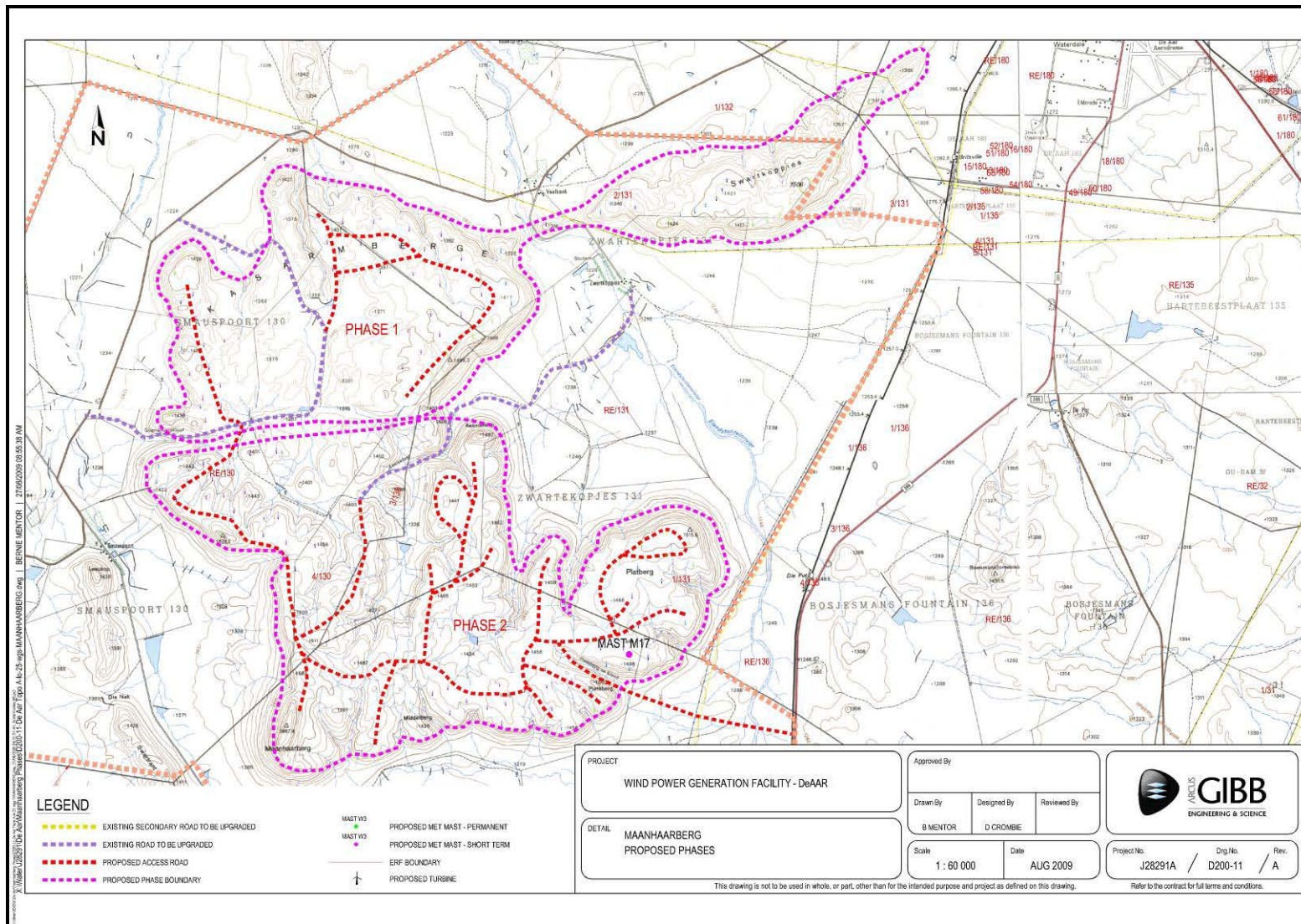


Figure A: De Aar Wind Energy Farm. Phase 1 and Phase 2



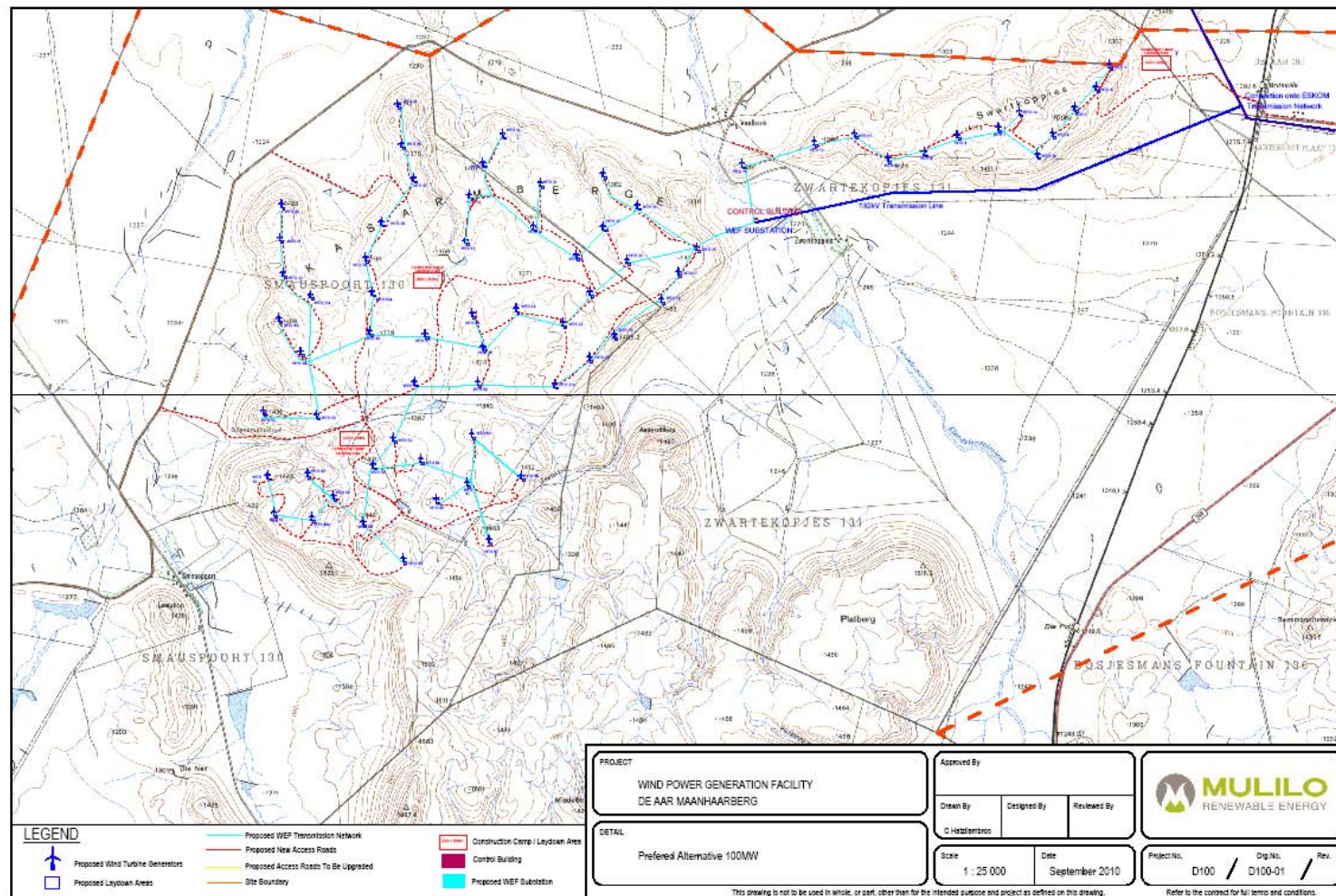


Figure B: De Aar Wind Energy Farm. Final layout, including proposed transmission line and access roads to wind turbine location sites





Figure C. De Aar Wind Power Generation Facility. Google aerial photograph illustrating locations of Wind Measuring Mast and historical features mentioned in the text