



**AN ARCHAEOLOGICAL WALKTHROUGH SURVEY OF THE FINAL LAYOUT OF THE PROPOSED NOJOLI WIND ENERGY FACILITY NEAR COOKHOUSE, BLUE CRANE ROUTE LOCAL MUNICIPALITY, BEDFORD DISTRICT, EASTERN CAPE PROVINCE.**

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## **BRIEF SUMMARY/OVERVIEW**

### **Background**

African Clean Energy Developments (ACED) Cookhouse South Wind Farm (Pty) Ltd (in the process of being changed to Nojoli Wind Farm (Pty) Ltd) is proposing the establishment of the Nojoli Wind Energy Facility (WEF) near Cookhouse (Maps 1-2). Savannah Environmental (Pty) Ltd on behalf of the Nojoli Wind Farm Project Company appointed Eastern Cape Heritage Consultants to conduct an archaeological walkthrough survey of the final layout of the turbine positions and associated infrastructure.

Comprehensive archaeological impact assessments and reports have been compiled for the ACED Cookhouse South Wind Farm site (Webley *et al.* 2009; Gaigher 2012) and for the construction of a new substation and 132KV power line from the Nojoli WEF to Eskom's Poseidon Substation (Binneman 2013). Several studies have also been conducted in adjacent areas (Hart and Webley 2010; Halkett *et al.* 2010; Booth, C. 2011; Binneman 2012a & c). All background information is included in these reports and will not be repeated here in any detail.

The wind energy facility will comprise of 44 wind turbines and associated infrastructure with a contracted generating capacity of up to 86.6MW MW at the point of connection. An on-site substation as well as a new section of 132KV overhead power line feeding into the Poseidon Substation north of the study area will also be constructed.

### **Purpose of the Study**

The purpose of the study was to conduct an archaeological walkthrough survey of the near final layout of the turbine positions and associated infrastructure of the Nojoli Wind Energy Facility near Cookhouse, Blue Crane Route Local Municipality, Eastern Cape Province, in order to establish;

- the range and importance of possible exposed and *in situ* heritage remains and features within the footprint of the proposed developments,
- the potential impact of the developments on these heritage resources,
- to make recommendations to minimize possible damage to these heritage sites/materials,

### **The site and location**

The Nojoli Wind Energy Facility (WEF) site near Cookhouse is located within the 1:50 000 topographic reference maps 3225 DB Cookhouse and 3225 DD Golden Valley (Map 1). It falls within the Bedford Magisterial District, Blue Crane Route Local Municipality of the Eastern Cape Province and is situated approximately 12 kilometres south-east of Cookhouse and about 15 kilometres south-west of Bedford. The site is located north and south of the gravel road between Cookhouse and Bedford which also runs past the Poseidon substation. The Nojoli WEF will be constructed on the following farms:

- Farm Bavians 151
- Portion 2 of the Farm Bavians 151
- Farm 148
- Portion 1 of the Farm 148
- Farm Rooidraai 146
- Portion 2 of the Farm Klipfontein 150

The proposed area for development is situated close to the edge (western side) of a raised plateau overlooking the Great Fish River Valley. The edge of the plateau is steep in the north, but less pronounced towards the south. The general landscape towards the north and south comprises a gentle undulating hill landscape, lowlands and non-perennial open valley drainage systems/lines. The middle section of the site is hillier with pronounced drainage valleys, steep gradients and areas of deep soil erosion. No perennial rivers traverse the study area. The major rivers occurs many kilometres to the north, east (Great Fish River) and west (Sunday's River). The dominant natural vegetation is grassland, small, low shrubs in places and patches of *Acacia karroo* in the drainage valleys. The main activity in the study area is commercial stock farming and the land is used for grazing of livestock.

### **Type of development**

The wind energy facility will comprise 44 turbines with a contracted capacity of 86.6MW at the point of connection within an area of approximately 20 km<sup>2</sup>. The associated infrastructure required for the facility will include concrete foundations to support the turbine towers, hardstand areas, lay down areas (together approximately 40 x 40 metres) next to each turbine. Cabling between the turbines will be lain underground where practical. An on-site substation (of up to 250 x 200 metres) and a new section of a 132kV overhead power line feeding into the Poseidon Substation north-west of the study area will be constructed. A warehouse and administration offices will also be constructed within the substation area. Other developments will include internal access roads to each turbine (3-5 metres wide), turn-around areas and a maintenance yard.

### **Investigation**

The purpose of the study was to do a walkthrough of the near final layout of the turbine locations, underground cable routes and roads. Due to the fact that these developments follow the high ground, little attention was given to drainage lines, erosion gullies and open valleys where in general archaeological sites/materials are concentrated. The terrain was relatively easy to access, but the archaeological visibility in general was poor due to the dense surface cover of grass and shrubs. The dense grass in the northern and southern sections of the Nojoli WEF also prevented surface soil erosion on the high ground which in turn made it impossible/difficult to locate archaeological sites/materials. Such limitations do not however pose any project risk although it is possible that sites/materials are covered by soil and vegetation. However, in the middle hilly section of the WEF site the surface soils were exposed by natural erosion (severe in places) the archaeological visibility was better and made it easier to observe archaeological materials. Apart from

occasional isolated stone tools observed only one significant archaeological site was located.

### **Cultural sensitivity**

In general the study area investigated appears to be of low archaeological and historical (sites/materials) sensitivity and the impact of construction will be of low negativity. However, construction activities and the visual impact of the turbines will have a cumulative visual impact and negative effect on the cultural landscape.

### **Recommendations**

The Khoi San living/campsite and surrounding area which is situated within the proposed turn-around area and access road between turbine positions 27 and 28, must be protected from these developments. There are two possibilities;

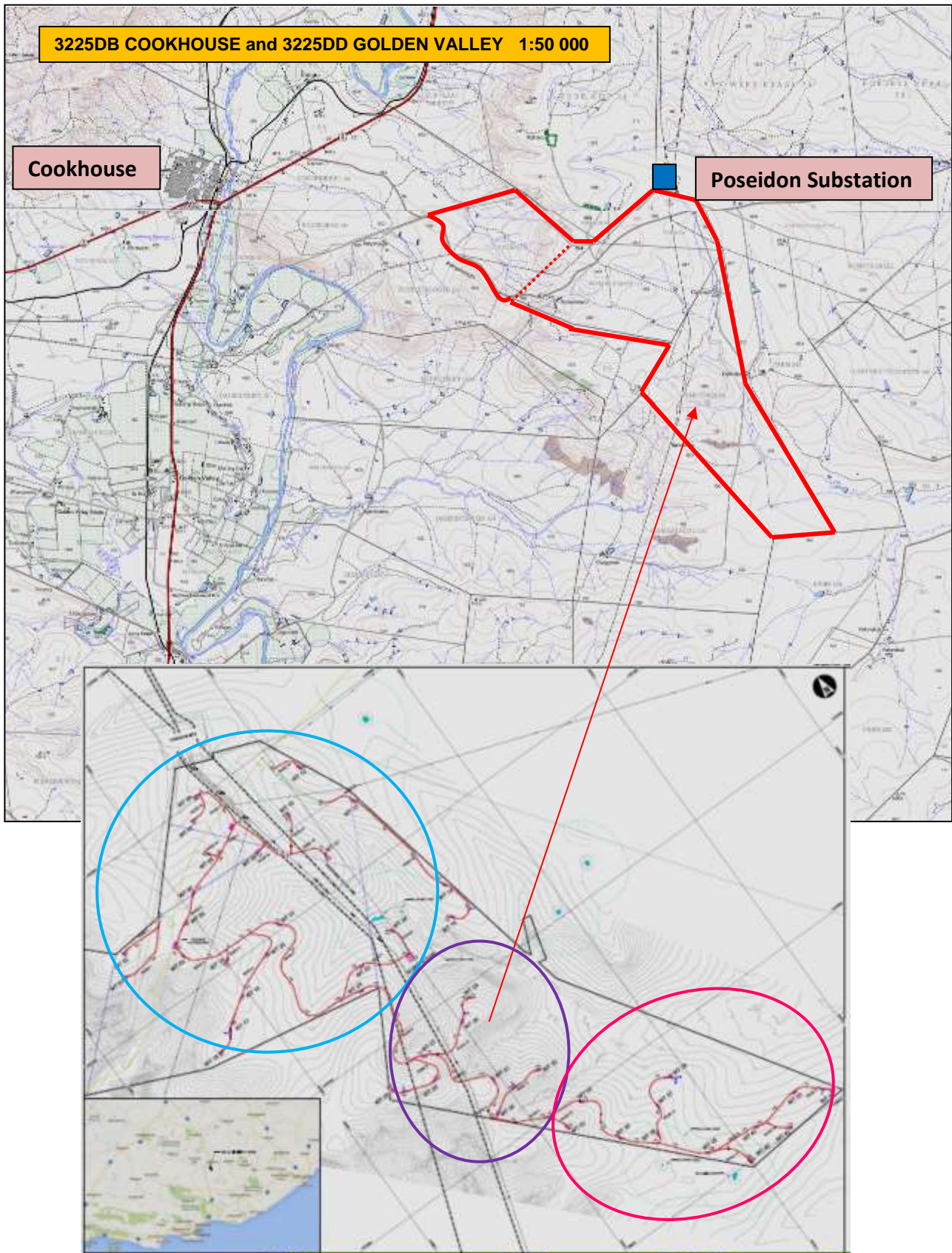
- the first is to reallocate the turn-around area and access road between turbine positions 27 and 28 with at least 50 metres from the archaeological sites; or,
- to appoint an archaeologist to collect/remove all the archaeological material in the area that will be affected by the development. This may be a time-consuming and costly exercise.

Although the stone dam wall, cairn and stone post are of low heritage significance care should be taken that they are not damaged during the construction of the nearby turbines and access road. Marked buffer zones must be placed around structures before construction starts to protect them from damage/vandalism.

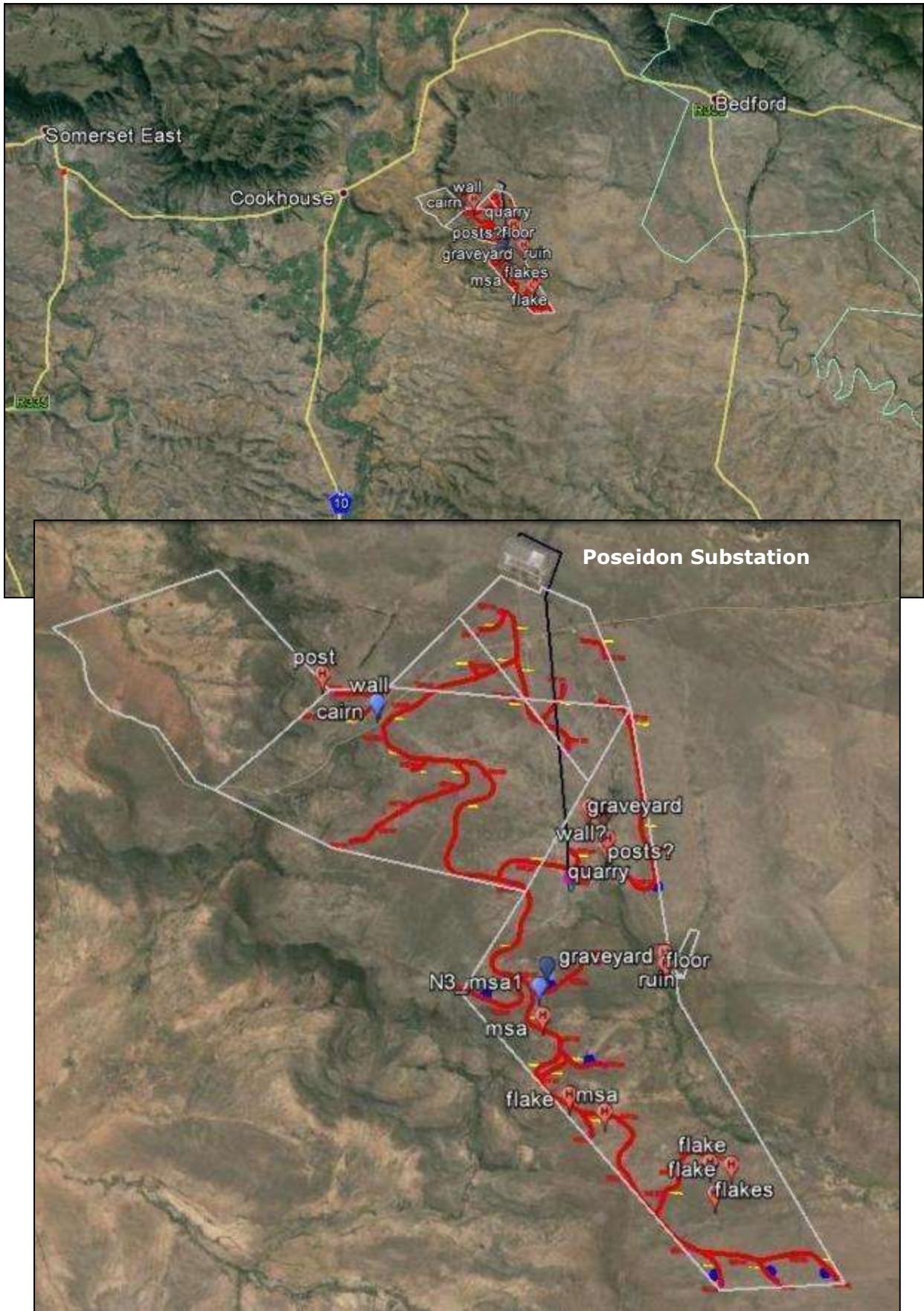
All construction activities must be monitored by an archaeologist/heritage practitioner or alternatively a person must be specially trained, for example the ECO, as a site monitor. The archaeologist/heritage practitioner should apart from monitoring specific activities at specific times also regularly visit the construction site to inspect the construction routes and activities and to meet with the ECO.

Construction managers should be informed before construction starts on the possible types of heritage sites and material they may encounter. Alternatively the ECO must be trained as a site monitor to report to the foreman when heritage sites are exposed.

Should any concentrations of heritage material be exposed during construction, all work must cease in the immediate area (depending on the type of find) and it must be reported to the archaeologist at the Albany Museum in Grahamstown (046 6222312) or to the Eastern Cape Provincial Heritage Resources Authority (043 6422811), so that a systematic and professional investigation can be undertaken. Sufficient time should be allowed to investigate and to remove/collect such material



**Map 1. 1:50 000 Topographic maps indicating the location of the proposed Nojoli WEF near Cookhouse marked by the red lines. The blue square marks the Poseidon Substation. The insert map indicates the layout of the turbine positions and the service roads. In the text the blue circle represents the southern section, the purple the middle section and the pink the northern section (insert map courtesy of Savannah Environmental (Pty) Ltd).**



**Map 2. Aerial images indicating the location of the proposed Nojoli WEF near Cookhouse and south of the Poseidon substation. The pink bubbles represent heritage sites previously identified and the blue bubbles observed during the walkthrough (information courtesy of Savannah Environmental (Pty) Ltd).**

## Archaeological background

The archaeology and history of the area have been addressed in several reports and will not be repeated here again (see relevant impact assessment reports below).

## Relevant impact assessments

- Binneman, J. 2013. A phase 1 archaeological impact assessments of the proposed new substation and 132kv power line at the Cookhouse South Wind Farm near Cookhouse, Blue Crane Route Local Municipality, Bedford District, Eastern Cape Province. Prepared for Savannah Environmental Ltd. (Pty). Eastern Cape Heritage Consultants.
- Binneman, J. 2012a. An archaeological walkthrough survey of the turbine footprint for the proposed Phase 1 Amakhala Emoyeni Wind Energy Facility, Cookehouse District, Blue Crane Route Municipality, Eastern Cape Province. Prepared for Savannah Environmental Ltd. (Pty). Eastern Cape Heritage Consultants.
- Binneman, J. 2012b. Basic archaeological assessments for: 1. the kopleegte substation (250m x 250m), 2. the new 132kv powerline from Kopleegte Substation to Poseidon Substation, 3. the re-route of the 66kv powerline from Poseidon Substation to Zebra Substation, 4. the re-route of the 132kv powerline from Klipfontein to Poseidon Substation, Cookhouse District, Blue Crane Route Municipality, Eastern Cape Province. Prepared for Savannah Environmental Ltd. (Pty). Eastern Cape Heritage Consultants.
- Binneman, J. 2012c. Basic archaeological assessments for the proposed: 1. Golden Valley-Poseidon 132kv power lines (3 power lines), 2. Golden Valley-Kopleegte power lines (2 power lines) and, 3. the 132kv Golden Valley Substation (250m x 250m) (2 options), Bedford District, Blue Crane Route Local Municipality, Eastern Cape Province. Prepared for Savannah Environmental Ltd. (Pty). Eastern Cape Heritage Consultants.
- Booth, C. 2011. A phase I archaeological impact assessment (AIA) for the proposed Cookhouse II wind energy facility, Blue Crane Route Local Municipality, Eastern Cape. Prepared for Savannah Environmental Ltd. (Pty). Albany Museum.
- Gaigher, S. 2012. Walk-through survey and re-evaluation report indicating the possible impact on heritage resources by the infrastructure proposed for the wind farm near Cookhouse in the Eastern Cape. Prepared for Savannah Environmental Ltd. (Pty). G & A Heritage.
- Halket, D., Webley, L., Orton, J. and Pinto, H. 2010. Heritage impact assessment of the proposed Amakhala-Emoyeni wind Energy Facility, Cookhouse District, Eastern Cape. Prepared for Savannah Environmental Ltd. (Pty). ACO Associates cc.
- Halket, D. and Webley, L. 2010. Heritage scoping assessment of a proposed Amakhala-Emoyeni wind Energy Facility to be situated on 19 farms in the Cookhouse District, Eastern Cape. Unpublished report prepared for Savannah Environmental Ltd. (Pty). ACO Associates cc.
- Hart, T. and Webley, L. 2010. Heritage impact assessment of a proposed Cookhouse Wind Energy Project, Blue Crane Route Local Municipality. Unpublished report prepared for CES Ltd. (Pty). ACO Associates cc.



- Webley, L. and Hart, T. 2008. Scoping Heritage Impact Assessment of a proposed Wind Energy Facility to be situated on portions of farms Arolsen 69, Farm 148, Farm 148/1; Rooidraai 146, Baviaans Krans 151, Baviaans Krantz 151/2, Klip Fonteyn 150/2, Roberts Kraal 281, Zure Kop 74/1, Zure Kop 74/2, Van Wyks Kraal 73, Van Wyks Kraal 73/2 and Van Wyks Kraal 73/3 in the Cookhouse District, Eastern Cape. Unpublished report prepared for Savannah Environmental Ltd. (Pty). ACO Associates.
- Webley, L., Halkett, D. and Hart, T. 2009. Heritage Impact Assessment of a proposed Wind Energy Facility to be situated on portions of farms Arolsen 69, Farm 148, Farm 148/1; Rooidraai 146, Baviaans Krans 151, Baviaans Krantz 151/2, Klip Fonteyn 150/2, Roberts Kraal 281, Zure Kop 74/1, Zure Kop 74/2, Van Wyks Kraal 73, Van Wyks Kraal 73/2 and Van Wyks Kraal 73/3 in the Cookhouse District, Eastern Cape. Unpublished report prepared for Savannah Environmental Ltd. (Pty). ACO Associates.

## **THE WALKTHROUGH INVESTIGATION**

### **Methodology**

The purpose of the study was to do a walkthrough of the turbine locations, underground cable routes, roads and other infrastructures for the proposed Nojoli WEF site. The landowners were contacted prior to the visit to inform them of the investigation and to obtain permission to access their properties. They were also consulted on possible locations of historical buildings and features, cemeteries, graves and archaeological sites. All relevant survey information for the immediate and adjacent areas was consulted before the walkthrough started (see reference list). A Google Earth aerial image investigation was also conducted of the area (Maps 1–6). The walkthrough for the proposed Nojoli WEF and associated infrastructure followed the layout as supplied by the developer which mainly follows the hilltops and high ground. The turbine positions, roads and cable connections routes were already signposted and it was relatively easy to follow the markers through the landscape. These were well removed from the drainage lines, open valleys and erosion gullies where in general concentrations of archaeological sites/materials occur (Halkett *et al.* 2010; Binneman 2012a)

The walkthrough survey was conducted on foot by two people and spots checks and surveys were also conducted from a vehicle to investigate as much of the terrain as possible. The substation location and overhead power line route to the Poseidon Substation have been investigated previously (Binneman 2013). GPS readings were taken and all important features were digitally recorded (for views of the turbine routes and the surrounding landscape and vegetation see Appendix D, Maps 3-6 and Figures 1-9).

A number of pre-colonial and colonial heritage sites have been recorded for the Nojoli WEF site during the previous reconnaissance survey of the Wind Farm site (Webley *et al.* 2009, marked with the brown bubbles, Maps 1-6). The sites included graveyards, historical features and pre-colonial archaeological sites (mainly Middle Stone Age stone tools). The development will not have any impact on these sites and they were not re-visited.

### **Limitations and assumptions**

Although the terrain was relatively easy to access, the archaeological visibility in general was poor due to the dense surface cover of grass and shrubs in places. The region experienced exceptional good rainfall the past year which resulted in dense high grass cover. Due to the dense surface vegetation and little sheet erosion on the high ground in the northern and southern sections of the site, it was difficult to locate archaeological sites/materials. However, the middle section of the site is hillier with pronounced drainage valleys, steep gradients and areas of surface and deep soil erosion (Map 1 insert map). Where the surface soils were exposed by natural erosion the archaeological visibility was good and made it fairly easy to locate archaeological materials. Several days of heavy rain delayed the initial walkthrough survey because the terrain was too wet for vehicles to enter the site. A second site visit had to be conducted a few days later and took place under almost similar conditions.

Regardless of the restrictions imposed by the dense vegetation, the experiences and knowledge gained from several other investigations in the wider surrounding region provided background information to make assumption and predictions on the incidences and the significance of possible pre-colonial archaeological sites/material which may be located in the area, or which may be covered by soil and vegetation.

## **Results and findings**

No significant archaeological sites/materials were observed during the survey of the substation and overhead power line route to the Poseidon Substation (Binneman 2013). Although the terrain was relatively easy to access, the archaeological visibility in general was poor due to the dense surface cover of grass and shrubs in places after good rains during the past two years (for general views of the landscape and vegetation see Figures 1-9). The walkthrough of the northern and southern sections of the study site yielded no significant archaeological site/materials (Map 1 insert). Although sites/materials may be covered by soil and vegetation, these areas appears to be of low cultural sensitivity and it would be unlikely that any archaeological remains of significance will be found *in situ* or exposed during the development. There are no known buildings/features or graves older than 60 years in the layout zone.

The only historical heritage structure observed within the layout zone was a dry stone packed dam wall next to the gravel road to Cookhouse and Bedford (Map 3, Figure 1 bottom inserts)(Appendix A). A stone cairn was identified by the ACO survey in 2009 approximately 50 metres north-east of the dam wall. The origin/significance of the cairn is unknown, but should not be disturbed in case it is a burial. During the same survey a stone post was also identified which is near turbine position 2, but is of low significance and falls outside the development area (Map 3, insert image). However, on the other hand there may be sites/materials covered by soil and vegetation. The stone dam wall has an important everyday functional value, but is of low heritage significance. Although it is about 100 metres from the nearest point of the development, care should be taken that it is not damage during the construction of the nearby turbines and access road.

Two archaeological sites were observed in the middle section of the site (Map 1 insert) where the terrain is hillier with prominent drainage valleys, steep gradients and areas of surface and deep soil erosion. One of these sites (N3\_msa1) falls outside the development area (about 75 metres away) and comprised of a random scatter of weathered quartzite Middle Stone Age stone tools (dating between 250 000 and 30 000 years old) along a small surface erosion area (Map 6, Figure 8). The stone tools were in secondary context and not associated with any other archaeological remains and are of low heritage significance and therefore need no further mitigation.

The second site (N2\_pottery) is situated near road 10 at the proposed turn-around area between turbine positions 27 and 28. This significant site is situated in the side of a deep erosion gully. It comprises of a pile of stones that contained at least four large lower grindstones. The origin of the feature is not clear, but it could be a burial hollow lined/filled with stones. Although the outline of a hollow is visible in the profile of the donga, the presence of the lower grindstones in the pile is puzzling. The origin of the grindstones is no mystery, because there is an archaeological occupation site on the surface next to the gully and stone pile. The lower grindstones in the stone pile most probably were associated with this occupation floor. Grindstones were also observed in the general vicinity. The occupation floor comprised many pottery fragments and stone tools. A part of a buried ceramic container is still visible surrounded by stone flakes, cores and a fine example of a well-used rubber (upper grindstone). The site represents a Khoi San living/campsite and the pottery date within the past 1 800 years, but the stone tools may date older.

Stone filled burial hollows were recorded and excavated in the wider Eastern Cape Midlands by amateur archaeologists (Records in the Department of Archaeology at the Albany Museum) and it is possible that the lower grindstones were added to the other stones as a symbolic statement/meaning. The first archaeological excavation/investigation in South Africa was conducted on such a stone cairn near Cookhouse in 1776 by Anders Sparrman, the well-known Swedish early traveller.

A second scenario for the origin of the stone pile is that some time ago the grindstones along with the other stones were used to fill-in an erosion gully to prevent further erosion (common practice by farmers to fill gullies with stones). The grindstones were in close proximity of the gully, most probably associated with the Khoi San campsite, and were unceremoniously used as fill.

Unfortunately it would appear that part of the original Khoi herder site has been destroyed by the severe soil erosion in the area. Other archaeological materials observed exposed by the gully erosion included Earlier and Middle Stone Age stone tools (dating between 1.5 million and 30 000 years old) (Figure 7, bottom right insert). Time unfortunately did not allow for a comprehensive investigation, but the brief walkthrough of the gully and adjacent areas suggested that it is a sensitive archaeological landscape and must not be disturbed. There are two possibilities; the first is to reallocate the turn-around area and access road between turbine positions 27 and 28 with at least 50 metres from the archaeological sites. The second option is to appoint an archaeologist to collect/remove all

the archaeological material in the area that will be affected by the development. This may be a time-consuming and costly exercise.

## ASSESSMENT OF THE IMPACTS

### Pre-colonial archaeology

#### *Nature of the potential impacts*

Apart from the Khoi San living site and Middle Stone Age stone tool occurrences and occasional stone tool finds, no other sites/remains of significance were observed. However site/materials may be covered by soil and vegetation. The main impact to archaeological sites/remains (if any) will be the physical disturbance and/or destruction of the material and its context. The construction of the turbine foundations, substation, cabling between the turbines and access roads may expose, disturb, displace and destroy archaeological sites/material. It is assumed that the overhead transmission lines may have less impact on possible buried archaeological material due to their smaller foot print, but that depends on the construction activities.

#### *Extent of the impacts*

Construction of the turbine foundations, substation, cabling between the turbines and access roads may impact on remains which are buried, but these impacts will be limited and restricted to the local area. The construction of the turbine bases may disturb small areas and the negative impact on possible archaeological sites/materials may be relatively small. Other projects such as the construction of roads, buildings and underground lines will disturb large areas and may expose sites/materials on a larger scale. In both cases further disturbances of sites/materials can be limited by mitigation.

**Table 1. Impacts on the pre-colonial archaeology.**

<b>Nature:</b> The potential impact of the construction of the turbines, substation, cabling between the turbines, access roads and maintenance yard on above and below ground archaeology.		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (1)	Local (1)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	Minor (2)	Minor (2)
<b>Probability</b>	Unlikely (2)	Unlikely (2)
<b>Significance</b>	Low (16)	Low (16)
<b>Status (positive or negative)</b>	Negative	Neutral
<b>Reversibility</b>	No	No
<b>Irreplaceable loss of resources?</b>	No, but in some cases, yes	No
<b>Can impacts be mitigated?</b>	Yes	
<p><b>Mitigation:</b> two options:</p> <ol style="list-style-type: none"> <li>1. The pre-colonial KhoiSan living site is of high significance and must not be disturbed during the development. The turn-around area and access road between turbine positions 27 and 28 must be reallocated with least 50 metres from the archaeological sites; or,</li> <li>2. Appoint an archaeologist to collect/remove all the archaeological material in the area that will be affected by the development. This may be a time-consuming and costly exercise.</li> </ol>		

No mitigation is proposed for the Middle Stone Age stone tool occurrence.

All construction activities of the development must be monitored by an archaeologist/heritage practitioner or trained ECO.

If any human remains or any other concentrations of archaeological heritage material are exposed during construction, all work in that area must cease and it must be reported immediately to the nearest museum/archaeologist or to the Eastern Cape Provincial Heritage Resources Authority, so that a systematic and professional investigation can be undertaken. Sufficient time should be allowed to investigate and to remove/collect such material. Recommendations will follow from the investigation (see Appendix C below).

**Cumulative impacts:** The number of concrete bases will determine the impact on the buried materials (if any) and if these increase so will the impact.

**Residual impacts:** Permanent

## **Cultural landscape and sense of place**

### *Nature of the impacts*

Power lines and substations are an integral part of the South African landscape. This is especially visible in the wider Poseidon Substation area, where huge pylons and power lines previously dominated the skyline in all directions. The recent construction of a large number of turbines in the immediate vicinity has taken over the dominating effect and contributed in a major way to the change of the rural cultural landscape. The construction of the proposed Nojoli WEF will have a further cumulative effect on the surrounding landscape and confront the public directly in terms of changes of place. It will have a significant visual effect on the cultural landscape and will also introduce an 'industrial character' to a once rural agricultural environment. The negative visual impact on the historical and natural landscape will be restricted mainly to the immediate region. However, the main impact on the cultural landscape will be the extensive construction of roads and other activities which will leave permanent scars.

### *Extent of the impacts*

The size and large number of turbines will definitely change the character and meaning of 'place'. The extensive construction of roads and other activities will transform the landscape and it will be difficult to fully rehabilitate this scarring of the landscape. However, it will also create new identities and activities in the immediate and wider surrounding areas. These developments will generate employment opportunities as well as for develop tourism in the future, which will create jobs and have positive economic expansion. The project is committed to community ownership as well as funding socioeconomic and enterprise development initiatives over the life of the 20 year project. However, mitigation if needed falls in the domain of the visual impact assessment.

**Table 2 . Impact on the cultural landscape.**

<b>Nature:</b> The potential impact of the construction of the turbines, substation, cabling between the turbines, access roads and maintenance yard on the cultural landscape.		
	<b>Without Mitigation</b>	<b>With Mitigation</b>
<b>Extent</b>	Local (4)	Local (4)
<b>Duration</b>	Long term/permanent (5)	Long term/permanent (5)
<b>Magnitude</b>	Moderate(6)	moderate (6)
<b>Probability</b>	Highly probable (4)	Highly probable (4)
<b>Significance</b>	high (60)	High (60)
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Reversible	Reversible
<b>Irreplaceable loss of resources?</b>	No	
<b>Can impacts be mitigated?</b>	no	no
<b>Mitigation</b> Given the size and numbers of the turbines, no mitigation can reduce the negative visual effect on 'significance of place'.		
<b>Cumulative impacts:</b> The cumulative impacts may be increasing as further wind farms are planned for adjoining areas. The large number of turbines will bring permanent changes to the cultural landscape in terms of visual impacts and changes to 'sense of place'.		
<b>Residual impacts:</b> Disturbances to the landscape by the construction of roads and trenches for the cables will be long term to permanent.		

**Table 3. Environmental management programme for heritage resources.**

<b>Objective:</b> Preserving the pre-colonial archaeological and colonial period heritage sites/remains of the Nojoli WEF site.	
<b>Project component/s</b>	Construction of turbines, new roads, power lines, substation, maintenance yard and other associated infrastructure.
<b>Potential impact</b>	The physical disturbance, damage and/or destruction of pre-colonial archaeology and colonial period heritage sites/remains, either by direct impact or secondary impact such as vandalism. The impact on the cultural landscape.
<b>Activity/risk source</b>	Large scale levelling, construction of substation, power lines and access roads for construction vehicles.
<b>Mitigation: Target/Objective</b>	All construction activities on the substation site must be monitored by an archaeologist/heritage practitioner (or alternatively a person specially trained to conduct the monitoring, i.e. the ECO). This must include the clearing of the vegetation (which constrained the visibility of heritage resources during the walkthrough investigation), and the leveling of turbine positions.

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Of the heritage sites observed during the walkthrough survey, only the Khoi San living site is of high significance. <ul style="list-style-type: none"> <li>No development may occur within 50 metres of the site and marked buffer zones must be placed around it.</li> </ul> This would imply that the turn-around area and access road between turbine positions	Proponent, consultant, contractor, the heritage practitioner, ECO and heritage authority.	Before construction starts.

<p>27 and 28 must be reallocated with least 50 metres from the archaeological sites; <b>or,</b></p> <p>An archaeologist must be appointed to collect/remove all the archaeological material in the area that will be affected by the development. This may be a time-consuming and costly exercise.</p> <ul style="list-style-type: none"> <li>• The archaeologist will be responsible for obtaining the permit from the relevant heritage resources agency to collect and/ or excavate materials from the site.</li> <li>• Although the dry stone dam wall is of low heritage significance it must still be protected against possible damage. A buffer zone must be placed around it.</li> </ul> <p>If any human remains or any other concentrations of archaeological heritage material are exposed during construction, all work in that area must cease and it must be reported immediately to the archaeologist at the Albany Museum in Grahamstown (046 6222312) or to the Eastern Cape Provincial Heritage Resources Authority (043 6422811), so that a systematic and professional investigation can be undertaken. Sufficient time should be allowed to investigate and to remove/collect such material. Recommendations will follow from the investigation (see Appendix C below).</p> <p>Apply for permits from the Eastern Cape Province Heritage Resources Authority to collect and/or excavate sites/materials from archaeological sites when exposed during construction work.</p>	<p>Proponent, consultant, contractor, ECO, heritage practitioner and heritage authority.</p> <p>Proponent, Consultant, ECO, the archaeologist/ heritage practitioner and heritage authority.</p>	<p>From the start and duration of all phases of the construction, i.e., during the clearing of the vegetation for the above ground heritage. During the levelling and construction phases for the buried heritage.</p> <p>Before the construction continues and for the duration of the project.</p>
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<b>Performance indicator</b>	All heritage sites/materials observed during any construction activity must be recorded. The success of the monitoring will be determined by the degree of damage/disturbance that can be avoided to heritage resources.
<b>Monitoring</b>	All construction activities must be monitored by a heritage practitioner or alternatively a person must be specially trained, for example the ECO. The heritage practitioner should apart from monitoring specific activities at specific time also regularly visit the construction site (for example, once a month) to inspect the construction routes and activities (or to meet with the ECO, A report and if required a list of

	recommendations, should be compiled and submitted to the Eastern Cape Provincial Heritage Resources Authority after the monitoring phase(s) for comment.
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## DISCUSSION AND MITIGATION

Dense grass cover throughout the study area and little sheet erosion on the high ground made it difficult to locate pre-colonial archaeological sites and materials. However, in areas where the surface soils were exposed by natural erosion, for example in foot paths and in vehicle tracks the archaeological visibility was good and made it fairly easy to locate archaeological materials. No significant archaeological sites/materials were observed during the survey of the northern and southern sections of the study site. However, sites/materials may be covered by soil and vegetation. The only historical heritage structure observed within the layout zone was a dry stone packed dam wall next to the gravel road to Cookhouse and Bedford and a stone cairn previously identified by the ACO survey in 2009. Both appear to be of low heritage significance, but care should be taken that these features are not damaged during the construction of the nearby turbines and access road. Two archaeological sites were observed in the middle section of the study site exposed by soil erosion. One of the sites that comprised of a random scatter of weathered quartzite Middle Stone Age stone tools falls outside the develop area and needs no further mitigation. The other comprises of a pile of stones and large lower grindstones in the side of an erosion gully close to a Khoi San occupation campsite with pottery and stone tools. Unfortunately it is situated near road 10 at the turn-around area between turbine positions 27 and 28. This significant site is situated in the side and next to a deep erosion gully. It is an important archaeological site and either the turn-around area and access road must be reallocated or an archaeologist must be appointed to collect/remove all the archaeological material in the area that will be affected by the development.

## RECOMMENDATIONS

In general (apart from above discussed heritage features) it would appear that the study area/layout which was investigated by a walkthrough, is of relatively low cultural significance. Although it would also appear unlikely that any significant *in situ* sites/material will be exposed during these developments, sites/materials may be covered by soil and vegetation. It is recommended that;

1. The Khoi San living/campsite and surrounding area which is situated within the proposed turn-around area and access road between turbine positions 27 and 28, must be protected from these developments. There are two possibilities;
  - the first is to reallocate the turn-around area and access road between turbine positions 27 and 28 with at least 50 metres from the archaeological sites, or
  - to appoint an archaeologist to collect/remove all the archaeological material in the area that will be affected by the development. This may be a time-



consuming and costly exercise.

2. Although the stone dam wall, cairn and stone post are of low heritage significance care should be taken that they are not damaged during the construction of the nearby turbines and access road. Marked buffer zones must be placed around structures before construction starts to protect them from damage/vandalism.
3. All construction activities must be monitored by an archaeologist/heritage practitioner or alternatively a person must be specially trained, for example the ECO, to conduct the monitoring. This must include the clearing of the dense grass (which constrained the visibility of heritage resources during the walkthrough), leveling, placing and excavations of the pylon foundations and construction of the access roads.
  - The archaeologist/heritage practitioner should apart from monitoring specific activities at specific times also regularly visit the construction site (for example, once a month) to inspect the construction routes and activities (or to meet with the ECO, see below).
5. Construction managers/foremen should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.
  - Alternatively the ECO must be trained as a site monitor to report to the foreman when heritage sites are exposed. This person must monitor all activities during the construction phase.
6. Although it would seem unlikely that any significant archaeological remains will be exposed during the development, there is always a possibility that human remains and/or other archaeological and historical material may be uncovered during the development. Should such material be exposed during construction, all work must cease in the immediate area (depending on the type of find) and it must be reported to the archaeologist at the Albany Museum in Grahamstown (046 6222312) or to the Eastern Cape Provincial Heritage Resources Authority (043 6422811), so that a systematic and professional investigation can be undertaken. Sufficient time should be allowed to investigate and to remove/collect such material. Recommendations will follow from the investigation (See appendix C for a list of possible archaeological sites that maybe found in the area).

## GENERAL REMARKS AND CONDITIONS

Note: This report is for a Phase 1 Archaeological Impact Assessment only and do not include or exempt other required heritage impact assessments (see below).

The National Heritage Resources Act (Act No. 25 of 1999, section 35) (see Appendix A) requires a full Heritage Impact Assessment (HIA) in order that all heritage resources, that is, all places or objects of aesthetics, architectural, historic, scientific, social, spiritual linguistic or technological value or significance are protected. Thus any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures older than 60 years, living heritage, historical settlements, landscapes, geological sites, palaeontological sites and objects

It must be emphasised that the conclusions and recommendations expressed in this archaeological heritage sensitivity investigation are based on the visibility of archaeological sites/material and may not therefore, reflect the true state of affairs. Sites and material may be covered by soil and vegetation and will only be located once this has been removed. In the unlikely event of such finds being uncovered, (during any phase of construction work), it must be reported to the archaeologist at the Albany Museum (046 6222312) or to the Eastern Cape Provincial Heritage Resources Authority (043 6422811) immediately. The Project Company must finance the costs should additional studies be required as outlined above. The *onus* is also on the Project Company to ensure that this agreement is honoured in accordance with the National Heritage Act No. 25 of 1999. The consultant is responsible to forward this report to the relevant Heritage Authority for assessment, unless alternative arrangements have been made with the specialist to submit the report.

It must also be clear that Phase1 Specialist Reports (AIAs) will be assessed by the relevant heritage resources authority. The final decision rests with the heritage resources authority, which should give a permit or a formal letter of permission for the destruction of any cultural sites.

## **APPENDIX A: brief legislative requirements**

Parts of sections 35(4), 36(3) and 38(1) (8) of the National Heritage Resources Act 25 of 1999 apply:

### **Archaeology, palaeontology and meteorites**

35 (4) *No person may, without a permit issued by the responsible heritage resources authority—*

- (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;*
- (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;*
- (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.*

### **Burial grounds and graves**

36. (3) (a) *No person may, without a permit issued by SAHRA or a provincial heritage resources authority—*

- (a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;*
- (b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or*
- (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.*

### **Heritage resources management**

38. (1) *Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorized as –*

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- (b) the construction of a bridge or similar structure exceeding 50m in length;*
- (c) any development or other activity which will change the character of the site –*
  - (i) exceeding 5000m<sup>2</sup> in extent, or*
  - (ii) involving three or more erven or subdivisions thereof; or*
  - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or*

- (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA, or a provincial resources authority;
- (d) the re-zoning of a site exceeding 10 000m<sup>2</sup> in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must as the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

#### **APPENDIX A: List of selected observations.**

<b>Text description</b>	<b>Text reference</b>	<b>GPS Location</b>	<b>Type of site</b>	<b>Rating</b>	<b>Location/ status</b>
N1_wall	Map 3	32.45.695S 26.54.344E	dry packed stone damwall	low	near turbines 3 but not directly impacted by the development
N2_pottery	Map 5	32.47.386S 26.55.742E 32.47.381S 26.55.748E	stone pile with lower grindstones and Khoi San living site	high	turn-around area and access road between turbine positions 27 and 28
N3_msa1	Map 5	32.47.520S 26.55.683E	Middle Stone Age stone tools	low	not impacted by the development

## **APPENDIX B: IDENTIFICATION OF ARCHAEOLOGICAL FEATURES AND MATERIAL FROM INLAND AREAS: guidelines and procedures for developers**

### **Human Skeletal material**

Human remains, whether the complete remains of an individual buried during the past, or scattered human remains resulting from disturbance of the grave, should be reported. In general human remains are buried in a flexed position on their side, but are also found buried in a sitting position with a flat stone capping. Developers are requested to be on alert for the possibility of uncovering such remains.

### **Freshwater mussel middens**

Freshwater mussels are found in the muddy banks of rivers and streams and were collected by people in the past as a food resource. Freshwater mussel shell middens are accumulations of mussel shell and are usually found close to rivers and streams. These shell middens frequently contain stone tools, pottery, bone, and occasionally human remains. Shell middens may be of various sizes and depths, but an accumulation which exceeds 1 m<sup>2</sup> in extent, should be reported to an archaeologist.

### **Large stone cairns**

They come in different forms and sizes, but are easy to identify. The most common are roughly circular stone walls (mostly collapsed) and may represent stock enclosures, remains of wind breaks or cooking shelters. Others consist of large piles of stones of different sizes and heights and are known as *isisivane*. They are usually near river and mountain crossings. Their purpose and meaning is not fully understood, however, some are thought to represent burial cairns while others may have symbolic value.

### **Stone artefacts**

These are difficult for the layman to identify. However, large accumulations of flaked stones which do not appear to have been distributed naturally should be reported. If the stone tools are associated with bone remains, development should be halted immediately and archaeologists notified.

### **Fossil bone**

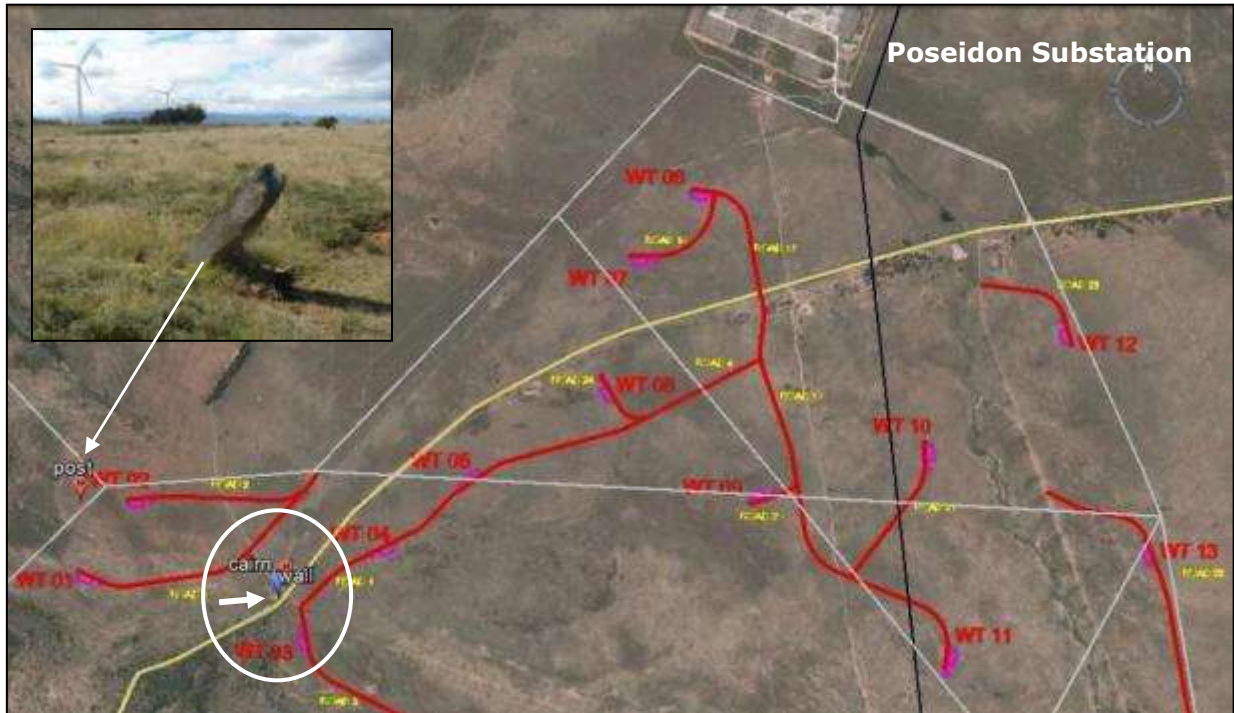
Fossil bones may be found embedded in geological deposits. Any concentrations of bones, whether fossilized or not, should be reported.

### **Historical artefacts or features**

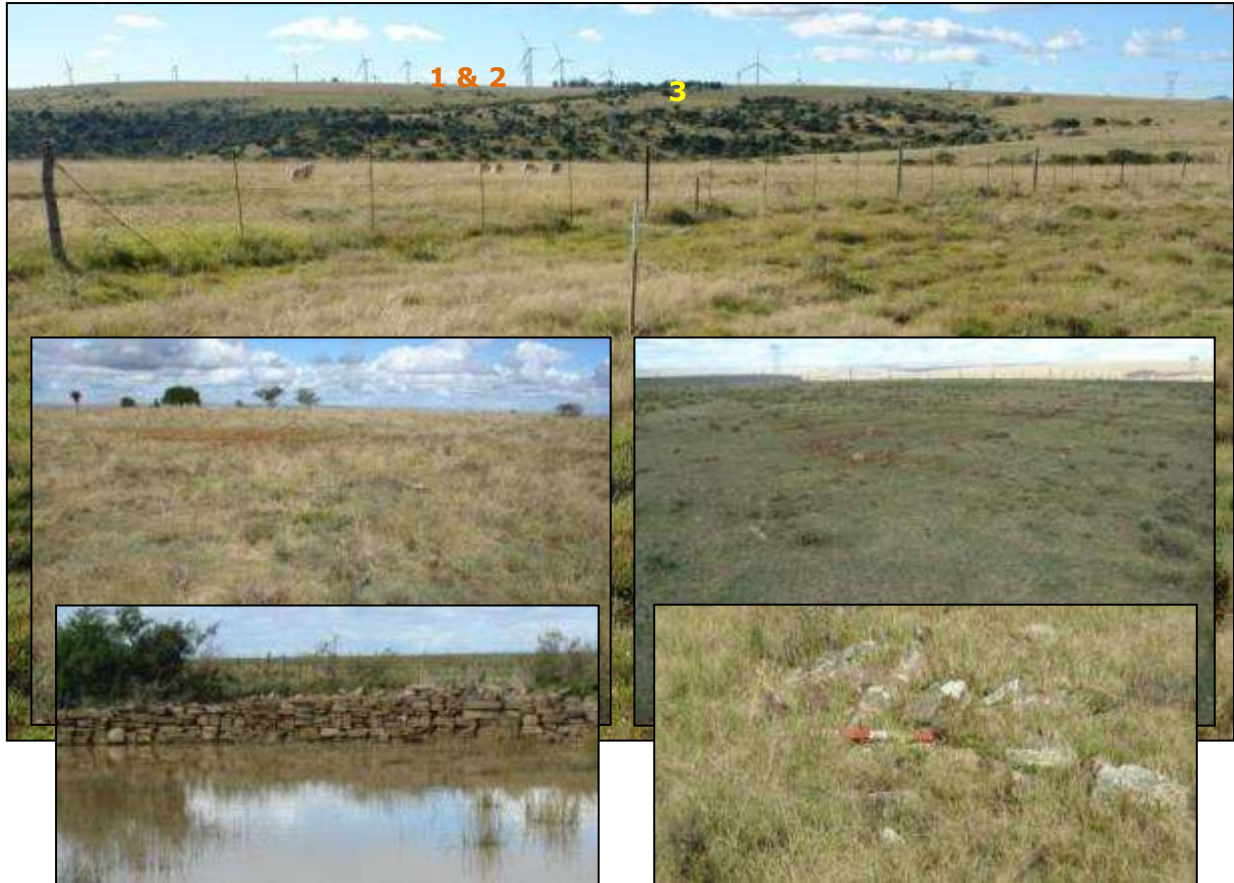
These are easy to identify and include foundations of buildings or other construction features and items from domestic and military activities.

**APPENDIX D**

DIGITAL IMAGES OF THE LANDSCAPE AND HERITAGE SITES  
AND  
AERIAL VIEWS OF THE HERITAGE SITES AND TURBINE LOCATIONS



**Map 3.** An aerial image of the northern part of the Nojoli WEF in the vicinity of the Poseidon Substation (south, south-east and south-west). The location of the stone dam wall is marked by the blue bubble and white arrow in the lower left corner. The stone post is of low significance and falls outside the area of development.



**Figure 1.** A view from turbine position 17 towards positions 1, 2 and 3 (main image) on the ridge, general views of the turbine positions 1 and 2 (left insert), position 3 (right insert), the stone dam wall (left insert) and stone cairn (right insert).



**Figure 2.** Views towards turbine positions 4, 5 (left insert), 8 (main image) and turbine positions 6 and 7 near the Poseidon Substation (right insert).



**Figure 3.** A view from turbine position 8 towards positions 9-13 in a north-easterly direction (main image) and reverse view towards turbine positions 9-11 from the south-west (inserts).





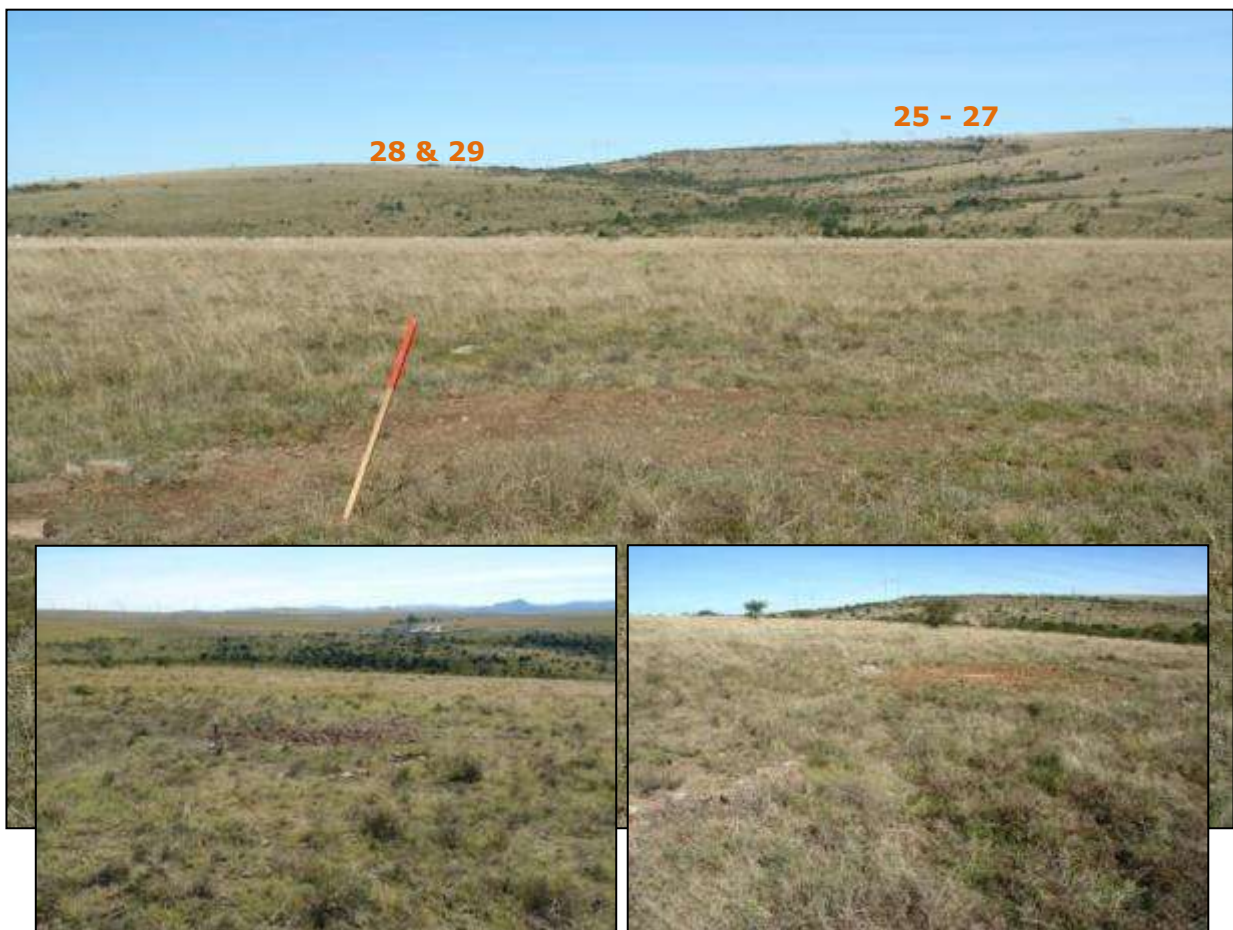
**Map 4. An aerial image of the north-western part of the Nojoli WEF.**



**Figure 4. A view from turbine position 3 towards positions 16-18 (main image and left insert) and positions 19-21 (right insert).**



**Map 5. Aerial image of the northern section and middle section (purple oval) of the Nojoli WEF.**



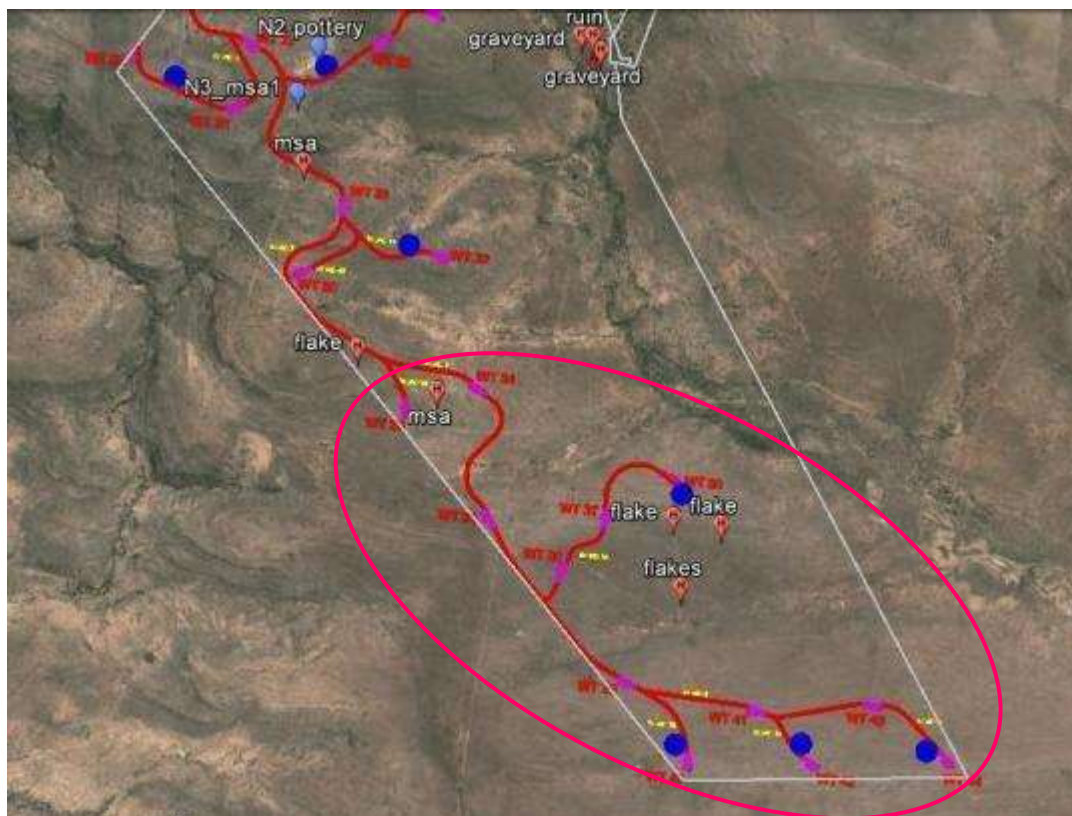
**Figure 5. A view from turbine position 15 towards positions 25-29 (main image), a reverse view from position 29 towards the northern section (left insert) and a view of position 28 and towards the middle section (right insert).**



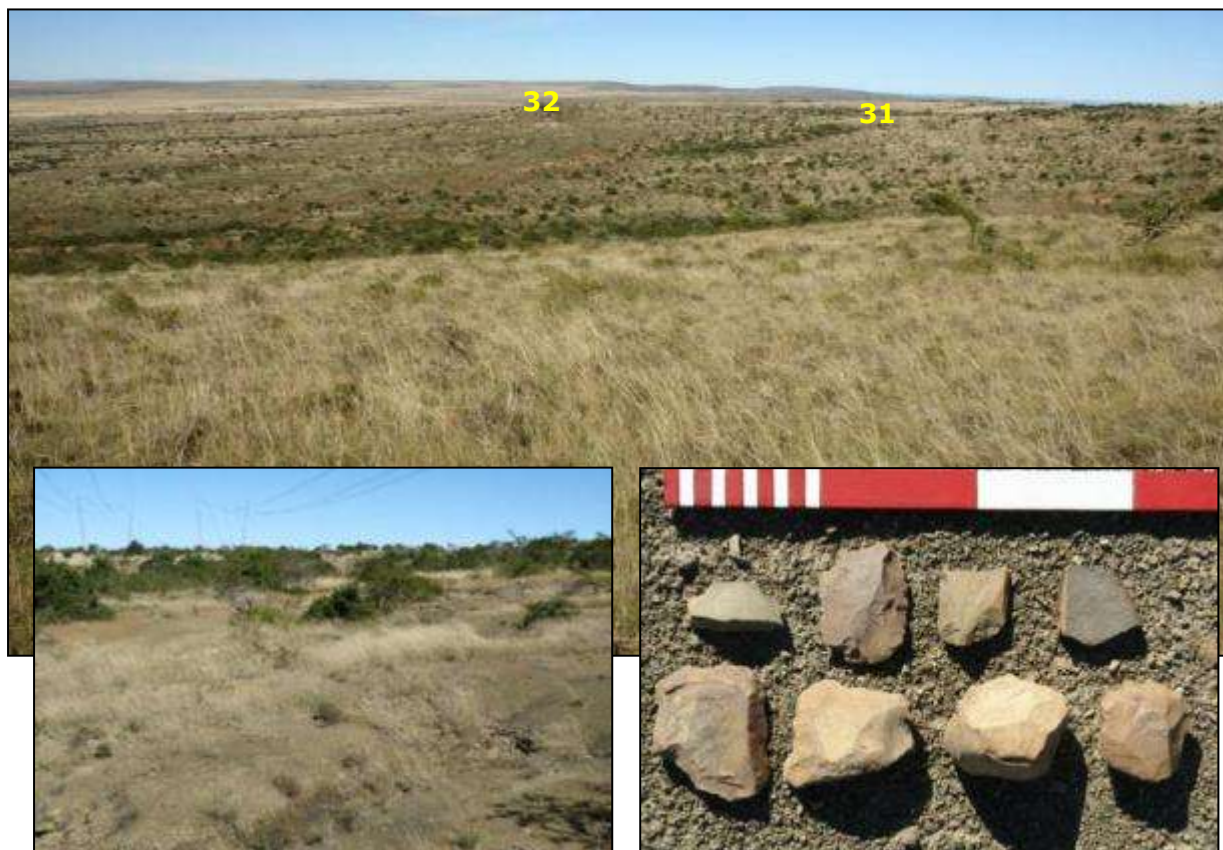
**Figure 6. The pile of stone with lower grindstones exposed in the side of an erosion gully(main image and inserts). The KhoiSan living site is to the top right where the person is standing (main image). The two top inserts are general views of the surface and deep soil erosion adjacent to the site.**



**Figure 7. A view of the khoiSan living site with the stone pile in the background (main image), images of a buried Khoi pot (top left insert), stone tools and pottery fragments (top right insert), a rubber (upper grindstone) (bottom left insert) and a sample of Earlier and Middle Stone Age stone tools from the same area (bottom right insert).**



**Map 6. Aerial image of the middle and southern (pink oval) sections of the Nojoli WEF.**



**Figure 8. A view towards turbines 31 and 32 and the southern section in the far background (main image) and an area of surface erosion (left image) where a number of Middle Stone Age stone tools were observed (right insert).**



**Figure 9. General view of the southern section (main image), turbine position 35 (top left insert), position 38 (top right insert), position 39 (middle left insert), position 42 (middle right insert), position 40 and a view towards positions 44 (bottom inserts).**