

**HERITAGE IMPACT ASSESSMENT: PROPOSED CONSTRUCTION  
OF THE GENOEGSAAM PHOTOVOLTAIC POWER FACILITY ON THE  
FARM ZEEVEN FONTEYNEN 254, CHRIS HANI DISTRICT  
MUNICIPALITY, EASTERN CAPE  
PROVINCE**

(Assessment conducted under Section 38(8) of the  
National Heritage Resources Act 25 of 1999)

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## EXECUTIVE SUMMARY

ACO Associates cc were appointed by ERM Southern Africa (Pty) Ltd, on behalf of the client, Solaire Direct, for the construction of the Genoegsaam photovoltaic power facility on a portion of the farm Zeeven Fonteynen 254, named Glencoe, some 55km north of Cradock in the Chris Hani District Municipality, Eastern Cape Province.

A survey of the land was conducted by Lita Webley and Tim Hart on the 8 March 2012. The desktop Palaeontological Impact Assessment was conducted by Dr Jennifer Botha-Brink of the National Museum in Bloemfontein.

The following heritage indicators were identified:

- According to the desktop PIA report this area contains Upper Permian and Quaternary deposits. Fossils are potentially present on exposures to the north of Genoegsaam and the report suggested that they could roll down the slopes onto the area under construction when they weather out. However, after being on site, this was considered unlikely;
- Scatters of Early, Middle and Late Stone Age artefacts were found on the soil surface in low concentrations. They did not appear to be *in situ*, and they were not associated with any other artefactual material. They are considered to be of low significance;
- No buildings or structures were recorded on the property. The farm buildings of Glencoe are located 1km to the south-east of the proposed facility and are shielded from view by thorn trees. The buildings are constructed of stone and date to the late 19<sup>th</sup> century, they are protected in terms of the NHRA and they are considered of medium significance;
- No cemeteries or graves were recorded on the property;
- The Cultural Landscape is grasslands used as pastures for livestock and game. It is considered of low significance.

The following mitigation measures are recommended:

- No palaeontological mitigation is required. However, due diligence should be applied as the rocks of the surrounding hills belong to the Balfour Formation of the Beaufort Group which is world-renowned for its rich fossil record;
- The ECO responsible for the development must remain aware that all sedimentary deposits have the potential to contain fossils and he/she should thus monitor all substantial excavations into sedimentary bedrock for fossil remains. If any fossils are found during construction, SAHRA should be notified immediately;
- No mitigation is required with regard the pre-colonial archaeology. However, if any human remains are uncovered during construction of the facility, work in that area must cease and SAHRA should be notified. They will advise on the appropriate measures;
- The Visual Impact Specialist should consider whether the proposed facility will have a negative visual impact on farm buildings of Glencoe;
- The Visual Impact Specialist should assess the impact of the proposed facility on the Cultural Landscape and on the N10.

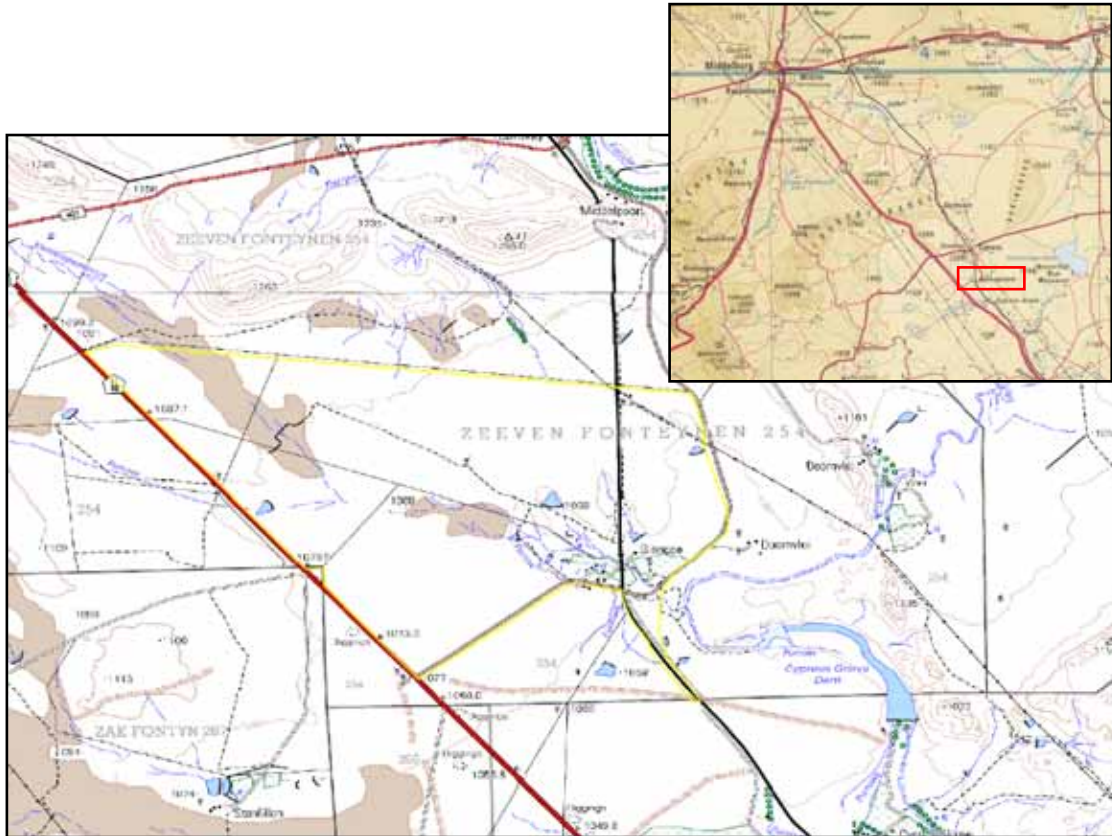
The construction of the proposed PV power facility is supported.

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## 1. INTRODUCTION

ACO Associates cc were appointed by ERM Southern Africa (Pty) Ltd, on behalf of the client, Solaire Direct, for the construction of the Genoegsaam photovoltaic power facility on a portion of the farm Zeeven Fonteynen 254, named Glencoe, in the Chris Hani District Municipality, Eastern Cape Province. The proposed facility will be situated on the N10, about 55km from Cradock and 40km from Middelburg (Figure 1).



**Figure 1:** Location of the proposed PV power facility located between Middelburg and Cradock on the N10.

## 2. DEVELOPMENT PROPOSALS

It is anticipated that the project will feed a total of 10 MWs into the national grid. The key components of the proposed PV power plant include the following:

- PV solar panels/modules (arranged in arrays);
- PV module mountings;
- DC-AC current inverters and transformers;
- New grid connection substation;
- Underground cabling/ overhead power lines;
- On-site buildings (including an operational control centre, office, ablutions and a guard house);
- Access roads and internal road network; and
- Ancillary infrastructure.

The proposed development will include PV solar panels that will occupy less than 20ha (0.2 km<sup>2</sup>) of the site area in total. The PV panels will be mounted on aluminium fixed frame structures approximately 3.33m in height from the ground. The aluminium structures will be mounted on steel screw piles or concrete foundations 1500mm deep, depending on soil conditions. The distance or spacing between rows will be approximately 6.2m. The 132kV power from the new grid connection substation will be connected to the existing Eskom Traction Substation. Existing gravel roads will be upgraded to 6m in width.



**Figure 2:** Aerial view of the proposed location of the PV power facility to the north-east of the N10. Note the position of the railway line which crosses the eastern section of the site, and the location of the sub-station (red square) in the top right hand corner.

### 3. TERMS OF REFERENCE

The assessment includes:

- A desk top study to determine the pre-history and history of the property;
- A site visit to locate and map heritage resources;
- The rating of significance of heritage resources on the property;
- An assessment of whether the construction of the solar reserve will result in a loss of significant heritage resources;
- Recommendations for mitigation if necessary.

### 4. LEGISLATION

The National Heritage Resources Act, No 25 of 1999 (Section 38 (1)) makes provision for a compulsory notification of the intent to development when any development exceeding 5000 m<sup>2</sup> in extent, or any road or linear development exceeding 300m in length is proposed.

The NHRA provides protection for the following categories of heritage resources:

- Cultural landscapes (Section 3(3))
- Buildings and structures greater than 60 years of age(Section 34)

- Archaeological sites greater than 100 years of age(Section 35)
- Palaeontological sites and specimens
- Shipwrecks and aircraft wrecks
- Graves and grave yards (Section 36).

With respect to the Cultural Landscape, the Visual Impact Assessment is being conducted by a VIA specialist. Nevertheless, in terms of Section 3 (2)(d) of the NHRA, No 25 of 1999, the national estate may include “landscapes and natural features of cultural significance”. It is important that the VIA specialist examines the impact of the development on the cultural landscape or consults with a heritage practitioner in this regard.

The Palaeontological Impact specialist report was conducted by Dr Jennifer Botha-Brink of the National Museum in Bloemfontein. The report is attached in full at the end of this HIA (Appendix 2).

## 5. RECEIVING ENVIRONMENT

It is proposed to construct the power facility on flat lands located to the south of a small range of hills, to the west of the railway line and to the north-east of the N10 (Figures 1 & 2). A small dry drainage channel crosses the property from north-west to south-east. It is marked by a line of thorn trees. The property is covered in knee high grasses but there are also patches of exposed silty soil.



**Plate 1:** A panorama of the landscape looking north-west towards the direction of Middelburg. The power facility will be constructed in the foreground.



**Plate 2:** View to the east, toward the substation and railway line.



**Plate 3:** View in south-westerly direction towards the dry river bed indicated by the line of thorn trees. The N10 lies beyond the river bed and will be located about 900m from the proposed facility.

### **5.1 Palaeontological Background**

The geology of the farm Genoegsaam (described in Appendix 2) contains Late Permian rocks, which are between 255 and 252 million years old and belong to the Balfour Formation of the Beaufort Group, Karoo Supergroup. These rocks consist mostly of mudstones and siltstones. The Beaufort Group is world-renowned for its rich fossil record. They contain some of the most significant evidence for the origins of dinosaurs, mammals and turtles. The rocks of the Beaufort Group are sub-divided into assemblage zones according to the various vertebrate fossils found in each zone. Genoegsaam falls within the *Dicynodon* Assemblage Zone, named after the most common dicynodont therapsid fossil found in the zone. The Dicynodon Assemblage Zone fauna include fish, amphibians, reptiles and numerous species of therapsids (the ancient ancestors of mammals).

A tiny portion of the sediments on Genoegsaam are intruded by non-fossiliferous Early Jurassic Karoo dolerite.

Superficial deposits of non-fossiliferous alluvium cover approximately 40% of Genoegsaam.

### **5.2 Archaeological Background**

Very little is known of this part of the Eastern Cape as little systematic archaeological work has been done. The Albany Museum in Grahamstown has received donations of stone implements from members of the public from as early as the 1880s. Many of these collections were received from Cradock area – where freshwater mussel middens containing stone implements and pottery were recorded from the banks of the Fish River. A certain JJ Kissack from Cradock started making donations of implements to the Museum during the 1930s. His collections included Early and Middle Stone Age material, including artefacts from the Conway station (near to the site).

We can therefore anticipate that the study area will contain artefactual material dating to the Early Stone Age and Middle Stone Age of the Pleistocene epoch (*3 million – 20 000 years ago*). This material is often noted in eroded areas, or on terraces in river valleys. Under very rare circumstances it is found in undisturbed contexts in association with fossil bone. Such sites enjoy high status in research terms as they have the potential to produce significant information about early human behaviour. A survey by Webley & Hart (2010) on the farms Denmark and Groene Vallei on the R61 to the west of Cradock, identified surface scatters of MSA and LSA artefact scatters along a rocky ledge on Denmark and a “factory” or “quarry” site on Groene Vallei.

Excavations by Hewitt (1931) at Tafelberg Hall and by Deacon (1976) at Highlands Rock Shelter near Cradock have produced Later Stone Age materials from both rock shelters. Deacon (1976) has two dates of 4 500BP and 3570BP from Highlands Rock Shelter. Illustrations of stone tools in Deacon's (1976) monograph show that both sites contained end scrapers and backed microliths on indurated shale. Deacon also refers to excavations by Pat Kramer of a freshwater shell midden on the Fish River but this unfortunately was never published.

However, the most comprehensive survey of Later Stone Age archaeology from open sites was conducted by CG Sampson over a period of 30 years. His study area comprises the Zeekoe Valley (Seacow River Valley), situated between Middelburg and Richmond (Sampson 1992), at least 50km west of the proposed facility. His detailed research has resulted in a comprehensive body of information which we may "borrow from" in terms of predicting the pre-colonial sensitivity of the area.

We may predict with some confidence that there will be Later Stone Age sites within the study area. These are attributed to the ancestors of the San people and Khoekhoen pastoralists (after 2000 years ago). The legacy of the San includes numerous open sites while traces of their presence can also be found in most large rock shelters, often in the form of rock art. They frequently settled a short distance from permanent water sources (springs or waterholes) and made use of natural shelters such as rock outcrops or large boulders. In the Great Karoo natural elevated features such as dolerite dykes and ridges played a significant role in San settlement patterns. The introduction of pastoralism (sheep and goats, later cattle) roughly 2000 years along with the arrival of the Khoekhoen was a significant event that broke the ancient tradition of hunting and gathering. According to the historic records the Khoekhoen herders were divided into large tribal communities, distributed along the coastal plains and up as far as Graaff Reinet. These transhumant communities (herding cattle and sheep) may have utilized the grazing opportunities of the Karoo on a seasonal basis but information on this is sketchy. The San appear to have retreated to the Great Karoo with the arrival of the first Dutch Trekboers in the mid-18<sup>th</sup> century. Here they managed to eke out an existence which includes hunting, gathering and raiding the livestock of the Trekboers, resulting in the "Bushman War" which continued for almost 60 years. Eventually the *kommandos* which were dispatched from regional centers such as Graaff Reinet prevailed, and the "wild bushman" of the Karoo were rendered extinct by the early 19<sup>th</sup> century.

### **5.3 Historical Background**

Sampson has recorded the spread of European settlement into the Seacow River Valley, which is located to the west of Middelburg. According to Sampson et al (1994), the first Trekboers settled in the headwaters of the Seacow River valley in the 1770s but many were driven out by attacks from Bushmen. A few farms were re-occupied in the 1780s and 1790s. "Land seizures from resident Bushmen were legitimised by the granting of Loan Places, i.e. rectangular 3000 morgen tracts of Karoo veld separated by unclaimed land" (Neville et al 1994:65).

In 1813, the Cradock Proclamation gave the right to Loan Place holders to apply for their lands to be granted to them in Perpetual Quitrent. "By 1840, swarms of these contiguous quitrent farms were in place, separated by vast, unchartered tracts of Crown Land which served, among other things, as a refugium for surviving Bushmen" (Sampson 1994a: 65).

Farmers were urged to make peace with the San through gifts of meat, tobacco and trinkets. Between 1825 and 1840, travellers reported increasing numbers of farm Bushmen acting as herders and servants. By the 1840s, when the first towns sprung up around the valley, most unattached Bushmen were partly acculturated and some were drawn into slum communities where they lost their identities.



Middelburg has its origins as a church town (Logie 2008) on the farm Driefontein in 1852. According to Franssen (2006), Cradock was proclaimed a town in 1814 although the first buildings were only constructed in 1818. The town became a municipality in 1873 and in 1883 the railway line from Cradock reached Middelburg Road (Rosmead Station). The little village of Conway, which is located near the proposed facility, is situated on the railway line and probably dates to the construction of the line. According to Logie (2008), there are a number of historic buildings in the village.

The farm Zeeven Fonteynen 254, on which the proposed facility will be constructed, was surveyed and granted to Johannes J Kruger in November 1836 (S.G. 417/1836).

## **6. METHODOLOGY**

The survey was conducted by Lita Webley and Tim Hart on the 8 March 2012. All heritage sites were recorded with the GPS, photographed and their significance rated. No archaeological material was removed from the project area, but recorded and photographed *in situ*. The reader of this report is referred to the appendices which contain the details of observations made in the field.

The desktop Palaeontological Impact Assessment was conducted by Dr Jennifer Botha-Brink of the National Museum in Bloemfontein and is attached as Appendix 2.

### **6.1 Limitations**

There were no restrictions to the survey except that an absence of farm tracks meant that we had to drive through the veld, with the permission of the landowner. It was difficult to survey close to the dry stream bed as the landowner warned us of marshy conditions. The ground cover consists of knee high grasses but there are many places where the silty soil is exposed, making visibility good.

## **7. RESULTS OF THE SURVEY**

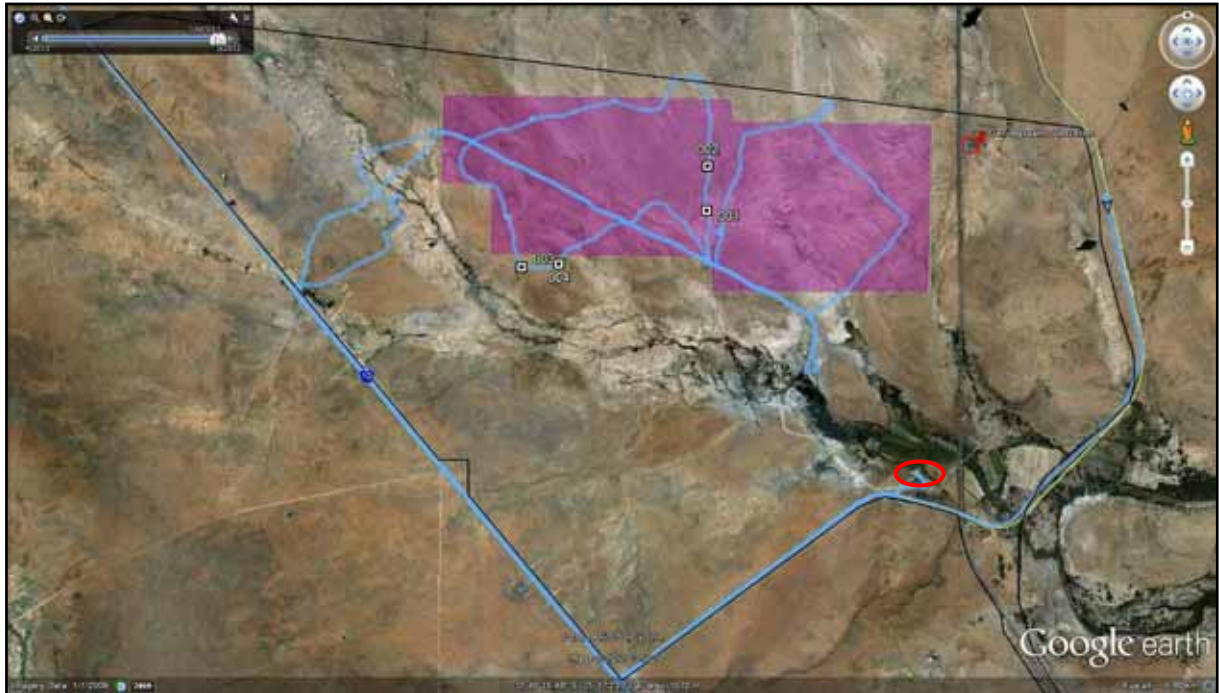
The location of the proposed PV power facility was surveyed by vehicle and on foot. A total of four archaeological "sites" were recorded (Figure 3) and are described in more detail in Appendix 1.

Although we have recorded four archaeological "sites" it is important to emphasise that there are scatters of ESA, MSA and LSA material across the landscape. However, the vegetation in these particular areas was very sparse and the stone artefacts were clearly visible on the silty soils (Plate 4).

The artefacts were made on indurated shales (or hornfels) and consisted of a range of stone artefacts spanning the Early, Middle and Later Stone Age.

We found a very small, weathered handaxe as well as a larger cleaver. Both are clearly recognisable artefacts of the Early Stone Age.

There are also weathered triangular flakes and snapped blades with prepared platforms, indicating the Middle Stone Age.



**Figure 3:** Aerial view of the proposed location of the PV power facility (within the purple polygon). Our survey tracks are shown in blue and the farmhouse is circled in red.

Finally, there are a number of unpatinated, black hornfels flakes and bladelets indicating the Later Stone Age. We recorded one end scraper. It closely resembles the hand drawn illustrations of end scrapers recovered by Deacon (1976) at Highlands Rock Shelter and by Hewitt (1931) at Tafelberg Hall. It is therefore possible that the LSA material on the property also dates to around 4500-3750 BP.



**Plate 4:** View of silty soil patches containing stone artefacts.



**Plates 5 & 6:** Handaxe and cleaver, both on weathered indurated shales.



**Plates 7 & 8:** Collection of stone artefacts showing the range of patination – note the Later Stone Age end scraper at the bottom, right.

According to the S.G. diagrams for the farm Zeven Fonteynen, the property (now named Glencoe) dates back to at least 1838. There are a number of 19<sup>th</sup> century farm buildings on the property. These buildings are located about 1km south-east of the proposed PV power facility and they are screened from the development by a thick grove of thorn trees (Figure 3). We know that the property was surveyed for Johannes Kruger in 1838 and therefore some of the buildings may date to this period or soon afterwards.



**Plates 9 & 10:** The back and front of the main farmhouse. It has been considerably altered.



**Plate 11:** Stone shed.



**Plates 12 & 13:** Stone shed and kraal.

## 8. ASSESSMENT OF IMPACT AND SIGNIFICANCE

The main heritage indicators are:

- According to the desktop PIA report this area contains Upper Permian and Quaternary deposits. Fossils are potentially present on exposures to the north of Genoegsaam and according to the PIA report they may roll down the slopes of the nearby hill onto the area under construction when they weather out. However, after being on site, we consider this unlikely;
- There is a disbursed scatter of Early, Middle and Later Stone Age artefacts across the proposed area for the PV power facility;

- There are some 19<sup>th</sup> century stone buildings clustered 1km to the south-east of the proposed facility;
- The Cultural Landscape consists of natural veld used as pastures for livestock and game.

### **8.1 Significance**

The rocks of the hills to the north of the proposed PV power facility belong to the Balfour Formation of the Beaufort Group which is world-renowned for its rich fossil record. Fossils from this area could potentially have very high significance.

The disbursed scatters of ESA, MSA and LSA stone tools are very common in the Karoo and they are of low significance.

The farm buildings on Glencoe consist of stone structures which are at least 60 years of age. Some probably date to the late 19<sup>th</sup> century. They are protected by the NHRA, No 25 of 1999, and may not be altered or destroyed. The main farmhouse has been altered and is no longer in its original condition. However, the outbuildings such as the sheds and kraal are considered to have medium significance as they are still in good condition.

The Cultural Landscape may be considered to have low significance. However, the Visual Impact specialist should consider the impact of the proposed development on motorists travelling along the N10.

### **8.2 Impact**

With regard the palaeontology of the area (see Appendix 2 at the end of the report) the Palaeontological Impact Assessment has indicated that the rocks of the surrounding hills belong to the Balfour Formation of the Beaufort Group which is world-renowned for its rich fossil record. Fossils are potentially present on exposures to the north of Genoegeesam and may roll down the slopes onto the area under construction when they weather out. Fossils may be exposed and destroyed during the construction of the PV power facility. However, after being on site and considered the distance between the proposed facility and the nearby hill, it is considered unlikely that fossils will roll onto site.

**Table 1: Impacts to Palaeontology**

Criteria	Without Mitigation	With Mitigation
Extent	Regional	Local
Duration	Permanent (loss of palaeontological resources is permanent)	n/a
Intensity	High	Medium
Probability	High	Low
Confidence	High	Medium
Significance	High	Low
Nature of cumulative impact	High	
Can impact be reversed?	No, palaeontological resources are non-renewable	
Impact may cause irreversible loss of resources	Yes, if fossils are destroyed.	
Can impact be mitigated?	The ECO responsible for the development must remain aware that all sedimentary deposits have the potential to contain fossils and he/she should thus monitor all substantial	

	excavations into sedimentary bedrock for fossil remains. If any fossils are found during construction, SAHRA should be notified immediately.
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**Table 2: Impacts to Pre-colonial Archaeology**

The impact of the construction of the PV power facility on the archaeology of the area is considered to be low and no mitigation is required.

Criteria	Without Mitigation	With Mitigation
Extent	Local	Local
Duration	Permanent (loss of archaeological resources is permanent)	n/a
Intensity	Very Low	Very Low
Probability	Medium	Low
Confidence	Medium	Medium
Significance	Low	Low
Nature of cumulative impact	Low	
Can impact be reversed?	No, archaeological resources are non-renewable	
Impact may cause irreversible loss of resources	No.	
Can impact be mitigated?	No mitigation required.	

**Table 3: Impacts to Built Environment**

The proposed facility will be constructed at least 1km to the north-west of the present farmhouse of Glencoe. There is a thick grove of trees separating the farm buildings from this site (Figure 3) and it seems unlikely that there will be a visual impact on the Built Environment of the farm. However, this must be determined by the Visual Impact Specialist.

Criteria	Without Mitigation	With Mitigation
Extent	Local	Local
Duration	n/a	n/a
Intensity	Low	Low
Probability	Low	Low
Confidence	Medium	Medium
Significance	Medium	Low
Nature of cumulative impact	None	
Can impact be reversed?	Yes, after facility is decommissioned	
Impact may cause irreversible loss of resources	The visual impact of the proposed development on the farm buildings must be assessed by the Visual Impact Specialist.	
Can impact be mitigated?	Yes, the Visual Impact Specialist will indicate if this is required.	

**Table 4: Impacts to Cultural Landscape**

The proposed facility will be constructed on flat grasslands adjoining the N10 which links Cradock with Middelburg. The Cultural Landscape of the area is not considered to have high significance but the Visual Impact Specialist can advise on this. The VIA specialist should also consider the impact of the facility on motorists travelling along the N10.

Criteria	Without Mitigation	With Mitigation
Extent	Local	Local
Duration	Long term	Long term
Intensity	Low	Low
Probability	Medium	Low
Confidence	Medium	Low
Significance	Low	Low
Nature of cumulative impact	Low	
Can impact be reversed?	Yes, after facility is de-commissioned	
Impact may cause irreversible loss of resources	No, it is not expected that the proposed facility will have a significant impact on the Cultural Landscape but this must be determined by the Visual Impact Specialist	
Can impact be mitigated?	Yes, visual impact specialist to consider whether there will be an impact and to suggest mitigation measures	

### 8.3 Mitigation

No specific mitigation is required with regard the palaeontology, but the ECO responsible for the development must remain aware that all sedimentary deposits have the potential to contain fossils and he/she should thus monitor all substantial excavations into sedimentary bedrock for fossil remains. If any fossils are found during construction, SAHRA should be notified immediately.

With regard archaeology, no mitigation is required. However, if any human remains are uncovered during construction of the facility, work in that area must cease and SAHRA should be notified. They will advise on the appropriate measures.

The Built Environment comprises a complex of 19<sup>th</sup> century farm buildings located about 1km south-east of the proposed facility. The buildings are screened from the site by a grove of trees. However, the Visual Impact Specialist should consider whether the proposed facility will have a negative visual impact on farm buildings of Glencoe.

The Visual Impact Specialist needs to consider the impact of the proposed facility on the Cultural Landscape, including the N10.

## 9. RECOMMENDATIONS

The following heritage indicators were identified:

- According to the desktop PIA report this area contains Upper Permian and Quaternary deposits. Fossils are potentially present on exposures to the north of Genoegsaam and may roll down the slopes onto the area under construction when they weather out. However, after being on site, this is considered unlikely;
- Scatters of Early, Middle and Late Stone Age artefacts were found on the soil surface in low concentrations. They did not appear to be *in situ*, and they were not associated with any other material such as bone fragments, ostrich eggshell or pottery. They are considered to be of low significance;
- No buildings or structures were recorded on the property. The farm buildings of Glencoe are located 1km to the south-east of the proposed facility and are shielded

from view by thorn trees. The buildings are constructed of stone and date to the late 19<sup>th</sup> century, they are protected in terms of the NHRA and they are considered of medium significance;

- No cemeteries or graves were recorded on the property;
- The Cultural Landscape is grasslands which are used as pastures for livestock and game. It is considered of low significance.

The following mitigation measures are recommended:

- No palaeontological mitigation is required. However, due diligence should be applied as the rocks of the surrounding hills belong to the Balfour Formation of the Beaufort Group which is world-renowned for its rich fossil record;
- The ECO responsible for the development must remain aware that all sedimentary deposits have the potential to contain fossils and he/she should thus monitor all substantial excavations into sedimentary bedrock for fossil remains. If any fossils are found during construction, SAHRA should be notified immediately;
- No mitigation is required with regard the pre-colonial archaeology. However, if any human remains are uncovered during construction of the facility, work in that area must cease and SAHRA should be notified. They will advise on the appropriate measures;
- The Visual Impact Specialist should consider whether the proposed facility will have a negative visual impact on farm buildings of Glencoe;
- The Visual Impact Specialist should assess the impact of the proposed facility on the Cultural Landscape and on the N10.

## 10. REFERENCES

- Booth, C. 2011. An archaeological desktop study for the proposed 200MW wind energy facility near Aberdeen, Camdeboo Local Municipality, Eastern Cape Province. Unpublished report for Savannah Environmental (Pty) Ltd.
- Deacon, H.J. 1976. Where Hunters Gathered: a study of Holocene Stone Age people in the Eastern Cape. South African Archaeological Society Monograph Series No 1.
- Fransen, H. 2006. Old towns and villages of the Cape. Cape Town: Jonathan Ball Publishers.
- Logie, B. 2008. Dusty Road to Long Ago. Bluecliff Publishing: Port Elizabeth.
- Moir, R.W. & Sampson, C.G. 1993. European and Oriental ceramics from rock shelters in the Upper Seacow Valley. *Southern African Field Archaeology* 2:35-43.
- Neville, D., Sampson, B.E. & Sampson, C.G. 1994. The frontier wagon track system in the Seacow River Valley, North-Eastern Cape. *South African Archaeological Bulletin* 49: 65-72.
- Sampson, C.G., 1988 Stylistic boundaries among mobile hunter-gatherers in the Zeekoe Valley, Eastern Cape. *Washington, Smithsonian Institution Press*.
- Sampson, C.G. 1993. 'Zeer grote liefhebbers van tobak': Nicotine and Cannabis dependency of the Seacow River Bushmen. *The Digging Stick* Vol 10(1): 1-6
- Sampson, C.G., Sampson, B.E. & Neville, D. 1994a. An early Dutch settlement pattern on the north east frontier of the Cape Colony. *Southern African Field Archaeology* 3: 74-81



Sampson, C.G. & Sampson, B.E. 1994b. Nineteenth century survey diagrams of the Seacow River Valley. *Martevaan* 11:1-15.

Sampson, C.G. 1995. Acquisition of European livestock by the Seacow River Bushmen between AD 1770-1890. *Southern African Field Archaeology* 4:30-36.

Webley, L. & Hart, T. 2010. Scoping Archaeological Impact Assessment: Proposed prospecting on Denmark 119 and Groene Vallei 226 North and South (Site 37), Cradock, Eastern Cape. Unpublished report for Tasman Pacific Minerals Limited.

The Surveyor Generals Office, Cape Town.

**Appendix 1:** List of heritage sites recorded during the assessment

<b>Site Name</b>	<b>GPS co-ordinates</b>	<b>Discussion</b>	<b>Significance</b>
001	S31 45 50.4 E25 17 42.9	Flat deflated area, no vegetation, near farm fence. Collection of weathered hornfels flakes, probably MSA	Low
002	S31 45 42.5 E25 17 42.9	A small handaxe on hornfels, very weathered. Also in a deflated area alongside the fence. There is a background scatter of stone artefacts.	Low
003	S31 46 00.9 E25 17 04.6	A scatter of artefacts from different time periods, including a weathered Early Stone Age core on hornfels, some weathered MSA flakes and some LSA artefacts on unpatinated hornfels, including a bladelet and endscraper.	Low
004	S31 46 00.3 E25 17 12.4	A ESA cleaver, an unpatinated hornfels core, on silty soils in a deflated area.	Low