

**A PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) FOR THE PROPOSED
75 MW COLLETT PHOTOVOLTAIC POWER STATION AND ASSOCIATED
INFRASTRUCTURE AT COLLETT SUBSTATION, ON FARMS 335/0 AND FARM 180/0,
NEAR MIDDLEBURG, EASTERN CAPE PROVINCE**

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Note: This report follows the minimum standard guidelines required by the South African Heritage Resources Agency for compiling a Phase 1 Archaeological Impact Assessment (AIA).

1. EXECUTIVE SUMMARY

Purpose of the Study

The purpose of the study was to conduct a phase 1 archaeological impact assessment (AIA) for the proposed Photovoltaic Power Plant at Collett Substation, near Middleburg, Eastern Cape Province. The survey was conducted to establish the range and importance of the exposed and *in situ* archaeological heritage materials and features, the potential impact of the development, and to make recommendations to minimize possible damage to these sites (see page 24 for full recommendations).

2. BACKGROUND INFORMATION

AE-AMD Renewable Energy proposes to establish a 75 MW photovoltaic solar farm outside Middleburg in the Eastern Cape to supply electricity to Eskom via the REBID program.

The phase 1 archaeological impact assessment (AIA) report has been prepared as part of the Environmental Impact Assessment (EIA) process. The proposed activity includes the development of a 75 MW photovoltaic solar farm that would comprise the following infrastructure:

- Up to 75 MW of photovoltaic (PV) panels; with a coverage of 225 ha on farms 335/0 and 180/0. The greater portion of panels will be on Farm 335/0;
- A 132kV connection power line from the PV plant to the existing Eskom Collect substation on Farm 180/0;
- A 400m wide power line corridor to be developed from the photovoltaic plant to the Collett substation;
- A second 400m wide corridor to be developed from Rosmead to the Photovoltaic plant.
- A high quality gravel access road to the solar PV plant development, which will either be the existing Spoornet access road which runs alongside the railway line (Farm 180/0 and 335/0 and then onto the Rosmead town commonage) or the existing access road to Farm 335/0 (Farm 335/0 and then onto the Rosmead town or

commonage), with the construction of about 1.5km of new road from the farm access road to the site.

Terms of Reference (ToR)

- Provide a description of the area that would be affected by the activity;
- Provide an outline and description of the approach/methodology used during the phase 1 archaeological impact assessment (AIA) including assumptions, limitations, sources of information and the knowledge of local people (where possible);
- Provide a description and assess the sensitivity of the affected environment (archaeological heritage) that were identified during the phase 1 archaeological impact assessment (AIA);
- Identify the potential sources of risk to the affected environment (archaeological heritage) as a result of the construction of the proposed solar farm for the construction and operation phases; and
- Provide a clear statement identifying potential environmental impacts of the proposed project of the archaeological heritage and indicate any very significant adverse environmental impacts that cannot be mitigated and will jeopardise the project.

Developer:

AE-AMD Renewable Energy (Pty) Ltd

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3. BRIEF LEGISLATIVE REQUIREMENTS

Parts of sections 34(1), 35(4), 36(3) and 38(1) (8) of the National Heritage Resources Act 25 of 1999 apply:

Structures

34. (1) *No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.*

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 paleontological 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, power line, 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 5000m² 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 000m² 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.

4. BRIEF ARCHAEOLOGICAL BACKGROUND

Literature review

The Early Stone Age (ESA) spans a period of between 1.5 million and 250 000 years ago and refers to the earliest that *Homo sapiens sapiens* predecessors began making stone artefacts. The Acheulian Industry which replaced the Olduvian Industry approximately 1.5 million years ago is attested to in diverse environments and over wide geographical areas. The hallmark of the Acheulian Industry is its large cutting tools (LCTs or bifaces), primarily handaxes and cleavers. The end products were astonishingly similar across the geographical and chronological distribution of the Acheulian techno-complex: large flakes that were suitable in size and morphology for the production of handaxes and cleavers perfectly suited to the available raw materials (Sharon 2009). Early Stone Age stone artefacts endure for long periods and generally occur as open air surface scatters either as isolated occurrences or in large quantities and very rarely in association with other archaeological heritage, plant and material remains. The Albany Museum database includes records of occurrences of Acheulian handaxes between Middelburg and the Camdeboo National Park near Graaff Reinet, Sampson (1985) located a large number of sites and there is also a collection in the Albany Museum from the Cradock area.

The large Early Stone Age handaxes and cleavers were replaced by smaller stone tools called the Middle Stone Age flake and blade industries. The Middle Stone Age spans a period from 250 000-30 000 years ago and focuses on the emergence of modern humans through the change in technology, behaviour, physical appearance, art, and symbolism. Various stone artefact industries occur during this time period, although less is known about the time prior to 120 000 years ago, extensive systemic archaeological research is being conducted on sites across southern Africa dating within the last 120 000 years (Thompson & Marean 2008). Surface scatters of these flake and blade industries occur widespread across southern Africa although rarely with any associated botanical and faunal remains. It is also

common for these stone artefacts to be found between the surface and approximately 50-80cm below ground. Fossil bone may be associated with Middle Stone Age occurrences. These stone artefacts, like the Earlier Stone Age handaxes are usually observed in secondary context with no other associated archaeological material. The Albany Museum database holds records of the occurrence of Middle Stone Age stone artefacts around the Cradock area and the Department of Archaeology has curated Middle Stone Age stone artefacts in its collection from the Cradock area including Highlands Rock Shelter excavated by H.J. Deacon during the 1970's.

Relevant archaeological impact assessments conducted by the Archaeology Contracts Office of the National Bloemfontein Museum in 2006 (Van Ryneveld & Koortzen 2006) and the Albany Museum in 2008 have recorded surface scatters of Middle Stone Age stone artefacts in the Cradock vicinity (Binneman & Booth 2008). Middle Stone Age stone artefacts (long blades and points) are found throughout the region, but because these are found in the open areas it is difficult to know where they fit into the cultural time sequence. At Highlands Rock Shelter MSA stone artefacts, possibly a Howieson's Poort Industry, was dated older than 30 000 years (Deacon 1976). Sampson on the other hand reported many open-air MSA sites which he assigned to the Orangian Industry (dating between 128 000 - 75 000 years old), Florisbad and Zeekoegat Industries dating between 64 000 and 32 000 years old.

The Later Stone Age spans a period from 30 000 years ago to the historical period (the last 500 years) until 100 years ago and is associated with the archaeology of San hunter-gatherers. The majority of archaeological sites date from the past 10 000 years where San hunter-gatherers inhabited the landscape living in rock shelters and caves as well as on the open landscape, inland and along the coast. The open sites are difficult to locate because they are in the open veld and often covered by vegetation and sand and those along the coast are sometimes opened and closed by the movement of the dunes. Sometimes these sites are only represented by a few stone artefacts and fragments of bone. The preservation of these sites is poor and it is not always possible to date them (Deacon & Deacon 1999). Caves and rock shelters, however, in most cases, provide a more substantial preservation record of pre-colonial human occupation. The Albany Museum holds records of Later Stone Age fresh water shell midden sites along the Fish River and the surrounding area as well as rock shelters containing rock paintings. Some 2 000 years ago Khoekhoen pastoralists entered into the region and lived mainly in small settlements. They were the first food producers in South Africa and introduced domesticated animals (sheep, goats and cattle) and ceramic vessels to southern Africa.

Often, these archaeological sites are found close to the banks of large streams and rivers and along the coast. Large piles of freshwater mussel shell (called freshwater middens) usually mark the large stream and river sites and large piles of marine shellfish middens mark the coastal sites. Pre-colonial groups collected the freshwater mussel from the muddy banks of the rivers as a source of food. Mixed with the shell and other riverine and terrestrial

food waste are also cultural materials. Human remains are often found buried in the middens along the coast (Deacon and Deacon 1999).

In general little systematic archaeological research and regional surveys/recordings have been conducted in the Cradock area. The only systematic survey and recording in the immediate vicinity was conducted in the Mountain Zebra National Park (Brooker 1974) and H.J. Deacon (1976) excavated Highlands Rock Shelter a few kilometres to the north. Sampson's, Brooker's, and Deacon's research and surveys, together with records/collections of the Albany Museum, provide the background information for compiling an archaeological time sequence for the region. The Later Stone Age deposits at Highlands Rock Shelter date to 4 500 years old (Deacon 1976). Better preservation of organic material at Highlands Rock Shelter provides some insight into hunter-gatherer subsistence in the area. Collecting of underground plant remains such as *Cyperus usitatus* and *Freezia corymbrosa* would appear to have been an important food source together with the hunting of mountain zebra/quagga, mountain reedbuck, and various small antelope such as duiker, klipspringer and steenbok. The survey of the Mountain Zebra National Park (Brooker 1974) confirmed that the area is rich in archaeological remains and that some of the Later Stone Age time sequence for the region was present, as well as rock art.

Unfortunately, apart from the stone tools, little else is preserved and it is not possible to reconstruct subsistence patterns. Also listed in the museum records are freshwater shell middens along the banks of the Great Fish River and small quantities of crab and freshwater mussel were also found in the excavations. Many stock enclosures with stone walls and fragments of sand-tempered ceramic vessels are found throughout the Seacow River area and are most probably associated with Khoekhoen pastoralists who settled in the area during the past 1000 years.

Rock art is generally associated with the Later Stone Age period mostly dating from the last 5000 years to the historical period. It is difficult to accurately date the rock art without destructive practices. The southern African landscape is exceptionally rich in the distribution of rock art which is determined between paintings and engravings. Rock paintings occur on the walls of caves and rock shelters across southern Africa. Rock engravings, however, are generally distributed on the semi-arid central plateau, with most of the engravings found in the Orange-Vaal basin, the Karoo stretching from the Eastern Cape (Cradock area) into the Northern Cape as well as the Western Cape, and Namibia. At some sites both paintings and engravings occur in close proximity to one another especially in the Karoo and Northern Cape. The greatest concentrations of engravings occur on the and site basement rocks and the intrusive Karoo dolerites, but sites are also found on about nine other rock types including dolomite, granite, gneiss, and in a few cases on sandstone (Morris 1988).

5. DESCRIPTION OF THE PROPERTY

Area Surveyed

The area for the proposed Collett 75 MW Photovoltaic Solar Farm is situated on two farms, Farm Harms Fontein 335/0 and Farm Brakke Kuilen 180/0, approximately 5km south-east of the railway village Rosmead, off the R56 road TO Middelburg. The proposed area is approximately 225ha in extent. The Farm Harms Fontein 335/0 is proposed to contain the majority of the structures, while the existing Collett Substation situated on the Farm Brakke Kuilen 180/0 will be upgraded.

The proposed area comprises typical Karoo vegetation predominantly made up of Eastern Upper Karoo and Tarkastad Montane Shrubland. No main waterways or perennial streams occur within the area.

Map

1:50 000 map: 3125 CA TAFELBERG

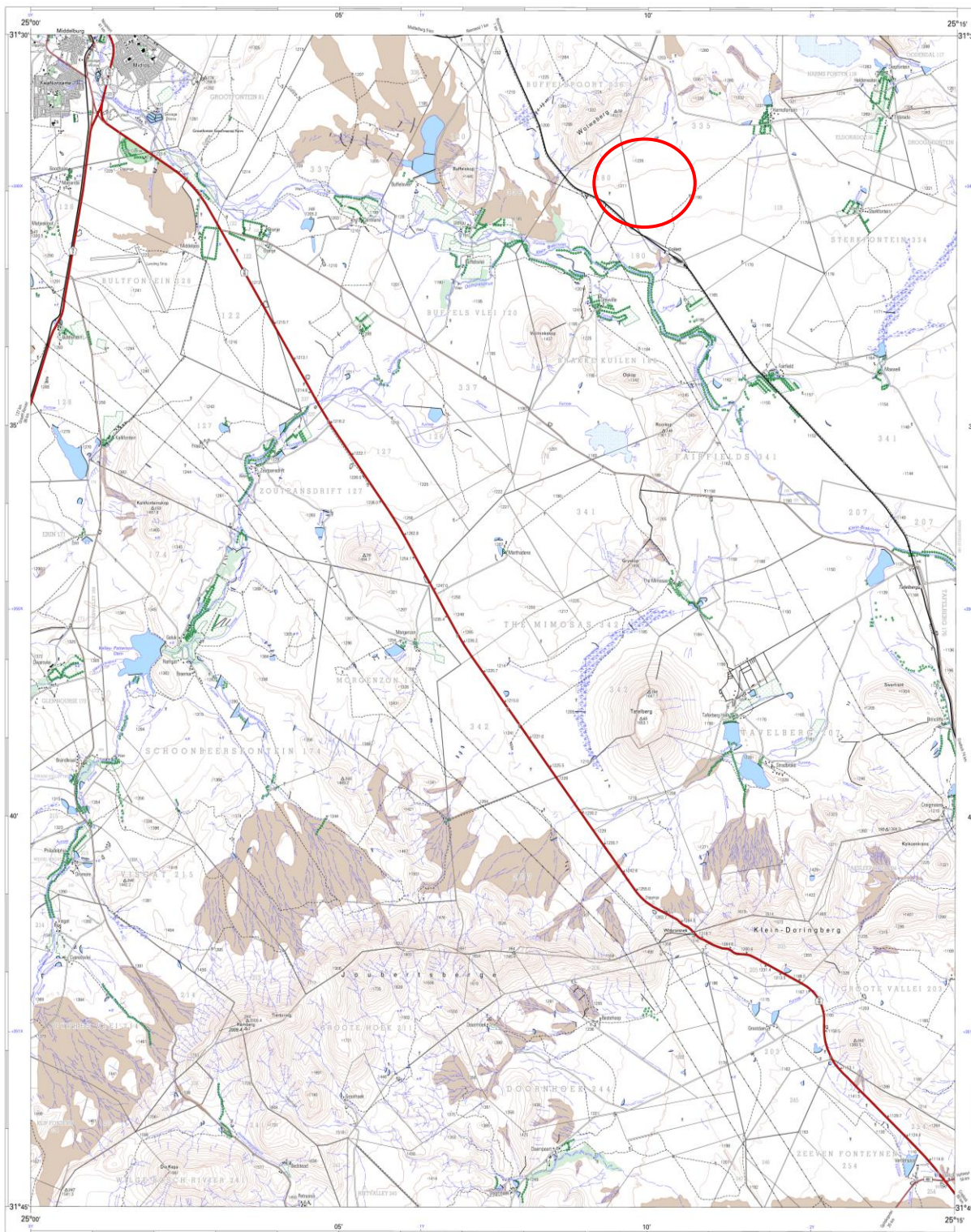


Figure 1. Map 1. 1:50 000 topographic map showing the location of the area proposed for the Collett 75 MW Photovoltaic Solar Farm.

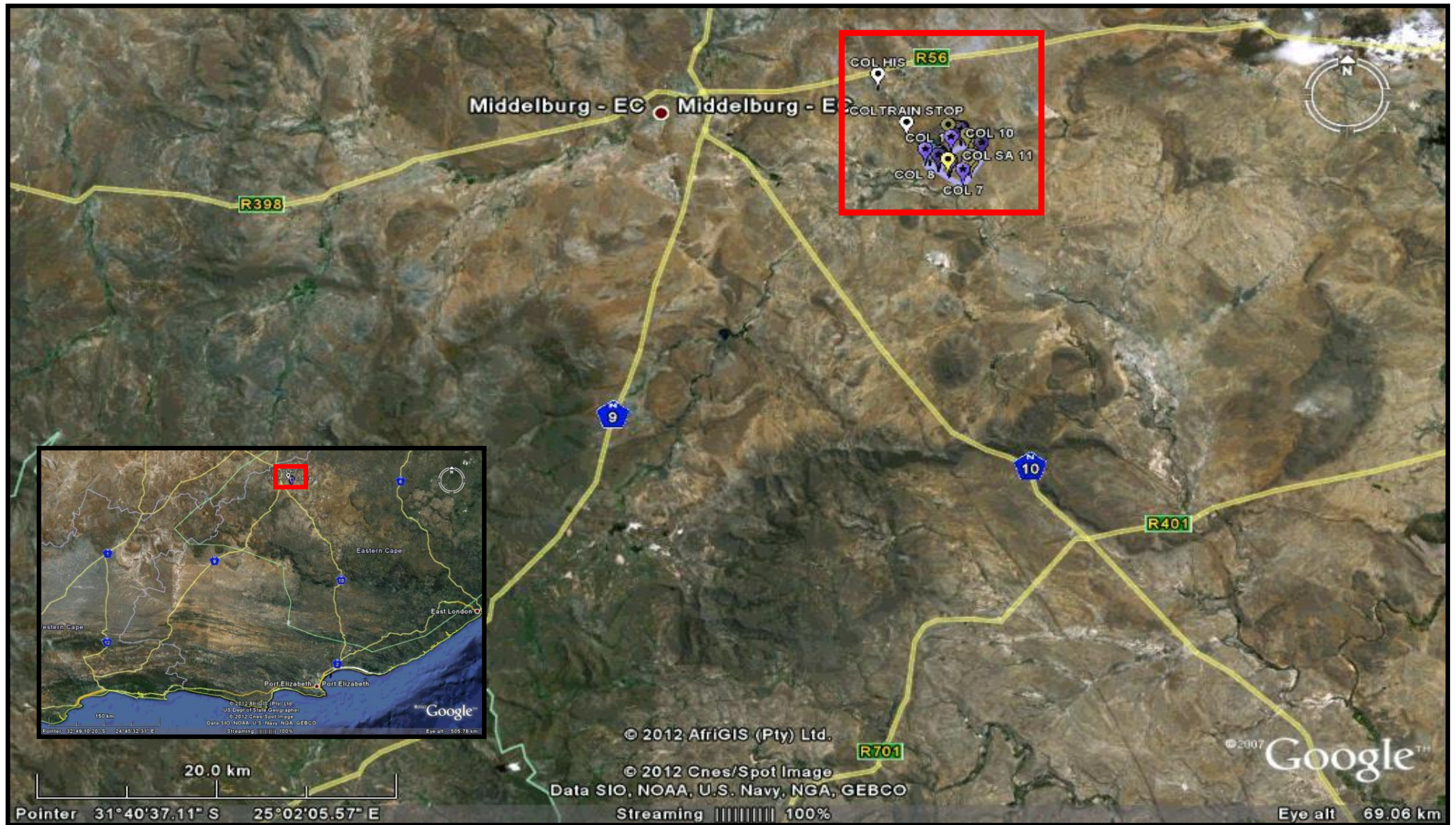


Figure 2. Map 2. Aerial view of the location of the area proposed for the development of the Collett 75 MW Photovoltaic Solar Farm.

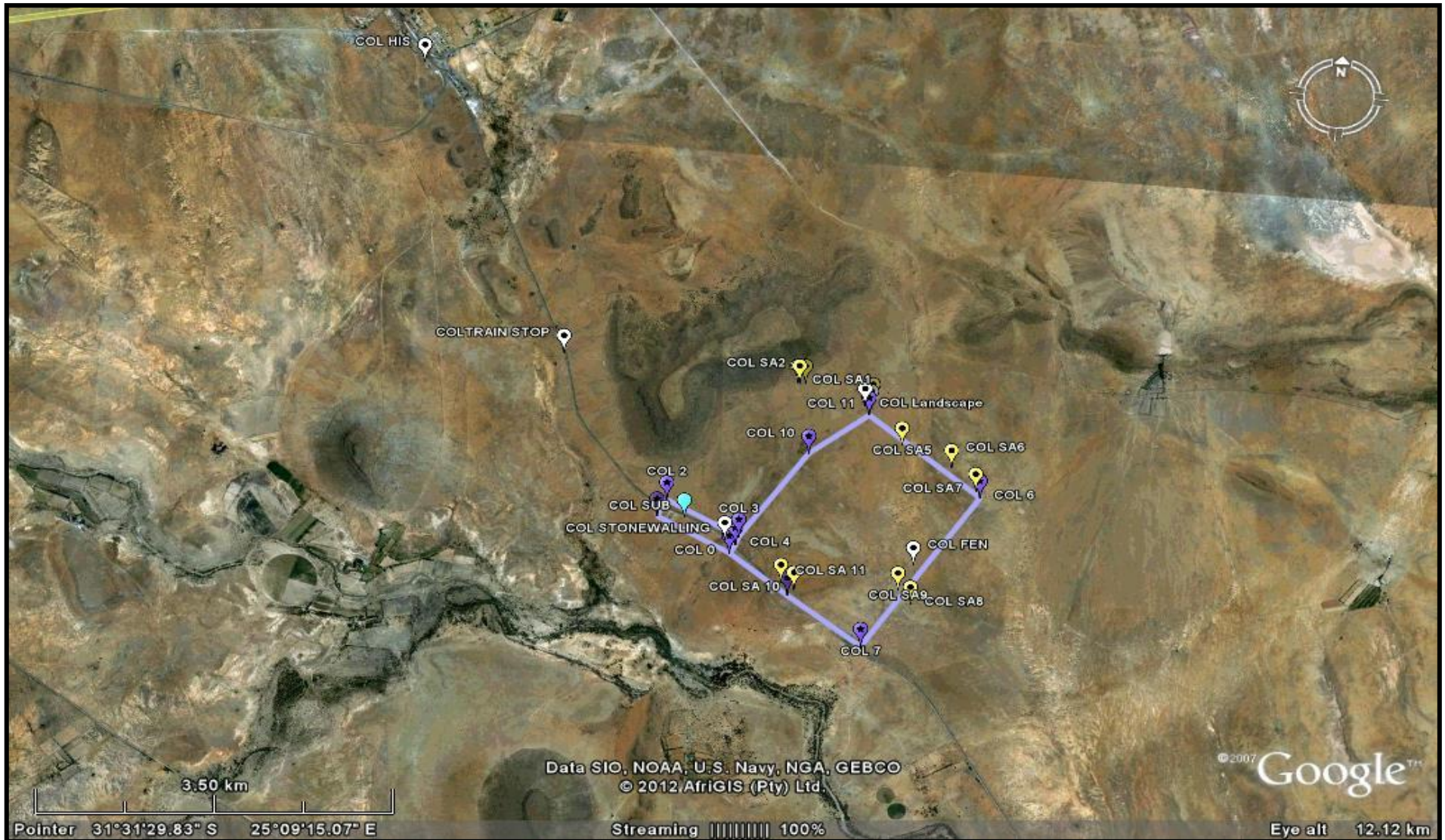


Figure 3. Map 3. Close-up aerial view of the proposed area for the development of the Collett 75 MW Photovoltaic Solar Farm showing the location of the GPS co-ordinates and sites.

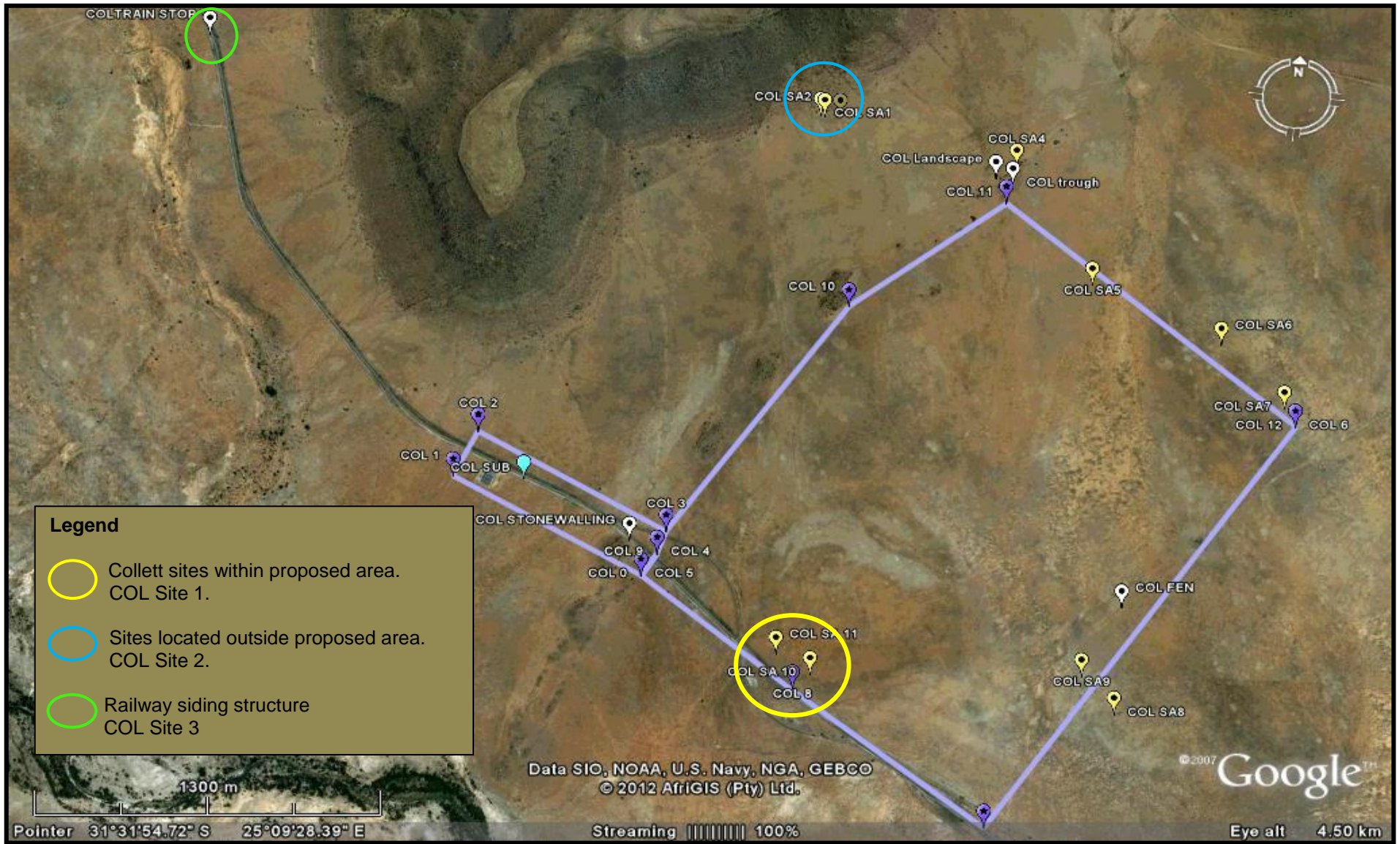


Figure 4. Map 4. Layout of the proposed area for the development of the Collett 75 MW Photovoltaic Solar Farm.

6. ARCHAEOLOGICAL INVESTIGATION

The archaeological investigation was conducted on foot focusing on the proposed area for the establishment of the Collett 75 MW Photovoltaic Solar Farm. The proposed power line corridor connecting from the existing Collett substation to Rosmead was followed in a vehicle and spot checks were conducted to investigate selected areas. GPS co-ordinate readings and photographs were taken using a Garmin Oregon 550 unit. The general GPS readings, artefact surface occurrences, and sites have been plotted on Figures 3 and 4.

The archaeological visibility in the proposed area varies as the vegetation cover is denser in some areas and along the proposed power line corridor to Rosmead. The archaeological visibility was relatively good closer to the *koppie* referred to as Wolweberg (Figure 1) allowing for easier identification of archaeological remains and sites on the surface (Figure 5). The proposed area for development has been slightly disturbed by the construction of internal farm fences and farm gravel roads. The construction of the railway and substation to the south may have caused the disturbance and/or destruction of archaeological heritage remains and/or sites.



Figure 5. View of the landscape of the proposed area for development.

It is highly likely that the archaeological material documented in the proposed development area no longer occurs *in situ*. This may have been caused by continuous natural animal, and human influences and disturbances. It is possible that stone artefacts may have been moved during heavy rains and flooding. The construction of the railway lines and associated

infrastructure, the Collett Substation, power lines, and internal farm fences and roads may also have resulted in negative impact on the possible archaeological heritage remains and sites (Figure 6).



Figure 6. View of the existing Collett Substation proposed to be upgraded.

Mainly Middle Stone Age (MSA) stone artefacts were documented within the proposed development area. . The stone artefacts were predominantly manufactured on a fine-grained black (hornfels) raw material and included flakes, blades, and cores, some of which have been heavily weathered over time (Figures 7-10). Some of the stone artefacts showed evidence of secondary retouch and edge damage, although some of the edge-damage is recent and may have been caused from trampling by humans and animals.

Two significant stone artefact scatters (COL Site 1 and COL Site 2; see Figure 4) were documented during the survey. These areas have been identified as archaeological sites owing to the denser distribution of the stone artefacts within a particular area. Possible knapping areas were also identified within these areas.

COL Site 1, that includes the areas marked COL 8, COL SA 10, and COL SA 11 (Figure 4), is situated immediately north of the railway line and is approximately 20 m x 10 m in extent (Figure 11). The area falls within the proposed area for the photovoltaic solar plant. The site is situated on a slight gradient slope and continues on the higher ground adjacent to the railway line.



Figures 7-10. Middle Stone Age stone artefacts documented within the proposed area for development.

The site comprised of several Middle Stone Age stone artefacts, the majority were manufactured on the fine-grained hornfels raw material (Figures 12-13). There was a higher density of stone artefact scatter in this area which is most likely related to the knapping sites occurring at COL Site 1. There were a minimum of three knapping areas at COL Site 1. No other organic or cultural archaeological heritage remains were documented in association with the stone artefact scatters. However, it is possible that archaeological material remains and sites may occur *in situ* between the surface and 50cm-80cm below ground owing to years of soil deposition.

COL Site 2, that includes the points marked COL SA1, COL SA 2, and COL SA 3, is situated at the foot, continuing onto the slight gradient slope, of the Wolwekop *koppie*, and is approximately 20 m x 20 m in extent (Figure 4). The area is rocky with very little vegetation and shrub cover therefore allowing for good archaeological visibility. This area occurs outside the proposed development area.

A relatively higher frequency of Middle Stone Age stone artefacts were identified within this area that included blades, flakes, cores, as well as pockets of stone artefacts that may indicate stone knapping areas (Figures 14-16). A minimum of two such knapping areas were identified. It is possible that archaeological material remains and sites may occur *in situ* between the surface and 50cm-80cm below ground owing to years of soil deposition. No other organic or cultural archaeological heritage remains were documented in association with the stone artefact scatters.



Figure 11 View of the area marked COL 8 at COL Site 1.



Figures 12-13. Close-up of area showing the denser distribution of stone artefacts (left); Example of stone artefacts documented within the area (COL Site 1) (right).

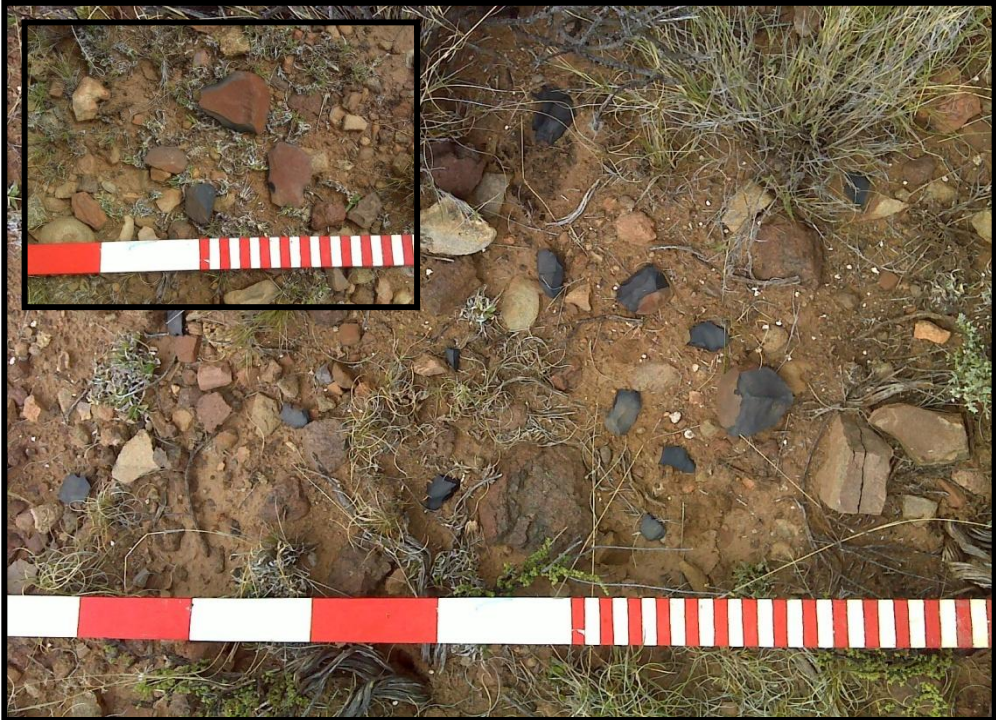


Figure 14. Distribution of stone artefacts within COL Site 2.



Figures 15-16. Examples of stone artefacts documented within the COLSite 2 area.

Dry packed stone walling was documented on a *koppie* adjacent to the railway line on the Farm Brakke Kuilen 180/0 (Figure 17). The stone walling is situated within the proposed 400 m power line corridor that will connect at Rosmead (Figure 4). The wall remains mostly intact, but has collapsed in some places.



Figure 18. View of the dry packed stone walling situated on the *koppie*.

Built environment structures were documented within the proposed development as well the 200 m buffer zone. These include a disused water trough at the foot of Wolweberg outside the core development area but within the 200 m buffer zone around the area for the proposed photovoltaic plant. The remains of empty railway siding buildings were documented south-east of the main development area and is therefore not included within the core development area (Figure 19). A single railway siding structure was recorded along the gravel road adjacent to the railway line (Figure 20). The single structure alongside the road may be impacted by the proposed widening of the access road for the development of the solar energy facility and substation.



Figure 18. Photograph taken at point COL SA 9 showing the view of the railway siding south of the proposed development area.



Figure 19. Example of the railway siding building alongside the access road.

7. DESCRIPTION OF SITES

7.1. Stone Artefact Occurrences and Scatters:

Surface scatters of mainly Middle Stone Age (MSA) stone artefacts are distributed over the area proposed for the Collet Solar Energy Facility (SEF). GPS co-ordinate readings were taken to show the extent of the distribution (COL SA1 – COL SA11). The stone artefacts comprised mainly patinated and heavily weathered flakes and miscellaneous retouched pieces of varying sizes manufactured on a fine-grained (hornfels and lydianite) raw material. It is unlikely that the surface exposed stone artefacts occur *in situ* and are considered to be in a secondary and disturbed context. No other organic or material cultural remains were documented in association with the stone artefacts. However, it is also possible that stone artefact may occur below the vegetation cover between the surface and 50 – 80 cm below the ground.

The stone artefact occurrences and scatters are considered as having a medium-low cultural significance.

The stone artefact occurrences and scatters have been allocated a heritage grading of General Protection (NHRA 25 of 1999) as is standard with archaeological heritage remains.

(See Table 11.1. for descriptions and co-ordinates)

7.2. COL Site 1

COL Site 1, which includes the areas marked COL 8, COL SA 10, and COL SA 11, is situated immediately north of the railway line and is approximately 20 m x 10 m in extent. The site falls within the proposed area for the photovoltaic solar plant. The site is situated on a slight gradient slope and continues on the higher ground adjacent the railway line.

The site comprised of several Middle Stone Age stone artefacts, the majority were manufactured on the fine-grained hornfels raw material. There was a higher density of stone artefact scatter in this area which is most likely related to the knapping sites occurring at COL Site 1. There were a minimum of three knapping areas at COL Site 1. No other organic or cultural archaeological heritage remains were documented in association with the stone artefact scatters. However, it is possible that archaeological material remains and sites may occur *in situ* between the surface and 50cm-80cm below ground owing to years of soil deposition.

The site has been identified as an archaeologically sensitive area with several sites occurring within the area. This area is considered as having a medium-high cultural significance.

The site has been allocated a heritage grading of General Protection (NHRA 25 of 1999) as is standard with archaeological heritage remains.

(See Table 11.1. for descriptions and co-ordinates)

7.3. COL Site 2

COL Site 2, that includes the points marked COL SA1, COL SA 2, and COL SA 3, is situated at the foot, continuing onto the slight gradient slope, of the Wolwekop *koppie*, and is approximately 20 m x 20 m in extent. The area is rocky with very little vegetation and shrub cover therefore allowing for good archaeological visibility. This site occurs outside the proposed development area.

A relatively higher frequency of Middle Stone Age stone artefacts were identified within this area that included blades, flakes, cores, as well as pockets of stone artefacts that may indicate stone knapping areas. A minimum of two such knapping areas were identified. It is possible that archaeological material remains and sites may occur *in situ* between the surface and 50cm-80cm below ground owing to years of soil deposition. No other organic or cultural archaeological heritage remains were documented in association with the stone artefact scatters.

The site has been identified as an archaeologically sensitive area with several sites occurring within the area. This area is considered as having a medium-high cultural significance.

The site has been allocated a heritage grading of General Protection (NHRA 25 of 1999) as is standard with archaeological heritage remains.

(See Table 11.1. for descriptions and co-ordinates)

7.4. Dry packed stone walling

Dry packed stone walling was documented on a *koppie* adjacent to the railway line on the Farm Brakke Kuilen 180/0. The stone walling is situated within the proposed 400 m power line corridor that will connect at Rosmead. The wall remains mostly intact, but has collapsed in some places.

This area is considered as having a medium-high cultural significance.

The site has been allocated a heritage grading of General Protection (NHRA 25 of 1999) as is standard with archaeological heritage remains.

7.5. Built Environment

Built environment structures were documented within the proposed development as well the 200 m buffer zone.

A disused water trough was at the foot of Wolweberg outside the core development area but within the 200 m buffer zone around the area for the proposed photovoltaic plant.

The remains of empty railway siding buildings were documented south-east of the main development area and is therefore not included within the core development area.

A single railway siding structure was recorded along the gravel road adjacent to the railway line. This structure may be impacted by the proposed widening of the access road for the development of the solar energy facility and substation.

It is recommended that a built environment specialist or historical architect or historian be appointed to assess the significance of the built environment remains if they are to be affected by the proposed development.

(See Table 11.1. for descriptions and co-ordinates)

8. CONCLUSION

The area proposed for the Collett Solar Energy Facility, the 200 m buffer zone and the 400 m wide power line corridor that will connect from the photovoltaic plant to the Collett Substation was investigated on foot. The area proposed for the 400 m wide power line corridor that will connect from the Collet Substation to Rosmead was investigated by conducting spot checks from a vehicle. Archaeological visibility was relatively good throughout the proposed area for the photovoltaic plant, although denser vegetation occurred in some areas.

It was established that predominantly Middle Stone Age stone artefacts that was manufactured from a local hornfels raw material and included flakes, blades, and cores occurred over the general area for the proposed developments. Two significant sites (COL Site 1 and COL 2) were identified to contain a denser distribution of stone artefacts and included areas that may be considered knapping or stone artefact manufacture areas. It is unlikely that the stone artefact surface scatters that occur on the exposed surface areas are positioned *in situ*; however, stone artefacts may occur between 50 – 80 cm below the surface. The sites (COL Site 1 and COL Site 2) may be less disturbed by natural, human, and animal influences. These sites showed evidence of stone knapping and manufacture debris and must be protected as to avoid negative impact.

The proposed development would have negative implications on the archaeological heritage remains documented within the proposed area during all phases of the development. The negative implications include the destruction of the surface scatters of stone artefacts and further occurrences that are not immediately visible, as well as sites (COL Site 1 and COL Site 2). The recommendations must be considered as appropriate mitigation measures to protect and conserve the archaeological heritage remains observed within the proposed development area and further archaeological remains that may occur and are not immediately visible on the surface.

The dry packed stone walling situated on the koppie adjacent to the railway line is situated within the proposed area for the 400 m power line corridor that will connect from the Collett Substation to Rosmead. The recommendations in the report must be taken into consideration to protect and conserve the occurrence of the stone walling.

A disused water trough is situated at the foot of Wolweberg *koppie* within the 200 m buffer zone around the main development area. Railway siding buildings were documented south-east of the proposed development area and it is unlikely that these structures would be negatively impacted by the proposed development. A single railway siding structure is situated alongside that access road from Rosmead. This structure may be negatively impacted by the proposed upgrade of the road and mitigation measures must be considered.

9. RECOMMENDATIONS

The area is of a medium-high cultural sensitivity, the following recommendations must be considered:

1. a) Once the final layout (including the positions of the solar panels; underground cabling; overhead power lines [including the 400 m power line connecting the solar energy facility to the Collett Substation and the power line corridor connecting from the Collett Substation to Rosmead]; additional internal access roads, and the workshop area) of the proposed Collet Solar Energy Facility has been finalised an archaeological ground-truthing should be conducted and further recommendation/s be made to protect the archaeological heritage and other heritage resources within the area proposed for development.

b) In addition, a built environment specialist, historical architect, or historian be appointed to assess the significance of the remains of the built environment structures.
2. If recommendation 1a) is not considered, the following mitigation measures to protect and conserve the heritage resources must be considered:
 - a) A 20 m buffer / no development zone be established around the archaeological sites COL Site 1 and COL Site 2.
 - b) The *koppie* on which the dry packed stone walling is situated be regarded a no development area and the power line pylon position be realigned to adhere to this recommendation.
 - c) A professional archaeologist must be appointed during all construction and development activities including vegetation clearing and the excavation activities to monitor and identify possible archaeological material remains and features that may occur below the surface and make further appropriate recommendations on removing and / or protecting the archaeological material remains and features.
 - d) If concentrations of archaeological heritage material and human remains are uncovered during construction, all work must cease immediately and be reported to the Albany Museum (046 622 2312) and/or the South African Heritage Resources Agency (SAHRA) (021 642 4502) so that systematic and professional investigation/ excavation can be undertaken.
 - e) 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.

10. REFERENCES:

Albany Museum records (Department of Archaeology).

Binneman, J.N.F. & Booth, C. 2008. A Phase 1 Archaeological Heritage Impact Assessment for the proposed construction and operation of an ethanol production plant on Erven 31, 32, 33 and the remaining extent of Erf 1, Cradock, Inxuba Yethemba Local Municipality, Eastern Cape Province

Brooker, M. 1977. The archaeology of the Mountain Zebra Park. *Koedoe* 20:77-93.

Deacon, H. J. 1976. *Where hunters gathered: a study of Holocene Stone Age people in the Cape*. South African Archaeological Society Monograph Series No. 1.

Deacon, H.J. & Deacon, J. 1999. *Human beginnings in South Africa*. Cape Town: David Phillips Publishers.

Nel, J. 2008. Final Report Heritage Resource Scoping Survey & Preliminary Assessment Transnet Freight Line EIA, Eastern Cape & Northern Cape. An unpublished report by Archaic Heritage Project Management on file at SAHRA.

Sampson, C. G. 1985. *Atlas of Stone Age Settlement in the Central and Upper Seacow Valley*. Memoirs van die Nasionale Museum Bloemfontein, Vol. 20:1-116.

Sharon, G. 2009. Acheulian Giant-Core Technology. *Current Anthropology*, 50(3):335-367.

Thompson, E. & Marean, C.W. 2008. The Mossel Bay lithic variant: 120 years of Middle Stone Age Research from Cape St. Blaize Cave to Pinnacle Point. *South Africa Archaeological Society Goodwin Series*, 10: 90-104.

Van Ryneveld, K & Koortzen, C. 2006. Borrow Pit 76.0 Quarry impact on archaeological "Michausdal" deposits, Cradock District, Eastern Cape, South Africa.

Van Ryneveld, K. 2008. Phase 1 Archaeological Impact Assessment: Utilization of 17 Quarries for Upgrade of the DR 2629 road NR 654 & THE DR 2631, Middelburg area, Eastern Cape, South Africa.

11. GPS CO-ORDINATES AND SITES FOR THE PROPOSED COLLETT SOLAR ENERGY FACILITY.

TABLE 11.1: GPS CO-ORDINATES AND SITES FOR THE PROPOSED COLLETT SOLAR ENERGY FACILITY.

Reference	Description	Co-ordinates
COL SA1	Middle Stone Age stone artefact scatter	31° 31' 13.60"S; 25° 09' 41.50"E
COL SA2	Middle Stone Age stone artefact scatter	31° 31' 13.70"S; 25° 09' 42.10"E
COL SA3	Middle Stone Age stone artefact scatter	31° 31' 13.60"S; 25° 09' 44.30"E
COL SA4	Middle Stone Age stone artefact scatter	31° 31' 18.20"S; 25° 10' 10.00"E
COL SA5	Middle Stone Age stone artefact scatter	31° 31' 32.70"S; 25° 10' 22.30"E
COL SA6	Middle Stone Age stone artefact scatter	31° 31' 39.10"S; 25° 10' 41.40"E
COL SA7	Middle Stone Age stone artefact scatter	31° 31' 46.7"S; 25° 10' 51.2"E
COL SA8	Middle Stone Age stone artefact scatter	31° 32' 28.00"S; 25° 10' 31.00"E
COL SA9	Middle Stone Age stone artefact scatter	31° 32' 23.40"S; 25° 10' 25.90"E
COL SA10	Middle Stone Age stone artefact scatter	31° 32' 26.00"S; 25° 09' 47.30"E
COL SA11	Middle Stone Age stone artefact scatter	31° 32' 23.70"S; 25° 09' 42.20"E
COL STONEWALLING	Dry packed stone walling	31° 32' 10.50"S; 25° 09' 19.90"E
COL HIS	Water tower and ruins	31° 29' 31.70"S; 25° 07' 11.90"E
COL SUB	Substation	31° 32' 03.70"S; 25° 09' 04.10"E
COL TRAIN STOP	Railway siding structure situated alongside the access road adjacent to the railway line.	31° 31' 09.50"S; 25° 08' 13.70"E

12. ASSESSMENT OF THE SIGNIFICANCE OF IDENTIFIED IMPACT OF THE ARCHAEOLOGICAL AND OTHER HERITAGE RESOURCES.

12.1. The Destruction of Stone Artefact Scatter and Occurrences:

The nature of the impact is the destruction of the stone artefact scatters that occur across the proposed development areas for the Collett Solar Energy Facility. The development process including vegetation clearing, excavation, construction, operation, and long-term maintenance will have a negative effect on these archaeological heritage resources. Therefore, the mitigation measures (recommendations) must be considered.

Extent (spatial scale):

The extent of the impact is essentially local as far as the development activity is concerned. However, the significance of recording archaeological heritage remains fits into a broader spectrum both as regionally (limited to the Eastern Cape Province) and nationally, in this case extends to the Northern Cape in relation to pre-colonial occupation within the wider region.

Duration (duration of impact):

The duration of the impact is permanent as stone artefacts and other archaeological heritage remains occur in totality as they were left behind by the pre-colonial communities who occupied the area. Once these archaeological heritage remains have been affected by development and hence, disturbed and displaced, the context in which they occurred is irrelevant and therefore cannot be interpreted in essence.

Status and Intensity of the Impact (severity):

The status and intensity of the impact can be considered as high as the development will impact to the extent that the scatters and occurrences are altered to the extent that it will temporarily and permanently cease as these resources are essentially irreplaceable.

Probability:

It is highly probable that the stone artefact scatters and occurrences will be impacted as they occur across the proposed development areas.

12.2. The Destruction of COL Site 1:

The nature of the impact is the destruction of the archaeological site COL Site 1 situated within the proposed development area for the Collett Solar Energy Facility. The development process including vegetation clearing, excavation, construction, operation, and long-term maintenance may have a negative effect on these archaeological heritage resources. Therefore, the mitigation measures (recommendations) must be considered.

Extent (spatial scale):

The extent of the impact is essentially local as far as the development activity is concerned. However, the significance of recording archaeological heritage remains fits into a broader spectrum both as regionally (limited to the Eastern Cape Province) and nationally, in this case extends to the Northern Cape in relation to pre-colonial occupation within the wider region.

Duration (duration of impact):

The duration of the impact is permanent as stone artefacts and other archaeological heritage remains occur in totality as they were left behind by the pre-colonial communities who occupied the area. Once these archaeological heritage remains have been affected by development and hence, disturbed and displaced, the context in which they occurred is irrelevant and therefore cannot be interpreted in essence.

Status and Intensity of the Impact (severity):

The status and intensity of the impact can be considered as high as the development will impact to the extent that the scatters and occurrences are altered to the extent that it will temporarily and permanently cease as these resources are essentially irreplaceable.

Probability:

It is highly probable that COL Site 1 will be impacted as it occurs within the proposed development area, therefore mitigation measures (recommendations) must be considered to avoid negative impact on the site.

12.3. The Destruction of COL Site 2:

The nature of the impact is the destruction of the archaeological site COL Site 2. Although this archaeological site does not occur within the main area proposed for the development of the solar energy facility, it does occur within the 200 m buffer zone. The development process including vegetation clearing, excavation, construction, operation, and long-term maintenance may have a negative effect on these archaeological heritage resources. Therefore, the mitigation measures (recommendations) must be considered.

Extent (spatial scale):

The extent of the impact is essentially local as far as the development activity is concerned. However, the significance of recording archaeological heritage remains fits into a broader spectrum both as regionally (limited to the Eastern Cape Province) and nationally, in this case extends to the Northern Cape in relation to pre-colonial occupation within the wider region.

Duration (duration of impact):

The duration of the impact is permanent as stone artefacts and other archaeological heritage remains occur in totality as they were left behind by the pre-colonial communities who occupied the area. Once these archaeological heritage remains have been affected by development and hence, disturbed and displaced, the context in which they occurred is irrelevant and therefore cannot be interpreted in essence.

Status and Intensity of the Impact (severity):

The status and intensity of the impact can be considered as high as the development will impact to the extent that the scatters and occurrences are altered to the extent that it will temporarily and permanently cease as these resources are essentially irreplaceable.

Probability:

It is probable that COL Site 2 may be impacted if the layout of the proposed Collett Solar Energy Facility changes, therefore mitigation measures (recommendations) must be considered to avoid negative impact on the site.

12.4. Dry Packed Stone Walling

The nature of the impact is the destruction of the dry packed stone that occurs in the proposed 400 m power line corridor that will connect to the Collett Substation and Rosmead. Mitigation measures (recommendations) must be considered.

Extent (spatial scale):

The extent of the impact is essentially local as far as the activity. However, the significance of recording archaeological heritage remains fits into a broader spectrum both as regionally (limited to the Eastern Cape Province) and nationally, in this case extends to the Northern Cape in relation to Colonial occupation within the wider region.

Duration (duration of impact):

The duration of the impact is permanent as such heritage remains occur in totality as they were left behind by the Colonia settler communities who occupied the area. Once these archaeological heritage remains have been affected by development and hence, disturbed and displaced, the context in which they occurred is irrelevant and therefore cannot be interpreted in essence.

Status and Intensity of the Impact (severity):

The status and intensity of the impact can be considered as high as the development will impact to the extent that the process are altered to the extent that it will temporarily and permanently cease as the destruction of the dry packed stone walling is essentially irreplaceable.

Probability:

It is probable that that the dry packed stone walling may be impacted if the position of a pylons is proposed to be positioned in that area, therefore mitigation measures (recommendations) must be considered to avoid negative impact on the site.

APPENDIX A: GENERAL REMARKS AND CONDITIONS

NOTE: This report is a phase 1 archaeological impact assessment (AIA) only and does not include or exempt other required specialist assessments as part of the heritage impact assessments (HIAs).

The National Heritage Resources Act (Act No. 25 of 1999, Section 35 [Brief Legislative Requirements]) requires a full Heritage Impact Assessment (HIA) in order that all heritage resources including 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 emphasized that the conclusions and recommendations expressed in this phase 1 archaeological impact assessment (AIA) are based on the visibility of archaeological remains, features and, sites and may not reflect the true state of affairs. Many archaeological remains, features and, sites may be covered by soil and vegetation and will only be located once this has been removed. In the event of such archaeological heritage being uncovered (such as during any phase of construction activities), archaeologists or the relevant heritage authority must be informed immediately so that they can investigate the importance of the sites and excavate or collect material before it is destroyed. The onus is on the developer to ensure that this agreement is honoured in accordance with the National Heritage Resources Act No. 25 of 1999 (NHRA 25 of 1999).

Archaeological Specialist Reports (desktops and AIA's) will be assessed by the relative heritage resources authority. The final decision rests with the heritage resources authority that may confirm the recommendations in the archaeological specialist report and grant a permit or a formal letter of permission for the destruction of any cultural sites.

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

1. Human Remains:

All human remains exposed during all the phases of the construction activities must be reported to the archaeologist, nearest museum or relevant heritage resources authority. Construction must be halted until the archaeologist has investigated and removed the human remains. Human remains may be exposed when a grave or informal burial has been disturbed. In general, the remains are buried in a flexed position on the side and may also be buried in a sitting position with a flat stone capping the location of the burial. Developers are requested to be aware of the exposing human remains.

2. Stone Artefacts:

Stone artefacts are difficult for the layman to identify. Large accumulations of flaked stones that do not appear to have been distributed naturally must be reported. If the stone artefacts are associated with bone / faunal remain or any other associated organic and material cultural artefacts development must be halted immediately and reported to the archaeologist, nearest museum or relevant heritage resources authority.

3. Large Stone Features:

Large stone features occur in different forms and sizes, however, are relatively easy to identify. The most common features are roughly circular stone walls (mostly collapsed), usually dry packed stone, and may represent stock enclosures, the remains of wind breaks or, cooking shelters. Other features consist of large piles of stones of different sizes and heights are known as *isisivane*. These features generally occur near river and mountain crossings. The purpose and meaning of the *isisivane* are not fully understood, however, interpretations include the representation of burial cairns and symbolic value.

4. Freshwater Shell Middens:

Accumulations of freshwater shell middens comprising mainly freshwater mussel occur along the muddy banks of rivers and streams and were collected by pre-colonial communities as a food resource. The freshwater shell middens generally contain stone artefacts, pottery, bone and, sometimes even human remains. Freshwater shell middens may be of various sizes and depths, an accumulation that exceeds 1m² in extent must be reported to the archaeologist, nearest museum or, relevant heritage resources authority.

5. Historical Artefacts and Features:

These are relatively easy to identify and include the foundations and remains of buildings, packed dry stone walling representing domestic stock kraals. Other items include historical domestic artefacts such as ceramics, glass, metal and military artefacts and dwellings.

6. Fossil Bone:

Fossil bones may be embedded in geological deposits. Any concentrations of bone whether fossilized or not must be reported.