

A PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT FOR THE PROPOSED ESTABLISHMENT OF THE ACED MIDDELBURG SOLAR PARK (PARK 1 AND PARK 2) ON THE FARM TWEEFONTEIN REMAINDER OF FARM 11 (SOLAR PARK 1) AND TWEEFONTEIN PORTION 4 OF FARM 11 (SOLAR PARK 2), MIDDELBURG, EASTERN CAPE PROVINCE.

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

1. EXECUTIVE SUMMARY

1.1. Purpose of the Study

The purpose of the study was to conduct and compile a phase 1 archaeological impact assessment (AIA) for the proposed establishment of the ACED Middelburg Solar Park (Park 1 and Park 2) on the Farm Tweefontein Remainder of Farm 11 (Solar Park 1) and Tweefontein Portion 4 of Farm 11 (Solar Park 2), Middelburg, Eastern Cape Province. The survey was conducted to establish the range and importance of the exposed and *in situ* archaeological heritage material remains, sites and features; to establish the potential impact of the development; and to make recommendations to minimize possible damage to the archaeological heritage.

1.2. Brief Summary of Findings

1.2.1. Solar Park 1 on the Farm Tweefontein Remainder of Farm 11:

Isolated surface occurrences of Middle Stone Age (MSA) stone artefacts extend over the proposed Solar Park 1 area. Middle Stone Age (MSA) and Later Stone Age (LSA) stone artefacts as well as worked glass artefacts were observed and documented on a rocky outcrop situated east of the Vlakfontein farmstead near the central north-eastern border of the proposed area. One worked glass artefact was documented near the N9 border of the development area. A circular dry stone packed walling feature was documented south of the main house dwelling area. The remains of the old railway line run across the proposed development area.

1.2.2. Solar Park 2 on the Farm Tweefontein Portion 4 of Farm 11:

Isolated surface occurrences of mostly Middle Stone Age (MSA) and some Later Stone Age (LSA) stone artefacts extend over the proposed Solar Park 2 area. An undetermined brick feature was documented within the southern central area of the proposed development. The remains of the old railway line run adjacent and east of the N9 national road and falls outside of the boundary of the proposed development area. The associated railway siding comprises the remains of buildings and is situated between the

remains of the old railway line and the eastern border of the proposed development area. Broken glass and pottery fragments were observed within the extent of the old railway line and siding.

1.3. Recommendations

Solar Park 1 on the Farm Tweefontein Remainder of Farm 11 and Solar Park 2 on the Farm Tweefontein Portion 4 of Farm 11:

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

1. The remains of the old railway and railway siding are situated outside of the border of the proposed development and must be protected during all construction and development activities to avoid negative impact.
2. A 50m diameter protection perimeter around the circular dry stone walling feature must be established before and during all construction and development activities to avoid negative impact.
3. A 100m diameter protection perimeter around the archaeological site (TF1) on the rocky outcrop must be established before and during all construction and development activities to avoid negative impact.
4. The location of the undetermined brick feature must be noted and avoided during all construction and development activities.
5. A professional archaeologist (with an already authorised collection permit) 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.
6. 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.
7. 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.

2. BACKGROUND INFORMATION

The phase 1 archaeological impact assessment (AIA) report has been prepared as part of the basic environmental assessment phase.

The proposed activity includes the development of a photovoltaic solar energy facility as two solar parks with a total combined capacity of up to 150MW. Each solar park would comprise the following infrastructure:

- Arrays of PV panels for the generation of electricity with a capacity of 75MW;
- Dedicated inverters to convert the electricity from DC to AC;
- On-site substations;
- Underground cabling between the PV panels, the dedicated inverters, and the on-site substations;
- Overhead powerlines connecting onto the existing Ludlow substation which is located on site (Solar Park 1) and;
- Administrative / security buildings.

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Terms of Reference (ToR)

- Provide an indication of the methodology used in determining the significance of potential environmental (archaeological heritage) impact by conducting and compiling the phase 1 archaeological impact assessment (AIA);
- Describe all environmental issues (archaeological heritage) that were identified during the phase 1 archaeological impact assessment (AIA) and;
- Assess the significance of direct, indirect and cumulative impacts on the environment (archaeological heritage) for Solar Park 1 and Solar Park 2 as separate entities.

3. 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 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

Substantial Later Stone Age Research within the last 20 000 years has been conducted within the areas surrounding the area proposed for development. However, less research has been conducted on the Early Stone Age and Middle Stone Age periods. Historically, the area is rich in military history as part of the Anglo-Boer War, railway histories, and was the route taken by the Great Trek Pioneers (Groot Trek Voortrekkers).

EARLY STONE AGE (1.5 million – 250 000 years ago)

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. Significant South African sites include Wonderwerk in the Northern Cape near Kimberly, and Montagu Cave in the Western Cape Province situated on the outskirts of the small town of Montagu in the Western Cape, and Amanzi Springs near to the small town of Uitenhage close to Port Elizabeth in the Eastern Cape, whereby some bone and plant material was found to be *in situ* and associated with the stone artefacts. The Albany Museum database includes records of occurrences of Acheulian handaxes between Middelburg and the Camdeboo National Park near Graaff Reinet, as well as a collection of stone artefacts from the Cradock area. Sampson (1985) located a large number of sites to the west of the proposed area of development within the Seacow River Valley.

MIDDLE STONE AGE (250 000 – 30 000 years ago)

The Middle Stone Age spans a period from 250 000 - 30 000 years ago and focuses on the emergence of modern humans by the change in technology, behaviour, physical appearance, art, and symbolism. 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 has 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 Albany Museum in 2008 have recorded surface scatters of Middle Stone Age stone artefacts in the Cradock vicinity (Binneman & Booth 2008). 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 (30 000 – recent)

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. 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 Later Stone Age archaeology of the Karoo is rich and varied. Various studies (Beaumont & Morris 1990, Beaumont & Vogel 1984, Morris & Beaumont 1990, Sampson 1985) have shown that the general area has been relatively marginal regarding pre-colonial human settlement, but is in fact exceptionally rich in archaeological sites and rock art. Bifacial and tanged barbed arrow heads made on very fine-grained dark or black chalcedony are distributed over the southern two-thirds of the Free State, the Kimberly area in the west, Lesotho in the east and along the southern boundary of this area as far south as Britstown and Steynsburg (Humphreys 1969).

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.

One of the most complete archaeological research surveys in South Africa was conducted in the Agter Sneeuberg region (northern side of the Sneeuberg) in the central and upper Seacow River Area that covered an area of 734 square kilometres between Hanover, Richmond and Noupoot in the Northern Cape (Sampson 1985). Later Stone Age Lithics and rare Khoekhoe pottery sherds were uncovered during systematic surveys of the area (Sadr & Sampson 1999). Several dense clusters of Smithfield settlement sites are concentrated among the lower dolerite hills and ridges in preference to flats and mountains. In the Free State, this particular stone artefact industry may be traced back

to the 8th century AD, however, only occurs in the Northern Cape as late as the 14th century AD. Today the term Smithfield is only used for stone tool assemblages with backed bladelets and long end scrapers dating within the last 1000 years and replaces the term Smithfield B (Sampson 1988). Typical Smithfield assemblages contain flaked lithics (most commonly of unpatinated blue-black hornfels), grinding and pounding equipment, bored stones, and sherds of a highly characteristic bowl form decorated with stamp-impressed motifs and date within the last 1000 years (Sampson 1988). Endscrapers dominate the flaked stone artefact, the only other formal tools being reamers, single platform cores recycled as trimming hammers, and rare convex scrapers commonly called thumbnail scrapers. Almost 5000 Smithfield sites were recorded during the 1979-1981 survey. These predominantly open sites, were categorized according to size, setting and artefact and included categories such as camps, chipping stations (or factories / manufacture areas), lookouts, quarries (for hornfels raw material), and mussel camps. However, these sites may also be attributed to rock shelters that have been occupied. Waterholes or natural springs were attractive areas for settlement and three different kinds of camps emerge when associated with water holes such as camp-clusters near waterholes, camp-clusters occurring singly or in pairs within some strong and many weak site clusters more than 1km from water and isolated camps far from water (Sampson 1984). In the southern Seacow Valley the presence of Khoekhoen ceramics and stone circular kraals demonstrates a dense occupation by herders, 30 – 40km south west of the town of Noupoot and the proposed area for development. In addition, Blydefontein Rock Shelter, situated about within 15km to the west of the town of Noupoot in the upper reaches of the Oorlogspoort River drainage in the Kikvorsberg Mountain Range, has been excavated and researched extensively (Bousman 2005). Hunter-gatherers occupied Blydefontein Rock Shelter sporadically during the Late Pleistocene and throughout the Holocene. The stratigraphic profile and associated ¹⁴C dates range between 11 850 ± 150 BP and 1810 ± 50 BP and include several stone artefact industries. The cultural sequence consists of the Robberg, Lockshoek, Interior Wilton, and Smithfield components. Discarded stone artefacts, lithic manufacturing debris, bone refuse and hearths scattered throughout the stratified rock shelter's deposits, as well as the occasional potsherd in the later components, represent the enduring record of hunter-gatherer settlement occupation. The majority of formal tools in the Blydefontein sequence consists of endscrapers and backed microliths.

ROCK ART (Engravings and Paintings)

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 andesite 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). Maria Wilman recorded engraving sites between Colesburg and Middelburg (Parkington *et al.* 2008:33). Rock art of the Middelburg area includes a site with numerous styles such as fine-lined paintings of antelope and human figures, probably done by San individuals, as well as red, yellow, black, orange and white finger dots done in the Khoekhoen style. Other figures include medium-grained white chalky paints with red accents such as fat-tailed sheep; two horse-and riders; a black rhinoceros; and two stretched-out and spotted animal skins or aprons (Ouzman. 2005: 106).

HISTORICAL ARCHAEOLOGY

In the early days of colonialism the Karoo was still a sparse and unknown area. It was only until the early travellers and pioneer European farmers ventured into this harsh landscape and documented their encounters with the San hunter-gatherers and Khoekhoen that had originally inhabited the landscape. Therefore, the towns of the Great Karoo were established much later. Between the years 1860 and 1875, there was an increase of travels through the Karoo between Graaff Reinet, Middelburg and Colesburg, due to the improvement of the Frontier Wagon Track or Public Roads Network (Neville *et al.* 1994).

5. DESCRIPTION OF THE PROPERTY

5.1. Area Surveyed

Location: Solar Park 1 on the Farm Tweefontein Remainder of Farm 11 and Solar Park 2 on the Farm Tweefontein Portion 4 of Farm 11:

The area for the proposed Solar Park 1 and Solar Park 2 is situated approximately 20km north of Middelburg and 14km south of Noupoort and adjacent to the N9 national route. Solar Park 1 is situated to the south of the farm gravel road that leads from the N9 national road to the Beskuitfontein farmstead and extends over the N9 national road to the east and border with the existing railway line. Solar Park 2 is limited to the area north of the farm gravel road that leads from the N9 national road to the Beskuitfontein farmstead and is limited to the east of the N9 national road.

5.2. Map

1:50 000 MAP: 3124BD CARLTON (not included)

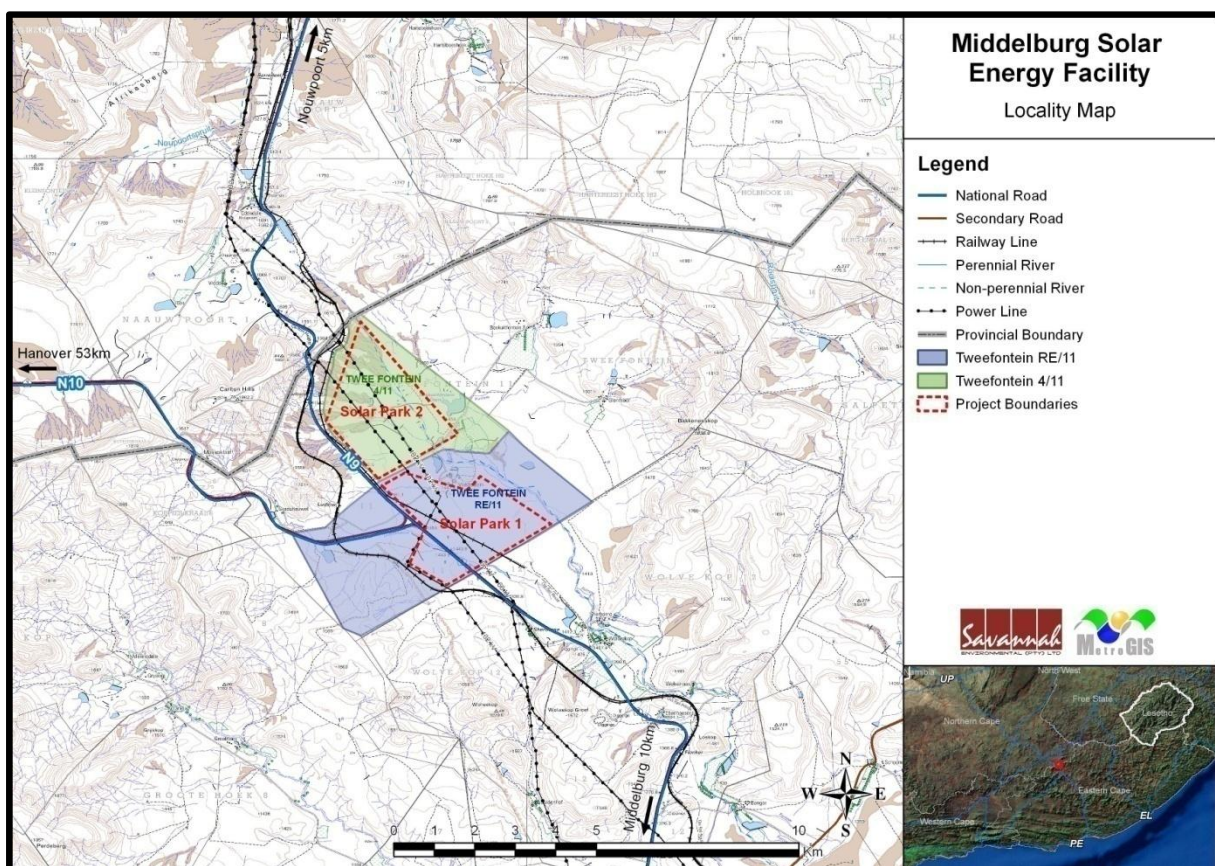


Figure 1. Locality and layout of the area for the proposed Middelburg Solar Parks 1 and 2 (map provided by Savannah Environmental (Pty) Ltd).



Figure 2. Map 2. Aerial view of the area proposed for the Middelburg Solar Parks 1 and 2 (final grid layout provided by Savannah Environmental (Pty) Ltd).

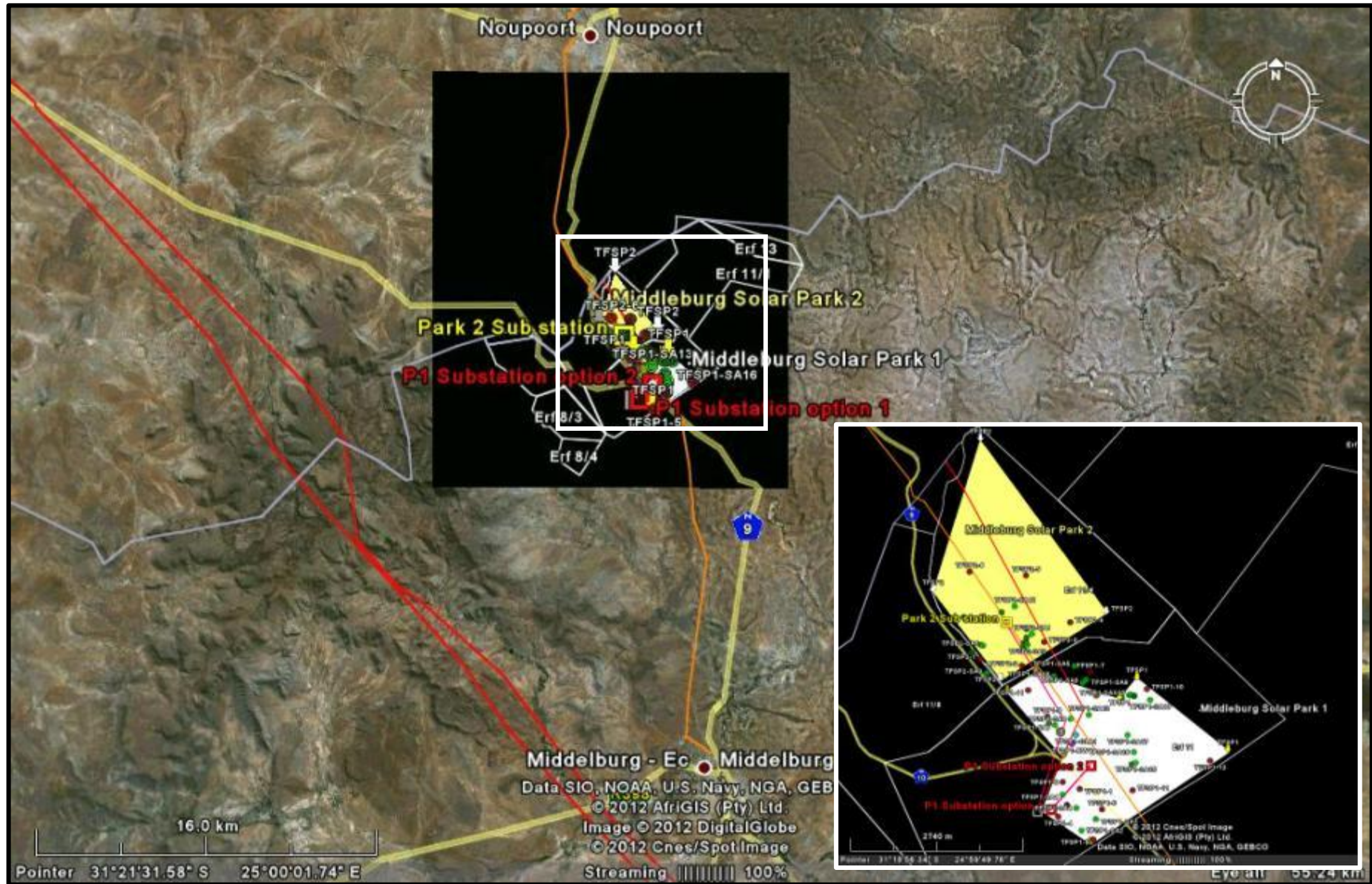


Figure 3. Map 3. Close-up aerial view of the area proposed for the Middleburg Solar Parks 1 and 2 (final grid layout provided by Savannah Environmental (Pty) Ltd).

6. ARCHAEOLOGICAL INVESTIGATION

The archaeological investigation was conducted on foot focusing on the two specific areas proposed for Solar Park 1 and Solar Park 2. The 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 Maps 2-7. The methodology and archaeological findings for each solar park (Solar Park 1 and Solar Park 2) will be discussed separately as required in the terms of reference and in consideration of the impact significance ratings.

6.1. Solar Park 1 on the Farm Tweefontein Remainder of Farm 11:

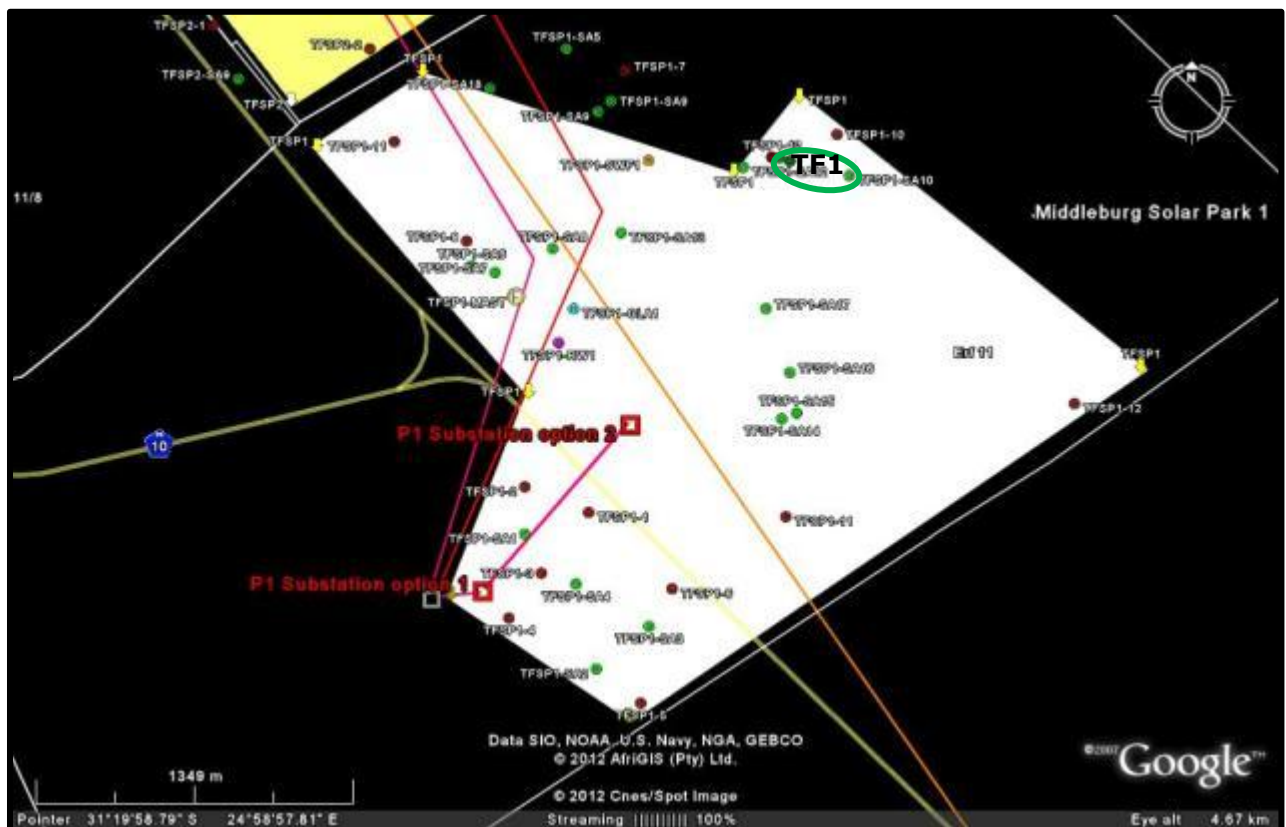


Figure 4. Map 4. Close-up aerial view of the area proposed for the Middelburg Solar Park 1 (final grid layout provided by Savannah Environmental (Pty) Ltd) (see table for co-ordinate and site references).

The proposed area for Solar Park 1 is situated on the flat floodplains of the Farm Tweefontein Remainder of Farm 11. The landscape is generally flat and the vegetation cover comprises typical Karoo shrub and dense grass vegetation. A substation (red square – “option 1”) is situated on the south-western portion (west of the N9 national road) of the proposed area and powerlines run south-east and north-east from the substation. The current railway line borders the western-most area. This portion has been susceptible to erosion and a large riverine donga occurs within 100m west of the N9 national road. The construction of the substation and the railway line has also disturbed the area. The area to the north and east of the N9 national road has also been disturbed by general farming



Figure 5. Map 5. Close-up aerial view of the area proposed for the Middelburg Solar Park 1 showing the terrain and location of stone artefact scatters / occurrences, features, and sites (Site TF1) (green dots: stone artefact occurrences, scatters, and sites; blue dot: clear-glass artefact; orange dot: circular dry stone walling feature; pink dot: original railway line; red dots: general readings).

activities and the establishment of farm roads and fences, the large donga as well as the original railway line (Figures 6-9).

An alternative substation (red square – “option 2”) is proposed for development on the area east of the N9 national road. The proposed substation will link with the existing powerline grid and solar panels.



Figure 6. View of the large donga and associated weir infrastructure.



Figure 7. View of the landscape and the existing substation in the distance.



Figure 8. View of the landscape.

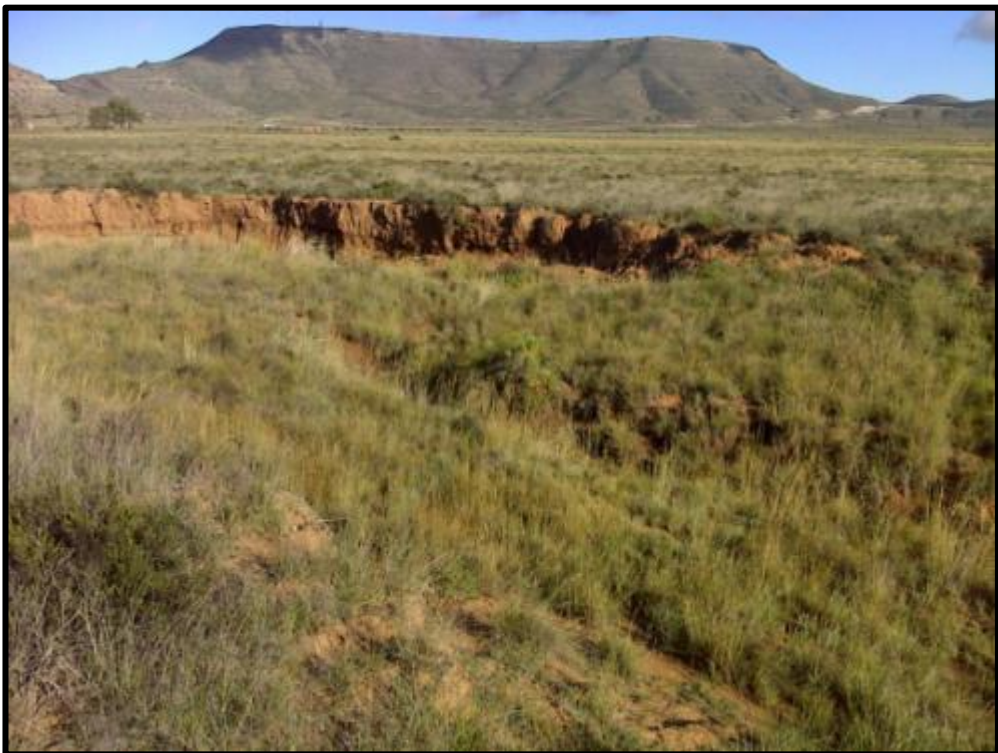


Figure 9. View of the landscape.

Stone artefacts were observed and documented on exposed surface areas between the dense grass vegetation, the informal farm gravel roads, and the extent of the donga (Figures 10-11). Denser occurrences of stone artefacts (more than four within a 10m area) occurred closer to or within areas that may have been disturbed by the construction of the power lines (Figure 12). A relatively dense scatter of stone artefacts occurred between the immediate entrance to the Vlakfontein farmstead area and the informal farm gravel road that leads to the ploughed lands (Figure 13). This area is not included within the area proposed for development, however, it is possible that road may be the main access route and proposed for upgrade.

Mainly isolated scatters of weathered Middle Stone Age (MSA) stone artefacts were noted and occurred throughout the proposed development area. The stone artefacts included flakes and blades with retouch (including some pronounced denticulation) and edge-damage mainly manufactured on hornfels and some shale raw materials. Most of the stone artefacts were weathered and patinated with evidence of recent damage that may have been caused by trampling by domestic stock (Figures 14-18).



Figure 10. Example of the disturbed donga area yielding stone artefacts.



Figure 11. Example of an exposed surface area in the informal farm gravel road.



Figure 12. Example of the exposed surface area close to the powerlines.

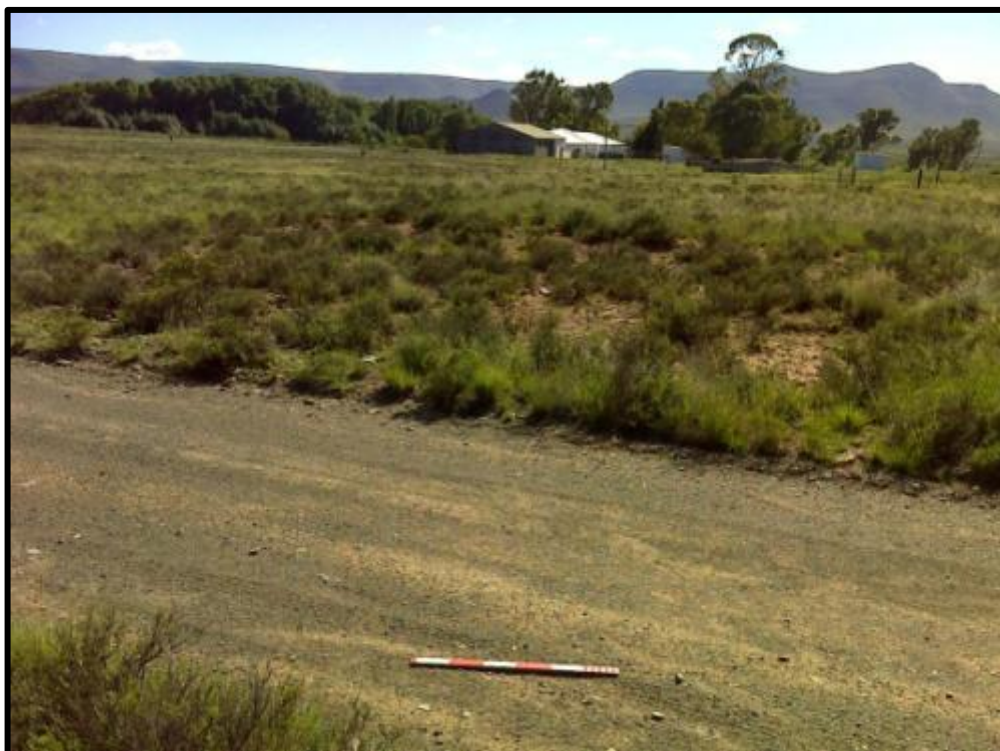


Figure 13. View of the denser scatter of stone artefact south between the Vlakfontein farmstead and the informal farm gravel road.



Figure 14. Examples of Middle Stone Age (MSA) stone artefacts documented within the area proposed for Solar Park 1.



Figures 15-18. Examples of stone artefacts documented within the area proposed for Solar Park 1.

A rocky outcrop located near the central northern corner border of the proposed area contained several Middle Stone Age (MSA) and Later Stone Age (LSA) stone artefacts as well as some historical artefacts. The rocky outcrop runs east-west and is approximately 100m in extent (Figures 18-19). The Middle Stone Age (MSA) stone artefact collection comprised weathered and patinated hornfels flakes and blades showing evidence of retouch, edge-damage, and recent damage caused by trampling and/or human activities. The scatter of Middle Stone Age (MSA) stone artefacts extends to the central northern border of the proposed development area, although less stone artefacts occur to the south of the rocky outcrop.

Later Stone Age (LSA) stone artefacts occur mainly from the centre of the rocky outcrop to the eastern-most extent of the stone artefact scatters. Several relatively small areas of Later Stone Age (LSA) knapping (stone artefact manufacturing) areas that were identified by the amount of flakes and chips in close proximity occur within the central area of the rocky outcrop. Other stone implements included scraper-like stone artefacts (Figure 20). All of the Later Stone Age (LSA) flakes, chips, and formal implements (mainly scrapers) were manufactured on hornfels (fine-grained black material) raw material. Worked glass artefacts, mostly dark green and dark blue, shaped into scraper-like implements, were observed and documented within the central area of the rocky outcrop. A few worked fragments of stoneware pottery were also observed in association with the Later Stone Age (LSA) and worked glass artefact scatters (Figure 21-23). An isolated worked clear-glass scraper that may have been associated with the activities evidenced on the rocky outcrop was documented on the floodplains almost adjacent to the N9 approximately 1000m south-west of the rocky outcrop (Figure 24-25).



Figure 18. View from the rocky outcrop (Site TF1) facing north towards the Vlakfontein farmstead.



Figure 19. View from the rocky outcrop (Site TF1) facing south.



Figure 20. View of the distribution of Later Stone Age (LSA) stone artefacts including formal tools and flakes on the rocky outcrop (Site TF1).



Figure 21. Views of the distribution of Later Stone Age (LSA) stone artefacts, worked glass and ceramics.



Figures 22-23. Examples of the worked glass (left) and ceramics (right).



Figure 24. Isolated worked clear glass scraper documented 1000m south of Site TF1



Figure 25. Exposed area where the clear glass scraper was documented.

A circular dry stone walling feature is situated approximately 350m south of the Vlakfontein farmstead house bordering within the proposed development area (Figure 26). The feature has a single base layer of large packed boulders and is approximately 2.5m x 2.5m in extent with a 1m wide entrance. A few sherds of broken glass were documented within the immediate surrounding area.



Figure 26. Circular dry stone walling feature.

The remains of the original railway line runs across the south-eastern corner of the area east of the N9 national road (Figure 27). The remains can be identified by the built-up mound where the train used to run and the gravels. No railway tracks or sleepers remain. The extent of the railway line remains is covered in dense grass vegetation.

The area proposed for Solar Park 1 has a medium to high cultural sensitivity. The exposed Middle Stone Age (MSA) stone artefact surface scatters show evidence of the landscape was inhabited by precolonial populations from about 250 000 years ago. It is unlikely that these stone artefacts may be found *in situ*, and generally considered to be in a disturbed and secondary context. No other organic or material culture was documented in associated with the isolated occurrences of the Middle Stone Age (MSA) stone artefacts. The site (Site TF1) and associated material on and around the rocky outcrop show evidence that the San hunter-gatherers inhabited this landscape although may have occupied caves and rock shelters within the surrounding mountains. The occurrence of both historical material such as glass and ceramics in association with Later Stone Age (LSA) stone artefacts indicate interaction between the early colonial settlers, trekboers, or pioneers travelling through the area. The



Figure 27. Remains of the original railway line.

dry stone walling feature shows evidence of historical domestic stock farming if the feature was intentionally packed as a kraal. The remains of the original railway line marks the first attempt to connect South Africa through the railway lines.

6.2. Solar Park 2 on the Farm Tweefontein Portion 4 of Farm 11:

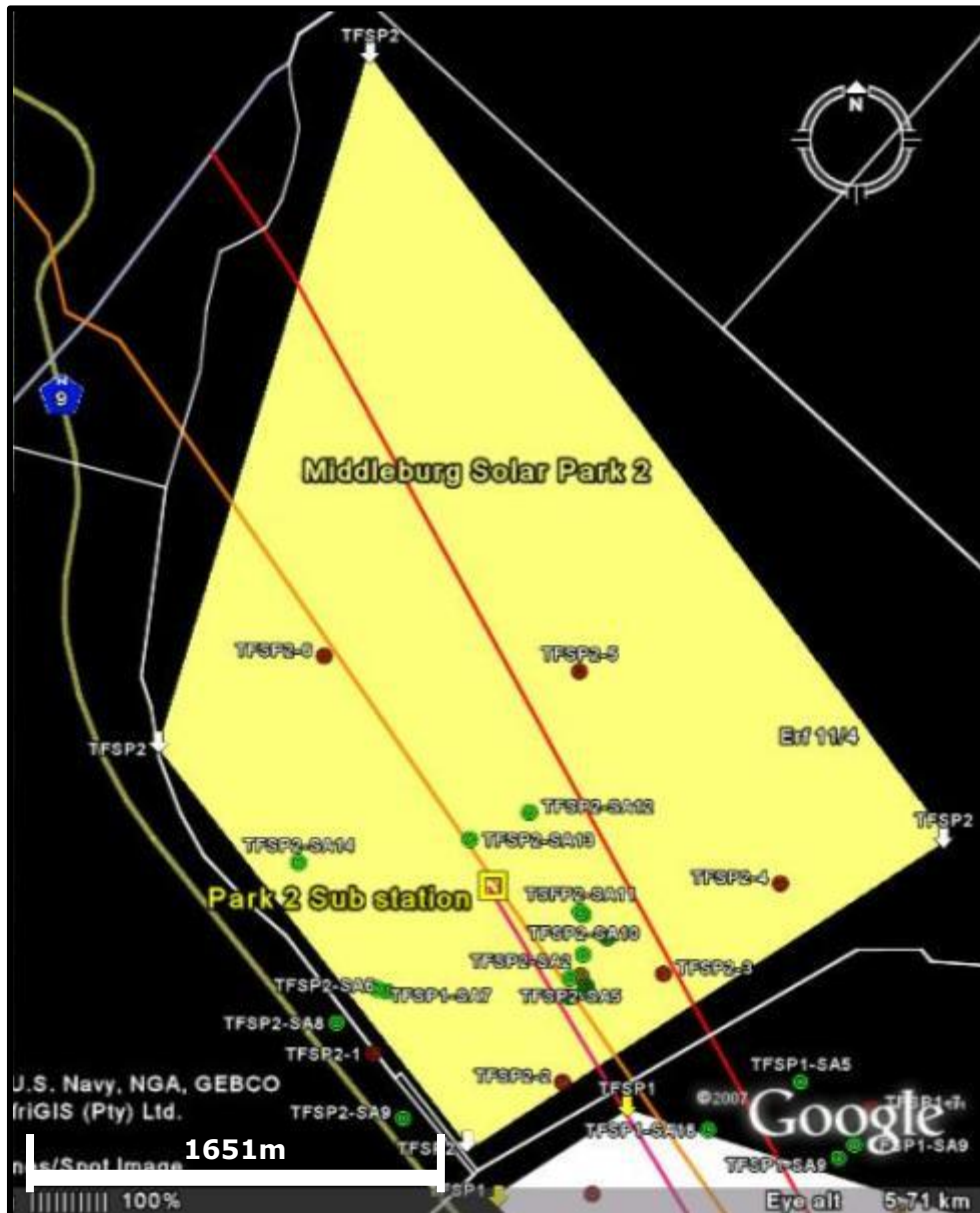


Figure 28. Map 6. Close-up aerial view of the area proposed for the Middelburg Solar Park 2 (final grid layout provided by Savannah Environmental (Pty) Ltd) (see table for co-ordinate and site references).

The proposed area for Solar Park is situated on the flat floodplains on the Farm Tweefontein Portion 4 of Farm 11. The landscape is generally flat and the vegetation cover comprises typical Karoo and dense grass vegetation. Prickly pear trees dominate the landscape on the western half of the proposed area. No substation currently exists within this area, however, a substation is proposed to be developed within the southern half (yellow square). Two sets of powerlines currently run diagonally north-south through the centre of the area (Figures 30-32). The original railway line runs adjacent to the N9 national road between the fence line and the western border of the proposed development. The remains of the associated railway siding are similarly situated between the old railway line and the western border of the proposed development, falling outside of the boundary of the development area.



Figure 29. Map 6. Close-up aerial view of the area proposed for the Middelburg Solar Park 2 showing the terrain and location of stone artefact scatters / occurrences, features, and sites.

The northern half of the proposed area has been susceptible to erosion and work has been done in the past and present to build up 8m deep dongas. This area has been disturbed by the construction of the original railway line and associated sidings and infrastructure, the existing powerlines, informal farm gravel roads, fences, and heavy erosion.



Figure 30. View of the landscape and disturbances.



Figure 31. View of the landscape and disturbances.



Figure 32. View of the landscape and disturbances.

Stone artefacts were observed and documented within exposed surface areas between the dense grass vegetation, the informal farm gravel roads. Denser scatters of stone artefacts (more than four within a 10m area) occurred closer to or within areas that may have been disturbed by the construction of the power lines (Figures 33-35).

Mainly isolated scatters of weathered Middle Stone Age (MSA) stone artefacts were noted and occurred throughout the proposed development area. The stone artefacts included faceted platform flakes and blades with retouch and edge-damage manufactured on hornfels raw material. Most of the stone artefacts were weathered and patinated with evidence of recent damage that may have been caused by trampling by domestic stock. Isolated stone artefacts that resembled the Later Stone Age (LSA) stone artefact manufacturing technique were also documented within the proposed development area (Figures 36-39).



Figure 33. Example of the exposed area yielding stone artefacts amongst the prickly pear trees.



Figure 34. Example of the exposed surface area yielding stone artefacts.



Figure 35. Example of the exposed surface area yielding stone artefacts.



Figure 36. Examples of the stones artefacts documented within the area proposed for Solar Park 2.



Figure 37. Examples of stone artefacts documented within the area proposed for Solar Park 2.



Figures 38-39. Examples of stone artefact documented within the area proposed for Solar Park 2.

An undermined brick feature is situated in the southern half of the proposed develop area. The feature comprises bricks laid down in three directions. The bricks appear to relatively modern.



Figure 40. View of the brick feature within the southern half of the proposed Solar Park 2 area.

The original railway line runs along the fence line adjacent to the N9 national road from the entrance off the N9 national road and for the entire extent of the property (Figure 41). The railway siding is situated about 300m from the entrance off the N9 national road adjacent to the original railway line. Broken fragments of glass and sherds of ceramics occur in association with the extent of the original railway line and railway siding houses. Similarly, the remains can be identified by the built-up mound where the train used to run and the gravels. No railway tracks or sleepers remain. The extent of the railway line remains is covered in dense grass vegetation.

The area proposed for Solar Park 2 has a medium cultural sensitivity. The exposed Middle Stone Age (MSA) stone artefact surface scatters show evidence of the landscape was inhabited by pre-colonial populations from about 250 000 years ago. It is unlikely that these stone artefacts may be found *in situ*, and generally considered to be in a disturbed and secondary context. No other organic or material culture was documented in associated with the isolated occurrences of the Middle Stone Age (MSA) stone artefacts. The remains of the original railway line marks the first attempt to connect South Africa through the railway lines.



Figure 41. The remains of the original railway line and railway siding in the distance.

7. DESCRIPTION OF SITES

7.1. Site TF1:

Site TF1 is situated on a rocky outcrop within the area proposed for the Middelburg Solar Park 2 on the Farm Tweefontein Remainder of Farm 11 near to the north central corner boundary for the proposed development. Later Stone Age (LSA) knapping (stone artefact manufacture) areas and formal tools comprising mainly of scrapers are distributed in association with worked glass and ceramics scraper implements. Middle Stone Age (MSA) stone artefacts also occur on the rocky outcrop and surrounding the rocky outcrop.

Site TF1 is considered as having a high cultural significance.

Site TF1 has been allocated a heritage grading of Grade III (NHRA 25 of 1999) being worthy of conservation by local authorities.

7.2. Stone Artefact Occurrences and Scatters:

Mainly isolated occurrences of Middle Stone Age (MSA) and some Later Stone Age (LSA) stone artefacts are distributed over the areas proposed for the Middelburg Solar Park 1 on the Farm Tweefontein, Remainder of Farm 11 and the Middelburg Solar Park 2 on the Farm Tweefontein, Portion 4 of Farm 11. Denser scatters of stone artefacts (more than four within a 10m² area) also occur in a few exposed surface areas. 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.

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

The stone artefact occurrences and scatters has been allocated a heritage grading of Grade III (NHRA 25 of 1999) being worthy of conservation by local authorities.

(See Table 8.1 and 8.2 for descriptions and co-ordinates)

7.3. Circular Dry Stone Walling Feature:

A circular dry stone walling feature, possibly arranged as kraal is situated about 350m south of the Vlakfontein farmstead on the area for the proposed Middelburg Solar Park 2 on the Farm Tweefontein, Remainder of Farm 11. The feature is approximately 2.5m x 2.5m in extent, a 1m entrance area, and one level of large packed rocks. Few fragments of broken glass was observed surrounding the feature.

The circular dry stone walling feature is considered as having a medium-high cultural significance.

The circular dry stone walling feature has been allocated a heritage grading of Grade III (NHRA 25 of 1999) being worthy of conservation by local authorities.

7.4. Original Railway Line and Associated Railway Siding Buildings:

The original railway line runs across the areas proposed for the Middelburg Solar Park 1 on the Farm Tweefontein, Remainder of Farm 11 and the Middelburg Solar Park 2 on the Farm Tweefontein, Portion 4 of Farm 11. The original railway line runs across a portion of southern area of proposed Solar 1 and continues between the fence line and the boundary for the proposed Solar Park 2. The associated railway siding buildings occur between the original railway line and the boundary of the proposed Solar Park 2 and therefore fall outside of the proposed area for development. Several fragments of broken glass and ceramics sherds were observed along the extent of the original railway line and the railway siding buildings.

The original railway line and associated railway siding buildings are considered as having a medium-high cultural significance.

The original railway line and associated railway siding buildings has been allocated a heritage grading of Grade III (NHRA 25 of 1999) being worthy of conservation by local authorities.

8. GPS CO-ORDINATES AND SITES FOR THE PROPOSED SOLAR PARK 1 ON THE FARM TWEEFONTEIN REMAINDER OF FARM 11 AND SOLAR PARK 2 ON THE FARM TWEEFONTEIN PORTION 4 OF FARM 11

TABLE 8.1: GPS CO-ORDINATES AND SITES - SOLAR PARK 1 ON THE FARM TWEEFONTEIN REMAINDER OF FARM 11:

REFERENCE	DESCRIPTION	CO-ORDINATES	HERITAGE GRADING
TFSP1-SA1	Isolated stone artefact occurrence / hornfels /scraper-like retouch / edge-damage	31°20'14.40"S; 24°58'38.40"E	III
TFSP1-SA2	Middle Stone Age (MSA) stone artefact occurrence / hornfels / weathered	31°20'33.00"S; 24°58'50.00"E	III
TFSP1-SA3	Middle Stone Age (MSA) stone artefact occurrence / shale / blade / cortex / retouch	31°20'27.10"S; 24°58'58.50"E	III
TFSP1-SA4	Middle Stone Age (MSA) flakes / hornfels / weathered	31°20'21.30"S; 24°58'46.70"E	III
TFSP1-SA5	Core / hornfels / cortex	31°19'07.40"S; 24°58'44.90"E	III
TFSP1-SA6	Middle Stone Age (MSA) stone artefact occurrence / hornfels / very weathered	31°19'37.40"S; 24°58'29.70"E	III
TFSP1-SA7	Later Stone Age (LSA) scraper / hornfels	31°19'38.30"S; 24°58'33.50"E	III
TFSP1-SA8	Middle Stone Age (MSA) flakes / hornfels / very weathered	31°19'35.00"S; 24°58'42.80"E	III
TFSP1-SA9	Flake / hornfels / retouch along sides	Extent: 31°19'16.10"S; 24°58'50.00"E 31°19'14.60"S; 24°58'52.10"E	III
TFSP1-SA10 (Site TF1)	Middle Stone Age (MSA) stone artefact occurrence / very weathered	Extent of Site TF1: 31°19'22.30"S; 24°59'18.10"E 31°19'22.80"S; 24°59'21.00"E	III
TFSP1-SA11 (Site TF1)	Later Stone Age (LSA) stone artefact scatter / knapping (manufacture) areas / hornfels / worked glass and ceramics	31°19'22.40"S; 24°59'19.30"E	III

REFERENCE	DESCRIPTION	CO-ORDINATES	HERITAGE GRADING
TFSP1-SA12	Later Stone Age (LSA) core (irregular) / hornfels	31°19'23.70"S; 24°59'13.50"E	III
TFSP1-SA13	Core (single platform) / hornfels	31°19'32.80"S; 24°58'53.80"E	III
TFSP1-SA14	Middle Stone Age (MSA) flake and blade / weathered	31°19'58.40"S; 24°59'19.80"E	III
TFSP1-SA15	Middle Stone Age (MSA) stone artefact occurrence / hornfels	31°19'57.60"S; 24°59'22.20"E	III
TFSP1-SA16	Middle Stone Age (MSA) stone artefact scatter / hornfels / weathered MSA / denser scatter	31°19'52.00"S; 24°59'21.10"E	III
TFSP1-SA17	Core / shale	31°19'43.20"S; 24°59'17.20"E	III
TFSP1-SA18	Middle Stone Age (MSA) stone artefact occurrence / hornfels / weathered	31°19'12.90"S; 24°58'32.60"E	III
TFSP1-GLA1	Isolated clear-glass scraper	31°19'43.30"S; 24°58'46.20"E	III
TFSP1-SWF1	Circular dry stone walling feature	31°19'22.80"S; 24°58'58.20"E	III
TFSP1-RW1	General reading on original railway line	31°19'48.00"S; 24°58'43.80"E	III
TFSP1-1	General Reading	31°20'11.40"S; 24°58'48.70"E	
TFSP1-2	General Reading	31°20'07.90"S; 24°58'38.40"E	
TFSP1-3	General Reading	31°20'19.80"S; 24°58'41.10"E	
TFSP1-4	General Reading	31°20'26.00"S; 24°58'35.90"E	
TFSP1-5	General Reading	31°20'37.70"S; 24°58'57.20"E	
TFSP1-6	General Reading	31°20'21.90"S; 24°59'02.20"E	
TFSP1-7	General Reading	31°19'10.40"S; 24°58'54.40"E	
TFSP1-8	General Reading	31°19'20.30"S; 24°58'17.20"E	
TFSP1-9	General Reading	31°19'34.00"S; 24°58'29.90"E	

REFERENCE	DESCRIPTION	CO-ORDINATES	HERITAGE GRADING
TFSP1-10	General Reading	31°19'19.40"S; 24°59'28.59"E	
TFSP1-11	General Reading	31°20'11.90"S; 24°59'20.52"E	
TFSP1-12	General Reading	31°19'56.18"S; 25°00'07.01"E	
TFSP1	Corner	31°19'11.54"S; 24°58'21.75"E	
TFSP1	Corner	31°19'25.16"S; 24°59'12.01"E	
TFSP1	Corner	31°19'55.82"S; 24°58'38.94"E	
TFSP1	Corner	31°19'21.92"S; 24°58'04.66"E	
TFSP1	Corner	31°19'14.88"S; 24°59'22.47"E	
TFSP1	Corner	31°20'40.50"S; 24°58'55.20"E	
TFSP1	Corner	31°20'24.70"S; 24°58'26.60"E	
TFSP1	Corner	31°19'52.00"S; 25°00'17.70"E	
TFSP1-MAST	Windmast (Flagging Trees)	31°19'41.50"S; 24°58'36.90"E	

TABLE 8.2.: GPS CO-ORDINATES AND SITES - SOLAR PARK 2 ON THE FARM TWEEFONTEIN PORTION 4 OF FARM 11:

REFERENCE	DESCRIPTION	CO-ORDINATES	HERITAGE GRADING
TFSP2-SA1	Middle Stone Age (MSA) stone artefact scatter / hornfels / edge-damage	31° 18'51.00"S; 24° 28'19.10"E	III
TFSP2-SA2	Middle Stone Age (MSA) broken proximal flake / faceted platform / hornfels / retouch / patinated / recent damage	31° 18'52.90"S; 24° 58'15.90"E	III
TFSP2-SA3	Middle Stone Age (MSA) stone artefact occurrence / convex flakes / hornfels / retouch / patinated	Extent: 31° 18'56.50"S; 24° 58'16.20"E 31° 18'56.60"S; 24° 58'16.40"E	III
TFSP2-SA4	Stone artefact occurrence / shale	31° 18'57.80"S; 24° 58'14.10"E	III
TFSP2-SA5	Stone artefact occurrence / core (irregular) / scraper	31° 18'55.60"S; 24° 58'14.20"E	III
TFSP2-SA6	Stone artefact occurrence / core	31° 18'57.20"S; 24° 57'49.80"E	III
TFSP2-SA7	Middle Stone Age (MSA) stone artefact occurrence	31° 18'56.90"S; 24° 57'48.50"E	III
TFSP2-SA8	Middle Stone Age (MSA) stone artefact occurrence	31° 19'00.80"S; 24° 57'43.10"E	III
TFSP2-SA9	Middle Stone Age (MSA) stone artefact occurrence	31° 19'11.70"S; 24° 57'52.00"E	III
TFSP2-SA10	Middle Stone Age (MSA) stone artefact scatter / hornfels / quartzite / weathered	31° 18'48.40"S; 24° 58'15.90"E	III
TFSP2-SA11	Middle Stone Age (MSA) stone artefact occurrence	31° 18'48.00"S; 24° 58'15.50"E	III
TFSP2-SA12	Middle Stone Age (MSA) flakes / very weathered	31° 18'36.70"S; 24° 58'08.70"E	III

REFERENCE	DESCRIPTION	CO-ORDINATES	HERITAGE GRADING
TFSP2-SA13	Middle Stone Age (MSA) stone artefact occurrence	31° 18'39.80"S; 24° 58'00.80"E	III
TFSP2-SA14	Middle Stone Age (MSA) stone artefact occurrence / weathered	31° 18'42.50"S; 24° 57'58.00"E	III
TFSP2-Feat1	3-way brick feature and a little pile of stones	31° 18'55.30"S; 24° 58'15.60"E	
TFSP2-1	General Reading	31° 19'04.30"S; 24° 57'48.00"E	
TFSP2-2	General Reading	31° 19'07.50"S; 24° 58'13.20"E	
TFSP2-3	General Reading	31° 18'55.10"S; 24° 58'26.60"E	
TFSP2-4	General Reading	31° 18'44.74"S; 24° 58'42.13"E	
TFSP2-5	General Reading	31° 18'20.56"S; 24° 58'15.31"E	
TFSP2-6	General Reading	31° 18'18.88"S; 24° 57'41.34"E	
TFSP2	Corner	31° 17'11.26"S; 24° 57'47.17"E	
TFSP2	Corner	31° 18'30.12"S; 24° 57'19.29"E	
TFSP2	Corner	31° 19'15.68"S; 24° 58'00.52"E	
TFSP2	Corner	31° 18'40.77"S; 24° 59'03.82"E	

9. ASSESSMENT OF THE SIGNIFICANCE AND OF THE ARCHAEOLOGICAL AND HISTORICAL HERITAGE RESOURCES FOR SOLAR PARK 1 AND SOLAR PARK 2

TABLE 9.1: ASSESSMENT OF THE SIGNIFICANCE OF SOLAR PARK 1 ON THE FARM TWEEFONTEIN REMAINDER OF FARM 11: The destruction of the Site TF1 (on rocky outcrop)

Nature: The destruction of the Site TF1 (on rocky outcrop)		
	Without mitigation	With mitigation
Extent	Regional (5)	Low (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Very High (10)	Moderate (6)
Probability	Highly Probable (4)	Improbable (2)
Significance	High (80)	Low (24)
Status (positive or negative)	Negative	Negative
Reversibility	None	Low
Irreplaceable loss of resources?	Yes	Low
Can impacts be mitigated?	Yes	Yes
Mitigation: <ul style="list-style-type: none"> A 100m diameter protection perimeter around the archaeological site TF1 on the rocky outcrop must be established before and during all construction and development activities to avoid negative impact. 		
Cumulative impacts: <ul style="list-style-type: none"> Irreplaceable loss of archaeological heritage resources. 		
Residual impacts: <ul style="list-style-type: none"> Irreplaceable loss of archaeological heritage resources. 		

TABLE 9.2: ASSESSMENT OF THE SIGNIFICANCE OF SOLAR PARK 1 ON THE FARM TWEEFONTEIN REMAINDER OF FARM 11: The destruction of the stone artefact occurrences and scatters.

Nature: The destruction of the stone artefact occurrences and scatters.		
	Without mitigation	With mitigation
Extent	Regional (5)	Low (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Very High (10)	Moderate (6)
Probability	Highly Probable (4)	Probable (3)
Significance	High (80)	Medium (36)
Status (positive or negative)	Negative	Negative
Reversibility	None	Low
Irreplaceable loss of resources?	Yes	Low
Can impacts be mitigated?	Yes	Yes
Mitigation:		
<ul style="list-style-type: none"> • A professional archaeologist (with an already authorised collection permit) must be appointed during the various phases of development including vegetation clearing and the excavation activities to monitor and identify possible archaeological material remains and features that may occur below the surface and further make appropriate recommendations on removing and / or protecting the archaeological material remains and features. • 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. • 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. 		
Cumulative impacts:		
<ul style="list-style-type: none"> • Irreplaceable loss of archaeological heritage resources. 		
Residual impacts:		
<ul style="list-style-type: none"> • Irreplaceable loss of archaeological heritage resources. 		

TABLE 9.3: ASSESSMENT OF THE SIGNIFICANCE OF SOLAR PARK 1 ON THE FARM TWEEFONTEIN REMAINDER OF FARM 11: The negative impact of development on the packed dry stone walling feature.

Nature: The destruction of the packed dry stone walling feature.		
	Without mitigation	With mitigation
Extent	Local (5)	Low (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Very High (10)	Moderate (6)
Probability	Highly Probable (4)	Improbable (2)
Significance	High (80)	Low (24)
Status (positive or negative)	Negative	Negative
Reversibility	None	Low
Irreplaceable loss of resources?	Yes	Low
Can impacts be mitigated?	Yes	Yes
Mitigation: <ul style="list-style-type: none"> A 50m diameter protection perimeter around the circular dry stone walling feature must be established before and during all construction and development activities to avoid negative impact. 		
Cumulative impacts: <ul style="list-style-type: none"> Irreplaceable loss of historical heritage resources. 		
Residual impacts: <ul style="list-style-type: none"> Irreplaceable loss of historical heritage resources. 		

TABLE 9.4: ASSESSMENT OF THE SIGNIFICANCE OF SOLAR PARK 1 ON THE FARM TWEEFONTEIN REMAINDER OF FARM 11: The negative impact of development on the original railway line.

Nature: The destruction of the original railway line.		
	Without mitigation	With mitigation
Extent	Regional (5)	Low (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Very High (10)	Moderate (6)
Probability	Highly Probable (4)	Improbable (2)
Significance	High (80)	Low (24)
Status (positive or negative)	Negative	Negative
Reversibility	None	Low
Irreplaceable loss of resources?	Yes	Low
Can impacts be mitigated?	Yes	Yes
Mitigation: <ul style="list-style-type: none"> The remains of the old railway and railway siding are situated outside of the border of the proposed development and must be protected during all construction and development activities to avoid negative impact. 		
Cumulative impacts: <ul style="list-style-type: none"> Irreplaceable loss of historical heritage resources. 		
Residual impacts: <ul style="list-style-type: none"> Irreplaceable loss of historical heritage resources. 		

TABLE 9.5: ASSESSMENT OF THE SIGNIFICANCE OF SOLAR PARK 2 ON THE FARM TWEEFONTEIN PORTION 4 OF FARM 11:

Nature: The destruction of the stone artefact occurrences and scatters.		
	Without mitigation	With mitigation
Extent	Regional (5)	Low (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Very High (10)	Moderate (6)
Probability	Highly Probable (4)	Probable (3)
Significance	High (80)	Medium (36)
Status (positive or negative)	Negative	Negative
Reversibility	None	Low
Irreplaceable loss of resources?	Yes	Low
Can impacts be mitigated?	Yes	Yes
<p>Mitigation:</p> <ul style="list-style-type: none"> • A professional archaeologist (with an already authorised collection permit) must be appointed during the various phases of development including vegetation clearing and the excavation activities to monitor and identify possible archaeological material remains and features that may occur below the surface and further make appropriate recommendations on removing and / or protecting the archaeological material remains and features. • 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. • 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. 		
<p>Cumulative impacts:</p> <ul style="list-style-type: none"> • Irreplaceable loss of archaeological heritage resources. 		
<p>Residual impacts:</p> <ul style="list-style-type: none"> • Irreplaceable loss of archaeological heritage resources. 		

TABLE 9.6: ASSESSMENT OF THE SIGNIFICANCE OF SOLAR PARK 2 ON THE FARM TWEEFONTEIN PORTION 4 OF FARM 11:

Nature: The negative impact of development on the original railway line.		
	Without mitigation	With mitigation
Extent	Regional (5)	Low (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Very High (10)	Moderate (6)
Probability	Highly Probable (4)	Improbable (2)
Significance	High (80)	Low (24)
Status (positive or negative)	Negative	Negative
Reversibility	None	Low
Irreplaceable loss of resources?	Yes	Low
Can impacts be mitigated?	Yes	Yes
Mitigation: <ul style="list-style-type: none"> The remains of the old railway and railway siding are situated outside of the border of the proposed development and must be protected during all construction and development activities to avoid negative impact. 		
Cumulative impacts: <ul style="list-style-type: none"> Irreplaceable loss of historical heritage resources. 		
Residual impacts: <ul style="list-style-type: none"> Irreplaceable loss of historical heritage resources. 		

10. RECOMMENDATIONS

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

1. The remains of the old railway and railway siding are situated outside of the border of the proposed development and must be protected during all construction and development activities to avoid negative impact.
2. A 50m diameter protection perimeter around the circular dry stone walling feature must be established before and during all construction and development activities to avoid negative impact.
3. A 100m diameter protection perimeter around the archaeological site on the rocky outcrop must be established before and during all construction and development activities to avoid negative impact.
4. The location of the undetermined brick feature must be noted and avoided during all construction and development activities.
5. A professional archaeologist (with an already authorised collection permit) 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.
6. 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.
7. 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.

11. 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.

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APPENDIX A: GRADING SYSTEM

The NHRA stipulates the assessment criteria and grading of archaeological sites. The following categories are distinguished in Section 7 of the Act:

- Grade I: Heritage resources with qualities so exceptional that they are of special national significance;
- Grade II: Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region; and
- Grade III: Other heritage resources worthy of conservation on a local authority level.

The occurrence of sites with a Grade I significance will demand that the development activities be drastically altered in order to retain these sites in their original state. For Grade II and Grade III sites, the applicable mitigation measures would allow the development activities to continue.

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.

