HERITAGE IMPACT ASSESSMENT FOR THE PROPOSED AUGRABIES SOLAR ENERGY FACILITY, KENHARDT MAGISTERIAL DISTRICT, NORTHERN CAPE

(Assessment conducted under Section 38 (8) of the
National Heritage Resources Act (No. 25 of 1999) as part of a BAR)

Prepared for

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EXECUTIVE SUMMARY

ACO Associates cc was asked by Rosenthal Environmental to assess the potential impacts to heritage resources that might occur through construction of a photo-voltaic solar energy facility on Rooipad 15/9, just to the west of Augrabies Falls National Park (Figure 1). The proposed facility would be approximately 19.9 ha in extent and would generate 10 MW of electricity. The power would be evacuated via a 7.5 m high 22 kV power line that would connect to the existing Blouputs Substation that lies just to the west of the farm. An access road of about 400 m long and 6 m wide would be required to connect the site to the R357. Two alternative sites are proposed.

The site was visited on 14th February 2012 and heritage features and finds were photographed and recorded. The site was found to be generally flat but with occasional rocky outcrops and numerous small drainage lines. Vegetation was sparse with most areas covered only by scattered clumps of grass.

Stone Age archaeological finds were found throughout the site but were far more dense in rocky areas than in sandy areas with no concentrations of artefacts found anywhere on Site 2. Scatters on rocky koppies and ridges are of low-medium significance while the background artefact scatter found everywhere else is of very low significance. The most significant find is a stone cairn that may well represent a Khoekhoe grave similar to a host of others documented in the general area. While it cannot be proceed without excavation that it is a grave, it should be treated as of very high significance and protected from any disturbance. A small building, a sheep dip and a historical grave date to the early and/or mid-20th century. The former two are of low significance but the grave is accorded very high significance.

Overall, the proposed project will have very low impacts to heritage resources. The Visual Impact Assessment may require the project footprint to be altered but provided that no rocky ridges and koppies will be impacted it should be allowed to proceed. The following recommendations should be adhered to:

- The stone cairn and historic grave must be avoided and protected;
- The ECO should be made aware of the potentially very high significance of stone cairns and should ensure that any revised footprint location will not impact on any stone cairns not documented by the present report; and
- If any human remains are revealed during earthworks, excavations in the immediate vicinity should be halted and the find reported to an archaeologist or to SAHRA (telephone: 021 462 4502). Exhumation may be required at the expense of the developer.

Contents

1. INTRODUCTION

ACO Associates cc was asked by Rosenthal Environmental to assess the potential impacts to heritage resources that might occur through construction of a photo-voltaic solar energy facility on Rooipad 15/9, just to the west of Augrabies Falls National Park (Figure 1). The proposed facility would be approximately 19.9 ha in extent and would generate 10 MW of electricity. The power would be evacuated via a 7.5 m high 22 kV power line that would connect to the existing Blouputs Substation that lies just to the west of the farm. An access road of about 400 m long and 6 m wide would be required to connect the site to the R357. Two alternative locations are proposed, although larger areas around each have been identified in case of the need to shift the footprint after the specialist studies.

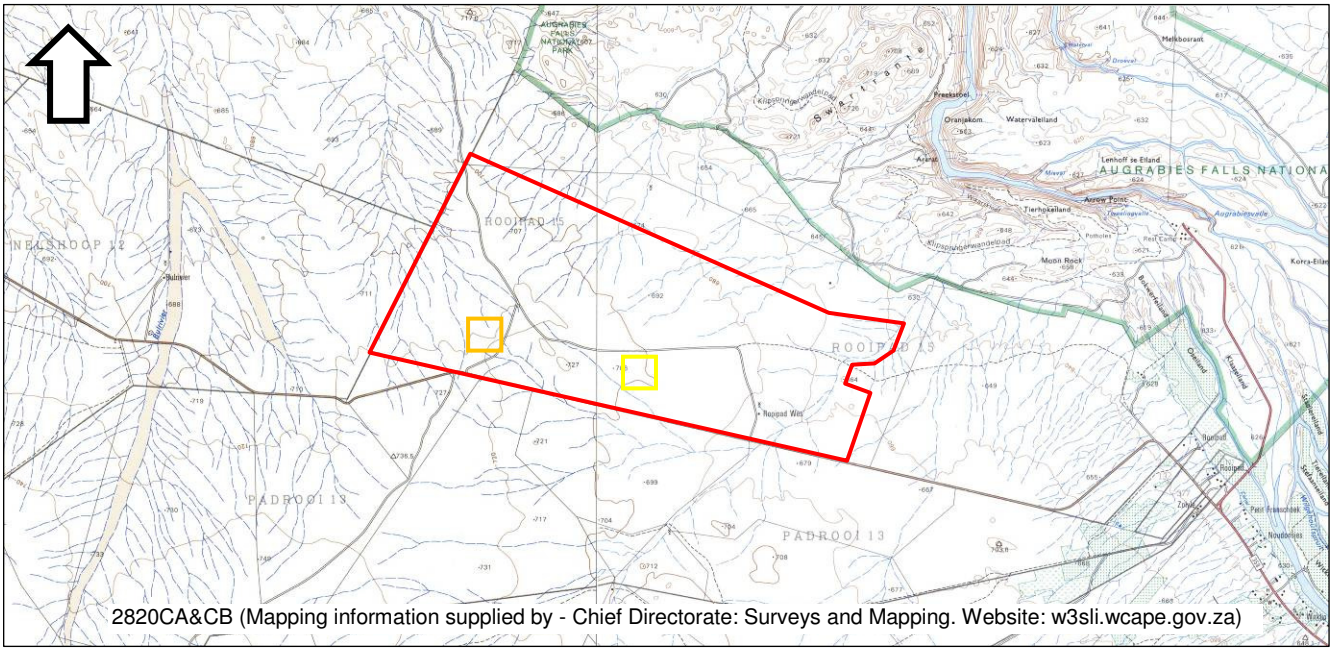


Figure 1: Map showing the Site 1 (preferred; orange polygon) and Site 2 (alternative; yellow polygon) locations for the proposed Augrabies Solar Energy Facility.

Due to the proximity to the Augrabies National Park and an adjacent road, tree planting is being considered as a potential visual mitigation measure. Should this be enacted, then a small water pipeline would need to be laid along the road from the east to enable irrigation of the trees.

2. HERITAGE LEGISLATION

The National Heritage Resources Act (NHRA) No. 25 of 1999 protects a variety of heritage resources including palaeontological, prehistoric and historical material (including ruins) more than 100 years old (Section 35), human remains older than 60 years and located outside of a formal cemetery administered by a local authority (Section 36) and non-ruined structures older than 60 years (Section 34). Landscapes with cultural significance are also protected under the definition of the National Estate (Section 3 (3.2d)). Section 38 (2a) states that if there is reason to believe that heritage resources will be affected then an impact assessment report must be submitted. This report fulfils that requirement.

Since the project is subject to a Basic Environmental Assessment, Heritage Northern Cape (for the Built Environment) and the South African Heritage Resources Agency (SAHRA; for archaeology) are required to provide comment on the proposed project in order to facilitate final decision making by the Department of Environmental Affairs (DEA).

3. METHODS

The positions of the two alternatives were loaded onto GPS receivers to facilitate field survey of the areas. The survey was conducted on the 14th February 2012 by two archaeologists (Jayson Orton and Lita Webley). The survey combined driving and walking across the site and emphasis was placed on the two Alternatives for the actual footprint. All features and finds were photographed and their positions were recorded on the GPS (set to the WGS84 datum) as required. Archaeological and other heritage sites are named after the farm on which they were found, in this case Rooipad (3-letter acronym: RPD), the year in which they were found and a consecutive number (e.g. RPD2011/001). Occurrences of background artefact scatter are not deemed to be archaeological sites in the strictest sense and are thus not numbered.

A heritage context was compiled from previous published and unpublished sources to allow contextualisation of the finds and a more reliable estimation of their heritage significance.

3.1. Limitations

The site was large and could not be surveyed in detail. However, the finds and their context suggest that a reliable understanding of the site was gained and that the limited survey will not have negatively influenced the outcome of this report.

4. HERITAGE CONTEXT

Palaeontological material is highly unlikely to be present in the area given the igneous rocks forming the bulk of the landscape. Almond and Pether (2008) note the Namaqua-Natal Metamorphic rocks to have no palaeontological significance, since no fossils have yet been recorded in them. The bulk of archaeological research conducted in the vicinity of Augrabies was done during the 1970s and 1980s. It demonstrates that there are important heritage sites located in the region. Existing reports are summarised here.

The only decent Middle Stone Age (MSA) site is the cave at Zoovoorbij (Smith 1995) some 64 km east of Augrabies. Here a collection of flaked stone artefacts was made from the lower levels of an excavation. The upper levels contained typical Later Stone Age (LSA) materials including stone artefacts, bone beads, ostrich eggshell beads and a few potsherds. Stone artefacts included scrapers and miscellaneous retouched pieces. Dating revealed a strong pulse of occupation spanning 4140 ± 70 BP (Pta-2889) at the base of the LSA to 2800 ± 60 BP (Pta-2870) near the top. Aside from this site, a small collection of MSA artefacts was found by Morris and Beaumont (1991) at the base of a rock shelter near Augrabies. This will be mentioned below. Aside from these occurrences, “thousands of square kilometres of Bushmanland are covered by a low density lithic scatter” (Beaumont *et al.* 1995:240), which

will likely relate predominantly to the MSA but with contributions from the Early Stone Ahe (ESA) and LSA as well.

Morris and Beaumont (1991) reported on the excavation of two Stone Age archaeological sites on Renosterkop, immediately east of the town of Augrabies. At Renosterkop 1 he found an open scatter of stone artefacts, pottery, ostrich eggshell beads and other materials. The stone was predominantly informal though a few retouched items (scrapers and backed tools) were present. Grindstones occurred and included one stone of the sort described by Webley (1990) for use in scraping skins. The pottery was thin walled and had incised horizontal lines and tear-drop-shaped impressions. Most sherds had mineral temper but a few were tempered with grass. The beads were mostly small, but a few far larger examples were also present. Renosterkop 2 was a small rock shelter. Two square metres were excavated and found to contain modern material in the upper deposits with material similar in character to Renosterkop 1 occurring below. At the base was a collection MSA artefacts but the interface between the LSA and MSA was unclear and the deposits were poorly stratified. Through comparison with other sites, Morris and Beaumont (1991) consider the LSA material to relate to a late phase of herder occupation.

Smith (1986) mentions a site near Augrabies Falls that contained pottery, sheep bones and an informal stone artefact assemblage with just one scraper among 1000 flaked artefacts. The site was dated to 760 ± 40 BP (Pta-3847) and is said to have been occupied by herders. He later names this site Waterval 1 and claims five miscellaneous retouched pieces and no scrapers among 827 artefacts (Smith 1995). Beads, a decorated flask mouth fragment and thin-walled pottery were also found. The latter were grit-tempered and included impressed decoration and lugs.

Well south of the study area, far from the Orange River, Smith (1986) has also excavated a site called Droëgrond. It was occupied repeatedly during the last few hundred years with the proximate permanent water source no doubt the main attraction. He ascribed the site to a hunter-gatherer occupation. Other sites even further south into the Karoo and Bushmanland have also been studied but are less relevant here.

All these studies have resulted in the separation of two seemingly distinctive industries that are termed “Swartkop” and “Doornfontein”. The former are said to be related to occupation by hunter-gatherers and to occur away from large water courses, while the latter were said to be from herders and to cluster along the banks of the Orange River and its larger tributaries (Beaumont & Vogel 1984).

Parsons (2007) has recently worked on assemblages excavated from sites in the Augrabies Falls area by Peter Beaumont in past decades. These include Biesje Poort 2 and Bokvasmaak 3, both on the northern side of the falls. Beaumont *et al.* (1995) provide dates of 1390 ± 70 BP (Pta-4772) and 120 ± 50 (Pta-4872) for the two sites respectively. Biesje Poort 2 in particular contained numerous retouched items with many different types represented. Both sites had been ascribed to herders by Beaumont *et al.* (1995) but Parsons’ (2007) analyses showed the relevant characteristics to be blurred and unreliable. Many archaeological sites are also on record in the Riemvasmaak area and surroundings to the north of the river (Hoffmann *et al.* 1995).

Also potentially relevant in the vicinity is the possibility of finding circular stone structures constructed by the pre-colonial occupants of the area. While such structures are found throughout much of the Karoo, they are less well documented in this region. However, on the

farm Bloubos to the north of Augrabies Falls, Parsons (2004) has described a number of these features.

Many human skeletons have been exhumed from the area between Augrabies Falls and Upington, both by Dreyer and Meiring (1937) and by Alan Morris (1995). Eighteen came from close to Augrabies Falls. The burial cairns and other information suggested Khoekhoen people, specifically the Einiqua, and historical data shows the majority of graves to date to the 18th and early 19th centuries (A. Morris 1995).

Very limited cultural resource management (CRM) work has been carried out in the region. The only major excpetion being that carried out for the Augrabies Falls National Park cultural heritage management plan in 2001. The findings of this survey showed that ESA, MSA and LSA sites, graves, rock art (pre- and post-colonial), historical sites and the Manie Maritz Fort (see below) were all found in the region (Anonymous 2001).

Hart (2003) subsequently conducted a desktop review of the heritage sensitivity of the southern side of the Lower Orange River valley to the west of the park noting that areas in close proximity to the river were likely to have very high sensitivity. Kinahan (2003) did an archaeological sensitivity assessment of the northern side which included some fieldwork. His fieldwork in the Augrabies Falls area was limited to the gorge where archaeological remains were infrequent. He did, however, note that "Historical remains relating to events of the late nineteenth and early twentieth centuries, such as the Anglo-Boer War and the subsequent rebellion lead by Manie Maritz, are well preserved within the Augrabies Falls National Park" (Kinahan 2003: 14). In a personal communication to the Environmental Practitioner, the landowner, Mr Rudolph Oosthuizen (born 1926), asserts that, to the best of his knowledge, no battles were fought on the farm. The SA Military History website indicates that military graves are present on many farm in the Pofadder, Kakamas and Keimoes areas (The South African Military History Society n.d.). A large number of these graves probably pertain to the Anglo-Boer War testifying to its presence in the area.

Perhaps particularly important in this regard is the Manie Maritz Fort located in the western part of the park some 18 km north-west of the study area. The fort is built of piled stones and whether the fort was really associated with General Maritz remains unknown (Anonymous 2001). It has not been possible to find out anything more about this fort but information on the person after whom it was named is readily available. Maritz was a Boer General during the second Anglo-Boer War and in 1914, during the First World War, he allied himself with the Germans and led a Boer revolt against the South African government. The rebellion was aimed at recreating the old Boer republics but it failed and the leaders were fined and imprisoned (Wikipedia 2011).

The name "Augrabies" comes originally from the Khoe word "Aukoerebis" meaning the Place of the Great Noise. This was, of course, in reference to the thundering of the Augrabies Falls as they plummeted around 60 m to the base of the gorge (SA Venues 2012).

In more recent times the water related infrastructure in the Kakamas area was important for agricultural development and several water wheels and excavated tunnels and leiwaters/furrows have been declared Provincial Heritage Sites (SAHRA, n.d.). The hand-dug tunnels represented impressive feats of engineering for the early 20th century (Open Africa 2012).

The author has not personally examined any farm complexes in the area. Given that agriculture has developed here only within the 20th century, early buildings are likely to be rare, although a few early 20th century water mills have been declared Provincial Heritage Sites. The town of Kakamas was founded by the Dutch Reformed Church in 1898 at a place where the river was relatively easy to cross. It was earlier known as Bassonsdrif (Wikipedia 2012).

5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

The site lies along the southern border of the Augrabies Falls National Park but is far less rocky than the park land (Figure 2). The site is generally flat but has several low rocky ridges crossing the south-western portion (Site 1) and running from northwest to southeast. Many small drainage lines, generally following the same directional trend, also occur in the south-western area but the rest of the land examined (Site 2) is generally level and far sandier with few drainage lines. Vegetation is either very sparse (at ground level) or else scattered bushes of approximately waist to head height. Occasional quiver trees also occur.

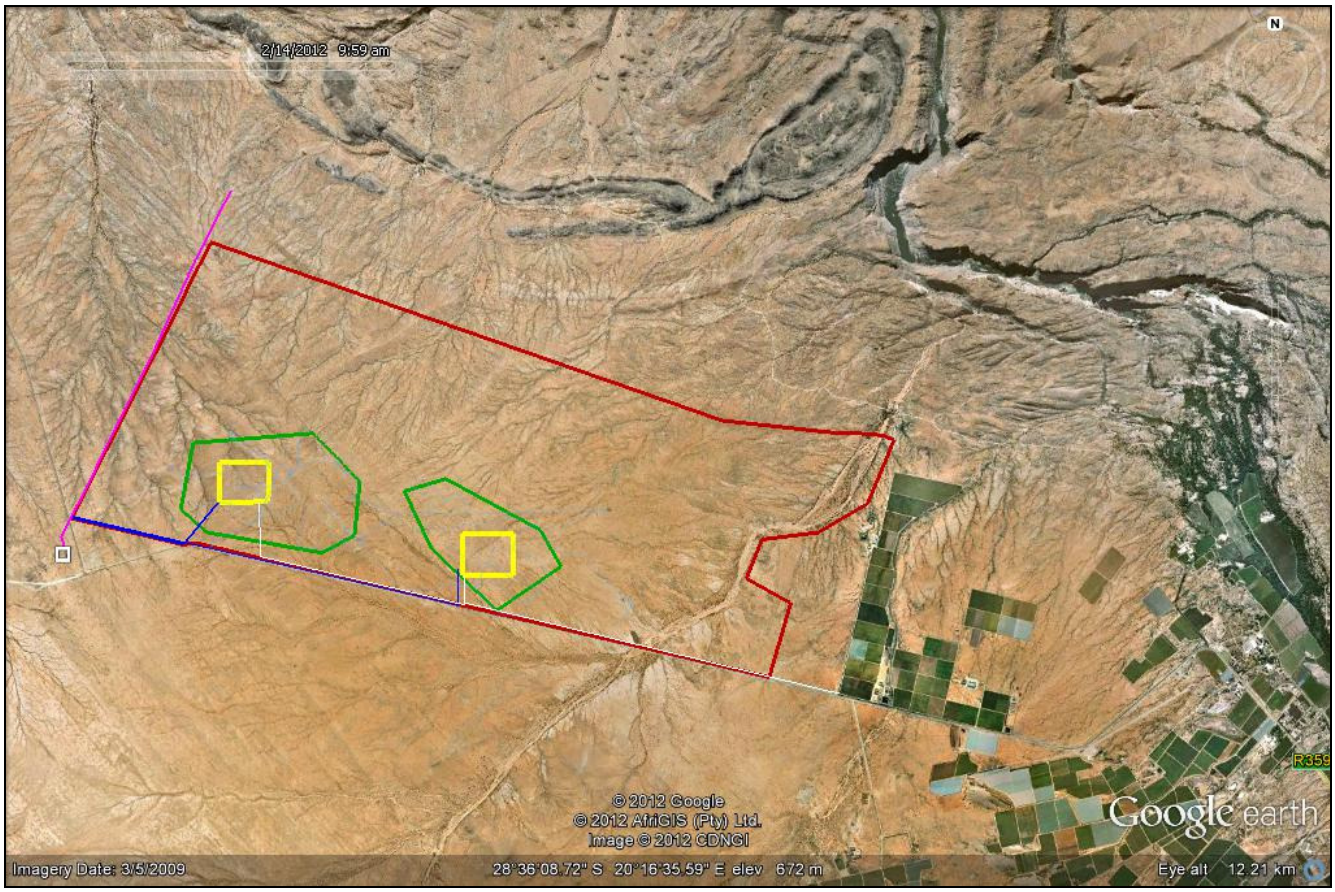


Figure 2: Aerial view of the study area with the Augrabies Falls National Park in the northeast. The canyon and waterfall are visible in the upper right hand side. The polygons and lines are as follows: Red: cadastral boundary of Rooipad 15 Portion 9, Yellow: site alternatives, Green: areas within which layouts can be moved as required, Blue: proposed 22 kV power line, White: proposed water pipeline, Pink: Existing 22 kV power line, White square: existing Blouputs Substation.

Figure 3: View of a wet area (presumably accumulated rain water) in the centre of Site 1.

Figure 4: View from the crest of one of the rocky ridges on the site facing towards the northwest. The Orange River lies towards the mountains on the far right hand side of the photograph.

Figure 5: View northwards towards the largest of the rocky ridges in the eastern part of the Site 1 area.

Figure 6: View across the south-eastern part of the Site 1 area showing denser vegetation in an area of small water courses with typical grassland in the foreground.

Figure 7: Quartz gravel that lies across much of Site 1.

Figure 8: One of the deeper drainages present along the northern edge of Site 1.

Figure 9: Looking northwest at the rocky areas on the crest of the largest ridge. The windmill lies at the north-western end of the ridge.

F**igure 10:** Grasslands on Site 2. This view faces the Augrabies National Park. Moon Rock is visible.

6. FINDINGS

Figures 11 and 12 show the distribution of heritage on the site as recorded during the fieldwork. Sites are numbered with an RPD acronym while “BkgrSc” indicates recorded occurrences of background artefact scatter. Table 1 provides a summary of the sites.

Table 1: Summary list of all heritage occurrences found on Rooipad 15/9.

Number	Location	Description	Heritage significance
RPD2011/001	S28 36 20.5 E20 14 05.6	LSA artefact scatter	Low
RPD2011/002	S28 36 17.6 E20 13 40.7	Stone cairn / grave	(potentially) Very high
RPD2011/003	S28 36 07.5 E20 14 19.5	LSA artefact scatter	Low-Medium
RPD2011/004	S28 36 14.8 E20 14 33.4	LSA artefact scatter	Low-Medium
RPD2011/005	S28 36 17.6 E20 14 37.4	LSA artefact scatter	Low-Medium
RPD2011/006	S28 36 58.4 E20 16 18.3	Sheep dip	Low
RPD2011/007	S28 36 59.3 E20 16 22.1	House	Low
RPD2011/008	S28 37 04.5 E20 16 19.6	Historical grave	Very high

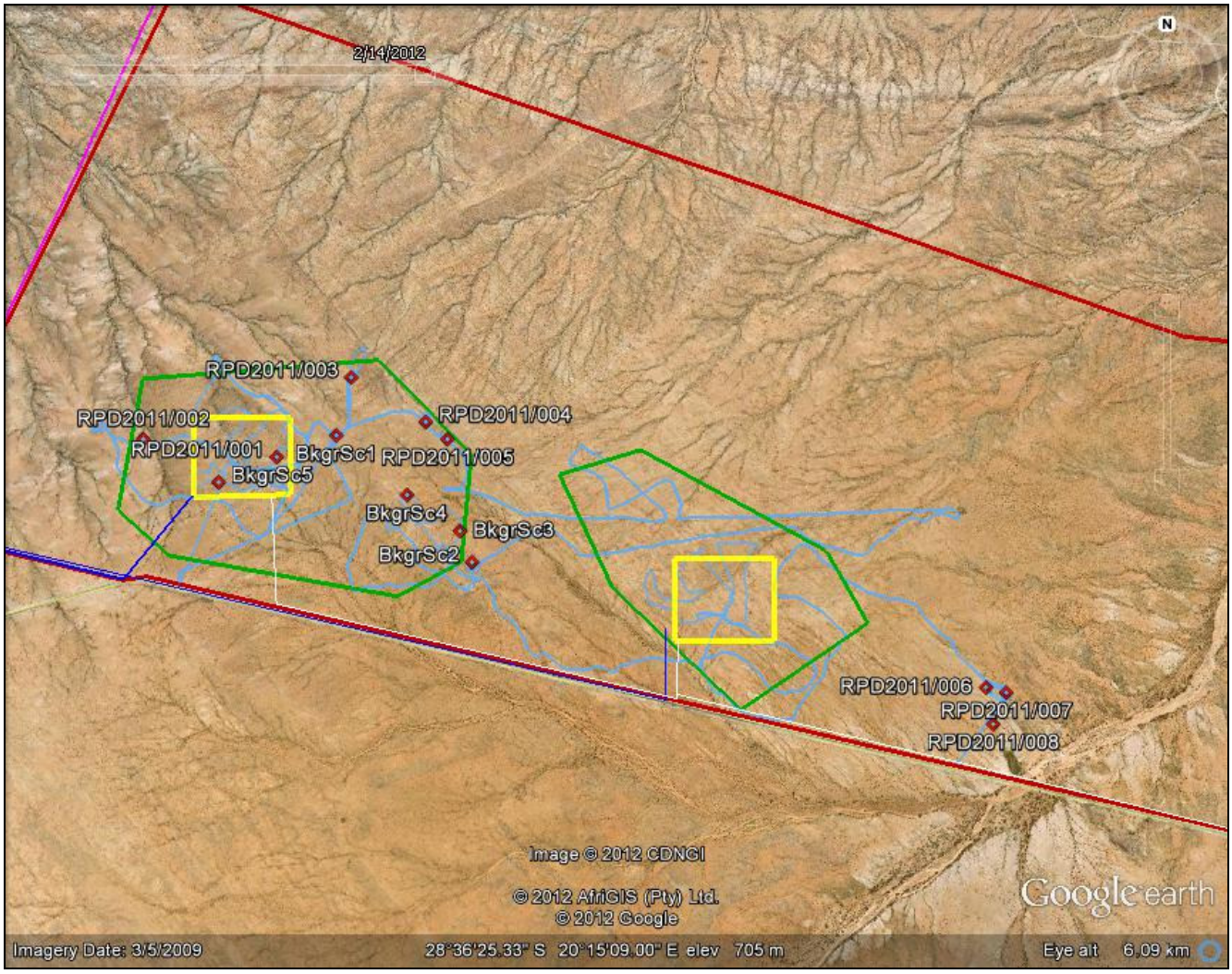
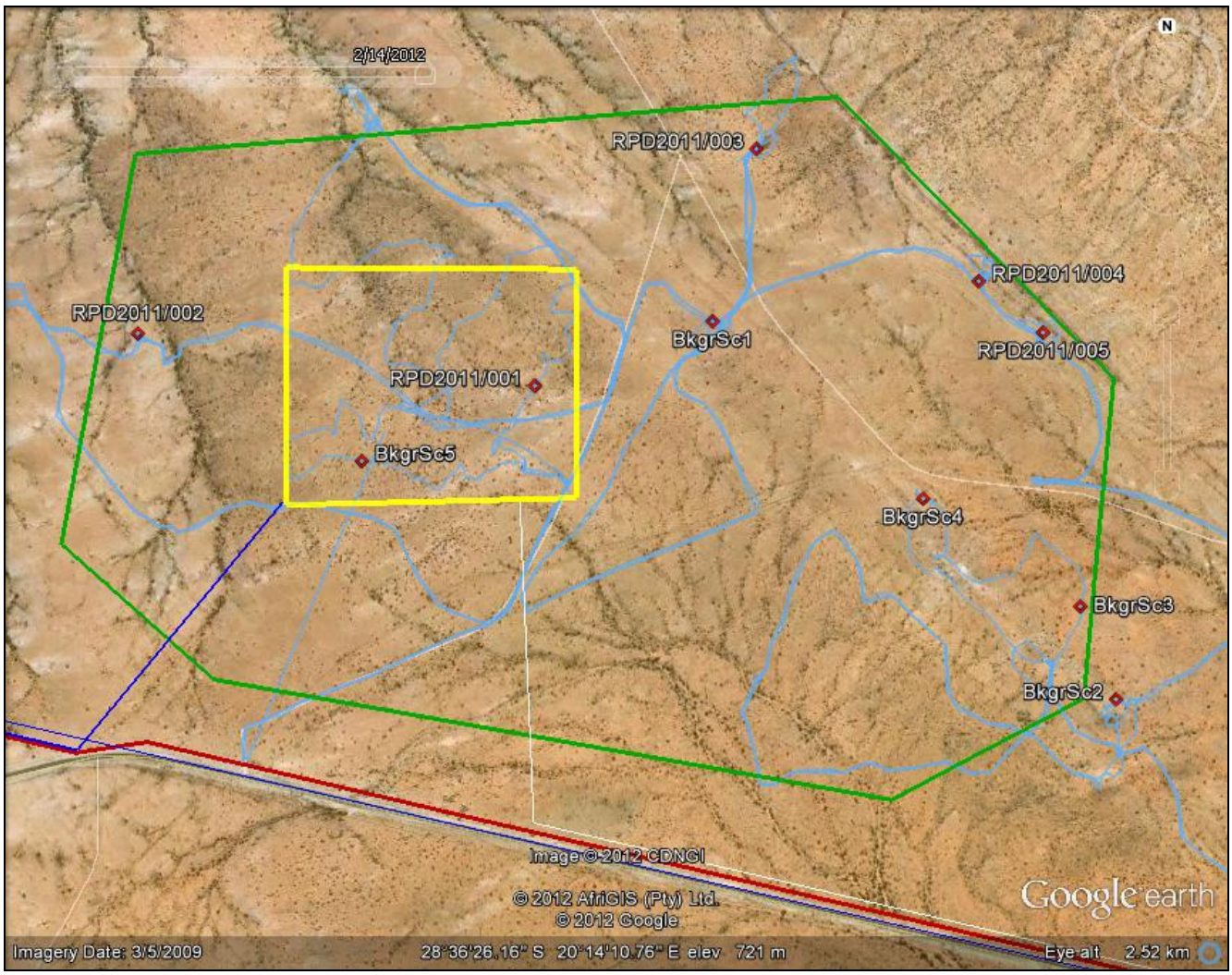


Figure 11: Aerial view of the study area showing the locations of all described heritage resources. Sites are labelled with an "RPD acronym, while areas in which lithics ascribable to background scatter were recorded are indicated by "BkgrSc".



F**igure 12:** Aerial view of the Site 1 study area showing the locations of all described heritage resources. Sites are labelled with an "RPD acronym, while areas in which lithics ascribable to background scatter were recorded are indicated by "BkgrSc".

6.1. Stone Age archaeology

Much of the site contained a very low density scatter of stone artefacts, many of which probably pertain to the MSA. The artefacts tend to be abraded from thousands of years of exposure (Figures 13 & 14). This is in keeping with similar observations for the rest of Bushmanland. Occasional and isolated fresher artefacts were also noted from time to time and testify to the presence of later people all over the landscape as well. It is interesting to note that artefacts on Site 2, a very sandy area, were far too low in density to record any points at all.

Figure 13: Artefacts from BkgrSc1.

Figure 14: Artefacts from BkgrSc5.

However, in a few locations there were higher concentrations of fresher-looking artefacts and these probably reflect campsites dating to the LSA. RPD2011/001 is one such example from an open location where a number of small quartz flakes were found together (Figures 15 & 16). Artefacts in other materials were also found but were slightly weathered, perhaps either due to their being older, or else because different materials weather at different rates. This site lies within the footprint of the Site 1 alternative.

RPD2011/003 was a far larger scatter of artefacts focused around the slopes of a small rocky koppie (Figure 17). Although the artefacts are generally fairly low density (Figure 18), the size of the scatter means that it probably does have some research value. This site lies well outside of the Site 1 footprint but is inside the northern margin of the Site 1 study area.

RPD2011/004 was a similar scatter along the edge of a rocky ridge (Figure 19). Artefacts were widely scattered and again of relatively low density (Figure 20). RPD2011/005 is a similar scatter located further along the same ridge and both sites lie along the north-eastern margin of the Site 1 study area.

Figure 15: Stone artefacts from RPD2011/001.

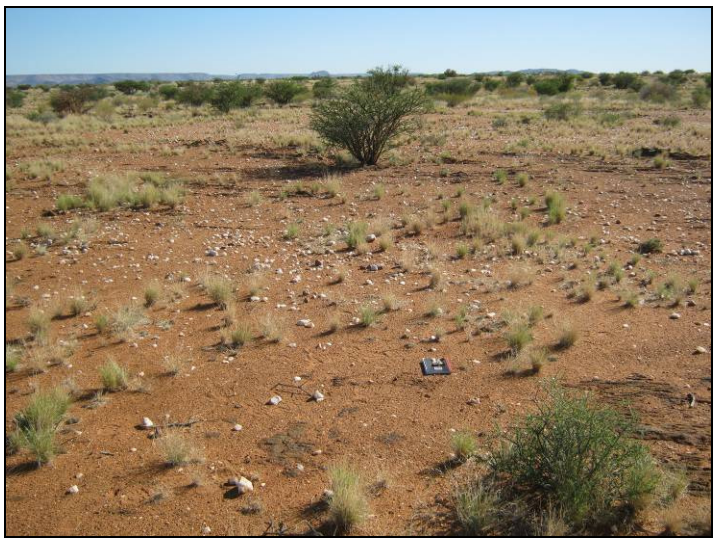


Figure 16: Location of RPD2011/001.

Figure 17: The koppie around which the artefacts of RPD2011/003 were found.

Figure 18: Part of the ground surface at RPD2011/003.

Figure 19: The rocky ridge at RPD2011/004.

Figure 20: Part of the ground surface at RPD2011/004.

6.2. Built environment

Only one structure was found on the property at RPD2011/007. It consists of a 28 m by 6 m, flat-roofed farm building that was probably originally built in the early to mid-20th century but has been added to and altered several times since then (Figures 21 & 22). It is 1.5 km and 4.0 km away from the centre of the primary footprint areas of Sites 1 and 2 respectively and will not be affected in any way by the proposed development. Outbuildings made of poles and reeds are much younger and a sheep dip also occurs nearby (RPD2011/006). Parts of it look of similar age to the building but it too has been added to in more recent years.

Figure 21: View of the front of the farm building.

Figure 22: View of the rear of the farm building.

Figure 23: View of the sheep dip.

6.3. Graves

A single historical grave occurs on the property at RPD2011/008 (Figure 24 & 25). It is 150 m to the south of the building. It dates to 1955. Being outside of a formal cemetery and younger than 60 years it is not protected under the NHRA. However, it is well away from the proposed development area and will not be affected by the proposal at all.

Figures 24 and 25: The 1955 grave and its headstone.

Given the large number of burial cairns reported from the area, it would not seem surprising to find one in this area as well. RPD2011/002 represents a large pile of rocks, seemingly placed on top of the degraded bedrock. Although burial on a bedrock exposure would seem unlikely, Morris (1995) reported one burial shaft dug into degraded bedrock and covered with a cairn. He also reports cairns of up to 3 m diameter and 0.5 m height, further supporting the possibility that this cairn represents a burial. Without any proof to the contrary, the cairn is thus here assumed to be one of the many similar burial sites found in this region.

Figure 26: The large stone cairn / pile at RPD2011/002.

Although the locations of the farms with military graves on them are not known to the author, it was quite clear that, aside from the single child's grave reported above, no graveyards were present on the site. This was confirmed by the farmer.

6.4. Cultural and natural landscape

The area is generally very barren with few cultural features to be found. However, close to the Orange River where irrigation is possible, vineyards and fruit orchards have been developed. The proposal will not affect the agricultural landscape. The proposal to use trees as a screen for the road is not likely to have a significant impact since similar lines of trees are present along the same road further to the east (Figure27). However, suitable trees should be used so as to retain the local character.

Figure 27: The tree line along the road to the east of the study area.

The road past the site is likely not used much by tourists who would focus their attention on the Augrabies Falls National Park. The road is thus not considered an important scenic route. However, the long history of tourism connected to the Augrabies Falls is testified to by the presence of the very much out of place Augrabies Falls Hotel (original name) which was built in 1953. This hotel lies along the main road to the park and just north of the town of Augrabies.

7. ASSESSMENT OF IMPACTS

The proposed development footprint at Alternative 1 will have negligible impacts on archaeological resources, since these tend to cluster around rocky outcrops and ridges (Table 1). Alternative 2 contained no archaeological resources (hence a neutral impact) and the landscape impacts would essentially be the same as those at Alternative 1 (Table 2).

Concern over visual impacts to the landscape and Augrabies Falls National Park do exist but these will be investigated through a Visual Impact Assessment by Albert van der Stok. The imposition of a tree line to shield the site from the road is not going to provide an impact of any significance since an appropriate tree line would be in keeping with similar lines

elsewhere in the vicinity. The assessment in Table 1 assumes planting of a tree line as a mitigation measure.

Table 1: Assessment of archaeological impacts for Alternative 1.

Impact	Archaeology	Landscape
Extent	Footprint	Local
Duration	Permanent	Long
Intensity	Negligible	Medium
Probability	Improbable	Definite
Significance (without mitigation)	Negligible	Medium
Status (without mitigation)	Negative	Negative
Significance (with mitigation)	n/a	Negligible
Status (with mitigation)	n/a	Neutral
Confidence	High	High

Table 2: Assessment of archaeological impacts for Alternative 2.

Impact	Archaeology	Landscape
Extent	Footprint	Local
Duration	Permanent	Long
Intensity	Negligible	Medium
Probability	Improbable	Definite
Significance (without mitigation)	Negligible	Medium
Status (without mitigation)	Neutral	Negative
Significance (with mitigation)	n/a	Negligible
Status (with mitigation)	n/a	Neutral
Confidence	High	High

8. CONCLUSIONS

Overall it is considered that development of the proposed solar facility will have a very limited impact to heritage resources. The project should be allowed to proceed with no further archaeological or heritage inputs. However, the Visual Impact Assessment may require that the footprint be altered to reduce visual impacts to the Augrabies Falls National Park and surrounding landscape and this should be considered before final authorisation of the project. Site 1, although having a greater concentration of archaeological resources, is favoured due to the greater screening opportunity offered by a low ridge that traverses the property just northeast of the footprint area.

No permit requirements pertain to this project since no significant archaeological or heritage sites will need to be disturbed through the development provided that it stays away from all rocky ridges and prominent outcrops as well as from the house, historical grave and stone cairn. The flat sandy and gravelled areas hold no further concerns.

9. RECOMMENDATIONS

The project should be allowed to proceed but subject to the following recommendations:

- The stone cairn and historic grave must be avoided;

- The ECO should be made aware of the potentially very high significance of stone cairns and should ensure that any revised footprint location will not impact on any stone cairns not documented by the present report; and
- If any human remains are revealed during earthworks, excavations in the immediate vicinity should be halted and the find reported to an archaeologist or to SAHRA (telephone: 021 462 4502). Exhumation may be required at the expense of the developer.

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11. INVESTIGATION TEAM

Fieldwork:	J. Orton L. Webley
Report:	J. Orton