ARCHAEOLOGICAL IMPACT ASSESSMENT: PROPOSED CONSTRUCTION OF HUMANSRUS SOLAR PV ENERGY FACILITY 1 ON THE REMAINDER OF THE FARM HUMANSRUS 147 NEAR COPPERTON, NORTHERN CAPE

(Assessment conducted under Section 38 (8) of the
National Heritage Resources Act No 25 of 1999)

Prepared for:

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EXECUTIVE SUMMARY

ACO Associates cc was appointed by Perception Planning on behalf of the client, ***Humansrus Solar PV Facility 1 (Pty) Ltd,*** to undertake an Archaeological Impact Assessment for the construction of a 75 MW PV facility on the Remainder of the Farm 147, Humansrus near Copperton in the Siyathemba Municipality, Northern Cape.

A number of renewable energy facilities are planned (and some have received approval) in the Copperton area around the Cuprum and Kronos substations. .Orton & Webley (2013a&b) have undertaken impact assessments on the farm Hoekplaas 146 and the farm Klipgats Pan 117 to the south-west of Humansrus. Van der Walt (2013) has assessed the farm Bosjesmansberg to the north-east of the study area. Kaplan & Wiltshire (2011) assessed Vogelstruisbult to the west of the study area.

The area was surveyed by Lita Webley and David Halkett on the 23rd October 2014. The property was accessed by the local farm roads and transects were walked across the study area. We drove along sections of the access roads and powerline options where this was possible.

The field assessment identified:

- A large but diffuse spread of ESA and MSA stone artefacts across most of the study area;
- A slightly more dense concentration of artefacts around a pan which is located in proximity to the reservoir and wind pump;
- Two stone cairns may represent pre-colonial graves.

Indications are that in terms of archaeological heritage the proposed activity is viable; impacts are expected to be limited and controllable.

Construction of the proposed solar facility may proceed according to the layout assessed in this report. The following recommendations should be enforced:

- The distribution of ESA/MSA material around the pan (Sites D043, D063 and L057) is of particular significance because of the greater concentration and variety of stone artefacts. The area around the pan should be considered as “No-Go” area in order to conserve the archaeological material;
- While the two stone cairns cannot be unequivocally be identified as graves at this time, they should nevertheless be fenced off during construction to prevent accidental destruction. If it is not feasible to protect these, they should be further assessed to confirm if they are graves or not. If not the cairns could be removed.;
- If any human remains are uncovered during construction, the ECO should have the area fenced off and contact SAHRA (Tel: 021 462 4502) immediately.

If there are any significant changes to the layout of the facility, the new design should be assessed by a heritage practitioner.

GLOSSARY

Archaeology: Remains resulting from human activity which is in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures.

Early Stone Age: The archaeology of the Stone Age between 700 000 and 2500 000 years ago.

Fossil: Mineralised bones of animals, shellfish, plants and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

Heritage: That which is inherited and forms part of the National Estate (Historical places, objects, fossils as defined by the National Heritage Resources Act 25 of 1999.

Holocene: The most recent geological time period which commenced 10 000 years ago.

Late Stone Age: The archaeology of the last 20 000 years associated with fully modern people.

Middle Stone Age: The archaeology of the Stone Age between 20-300 000 years ago associated with early modern humans.

National Estate: The collective heritage assets of the Nation

Palaeontology: Any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

Pleistocene: A geological time period (of 3 million – 20 000 years ago).

SAHRA: South African Heritage Resources Agency – the compliance authority which protects national heritage in the Northern Cape.

Structure (historic:) Any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith. Protected structures are those which are over 60 years old.

Acronyms

DEA	Department of Environmental Affairs
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
LSA	Late Stone Age
MSA	Middle Stone Age
NHRA	National Heritage Resources Act
SAHRA	South African Heritage Resources Agency

1. INTRODUCTION

ACO Associates cc was appointed by Perception Planning on behalf of the client, ***Humansrus Solar PV Facility 1 (Pty) Ltd***, to undertake an Archaeological Impact Assessment for the construction of a 75 MW PV facility on the Remainder of the Farm 147, Humansrus near Copperton in the Siyathemba Municipality, Northern Cape (Figure 1). The study area is situated some 50 km south-west of Prieska.

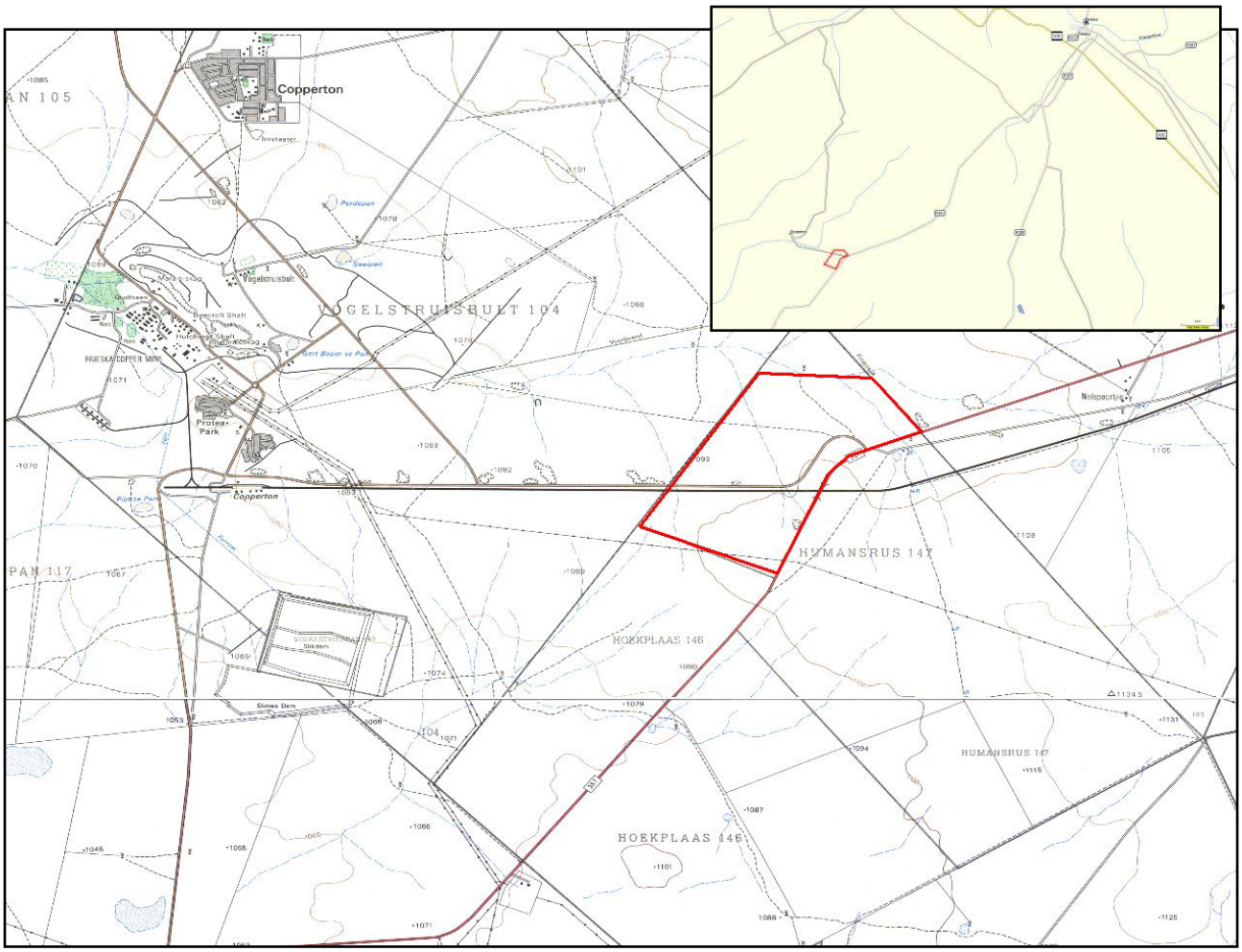

Figure 1: The location of the study area at the junction of the R357 and the gravel road to Copperton (1:50 000 map 2922 CD Copperton).

2. DEVELOPMENT PROPOSALS

Humansrus Solar PV Facility 1 (Pty) Ltd proposes to construct a 75 MW PV facility and/or concentrated PV with fixed, single or double axis tracking technology on 275 ha of land. Approximately 2-5 ha of land will be required for the laydown area. Various grid connections exist. There are two substations within the surrounding area namely at Kronos and Cuprum. The facility will connect to either of these via its own 132 kV line or by “loop-in; loop-out” lines to the existing lines of Burchell/Cuprum or Hydra/Cuprum. The powerlines will be serviced by an access road of between 6-8 m in width and the powerline servitude will be 32 m wide.

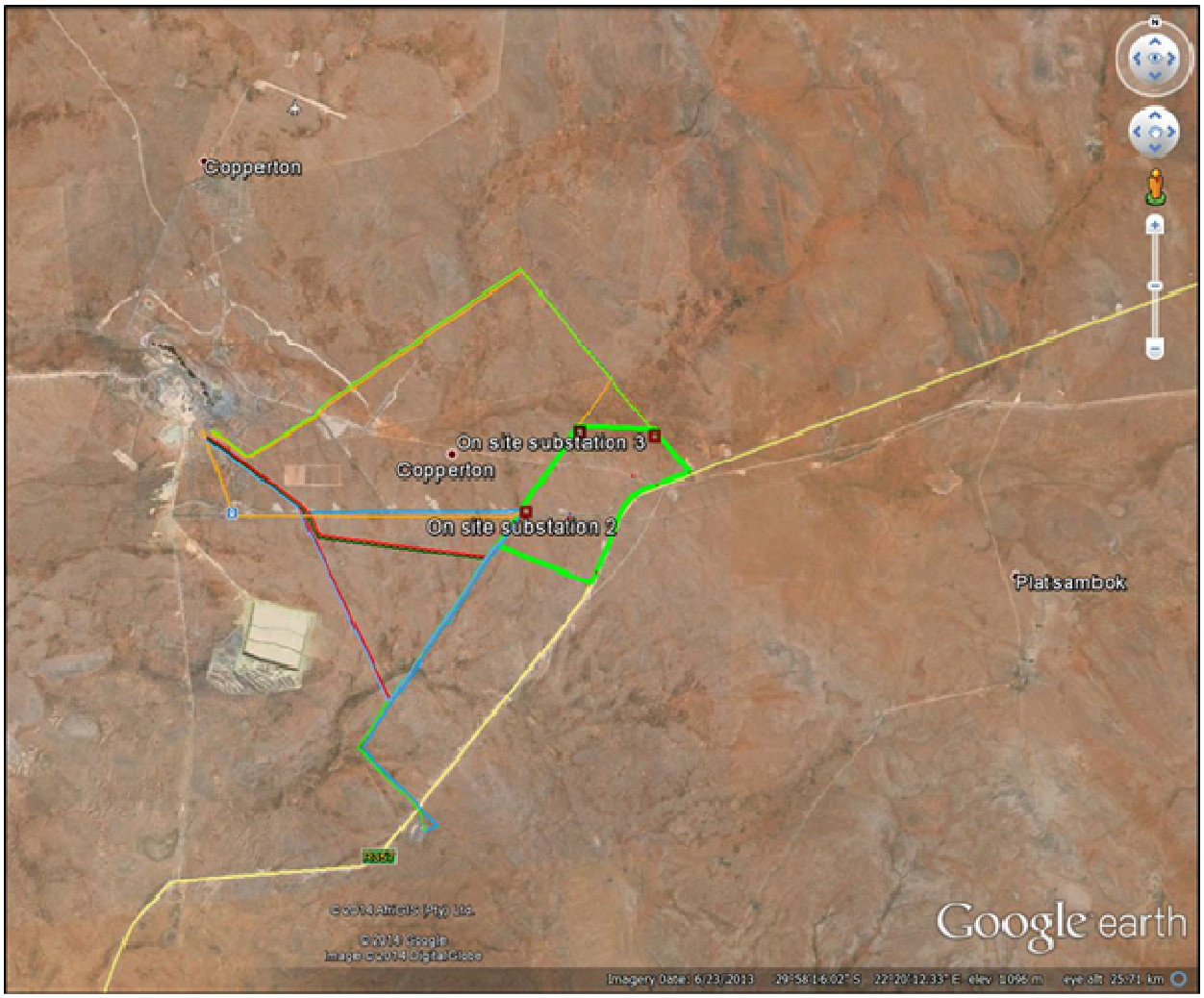

Figure 2: An aerial image of the proposed PV facility on the Farm Humansrus. The facility is indicated with the green polygon. The alternative grid connections, via a 132 kV powerline, to the Cuprum or Kronos substations are shown as green, blue, red and orange lines.

3. HERITAGE LEGISLATION

This report is conducted in terms of Section 38 (8) of the National Heritage Resources Act, No 25 of 1999.

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

- Landscapes, cultural or natural (Section 3 (3))
- Buildings or structures older than 60 years (Section 34);
- Archaeological Sites, palaeontological material and meteorites (Section 35);
- Burial grounds and graves (Section 36);
- Public monuments and memorials (Section 37);
- Living heritage (defined in the Act as including cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems and the holistic approach to nature, society and social relationships) (Section 2 (d) (xxi)).

3.1 Grading

The South African heritage resources management system is based on grading, which provides for assigning the appropriate level of management responsibility to a heritage resource. Heritage resources were assessed according to criteria specified in the NHRA and HWC Policy & Guidelines as outlined in Winter and Bauman (2005). It must be emphasised that the system of

grading as set out in Table 1 has not been consistently used for archaeological sites and a variety of systems are used for reports in the Northern Cape.

Table 1: Grading of Heritage Resources

Grade	Level of significance	Description
I	National	Of high intrinsic, associational and contextual heritage value within a national context, i.e. formally declared or potential Grade 1 heritage resources.
II	Provincial	Of high intrinsic, associational and contextual heritage value within a provincial context, i.e. formally declared or potential Grade 2 heritage resources.
IIIa	Local	Of high intrinsic, associational and contextual heritage value within a local context, i.e. formally declared or potential Grade 3a heritage resources.
IIIb	Local	Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3b heritage resources.
IIIc	Local	Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3c heritage resources.

4. METHODOLOGY

4.1 Literature Survey

A survey of available literature was carried out during the Scoping process to assess the general heritage context of the area. A background search of other Cultural Resource Management (CRM) projects in the area was made via the South African Heritage Resources Information Systems (SAHRIS) database. Numerous impact assessments have been conducted in proximity to the proposed facility as reflected on the SAHRIS database. The following CRM reports provide valuable information on the heritage resources of the area and were consulted:

Orton & Webley (2013a & b) have undertaken impact assessments on the farm Hoekplaas 146 and the farm Klipgats Pan 117 to the south-west of Humansrus. Van der Walt (2013) has assessed the farm Bosjesmansberg to the north-east of the study area. Kaplan & Wiltshire (2011) assessed Vogelstruisbult to the west of the study area.

Van Ryneveld (2006) conducted an assessment on the farm Vogelstruis Bult 104 for Amber Mountain Investments who are interested in re-working the old mine dump and, pending the results of this activity, the re-opening of the old Copperton Mine. The mine is located to the north-west of the farm Humansrus 147.

The location of the other renewable (solar and wind) facilities are shown in Figure 5.

4.2 Field Survey

The polygon of the proposed development was provided to ACO Associates. The area was surveyed by Lita Webley and David Halkett on 23 October 2014. Our tracks were recorded by means of Garmin GPS devices and all sites were digitally recorded.

We accessed the area by the local farm roads but then walked transects of the study area looking for archaeological remains. These tracks are indicated in Figure 3. Field experience has shown that pre-colonial people chose to live in fairly predictable parts of the landscape.

We drove along sections of the proposed access roads and powerline options where this was possible.

4.3 Assumptions and Limitations

There are only a few farm roads and tracks which cross the facility and this makes a detailed survey difficult. We are of the opinion that our coverage of the area was sufficiently broad to identify the distribution of heritage resources.

5. RECEIVING ENVIRONMENT

The Remainder of the farm Humansrus comprises a generally flat landscape, with knee-high vegetation (Plate 1) and a substrate which varies between thick red soils, calcretes surfaces and gravel patches. There is a single small pan in proximity to the reservoir and wind pump and on the eastern boundary of the property (Plate 2). The property is cut by the railway track to Copperton. The track is no longer functional and the rails have been removed. The southern edge of the property is bounded by the R357 while there is a powerline which crosses the western corner of the study area (Plate 3).

Plate 1: View across the study area to the north, with the Copperton mine visible in the distance.

Plate 2: View of the pan on the eastern edge of the property in proximity to the reservoir and wind pump.

Plate 3: View of the powerlines which cut across the western edge of the property.

5.1 Archaeological Background

Early and Middle Stone Age

The archaeology of the general area has been reviewed by Orton & Webley (2013a&b).

Much of the Karoo is covered by gravels that contain abundant stone artefacts in varying densities. Beaumont *et al.* (1995: 240) has declared with regard the Bushmanland area that "thousands of square kilometres of Bushmanland are covered by a low density lithic scatter". These artefacts are generally very well weathered and mostly belong to the Early (ESA) and Middle Stone Age (MSA). Occasional Later Stone Age (LSA) artefacts are also present within this scatter. These kinds of finds were made by Kaplan (2010) and Wiltshire (Kaplan & Wiltshire 2011) on proposed PV and wind energy sites of Vogelstruis Bult to the east. According to Beaumont *et al* (1995) the ESA in this area is said to be characterised by the presence of long blades, Victoria West cores and relatively few hand-axes and cleavers. Orton & Webley (2013) recorded a number of handaxes across the study area. While a few were large, the majority were smaller. These smaller handaxes were, prior to 1965, considered to signify a transitional stone tool industry between the ESA and the MSA called the Fauresmith. However, in a recent review, Underhill (2011) has highlighted the need to determine the validity of this industry. Van der Walt (2013) identified isolated scatters of ESA tools including bifaces made on quartzite to the north of the study area.

Orton & Webley (2013a&b) recorded large scatters of MSA material across Hoekplaas and Klipgats Pan to the south-east of the study area. A highly significant MSA site, associated with a fossilised equid tooth, was recorded in a borrow pit at the side of the road. Substantial MSA sites are rare with only a few isolated examples known (Beaumont *et al.* 1995). The open landscape holds few caves but one called Zoovoorbij Cave close to the Orange River near Upington did include an early MSA occupation (Smith 1995a). Van der Walt (2013) concurs about the presence localised MSA quarries utilising quartz and quartzite outcrops. He describes the MSA as including large flakes, radial and bipolar cores, end scrapers, large utilised and retouched blade tools, and utilised and retouched flakes.

A significant aspect of the Northern Cape archaeological record is the presence of pans which frequently display associated archaeological material. The only detailed work in this regard is that of Kiberd (2001, 2006) who excavated a site known as Bundu Pan, some 25 to 30 km northwest of Copperton. The site was subsequently excavated between 1998 and 2003 and, importantly, found to contain stratified deposits ascribable to the ESA, MSA and LSA. Local pans were also examined by Kaplan & Wiltshire and found to have greater densities of archaeological material surrounding them (Kaplan & Wiltshire 2011). Orton & Webley (2013a&b) and Van der Walt (2013) have all mentioned the importance of pans in this arid area.

Later Stone Age

Several LSA sites in the Bushmanland area to the northwest, west and southwest of Copperton have been investigated by Beaumont and colleagues (1995), Smith (1995a) and Parsons (2003, 2008). Work on these sites led to a distinction between hunter-gatherer and herder sites (Beaumont *et al.* 1995; Beaumont & Vogel 1984, 1989; Parsons 2003), which has recently been called into question (Parsons 2007). Briefly, it is asserted that hunter-gatherer assemblages, termed 'Swartkop' may be distinguished from herder sites, termed 'Doornfontein' based on stone artefact assemblages. All these LSA sites have very few, if any, organic items on them. The only organic material generally present is fragments of ostrich eggshell which originated either from eggs eaten or else whole shells used as flasks.

Orton & Webley (2013a & b) observed that LSA artefacts were often found in clusters, suggesting that they represented occupation sites. These artefacts are recognised by their small size, their relatively unweathered surface appearance and the inclusion of quartz in the assemblages. Most LSA scatters were found located around pans. There is also some evidence for the quarrying of quartzite outcrops. Van der Walt (2013) described fewer concentrations of LSA material, including scraper, retouched and utilisted flakes, blades and small round cores predominantly made on crypto-crystalline silica (CCS) material.

Rock art, in the form of engravings, is widely known from Bushmanland and the Northern Cape in general (Beaumont *et al.* 1995; Beaumont & Vogel 1989; Rudner & Rudner 1968; Rusch & Parkington 2010). Examples of well-known sites include Wildebeest Kuil and Driekopseiland. Various styles occur and are attributed to different time periods: incised finelines extend back the furthest in time, while pecked and scraped engravings occurred within the last 2000 years. However, no engravings have been recorded in the study area.

5.2 Historical Background

Smith (1995b) notes that around end of the 19th century white farmers were making extensive use of Bushmanland for summer grazing and that this led to the extermination of the massive springbok herds on which the indigenous population subsisted. This in turn led to the descendants of indigenous groups turning to the farmers for food (and employment), effectively ending the span of prehistory in the region. The farm houses of Humansrus and Platsambok lie outside the study area. The farms of Humansrus and Hoekplaas were surveyed in 1977 and appear to comprise portions of the farms Plat Sjambok 102 and Vogelstruis Bult 104 both of which date to the 1880s and appear to be some of the older farms in this district.

The town of Copperton was established in 1972 to provide housing for the nearby copper mine, but after the mine closed down in 1992 the town was sold and some of the housing has been demolished.

6. FINDINGS

Our survey tracks are reflected in Figure 3 and the findings are listed in Table 2 at the end of the report. The most significant heritage resource on the property is archaeology. The majority of stone tool scatters are of Early and Middle Stone Age origins.

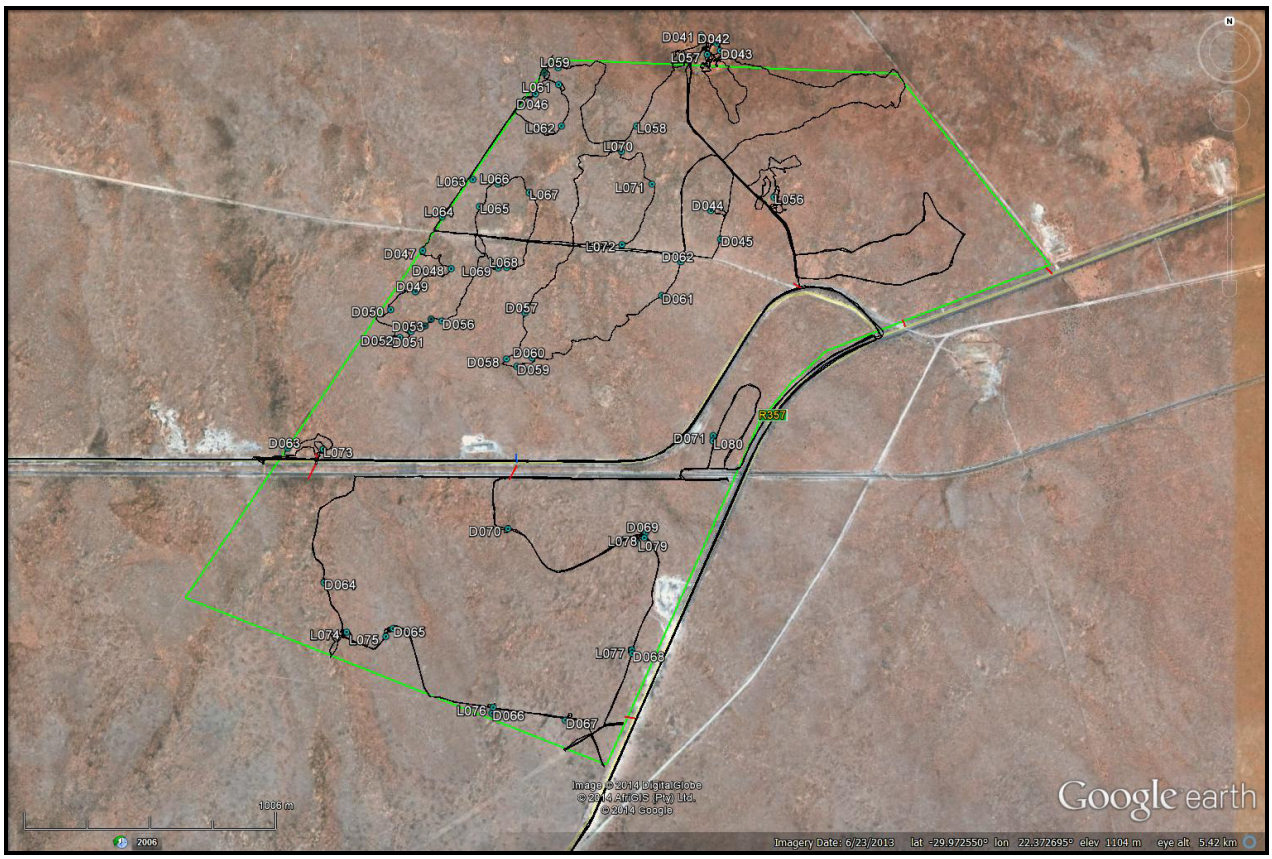

Figure 3: The tracks and sites recorded during the field survey of the property.

Humansrus Solar PV Facility 1 differs from ***Humansrus Solar PV Energy Facility 2 (Pty) Ltd*** in having a few more "pans". In other words, slightly deflated areas, covered in fine gravel, with occasional silty patches suggesting that they may accumulate water after rains. These "pans" tend to have light distributions of artefacts around the edges. There is a single large pan (Figure 4) in proximity to the only reservoir and wind pump on the site (Plate 2). The boundary fence for the facility cuts across the middle of the pan.

Low density scatters of stone artefacts were found widely distributed across the study area. They tended to be concentrated on slightly deflated areas covered in fine gravel. Often these stone scatters occurred on surfaces underlain by calcretes exposures – i.e. north eastern corner of the property.

Those parts of the study area under dense knee-high bush and thick sands, had much lower concentrations of artefacts. We did not record individual stone artefacts during the survey (with the exception of type artefacts such as handaxes), but denser concentrations exceeding three stone artefacts or more in a limited area were recorded as "sites".

In general, the artefact distributions on ***Humansrus Solar PV Facility 1*** closely resemble those on ***Humansrus Solar PV Energy Facility 2*** but the densities are much lower. Artefact distributions appeared to consist predominantly of MSA material. Very few ESA artefacts were recorded and virtually no LSA material was identified.

A few handaxes were recorded. These included one small, finely flaked handaxe from the edge of the pan. The other handaxes were roughly flaked on quartzite and quartz. There was a single weathered hornfels biface.

Plates 4 & 5: Both surfaces of a small, finely worked quartzite handaxe. Recovered from the edge of the pan at Site D041-D43.

Plate 6 & 7: A more roughly flaked quartzite biface.

The MSA is made predominantly on quartzite, although some artefacts were recorded in quartz. MSA artefacts included flakes with facetted platforms, large retouched and utilized blades, radial cores – bipolar cores were rare. End scrapers rare.

Plates 8 & 9: Dorsal and ventral surfaces of a large quartzite flake of MSA attribution.

Plates 10, 11 & 12: Views of a unifacially flaked MSA point from the pan area (D041-D043).

ESA and MSA artefacts are mixed, suggesting deflation onto a harder substrate.

A higher concentration of ESA and MSA artefacts were recorded around the pan at the cement reservoir and wind pump (D043/D063 and L057) than elsewhere on site. Although the artefacts did not appear to be *in situ*, nevertheless the range of artefact types suggests that the pan may have functioned as a powerful draw card during ESA and MSA times. Of particular interest were the small biface and the finely worked unifacial point.

Plates 13 & 14: Two typical cores recovered from the area.

Some MSA quarries were recorded, where quartzite ridges and outcrops occur (Plate 15). These areas are often surrounded by denser distributions of stone tools although the tools are sometimes on other raw materials, and not only on quartzite. The coarsely grained grey quartzite was used in the production of stone artefacts (Plate 16).


Plate 15: A quartzite outcrop which has been quarried. **Plate 16:** Quartzite chunks and cores.

In addition to the pre-colonial archaeological sites described above, the only other sites recorded were two stone cairns.


Plate 17: Site D051. **Plate 18:** Site D059

Both cairns are small and may represent pre-colonial burials. There is however some uncertainty with these identifications and the ground below would need further assessment to say if they are indeed graves or not.

6.1 The Pan Location

The pan, which is located on the eastern edge of the property facility, contains the highest concentration of stone artefacts on the site. While the artefacts appear to consist predominantly of MSA implements (Plates 10, 11 & 12), there are artefacts such as the small handaxe (Plates 4 & 5) which indicates a possible terminal ESA presence.

Figure 4: The pan at the wind pump and reservoir on the eastern edge of the study area.

7. IMPACT ASSESSMENT

The levelling and clearing of the ground to install the PV units will result in the relocation or destruction of all surface heritage material. Similarly, the clearing of vegetation for the on-site substation and control room, as well as access roads will impact material that lies buried in the surface sand. Since heritage sites, including archaeological sites, are non-renewable, it is important that they are identified and their significance assessed prior to construction.

7.1 Impact on Pre-Colonial Archaeology

The main cause of impacts to archaeological sites is direct, physical disturbance of the material itself and its context. The significance of an archaeological site is highly dependent on its geological and spatial context. This means that even though, for example a deep excavation may expose buried archaeological sites and artefacts, the artefacts are relatively meaningless once removed from the area in which they were found. The impacts are likely to be most severe during the construction period although indirect impacts may occur during the operational phase of the project.

Our survey for ***Humansrus Solar PV Facility 1*** on the Remainder of Humansrus 147 confirms the results of archaeological surveys by Orton & Webley (2013a&b), Kaplan & Wilshire (2011) and Van der Walt (2013) on farms adjoining Humansrus. There are ephemeral scatters of ESA material and widespread, but dispersed scatters of MSA artefacts across the study area. We did not record any LSA artefacts in the study area.

Assigning significance to the surface scatters of ESA and MSA material in the Copperton area is difficult. The stone artefacts are no longer in their original locations or *in situ,* nor are there any associated non lithic items or stratigraphy. They therefore provide limited information with respect to activity areas. There are however, some aspects of the artefact distribution which could be examined in greater depth:

- The location of the artefact scatters (i.e. whether they are situated next to a stream or on a slight rise in the landscape) can inform on settlement preferences;
- While the majority of artefacts are manufactured on locally available raw material, such as quartzites, there are many artefacts which are manufactured on banded ironstone. The source of the banded ironstone pebbles may provide information on movements across the landscape;
- Some quartzite outcrops were utilised as a source of raw material and they also appear to have functioned as a foci for more intensive knapping of other raw materials as well;
- Detailed measurements of stone artefacts, such as handaxes, may provide an indirect form of dating. Similarly, the presence of certain key artefacts such as the unifacial point may also provide relative dating.

Table 3: Potential impact to pre-colonial Archaeology

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	1 Local	1 Local	3 Irreversible	5 Low	Probable	Low - Medium	Negative	High
Essential Mitigation Measures: • The area around the pan (including distributions D041 to D43 and L057) must be conserved and should be declared a “No-Go” area; • If any significant concentrations of archaeological material area uncovered, then work in that area should stop, and SAHRA (Telephone: 021 462 4502) should be contacted. Best Practice Mitigation Measures: • Archaeological remains are best left *in situ*, and conserved for the future. If this is not possible then mitigation in the form of excavation with a permit will be required.								
With mitigation	1 Low	1 Low	3 Irreversible	5 Low	Improbable	Very Low	Neutral	High

The distribution of ESA/MSA material around the pan (Sites D041 to D43 and L057) is of particular significance because of the range of stone artefacts identified. The area around the pan (Figure 4) should be considered as a "No-Go" area in order to conserve the archaeological material.

7.2 Impacts on Colonial Period Heritage

The 1:50 000 maps and Google imagery confirm that there are no farm buildings or structures on the land identified for the solar facility. No historical archaeological material was identified during the survey.

7.3 Impacts to Graves

The landowner was interviewed with respect to graveyards on the property and confirmed that none were present. Two small stone cairns were recorded that may mark pre-colonial graves.

Table 4: Potential Impacts to Graves

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	1 Local	1 High	3 Irreversible	5 Low	Probable	High	Negative	High
Essential Mitigation Measures: • The two cairns identified during the survey should be fenced off during construction; • If any human remains are uncovered during construction, then work in that area should stop immediately, and SAHRA (Telephone: 021 462 4502) should be contacted. Best Practice Mitigation Measures: • Human remains are best left *in situ*. If it becomes necessary to exhume human remains, then application must be made to SAHRA.								
With mitigation	1 Low	1 Low	3 Irreversible	5 Low	Improbable	High	Neutral	High

Human remains are the most complicated aspects of heritage to mitigate since they require a separate public participation process (See Section 36 of the NHRA) before they can be exhumed. Human remains are protected by a range of legislation including the Human Tissues Act (Act No 65 of 1983), the Exhumation Ordinance of 1980 and the National Heritage Resources Act (Act No 25 of 1999). In the event of human bones being found on site, SAHRA must be informed immediately and the remains removed by an archaeologist under an emergency permit. This process will incur some expense as removal of human remains is at the cost of the developer. Time delays may result while application is made to the authorities and an archaeologist is appointed to do the work.

7.4 Impacts of Powerlines and Access Roads

Potential impacts caused by a 132 kV power line and the power line access roads are likely to be limited and local.

Humansrus Solar PV Facility 1 is located at the intersection between the R357 and the gravel road to Copperton and access roads onto the site will be short and unlikely to result in any significant impact.

A number of alternative power line options are proposed (Figure 2) to transfer the power to the closest substation. The alternative grid connections, via a 132 kV powerline, to the Cuprum or Kronos substations are shown on Figure 2. It was not possible to drive down all the alternative routes as they cross properties for which we had no contact details. However, inferences may be drawn from the other CRM projects undertaken in proximity to the site. Due to the limited amount of disturbance resulting from powerline installation, it is concluded that the impacts will be limited.

7.5 Cumulative Impact

Of concern, however, is the increasing number of solar facilities in this area (Figure 5). The cumulative impacts of the developments will result in widespread destruction of surface distributions of ESA and MSA material. Although many of these distributions/sites have individually been rated as having low significance, the cumulative impact of the removal of all archaeological material will result in the destruction of large areas of archaeology.

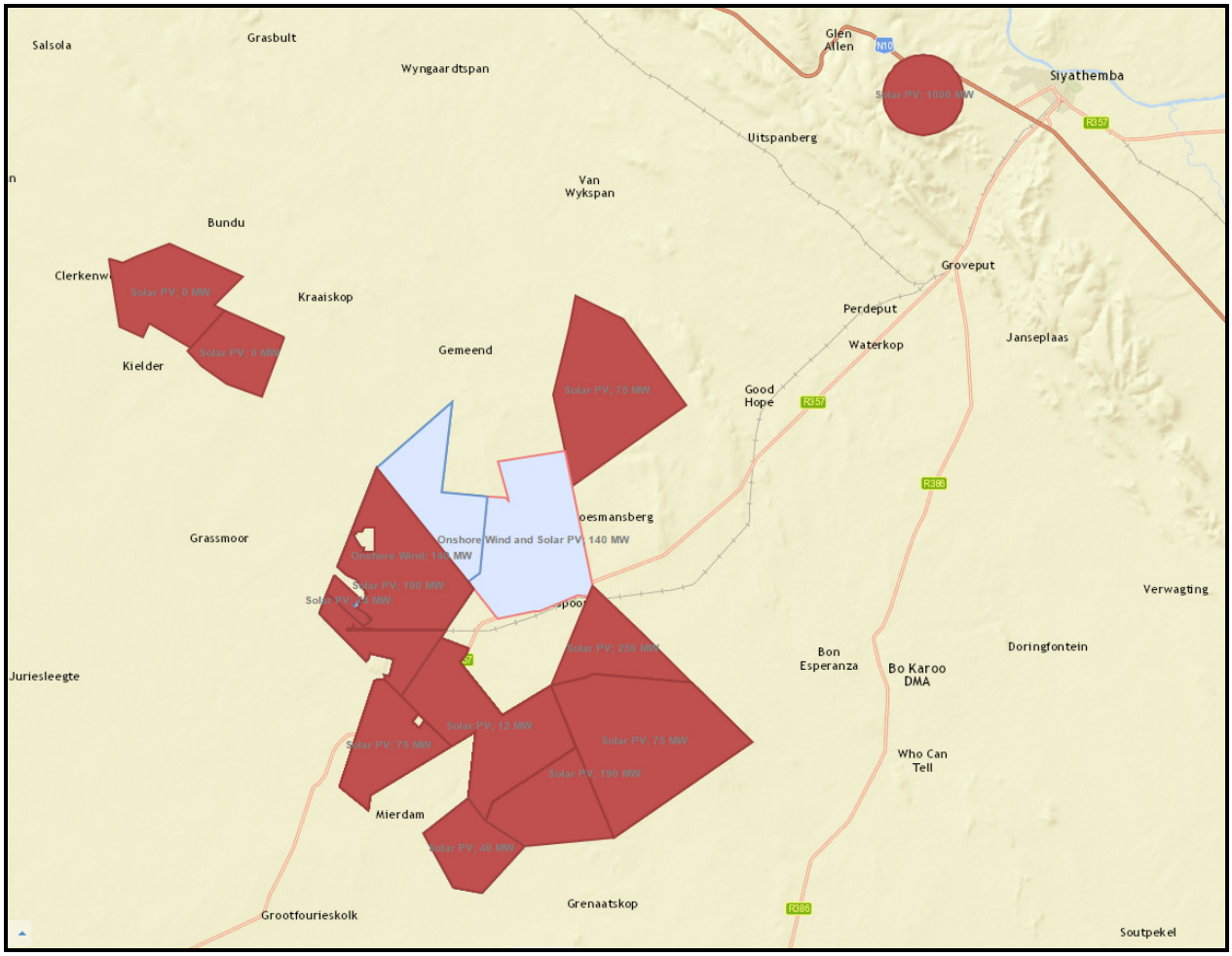

Figure 5: Other renewable energy projects (solar and wind) proposed for the Copperton area. ***Humansrus Solar PV Facility 1 and Humansrus Solar PV Energy Facility 2*** will be situated on the farm Humansrus in the centre of the map. (DEA renewable energy map https://dea.maps.arcgis.com)

8. CONCLUSIONS AND RECOMMENDATIONS

Indications are that in terms of archaeological heritage the proposed activity is viable; impacts are expected to be limited and controllable.

Construction of the proposed solar facility may proceed according to the layout assessed in this report. The following recommendations should be enforced:

- The distribution of ESA/MSA material around the pan (Sites D043, D063 and L057) is of particular significance because of the variety of stone artefacts. The pan and the immediate area surrounding it should be considered as a “No-Go” area in order to conserve the archaeological material. For ecological reasons the pan will in all likelihood be a no-go area;
- The two stone cairns should be fenced off during construction to prevent accidental destruction. If this is not feasible in the context of the activity, the ground below the cairns

should be tested to determine if they cover graves or not. If it is found that they are not graves, then they could be removed;
- If any human remains are uncovered during construction, the ECO should have the area fenced off and contact SAHRA (Tel: 021 462 4502) immediately.

If there are any significant changes to the layout of the facility, the new design should be assessed by a heritage practitioner.

9. REFERENCES

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Table 2: List of archaeological sites recorded during the field survey.

Field number	Latitude	Longitude	Site description	Significance
D041	-29.95840302	22.37536102	Area of pan with MSA scatter sporadically around the edges.	Low-Medium
D042	-29.95872002	22.37598999	Ditto	Low-Medium
D043	-29.95897299	22.37613701	Ditto. 1 x unifacial point. Small biface artefact.	Low-Medium
D044	-29.96467503	22.37575103	Light MSA scatter at the edge of the pan. Slightly concentrated at GPS point but scattered throughout in low density	Low-Medium
D045	-29.96570097	22.37615503	Low density MSA on general stone pavement area. Artefacts in general much small than on RE Capital 14.	Low
D046	-29.96051098	22.36853002	Artefact scatter	Low
D047	-29.96610104	22.36388803	Artefact scatter	Low
D048	-29.96674804	22.36505899	Pan areas with low density general scatter. Bedrock outcrops. Possibly all ESA?	Low
D049	-29.96756704	22.36358796	Ditto. ESA	Low
D050	-29.96821202	22.36257099	Ditto	Low
D051	-29.96925700	22.36261600	Artefact scatter	Low
D052	-29.96920402	22.36295404	Small stone cairn, using 6 slabs of rock, local bedrock used [1990]	Medium-High
D053	-29.96899003	22.36341597	Artefact scatter	Low
D054	-29.96879096	22.36398803	Ditto	Low
D055	-29.96854898	22.36424200	Ditto	Low
D056	-29.96861503	22.36468398	Ditto	Low
D057	-29.96832401	22.36810204	Ditto	Low
D058	-29.96996803	22.36734096	Ditto	Low
D059	-29.97023399	22.36777104	Small stone cairn of grey quartzite [1991-1995]	Medium-High
D060	-29.96992998	22.36839901	Extensive grey quartzite outcrop area with stone scatter. Low density ESA/MSA but made on variety of raw materials. [1996-1998]	Low
D061	-29.96771003	22.37372696	Artefact scatter	Low
D062	-29.96650899	22.37451503	Ditto	Low
D063	-29.97314704	22.35833100	Return to the pan area. A bifacial piece on quartzite [2002-2006]	Low
D064	-29.97793302	22.35983396	Discrete pavement with some medium density ESA. 1 x weathered biface. [2013-2017]	Low
D065	-29.97956799	22.36269102	Ditto	Low
D066	-29.98258003	22.36677099	Pavement with low density scatter [2018-2021]	Low
D067	-29.98281900	22.36977800	Ditto	Low
D068	-29.98043904	22.37252399	Pavement with low density scatter and 1 small biface [2024-2029]	Low
D069	-29.97613602	22.37307804	Pavement with low density scatter	Low
D070	-29.97600996	22.36741497	Ditto	Low
D071	-29.97269902	22.37584197	Ditto	Low
D072	-29.99315104	22.36795996	Ditto	Low

L056	-29.96419801	22.37834799	Around edges of a small pan. Possibly rather a deflated area. Few quartzite flakes, 1 quartzite core, 1 hornfels core. Very light distribution.	Low
L057	-29.95910517	22.37560267	Big pan at the reservoir and windpump. Few small quartzite flakes. Some blade elements [3516-3537]	Low-Medium
L058	-29.96165972	22.37269507	1 quartzite core	Low
L059	-29.95956534	22.36946636	Unusual spread of artefacts on a slight deflation	Low
L060	-29.95975343	22.36889161	Artefact scatter	Low
L061	-29.96017621	22.36948228	Low distribution of artefacts	Low
L062	-29.96165922	22.36960106	1 quartzite radial core. Artefacts on calcretes exposures [3538-3539]	Low
L063	-29.96356811	22.36595149	Artefact scatter	Low
L064	-29.96489606	22.36468825	Ditto	Low
L065	-29.96453069	22.36622449	Ditto. Blade core on silcrete [3540-3541]	Low
L066	-29.96372150	22.36697953	Ditto	Low
L067	-29.96403272	22.36826892	Ditto	Low
L068	-29.96670219	22.36734607	Ditto	Low
L069	-29.96672583	22.36699454	Distribution of grey quartzite although no obvious bedrock outcrops, photos of large chunks and cores on grey quartzite. Often only 1-2 flakes removed.	Low
L070	-29.96256639	22.37207204	Evidence for the re-use of an older hornfels core. There are some “fresher” hornfels flakes nearby. There is one white quartz radial core in the bush.	Low
L071	-29.96373349	22.37333285	Ditto	Low
L072	-29.96589174	22.37209526	Ditto	Low
L073	-29.97318534	22.35978819	At the location of the other sub-station, photos of 2 scrapers, 1 hornffels “levallois” type flake, 1 core.	Low
L074	-29.97969707	22.36077525	One blade	Low
L075	-29.97984795	22.36239555	Quartzite blocks, some of which are flaked. Some are radial cores, others more irregular. 1 shale flake.	Low
L076	-29.98236235	22.36681156	Close to the Eskom servitude road, 1 worn hornfels flake, 1 retouched blade, 1 hornfels core apparently freshly flaked.	Low
L077	-29.98031314	22.37250916	Ditto	Low
L078	-29.97633660	22.37301584	Artefact scatter. 1 flake with cortext; some “freshly” flaked hornfels.	Low
L079	-29.97651044	22.37273195	Artefact scatter. 1 quartzite radial core	Low
L080	-29.97288393	22.37583593	Ditto	Low