

HERITAGE IMPACT ASSESSMENT

**THE PROPOSED BRANDVLEI BULK WATER
SUPPLY PIPELINE & RESERVOIR, BRANDVLEI
NORTHERN CAPE**

Prepared for:

ENVIROAFRICA

Att: Mr Clinton Geyser

PO Box 5367

Helderberg

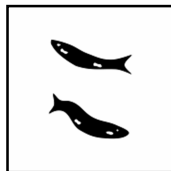
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E-mail: Clinton@enviroafrica.co.za

Applicant:

HANTAM MUNICIPALITY

By



Jonathan Kaplan

Agency for Cultural Resource Management

5 Stuart Road

Rondebosch, 7700

Ph/Fax: 021 685 7589

Mobile: 082 321 0172

E-mail: acrm@waccess.co.za

**NOVEMBER
2013**

Executive summary

ACRM was commissioned to conduct a Heritage Impact Assessment (HIA) – specialist archaeological study, for the proposed Brandvlei Bulk Water Supply Pipeline and Reservoir, near Brandvlei in the Northern Cape Province.

The development entails the construction of a new water pipeline and reservoir to supply the town of Brandvlei. The proposed pipeline will be constructed from existing boreholes near the Romanskolk Reservoir, within the servitude of the existing dirt road (OG 86) to the R353, within the servitude of the R353 to the R357, and within the servitude of the R357, to the existing reservoir in Brandvlei. A new concrete reservoir will be constructed next to the existing reservoir at Brandvlei. The length of the pipeline is about 52km.

It is important to note that the proposed new bulk water pipeline will not extend beyond the road reserve (in any of the affected roads), or cross any farm fence boundaries.

The aim of the study is to record archaeological remains that may be impacted by the proposed activities, to assess the significance of the impacts and to propose measures to mitigate the impacts.

The HIA forms part of the Environmental Impact Assessment (EIA) process that is being conducted by EnviroAfrica cc.

A vehicle and foot survey of the proposed development activities was undertaken on 7 November 2013, in which the following observations were made:

- A diffuse scatter of Middle and Later Stone Age artefacts was documented on the site of the proposed new Brandvlei Reservoir, and in the short pipeline route from the reservoir to the northern edge of the town.
- Medium and low density scatters of MSA and LSA implements were encountered alongside the alignment of the dirt road (OG 86), but will not be impacted by proposed construction activities.
- Very large numbers (exceptionally high density scatters) of MSA implements were recorded close to the existing pipeline servitude between the Romanskolk Reservoir and OG 86, but these important, well preserved activity sites will not be impacted by the proposed development, as the (old) concrete pipeline alongside the gravel road will merely be replaced by a new PVC pipeline.
- Well preserved stone enclosures (domestic stock kraals), and thousands of stone implements and fragments of ostrich eggshell, including some 19th Century colonial remains (such as glass and ceramics) were encountered on a dolerite kopje/ridge about 100m from the pipeline servitude between the Romanskolk Reservoir and the dirt road (OG 86).
- There are no visible graves in the alignment of the proposed new water supply pipeline, or in the footprint area of the proposed new Brandvlei Reservoir.

The results of the study indicate that the proposed Brandvlei Bulk Water Supply Pipeline and Reservoir will not impact on any significant archaeological heritage, as long as the following recommendations are adhered to.

1. Replacement of the old pipeline between the Romanskolk Reservoir and the dirt road (OG 86) remains within the existing servitude (as planned)
2. Construction of the new pipeline along the dirt road (OG 86), till R353 stays within the road reserve (as planned).
3. Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered during construction activities, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or Ms Katy Smuts at the South African Heritage Resources Agency (021 462 4502). Burials must not be removed or disturbed until inspected by the archaeologist.

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1. INTRODUCTION

ACRM was commissioned by EnviroAfrica to conduct a Heritage Impact Assessment (HIA) – specialist archaeological study, for the proposed Brandvlei Bulk Water Supply Pipeline and Reservoir, near Brandvlei (Hantam Municipality) in the Northern Cape (Figure 1).

The development entails the construction of a new bulk water supply pipeline and reservoir to supply the town of Brandvlei (Figure 2). The 160mm PVC pipeline will be constructed from existing boreholes near the Romanskolk Reservoir, within the servitude of the existing dirt road (OG86) to the R353, within the servitude of the R353 to the R357, and within the servitude of the R357, to the existing reservoir in Brandvlei on the northern edge of the town. The length of the pipeline is about 52km. A new concrete reservoir will also be constructed next to the existing reservoir at Brandvlei.

It is important to note that the proposed water supply pipeline will not extend beyond the road reserve (in any of the affected roads), or cross any farm fence boundaries.

The aim of the study is to record archaeological remains that may be impacted by the proposed activities, to assess the significance of the impacts and to propose measures to mitigate the impacts.

The HIA forms part of the Environmental Impact Assessment (EIA) process that is being conducted by EnviroAfrica cc.

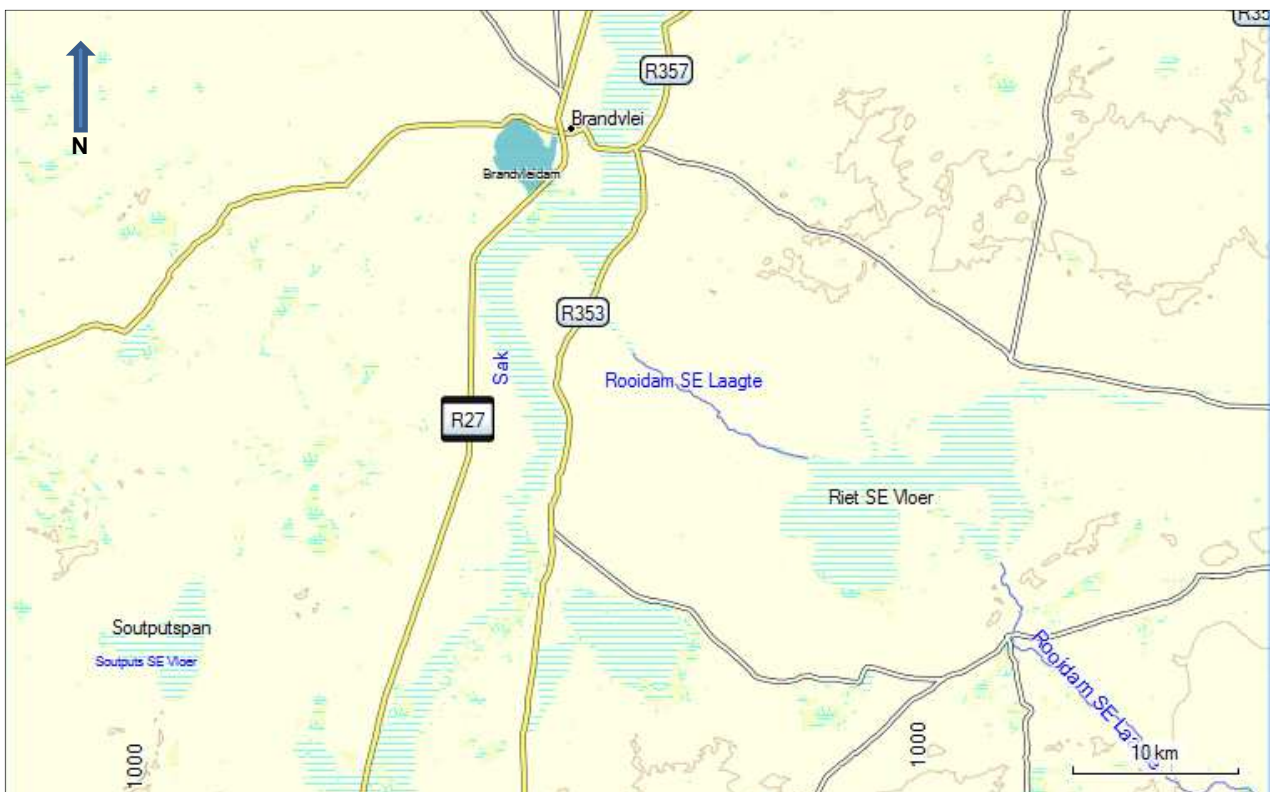


Figure 1. Locality map.



Figure 2. Google Aerial photograph indicating the proposed route of the new Brandvlei Bulk Water Supply pipeline (red line) and reservoirs.

2. LEGAL FRAMEWORK

The National Heritage Resources Act (No 25 of 1999) makes provision for a compulsory Heritage Impact Assessment (HIA) when an area exceeding 5000 m² is being developed. This is to determine if the area contains heritage sites and to take the necessary steps to ensure that they are not damaged or destroyed during development.

In addition, Section 38 (1) (a) of the Act indicates that any person constructing a powerline, pipeline or road, or similar linear development exceeding 300m in length is required to notify the responsible heritage resources authority, who will in turn advise whether an impact assessment report is needed before development can take place.

3. TERMS OF REFERENCE

The terms of reference for the study were to:

- Determine whether there are likely to be any important archaeological remains that may be impacted by the proposed development;
- Indicate any constraints that would need to be taken into account in considering the development proposal;
- Identify potentially sensitive archaeological areas, and

- Recommend any further mitigation action.

4. DESCRIPTION OF THE RECEIVING ENVIRONMENT

Brandvlei is located 572kms north east of Cape Town and 150kms north of Calvinia on the R27. The R353 south from Brandvlei is the main road to Williston. OG 86 is a gravel farm road off the R353 which eventually leads to an unnamed pan where the pump station and boreholes are located, and the nearby Romanskolk Reservoir.

Photographs illustrating the receiving environment are presented in Figures 3-24.

As indicated above, the new pipeline will be constructed within the road reserve. The existing concrete pipeline from the Romanskolk Reservoir till OG86 will be replaced by a new PVC pipeline (refer to Figure 10).



Figure 3. Footprint for new Brandvlei Reservoir.



Figure 5. View from Buitenkant Street up Korster Street.



Figure 4. View from the Brandvlei Reservoir to the edge of town.



Figure 6. View along Korster Street.

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Figure 7. Existing pump station at the unnamed pan.



Figure 10. Existing/proposed servitude to OG 86.



Figure 8. View from the Romanskolk Reservoir. Arrow indicates extensive scatters (orange) of MSA tools. The pipeline servitude follows the road.



Figure 11. View along OG 86.



Figure 9. Proposed servitude from the Romanskolk Reservoir to OG 86



Figure 12. View along OG 86.

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Figure 13. View along OG 86.



Figure 16. View along OG 86. Note tools (Site 174) in the road reserve.



Figure 14. View along OG 86.



Figure 17. View along OG 86.



Figure 15. View along OG 86. Note tools (Site 171) in the road reserve, which extends over the fence (Site 172).



Figure 18. View along OG 86.



Figure 19. View along OG 86.



Figure 22. View along R353.



Figure 20. View along OG 86.



Figure 23. Dolerite exposure along R353.



Figure 21. View along OG 86.



Figure 24. Dolerite exposure along R353.

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Figure 25. View along R353.



Figure 28. Intersection of R353 & R357.



Figure 26. View along R353.



Figure 29. View along R357.



Figure 27. View along R353.



Figure 30. View along Korster Street, Brandvlei.

5. STUDY APPROACH

5.1 Method of study

A foot and vehicle survey of the proposed pipeline route was undertaken, with frequent spot checks along the route. Several outcroppings of dolerite occur alongside the R353 (refer to Figures 23 & 24, & Figure 56 in Appendix II) and these also searched for rock engravings which are known to occur in the region.

The existing Brandvlei and Romanskolk Reservoirs, and the pipeline servitude between the Romanskolk Reservoir and the gravel road (OG 86) were searched in detail.

A track path of the survey was created (refer to Figures 53-57 in Appendix II).

All archaeological remains documented during the study were recorded using a hand held GPS device set on the map datum WGS 84. A spreadsheet of waypoints and a description of the archaeological finds can be found in Table 1 (Appendix I).

A desk top study was done, and the SAHRIS database was searched.

J Kaplan also consulted with the archaeologists Lita Webley and Jayson Orton.

5.2 Constraints and limitations

There were no constraints or limitations encountered during the study and archaeological visibility was very good. The terrain is mostly rocky and barren, with sparse bush vegetation. The road reserve alongside much of the R353 is well grassed, and only a few spot checks were done along the route. The R357 till Brandvlei was not searched as the receiving environment is severely degraded.

5.3 Identification of potential risks

The results of the study indicate that the proposed development poses no risk to significant archaeological heritage.

It should be noted that several heritage sites of High (3A) significance were identified during the study, but these are located away from the proposed pipeline route/road reserve, and therefore no measures need to be taken to protect them.

5.4 Results of the desk top study

The archaeology of the Northern Cape is rich and varied covering long spans of human history. According to Beaumont and Vogel (1994:240) "thousands of square kilometres of Bushmanland are covered by a low density lithic scatter".

While an increasing amount of work (commercial archaeological surveys for wind and solar energy farms) have taken place in the Kenhardt area (Halkett & Orton 2011; Kaplan 2012a, b, 2011a, b, c; Pelsner 2011; Webley & Halkett 2010) about 150kms north of Brandvlei, little archaeological information is available from the Brandvlei area, although rock engravings are known to occur (Janette Deacon pers. comm.). Webley and Orton (2012) recorded thin scatters of 20th century dump material to the south and

east of the Brandvlei reservoir during a HIA for a proposed reverse osmosis plant, but no pre-colonial archaeological heritage was encountered. Webley & Halkett (2010) also report on ephemeral scatters of weathered Middle Stone Age (MSA) artefacts around the Katkop Hills to the west of Brandvlei.

The northern Karoo (or Bushmanland) was one of the last regions of the Cape Province to be settled by early European farmers, partly because it is so dry and partly because it was so far from Cape Town and produce markets. The result was that it became a last outpost of the /Xam Bushman who still hunted and gathered there in the last decades of the 19th Century (Deacon 1986, 1997; Morris 1989). Research undertaken by Janette Deacon (1996) suggests that the 'Grass Bushmen' may have lived between Kenhardt and Brandvlei, while the 'Flat Bushmen' lived between Vanwyksvlei and Kenhardt. LSA (or Wilton) microlithic stone implements, pottery and ostrich eggshell litter the occupation areas visited by Deacon (1986) in her quest to locate sites described by /Xam informants in the 1870's and 1880's. Many of the sites visited were documented in this vast, seemingly featureless region, close to pans, springs, and among sand dunes near dry river beds, while the round dolerite boulders scattered over the flat landscape and on mountain tops and kopjes contain many different types of rock engravings.

6. FINDINGS

6.1 Proposed Brandvlei Reservoir

A diffuse scatter of Middle (MSA) and Later Stone Age (LSA) remains (Sites 150-156) were encountered in the proposed footprint area for the new Brandvlei Reservoir, and on the weathered shale slopes in the (short) pipeline route between the proposed reservoir and Buitenkant Street on the northern edge of the town. The tools comprise a few irregular flakes and chunks, a nicked/retouched flake and a partially retouched flake, in banded ironstone, quartzite and indurated shale (Figure 31) The area around the existing Brandvlei reservoir has been significantly disturbed (most of the topsoil has been removed) due to previous development on the site, as well as pedestrian traffic, dumping, and road works. The receiving environment is quite degraded and all the tools occur ex-situ.

6.2 Romanskolk Reservoir

Large numbers of weathered MSA tools (Site 162) were found below the kopje on which the Romanskolk Reservoir has been built. The tools occur alongside the alignment of the proposed (new) pipeline, and are part of a much wider and very extensive scatter of possibly tens of thousands of indurated shale implements that occur over the surrounding landscape (Figures 32-34). Figure 8 illustrates how large this site is, which might be several hundred meters in extent. This well-preserved activity site includes vast numbers of tools including triangular shaped flakes, chunks, flaked chunks, unmodified, utilized and retouched blades, round and irregular shaped cores. While there has been some, but fairly minimal disturbance alongside the proposed pipeline servitude, it is estimated that more than 99% of this important archaeological site is intact, and will not be impacted by proposed construction activities. Similar MSA remains (mostly small, isolated scatters) have been recorded by the archaeologist in the Kenhardt area (refer to Kaplan 2012a & b), but such a vast, almost endless scatter of in-situ remains have not been encountered before.



Figure 31. Tools, Brandvlei Reservoir. Scale is in cm



Figure 33. Site 162



Figure 32. MSA (Site 162) site below the Romanskolk Reservoir, alongside the existing servitude.



Figure 34. MSA tools (Site 162) below the Romanskolk Reservoir. Scale in cm

6.3 Proposed Bulk Water Supply Pipeline

Sites 163a and 163b (refer to Figure 54 in Appendix II) comprise a similarly vast and extensive scatter of weathered MSA remains that cover an area measuring several hundred meters in extent. Sites 162 and 163 are in effect one massive activity site of in-situ implements that occurs on the south facing hill slopes, east of the dirt road/pipeline servitude. While the edge of the Site 162b occurs fairly close to the proposed pipeline servitude, and there is some disturbance here, it is estimated that more than 99% of this important site will not be impacted by proposed construction of the new pipeline which, as indicated, will remain within the existing servitude alongside the road (refer again to Figure 10). The MSA tools encountered are the same as those noted in Site 162, and include many thousands of weathered, triangular shaped flakes, chunks, modified and unmodified blades, round and irregular cores, manuports and several hammerstones (Figures 35-39).



Figure 35. Site 163a



Figure 38 Site 163a. View facing north to the reservoir



Figure 36. tools from Site 163a. Scale is in cm



Figure 39. Tools from Site 163b. Scale is in cm



Figure 37. Site 163b. Note the bakkie in the distance



Figure 40. Site 171 alongside OG 86

A medium density scatter of tools (Site 165) dominated by weathered MSA indurated shale flakes, blades, and chunks, was also located about 50m from the existing water supply pipeline (refer to Figure 54). A diffuse scatter of LSA tools including thin flakes, blades/bladelets, chunks, flaked pieces/chunks were also encountered. The site will not be impacted by proposed development activities.

A few isolated MSA and LSA tools (Sites 166-170) were encountered alongside OG 86 during random spot checks, where farm fence boundaries are in some places located just a few meters from the road reserve. However several low, medium and higher density scatters of tools were encountered alongside the road, beyond the road reserve, as well as over farm fence boundaries. Most of these scatters occur on sheet washed surfaces of sand and/or baked shale, near dry drainage channels which are aligned perpendicular to the road.

Low density scatters comprising weathered MSA indurated shale implements (Sites 171 & 176), and LSA indurated shale tools including flakes, blades/bladelets, chunks, utilized and retouched pieces (Sites 173, 177, 178 & 179) were encountered alongside the dirt road and beyond the road reserve on sheet washed sandy and shale surfaces (Figures 41-43). No LSA organic remains such as pottery or ostrich eggshell were found.

A medium density scatter (Site 174) of indurated shale LSA flakes, utilized and retouched pieces, utilized/retouched blade tools, that extends on both sides of the road reserve was also encountered along OG 86, but is some distance from the road reserve (Figures 44 & 45).

A high density scatter of tools (Site 172) was encountered over the farm boundary fence alongside OG 86. The site comprises an extensive scatter of weathered MSA flakes (not unlike Sites 162 & 163) in indurated shale, that includes many triangular shaped flakes, chunks, worked pieces, cores and blades on a sheet washed surface not far from a dry drainage channel (Figure 48). The site, which is rated as having High (3A) importance, will not be impacted by construction of the pipeline.



Figure 41. MSA tools from Site 171. Scale is in cm



Figure 42. Site 173 alongside OG 86.



Figure 43. Tool from Site 173. Scale is in cm



Figure 46. Site 174 alongside OG 86. Note the bakkie.



Figure 44. Site 176 alongside OG 86



Figure 47. Tools from Site 174. Scale is in cm



Figure 45. Tools from Site 176. Scale is in cm



Figure 48. Site 172. Note the bakkie in the distance

6.4 Other finds

A LSA site (Site 164), probably dating to the 19th Century, was documented on a small dolerite kopje/ridge about 100m east of the proposed pipeline servitude between the Romanskolk Reservoir and the dirt road (OG 86) (refer to Figure 54). Very large numbers of pressure flaked indurated shale bladelets, including many thin unmodified and utilized flakes, chips, and small worked chunks/cores were also counted. Two or three pieces of chalcedony, mica and quartz were also found. No formal tools were found but due to time constraints, not enough time was spent inspecting the site. The lithics however, appear to be concentrated around two small flat south east facing terraces which apart from the large numbers of stone tools, also contained possibly several 1000 pieces of small ostrich eggshell (Figures 49 & 50). No beads or fragments of eggshell water containers were found. Some colonial glass and ceramics were also noted. A few weathered (possibly reworked) MSA indurated shale flakes similar to what occurs in the surrounding landscape (Sites 162 & 163), were also counted. No pottery or bone was found.

A small dolerite kraal/stock enclosure was recorded on the kopje, while a much larger enclosure measuring about 15 x 7m, was found about 20m to the south and below the kopje (Figures 51 & 52). Scatters of LSA indurated shale flakes, bladelets, 100s of pieces of ostrich eggshell, and fragments of Annular ware and white ceramics were found in the large enclosure.

No rock engravings were found.

J Deacon (1986, 1987) has shown that the Bushmanland region became a last outpost of the /Xam Bushman who still hunted and gathered there in the last decades of the 19th Century and it may be that Site 164 represents this period during which there was contact between indigenous hunter-gatherers and European settlers.

The site, which has been rated as having High (3A) significance, will not be impacted by proposed construction activities.



Figure 49. Site 164. White fragments are ostrich eggshell



Figure 50. Site 164. White fragments are ostrich eggshell



Figure 51. Site 164. Small enclosure on kopje



Figure 52. Site 164. Large stock enclosure below kopje

7. CONCLUSION

The study has shown that archaeological heritage is very visible in this seemingly arid and inhospitable landscape.

Extensive scatters of MSA tools were documented on the rocky slopes below the Romanskolk Reservoir, and a possible 19th Century LSA site was encountered on a dolerite ridge about 100m east of the dirt road. While these sites have been rated as having High (3A) significance, they will not be impacted by proposed construction activities.

Low, medium and higher density scatters of MSA and LSA tools were also encountered alongside OG 86, but the remains are located outside and away from the road reserve, where the proposed water pipeline will be buried.

No graves were encountered along the proposed pipeline route.

No rock engravings were found.

There will be no impact on the built environment, cultural landscape or scenic routes. The pipeline will be buried underground, while the proposed new Brandvlei Reservoir will be constructed alongside the existing Brandvlei Reservoir and infrastructure that includes a Telkom tower, roads and fences.

8. RECOMMENDATIONS

With regard to the proposed construction of the Brandvlei Bulk Water Supply Pipeline and Reservoir, the following recommendations are made:

1. Replacement of the (old) pipeline between the Romanskolk Reservoir and OG 86 must stay within the existing servitude (as planned)
2. Construction of the new pipeline along the OG 86 till R353 must remain within the road reserve (as planned).
3. Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered during construction activities, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or Ms Katy Smuts at the South African Heritage Resources Agency (021 462 4502). Burials, etc must not be removed or disturbed until inspected by the archaeologist.

9. REFERENCES

Beaumont, P.B. & Vogel, J.C. 1984. Spatial patterning of the ceramic Later Stone Age in the Northern Cape Province, South Africa. In: Hall, M., Avery, G., Avery, D.M., Wilson, M.L. & Humphreys, A.J.B. (eds) *Frontiers: southern African archaeology today*: 80-95. Oxford: British Archaeological Reports International Series 207.

Deacon, J. 1986. 'My place is the Bitterpits': the home territory of Bleek and Lloyd's /Xam San informants. *African Studies* 45: 135-155.

Deacon, J. 1996. Archaeology of the Flat and Grass Bushmen. In Deacon, J. & Dowson, T. (Eds) *Voices from the Past: /Xam Bushmen and the Bleek and Lloyd Collection*. Pp. 245-270. Witwatersrand University Press: Johannesburg.

Deacon, J. 1997. Home of the /Xam: A guide to places in the Northern Cape where /Xam lived in the nineteenth century. Guide for the post-conference excursion on "Khoisan Identities and Cultural Heritage".

Halkett, D & Orton, J. 2011. Heritage Impact Assessment (archaeology and palaeontology): proposed Olyven Kolk solar power plant, Northern Cape Province. Unpublished report for ERM.

Pelser, A. 2011. A report on an Archaeological Impact Assessment (AIA) for the proposed solar energy plant on Klein Zwart Bast 188, Kenhardt District, Northern Cape. Unpublished report for Robert de Jong & Associates.

Webley, L. & Halkett, D. 2010. An Archaeological Impact Assessment (Report 3): Proposed construction of a substation between Aries-Helios and associated loop in and loop out lines, west of Brandvlei in the Northern Cape. Unpublished report for Nzumbululo Heritage Solutions.

Webley, L. & Halkett, D. 2012. Heritage Impact Assessment: Proposed Kenhardt photovoltaic solar power plant on remainder of the farm Klein Zwart Bast 188, Northern Cape Province. Unpublished report for Digby Wells Environmental.

Kaplan, J. 2012a. Archaeological Impact Assessment the proposed Green Energy Continent 75MW Photovoltaic Energy Generation Facility on Portion of the Farm Olyvenkolk 187, Kenhardt District, Northern Cape. Report prepared for Eco Impact Legal Consulting. Agency for Cultural Resource Management. Cape Town

Kaplan, J. 2012b. Archaeological Impact Assessment the proposed Wine Estate Capital Management 75 MW Photovoltaic Energy Generation Facility on Portion 12 of Farm Olyvenkolk 187, Kenhardt District, Northern Cape Province. Report prepared for Eco Impact Legal Consulting. Agency for Cultural Resource Management. Cape Town

Kaplan, J. 2011a. Archaeological Impact Assessment the proposed Solar Cape 10 MW photovoltaic energy generation facility on Farm 187/3 near Kenhardt, Northern Cape Province. Report prepared for Cape Lowlands Environmental Services. Agency for Cultural Resource Management.

Heritage Impact Assessment, the proposed Brandvlei Bulk Water Supply Pipeline and Reservoir

Kaplan, J. 2011b. Archaeological Impact Assessment the proposed Solar Cape 100MW photovoltaic energy generation facility on Farm 187/7 near Kenhardt Northern Cape Province. Report prepared for Cape Lowlands Environmental Services. Agency for Cultural Resource Management.

Kaplan, J. 2011c. Addendum to report. Archaeological Impact Assessment the proposed Solar Cape 100 MW photovoltaic energy generation facility on Farm 187/7 near Kenhardt Northern Cape Province. Report prepared for Cape Lowlands Environmental Services. Agency for Cultural Resource Management.

Webley, L. & Orton J. 2012. Heritage Impact Assessment of the proposed reverse osmosis plant and associated infrastructure, Brandvlei, Hantam Local Municipality, Northern Cape. Report prepared for Irme van Zyl Environmental Consultant. Archaeology Contracts Office, Cape Town.

Appendix I

Spreadsheet of waypoints and description of finds

Heritage Impact Assessment, the proposed Brandvlei Bulk Water Supply Pipeline and Reservoir

Site No.	GPS co-ordinates	Description of finds	Significance
150	S30 27.390 E20 29.234	Banded ironstone flake	Low (3C)
151	S30 27.381 E20 29.230	Indurated shale flake & 2 chunks	Low (3C)
152	S30 27.400 E20 29.279	Indurated shale chunk	Low (3C)
153	S30 27.426 E20 29.306	nicked/partially retouched MSA flake	Low (3C)
154	S30 27.473 E20 29.371	Round convex shaped indurated shale partially retouched flake	Low (3C)
155	S30 27.472 E20 29.342	Indurated shale chunk	Low (3C)
156	S30 27.473 E20 29.344	Broken retouched indurated shale chunk	Low (3C)
159	S30 45.469 E20 39.570	Quartzite MSA flake	Low (3C)
160	S30 45.454 E20 39.563	Indurated shale flake	Low (3C)
161	S30 45.436 E20 39.559	Indurated shale flake & chunk	Low (3C)
162	S30 44.697 E20 38.932	Scatter of weathered MSA flakes, retouched & unmodified blades, large angular chunks, round and irregular cores, below the Romanskolk Reservoir kopje, and alongside the alignment of the existing water pipeline. Part of a very extensive scatter of MSA tools on the rocky elevated hill slopes east of the existing pipeline. The tools number thousands of lithics and the site extends for several 100m ² .	High (3A), but site will not be impacted by proposed activities
163a & 163b	S30 44.843 E20 39.051	Massive scatter of weathered MSA lithics (same as above), covering a very large area east of the existing pipeline servitude. 1000s of tools spread over a very wide area	High (3A), but site will not be impacted by proposed activities
164	S30 45.022 E20 39.220	LSA (possibly early 19 th Century) site on dolerite kopje about 100m east of the existing/proposed pipeline servitude. Very large numbers of pressure flaked bladelets, thin unmodified and utilized flakes, chips, chunks and cores. No formal tools noted, but not enough time spent on the site. Literally 1000s of pieces of small ostrich eggshell fragments also present. 2 or 3 pieces of chalcedony, mica and quartz also noted, including some glass and ceramics (white and blue). Some weathered MSA indurated shale (same as 162 & 163), possibly reworked, also occur. No pottery or bone noted. Tools and organic remains are concentrated around 2-3 small flat south facing terraces. A small dolerite kraal/small stock enclosure is present on the kopje and a much large enclosure measuring about 15 x 7m occurs about 20m to the south, where inside the enclosure scatters of LSA indurated shale flakes/bladelets, one piece of Annular ware, and 100s of pieces of fragmented OES, and fragment of white plate, were counted.	High (3A), but site will not be impacted by proposed activities

Heritage Impact Assessment, the proposed Brandvlei Bulk Water Supply Pipeline and Reservoir

165	S30 45.079 E20 39.220	Medium density, scatter of tools about 50m from existing/proposed water supply pipeline. Lithics comprise mainly weathered MSA indurated shale flakes, blades, chunks, angular chunks/minimal cores, but also thin scatter of LSA indurated shale flakes, chunks, chips.	Low/Moderate (3A/B), but site will not be impacted by proposed activities
166	S30 45.681 E20 38.700	Indurated shale flake	Low (3C)
167	S30 45.677 E20 38.662	Flaked chunk	Low (3C)
168	S30 45.633 E20 35.973	Patinated Indurated shale in road	Low (3C)
169	S30 45.129 E20 35.085	Retouched indurated shale flake	Low (3C)
170	S30 45.117 E20 35.069	Weathered silcrete LSA scraper	Low (3C)
171	S30 44.653 E20 34.516	A low density, scatter of indurated shale, MSA flakes and chunks between the (OG86) road reserve and the fence line (about 2.5m).	Low (3C)
172	S30 44.648 E20 34.515	High density and extensive scatter of indurated shale MSA flakes, retouched and utilized flakes, blades, chunks, several cores, a hammerstone, on flat, sheet washed gravels, fairly close to a drainage channel. Scatter of tools is also visible on the other side (south) of the gravel road (OG 86).	Moderate to High (3B) , but site will not be impacted by proposed activities.
173	S30 43.841 E20 33.613	A low density scatter of indurated shale LSA flakes, including flakes, blades, chunks, minimal cores/cores, utilized and retouched pieces. A few weathered MSA tools in indurated shale. The scatter extends some distance beyond the road reserve (OG 86). No organic remains found.	Low-moderate ((3C), but site will not be severely impacted by proposed activities.
174	S30 43.334 E20 33.164	Medium density scatter of indurated shale LSA flakes, utilized and retouched pieces, blade like tools (utilized & retouched), that extends over both sides of the road reserve (OG 86). No organic remains found.	Moderate (3B), but site will not be impacted by proposed activities.
176	S30 43.062 E20 31.792	Low density scatter alongside the road (OG 86) that comprises a few weathered MSA indurated shale flakes and chunks.	Low (3C)
177	S30 43.053 E20 31.760	A low-medium density scatter about 10 m from the road reserve (OG 86), comprising a few weathered MSA indurated flakes, 'fresh' indurated shale LSA flakes, including a few utilized/partially retouched flakes, on a washed surface. The density of the scatter increases further away from the road. No organic remains were found.	Low (3C)
178	S30 43.038 E20 31.722	Low density scatter of LSA lithics, including a few indurated shale flakes, chunks, and utilized/partially retouched pieces on sheet washed sandy surface alongside the road (OG86). No organic remains found	Low (3C)
179	S30 42.802 E20 31.187	A few (low density scatter) of indurated shale LSA flakes alongside the road (OG86) reserve	Low (3C)

Table 1. Spreadsheet of waypoints & description of archaeological finds

Appendix II

Track paths



Figure 53. Track path and waypoint of finds described in the text

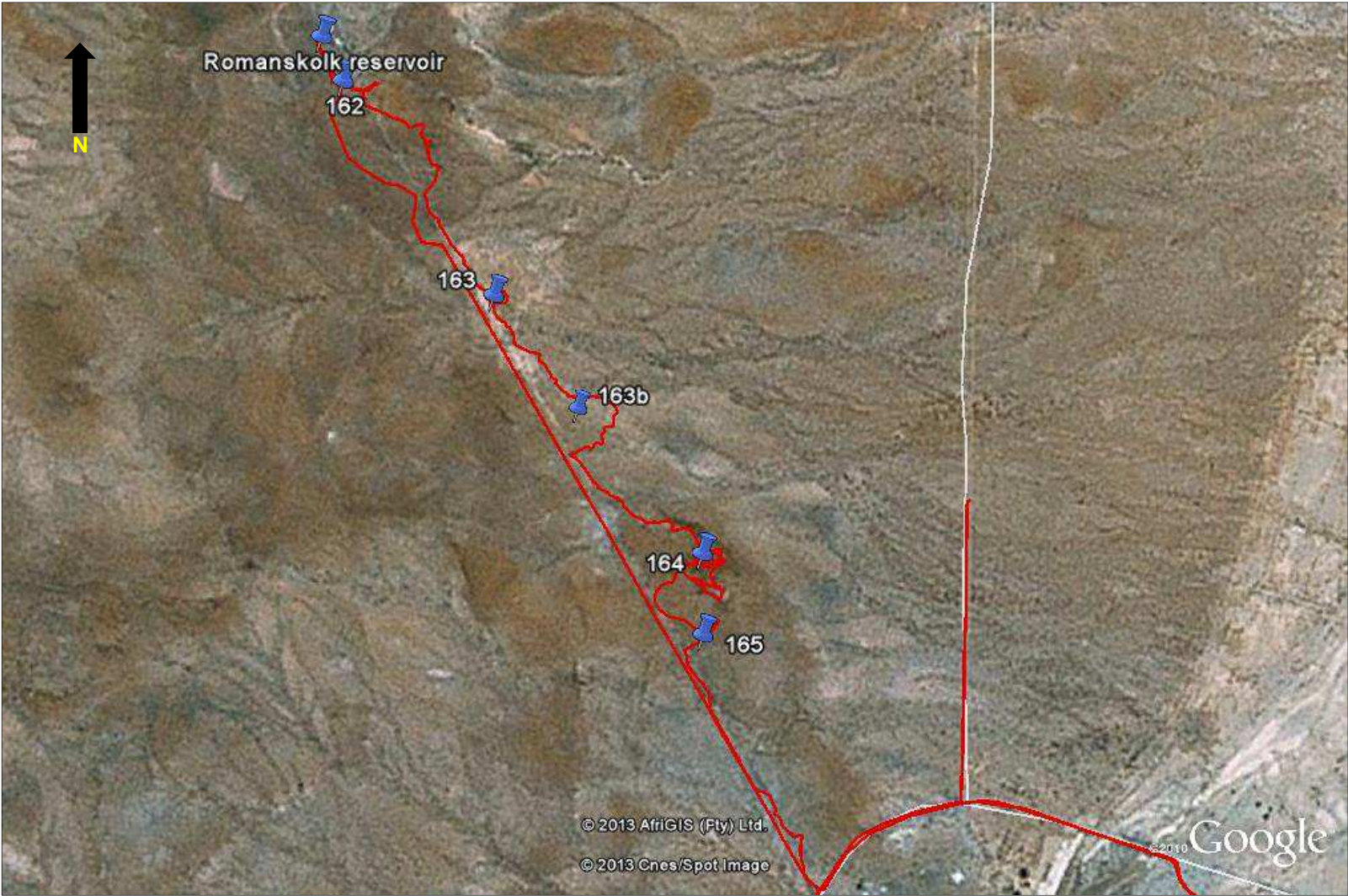


Figure 54. Track path and waypoints of finds described in the text



Figure 55. Track path and waypoint of finds described in the text

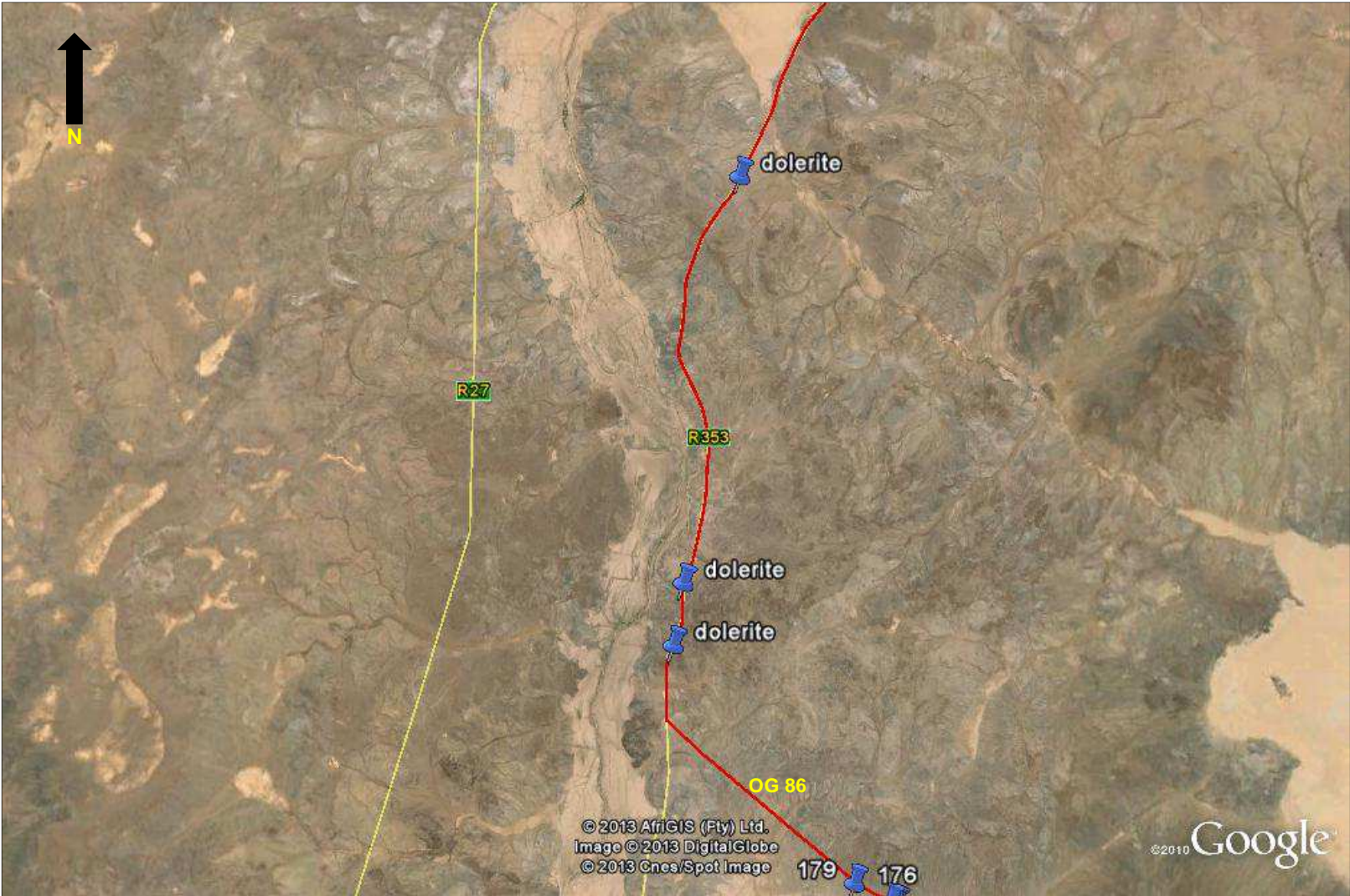


Figure 56. Track path and waypoints of finds described in the text



Figure 57. Track path and waypoints of finds described in the text.