

**AN ARCHAEOLOGICAL IMPACT ASSESSMENT (REPORT 2):  
PROPOSED CONSTRUCTION OF A SUBSTATION BETWEEN  
HELIOS-JUNO AND ASSOCIATED LOOP IN AND LOOP OUT  
LINES, NORTH OF NIEUWOUDTVILLE, NORTHERN CAPE**

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

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## EXECUTIVE SUMMARY

The Archaeology Contracts Office at the University of Cape Town was appointed by Nzumbululo Heritage Solutions to undertake the archaeological impact assessment for the proposed construction of five substations between Sishen and Saldanha. The railway line is currently being strengthened to carry more iron ore from Sishen to the port of Saldanha.

The three alternative locations have been proposed for the Helios-Juno sub-station, which will be located on the railway line to the south-west of Loeriesfontein in the Bokkeveldberge of the Northern Cape.

*As a result of the desktop review conducted by Webley (2009), the Archaeology and Palaeontology Unit of SAHRA issued a review comment recommending a field assessment.* Fieldwork was conducted by Webley and Halkett in March 2010. The GPS co-ordinates for the alternative locations for the sub-station place the structure directly in the gravel road next to the railway line. The co-ordinates are clearly approximations. Surveys of the general area indicate no archaeological material with the exception of some large flaked cobbles in Site 2a. The cobbles may have been naturally flaked.

The current transmission lines are situated at a considerable distance from the railway line. There is insufficient information on the exact angle of the loop in and loop out lines to undertake a thorough survey of the loop in and loop out lines. However, in view of the absence of any archaeological remains in this area, it is regarded as highly unlikely that archaeological remains will be impacted by the loop in and loop out lines.

*It is recommended that construction should proceed and no preference is expressed for any of the three alternatives.* The contractors should be alert to the possibility of recovering below ground archaeological remains, and work should cease if any of the following are recovered:

- Graves or human remains;
- Concentrations of stone tools, bones, pottery or metal items.

If any of the above are discovered, SAHRA should be alerted to investigate further.

## TERMINOLOGY

**Backed Microliths:** are short blades or flakes of stone with a sharp cutting edge on one side and a blunted edge on the other. The blunt edge is the result of steep retouch or backing (Deacon 1984). It is thought that these tools were hafted onto the edge of arrows or spears using a resin as glue.

**Engravings:** involves the etching of drawings into the rock surface of andesite and dolerite boulders at selected spots in the landscape using several techniques such as 'fine line engravings', pecking and shallow scratches or scrapings.

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

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

**Later Stone Age (LSA):** The archaeology of the last 20 000 years associated with fully modern people.

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

**Scrapers:** are stone tools characterised by having a flat ventral surface and convex working edge shaped by secondary retouch (Deacon 1984). They may be of varying sizes, but are circular in shape and are thought to have been used for leather work.

**Utilized pieces:** are stone flakes or flake fragments with damage in the form of small flake scars along the cutting edge (Deacon 1984).

**Wilton:** the term used for a stone tool industry (combination of stone tool types) which was first identified at the Wilton type site in the Eastern cape, and which has now been found elsewhere in South Africa. It dates from the mid to late Holocene.

# 1. INTRODUCTION

The Archaeology Contracts Office at the University of Cape Town was appointed by Nzumbululo Heritage Solutions to undertake archaeological impact assessment for the proposed construction of five substations along the Sishen-Saldanha railway line. Sishen is located in the Northern Cape and Saldanha in the Western Cape.

The three alternative locations have been proposed for the Helios-Juno substation, which will be located on the railway line to the south-west of Loeriesfontein in the Bokkeveld Mountains of the Northern Cape (Figure 1).

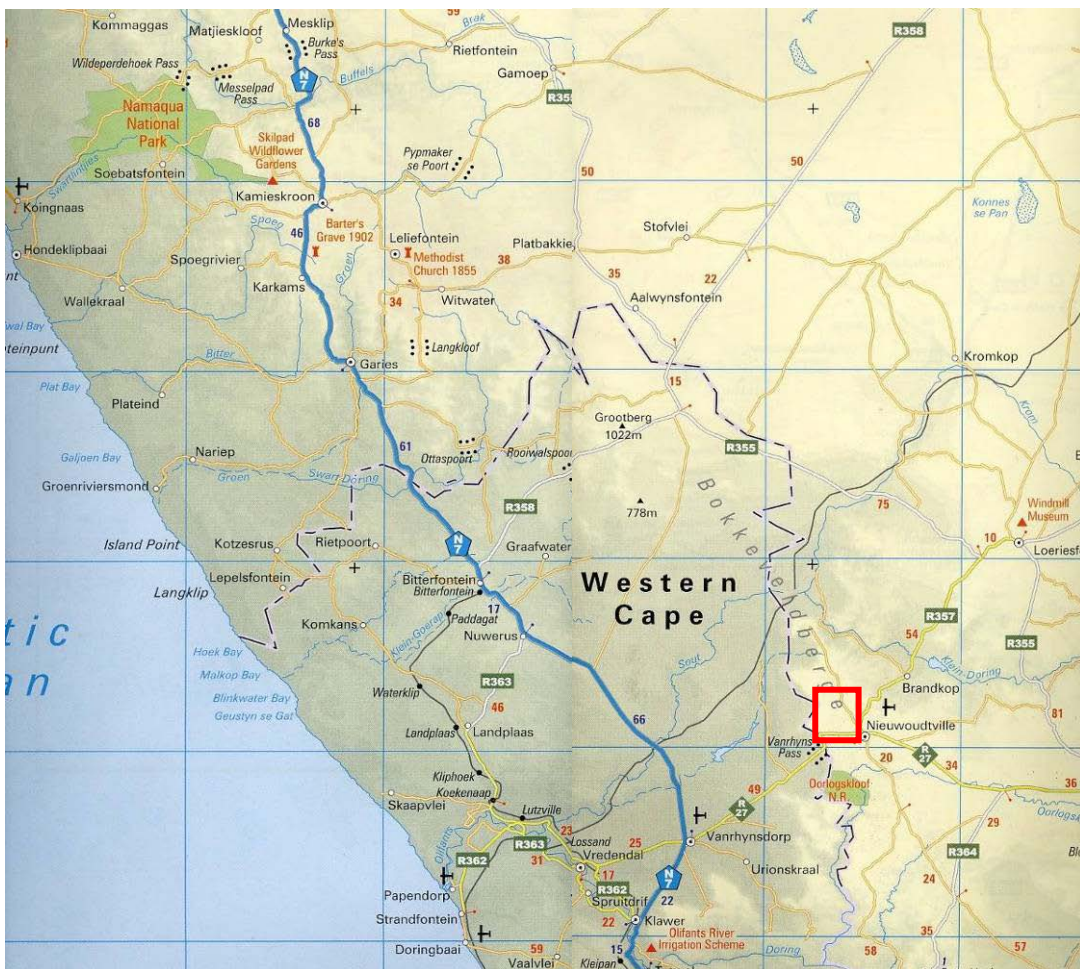


Figure 1: Map with 1:250 000 scale of the Western and Northern Cape showing the location of the proposed substations in the rectangle to the north of Nieuwoudtville and west of Loeriesfontein.

## 2. PROJECT DESCRIPTION

The expansion and refurbishment of the 861 km long rail-line from Sishen to Saldanha is currently under way to cater for increased iron ore exports (Webb 2010). Spoornet's plans for the line include expanding the shunting yards, increasing the length of crossing facilities, introducing new technology and rolling stock, and replacing the diesel locomotives with electric locomotives. Eskom has agreed to shorten the interval between sub-stations so that Spoornet will be able to use more locomotives per train and ensuring that trains can be made longer.

*Three locations have been suggested for the proposed sub-station with 2a the preferred site.* The schematic diagram of the development, provided as Figure 3, does not clearly indicate the routes which will be taken by the loop-in and loop-out lines at each sub-station. The approximate size of each sub-station will be 500m by 500m.

The substation between Aries and Helios will be a 400/50Kv substation with the following specifications:

- -2x40MVA 400/50Kv single-phase TRFR's;
- -400Kv double busbar;
- -2x150MVA series caps (one on the incomer and the second in the outgoing feeder);
- -400Kv turn-in lines of about 20km in total per substation.

## 3. TERMS OF REFERENCE

The Archaeology Contracts Office was asked to undertake an archaeological impact assessment to determine the:

- Archaeological potential of each of the alternative sites, including any known data on sites in the affected areas or immediate vicinity;
- Conduct a survey of the proposed localities to determine if archaeological resources will be impacted;
- Determine the significance of the sites and the nature of the impact;
- Recommend measures to mitigate the extent of the impact.

## 4. LEGISLATION

Section 38 (1) of the National Heritage Resources Act (No 25 of 1999) requires that when constructing a road or similar linear developments exceeding 300m in length or developing an area exceeding 5000 m<sup>2</sup> in extent, the developer must notify the responsible heritage authority of the proposed development and they in turn must indicate within 14 days whether an impact assessment is required.

These particulars do not apply if an evaluation (Section 38(8)) of the impact of development on heritage resources is required in terms of the Environmental Conservation Act, 1989 (No 73 of 1989) as is the case with this development. However, the Act notes that “any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent”, the heritage authority here being SAHRA National and SAHRA Northern Cape.

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)).

***As a result of the desktop review conducted by Webley (2009), the Archaeology and Palaeontology Unit of SAHRA issued a review comment recommending a field assessment.***

## 5. RECEIVING ENVIRONMENT

This area is known as the Onder-Bokkeveld. Anschwand (2009) describes the geology of the area as comprising basal shale beds of the Malmesbury Group. Above this is a thin layer of Cape Sandstone and the top layer is composed of dwyka tillites of the Karoo Sequence with a narrow strip of dolerite above it. These various rock types have disintegrated to form

various soils which in turn have produced different types of vegetation, gradually becoming more succulent Karoo to the east. The rainfall is heaviest at the western edge of the Bokkeveld escarpment, where it can be as much as 600mm per annum. It drops off to the east.

The proposed location of the substation will be on the farm Kanakies 332, which is located beneath the high mountain ranges of the Bokkeveld Mountains. The farm is arid, flat, and covered in short (knee-high) vegetation (Plates 1-4).

## **6. ARCHAEOLOGY OF THE AREA**

In a desktop review of the archaeological literature, Webley (2009) summarised our current knowledge of the archaeology of the area and pointed out that there is no published literature so that information has to be gleaned from sites more than 40km away. Morris (2007) has reported on a Middle Stone Age scatter some 40km to the north-east, while Orton (pers comm.) has discovered MSA scatters some 50km to the south-west along the Sout River. The Bokkeveldberge contain many rock art sites, but the only published accounts are from the Koebee River some 100km to the south. We therefore anticipated possible MSA remains as well as rock art sites in the mountains. Amschwand (2009) refers to stone walling, potsherds and paintings of fat tailed sheep which the presence of pastoralists in the area.

The history of the area has been studied by Mitchell (2007) and Amschwand (2009). The Onder-Bokkeveld was part of the northern frontier of the Cape Colony for many years. By the 1770's the area was almost completely settled by white colonists and the indigenous peoples were subjugated and worked on the stock farms. The farm Kanakies 332 was surveyed in 1874. Prior to this date it was Crown Lands. Historical archaeological remains, such as farm houses, sheds, kraals, etc may also be encountered on the farms in the area, as recorded by Amschwand (2009).

## **7. METHOD OF STUDY**

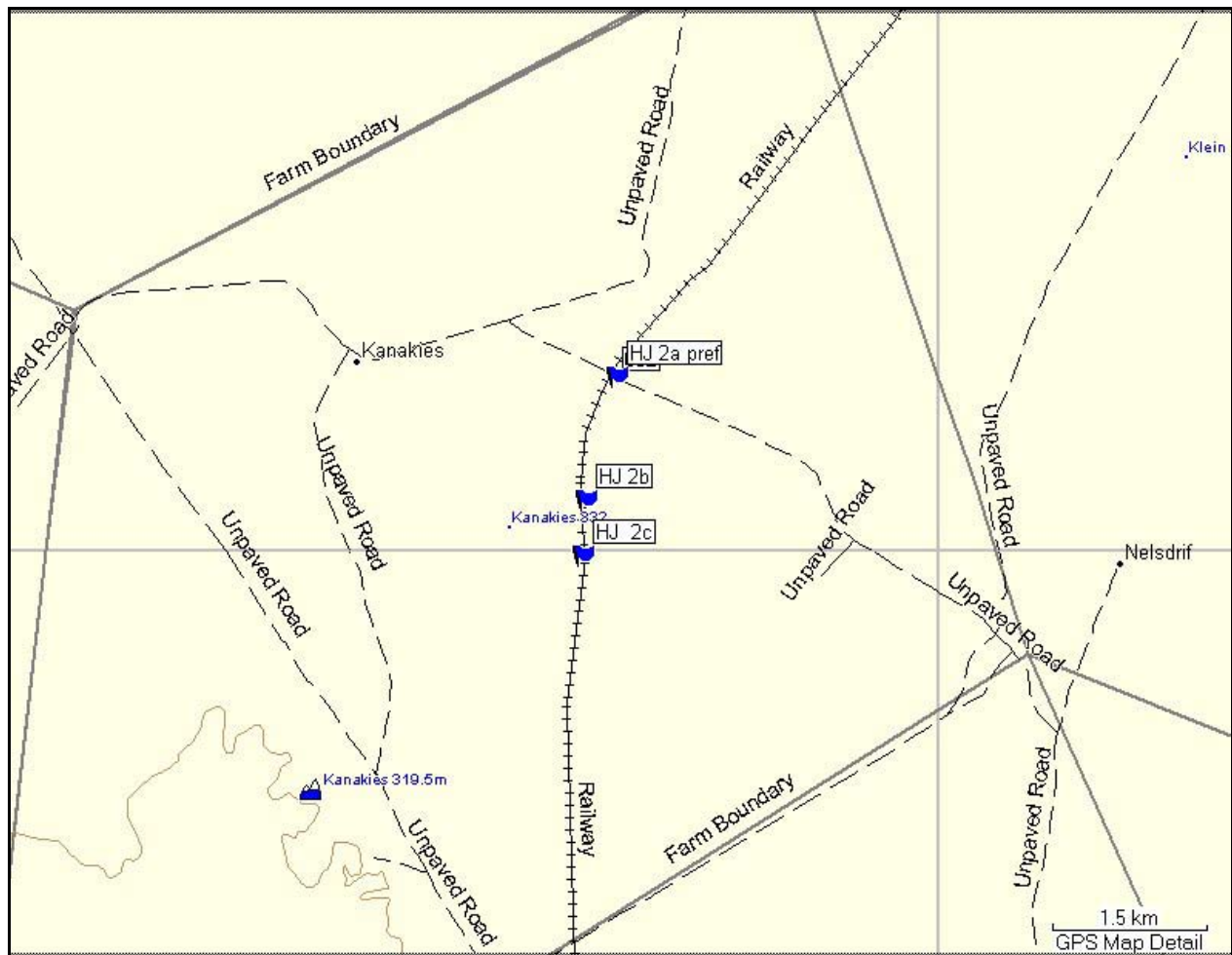
The locations of the proposed substations were loaded onto handheld GPS receivers (set to the WGS84 datum) to facilitate the identification of the search area during field work. Fieldwork was undertaken by Lita Webley and David Halkett during the week 29 March to 1 April 2010. Walk paths and site locations were recorded with GPS and finds were photographed and described.

## 7.1 Limitations

We were provided with the following GPS co-ordinates for the location of the substation:

Site		
2a (preferred)	S30 59 05.8	E18 58 02.1
2b	S30 59 44.6	E18 57 50.8
2c	S31 00 01.8	E18 57 49.9

However, these co-ordinates place the substation in the middle of the gravel road next to the railway line. We therefore had to undertake a general survey of the areas, as it was not always clear exactly where the substation would be located. Further, no shape files were provided for the angle of the loop in and loop out lines.



**Figure 2:** The farm three alternative locations for the proposed substation on Kanakies 332 are indicated on this map. According to the GPS co-ordinates provided, they are all on the road which runs next to the railway line.



## 8. RESULTS OF THE SURVEY

All three locations, according to the GPS co-ordinates which were provided, are located in the gravel service road which runs parallel to the railway line. For this reason, we looked at both sides of the road and across the railway line to ensure that all possible locations were examined for archaeological remains. It was particularly difficult to survey Site 2a (the preferred site). This is because of a gravel road which crosses the railway line at this point (Figure 2). The sub-station could be positioned on either side of this road. There appears to be a few large quartzite boulders next to the raised road (Plate 1). These boulders appear to have been freshly flaked but they could represent road working activities (Plate 2).



Plate 1: Site 2a: View of the area adjoining the railway line and the gravel farm road which crosses the railway line at this point. Plate 2: Large boulders showing signs of recent flaking.



Plate 3: The location of Site 2b and 2c are on either side of the railway line. The GPS co-ordinates indicate that they are located in the road (Plate 3).

Sites 2b and 2c are both located in the service road, running parallel to the railway line. There are no archaeological remains in these areas.

The current transmission lines are located at a considerable distance, between the railway line and the escarpment.

## **9. SIGNIFICANCE OF SITES AND IMPACT OF DEVELOPMENT**

While the desktop study suggested that the area had potential to provide significant information, the survey of the substation footprint did not recover any archaeological remains with the exception of a few large cobbles which may have been naturally flaked. These proposed locations are at a considerable distance from the closest farmhouse and dwellings and it is not anticipated that any structures or graves will be impacted.

It was not feasible to walk the distance between the railway line and the transmission lines to determine the impact of the loop in and loop out lines as we did not have the appropriate shape files. The loop in and loop out lines connecting the sub-station with the transmission lines will involve constructing electricity pylons. However, in view of the absence of any archaeological remains in this area, it is regarded as highly unlikely that archaeological remains will be impacted by the loop in and loop out lines.

## **10. RECOMMENDATIONS**

The GPS co-ordinates for the alternative locations for the sub-station place the structure directly in the gravel road next to the railway line. The co-ordinates are clearly approximations and the final location has yet to be determined. Surveys of the general area indicate no archaeological material.

The current transmission lines are situated at a considerable distance from the railway line. There is insufficient information on the exact angle of the loop in and loop out lines to undertake a thorough survey of the loop in and loop out lines. However, in view of the absence of any archaeological remains in this area, it is regarded as highly unlikely that archaeological remains will be impacted by the loop in and loop out lines.

It is recommended that construction should proceed. The contractors should be alert to the possibility of recovering below ground archaeological remains, and work should cease if any of the following are recovered:

- Graves or human remains;
- Concentrations of stone tools, bones, pottery or metal items.

If any of the above are discovered, SAHRA should be alerted to investigate further.

## **11. REFERENCES**

Amschwand, N. 2009. Short history of the Onder-Bokkeveld. Aquaknowledge: Howard Place.

Hollman, J. 1993. Preliminary report on the Koebee rock paintings, Western Cape Province, South Africa. South African Archaeological Bulletin 48: 16-25.

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Morris, D. 2007. Archaeological Specialist Input with respect to upgrading railway infrastructure on the Sishen-Saldanha Ore Line in the vicinity of Loop 7a near Loeriesfontein, and at Oorkruis, Loop 15, near Groblershoop, Northern Cape.

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Webley, L. 2009. An Archaeological desktop study (Report 2): proposed construction of a substation between Helios-Juno and associated loop in and loop out lines, Northern Cape.

**Figure 3:** Schematic diagram of the substations and associated infrastructure (supplied by client)

