

**ARCHAEOLOGICAL, PALAEOANTHROPOLOGICAL & GEOLOGICAL
INVESTIGATION OF THE PROPOSED MINING APPLICATION ON
A PORTION OF THE FARM LESSEYTON 81, QUEENSTOWN,
SOUTH EASTERN CAPE**

REPORT PREPARED FOR:

**GREENMINED ENVIRONMENTAL
PRIVATE BAG X15
SOMERSET WEST
7129**

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REPORT PREPARED BY:

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&

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SPECIALIST PANEL & DECLARATION OF INDEPENDENCE

Cobus Dreyer (MA Archaeology (Wits)), is an Archaeologist and accredited member of ASAPA, rated as Principal Investigator for Stone Age, Iron Age, Colonial and Industrial Archaeology, with Specialist rating on Anglo-Boer War history. Based in Bloemfontein he has been involved with heritage and archaeological impact assessments since 1998. After many environmental and heritage impact assessments in the Karoo, Northern Cape, the upper part of the West Coast and along the Orange River towards the Richtersveld, I consider myself familiar with the archaeology and cultural heritage of the region and competent to do the investigation.

Dr Johan C. Looek, PhD (HC) from Bloemfontein has retired from the Geology Department at the University of the Free State after lecturing for over fifty years. Dr Looek has a thorough understanding of the geology and palaeontology of the Karoo. Born and bred in the Karoo he has a keen interest in, and a wide knowledge of the history and the farm and place names of the region. His love of fieldwork contributed to his expert knowledge of the saga and paraphernalia of the Anglo-Boer War. He is a member of the Geological Society, Palaeontological Society and the Archaeological Society of South Africa.

Cobus Dreyer and Johan Looek are working as a team of independent specialists, in the delivery of consulting services on the project.

EXECUTIVE SUMMARY

Greenmined Environmental, from Somerset West, is conducting the Scoping and Environmental Impact Assessment process for the mining application by Raumix Aggregates on a portion of the farm Lesseyton in the district of Queenstown.

The mining impact by the South African Railway Services during previous ballast removal activities on the environment had been severe. The crater, remains of a crusher, loading bay and a railway line for the transport of the stone is still visible.

The Archaeological Impact Assessments did not produce any cultural material near the quarry. Middle Stone Age (MSA) stone flakes were found near the Bowker's Park siding about 1,5km distant from the quarry site.

- Geology

The Queenstown area lies in the Burgersdorp formation of the Tarkastad sub group, in the upper Beaufort Group Triassic in age in the Karoo super group. Red mudstone and sandstone occur in layers deposited by meandering rivers in the flood plain in an environment gradually filling the Karoo basin. The formations reach a considerable thickness in the Queenstown and Lady Frere area. Numerous dolerite dykes intrude the area creating good localities for gravel mining exploration.

- Archaeology

Archaeological Impact Assessments at several sites in the area produced a distribution of Later Stone Age (LSA) and Middle Stone Age (MSA) material.

In the case of the Bowker's Park quarry site, no archaeological material was found near the proposed mining site.

The only stone flakes occurred about 1,5km away near the railway junction at Bowker's Park siding (Fig.12) and near the bridge (Fig.23).

Van Riet Lowe (1956:25) mentions the presence of rock paintings near Lesseyton Station, without any further reference to the locality.

- Graves

No graves were found anywhere near the site.

We recommend that the proposed developments may continue.

DISCUSSION

The topography and natural environment of the whole Karoo region is mainly determined by the geology. For a full description of the geology of the specific area, kindly refer to the additional geological and palaeontological report by Dr J.C. Loock (This report & 2005, 2010).

The lithic assemblages found during the investigation seem to be concentrated on the lower point near the river and natural water sources.

Stone flake occurrences seem to be a distribution of waste flakes and flaked cores. The flakes show convergent sides with single or multiple flaking on the dorsal surface. The flakes form triangular points with no scars or secondary trimming. A number of flaked cores and parallel sided flakes resembling Later Stone Age artefacts occurred on the surface. The flakes are unutilised and cannot be described as "tools". The artefacts were made from the local lithic sources of chert and lydianite.

Percussion bulbs are clearly recognisable in most cases. Prepared platforms are narrow and either bent or flat and are either faceted or plain. Through the application of standard tool typology and basic characteristics, the material could arbitrarily be classified as originating from the Middle and Later Stone Age.

No specific manufacturing sites could be found.

Methodology

1. Standard archaeological and geological survey and recording methods were applied.
2. A survey of the literature was done to obtain information about the history, archaeology, palaeontology and heritage of the area.
3. The area along the route was inspected by vehicle, with stops at border fences and features where inspections were done on foot.
4. The layout of the route was plotted by GPS and transferred on to Google Earth.
5. Surroundings and features were recorded on camera.

LEGISLATION

The quarry was examined for possible archaeological and historical remains and to establish the potential impact on any cultural material that might be found. The Heritage Impact Assessment (HIA) is done in terms of the National Heritage

Resources Act (NHRA), (25 of 1999) and under the National Environmental Management Act, 1998 (Act. 108 of 1998).

The study aims to locate and evaluate the significance of heritage sites, archaeological material, manmade structures older than 60 years, and sites associated with oral histories and graves that might be affected by the proposed developments. In many cases, planted and self-sown trees and other types of vegetation determine a major part of the historical environment of human settlements in villages and towns, on farmyards or even deserted places in the open veld. These features should be recognised and taken into consideration during any cultural investigation.

Archaeological and palaeontological material and historical features along the route do not belong to the landowner or developer to deal with at free will. In the case of the alteration, destruction or removal of any of these finds of significance, the necessary approval and permits will have to be obtained from the South African Heritage Resources Agency (SAHRA) in Cape Town.

LOCALITY

The Bowker's Park quarry site is located about 4km outside Queenstown.

The following GPS coordinates (Cape scale) were taken (3126DC, 3126DD) (Maps 1-5):

A	31°52'45"S. 026°45'06"E. Altitude 1121m (Fig.2).
B	31°52'48"S. 026°45'07"E. Altitude 1143m (Figs.3-5).
C	31°52'55"S. 026°45'08"E. Altitude 1100m (Figs.6-7).
D	31°52'47"S. 026°45'17"E. Altitude 1096m (Figs.8-8-13).
Reservoir	31°52'35"S. 026°45'30"E. Altitude 1092m (Figs.14&18).
E	31°52'01"S. 026°45'56"E. Altitude 1071m (Fig.22).
Bowker's Park	31°52'35"S. 026°45'56"E. Altitude 1009m (Fig.19-21).

RESULTS

FINDS

- GEOMORPHOLOGY

The quarry is situated in the mountainous dissected area near the southern edge of the Great Escarpment. Irregular-shaped mountains capped by dolerite sills, ring dykes or incised sheets are separated by narrow and wide valleys. The landforms seen today are inherited from a former very long period of erosion during an arid climate.

- STRATIGRAPHY OF THE AREA

The general stratigraphy of the area can be described briefly as:

- Alluvium
- Pediment cover
- Scree
- Karoo Dolerite
- Beaufort Group of the Karoo

The Beaufort Group is represented by grey and maroon mudstones and sandstones of the uppermost unit, the Tarkastad Subgroup.

On the western side of the Bowker's Park Station and up to the mountain slopes to the north of the quarry, not a single outcrop can be seen because everything is covered; the mountain slopes by scree and on the pediment extending from the quarry towards the station, by a thin cover of recent sediments.

The Beaufort rock in the area contains the following fossils: fishes, amphibians, reptiles, a rare *Unio sp.* mussel, and a few plants (Kitching 1977, Rubidge 1995). Because of the extensive cover of recent scree and unconsolidated sediments, not a single fossil was found.

An abbreviated and simplified column of the geological stratigraphy of the area north of Beaufort West is given here:

KAROO DOLERITE

The Bowker's Park quarry is situated in a thick dolerite intrusion in the lower slopes of the mountain.

The rock quarried is a hard and dense dolerite when un-weathered. The crystal size of the minerals is 2mm. In a few small outcrops in the quarry the feldspar and pyroxene crystals are 3mm and even 4mm wide.

Vertical joints in the rocks trend 90° and 135°.

Dolerite is an igneous rock formed by the cooling and crystallisation of a basalt magma intruding the earth's crust at a temperature of 1000°C. Because of the extreme temperature, fossils cannot occur in this rock.

MOUNTAIN SLOPE SCREE

The scree on the eastern slope of the mountain above and north of the quarry is a jumbled mixture of angular blocks of dolerite, smaller pebbles and soil overgrown with plants and a few trees.

Fossils do not occur in the specific sediment type. A diligent search yielded no fossils.

THE COVER ON THE PEDIMENT

The pediment is the flat erosion surface extending from the base of the mountain towards the Bowker's Park siding at the Lesseyton River.

The thin veneer of unconsolidated sediments resting on the pediment consists of soil, alluvium, elluvium and pebbles. This cover rests on buried Karoo beds. A thorough search on the pediment yielded no fossils.

ALLUVIUM NEXT TO THE LESSEYTON RIVER

No animal bones or shells of the *Unio sp.* Freshwater mussel, seen. The alluvium is found about 1,5km from the quarry.

It is necessary to record that two (2) fragments of *Unio* mussel shell were observed amongst a few Later Stone Age flakes, just east of the river (Fig.). This find proves that *Unio sp.* freshwater mussels did inhabit the river in the past.

CONCLUSION

No fossils were found in or near the quarry.

If the quarry is extended in future, no fossils will be disturbed, for the reasons explained above.

IMPACT ASSESSMENT

The potential impact by the new mining developments at the quarry will have no effect on any fossil remains and no mitigation measures will be needed.

MITIGATION

No further mitigation measures will be required.

ACKNOWLEDGEMENTS

I thank Dr Johan C. Looek, PhD (HC) from Bloemfontein for clearing up the Karoo geology and local Anglo-Boer War history in an exceptional way.

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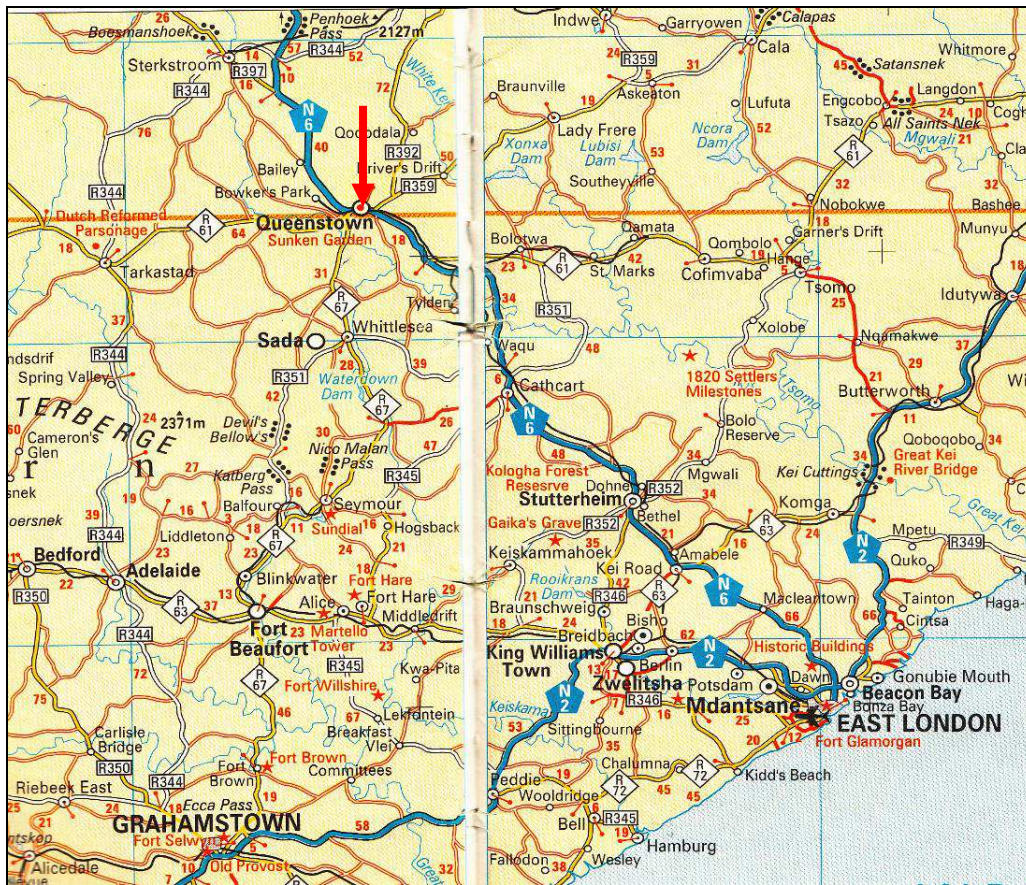
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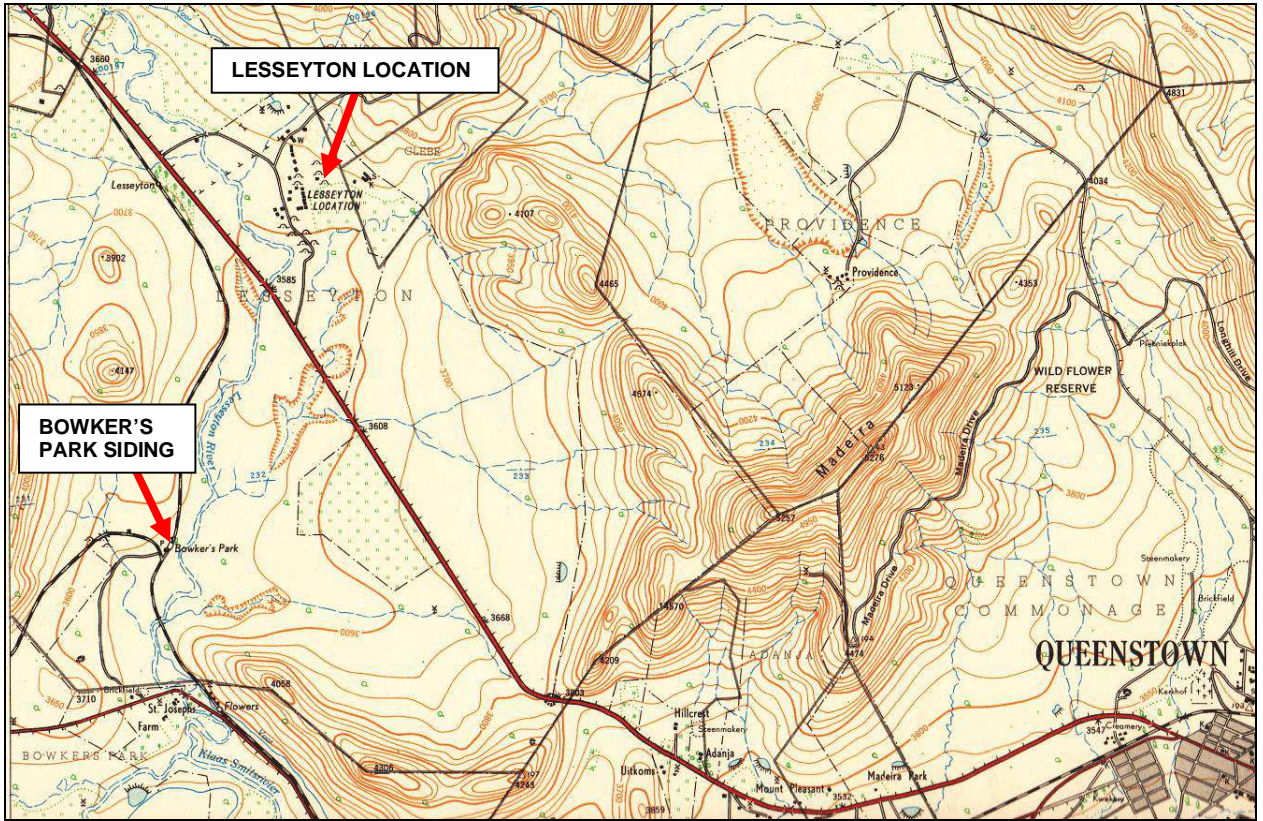
LIST OF ILLUSTRATIONS:



Map 1 Queenstown along the N6 main road to East London.



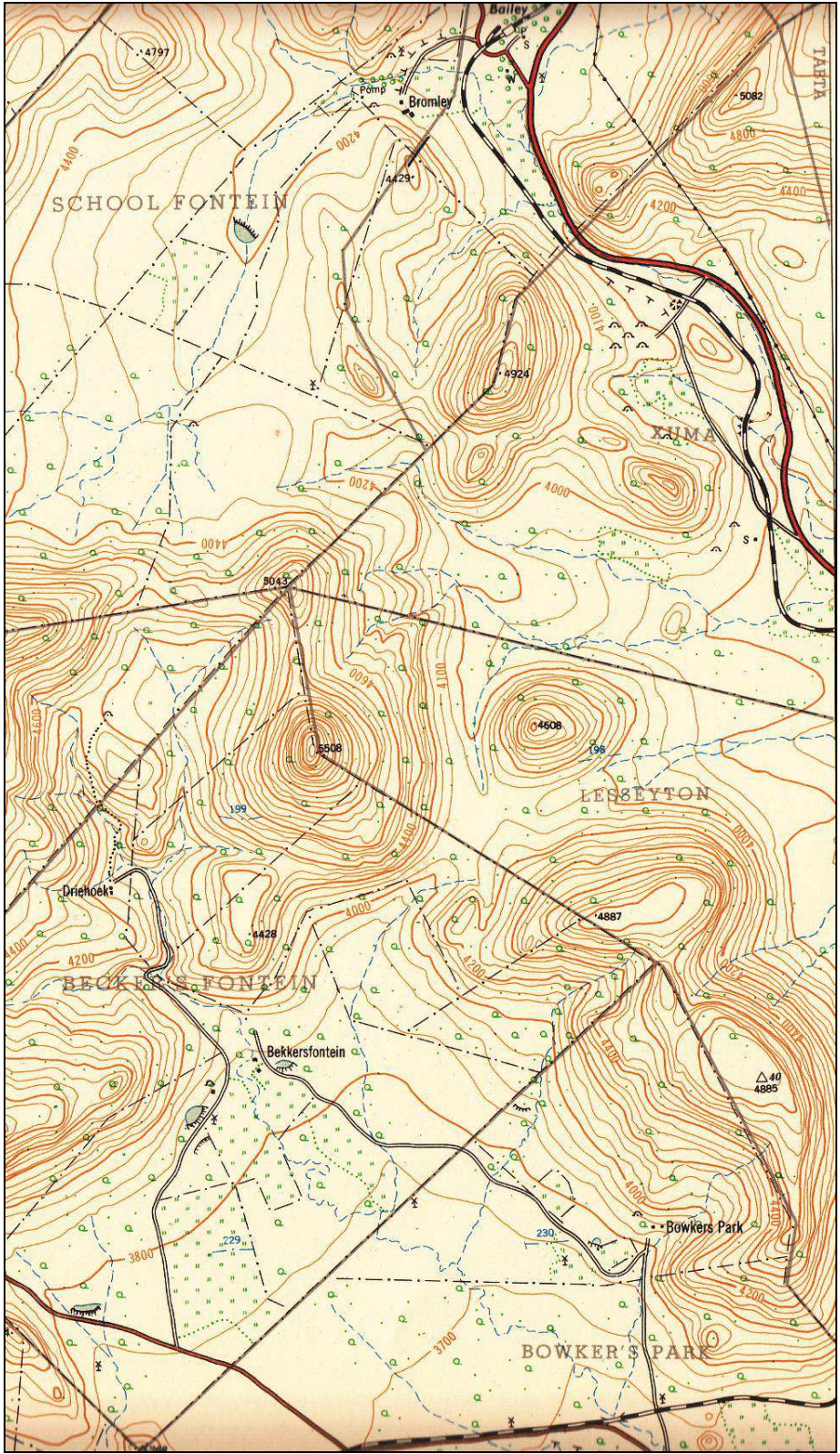
Fig.1 View of the Bowker's Park quarry against the hill.



Map 2 Bowker's Park railway siding & Lesseyton location in relation to Queenstown (3126DD).



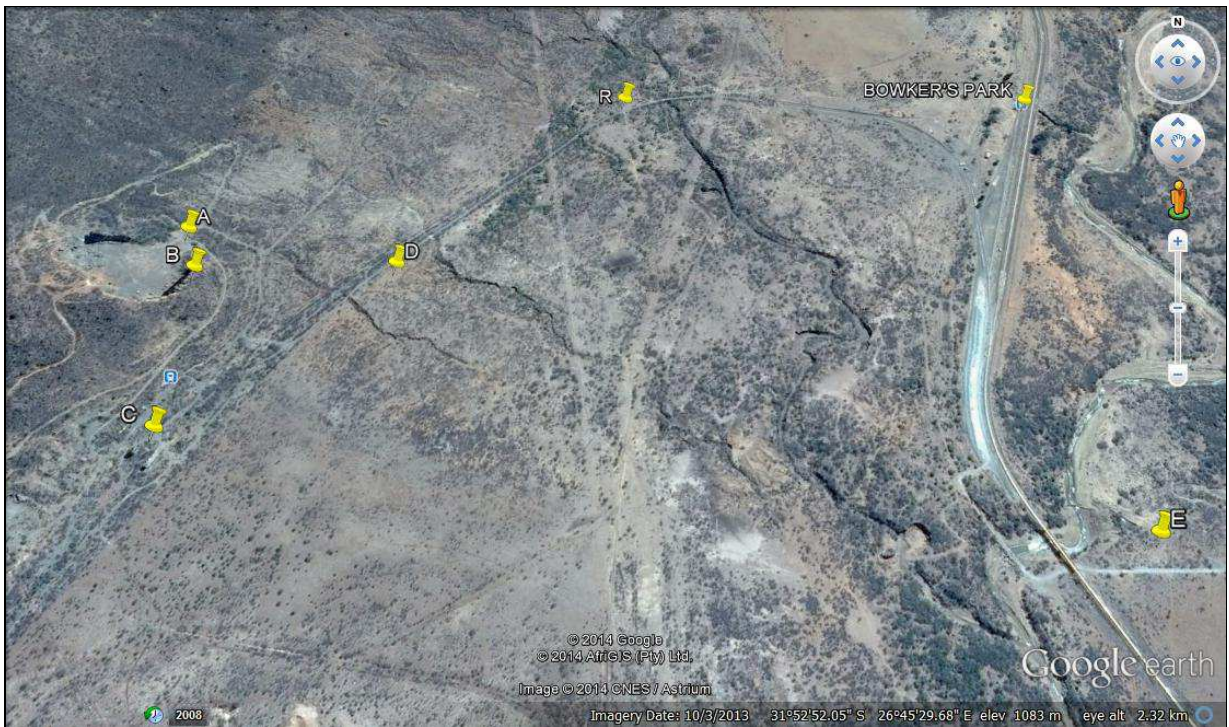
Fig.2 Point A at Bowkers Park quarry near Queenstown.



Map 3 Locality of Lesseyton & Bowker's Park farms (3126DC).



Map 4 Bowker's Park railway siding in relation to Queenstown.



Map 5 Bowker's Park quarry with related GPS coordinate points.



Map 6 Lesseyton Township in relation to quarry and other GPS coordinate points indicated.



Map 7 Layout of Lesseyton Township.



Map 8 Bowker's Park quarry with coordinate points indicated.



Fig.3 View from Point B on top of the ridge at Bowker's Park quarry.



Fig.4 Point B on top of the ridge at Bowker's Park quarry.



Fig.5 Point B on top of the ridge at Bowker's Park quarry.



Fig.6 Point C near the loading bay at Bowker's Park quarry.



Fig.7 Point C loading bay at Bowker's Park quarry.



Fig.8 Ballast remains of the old railway line to the loading bay at Bowker's Quarry.



Fig.9 Remains of the old railway line to the loading bay at Bowker's Quarry.



Fig.10 Office site at Point D along the old railway line to the quarry.



Fig.11 Point D. Railway line stop at the junction or office site.

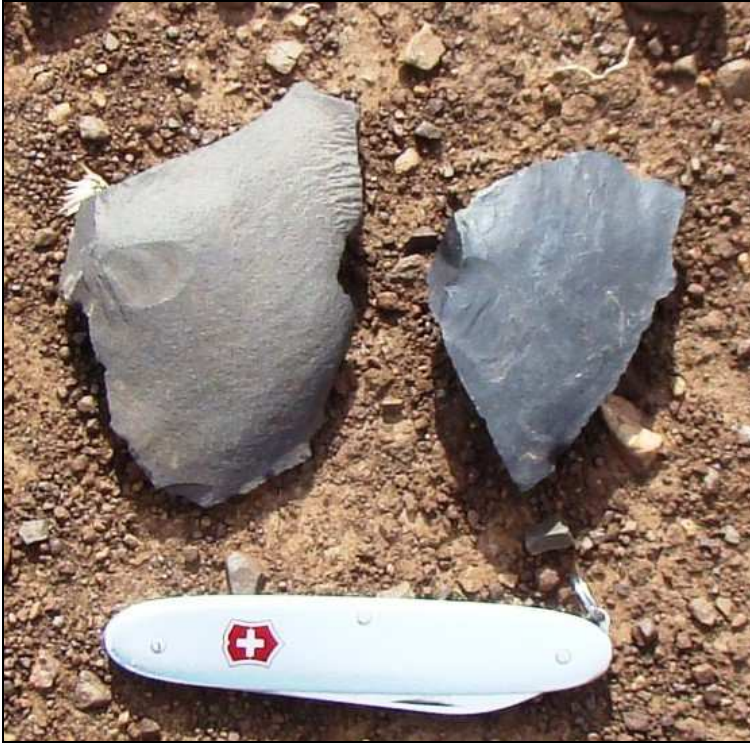


Fig.12 Middle Stone Age flakes at the office site. Point D. (Pocket knife = 84mm).



Fig.13 Glass from household remains at the office site. Point D.



Fig.14 Point R. Remains of steel structure over bore hole.



Fig.15 Point R. Remains around bore hole.



Fig.16 Reservoir tanks and dams at Point R.



Fig.17 Ash midden near reservoir tanks at Point R.



Fig.18 Remains of South African Railways underground cable layout.



Fig.19 Bowkwer's Park siding.



Fig.20 Bowkwer's Park siding.

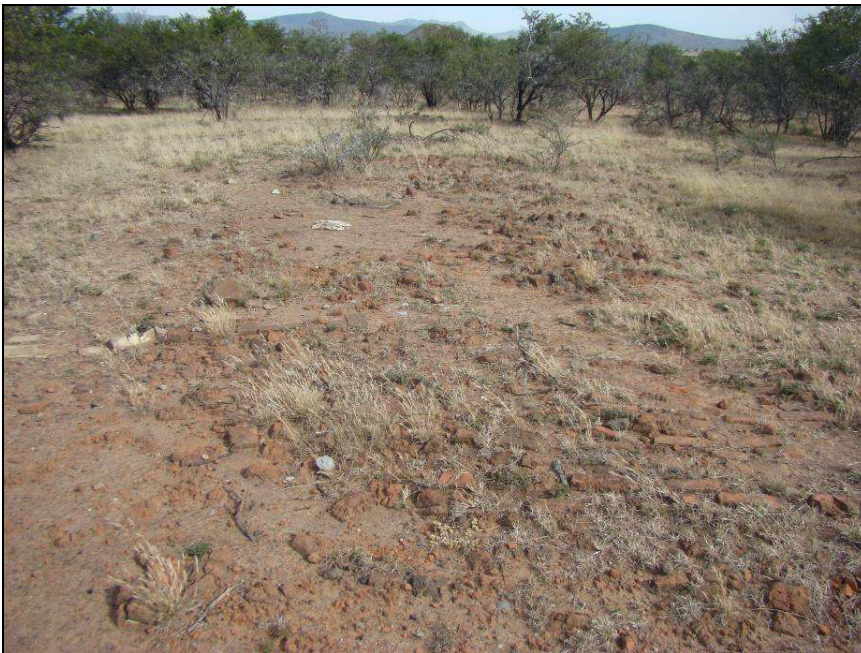


Fig.21 Remains of brick walled buildings near Bowkwer's Park siding.



Fig.22 Bridge across the Lesseyton River near Bowkwer's Park siding.



Fig.23 MSA stone flakes from Point E near the lesseyton River Bridge. Note the pieces of Unio sp. mollusc shell centre right of the picture. (Pocket knife = 84mm).

Fig.24 The rod points at a layer containing calcareous nodules.

Fig.25 A small sliver of reptilian bone. (Pocket knife = 84mm).

Fig.26 Boulder bed in and next to river at the entrance to De Hoop farm.

Fig.27 Conglomerate on top of debris fan.

Fig.28 The thick sandstone bed indicates the base of the Oukloof Member.

Fig.29 Hypothermal altered mudstone.

Fig.30 An example of the scree found on the mountain slopes of the area.

Fig.31 Maroon and grey mudstone of the Hoedemaker Member overlain by thin sandstone.