

# Heritage Impact Assessment of the De Put de-sludge area, Sandspruit, Senekal, Setsotso Local Municipality, FS Province.

Report prepared by  
Palaeo Field Services  
PO Box 38806  
Langenhovenpark  
9330  
31 August 2021



## Summary

A phase 1 Heritage Impact assessment was conducted for proposed de-sludging of a 0.6 ha area behind a 105 m – long concrete weir in the Sandspruit near Senekal in the FS Province. The survey area is primarily underlain by medium to coarse-grained sandstones and intercalated mudstones of the Adelaide Subgroup (Beaufort Group, Karoo Supergroup), capped by younger and well-developed, fluvial / alluvial deposits of Quaternary age . The affected area lies within a 240 m long section of the fluvial range of the Sandspruit and terminates at a concrete weir in the north. The concrete weir and an accompanying berm was constructed in the 1970's as part of the De Put Water Scheme for water retention in the Sand Spruit in order to alleviate an acute water shortage in town. The site has been severely degraded by previous and ongoing construction work. There is no evidence for the accumulation and preservation of intact fossil material within the Sandspruit fluvial sediments impacted by the development. There are no indications of Stone Age artifacts, prehistoric structures, graves or rock art within the footprint. There is also no evidence of historical structures within the confines of the study area. The development primarily affects late Quaternary fluvial deposits, which occurs within the normal course of the Sandspruit under a regime of continuously flowing water. Thus, given the nature of the footprint (active river), potential for palaeontological and archaeological impact is considered very low. There are no major archaeological grounds to suspend the proposed development, provided that all excavation activities are confined to within the (fluvial) confines of the development footprint and not adjacent alluvial deposits (sediments that are laid down when the river goes beyond its normal boundaries, i.e. ancient floodplains, terraces or overbank deposits). The study area is considered to be of low archaeological significance and is assigned a site rating of Generally Protected C.

# Introduction

A phase 1 Heritage Impact assessment was conducted for proposed de-sludging of a 0.6 ha area behind a 105 m – long concrete weir in the Sandspruit near Senekal in the FS Province. The extent of the proposed development (over 5000 m<sup>2</sup>) falls within the requirements for a Heritage Impact Assessment (HIA) as required by Section 38 (Heritage Resources Management) of the South African National Heritage Resources Act (Act No. 25 of 1999). The region’s unique and non-renewable archaeological and palaeontological heritage sites are ‘Generally’ protected in terms of the National Heritage Resources Act (Act No 25 of 1999, Section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority. As many such heritage sites are threatened daily by development, both the environmental and heritage legislation require impact assessment reports that identify all heritage resources within the area to be developed, and that make recommendations for protection or mitigation of the impact of the sites.

The assessment involved identification of possible archaeological and paleontological sites or occurrences in the proposed zone, an assessment of their significance, possible impact by the proposed development and recommendations for mitigation where relevant.

## Methodology

The palaeontological and archaeological significance of the affected area was based on existing field data, database information, published literature and maps. This was followed up with a field assessment by means of a pedestrian survey and investigation within the footprint. A Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) and a digital camera were used for recording purposes. Site significance classification standards prescribed by SAHRA (2005) were used to indicate overall significance and mitigation procedures where relevant (**Table 1**).

## Site Information

Maps: 1:50 000 topographical 2827BC Senekal

1:250 000 geological map 2826 Winburg

General Site Coordinates:

- A) 28°21'28.53"S 27°37'15.96"E
- B) 28°21'28.19"S 27°37'17.67"E
- C) 28°21'29.80"S 27°37'20.99"E

- D) 28°21'33.78"S 27°37'23.92"E
- E) 28°21'34.57"S 27°37'22.37"E
- F) 28°21'30.88"S 27°37'20.28"E

The site is located about 4km due south of the Senekal CBD on the farm De Put 298 and within a 1.6 ha section of the Sandspruit next to the Matwabeng Dam (**Fig. 2**).

## Background

### Geology

The survey area is primarily underlain by medium to coarse-grained sandstones of the Adelaide Subgroup (*Pa*, Beaufort Group, Karoo Supergroup) (Nolte 1995; Johnson *et al.* 2006) (**Fig. 3**). Sedimentary rocks form the base on which younger, fluvial / alluvial deposits of Quaternary age have been deposited by the Sandspruit (**Fig. 3**, *flying bird symbol*; **Fig. 4**).

### Palaeontology

The Karoo sedimentological strata underlying the site and surrounding area are generally accepted to be Late Permian in age, and are assigned to the *Dicynodon* and overlying *Lystrosaurus* Assemblage Zones (Kitching 1977; Groenewald & Kitching 1995) (**Fig. 5**). The sediments assigned to the *Dicynodon* AZ are associated with stream deposits consisting of floodplain mudstones and subordinate, lenticular channel sandstones. Therapsids and other vertebrate fossils from the *Dicynodon* AZ are usually found as dispersed and isolated specimens in mudrock horizons, associated with an abundance of calcareous nodules. *Dicynodon lacerticeps* have been found on the Senekal commonage. Vertebrate fossils of the *Lystrosaurus* Assemblage Zone are primarily found in the mudrock sequences between channel sandstones. Fossils are frequently preserved as articulated skeletons within well-defined blue-grey or red-brown calcareous nodules. Burrow casts have been described from several localities within the biozone (Groenewald, 1991). Fossils of *Lystrosaurus* have been recorded on the farms Kruis Vlei 279, Halfweg 356, Brandfort 320 and Magdala 97. Plant fossils (*Dadoxylon*, *Glossopteris*) and trace fossils (arthropod trails, worm burrows) are also present (Groenewald 1991). Fossil trees of the *Dadoxylon* genus are common in the Winburg and Harrismith districts. A high occurrence of fossil wood has been recorded on the farms Waterloop 698, Langlaagte 398, Helderwater 701, Onze Rust 700 and Blinkwater 702 (**Fig. 6**). Partially consolidated Quaternary alluvium found along the Sandspruit southeast of Senekal are characterized by extensive erosion in the form of dongas, and are known to occasionally contain late Pleistocene vertebrate remains (Rossouw pers comm) and even localized death assemblages, e.g. densely packed, large mammal bone beds at Heelbo, which

includes 3600 year old articulated skeletons of black wildebeest *Connochaetes gnou* (Backwell et al. 2018)(**Fig. 6 & 7**).

## **Archaeology**

The South African central plateau is distinctive in that it supported Stone Age people over thousands of years, who were also prolific makers of stone tools until relatively recent times. This can be seen in the high density of Stone Age archaeological traces visible on the landscape today. The range of archaeological sites encountered in the Free State is extensive, in terms of both typology and chronology. This include Early Stone Age bifaces, and retouched blades and trimmed points from the Middle Stone Age to the microlithic Wilton and Smithfield Complexes from the Holocene. Surface scatters of Later Stone Age and Middle Stone Age artifacts are frequent archaeological components along erosional gullies (dongas) of rivers and streams in the region. The incidence of surface scatters usually decreases away from localized areas such as riverine sites and dolerite-shale contact zones. Away from riverine contexts, Stone Age artifacts generally occur as contextually derived individual finds in the open veld. Ephemeral, LSA open sites have been mapped near alluvial contexts, e.g. on the banks of the Tom Schutte Spruit located about 8km south–west of Senekal on the N5 national road and the Sandspruit south of Paul Roux (Rossouw 2013, 2014) (**Fig. 8 & 9**). Several rock art localities, containing depictions of human figures, have been recorded in the Witteberge southeast of Paul Roux and at Langlaagte and Niekerksrust north and southeast of Senekal, respectively (van Riet Low 1941). Late Iron Age stonewalled complexes primarily dominate the archaeological footprint in the region (Breutz 1956; Maggs 1976) (**Fig. 10**). Stone enclosures found on and around dolerite koppies along the river valley between Winburg and Paul Roux, exhibit telltale signs of basic structural units including huts, large enclosures, and pieces of walling and stone circles related to Late Iron Age settlements in the area (**Fig. 11**). These sites were occupied from as early as the sixteenth to seventeenth centuries and represent a system that can be broadly attributed to groups ancestral to the Sotho-speaking people of today (Maggs 1976) (**Fig. 12**). Subsequent occupation of the Free State by trekboers and the British government culminated in the establishment of the Orange River Sovereignty (1848–1854) and the Orange Free State in 1854. This was followed by a period of ongoing territorial conflict between Boer and Basuto, with the site that would eventually become Senekal, situated about 50 km north of much disputed territories (**Fig. 13**). Senekal was founded in 1877 after farmers in the area appointed a committee to select suitable area (farm De Put) for construction of a new church in 1873 (Oberholzer & Stemmet 1977) (**Fig. 14**).

## Field Assessment

The affected area lies within a 240 m long section of the fluvial range of the Sandspruit and terminates at a concrete weir in the north (**Fig. 15**). The concrete weir and an accompanying berm was constructed in the 1970's as part of the De Put Water Scheme for water retention in the Sand Spruit in order to alleviate an acute water shortage in town (Oberholzer & Stemmet 1977) (**Fig. 16**). The site has been severely degraded by previous and ongoing construction work (**Fig. 17**). There is no evidence for the accumulation and preservation of intact fossil material within the Sandspruit fluvial sediments impacted by the development. There are no indications of Stone Age artifacts, prehistoric structures, graves or rock art within the footprint. There is also no evidence of historical structures within the confines of the study area.

## Impact Statement and Recommendations

The development primarily affects late Quaternary fluvial deposits, which occurs within the normal course of the Sandspruit under a regime of continuously flowing water. Thus, given the nature of the footprint (active river), potential for palaeontological and archaeological impact is considered very low. There are no major archaeological grounds to suspend the proposed development, provided that all excavation activities are confined to within the (fluvial) confines of the development footprint and not adjacent alluvial deposits (sediments that are laid down when the river goes beyond its normal boundaries, i.e. ancient floodplains, terraces or overbank deposits). The study area is considered to be of low archaeological significance and is assigned a site rating of Generally Protected C (**Table 1**).

## References

- Backwell L. et al. 2018. Holocene large mammal mass death assemblage from South Africa. *Quaternary International* 495: 49 - 63
- Breutz 1956. Stone Kraal settlements in South Africa. *African Studies* 15 (4): 157 – 175.
- Groenewald G.H. 1991. Burrow casts from the Lystrosaurus-Procolophon Assemblage Zone, Karoo Sequence, South Africa. *Koedoe* 34. 13-22.
- Groenewald G.H. and Kitching, J.W. 1995. Biostratigraphy of the Lystrosaurus AZ. In: B.S. Rubidge, *Biostratigraphy of the Beaufort Group*. Biostrat. Ser. S.Afr. Comm. Strat. 35 – 39.
- Johnson *et al.* 2006. Sedimentary rocks of the Karoo Supergroup. In: M.R. Johnson, *et al.* (eds). *The Geology of South Africa*. Geological Society of South Africa.

Kitching, J.W. 1977. The distribution of Karoo Vertebrate Fauna. Bernard Price Institute for Palaeontological Research. Memoir 1, 1 – 131.

Kitching 1995. Biostratigraphy of the Dicynodon Assemblage Zone **In**. Rubidge, B. S. (ed.) *Biostratigraphy of the Beaufort Group*. Biostrat. Ser. S.Afr. Comm. Strat. 1, 1 – 45.

Maggs, T.C. 1976. *Iron Age communities of the southern Highveld*. Occasional Papers of the Natal Museum No. 2.

Nolte, C.C. 1995. The geology of the Winburg area. Geological Survey of South Africa. Council for Geoscience.

Oberholzer, J.J & Stemmet 1977. Senekal se eerste honderd jaar. Oranje Drukkery Beperk. Senekal.

Partridge, T.C. *et al.* 2006. Cenozoic deposits of the interior. **In**: M.R. Johnson, *et. al.* (eds). *The Geology of South Africa*. Geological Society of South Africa.

Rossouw, L. 2013. Phase 1 Heritage Impact Assessment of the Tom Schutte Bridge on National Route 5 near Senekal, FS Province. Unpublished Report for SAHRA.

Rossouw, L. 2014. Phase 1 Heritage Impact Assessment for proposed new township development on the Farm Mary Ann 712, Paul Roux, Free State Province. Unpublished Report for SAHRA.

Rubidge, B.S. 1995. (ed) *Biostratigraphy of the Beaufort Group*. Biostrat. Ser. S.Afr. Comm. Strat. 1, 1 – 45.

SAHRA, 2005. Minimum Standards for the Archaeological and the Palaeontological Components of Impact Assessment Reports.

Van Riet Lowe, C. 1941. *Prehistoric Art in South Africa*. Archaeological Series No. V. Bureau of Archaeology, Dept. of the Interior. Pretoria.

~

#### DECLARATION OF INDEPENDENCE

I, Lloyd Rossouw, declare that I act as an independent specialist consultant. I do not have or will not have any financial interest in the undertaking of the activity other than remuneration for work as stipulated in the terms of reference. I have no interest in secondary or downstream developments as a result of the authorization of this project.

## Tables and Figures

**Table 1.** Field rating categories as prescribed by SAHRA.

Field Rating	Grade	Significance	Mitigation
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP.A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction



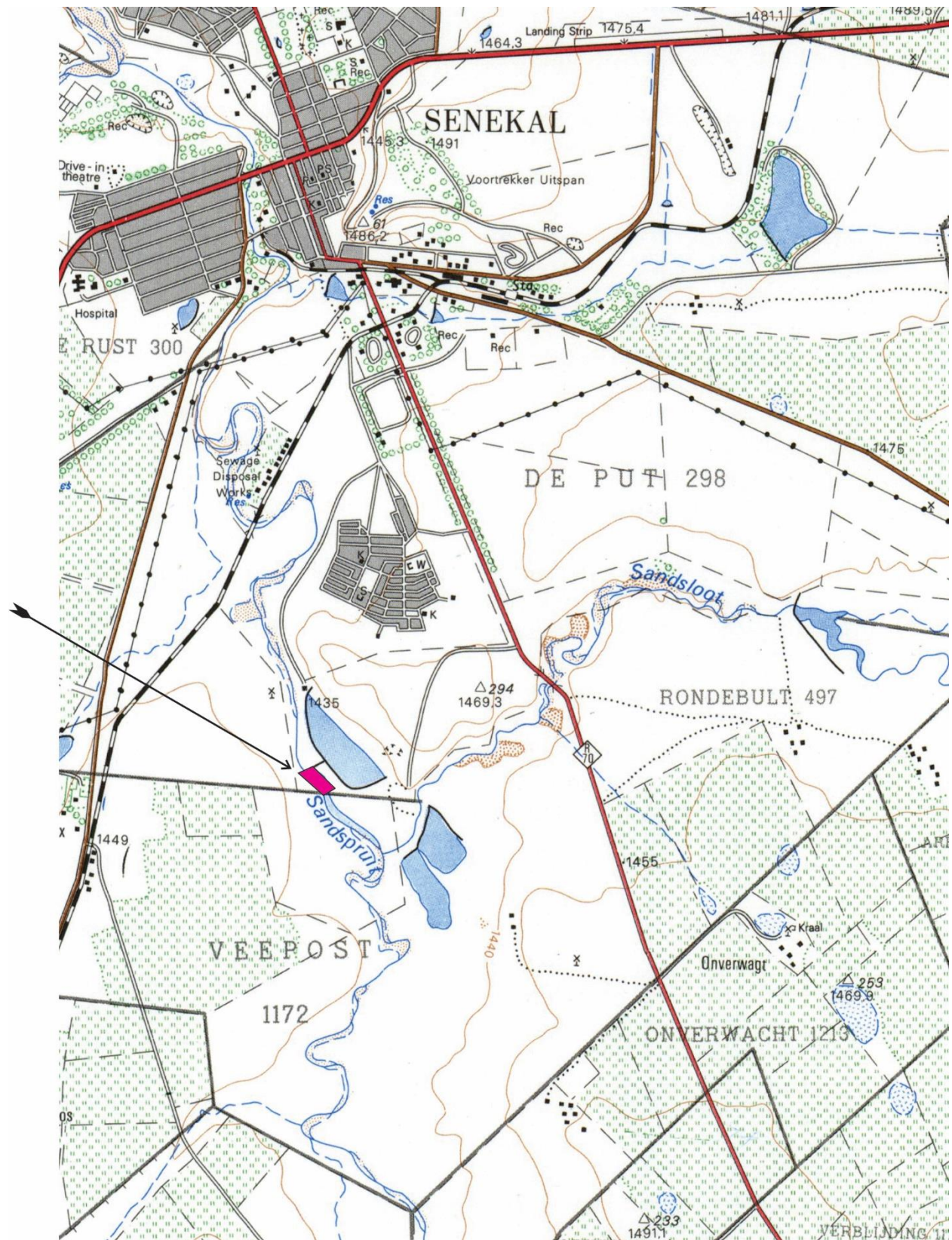


Figure 1. Map of the study area marked on portion of 1:50000 scale topographic map 2827 BC Senekal.

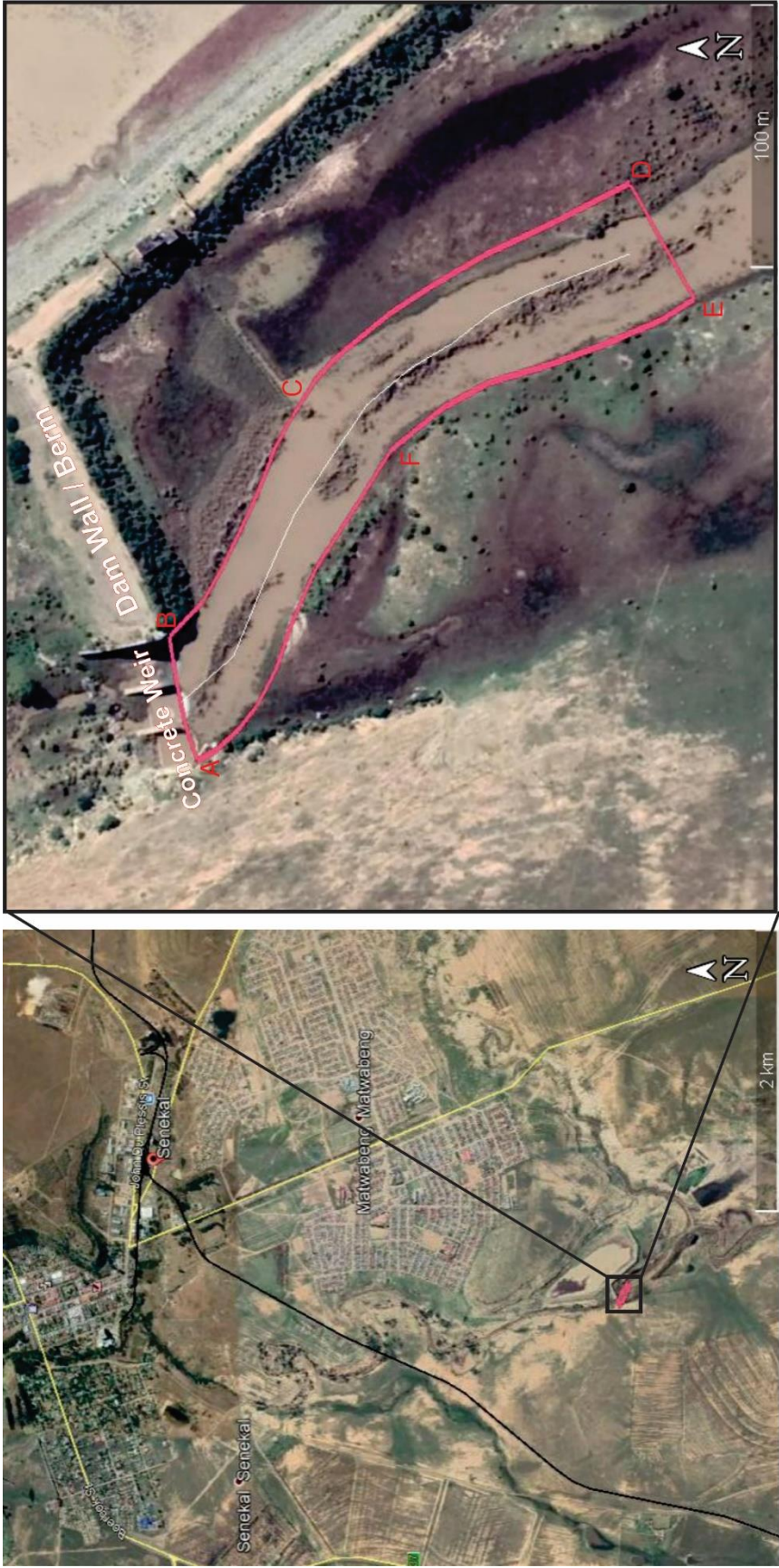
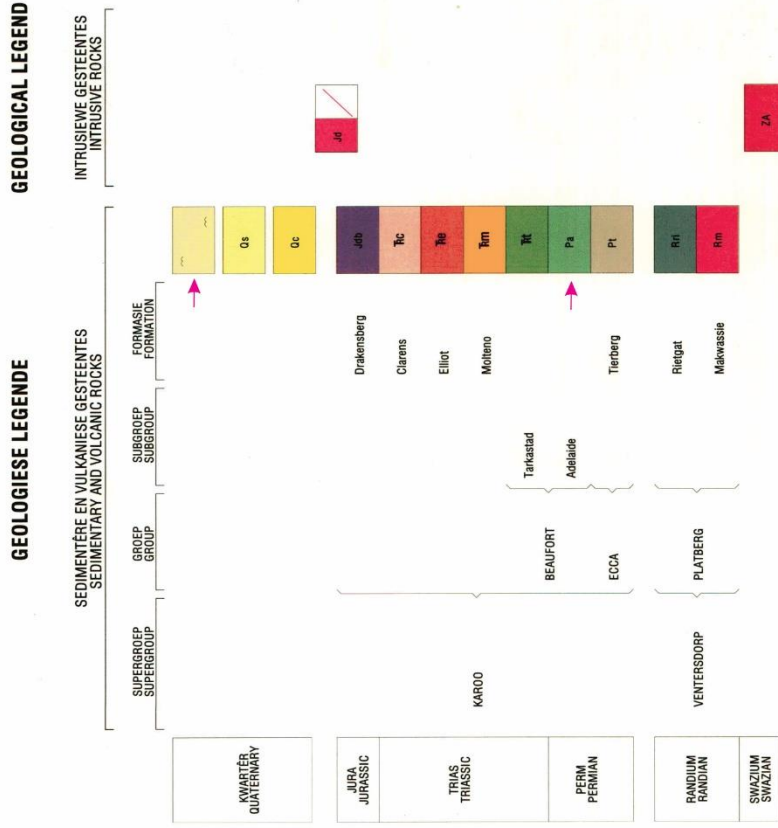
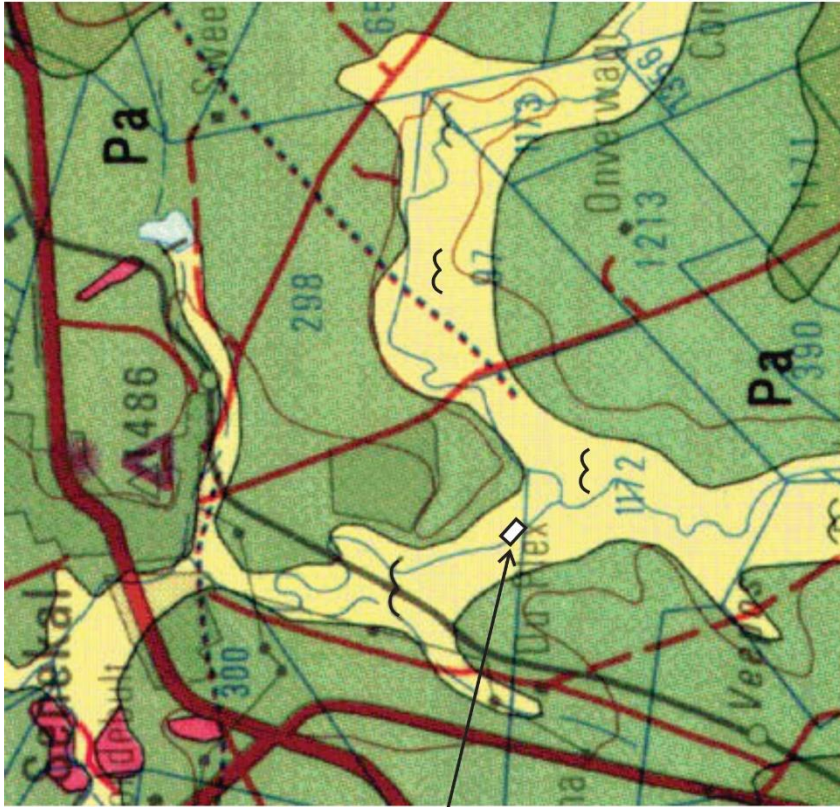


Figure 2. Aerial view of the study area.



Study area marked on portion of 1:250 000 scale geological map 2826 Winburg. The site lies within the outcrop area of the Permian Adelaide Subgroup (Pa, Beaufort Group, Karoo Supergroup) and is capped by fluvial / alluvial deposits of the Sandspruit (flying bird symbol).

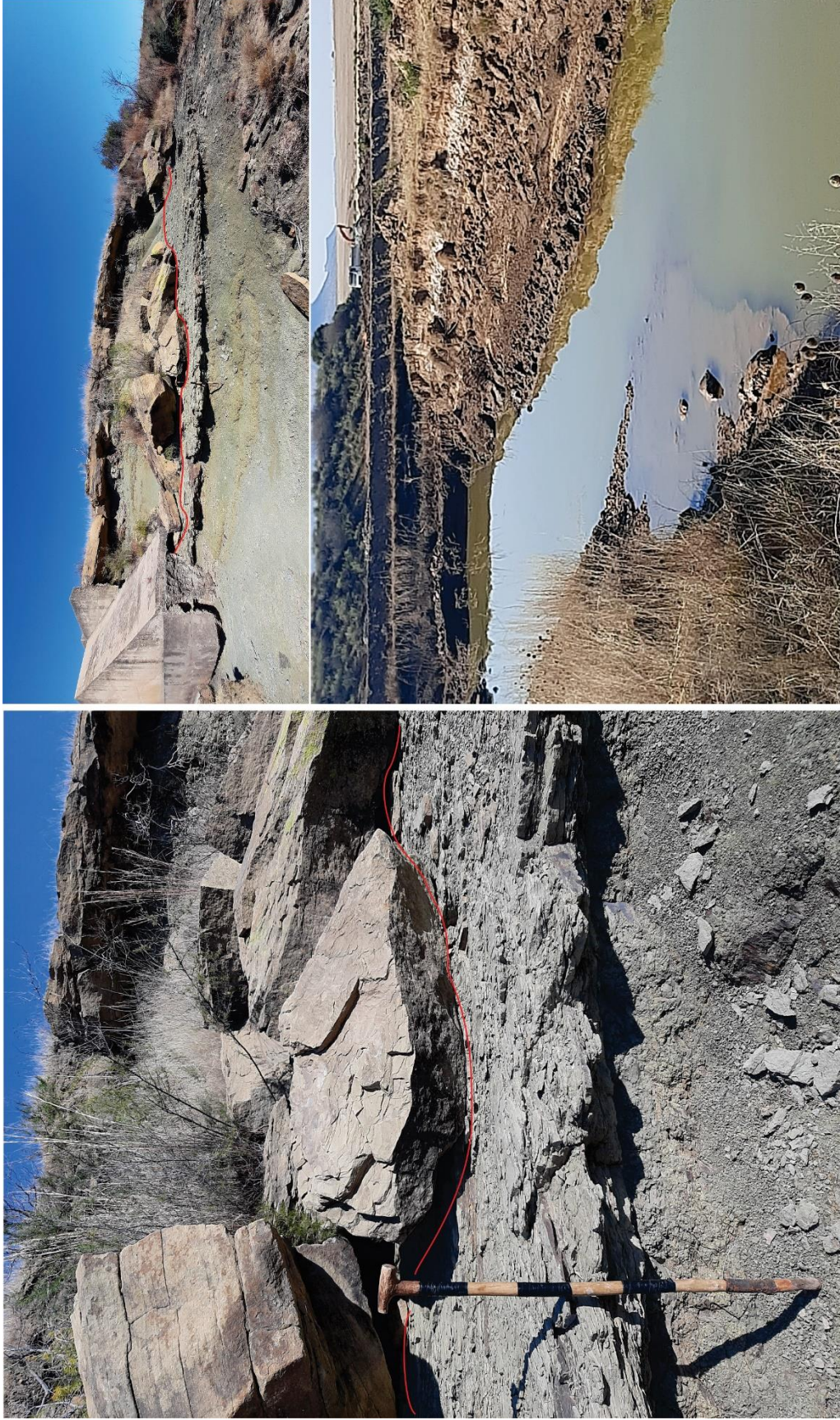


Figure 4. Adelaide Subgroup sandstones and mudstones exposed by river action (left and above right) and geologically recent overbank sediments (below right), located downstream and upstream from the weir, respectively. Scale 1 = 10 cm.

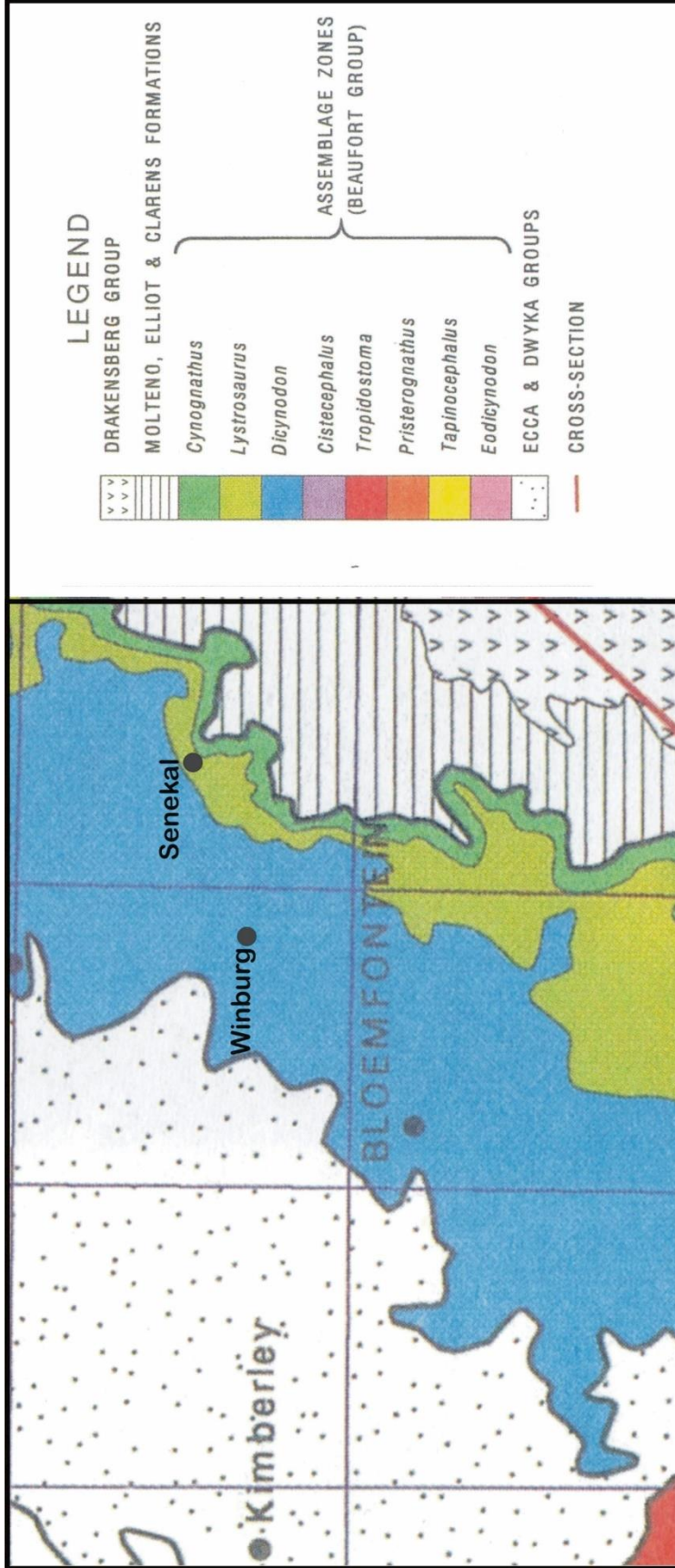


Figure 5. Geographic distribution of the vertebrate biozones (Assemblage Zones) of the Beaufort Group (after Rubidge 1995).

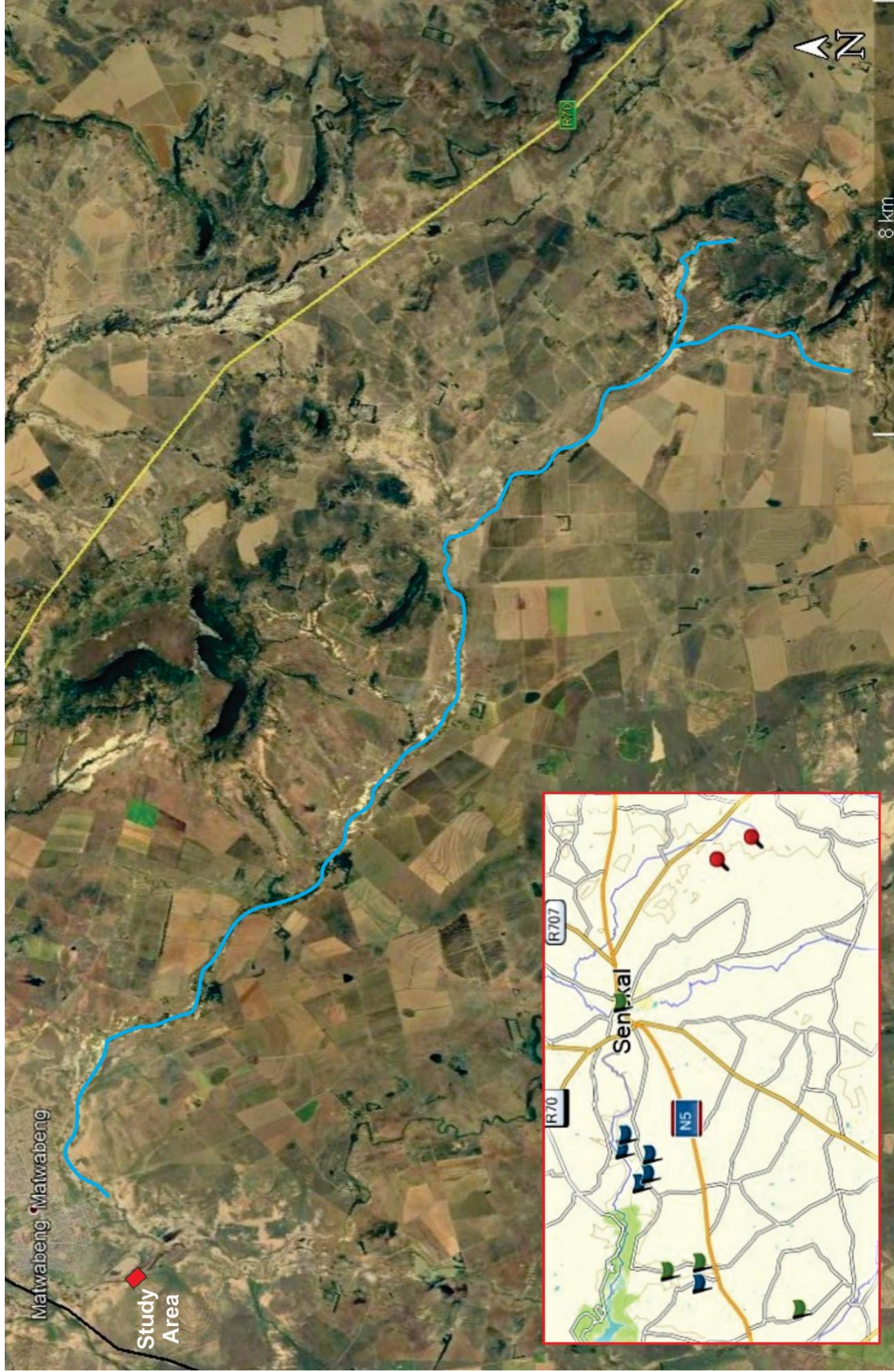


Figure Palaeontologically significant Sandspruit and map insert of Karoo vertebrate fossil sites (green flags) petrified wood localities (red flags) and late Quaternary fossil sites (red pins), mentioned in text.



Figure 7. Late Pleistocene (top) and Holocene (center & bottom) mammal fossils eroding from ancient, Sandspruit - associated overbank sediments.

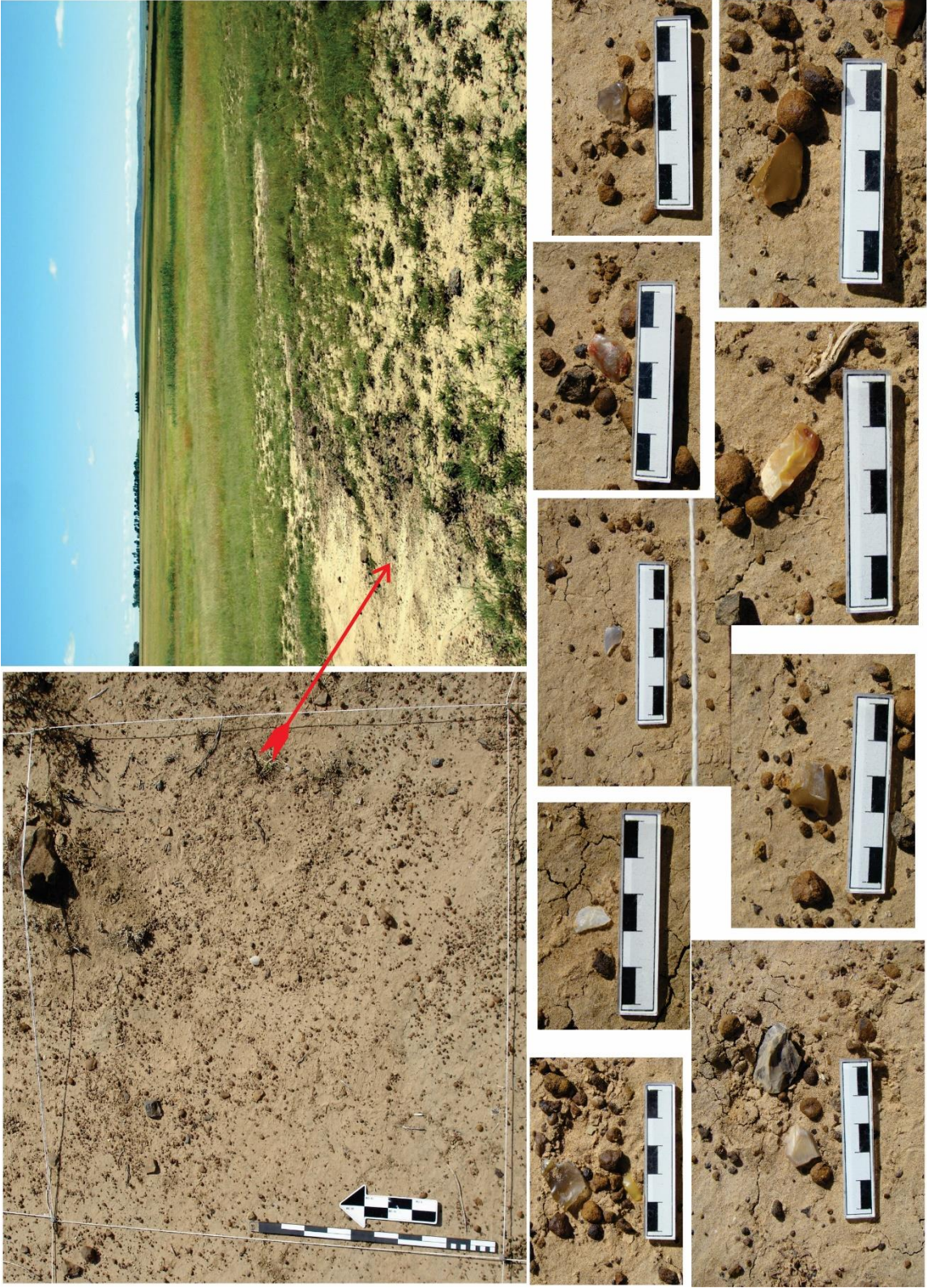


Figure 8. Later Stone Age open site located within overbank sediments of the Tom Schutte Spruit, about 8km south-west of Senekal on the N5 national road. Dense concentration of microliths made from cryptocrystalline quartz and petrified wood (*Dadoxylon*).



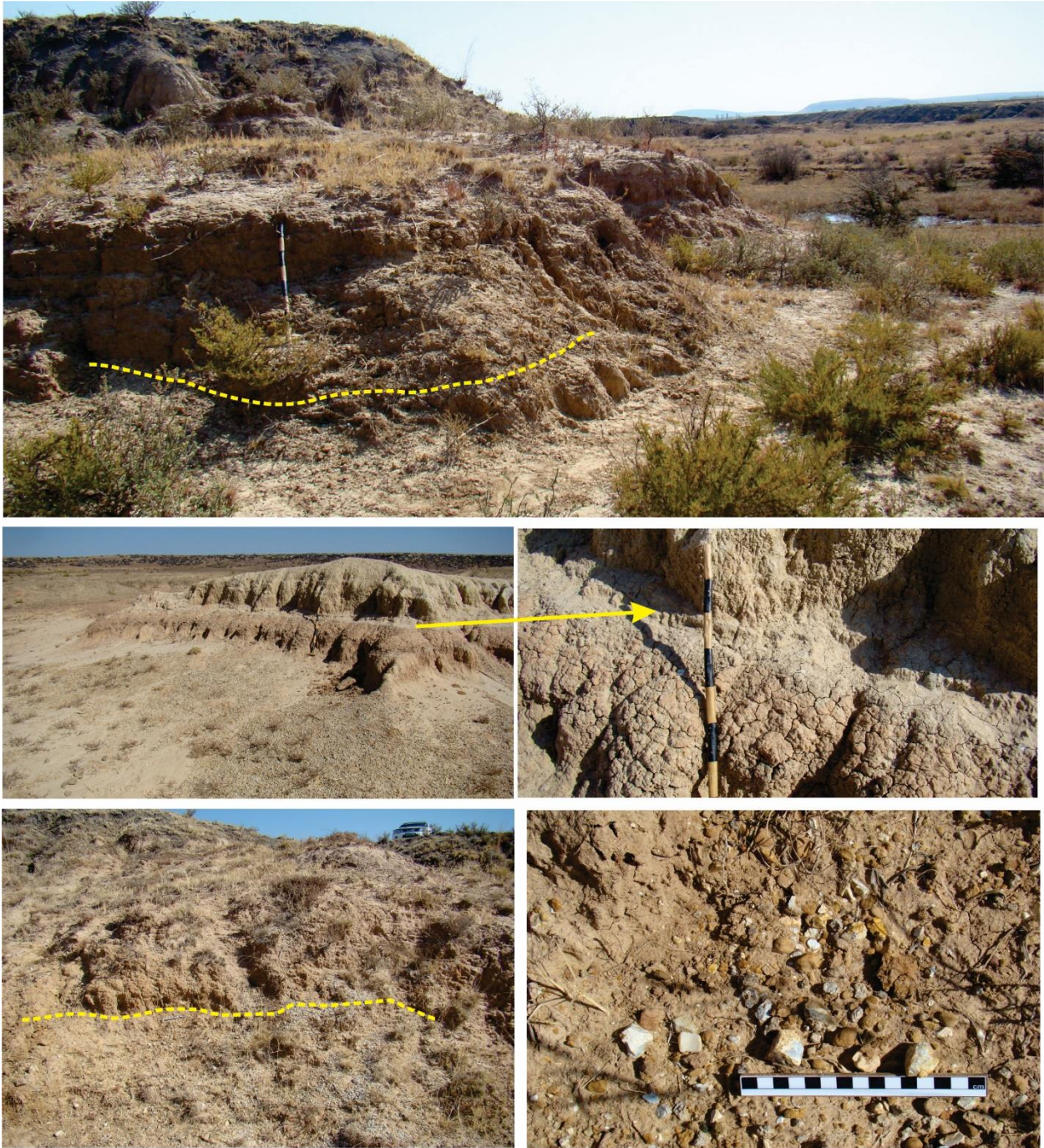


Figure 9. Partially intact Later Stone Age site on old palaeosurface, Sand River south of Paul Roux.

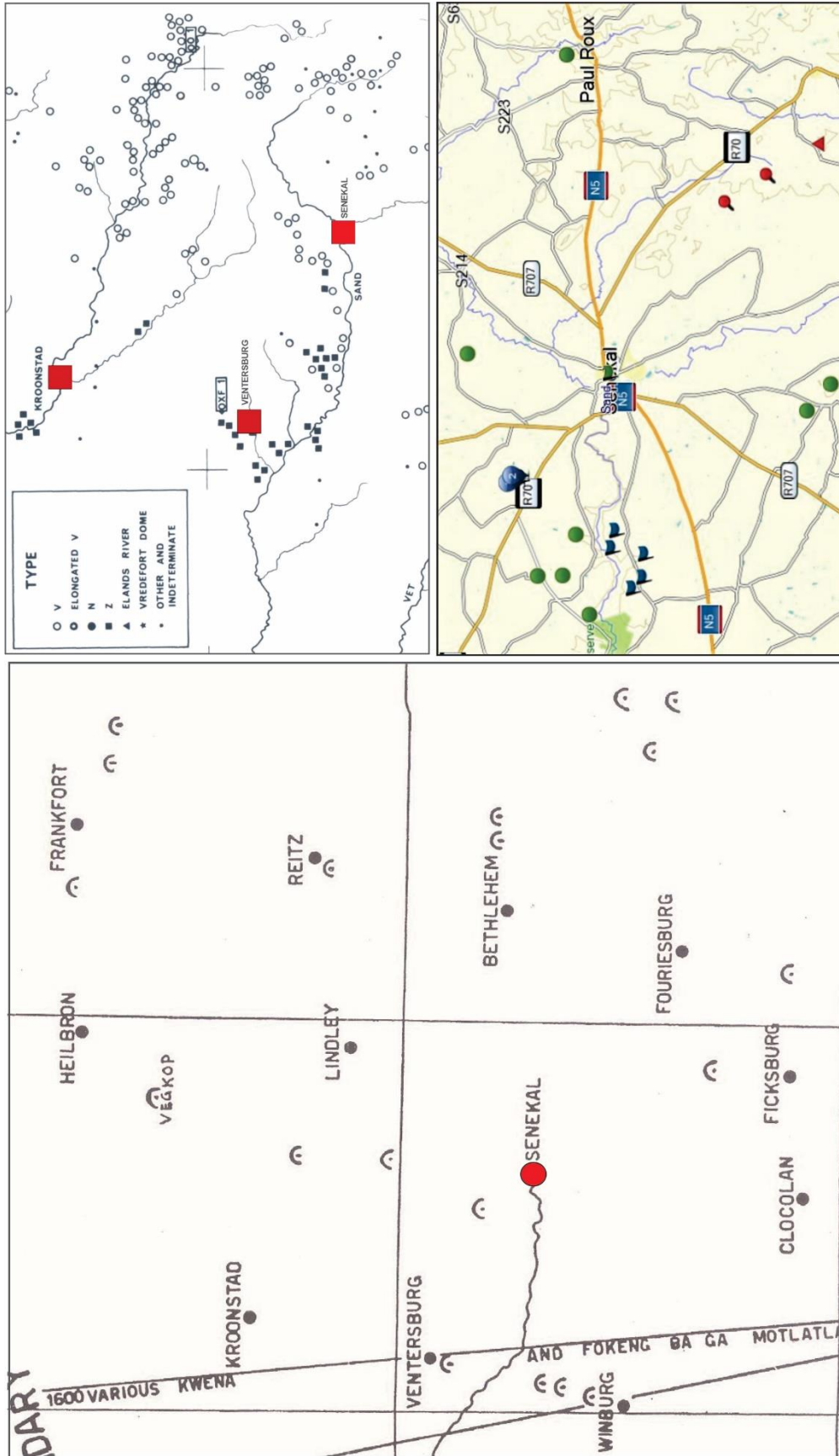


Figure 10. Distribution of Late Iron Age stonewalled settlements in the region after Breutz 1956 (left) and Maggs 1976 (above right). Position of previously recorded IA sites around Senekal indicated by green circles (below right).

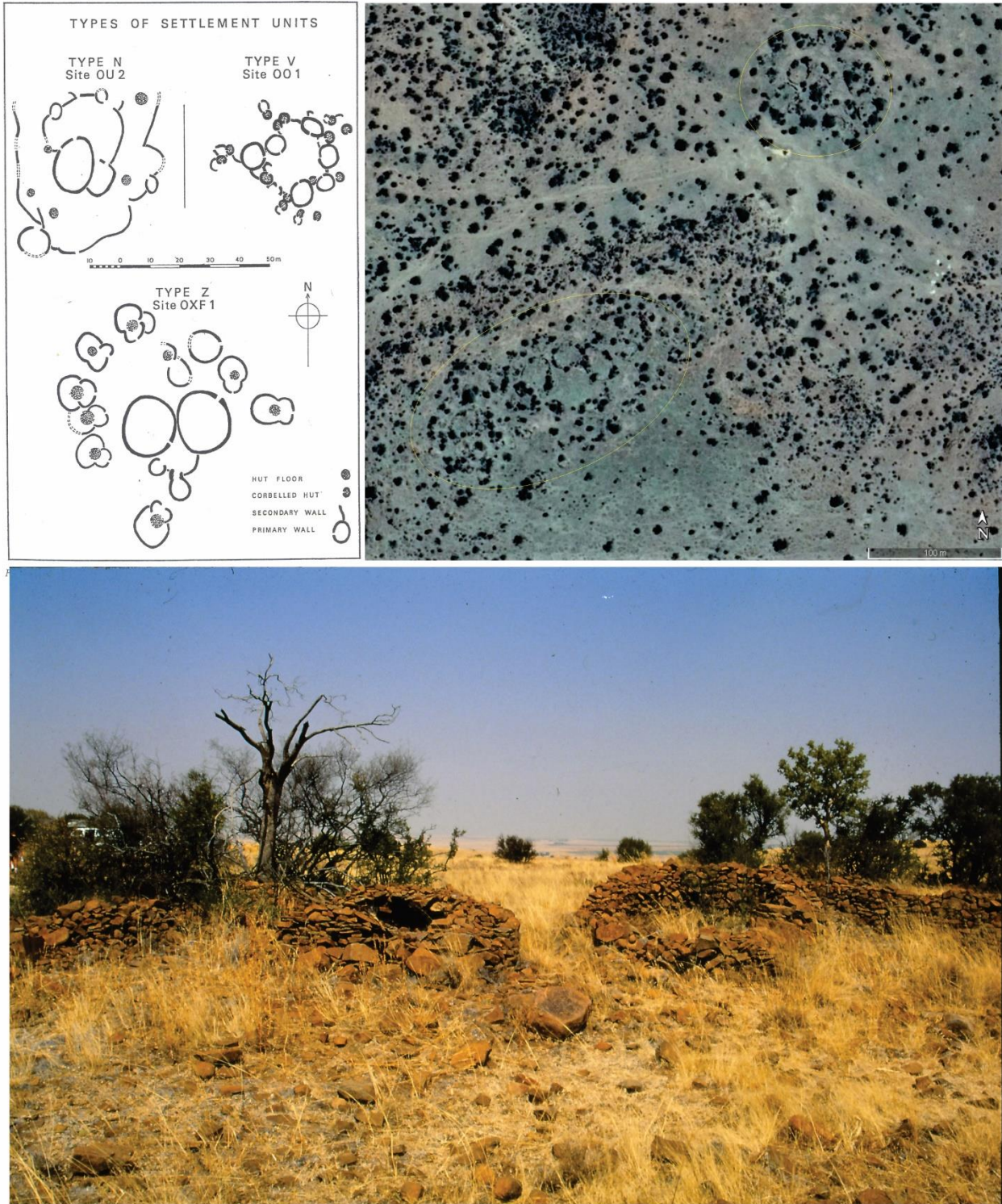


Figure 5. Late Iron Age settlement types from the region (above left) according to classification by Maggs (1976). Aerial and general view (above right & below) of bilobial dwellings located on high ground between Winburg and Senekal.



Figure 12. Erosional surfaces with signs of Iron Age occupation and localized concentrations of pottery and associated animal remains, near Paul Roux.

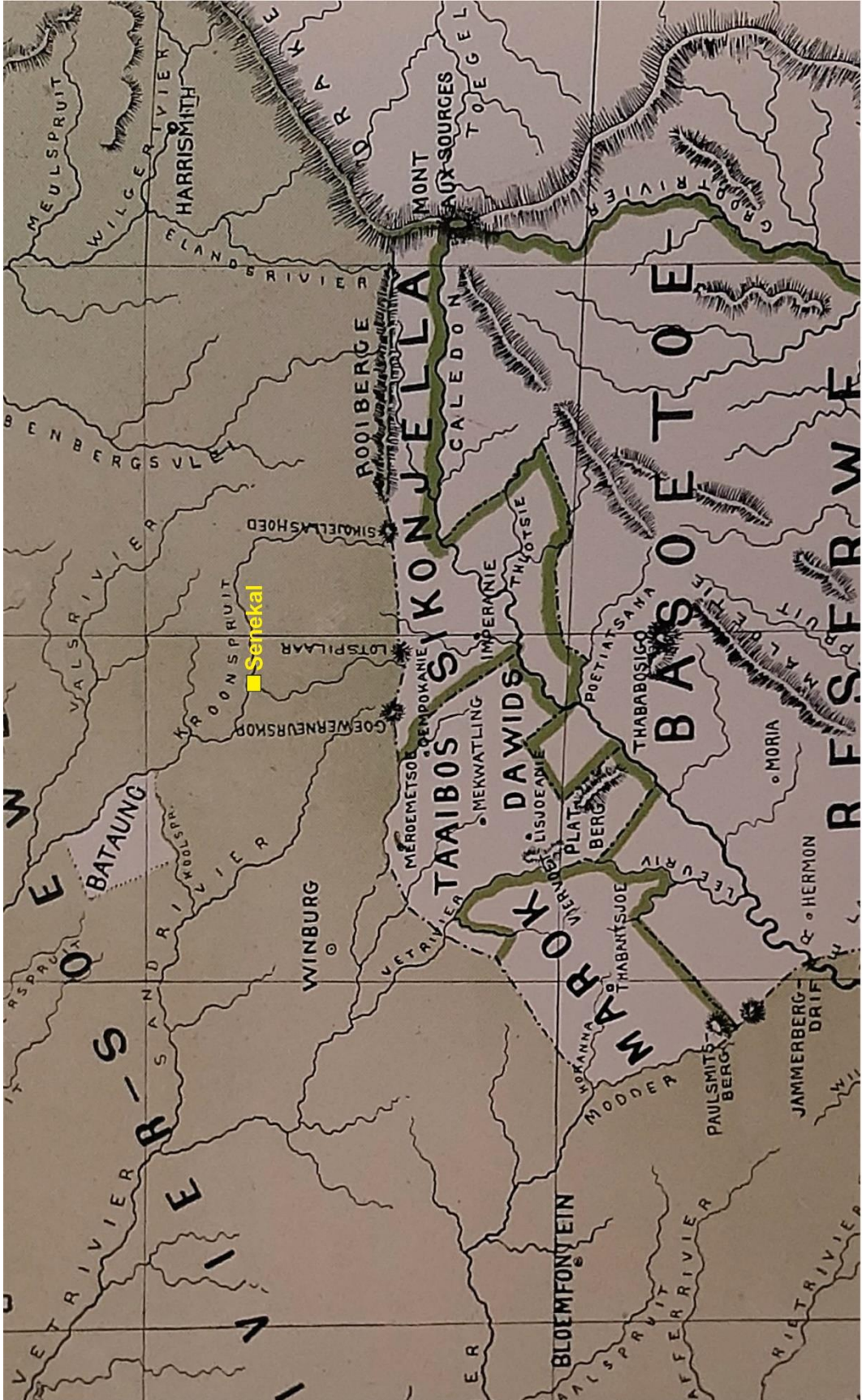


Figure 13. Map of Basuto territories east of the Orange River Sovereignty ca 1850.

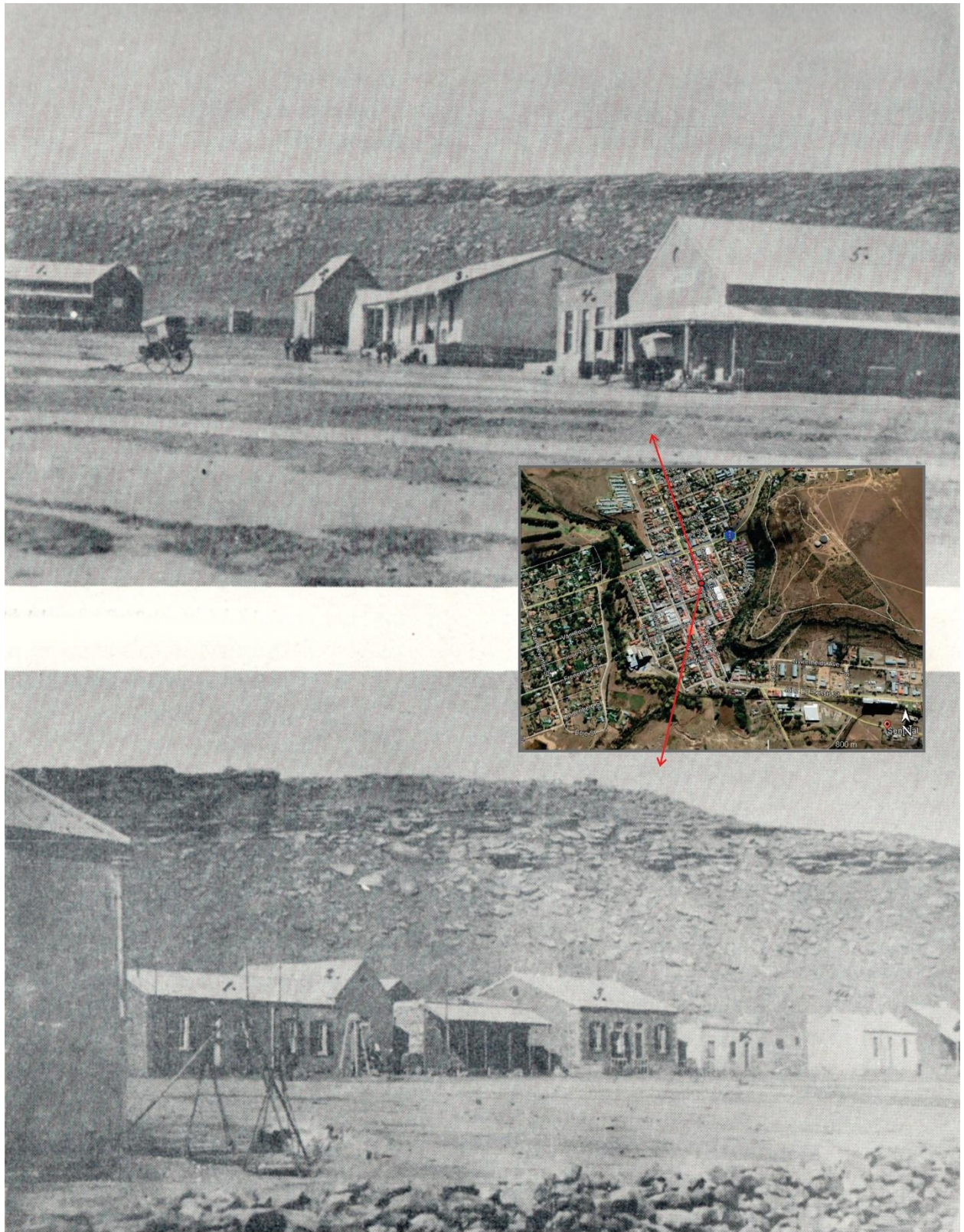


Figure 14. Corner of Van Riebeeck and Berg Street in Senekal ca. 1880's, looking northeast (above) and southeast (below).



Figure 15. Concrete weir at the northern boundary of the study area, looking west.

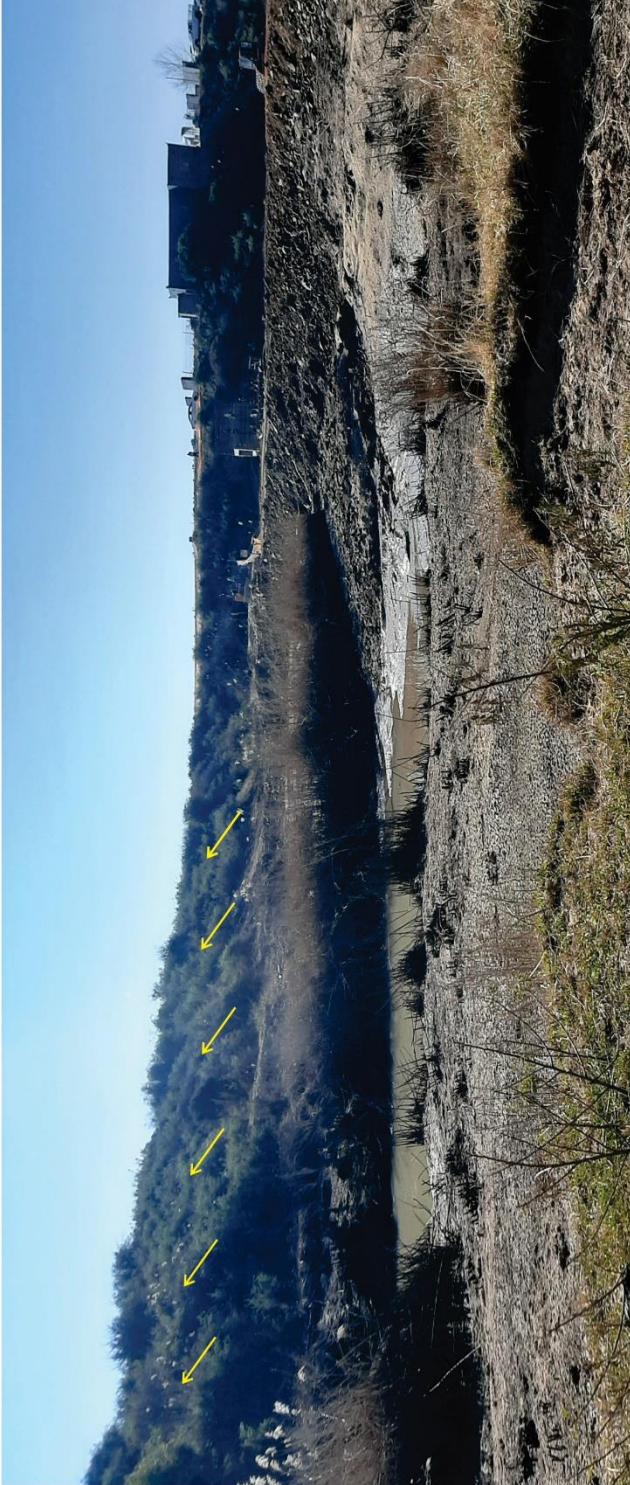


Figure 16. The concrete weir and an accompanying berm (below), looking west-southwest and east-northeast, respectively.



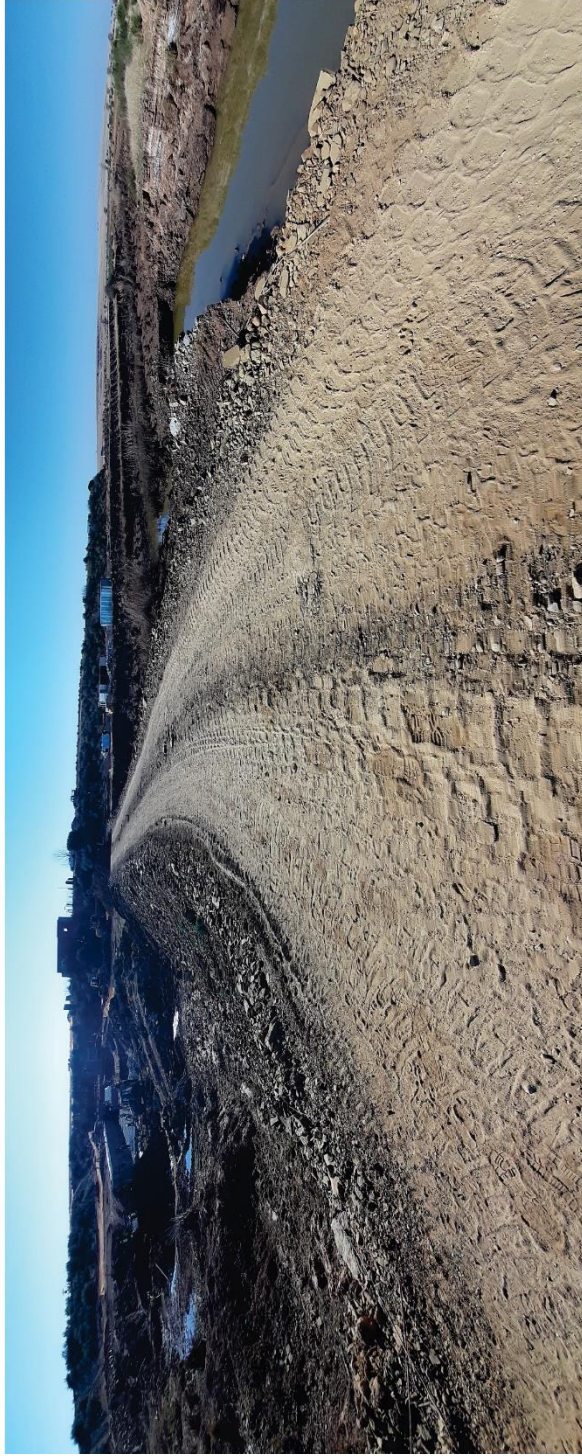


Figure 17. General view of the study area, looking northwest (above) and south (below).