M. SALT RIVER GORGE

Field Note M5. Tectonics

Overview

The De Hoop Vlei is contained in a shallow, elongated gorge, widely regarded as an erosional feature, i.e. it was cut by the Salt River, which is thought to have had an outlet to the sea.

The Salt River Gorge is a unique feature in the area. It comprises the northern extension (although not in the same direction) of the De Hoop Vlei Gorge (Figure 1) (See chapter N). It is the author's contention that tectonics played a role in the formation of the two gorges as well as several other features in the Study Area (see Chapter F).

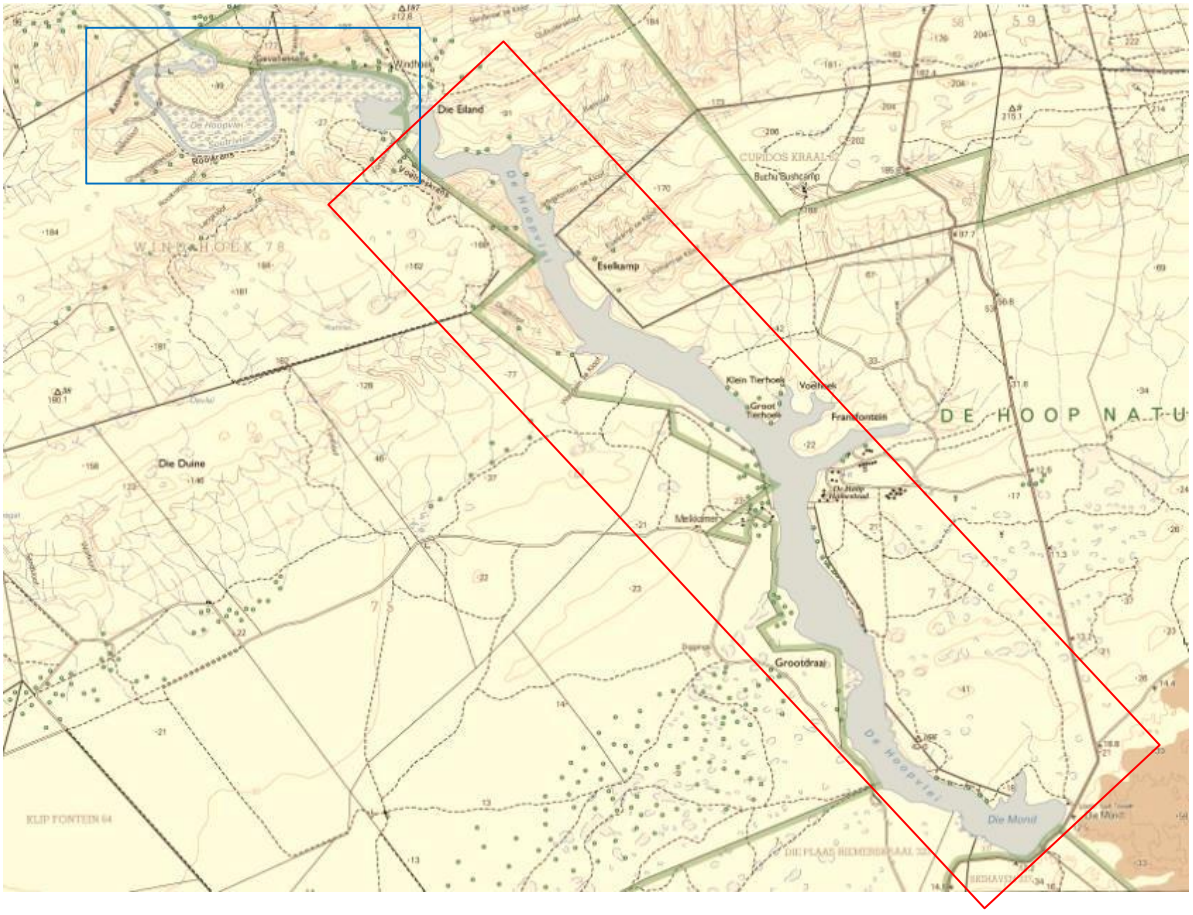

Figure 1. Topography map showing the two gorges: in the blue box - the Salt River Gorge; in the red box – the De Hoop Vlei Gorge.

The purpose of this Feld Note is to present evidence for possible tectonic activity in and around the Salt River Gorge.

Previous studies

The only information in the literature about tectonics in the vicinity of the gorge is a general geology map, where two major faults, trending SE-NW, indicate the estimated edges of the Enon Basin (Figures 2).

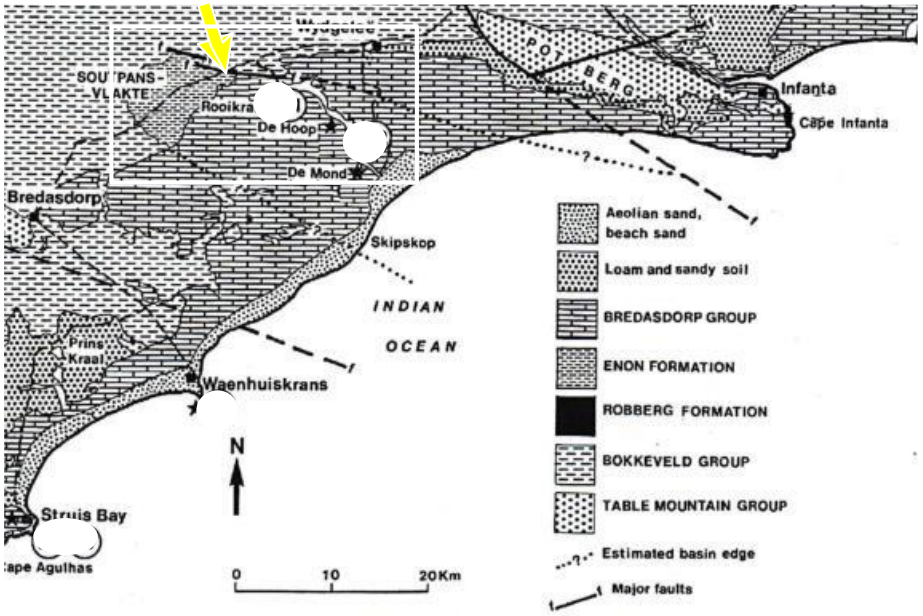

Figure 2. Simplified geological map of the area between Cape Agulhas and Cape Infanta. Yellow arrow points to faults. Yellow box enlarged in Figure 3.
(Source: J Malan and J Viljoen, 2016: Southern Cape Geology: Evolution of a Rifted Margin. 35th International Geological Congress, Cape Town. Field trip guide).

These faults (Figure 3) are not shown on the 1:50,000 field sheet (3420AD) of the 1984 geological mapping and not on the 1:250,000 Riversdale geology map. They could have been inferred as the inland extensions of faults mapped during offshore seismic surveys - information to which the author has no access. Whereas there is no knowledge of their reactivation after the deposition of the Bredasdorp Group formations, such tectonic activity could not be ruled out. See more on these faults in Field Note C6b.

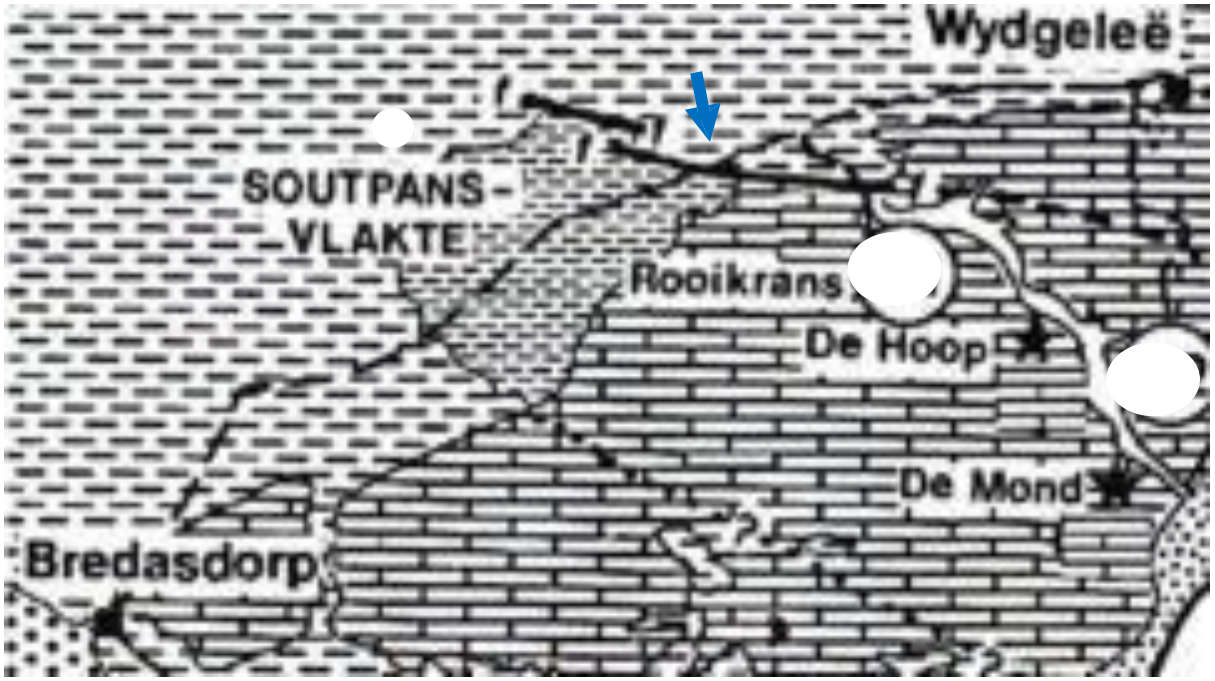

Figure 3. Enlargement of the box in Figure 2. Blue arrow points to faults.

Faults on the south side of the Salt River Gorge

The main possible faults identified close to the Salt River Gorge (Figure 4) are described below from north to south.

Figure 4. Satellite image of the area west of the Salt River Gorge, showing approximate locations of possible sub-parallel fault or fracture zones: white – Koleskloof North Wall Fault; ochre - Koleskloof South Wall Fault; blue – Patryze Fault; green – Langkloof Fault; yellow – Dolines Fault.

The Koleskloof Faults

Tilted huge blocks of the Wankoe Formation are situated at the top of the southwest corner of Koleskloof (Figures 5 and 6) and a dislodged block is located at the bottom of the north wall (Figure 7). Tilted small blocks are situated in the southwest corner (Figure 8), and fault scarps (or dislodged blocks), can be seen on the south wall (Figures 9 and 10). It is suggested that these are fault zones.

It is unclear whether the Gevallekrans, on the opposite side of the Gorge, is part of this fault zone (Figure 11). It is possible, though, that the fault mentioned by J Malan and J Viljoen is a blind fault, which has no surface expression, and what we see are other faults. Faulting or tilting is possible at the Gevallekrans cliffs (Figure 12).

Another question is whether the Patryze Fault (dashed blue line in Figure 4 above) is a continuation of the same feature.

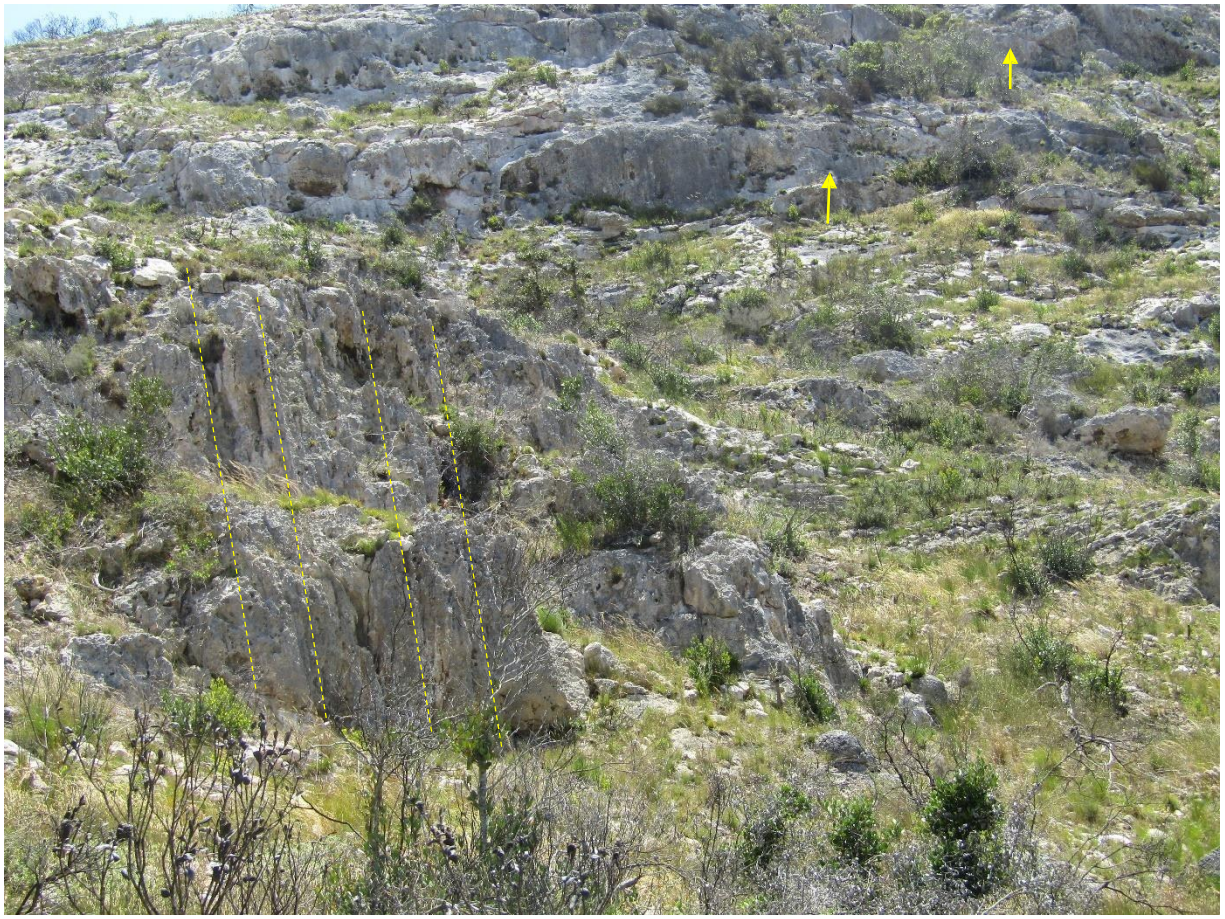

Figure 5. Huge blocks of the Wankoe Formation, at the southwest corner of Koleskloof, are tilted at nearly 90 degrees off the horizontal. Dashed lines indicate the depositional bedding plains. Arrows point to vertical scarps, possibly fault scarps (also see Figure 6). View to the north.

Figure 6. Several, low fault scarps (arrows) form the upper part of the north wall of Koleskloof. View to the north.

Figure 7. Block which probably slid from the upper part of the north wall, may indicate tectonic movement along that wall.

Figure 8. Tilted small blocks in the south-east corner of Koleskloof may constitute evidence of tectonic movement on the south wall.

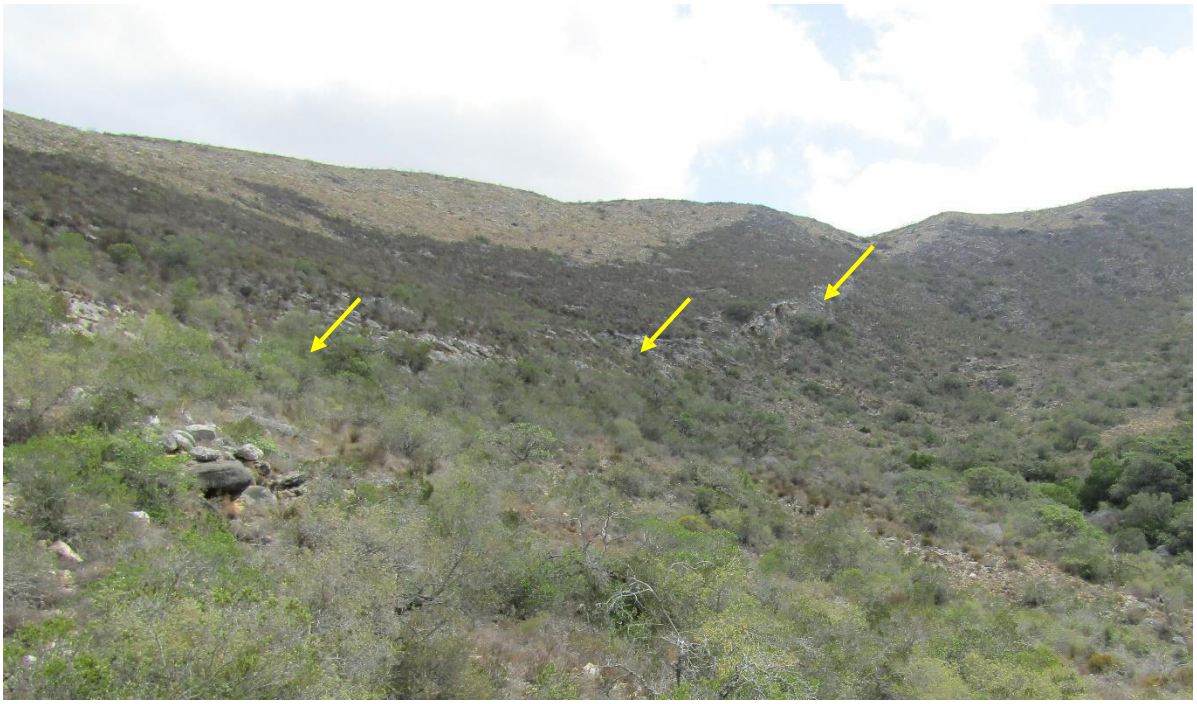

Figure 9. Fault scarps or dislodged blocks (arrows) on the south wall of Koleskloof may be indicative of vertical movements.

Figure 10. Fault scarp on the south wall of Koleskloof.

Figure 11. The north wall of Koleskloof (yellow arrow) and Gevallekrans (white arrow) appear to be situated along the same line (white dashed line).

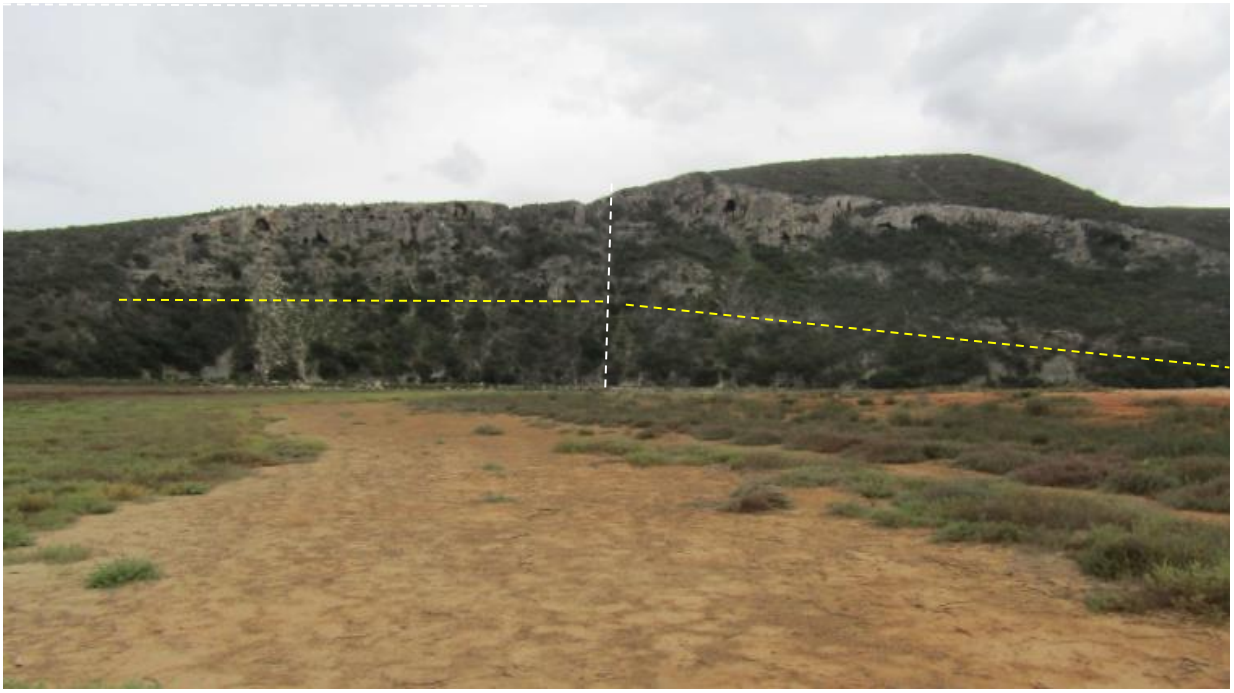

Figure 12. The Gevallekrans. The dashed yellow line is the base of the De Hoop Vlei Formation (overlying the shales of the Bokkeveld Voorstehoek Formation); from the vertical dashed white line this base is tilted to the right (and disappears in the Windhoek Farm area.

Faults east of Koleskloof

Whereas the De Hoop Vlei Formation is sloping gently to the south-west (see Field Note M3), the differences in elevation above sealevel of this formation south of the gorge may also indicate that east-west faults are present south of the gorge. The De Hoop Formation elevation at Aasvoëlkrans is 55 m (Figure 13), at Rooikrans (Figure 14) it is 36 m and at Voëlkrans (Figure 15) it is 22 m above sealevel. The locations of these faults, which resulted in the different elevations of the De Hoop Vlei Formation, are unknown at this stage of the study.

Figure 13. The Aasvoëlkrans, at the west end of the gorge. The dashed yellow line is the base of the De Hoop Vlei Formation (overlying the Voorstehoek Formation), at 55 m above sealevel.

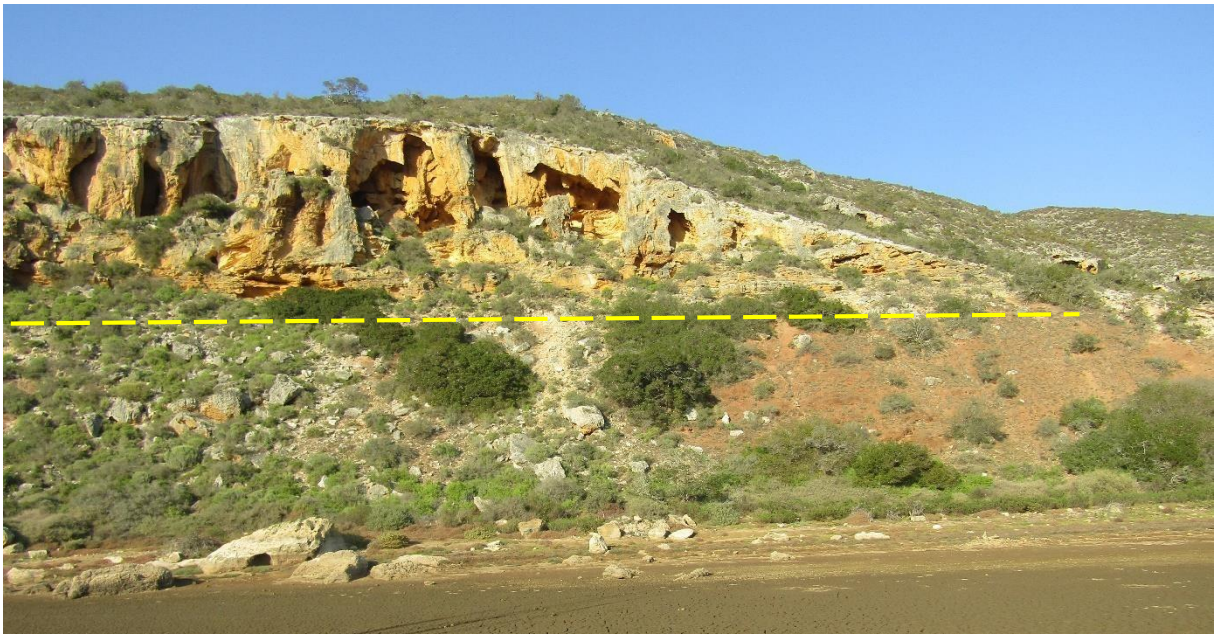

Figure 14. The Rooikrans, east of Koleskloof. The dashed yellow line is the base of the De Hoop Vlei Formation (overlying the Enon Formation), at 36 m above sealevel.

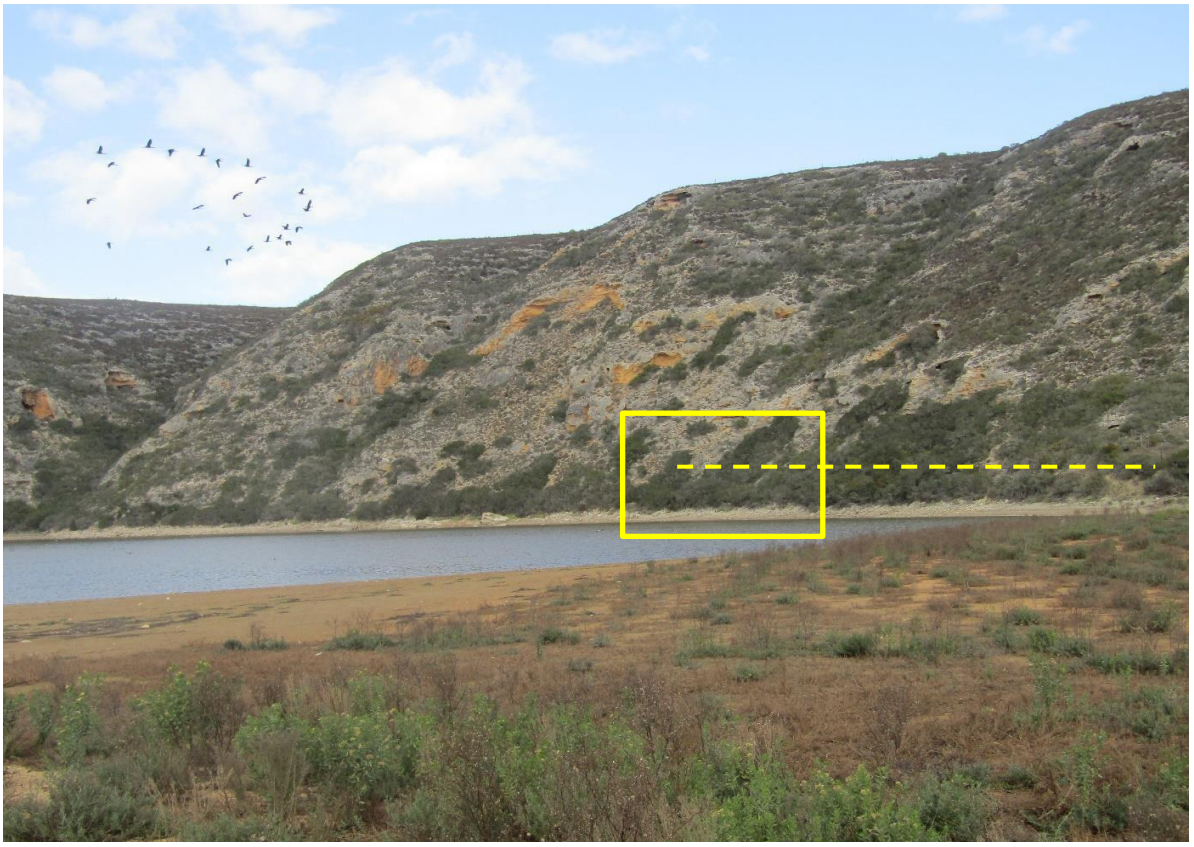

Figure 15. The Voëlkrans, at the east end of the gorge. The dashed yellow line is the base of the De Hoop Vlei Formation (overlying the Voorstehoek Formation), at 22 m above sealevel.

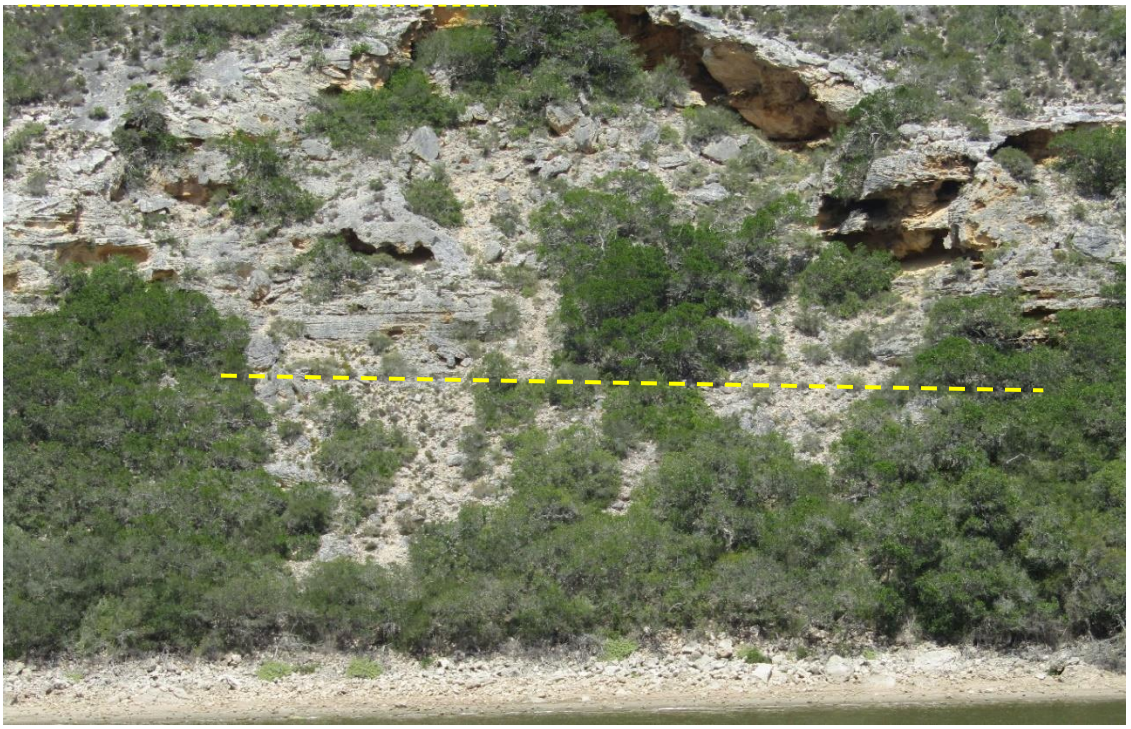

Figure 16. Enlargement of the box in Figure 15.

See Chapter E from more on faults east of Koleskloof.

