

D. DURICRUSTS

Field Note D4a4. Pedogenic silcretes – D. Multi-habit hilltops



Hilltop silcrete.

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Field Note D4a4. Pedogenic silcretes – G. Multi-habit hilltops

[For familiarity with silcrete habits, see Field Note on hill cap habits and the field guide ‘Silcretised landscape morphology’ in this chapter]. Whereas silcrete hill caps most commonly consist of one, two or three different habits (appearances) of silcrete, four hill caps in the Study Area exhibit multiple habits (and textures). These hills are: Frederick’s Rise (name given by the author) on Frederickskraal Farm; Hill 187, ~1.5 km to the west, on Louwyn Farm, Hill 268 (Seweneskop), on Muurkraal Farm and Hill 222, on Steynkop Farm, in between the above hills (Figure 1).



Figure 1. Satellite image of part of the Study Area, showing the locations of the multi-habit silcrete rise top and hilltops.

Frederick's Rise (on Frederickskraal Farm)

Frederick's Rise is a low relief hill with very moderate slopes in all directions (Figures 2 and 3).



Figure 2. Topography map (1:10,000) of Frederick's Rise (yellow arrow), where nearly thirty different silcrete habits and habit variations are present. Yellow box indicates the area enlarged in Figures 3 and 4.



Figure 3. Satellite image of Frederick Rise.

At least 30 different silcrete habits/textures variations are present on Frederick Rise, some of which are partially covered with heaps of silcrete and ferricrete stones and boulders, dumped there by farmers (Figure 3). For ease of reference, the habits/textures were given identity numbers with the letter F. It is possible that more habits are present, but they are covered by the stone heaps. Two additional habits are present 400 m to the south and 1400 m to the west. See field note on hill cap habits in this chapter for detailed habit definitions. For silcrete textures – see field note on textures in this chapter.

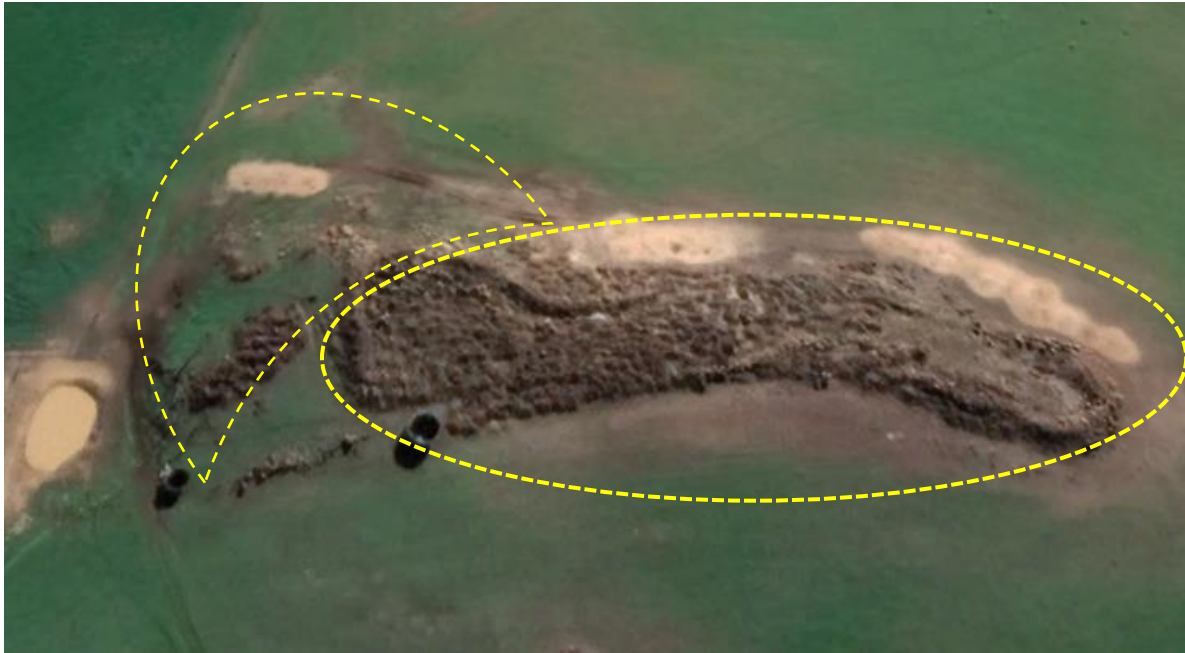


Figure 3. Satellite images of Frederick's Rise, where many heaps of stones and boulders, collected from the rise and dumped by farmers, are present. Top – the yellow box is enlarged in the bottom image. Bottom – the dashed 'half-moon' (~100 m long) indicates the area, in which at least sixteen different silcrete habits are present; the dashed ellipse indicates the area on which stones and boulders were dumped (the yellow heaps are hay for the sheep).

During decades of cultivation of the rise and its slopes, many stones and boulders were heaped on it (Figure 4).



Figure 4. Heaps of stones and boulders, collected from the rise's slopes and dumped here by farmers.

The following figures present the various habits on Frederick's Rise, not in any particular order.

Four habits are shown below (Figure 5).



Figure 5. Bulky silcrete (F1, F2) and platy silcrete (F3) over conglomeratic silcrete (F4). The dashed line points to the contact between the two latter habits.

Three patches of other habits are shown below (Figure 6).



Figure 6. Three different silcrete habits (F5, F6 and F7).

There are at least two types of pillowy (low relief) silcrete (Figure 7).



Figure 7. Two types (F8 and F9) of pillowy silcrete.

There are at least two types of cushiony (high relief) silcrete (Figure 8).



Figure 8. Two types (F10 and F11) of cushiony silcrete. The F11 cushions heavily ferruginised and probably manganised.

There are three types of platy silcrete (other than the F3 type shown above) (Figure 9).



Figure 9. Three types (F12, F13 and F14) of platy silcrete.

Some silcrete lenses, small and large, are present (Figure 10).



Figure 10. Silcrete lenses (F15). Top – a small, thin lens (F15a). Bottom – large, thick lenses (F15b).

Shapeless silcertes are also present on the northern slope of the rise (Figure 11).



Figure 11. Top and bottom - shapeless silcerte (F16).

A different cushiony habit (heavily ferruginised and probably manganised) is present 400 m south of Hill 171 (Figure 12).



Figure 12. Three different appearances of Ferruginised and probably manganised silcrete cushions, at the south end of Frederick's Rise. This type is quite different to the cushion habit F11 (see Figure 8).

Silcrete boulders were dug out on and around Frederick's Rise (Figures 13 and 14).



Figure 12. Two different appearances of conglomeratic silcrete boulders, which were dug out of the ground.



Figure 13. Two different appearances of massive silcrete boulders, which were dug out of the ground. (The silcrete cubes at the bottom photo are located 1400 m west of Frederick's Rise).

The heaps on the rise, dumped there by farmers, contain myriads of silcrete (and ferricrete) stones, of various textures and colours (Figure 14).



F 20



F 20



F 20

Figure 14. Some of the many different appearances of silcrete and ferricrete stones on Frederick's Rise.

Hill 187 (on Louwyn Farm)

Hill 187 is located south of Frederickskraal Farm, ~1.5 km SW of Hill 171. Its slopes are steeper than those of Hill 171 (Figures 13 and 14).



Figure 13. Topography map (1:10,000) of Hill 187 (yellow arrow) and it west extension (183).



Figure 14. Satellite image of Hill 187 and its west extension (183). The distance between the peaks is ~300 m.

At least ten different silcrete habits/textures are present on Hill 187, some of which are partially covered with heaps of stones. For ease of reference, the habits were given identity numbers with the letter L. Whereas most habits on Hill 171 were fine grained (massive), most silcretes on Hill 187 contain conglomerate and breccia.

There are cubical and pillowy habits (Figure 15).



Figure 15. Cubical (L1, top) and pillowy (L2, bottom) silcrete on Hill 187.

Conglomerated silcrete lenses are present (Figure 16).



Figure 16. Conglomerated silcrete lenses (L3) on Hill 187. Yellow box in the top photo is enlarged in the bottom photo.

Brecciated silcrete lenses are also present (Figure 17).



Figure 17. Brecciated silcrete lenses (L4) on Hill 187. Yellow box in the top photo is enlarged in the bottom photo.

Chunks of disintegrated brecciated silcrete slab are present (Figure 18).



Figure 18. Brecciated (quartz rich) silcrete slabs (L5) on Hill 187. Yellow box in the top photo is enlarged in the bottom photo.

Silcrete cushions are present (Figure 19).



Figure 19. Black silcrete cushions (L6) on Hill 187.

A few metres away, conglomeratic and brecciated cushions are present (Figure 20).



Figure 20. Dark-brown conglomerated and brecciated silcrete cushions (L7) on Hill 187. Both the L6 and L7 silcrete cushions are quite different from the silcrete cushions on Hill 171 (Figure 8).

Lenticular silcrete is present, in three different textures (Figure 21).



Figure 21. Silcrete lenses (L8) on Hill 187.

Platy silcrete is present with at least two different textures (Figure 22).



Figure 22. Platy silcretes (L9) on Hill 187.

Hill 268 (Sewenskop, on Muurkraal Farm)

Sewenskop is a silcrete-capped hill, measuring ~270 m from north to south (Figures 23 and 24). A clay mine is located on the eastern slope of the hill. There are at least ten different silcrete habits on this hill. For ease of reference, the habits were given identity numbers with the letter S. Also see “Silcretised landscape morphology – A field guide” in this Chapter).

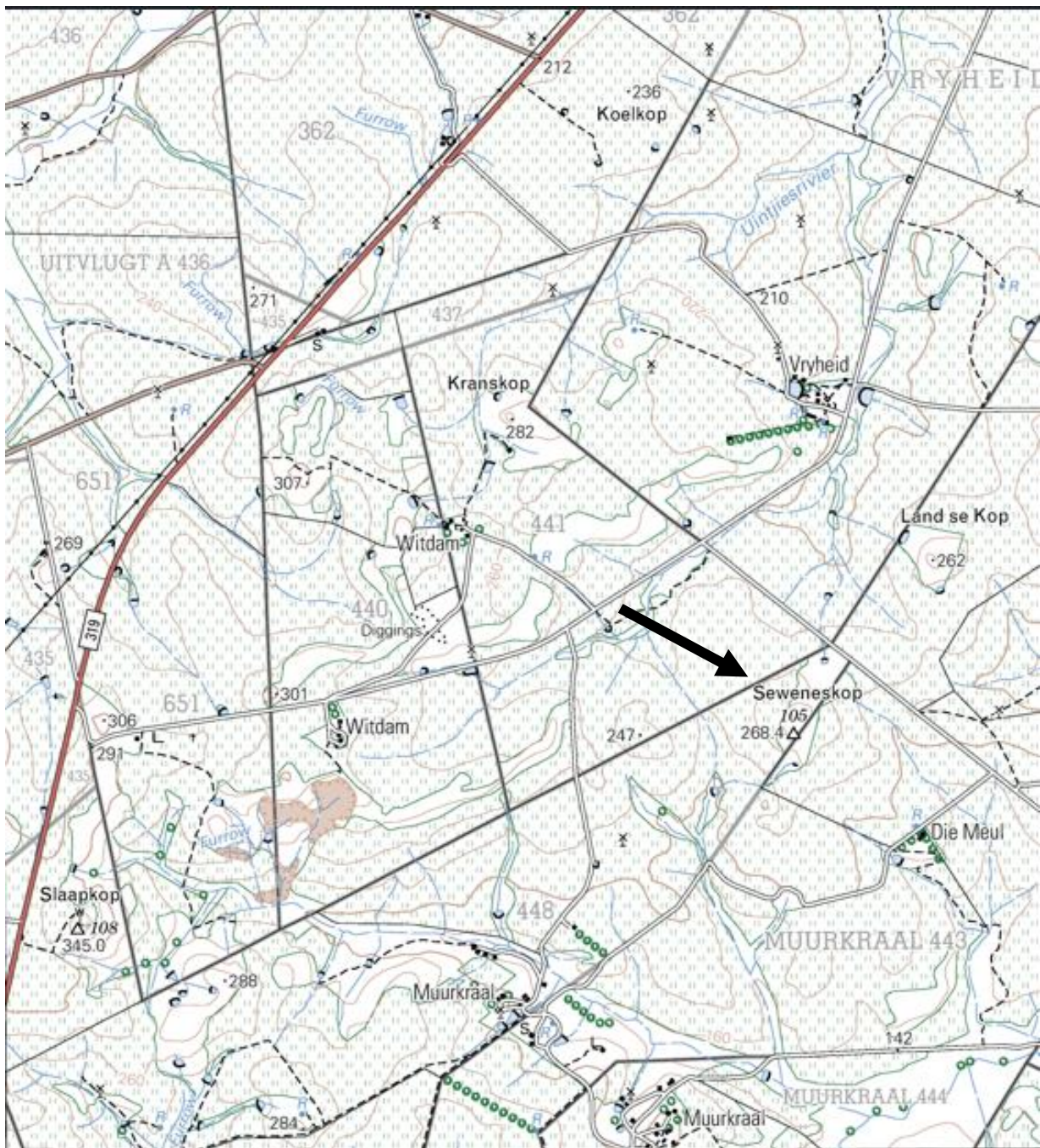


Figure 23. Topography map showing the location of Sewenskop (arrow).



Figure 24. Seweneskop. Top – satellite image. Bottom – view from the southwest. Yellow arrow points to a heavily ferruginised, silicified protrusion of shales.

Columnar and cubical silcrete habits are present (Figure 24).



Figure 24. Top – silcrete columns (S1). Bottom – silcrete cubes (S2).

Stacks and irregular habits are also present (Figure 25).



Figure 25. Top – silcrete stacks (S3). Bottom – irregular silcret (S4).

Platy silcrete is also present (Figure 26).



Figure 26. Two varieties of platy silcrete (S5).

Layered silcretes are present over massive silcrete at the top of a weathering profile (Figure 27).



Figure 27. Two different varieties of layered silcrete (S6) overlying massive silcrete.

Cushions are also present (Figure 28).



**Figure 28. Top – loose silcrete cushions (8a). Bottom – a ‘retaining wall’ of silcrete cushions (S8b).
These cushions have very few similarities to other silcrete cushions mentioned above.**

Conglomeratic silcrete (Figure 29) is located at the southern end of the hill, and a ferruginised silcrete bulge (Figure 30) is located on the western slope, below the hilltop.



Figure 29. Conglomerated silcrete (S9).



Figure 30. Heavily ferruginised silcrete bulge (S10) on the western slope of the hill. [This is one of several hillslope silcrete features in the Study Area (see Field Note 'Hillslope castles, bulges and pinnacles' in this chapter)].

Hill 222 (Steynkop Farm)

Hill 222 is the eastern peak of what appears to be a north-east trending, triple-crested ridge (Figures 31 to 33).

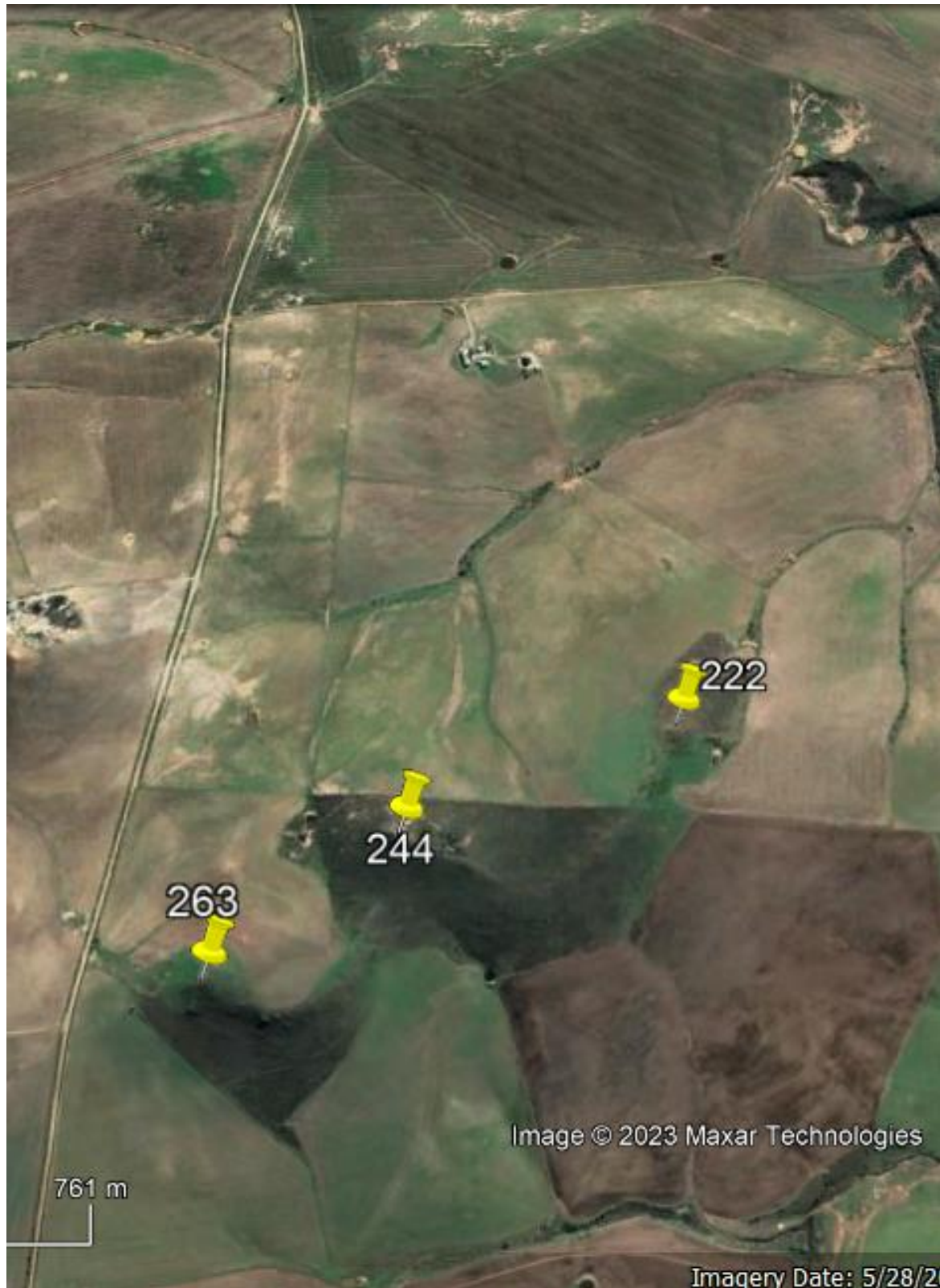


Figure 31. Satellite image: Hill 222 is the north-east peak of the ridge east of the road from Ouplaas to Swellendam on Steynkop Farm.

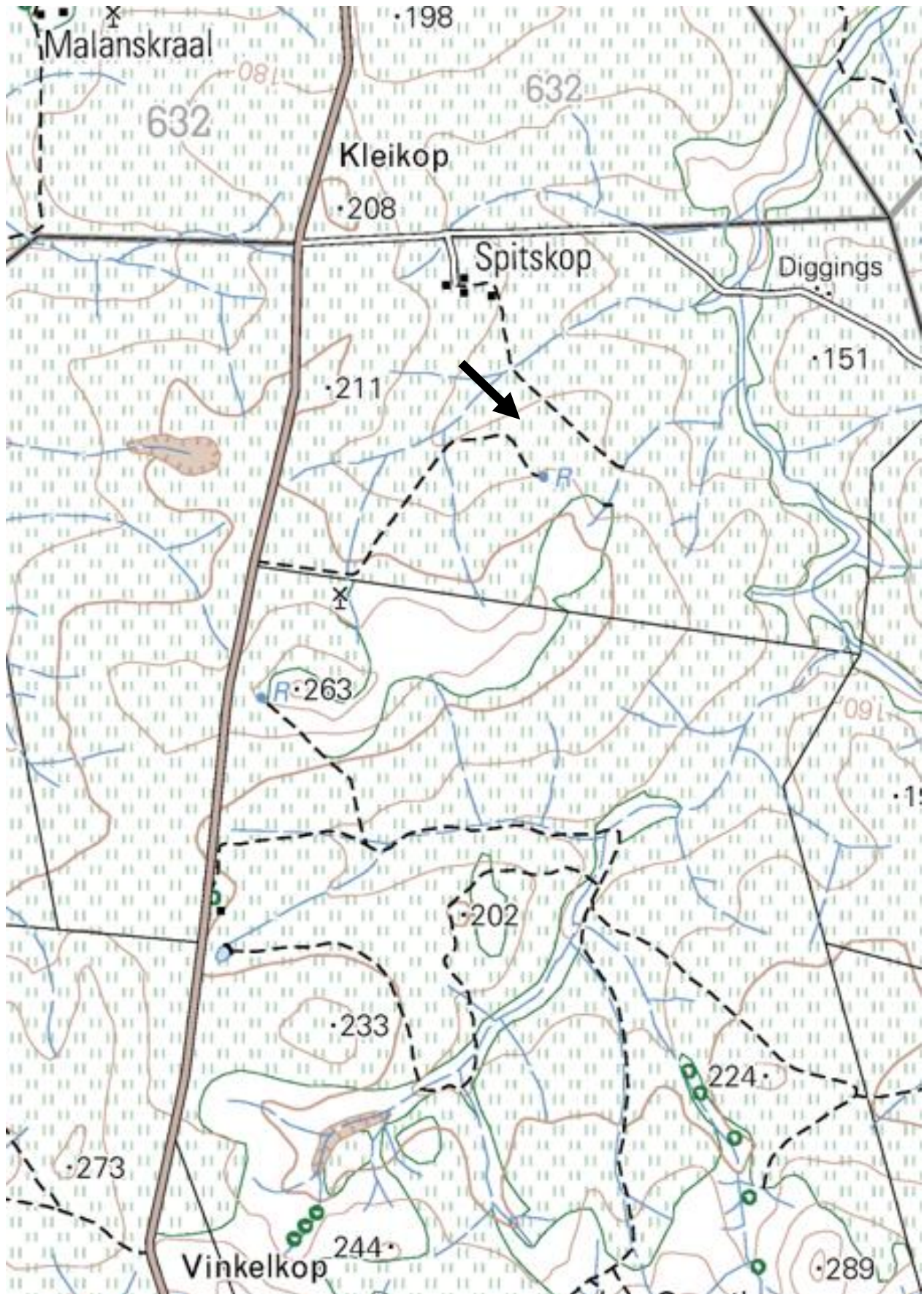


Figure 32. Topographic map (3420AD) showing Hill 222 (arrow).



Figure 33. Satellite image showing Hill 222.

A forest of aloes grows at the top of Hill 222 (Figure 34).



Figure 34. Top and bottom - a forest of aloes, which is quite rare on silcrete caps, is situated at the top of Hill 222.

There are at least six different habits of silcrete on Hill 222 (Figures 35 to 37).



Figure 35. 'Cauliflower' silcrete (St1) at the top of Hill 222.



Figure 36. Silcrete varieties on Hill 222. Top: St2 – with large angular quartz clasts. Bottom: St3 - breccia; St4 – conglomerate.



Figure 37. Silcrete varieties on Hill 222. Top: St5 – lenticular. Bottom: St6 – platy.

This Field Note described more than thirty different hill cap pedogenic silcrete habits, which are present on four hills, out of more than a hundred different habit variations (appearances) of pedogenic silcrete on the tops and slopes of about two hundred hills studied by the author, between De Hoop and Swellendam.

This Field Note illustrates the enigmatic nature of silcreted. More varieties are likely to be located. See the field guide 'Silcretised landscape morphology' for a comprehensive 'inventory' of pedogenic and non-pedogenic silcrete habits in the Study Area.