

CHH Champion Hill Land System

Undulating to rolling slopes between Pekina and Yatina, Southern Flinders Ranges

Total Area: 58.7 km²

Annual rainfall: 390 – 495 mm average

Geology: Siltstones of the Tapley Hill Formation and interbedded tillites, siltstones and sandstones of the Appila Tillite, overlain on lower slopes by locally derived alluvium.

Topography: Undulating to occasionally rolling slopes abutting the western edge of the Narien Range and sloping away to the west toward the Pekina and Appila Creek systems which are fed by numerous watercourses cutting across the Land System. Slopes are generally in the range 3 - 12%, but the occasional short dissection slope may reach 20%. A 500 m wide strip of Appila Tillite runs along the eastern edge and is characterized by linear rock outcrops. Elsewhere, there is little outcropping rock.

Elevation: 560 m at the northern end where Wepowie Creek leaves the system to 720 m at Champion Hill.

Relief: Local relief is generally less than 30 m, but may be up to 90 m in some places between Champion Hill and Tarcowie.

Soils: Most soils are shallow to moderately deep over weathering basement rock. Shallow calcareous loams, loamy texture contrast soils, and shallow non calcareous stony loams are most common.

Main soils

- D3** Hard loam over dispersive red clay - lower slopes and flats
- A2** Shallow rubbly calcareous loam - hillslopes
- D1** Hard loam over friable red clay on rock - hillslopes
- C2** Gradational loam on rock - hillslopes

Minor soils

- C3** Deep gradational loam - lower slopes and flats
- D2** Hard loam over friable red clay - lower slopes and flats
- D7** Hard loam over dispersive red clay on rock - lower slopes
- L1** Shallow stony loam - steeper rocky slopes

Main features: The Champion Hill Land System is mostly arable undulating land with some semi to non arable steeper and / or rocky slopes. The soils are mainly shallow and stony, so restricted moisture holding capacity is commonly the soil factor most limiting productivity. On lower slopes the soils tend to be deeper but are often poorly structured, with consequent effects on water infiltration, workability and emergence / root growth. Potential for water erosion is moderate to high throughout.



Soil Landscape Unit summary: 10 Soil Landscape Units (SLUs) mapped in the Champoin Hill Land System:

SLU	% of area	Main features #
AAC	0.6	Moderately steep non arable rocky slopes of 20-30%. Main soils: <u>shallow stony loam</u> - L1 (E) and <u>shallow rubbly calcareous loam</u> - A2 (E) with rocky outcrops. Management of these slopes is difficult due to accessibility problems, low waterholding capacity of the soils and potential for erosion. Erosion of watercourses has occurred in the past.
EGB EGC EGD	2.4 36.9 10.7	Rises and low hills formed on fine grained rocks. EGB Gently undulating rises of 2-3% slope. EGC Undulating rises of 3-10% slope. EGD Rolling low hills of 10-20% slope. Main soils: <u>shallow calcareous loam</u> - A2 (E) with <u>hard loam over friable red clay on rock</u> - D1 (C) and <u>gradational loam on rock</u> - C2 (L), and <u>hard loam over dispersive red clay on rock</u> - D7 (L) on lower slopes. These soils are: often shallow (restricted waterholding capacity) and susceptible to erosion. Poor surface structure in the hard loam over clay soils is responsible for excessive runoff, patchy emergence and workability problems in places. Some watercourses are eroded.
ESC ESD	4.5 12.9	Rocky semi arable slopes formed on fillies. ESC Slopes of 4-10%. ESD Slopes of 10-20%. Main soils: <u>shallow stony loam</u> - L1 (E), with <u>loam over friable red clay on rock</u> - D1 (C), <u>gradational loam on rock</u> - C2 (L) and <u>shallow calcareous loam</u> - A2 (L). Cropping potential is restricted by rocky reefs, erosion potential and shallow soils prone to moisture deficit in spring.
JDB JDE JDJ JDe	10.6 17.5 0.5 3.4	Pediments and drainage depressions formed on alluvium. There are scattered basement rock highs. JDB Gentle slopes of 2-3%. JDE Drainage depressions. JDJ Moderate slopes of up to 10% with eroded watercourses. JDe Drainage valleys with eroded watercourses and saline seepage. Main soils: <u>hard loam over dispersive red clay</u> - D3 (E), with <u>deep gradational loam</u> - C3 (L) and <u>loam over friable red clay</u> - D2 (L), all deep over alluvium. <u>Hard loam over dispersive red clay on rock</u> - D7 (L) occurs on pediments. Most of the soils have structural limitations leading to excessive runoff, restricted workability, patchy emergence, poor root growth and reduced waterholding capacity. Parts of the land are affected by water erosion and salinization.

PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

- (D) Dominant in extent (>90% of SLU)
- (V) Very extensive in extent (60–90% of SLU)
- (E) Extensive in extent (30–60% of SLU)
- (C) Common in extent (20–30% of SLU)
- (L) Limited in extent (10–20% of SLU)
- (M) Minor in extent (<10% of SLU)



Detailed soil profile descriptions:

- A2** Shallow calcareous loam (Paralithic, Calcic / Lithocalcic Calcarosol)
Calcareous loam with a subsoil accumulation of fine to rubbly carbonate grading to weathering rock within 50 cm.
- C2** Gradational loam on rock (Hypercalcic / Lithocalcic, Red Dermosol)
Loam to clay loam grading to a well structured red clay, underlain by soft to rubbly carbonate overlying weathering rock within 100 cm.
- C3** Deep gradational loam (Hypercalcic / Lithocalcic, Red Dermosol)
Loam to clay loam grading to a well structured red clay, underlain by soft to rubbly carbonate overlying alluvium or deeply weathered rock, continuing below 100 cm.
- D1** Hard loam over friable red clay on rock (Calcic / Supracalcic, Red Chromosol)
Hard loam to clay loam abruptly overlying a well structured red clay, underlain by soft to rubbly carbonate grading to weathering rock within 100 cm.
- D2** Hard loam over friable red clay (Calcic, Red Chromosol)
Hard loam to clay loam abruptly overlying a well structured red clay, underlain by soft to semi-hard or rubbly carbonate, grading to alluvium.
- D3** Hard loam over dispersive red clay (Calcic, Red Sodosol)
Hard sandy loam to clay loam sharply overlying a red poorly structured dispersive clay, underlain by soft Class I carbonate grading to alluvium.
- D7** Hard loam over dispersive red clay on rock (Calcic, Red Sodosol)
Hard sandy loam to clay loam sharply overlying a red poorly structured dispersive clay, underlain by soft Class I carbonate grading to weathered rock.
- L1** Shallow stony loam (Calcareous, Paralithic, Leptic Tenosol)
Shallow non calcareous stony loam grading to weathering siltstone with accumulations of soft carbonate in fractures and cleavages.

Further information: [DEWNR Soil and Land Program](#)

