

# TAR Tarcowie Land System

Upper catchment area of Appila Creek, near Tarcowie

**Area:** 92.5 km<sup>2</sup>

**Annual rainfall:** 400 - 450 mm average

**Geology:** Sandstones and siltstones of the Tarcowie and Tapley Hill Formations, associated with medium to fine grained alluvium.

**Topography:** Broad valley containing the headwaters of Appila Creek, its major tributary (Hogshead Creek) and numerous minor tributaries. The valley is bounded on the east by a low range of hills and on the west by the much higher Pekina Range. Within the valley are undulating rises formed mainly on sandstone, and to a lesser extent siltstone, flanked by broad gently sloping outwash fans formed on locally derived alluvium. Deeply eroded watercourses are a feature of the land.

**Elevation:** 450 m where Appila Creek leaves the system to 700 m on the eastern border range

**Relief:** Up to 100 m on the eastern edge, but more commonly less than 50 m

**Soils:** Most soils are moderately deep over weathering basement rock. Hard sandy loam surfaces are typical, but subsoils vary and include dispersive red clays, well structured red clays, and soft to rubbly carbonate. Some soils on steeper or rocky slopes have no subsoil. On lower slopes and flats, soils are deep, and invariably feature hard sandy loam surfaces over thick red clay subsoils.

### Main soils

*Soils formed over basement rock on rises*

- A2** Shallow calcareous loam
- D1** Loam over red clay on rock
- C2** Gradational loam on rock

*Soils formed over alluvium on lower slopes and outwash fans*

- D3** Sandy loam over dispersive red clay
- D2** Sandy loam over well structured red clay

### Minor soils

- D7** Sandy loam over dispersive red clay on rock
- L1a** Shallow loam over calcareous rock
- L1b** Shallow stony sandy loam

**Main features:** The Tarcowie Land System is mainly undulating to moderately steep land characterized by highly erodible soils. There is considerable evidence of severe erosion in the past. Hard setting poorly structured texture contrast soils with sandy loam surfaces are predominant, and these are the soils most degraded. Shallow calcareous and non calcareous loams on upper slopes and steeper stony slopes account for most of the rest of the soils. Control of runoff and associated erosion is the main soil management issue.



**Soil Landscape Unit summary:** 22 Soil Landscape Units (SLUs) mapped in the Tarcowie Land System

SLU	% of area	Main features #
AKI AKi	5.7 1.7	Hillslopes formed on coarse grained rocks. There is 10-20% surface sandstone and quartzite. <b>AKI</b> Low hills with slopes of 20-35% and relief to 100 m. Water courses are commonly eroded. <b>AKi</b> Strongly dissected hillslopes with slopes of 20-30%, eroded watercourses and scalding. There is 10% sandstone outcrop. Main soils: <u>shallow calcareous loam</u> - <b>A2</b> (E) with <u>shallow loam over calcareous rock</u> - <b>L1a</b> (C) and <u>loam over red clay on rock</u> - <b>D1</b> (C). The hills are steep, rocky and inaccessible, with some areas affected by gully erosion and scalding. Soils are shallow and stony with low grazing value.
AQB	0.6	North-south trending quartzite ridges, 30 m high, with slopes of 20-40%, linear quartzite outcrops and 20-50% surface stone. Main soils: <u>shallow calcareous loam</u> - <b>A2</b> (E), <u>shallow stony sandy loam</u> - <b>L1b</b> (E) and <u>shallow loam over calcareous rock</u> - <b>L1a</b> (E). These ridges are minor in extent, are moderately steep to steep, rocky and with shallow stony soils prone to moisture deficit early in spring.
DCB DCC DCW	0.9 10.8 3.2	Rises formed on siltstone with up to 10% surface siltstone, calcrete and quartzite. <b>DCB</b> Low rises with slopes of up to 3%. <b>DCC</b> Gentle slopes of 3-10%. <b>DCW</b> Gentle slopes of 3-10% with 5-10% of the area scalded. Main soils: <u>loam over red clay on rock</u> - <b>D1</b> (E) with <u>gradational loam on rock</u> - <b>C2</b> (C) and <u>shallow calcareous loam</u> - <b>A2</b> (C). The slopes are arable but are highly susceptible to erosion. Soil structural problems are the main management issues. Hard setting surfaces restrict water infiltration, affect workability and cause patchy emergence.
DKC DKD DKW	12.8 1.7 1.3	Rises formed on coarse grained rocks with up to 10% rocky outcrop and 10-20% surface sandstone and quartzite. <b>DKC</b> Slopes of 3-10%. <b>DKD</b> Slopes of 10-20%. <b>DKW</b> Slopes of 5-15% with sporadic scalding. Main soils: <u>sandy loam over dispersive red clay on rock</u> - <b>D7</b> (E), with <u>loam over red clay on rock</u> - <b>D1</b> (C), <u>gradational loam on rock</u> - <b>C2</b> (L) and <u>shallow calcareous loam</u> - <b>A2</b> (L) on upper slopes. These slopes are extremely susceptible to erosion and have been badly degraded in the past. Hard setting surfaces (causing excessive runoff, restricted workability and patchy emergence), and dispersive subsoil clays (affecting water movement and root proliferation) affect most soils. The land is potentially arable, but requires very careful management.
EGC EGD	1.9 1.8	Rises formed on fine grained rocks. <b>EGC</b> Undulating rises with slopes of 5-12% and relief to 30 m. There is up to 20% surface stone. <b>EGD</b> Undulating to gently rolling slopes with sporadic rock outcrop in linear reefs, up to 20% surface stone and occasional short steep slopes. Slopes range from 5 to 20%. Main soils: <u>shallow calcareous loam</u> - <b>A2</b> (V) with <u>loam over red clay on rock</u> - <b>D1</b> (C) and <u>gradational loam on rock</u> - <b>C2</b> (L). These slopes are mostly arable, although steeper and /or rocky sections are only marginally suitable. The soils are generally shallow, stony and calcareous with consequent waterholding and fertility limitations.
ETD ETI	6.0 4.5	Low hills formed on coarse grained rocks. There is 10-20% rock outcrop and up to 20% surface quartzite and sandstone. <b>ETD</b> Moderately inclined low hills with slopes of 10-20% and relief to 50 m. Some watercourses are eroded. <b>ETI</b> Moderately inclined slopes of 10-20% and relief to 50 m. Most watercourses are eroded. Main soils: <u>shallow calcareous loam</u> - <b>A2</b> (V) with <u>sandy loam over dispersive red clay on rock</u> - <b>D7</b> (C) on lower slopes. These slopes are moderately steep and rocky and generally not suited to cropping. Soils are shallow and stony with workability and waterholding limitations.
JGB JGC JGG JGH JGJ JGW	6.6 1.3 11.9 1.1 4.2 1.7	Alluvial flats and outwash fans formed on sediments derived from coarse grained rocks: <b>JGB</b> Fans with slopes of 2-3%, and minor surface quartzite stones. <b>JGC</b> Fans with slopes of 3-6%, and minor surface quartzite stones. <b>JGG</b> Fans with 2-3% slope and eroded watercourses. <b>JGH</b> Fans with 3-6% slope and eroded watercourses. <b>JGJ</b> Drainage depressions with slopes of 2-5% and eroded watercourses. <b>JGW</b> Stony fans with slopes of 3-8% and sporadic scalding. Main soils: <u>sandy loam over dispersive red clay</u> - <b>D3</b> (V) and <u>sandy loam over well structured red clay</u> -



		<b>D2</b> (E). The land is arable, poor soil structure being the main limitation. Hard setting surfaces restrict infiltration, limit workability and cause patchy emergence. Dispersive subsoils impede water movement and root growth. Severe erosion gullies in watercourses affect significant areas.
JXC JXH	15.6 1.9	Complex of alluvial outwash fans and bedrock rises <b>JXC</b> Gently sloping fans of 4-10% interspersed with low rises, with up to 10% surface stone. <b>JXH</b> Gently sloping fans of 4-10% with eroded watercourses, interspersed with low rises with up to 10% surface stone. Main soils: <u>sandy loam over dispersive red clay</u> - <b>D3</b> (E) with <u>sandy loam over well structured red clay</u> - <b>D2</b> (C) on fans, and <u>loam over red clay on rock</u> - <b>D1</b> (L), <u>gradational loam on rock</u> - <b>C2</b> (L) and <u>shallow calcareous loam</u> - <b>A2</b> (L) on rises. The land is arable, poor soil structure being the main limitation. Hard setting surfaces restrict infiltration, limit workability and cause patchy emergence. Dispersive subsoils impede water movement and root growth. Severe erosion gullies in watercourses affect significant areas.
XAT	2.8	Miscellaneous watercourses and associated narrow terraces with variable alluvial soils. This land is extremely susceptible to erosion and the need to stabilize watercourses limits suitable use to light grazing.

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

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

### Detailed soil profile descriptions:

#### **A2** Shallow calcareous loam (Paralithic, Calcic / Lithocalcic Calcarosol)

Calcareous stony sandy loam to clay loam, more clayey with depth overlying soft or rubbly carbonate grading to weathering rock within one metre, and usually within 50 cm.

#### **C2** Gradational loam on rock (Calcic / Lithocalcic, Red Dermosol)

Medium thickness hard sandy loam to clay loam grading to a well structured red clay with variable soft to semi-hard carbonate at depth over weathering rock within 100 cm.

#### **D1** Loam over red clay on rock (Calcic / Lithocalcic, Red Chromosol)

Medium thickness hard sandy loam to clay loam abruptly overlying a well structured red clay with variable soft to semi-hard carbonate at depth grading to weathering rock within 100 cm

#### **D2** Sandy loam over well structured red clay (Calcic, Red Chromosol)

Medium thickness hard sandy loam to sandy clay loam overlying a red well structured clay with soft Class I carbonate at depth, grading to alluvium.

#### **D3** Sandy loam over dispersive red clay (Hypocalcic / Calcic, Red Sodosol)

Medium thickness hard sandy loam to clay loam sharply overlying a red poorly structured dispersive clay with soft Class I carbonate with depth, grading to alluvium.

#### **D7** Sandy loam over dispersive red clay on rock (Calcic, Red Sodosol)

Medium thickness hard setting sandy loam to sandy clay loam sharply overlying a red coarsely structured dispersive clay, calcareous with depth grading to weathering sandstone within 100 cm.

#### **L1a** Shallow loam over calcareous rock (Calcareous, Paralithic, Leptic Tenosol)

Stony sandy loam to sandy clay loam grading to sandstone with accumulations of soft carbonate within 50 cm.

#### **L1b** Shallow stony sandy loam (Lithic, Leptic Rudosol)

Shallow stony sandy loam to clay loam on hard quartzite within 50 cm.

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

