GTN Georgetown Land System

Broad valley of the Yackamoorundie Creek extending from east of Gladstone to Gulnare

Area: 153.8 km²

Annual rainfall 435 – 520 mm average

Geology: Fine grained alluvium derived from the range to the east. The alluvium is covered by

a veneer of fine carbonates deposited by the wind and leached into the overlying soil. The carbonate occurs mostly as finely divided segregations but some is rubbly. On the eastern side of the valley there are minor basement rock highs projecting through the alluvium. In the north are some Tertiary sand deposits which are also standing above the valley floor. These are relicts of a more extensive sheet of

sediments largely eroded away by Yackamoorundie Creek.

Topography: The lowest part of the land system is a flat alluvial plain which runs north - south up the

western side of the valley. Yackamoorundie Creek flows in a defined channel until about six km south of Georgetown where it spreads out on to a level plain which is marginally saline and subject to waterlogging and occasional flooding. Very gently to gently inclined outwash fans abut the plain and rise towards the range to the east. These have maximum slopes of 12%. On the upper fans are low rises underlain by basement rocks. In the north are three discrete north - south oriented rises of Tertiary sands. In the north-west the land rises to a gently undulating high plain before

dropping sharply away into the catchment of Pisant Creek.

Elevation: The highest point on the eastern side is 440 m, and on the western side is 350 m. There

is a gradual fall to the south with the flow of the creek to its exit point (220 m).

Relief: Tertiary residuals are up to 60 m above the plains and basement rock highs on the

eastern side are up to 20 m high. Overall relief across the fan is up to 140 m.

Soils: The characteristic soils are deep clay loams to cracking clays. Some are calcareous.

Loamy texture contrast soils are common.

Main soils

C3 Gradational clay loam
A6 Calcareous loam
E3 Brown cracking clay

Minor soils

D2/D1 Hard loam over red clay

E2 Red cracking clay

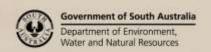
D5 Hard loamy sand over red clay

A2 Shallow calcareous loam C2/B4 Shallow gradational loam

Main features: The Georgetown Land System is flat to undulating and is characterized by deep,

fertile clayey soils. These have high production potential, with only minor limitations due to waterlogging, boron toxicity and salinity. Loamier soils on rises are also potentially productive, but are prone to structural problems and erosion. Minor sandy

soils have lower fertility and are susceptible to both wind and water erosion.





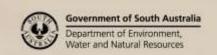
Soil Landscape Unit summary: 14 Soil Landscape Units (SLUs) mapped in the Georgetown Land System:

SLU	% of	Main features #
	area	
EGC	0.3	Rises with slopes of 3-7% on fine grained rock.
		Main soils: shallow calcareous loam - A2 (V), with shallow gradational loam - C2/B4 (L) and
		hard loam over red clay - D1 (L). The rises are fully arable, although moisture shortages limit crops in dry finishes. Improvement of hard setting surface soils to reduce water loss and
		erosion through runoff is the main management issue. "Lime - induced" nutrient deficiencies
		are probable on calcareous soils.
НЈВ	2.0	Rises formed on Tertiary sandstones and related unconsolidated sediments. There is minor
HJC	1.3	surface calcrete.
		HJB Slopes of 2-3%.
		HJC Slopes of 3-8%.
		Main soils: <u>hard loamy sand over red clay</u> - D5 (E) and <u>gradational clay loam</u> - C3 (E). The
		rises are arable but have a number of slight limitations mostly related to the poorly
		structured surface of the main soil. Excessive runoff, lower water holding capacity, difficulty
		in working, water and wind erosion, and patchy emergence are all potential problems.
IZC	1.6	Rises formed on clays derived from the deep weathering of basement rocks.
IZD	0.2	Approximately 30% of profiles have rock within a metre of the surface.
		IZC Slopes of 4-10%.
		IZD Slopes of 10-20%.
		Main soils: <u>calcareous loam</u> - A6 (V), with <u>gradational clay loam</u> - C3 (C). These rises are small and isolated, surrounded by outwash fan slopes (KAH). Potential for water erosion is
		the main limitation, with slight restrictions due to shallow soils and surface stone.
JEE	2.4	Creek flats formed on fine grained alluvium.
JLL	۷.٦	Main soils: <u>hard loam over red clay</u> - D2 (V) with <u>gradational clay loam</u> - C3 (C). The flats
		have deep well drained fertile soils with only slight limitations to agriculture. Hard setting
		surface soils are the main limitation, causing reduced water infiltration, restricted
		opportunities for working and patchy emergence.
KAB	17.3	Outwash fans formed on fine grained alluvium, capped by secondary carbonates.
KAH	11.9	KAB Slopes of 2-5%.
		KAH Slopes of 4-12% and eroded water courses.
		Main soils: <u>gradational clay loam</u> - C3 (E) and <u>calcareous loam</u> - A6 (E). This land has
		generally good agricultural potential, with the minor limitations of moderately low water
		holding capacity on shallower soils, boron toxicity in some places and abrasive surface
		stones. There has been extensive erosion in the past due to high levels of run-on water from the adjacent ranges and erosion control measures are required over much of the area.
KRP	5.5	Marginally saline alluvial flats.
IXIXF	٥.٥	Main soils: <u>brown cracking clay</u> - E3 (E) and <u>calcareous loam</u> - A6 (E), with <u>gradational clay</u>
		loam - C3 (L). These flats have heavy fertile soils, but marginal salinity and seasonal
		waterlogging restrict cropping.
KTA	24.1	Flats and outwash fans formed on fine grained alluvium.
KTB	17.1	KTA Flats with slopes of less than 2%.
		KTB Fans with slopes of 2-4%.
		Main soils: <u>brown cracking clay</u> - E3 (E) and <u>gradational clay loam</u> - C3 (E), with <u>calcareous</u>
		<u>loam</u> - A6 (L) and <u>hard loam over red clay</u> - D2 (L). This land is characterized by deep highly
		fertile soils with high production potential. Only limitations are slight; viz. some waterlogging,
		probable boron toxicity (unconfirmed) and potential for water erosion on slopes.
TAB	11.7	Rises formed on clayey sediments or highly weathered fine grained rocks.
TAC	2.2	TAB Rises with slopes of 2-4%.
TAZ	2.4	TAC Rises with slopes of 3-7%.
		TAZ Broad gently undulating crests with slopes of less than 4%.
		Main soils: gradational clay loam - C3 (V), with calcareous loam - A6 (L) and red cracking
		clay - E2 (L). These slopes have few limitations with predominantly deep fertile well drained
		soils and slight to moderate erosion potential.

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 / Petrocalcic, Lithocalcic Calcarosol)

20 - 30 cm calcareous loam grading to rubbly or sheet calcrete by 30 cm, over weathering rock. Rises.

A6 Calcareous Ioam (Regolithic / Pedal, Calcic / Supracalcic Calcarosol)

20 - 30 cm calcareous loam to clay becoming more clayey and calcareous with depth grading to soft (occasionally rubbly) carbonate over alluvium or deeply weathered rock. Flats and rises.

C2/B4 Shallow gradational loam (Supracalcic / Petrocalcic, Red Dermosol)

20 - 30 cm loam grading to friable red clay over rubbly or sheet calcrete grading to weathering rock. Rises.

C3 Gradational clay loam (Hypocalcic / Hypercalcic, Red Dermosol)

20 - 40 cm well structured clay loam grading to friable red clay with soft carbonate at moderate depth. Lower slopes and flats on alluvium, and rises on Tertiary sediments or highly weathered rock.

D2/D1 Hard loam over red clay (Calcic / Lithocalcic, Red Chromosol)

20 - 30 cm hard loam to clay loam abruptly overlying a well structured red clay with soft to rubbly carbonate at about 50 cm, grading to alluvium, or occasionally to weathering siltstone. Flats, occasionally on rises.

D5 Hard loamy sand over red clay (Calcic / Lithocalcic, Red Chromosol)

10 - 40 cm hard loamy sand to sandy loam abruptly overlying a well structured red clay with soft to rubbly carbonate at about 50 cm, grading to Tertiary sandstone. Rises.

E2 Red cracking clay (Self mulching, Red Vertosol)

20 - 40 cm well structured seasonally cracking red clay becoming more clayey and coarser structured with depth, usually calcareous throughout. Rises, over clayey sediments or deeply weathered rock.

E3 Brown cracking clay (Epipedal, Brown Vertosol)

20 - 40 cm well structured seasonally cracking brown clay becoming more clayey and coarser structured with depth, sometimes calcareous throughout. Flats over clayey alluvium.

Further information: DEWNR Soil and Land Program

