

# SAS Salter Springs Land System

Undulating slopes and low hills including the Hermitage Creek catchment, Salter Springs

**Area:** 44.4 km<sup>2</sup>

**Annual rainfall:** 425 – 500 mm average

**Geology:** The land system is formed on clayey sediments of mixed origin. Most are apparently depositional materials of Tertiary age, but at least some of the sediments adjacent to the ranges on the eastern side are more recent wash deposits. In addition, deep weathering of underlying basement rocks which are near the surface in places, has produced clay in which modern soils are forming. The sediments are covered by a veneer of soft carbonate of aeolian origin. On the crests of some rises, possibly old remnant land surfaces, the carbonate has hardened to sheet or rubbly forms.

**Topography:** The Salter Springs Land System is a valley lying in the cleft of two basement rock ranges. Erosion of the sedimentary infill of the valley has produced a strongly undulating topography of long slopes of 5 - 12% characterized by eroded water courses. Hermitage Creek is the principal stream. Watercourses flow in a westerly or north westerly direction to the Wakefield River, which marks the western edge of the System.

**Elevation:** 290 m in the south eastern corner to 140 m at the Wakefield River

**Relief:** Maximum relief is 80 m

**Soils:** Clayey soils (cracking clays or heavy clay loams) are characteristic, but there are extensive loamy texture contrast soils (with red clayey subsoils) and some shallow loams over calcrete.

**Main soils:**

- E2a** Red cracking clay - extensive (rises)
- C3a** Gradational clay loam - common (rises)
- D2b** Hard loam over well structured red clay - limited (outwash fans and drainage depressions)
- D3** Hard loam over dispersive red clay - limited (outwash fans and drainage depressions)
- E2b** Red cracking clay - extensive (outwash fans)

**Minor soils:**

- B4** Shallow clay loam over calcrete - rises
- B2** Shallow calcareous loam over calcrete - rises
- C3b** Gradational clay loam - outwash fans
- D2a** Clay loam over red clay - rises

**Main features:** The Salter Springs Land System is characterized by undulating land with mainly clayey soils. Most of the soils are deep, inherently fertile and well structured. Exceptions are shallow but well structured soils over hard calcareous layers on rises, and deep but poorly structured loam over clay soils on outwash fans and lower slopes. However, overall productivity potential is high. The soils are highly susceptible to gully erosion and protection of water courses from further damage is necessary. Slopes are generally long, so measures need to be taken to guard against sheet and rill erosion.



**Soil Landscape Unit summary:** 7 Soil Landscape Units (SLUs) mapped in the Salter Springs Land System

SLU	% of area	Main features #
JAB JAJ	1.1 17.8	Drainage depressions and outwash fans formed over clayey sediments. <b>JAB</b> Fans with slopes of 2-4%. <b>JAJ</b> Drainage depressions with eroded water courses. Main soils: <u>hard loam over dispersive / well structured red clay</u> - <b>D3/D2b</b> (V), with <u>red cracking clay</u> - <b>E2b</b> (L) and <u>gradational clay loam</u> - <b>C3b</b> (L). This land is dominated by water courses which are generally severely eroded. The soils are deep and fertile but highly erodible. Protection from further damage is the main management issue.
JBE	8.7	Narrow flats of the Wakefield River. Main soils: <u>hard sandy loam over dispersive / well structured red clay</u> - <b>D3/D2b</b> (D). These are deep and fertile, but the area is limited and use is restricted by the river channel.
KUB KUC	10.1 9.0	Outwash fans formed on clayey sediments. <b>KUB</b> Slopes of 3-4% with minor water course erosion. <b>KUC</b> Slopes of 4-10% with minor water course erosion. Main soils: <u>red cracking clay</u> - <b>E2b</b> (E) and <u>hard loam over dispersive / well structured red clay</u> - <b>D3/D2b</b> (E), with <u>gradational clay loam</u> - <b>C3b</b> (L). The soils are deep and fertile, although poor structure in the D3/D2 soils causes excessive runoff, restricts workability and causes patchy emergence, while the E2 soils become sticky and difficult to work when wet. However, provided erosion is controlled, productive potential is high.
TBH	32.0	Undulating low hills to 80 m high with slopes of 4-12% formed over clayey sediments or deeply weathered basement rock. There is severe gully erosion in main water courses. Main soils: <u>red cracking clay</u> - <b>E2a</b> (E), <u>clay loam over red clay</u> - <b>D2a</b> (C) and <u>gradational clay loam</u> - <b>C3a</b> (C), with <u>shallow clay loam</u> - <b>B4</b> (L). These soils are fertile, deep and generally well structured (although D2 surfaces are hard and seal over. The clayey soils are well structured, but become sticky and intractable when wet. Productivity potential is high, but erosion control (including watercourses) is critical.
TCC	21.3	Upper slopes and low rises with slopes of 3-8%, formed over clayey sediments or deeply weathered fine grained basement rock. The substrate is commonly capped by sheet or rubbly calcrete. There is up to 10% surface calcrete. Main soils: <u>gradational clay loam</u> - <b>C3a</b> (E) and <u>red cracking clay</u> - <b>E2a</b> (C), with <u>shallow clay loam</u> - <b>B4</b> (L), <u>shallow calcareous loam</u> - <b>B2</b> (M) and <u>clay loam over red clay</u> - <b>D2a</b> (M). These soils are mostly deep, fertile and generally well structured. Shallow soils over calcrete occur over 20% of the area, but have favourable properties in other respects. Productivity potential is high.

# 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:**

- B2** Shallow calcareous loam over calcrete (Hypercalcic / Petrocalcic Calcarosol)  
15 - 20 cm calcareous loam to clay loam grading to a very highly calcareous light brown clay loam to clay over soft to hard carbonate at about 45 cm.
- B4** Shallow clay loam over calcrete (Petrocalcic, Red Dermosol)  
20 - 30 cm clay loam grading to a well structured dark red clay on sheet calcrete at about 40 cm.
- C3a** Gradational clay loam (Hypercalcic, Red Dermosol)  
15 - 30 cm clay loam to light clay grading to a well structured red medium clay with abundant soft carbonate from about 50 cm, continuing below 100 cm over heavy clay.
- C3b** Gradational clay loam (Hypercalcic / Hypocalcic, Red Dermosol)  
Loam to clay loam grading to a well structured red clay overlying fine carbonate within 50 cm over alluvial sediments.
- D2a** Clay loam over red clay (Calcic, Red Chromosol)  
Hard setting red brown sandy loam to clay loam overlying a reddish well structured clay containing soft or rubbly carbonate with depth, formed in Tertiary age clay or clayey sandstone.
- D2b** Hard loam over well structured red clay (Calcic, Red Chromosol)  
20 - 50 cm hard fine sandy loam to clay loam abruptly overlying a well structured red clay with soft carbonate accumulations from about 60 cm, grading to alluvium.
- D3** Hard loam over dispersive red clay (Calcic, Red Sodosol)  
20 - 50 cm hard fine sandy loam to clay loam abruptly overlying a coarsely structured and dispersive red clay with soft carbonate accumulations from about 60 cm.
- E2a** Red cracking clay (Red Vertosol)  
Dark brown well structured and seasonally cracking calcareous light to medium clay, grading to a coarsely structured calcareous red brown heavy clay continuing below 100 cm.
- E2b** Red cracking clay (Epipedal, Red Vertosol)  
Seasonally cracking clay, becoming more clayey and coarser structured and calcareous with depth, grading to alluvium.

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

