

ANV Angle Vale Land System

Alluvial plains of the Gawler River

Area: 97.8 km²

Annual rainfall: 400 – 455 mm average

Geology: The System is underlain by clayey, silty and sandy alluvial sediments deposited by the Gawler River as it meandered across the plain during relatively recent geological history. The sediments are mantled by aeolian carbonates.

Topography: The landscape is a flat plain with slopes of less than 1% and usually less than 0.5%. The triangular shape of the System indicates that the river has always flowed on to the plains at its current location, but over time has taken many courses between the hills and the sea. The current flood plain of the river is mapped separately as the Gawler River Land System. At the western end of the System, elevation falls below 10 m. In this zone, groundwater tables, usually at least moderately saline, begin to influence soil profiles and productivity potential. This area is labelled separately on the map.

Elevation: 50 m in the east to 2 m in the west

Relief: Negligible

Soils: Most soils have sandy to loamy surfaces over clayey subsoils. There are limited areas of uniform or gradational loamy to clayey soils, and some rubbly calcareous types.

Main soils (on alluvial plains and flats)

- D5** Loamy sand over hard red clay
- D3** Hard sandy loam over dispersive red clay
- G1a** Sand over red sandy clay loam
- G1b** Sand over red sandy clay

Minor soils

Alluvial plains and flats

- C4** Gradational sandy clay loam
- D2** Hard sandy loam over friable red clay
- E3** Brown cracking clay
- F2** Hard silty clay loam over dispersive brown clay
- M2/E1** Black clay
- M4** Gradational loamy sand

Stony flats and rises

- A4** Rubbly calcareous sandy loam
- A5** Rubbly calcareous loam over clay
- B2** Shallow calcareous sandy loam on calcrete

Main features: The Angle Vale Land System is a very gently inclined plain with a range of sand to sandy loam soils over clayey subsoils. As irrigated horticulture is the main land use in the System, differences in thickness of surface soil, and profile drainage are significant. All soils appear to be accumulating sodium under irrigation, a trend which should be monitored. Most soils are saline at depth, partly due to accumulated salt leaching under irrigation, and partly to saline groundwater influence. This effect is more noticeable in the lower elevation areas (ie below 10 m).



Soil Landscape Unit summary: 11 Soil Landscape Units (SLUs) mapped in the Angle Vale Land System:

These soil landscape units are based on the units described by Matheson, W.E. (1975) in *The suitability of land for irrigation in portion of the Northern Adelaide Plain, South Australia*. Specific Land Use Survey. Department of Agriculture, South Australia.

SLU	% of area	Main features #
JoA JoK	7.8 1.0	<p>JoA Very gentle rises above the 10 m contour. JoK Very gentle rises below the 10 m contour.</p> <p>Main soils: <u>Sand over red sandy clay loam</u> - G1a (V) <u>Gradational loamy sand</u> - M4 (C). This land is well drained and the soils are relatively deep, although low in fertility and susceptible to wind erosion. Provided that erosion is controlled, the land is suitable for a wide range of irrigated crops. Soil sodicity is increasing under irrigation and should be monitored. Restricted drainage, shallower water tables and increased subsoil salinity can be expected in JoK.</p>
JpA JpK	48.3 2.7	<p>JpA Flats and gentle slopes above the 10 m contour. JpK Flats below the 10 m contour.</p> <p>Main soils: <u>Loamy sand over hard red clay</u> - D5 (E) <u>Sand over red sandy clay</u> - G1b (C) <u>Hard sandy loam over dispersive red clay</u> - D3 (L) <u>Gradational sandy clay loam</u> - C4 (L). These soils are considered to be suitable for most irrigated crops, as potential rooting depth is adequate and drainage is satisfactory, the soils are relatively fertile and erosion potential is moderately low. Soil sodicity is increasing under irrigation and should be monitored. Restricted drainage, shallower water tables and increased subsoil salinity can be expected in JpK.</p>
JqA JqK	11.7 2.8	<p>JqA Flats above the 10 m contour. JqK Flats below the 10 m contour.</p> <p>Main soils: <u>Loamy sand over hard red clay</u> - D5 (V) <u>Hard sandy loam over dispersive red clay</u> - D3 (L) <u>Hard sandy loam over friable red clay</u> - D2 (L). These soils are satisfactory for most irrigated crops, except deeper rooted vegetable crops and tree crops which are sensitive to somewhat restrictive clayey subsoils and marginal salt accumulation. The thinner surface soils compared with soils in JoA and JpA reduce irrigation flexibility, choice of crops and probably productivity to some degree. Soil sodicity is increasing under irrigation and should be monitored. Restricted drainage, shallower water tables and increased subsoil salinity can be expected in JqK.</p>
JrA JrK	1.8 0.4	<p>JrA Flats and depressions above the 10 m contour. JrK Flats and depressions below the 10 m contour.</p> <p>This land represents the least favourable conditions in a sequence of soil depth and drainage capacity (JoA - JpA - JqA - JrA). Main soils: <u>Hard sandy loam over dispersive red clay</u> - D3 (E) <u>Hard silty loam over dispersive brown clay</u> - F2 (C) <u>Rubby calcareous loam over clay</u> - A5 (L) <u>Loamy sand over hard red clay</u> - D5 (L) <u>Brown cracking clay</u> - E3 (M) in depressions. This land is considered to be generally unsuitable for irrigated crops due to insufficient surface soil thickness, impeded drainage and / or high subsoil salinity. Restricted drainage, shallower water tables and increased subsoil salinity can be expected in JrK.</p>



JsA	12.6	<p>Flats near water courses. These are intermediate between the flats of JqA and the modern alluvial flats of the Gawler River Land System.</p> <p>Main soils: <u>Hard silty clay loam over dispersive brown clay</u> - F2 (V) <u>Hard sandy loam over dispersive red clay</u> - D3 (L) <u>Hard sandy loam over friable red clay</u> - D2 (L). <u>Brown cracking clay</u> - E3 (M) in depressions.</p> <p>These soils tend to become wet and difficult to manage in winter due to restricted drainage. However they are deep and fertile, and suitable for most irrigated vegetable crops and vines, although suitability decreases with proximity to the Thompson Creek Land System. Soil salinity and sodicity are increasing under irrigation and should be monitored.</p>
KTA	10.7	<p>Black flats near water courses.</p> <p>Main soil: <u>Black clay</u> - M2/E1 (D)</p> <p>These soils are deep and highly fertile. However, restricted drainage does not favour perennial crops. The land is suitable for vegetable production.</p>
SbA	0.2	<p>Low stony rises.</p> <p>Main soils: <u>Rubbly calcareous sandy loam</u> - A4 (V) <u>Shallow calcareous sandy loam on calcrete</u> - B2 (L).</p> <p>The soils are moderately fertile and well drained, but usually shallow. Moisture stress in spring time is likely to be a significant limitation. Stone content makes the soils unsuitable for most vegetable crops.</p>

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:

- A4** Rubbly calcareous sandy loam (Lithocalcic / Supracalcic Calcarosol)
 10 - 30 cm calcareous loam grading to a highly calcareous brown clay loam over rubbly Class III B/C carbonate from 30 cm, becoming less rubbly and more clayey at depth.
- A5** Rubbly calcareous loam over clay (Lithocalcic Calcarosol)
 10 - 20 cm calcareous loam grading to a highly calcareous brown clay loam over nodular calcrete at about 30 cm, overlying a very highly calcareous mottled pale coloured clay (often wet and saline).
- B2** Shallow calcareous sandy loam on calcrete (Petrocalcic Calcarosol)
 15 - 35 cm calcareous sandy loam to loam with variable rubble, becoming more rubbly with depth over rubbly or sheet calcrete within 40 cm.
- C4** Gradational sandy clay loam (Sodic, Calcic, Red Dermosol)
 10 - 20 cm hard sandy clay loam grading to a red coarsely structured clay, calcareous from 30 cm, grading to alluvial clay.
- D2** Hard sandy loam over friable red clay (Calcic, Red Chromosol)
 Less than 15 cm hard platy sandy loam to sandy clay loam abruptly overlying a red well structured medium clay, calcareous from about 45 cm and grading to sandy clay loam to clay sediment at about 100 cm.



- D3** Hard sandy loam over dispersive red clay (Calcic, Red Sodosol)
Less than 15 cm hard platy sandy loam to sandy clay loam abruptly overlying a red coarsely structured dispersive medium clay, calcareous from about 45 cm and grading to sandy clay loam to clay sediment at about 100 cm.
- D5** Loamy sand over hard red clay (Calcic, Red Sodosol)
15 - 25 cm hard loamy sand to sandy loam abruptly overlying a coarsely prismatic hard red clay with soft or nodular carbonate from about 50 cm, grading to variable sandy to clayey alluvium from about 100 cm.
- E3** Brown cracking clay (Massive, Brown / Grey Vertosol)
Up to 30 cm grey brown hard coarsely structured clay, grading to a brown and grey mottled coarsely structured heavy clay. This soil may be overlain by up to 20 cm sand to sandy loam (drift).
- F2** Hard silty loam over dispersive brown clay (Calcic, Brown Sodosol)
15 - 45 cm hard silty loam (sometimes loamy sand) with a paler coloured A2 layer, overlying a dark brown coarsely structured dispersive medium clay, with minor soft carbonate and hard calcrete fragments from about 40 cm, grading to alluvial clay at about 100 cm.
- G1a** Sand over red sandy clay loam (Sodic, Calcic, Red Kandosol)
More than 35 cm soft loamy sand to light sandy loam over a red light sandy clay loam with weak coarse prismatic structure, and minor soft carbonate from about 70 cm, overlying a sandy to medium clay from about 100 cm.
- G1b** Sand over red clay (Calcic, Red Sodosol)
25 - 35 cm soft loamy sand to light sandy loam abruptly overlying a coarsely structured reddish brown sandy clay to light clay, highly calcareous and with variable nodular calcrete from about 55 cm, grading to sandy clay loam to sandy loam alluvium within 100 cm.
- M2/E1** Black clay (Hypocalcic, Black Dermosol)
Up to 25 cm black crumbly silty clay loam to medium clay, with seasonal cracking in more clayey types, grading to a coarsely structured black or brown clay, slightly calcareous at depth, overlying sandy clay loam to light clay alluvium.
- M4** Gradational loamy sand (Calcic / Eutrophic, Red Kandosol)
Thick loamy sand grading to a red light sandy clay loam with increasing clay content and sporadic carbonate at depth.

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

