

SIV Saint Ives Land System

Steep dissected slopes between Kanmantoo and Red Creek

Area: 34.5 km²

Annual rainfall: 400 – 600 mm average

Geology: The land is underlain by schists and metamorphosed sandstones of the Tappanappa Formation. Due to the degree of dissection, these rocks outcrop extensively. They are variably capped by soft carbonates, often as coatings on cleavage planes. Minor pyrite bands occur on the western edge of the system. Locally derived outwash sediments occur on creek flats. These are generally sandy and micaceous, but sandy clays also occur.

Topography: The land system comprises the strongly dissected eastern slopes of the Mount Lofty Ranges where Mount Barker Creek has cut a course through to the Bremer Valley. The main creek and its many tributaries are incised up to 80 m into the range, producing a topography of moderately steep to steep slopes, rounded crests and narrow drainage depressions. Slopes are up to 100%. There is extensive outcrop, especially on the steeper slopes.

Elevation: 80 m to 270 m

Relief: Up to 80 m

Soils: Most soils are shallow over basement rock. Soil variation is determined by the presence of subsoil clays and carbonates. Deeper soils on outwash sediments occur on creek flats and drainage depressions, but occupy less than 10% of the overall area.

Main soils

Soils formed on basement rock

- L1a** Shallow stony loamy sand
- L1b** Moderately deep sandy loam over highly weathered rock
- K3a** Sandy loam over red clay
- D1** Sandy loam over red clay, calcareous at depth

Minor soils

Soils formed on basement rock

- K3b** Sandy loam over red clay on pyritic rocks

Soils formed on outwash sediments

- M1** Deep alluvial loamy sand
- D2** Sandy loam over red clay
- F2** Loamy sand over brown or red dispersive clay
- M4** Gradational loamy sand

Main features: The Saint Ives Land System is characterized by moderately steep to steep rocky dissection slopes, with only small areas of flatter land in creek flats and rounded crests. The soils are generally shallow, although many have clayey subsoils, improving nutrient retention and waterholding capacities. However the slopes and extent of rockiness restrict land use overall to rough grazing.



Soil Landscape Unit summary: 7 Soil Landscape Units (SLUs) mapped in Saint Ives Land System

SLU	% of area	Main features #
AKC AKD	22.6 45.2	<p>Very rocky moderately steep to steep slopes, formed on weakly calcified schists, metasandstones and metasiltstones of the Tappanappa Formation. Water courses are very well defined and are often eroded. Rock outcrop is very extensive, particularly on steeper slopes.</p> <p>AKC Rolling low hills and moderate slopes with relief of 30-90 m, slopes of 15-30% and up to 20% surface stone and rock outcrop.</p> <p>AKD Steep hillslopes and ridges with relief of 50-100 m, slopes of 30-100% and up to 50% surface stone and rock outcrop.</p> <p>The soils are stony and usually overlie rock at shallow depth.</p> <p>Main soils: <u>shallow stony loamy sand</u> - L1a (E) and <u>moderately deep sandy loam over highly weathered rock</u> - L1b (C). Some profiles are deeper with clayey subsoils over weathering rock, viz. <u>sandy loam over red clay</u> - K3a (L) and <u>sandy loam over red clay, calcareous at depth</u> - D1 (L). The rocks are variably calcified, with carbonate contents ranging from nil to 50% or more. These slopes are extremely rocky, with substantial areas inaccessible to conventional equipment. Soils are generally very shallow, so water availability is a major limitation. The land is suited to rough grazing.</p>
ALB ALC ALY	3.3 10.1 9.0	<p>Undulating to rolling rises and low hills with rounded crests formed on schists, metasiltstones and metasandstones of the Tappanappa Formation, partially calcified with soft carbonate segregations. Slopes range from 4% to 30% and relief ranges from 20 to 80 metres. Rock outcrop is sporadic, but locally extensive. Watercourses are well defined and often eroded.</p> <p>ALB Gently rolling low hills and moderate slopes with relief to 60 m, slopes of 8-16% and up to 10% surface stone and rock outcrop.</p> <p>ALC Rolling low hills and moderate slopes with relief to 80 m, slopes of 16-30% and up to 20% surface stone and rock outcrop.</p> <p>ALY Gently undulating summit surfaces, steeper on margins with slopes of 5-20% and up to 5% surface stone and rock outcrop.</p> <p>Soils are shallow to moderately deep with stony sandy to loamy surfaces grading directly to rock. Main soils: <u>moderately deep sandy loam over highly weathered rock</u> - L1b (E), <u>shallow stony loamy sand</u> - L1a (L), <u>sandy loam over red clay</u> - K3a (C) and <u>sandy loam over red clay, calcareous at depth</u> - D1 (C). Subsoil carbonate contents vary according to leaching conditions. This land is essentially non arable due to the extent of stone and rock outcrop and moderately steep slopes. The soils, although often shallow, are moderately fertile and well drained with well structured clayey subsoils although usually with hard setting surfaces. Pasture productivity is limited mainly by lack of soil moisture storage capacity, particularly a problem in dry finishes.</p>
ApC	2.3	<p>Low discontinuous ridges up to 20 m high formed on pyritic rocks. Slopes are variable up to 20%. There is up to 25% ferruginized sandstone on the surface.</p> <p>Main soils: pyritic <u>sandy loam over red clay</u> - K3b (E) and <u>shallow stony loamy sand</u> - L1a (E). These small areas are non arable but have good grazing potential. However, the significance of the pyritic rocks is their association with acid sulfate soils, which become a problem when the pyrite is oxidized.</p>
LkJ	7.5	<p>Narrow creek flats and drainage depressions, formed on alluvial silty sands, clayey sands and sandy clays. Water courses are well defined and often eroded. Slopes range from 2% in broader flats to 10% on lower slopes of adjacent hill slopes.</p> <p>Main soils: <u>deep alluvial loamy sand</u> - M1 (E), <u>sandy loam over red clay</u> - D2 (E), <u>loamy sand over brown or red dispersive clay</u> - F2 (L) and <u>gradational loamy sand</u> - M4 (L). These soils are deep and moderately fertile but occur in restricted areas dominated by water courses. The risk of erosion is high due to the large runoff volumes which can be expected from the adjacent hillslopes. Erosion of watercourses has been severe in places in the past, and all creeks are at risk.</p>

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

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| (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:

- D1** Sandy loam over red clay, calcareous at depth (Calcic, Red Chromosol)
Medium thickness reddish brown loamy sand to loam, overlying reddish brown well structured clay with abundant rock fragments, grading to weathering metamorphosed sandstone or schist with carbonate coatings on fracture planes.
- D2** Sandy loam over red clay (Calcic, Red Chromosol)
Medium thickness loamy sand to fine sandy loam with a paler coloured A2 horizon, overlying a dark reddish brown well structured clay, highly calcareous with depth, grading to yellow, red and brown mottled micaceous sandy clay loam to clay alluvium.
- F2** Loamy sand over brown or red dispersive clay (Eutrophic, Brown Sodosol)
Medium to thick loamy sand to fine sandy loam with a bleached A2 layer abruptly overlying a weakly structured dispersive brown or red mottled sandy clay to light clay grading to highly micaceous sandy alluvium or soft silty deeply weathered rock below 100 cm.
- K3a** Sandy loam over red clay (Eutrophic, Red Chromosol)
Medium thickness reddish brown sandy loam with abundant quartz and schist gravel, overlying a dark reddish brown micaceous clay loam to clay with many rock fragments, grading to soft schist within 50 cm.
- K3b** Sandy loam over red clay (Pyritic Eutrophic, Red Chromosol)
Medium thickness reddish brown fine sandy loam with a paler coloured A2 horizon, sometimes with ironstone gravel, overlying a red clay up to a metre thick, with blocky structure and ferruginous rock fragments throughout.
- L1a** Shallow stony loamy sand (Lithic, Leptic Rudosol)
Medium thickness reddish brown massive loamy sand to sandy loam with abundant rock fragments, overlying hard metamorphosed sandstone.
- L1b** Moderately deep sandy loam over highly weathered rock (Basic, Paralithic, Brown-Orthic Tenosol)
Thick brown sandy loam to loam with schist fragments throughout, overlying soft schist (sometimes weakly calcareous), continuing below 100 cm.
- M1** Deep alluvial loamy sand (Calcareous / Basic, Regolithic, Brown-Orthic Tenosol)
Thick brown loamy sand to sandy loam, overlying a brown massive fine sandy to silty loam with limited soft calcareous segregations, grading to very fine brown micaceous sand from 100 cm.
- M4** Gradational loamy sand (Hypocalcic, Red Kandosol)
Thick reddish brown sand to sandy loam, overlying a reddish brown massive light sandy clay loam to sandy clay with occasional carbonate nodules, grading to variable silty, sandy and clayey layered alluvial sediments.

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

