STO Stonefield Land System

Outwash fans and flats east of the Mt. Lofty Ranges in the Stonefield area

Area: 201.4 km^2

Annual rainfall: 250 – 375 mm average

Geology: The land system is underlain by clayey sediments similar to Blanchetown Clay. These have been extensively mixed with, and covered by, more recent medium to fine grained outwash sediments derived from the ranges to the west. All the sediments have been extensively mantled by aeolian calcareous materials. Blanchetown Clay remnants are preserved under calcrete caps on low stony rises. There are minor areas of drift sand deposits.

Topography: The Stonefield Land System is a very gently inclined outwash fan with an eastward gradient of less than 1%. The landscape is very subdued; the main features being very low stony rises (about 15% of the area), and drainage depressions with water courses which are usually weakly defined. There are occasional sections of channel where water course erosion has occurred.

Elevation: 120 m in the west to 60 m in the east

Relief: Less than 5 m

Soils: Calcareous loams are very extensive. There are some loamy texture contrast soils and shallow soils on calcrete.

Main soils

A4a	Calcareous loam - extensive (fans)
D4	Loam over pedaric red clay - limited (scalded fans)
A4b/A5	Rubbly calcareous loam - limited (rises, fans)

Minor soils

A3	Deep calcareous loam (flats)
B2	Calcareous loam over sheet rock - (rises)

Main features: The Stonefield Land System consists of mainly flat arable land. Marginal rainfall is an over riding limitation to productivity. The soils are mainly deep, loamy and calcareous. They have moderate inherent fertility and are well structured. The main soil limitations to agricultural productivity are high alkalinity (with associated induced nutrient deficiencies) and high salt and boron levels at moderately shallow depth (may be within 50 cm of the surface). Scalded areas are common. These occur where natural surface soil salinity and/or sodicity is high, or where erosion has exposed unfavourable subsoil materials. These areas need to be kept covered to prevent further erosion. Limited areas of rubbly soils have little agricultural value due to their shallowness and limited waterholding capacity.

Soil Landscape Unit summary: 6 Soil Landscape Units (SLUs) mapped in the Stonefield Land System

SLU	% of area	Main features #
KOA KOE KOJ KOU	72.7 3.9 2.8 12.3	Outwash fans formed on medium to fine textured sediments, comprising alluvium from the ranges to the west and the underlying Blanchetown Clay. The alluvium was deposited on, and partially mixed with the clay, producing a complex of thin layers of medium grained alluvium, more or less unaltered Blanchetown Clay, and mixtures of the two. Carbonates, blown in after the alluvial activity, blanket the landscape and have hardened to calcrete in places. **KOA** Fans with slopes of less than 1% and about 15% very low rises with up to 20% surface calcrete stone. **KOE** Drainage depressions with moderately well defined water courses. **KOJ** Drainage depressions with eroded water courses. **KOU** Fans with slopes of less than 1% and up to 20% of the land surface affected by scalding. Main soils: calcareous loam - **A4a** (V), with loam over pedaric red clay - **D4** (L), rubbly calcareous loam - **A4b/A5** (L) and deep calcareous loam - **A3** (L). The pedaric soils occur mainly on scalded areas and the rubbly calcareous soils occur mainly on low stony rises. These soils are deep and well structured. They have moderate natural fertility due to their clay content, although they are alkaline throughout, strongly so at depth. Lime induced nutrient deficiencies can be expected. Moderate subsoil salt and boron levels restrict root zone depth. Erosion of surface soils in the past has exposed these subsoil materials in scalded patches. However, low rainfall is the major limitation to productivity.
KPA	1.1	Outwash fans as for **KOA**, but partly covered by low sand spreads. Soils are as for **KOA**, but with variable depth sandy profiles as well. Wind erosion and reduced fertility are additional limitations.
SRA	7.2	Very low rises formed on rubbly to soft carbonates, generally capping Blanchetown Clay remnants. There is variable surface calcrete stone up to 20%. Main soils: calcareous loam - **A4a** (E) and rubbly calcareous loam - **A4b/A5** (E) with calcareous loam over sheet rock - **B2** (L). These soils have limited value due to their often low waterholding capacity and high alkalinity. Much of the land is undeveloped due to the low rainfall and significant proportion of shallow soils.

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:

A3 Deep calcareous loam (Regolithic, Calcic Calcarosol)
Calcareous loam to clay loam continuing below 100 cm with only minor increases in clay and carbonate content.

A4a Calcareous loam (Regolithic, Hypercalcic Calcarosol)
10 - 20 cm calcareous sandy loam to clay loam becoming more clayey and calcareous at depth with abundant soft carbonate from 35 cm grading to a reddish sandy clay loam to light clay alluvium, or medium to heavy clay (Blanchetown Clay) below 120 cm. Minor quartzite gravel occurs throughout.

A4b/A5 Rubbly calcareous loam (Regolithic, Supracalcic / Lithocalcic Calcarosol)
10 - 20 cm calcareous sandy loam to loam over Class III B or III C rubbly carbonate, over a very highly calcareous light brown sandy clay loam grading to reddish medium to fine grained alluvium or Blanchetown Clay (within 100 cm in 50% of profiles, and deeper than 100 cm in 50%).

B2 Calcareous loam over sheet rock (Petrocalcic Calcarosol)
10 - 20 cm calcareous sandy loam to loam grading to rubbly sandy loam to sandy clay loam abruptly overlying sheet calcrete at 30 cm.

D4 Loam over pedaric red clay (Calcic, Pedaric, Red Sodosol)

5-40 cm fine sandy loam to clay loam abruptly overlying a well structured friable red clay, calcareous from 30 cm, grading to a reddish alluvial clay or Blanchetown Clay from 55 cm. The clay may contain variable quartzite gravel or gypsum crystals. The subsoil clay is friable although sodic (Pedaric) due to moderate salt content. Surface soil may be calcareous from carbonate dusting.

Further information: DEWNR Soil and Land Program