

BEW Bews Land System

(Based on the description by A. K. McCord in "A Description of Land in the Southern Mallee of South Australia")

Plains and dunefields north of the highway between Parrakie and Pinnaroo

Area: 1,206.0 km²

Annual rainfall: 300 – 395 mm average

Geology: The System is underlain, often at shallow depth, by heavy impermeable clay, equivalent to Blanchetown Clay. The clay is typically 200 to 600 cm thick, overlying Tertiary clayey sand to sandy clay (Parilla Sand equivalent). This is exposed in places where the Blanchetown Clay thins out. These sediments are overlain sporadically by remnant highly calcareous deposits of Woorinen Formation. These are generally rubbly. Superimposed on all these materials are dunes of Molineaux Sand.

Topography: The Bews Land System is a very gently undulating plain with broad flats and occasional low rises. Superimposed over the flats and the rises are dune fields of mainly low to moderate parallel sand ridges, with occasional patches of high jumbled dunes.

Elevation: 80 - 100 m

Relief: Less than 10 m

Soils: The characteristic soils are texture contrast types with sandy to clay loamy surfaces over dispersive clayey subsoils. Deep sands are common on rises. Calcareous soils are limited.

Main soils

Sandhill soils

H3 Deep sand

Texture contrast soils on flats

F2a Clay loam to sandy loam over dispersive heavy clay

F2b Sandy loam over dispersive clay

G3 Thick sand over clay

G4 Sand over dispersive red clay

Calcareous soils on flats and rises

A5 Rubbly calcareous loam

Minor soils

Calcareous soils on flats and rises

A6 Calcareous clay loam

Main features: The Bews Land System is a complex landscape of sand dunes and flats. The flats are more extensive and are characterized by mainly sandy loam to clay loam surfaces over dispersive clayey subsoils often at shallow depth. Sandy surfaced soils are less common. These soils are inherently fertile (except for the sandy types) with satisfactory waterholding capacity, and are productive cropping soils. However, irrigation potential is limited by the dispersive clay subsoils and the underlying impermeable Blanchetown Clay. Parts of the landscape have isolated wet moderately saline depressions. The sand rises and dunes are infertile and susceptible



to water repellence and wind erosion. Cropping potential is low, but they are suitable for irrigated horticulture with sound irrigation and tillage management. Calcareous loams occur to a limited extent on low rises and flats. Without the restrictive clay subsoil at shallow depth, these soils are potentially productive.

Soil Landscape Unit summary: 9 Soil Landscape Units (SLUs) mapped in the Bews Land System:

SLU	% of area	Main features #
HeA HeK	7.9 1.6	<p>Flats formed over Blanchetown Clay equivalent at shallow depth. There are minor low sandy rises and sporadic wet and marginally saline depressions.</p> <p>HeA Flats with up to 5% wet and moderately saline depressions. HeK Flats with 5-20% wet and moderately saline depressions.</p> <p>Main soils: <u>clay loam over heavy clay - F2a</u> (E) and <u>sandy loam over dispersive clay - F2b</u> (E), with <u>sand over dispersive clay - G4</u> (C), <u>rubbly calcareous loam - A5</u> (L) and <u>calcareous clay loam - A6</u> (L). The main soils are naturally fertile with moderate to high water holding capacity and low erosion potential. Main limitations are associated with the dispersive clayey subsoils which tend to perch water for a week or so following prolonged rainfall. In wetter depressions drainage is imperfect. Salinity is usually low at the surface, but may increase in the subsoil to moderate levels, moderately high in the wetter depressions. It is more likely that this salinity is linked to a shallow perched water table rather than the regional ground water table. Boron and sodium levels can be expected to be high from about 50 cm. The soils with sandy surfaces have lower fertility and are prone to wind erosion and water repellence. The calcareous soils are well drained and generally favourable for cropping.</p> <p>Irrigation potential is generally moderately low due to the unfavourable subsoil clay at shallow depth and the impermeable Blanchetown Clay layer within a metre.</p>
HfA	11.8	<p>Gently undulating flats formed over Blanchetown Clay equivalent at shallow depth, partially overlain by medium textured highly calcareous Woorinen Formation deposits. There are 10-30% low sandy rises and up to 5% wet and marginally saline depressions.</p> <p>Main soils: <u>clay loam over heavy clay - F2a</u> (E) and <u>sandy loam over dispersive clay - F2b</u> (E) on flats, with <u>deep sand - H3</u> (L-C) on rises and <u>sand over dispersive clay - G4</u> (L), <u>rubbly calcareous loam - A5</u> (L) and <u>calcareous clay loam - A6</u> (L) on gentle undulations and flats. These landscapes are similar to HeA (refer above), but with a higher proportion of deep sandy soils. Sands are highly infertile and prone to water repellence and wind erosion, and are less attractive for farming. They are suitable for irrigation, although saline seepage on lower slopes and adjacent flats will occur under inadequate irrigation management.</p>
HgB	0.4	<p>Undulating rises formed on Woorinen Formation deposits capping Blanchetown Clay equivalent. Typical soil is <u>rubbly calcareous loam - A5</u> (D). These soils are well drained, moderately fertile and with moderate to high water holding capacity depending on volume of rubble and depth to Blanchetown Clay. High carbonate content throughout induces some nutrient element deficiencies. Subsoil salinity may be moderate. Erosion potential is moderately low. Productive capacity is generally high, although irrigation suitability is moderately low due to the underlying clay within 100 cm.</p>
OUA OUF OUI OUJ OUe	0.1 4.4 66.8 5.6 1.4	<p>Complex landscapes of sand rises and dunes alternating with gently undulating flats and swales. The dunes are typically parallel, but higher dunes are usually jumbled. Flats are underlain by Blanchetown Clay equivalent. A veneer of Woorinen Formation sediments commonly overlies the clay on gently undulating rises. There is a higher proportion of sandy surfaced soils on the flats and low rises than in the He and Hf landscapes (see above). There is considerable variability in dune size and frequency:</p> <p>OUA 60-90% high jumbled sand dunes. OUF 60-90% moderate parallel sand ridges. OUI 30-60% moderate parallel sand ridges with minor wet and marginally saline flats. OUJ 30-60% low sand rises with minor wet and marginally saline flats. OUe 30-60% moderate parallel sand ridges superimposed on rises.</p> <p>Main soils: <u>deep sand - H3</u> (E-V) on dunes and sandy rises, with <u>sand over dispersive clay - G4</u> (C), <u>rubbly calcareous loam - A5</u> (C), <u>clay loam to sandy loam over heavy dispersive clay - F2a/F2b</u> (C) and <u>thick sand over clay - G3</u> (L) on intervening flats or gentle slopes. The predominant sandy soils are infertile and prone to water repellence and wind erosion. As such they have low cropping potential. However, they have potential for irrigated horticulture, provided that irrigation scheduling is controlled to prevent seepage at the</p>



	dune-flat interface. The soils of the flats, swales and slopes have similar characteristics to those of HfA . Sporadic patches in OUI and OIJ are prone to waterlogging and are marginally saline.
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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:

Texture contrast soils on flats

F2a Clay loam over heavy clay (Calcic, Brown Sodosol)

Thin clay loam abruptly overlying a coarsely prismatic, dispersive brown heavy clay, moderately calcareous throughout, grading to Blanchetown Clay equivalent within 50 cm. Seasonal cracking is common.

F2b Sandy loam over dispersive clay (Hypercalcic, Brown Sodosol)

Medium thickness fine sandy loam abruptly overlying a prismatic dispersive brown clay, highly calcareous throughout, grading to Blanchetown Clay equivalent within 60 cm.

G3 Thick sand over clay (Calcic, Red / Brown Sodosol)

Thick loose sand with a bleached A2 layer, abruptly overlying a red or brown mottled clay with coarse columnar structure, calcareous with depth, grading to Blanchetown Clay equivalent.

G4 Sand over dispersive red clay (Hypercalcic, Red Sodosol)

Medium thickness loamy sand to sand with a bleached A2 layer, abruptly overlying a coarsely columnar red sandy to medium clay, highly calcareous from about 40 cm, grading to Blanchetown Clay equivalent within 100 cm.

Calcareous soils on flats and rises

A5 Rubby calcareous loam (Regolithic, Lithocalcic / Supracalcic Calcarosol)

Calcareous sandy loam becoming more clayey and calcareous with depth, over rubby Class III B or III C carbonate from about 20 cm. Carbonate layer grades to a very highly calcareous clay with little rubble, and into Blanchetown Clay equivalent within 70 cm.

A6 Calcareous clay loam (Pedal, Calcic Calcarosol)

Calcareous clay loam grading to a very highly calcareous light to medium clay, over Blanchetown Clay as shallow as 30 cm.

Sandhill soils

H3 Deep sand (Calcareous, Arenic, Bleached-Orthic Tenosol)

Thin brown loose sand, bleached from shallow depth, and grading to a reddish brown sandy loam with minor soft carbonate below 100 cm.

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

