

BRB Barabba Land System

Complex of undulating low stony rises and dunefields in the Barabba district

Area: 101.3 km²

Annual rainfall: 375 – 440 mm average

Geology: The Land System is underlain by heavy clays of late Tertiary / early Pleistocene age, probably Hindmarsh Clay. These are overlain by medium to fine grained highly calcareous aeolian materials (Woorinen Formation) which have been partially cemented into rubbly forms. Dissolution and erosion of the Woorinen deposits have re-exposed the older clays over some of the area. More recently, wind blown sand has been deposited and reworked into dune - swale formations. These partly cover both of the pre-existing land surfaces.

Topography: The topography closely reflects the geological history of the area. Low lying flats occur on Hindmarsh Clay deposits exposed by the dissolution and erosion of overlying Woorinen carbonates. Gently undulating stony rises are formed on remaining Woorinen deposits, and low dunefields of Molineaux Sand are draped across both rises and flats.

Elevation: 142 m in the east to 40 m in the west

Relief: Maximum relief is 25 m

Soils: Calcareous sandy loams are predominant, with loamy and sandy texture contrast soils, and deep sands.

Main soils

- A4a** Rubbly calcareous loam
- A6** Calcareous loam
- D3** Loam over dispersive red clay
- H2** Deep sand

Minor soils

- D2** Loam over red clay
- A4b** Calcareous sandy loam
- G1** Loamy sand over red sandy clay
- C1** Gradational sandy loam
- F2** Sandy loam over dispersive brown clay

Main features: The Barabba Land System is a typical complex of mallee landscapes and soils. It includes:

- "Heavy" flats with medium to fine textured soils characterized by deep profiles and moderately high fertility, but often poor soil structure, high pH and subsoil accumulations of salt and boron.
- Stony rises characterized by medium textured calcareous soils, generally with significant carbonate rubble at shallow depth. Low moisture holding capacity and some nutrition problems are likely limitations.
- Dunefields with infertile, wind erosion prone soils on the rises and swale soils similar to soils of the stony rises and the heavy flats.



Soil Landscape Unit summary: 5 Soil Landscape Units (SLUs) mapped in the Barabba Land System:

SLU	% of area	Main features #
HJA	14.3	<p>Flats with slopes of less than 1% formed on Hindmarsh Clay.</p> <p>Main soils: <u>loam over red clay</u> - D2 (E), with <u>sandy loam over dispersive red clay</u> - D3 (L), <u>calcareous loam</u> - A6 (L), <u>calcareous sandy loam</u> - A4b (M) and <u>gradational sandy loam</u> - C1 (M). These soils are deep and moderately fertile but the predominant D2 and D3 soils have poorly structured hard setting surfaces. In addition, the D3 soils have dispersive clay subsoils. Reduced infiltration, subsurface waterlogging, patchy emergence and restricted workability are possible consequences. Use of gypsum and modified surface management practices can alleviate the problem to some extent. The calcareous soils are better structured, but there is some risk of high pH induced nutrient deficiencies. The underlying clayey substrate material restricts deep percolation of water, so high salt and boron levels can be expected in the subsoil.</p>
SbA	54.5	<p>Low rises with slopes of 1-3% formed on highly calcareous medium textured sediments. Rubbly forms of carbonate (Classes III B/C) account for half of the calcareous materials. There is up to 20% surface calcrete stone. Soils on lower slopes and in depressions are usually formed on clay (similar to HJA).</p> <p>Main soils: <u>rubbly calcareous loam</u> - A4a (V), with <u>calcareous sandy loam</u> - A4b (M) on rises, and <u>loam over dispersive red clay</u> - D3 (L), <u>calcareous loam</u> - A6 (L), <u>gradational sandy loam</u> - C1 (M) and <u>sandy loam over dispersive brown clay</u> - F2 (M) on lower slopes. These soils are moderately fertile and well drained, but often shallow. Moisture stress in spring time is likely to be a significant limitation, particularly in dry finishes. The other important management concern is nutrition on calcareous soils.</p>
U-C UFI UFJ	0.5 25.3 5.4	<p>Dune-swale systems with 30-60% dune coverage. The dunes overlie the older Hindmarsh Clay and Woorinen Formation landscapes of HJA and SbA. Two thirds of the soils in the swales are formed on Woorinen Formation (usually higher level swales), one third on Hindmarsh Clay.</p> <p>U-C Isolated single low dunes without a swale component. UFI Dunefields with low to moderate mainly arable dunes. UFJ Dunefields with fully arable low dunes.</p> <p>Main soils: Dunes: <u>Deep sand</u> - H2 (V), with <u>loamy sand over red sandy clay</u> - G1 (C) and <u>calcareous sandy loam</u> - A4b (M). Swales: <u>Rubbly calcareous loam</u> - A4a (V) and <u>calcareous loam</u> - A6 (E). The dunes, although mostly arable, are nevertheless difficult to manage due to the low fertility status of the soils and the constant risk of wind erosion. Some have been eroded in the past. The soils of the swales are potentially more productive, but the rubbly forms are subject to moisture deficit in spring. The main difficulty lies in managing the system as a whole, a problem made more difficult because property and paddock boundaries generally are not parallel to dune systems.</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:

- A4a** Rubbly calcareous loam (Regolithic, Supracalcic / Lithocalcic Calcarosol)
10 - 30 cm calcareous sandy loam to loam grading to a highly calcareous brown loam to clay loam over rubbly Class III B/C carbonate at 35 cm, becoming less rubbly and more clayey with depth.
- A4b** Calcareous sandy loam (Regolithic, Hypercalcic Calcarosol)
10 - 25 cm soft calcareous sandy loam grading to a highly calcareous sandy clay loam with abundant fine carbonate from 35 cm.
- A6** Calcareous loam (Pedal, Hypercalcic Calcarosol)
10 - 30 cm calcareous loam to clay loam grading to a highly calcareous brown clay loam to clay with abundant fine Class I carbonate from 35 cm, over heavy clay at 80 cm.
- C1** Gradational sandy loam (Hypercalcic / Lithocalcic, Red Kandosol)
10 - 30 cm sandy loam to sandy clay loam grading to a weakly structured red sandy clay loam to sandy clay, with abundant fine to rubbly carbonate from about 35 cm, grading to clayey substrate.
- D2** Loam over red clay (Hypercalcic, Red Chromosol)
10 - 40 cm hard loam to clay loam over a well structured red clay, calcareous from about 45 cm, grading to medium to heavy clay with depth.
- D3** Sandy loam over dispersive red clay (Hypercalcic, Red Sodosol)
15 - 40 cm hard sandy loam abruptly overlying a coarsely structured dispersive red clay, calcareous from 50 cm, grading to heavy clay at 100 cm.
- F2** Sandy loam over dispersive brown clay (Calcic, Brown Sodosol)
20 - 30 cm hard sandy loam with a bleached A2 layer over a very hard massive sandy clay loam grading to a hard coarsely structured dispersive brown heavy clay, calcareous from about 65 cm.
- G1** Loamy sand over red sandy clay (Hypercalcic / Lithocalcic, Red Chromosol)
20 - 50 cm soft loamy sand abruptly overlying a weakly structured red sandy clay loam, calcareous from 55 cm.
- H2** Deep sand (Calcareous, Arenic / Regolithic, Red-Orthic Tenosol)
50 cm or more loose loamy sand grading to a red clayey sand to sandy loam over fine or rubbly carbonate from 70 cm.

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

