

**MUR**

# Murbko Land System

(Based on the description by Potter, Wetherby and Chittleborough (1973) in "A Description of the Land in County Albert, County Alfred and Part of County Eyre, South Australia". Dept. of Agric. S.A. Soil Cons. Branch LD1).

Scattered but well defined dunefields along the eastern edge of the River Murray from Morgan to Nildottie

**Area:** 470.9 km<sup>2</sup>

**Annual rainfall:** 240 – 300 mm average

**Geology:** The System comprises two geological features. Underlying the entire area, and exposed on lower lying areas, is calcrete in sheet but more commonly rubbly form. Overlying a large proportion of the landscape are deposits of windblown Molineaux Sand.

**Topography:** The System is a gently undulating calcrete plain, stony where the calcrete is exposed on some flats. Extensive dunefields are superimposed on the plains. These vary from gentle sandy rises to high parabolic and jumbled dunes, which are highly unstable once exposed.

**Elevation:** 38 - 75 m

**Relief:** 6 - 15 m

**Soils:** Deep sands characterize the sandy rises. Loamier, usually calcareous, soils are typical of flats and low stony rises.

Main soils

*Sandy rises*

**H2a** Deep calcareous sand

*Sandhills*

**H2b** Deep sand

*Flats and non-sandy rises*

**A4** Calcareous loamy sand

**C1** Gradational sandy loam

Minor soils

*Flats and non-sandy rises*

**B2** Shallow calcareous sandy loam

**Main features:**

The Murbko Land System is a gently undulating series of dunefields and flats. The dunes are the characteristic feature of the System. A significant proportion are high and unstable and there is widespread evidence of past erosion. The smaller sandhills are less susceptible, but nevertheless require specialized soil conservation management. The flats and swales between the sandhills have either moderately shallow rubbly calcareous loamy sands which are arable although with limited productive potential due to shallow depth, or very shallow stony soils which are effectively non arable. These are often associated with low sandy rises.



**Soil Landscape Unit summary:** 12 Soil Landscape Units (SLUs) mapped in the Murbko Land System:

SLU	% of area	Main features #
QMA QME QOA	4.2 0.3 8.9	<p>Stony flats and low benches formed on hard calcrete, partially overlain by low sand ridges.</p> <p><b>QMA</b> Flats and benches with less than 10% sand ridges</p> <p><b>QME</b> Depressions.</p> <p><b>QOA</b> Flats with 10-30% low sand ridges.</p> <p>Main soils: <u>shallow calcareous sandy loam</u> - <b>B2</b> (V) with <u>calcareous loamy sand</u> - <b>A4</b> (L), and <u>deep calcareous sand</u> - <b>H2a</b> (M-C) on sand ridges. The majority of soils are non arable due to shallow profiles and extensive surface stone and sheet calcrete. The A4 soils are sometimes arable, but low water holding capacity is a moderate to severe limitation. The sandy soils of QOA are infertile and prone to wind erosion. Although arable, their low productive potential combined with their association with shallow B2 soils makes them very difficult to manage.</p>
SgA SgB	13.2 4.3	<p>Very gently undulating flats and rises formed on rubbly Bakara Calcrete, overlain by up to 30% low sandy rises. There is patchy but generally minor surface stone.</p> <p><b>SgA</b> Flats</p> <p><b>SgB</b> Rises</p> <p>Typical soils: <u>calcareous loamy sand</u> - <b>A4</b> (V) and <u>gradational sandy loam</u> - <b>C1</b> (L), with <u>deep calcareous sand</u> - <b>H2a</b> (M-C) on sandy rises. This land represents the more productive parts of the Murbko System, due to a higher proportion of deeper, non-sandy soils. The land is fully arable, although some soils have limited waterholding capacity. There are moderate amounts of salt in the subsoils. The sandy rises have low fertility and are prone to wind erosion. These landscapes, where they occur near the River Murray, are sometimes irrigated. Some saline seepage can be expected.</p>
UME UMF UMG UMH UMI UMJ UMK	5.2 25.0 8.4 2.5 4.5 22.2 1.5	<p>Dunes and sand spreads of Molineaux Sand. The swales and flats between the rises are underlain by rubbly Bakara Calcrete. There is considerable variation in sandhill height and coverage:</p> <p><b>UME</b> 60-90% high parabolic to jumbled dunes</p> <p><b>UMF</b> 60-90% moderate sandhills</p> <p><b>UMG</b> 60-90% low sandhills</p> <p><b>UMH</b> 30-60% high parabolic to jumbled dunes</p> <p><b>UMI</b> 30-60% moderate sandhills</p> <p><b>UMJ</b> 30-60% low sandhills</p> <p><b>UMK</b> Sand spreads and rises</p> <p>Typical soils: <u>deep sand</u> - <b>H2b</b> (E-C) on dunes and sandhills, <u>deep calcareous sand</u> - <b>H2a</b> (E-C) on sandhills, sandy rises and sandy swales, and <u>calcareous loamy sand</u> - <b>A4</b> (C-L) and <u>gradational sandy loam</u> - <b>C1</b> (L-C) in lower lying swales and on non sandy rises. These areas are characterized by deep, low fertility soils prone to wind erosion. Water repellence is a problem in some years. Many of the sandhills have extreme wind erosion potential. The larger sandhills are commonly still under scrub. Most of those that are not are either drifting or have drifted in the past. These require specialized stabilization management. The moderate to low sandhills, although arable, are also a wind erosion hazard. The sandy rises near the river are commonly irrigated. The intervening swales are similar to SgA, but usually sandier.</p>

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

- |     |  |     |                                   |
|-----|--|-----|-----------------------------------|
| (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:****A4** Calcareous loamy sand (Regolithic, Supracalcic / Lithocalcic Calcarosol)

Medium thickness calcareous loamy sand over a rubbly sandy loam over gritty semi hard carbonate at about 50 cm, grading to a highly calcareous yellow sandy clay loam at about 100 cm.

**B2** Shallow calcareous sandy loam (Petrocalcic, Lithocalcic Calcarosol)

Thin calcareous sandy loam to light sandy clay loam over a highly calcareous sandy clay loam with abundant carbonate nodules on sheet calcrete at about 30 cm.

**C1** Gradational sandy loam (Calcic, Red Kandosol)

Friable sandy loam, gradually becoming more clayey and calcareous with depth, over nodular or sheet calcrete

**H2a** Deep calcareous sand (Hypercalcic Calcarosol)

Thick slightly calcareous red brown sand grading to a paler coloured and highly calcareous sand over soft to semi-hard carbonate at about 200 cm.

**H2b** Deep sand (Calcareous, Regolithic, Red-Orthic Tenosol)

Thick non calcareous red brown sand over a red sandy loam, grading to a brown calcareous sand continuing below 150 cm.

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

