# BMR Barmera Land System

This system includes most of the Berri - Cobdogla - Barmera irrigation areas. A detailed survey of soils in these areas was compiled by Marshall and Hooper (1935) - A Soil Survey of the Berri, Cobdogla, Kingston and Moorook Irrigation Areas, and the Lyrup Village District, South Australia. CSIR Bulletin No. 86. To achieve compatibility with the state mapping program, this description is a generalization of the older survey, which should be consulted for details.

Gently undulating flats and rises between Cobdogla and Berri.

**Area**: 95.1 km$^2$

**Annual rainfall**: 245 – 260 mm average

**Geology**: The land is underlain by Loxton / Parilla Sands, partly veneered by Blanchetown Clay. These sediments are exposed in lower lying areas. Highly calcareous medium grained windblown sediments (Woorinen Formation) overlie these materials. In places the calcareous deposits have hardened to rubbly forms. Low dunes of Molineaux Sand are superimposed over the landscape.

**Topography**: The landscape is gently undulating. Broad flats alternate with low rounded rises and low east - west oriented sandhills. Most of the land is used for irrigated horticulture. In the west adjacent to Lake Bonney is an area of flats and low rises with high salinity and gypsum deposits which may be the remnants of an older lake. These areas are not irrigated.

**Elevation**: 20 - 50 m

**Relief**: Up to 10 m

**Soils**: The soils include deep sands on sandhills, with gradational sandy loams on flats and rises. These are both calcareous and non calcareous. Some are rubbly. Typical soils (with equivalent Marshall and Hooper (1935) names) are:

Main soils

*Slopes*

**C1/D2** Gradational sandy loam (Barmera Sandy Loam)

**A4a** Red calcareous sandy loam (Berri Sandy Loam)

**A4b** Grey calcareous sandy loam (Moorook Sandy Loam)

*Lower slopes and flats*

**A4c** Rubbly calcareous sandy loam (Loveday Sandy Loam)

**C1** Gradational sandy loam (Nookamka Sandy Loam)

*Sandhills*

**H2** Deep sand (Winkie Sand)

Minor soils

**G1** Gradational sand (Berri Sand)

**Main features**: Characterized by flats, rises and sandhills with sandy to sandy loam soils, most of which are more clayey and highly calcareous with depth (exceptions are deep sands of the sandhills). Most of the land is irrigated. The heaviest soils are on the flats, where impeded deep drainage coupled with seepage from higher ground has led to the development of some salinity problems. The rises are generally satisfactory for irrigation with better drainage due to position and sandier soils. The sandhills have the least fertile soils, but they are well (even excessively drained) and not subject to salinity. In the west is an area of naturally saline land which has little agricultural or horticultural value.

**Soil Landscape Unit summary:** 7 Soil Landscape Units (SLUs) mapped in the Barmera Land System:

| SLU | % of area | Main features # |
|---|---|---|
| SDA<br>SDK | 22.3<br>25.4 | Gently undulating land with some saline seepage, depending on irrigation history.<br>**SDA** Flats with little saline seepage.<br>**SDK** Flats with minor to moderate saline seepage.<br><br>Main soils: the Loveday - **A4c** (E), Nookamka - **C1** (C), Barmera - **C1/D2** (C), Berri - **A4a** (L) and Moorook - **A4b** (L) Sandy Loams. These soils all have sandy loam surfaces with increasing clay content at depth. Differences are due to amount and type (ie soft or rubbly) carbonate, and drainage characteristics. The Barmera and Nookamka types were considered by Marshall and Hooper to be the most favourable irrigation soils, the others being susceptible to waterlogging. Moorook and Loveday soils have naturally high levels of salt, and the Berri soils are susceptible to waterlogging. Past irrigation practices have led to seepage on lower slopes. This condition is more pronounced in **SDK**. |
| SIB | 25.1 | Gently undulating low rises with 10-30% low sandhills.<br>Main soils: Barmera and Berri Sandy Loams - **C1/D2** (E) and **A4a** (C) on the lower slopes, with Berri Sand - **G1** (L) on the higher ground and Winkie Sand - **H2** (C) on the sandhills. These areas are generally suitable for irrigation, although water tables can develop, especially in the Berri Sandy Loam. |
| SSQ | 5.3 | Gently undulating rises with 10-30% low east-west sandhills.<br>Main soils: Loveday and Moorook Sandy Loams - **A4c** (E) and **A4b** (E), with Berri and Winkie Sands - **G1** (L) and **H2** (L) on sandhills. The landscape is moderately saline with some highly saline depressions. |
| UFJ | 13.8 | Gently undulating low rises with 30-60% low sandhills.<br>Main soils: Winkie and Berri Sands - **H2** (C) and **G1** (C) on the sandhills and upper slopes, with Berri and Barmera Sandy Loams - **A4a** (C) and **C1/D2** (C) on the mid slopes. These areas are well suited to irrigation due to the satisfactory drainage of the main soils. |
| ZA- | 6.1 | Moderately to highly saline flats.<br>Main soils: marginally saline variants of Loveday - **A4c** (E), Nookamka - **C1** (E) and Moorook - **A4b** (L) Sandy Loams, often with gypsum. There are patches of highly saline land. These flats are generally non arable due to elevated salinity. |
| ZB- | 2.0 | Saline seepage depressions. The majority of land is highly saline, with about a third marginally saline. These areas have no agricultural value. |

# 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**:

The soil type names of Marshall and Hooper (1935) are included as well as the code, common name and Australian Soil Classification. The soils are listed in alphabetic order according to the two character soil code.

**A4a** Red calcareous sandy loam (Calcic / Hypercalcic Calcarosol)
(Berri Sandy Loam)
Medium thickness moderately calcareous red brown sandy loam grading to a light brown calcareous sandy loam over a calcareous sandy clay loam from about 75 cm, continuing to about 300 cm, below which the carbonate content decreases. Clay content may increase at depth to sandy light clay.

**A4b** Grey calcareous sandy loam (Hypercalcic / Supracalcic Calcarosol)
(Moorook Sandy Loam)
Medium thickness grey brown calcareous sandy loam over a highly calcareous sandy loam with up to 40% carbonate rubble, grading to a very highly calcareous sandy loam to sandy clay loam with variable carbonate nodules. From about 150 cm, the soil becomes greyer and more clayey. Grey clay continues to 350 cm.

**A4c** Rubbly calcareous sandy loam (Supracalcic Calcarosol)
(Loveday Sandy Loam)
Medium thickness calcareous sandy loam over highly calcareous light brown loam with up to 40% carbonate rubble grading to a highly calcareous sandy clay loam with rubble, becoming more clayey and less calcareous below 100 cm. From 150 cm, soil is a reddish brown medium clay, which becomes sandier with depth.

**C1** Gradational sandy loam (Calcic, Brown Kandosol)
(Nookamka Sandy Loam)
Medium thickness sandy loam over a light brown calcareous sandy clay loam grading to a light brown sandy clay from about 60 cm. This continues to about 150 cm where it overlies a reddish brown calcareous medium clay. From about 250 cm, the soil becomes sandier.

**C1/D2** Gradational sandy loam (Calcic, Red Kandosol)
(Barmera Sandy Loam)
Thick red brown sandy loam grading to a light reddish brown calcareous loam over a calcareous sandy clay loam from about 60 cm. Carbonate content decreases with depth. Between about 150 cm and 300 cm soil is reddish brown sandy clay loam to sandy clay, but may become sandier below this depth.

**G1** Gradational sand (Calcic, Red Kandosol)
(Berri Sand)
Thick red brown sand grading to a light reddish brown calcareous sandy loam over a calcareous sandy clay loam from about 60 cm, continuing below 150 cm.

**H2** Deep sand (Calcareous, Arenic, Red-Orthic Tenosol)
(Winkie Sand)
Very thick loose red brown sand, paler coloured with depth over a moderately calcareous sand to sandy loam continuing below 150 cm. Reddish brown sand with variable carbonate may continue to 350 cm. Increase in clay content to sandy clay loam may occur below this depth.

**Further information:** DEWNR Soil and Land Program