

# MAR Martini Land System

Very gently undulating plains on the eastern edge of the Everard flats, north west of Bowillia

**Area:** 91.3 km<sup>2</sup>

**Annual rainfall** 360 – 385 mm average

**Geology:** Clay deposits (often gypseous), probably old lake floor sediments, largely overlain by highly calcareous, mainly fine grained, windblown sediments. These have hardened over much of the area to rubbly and sheet calcrete (Bakara Calcrete).

**Topography:** Very gently undulating plain characterized by very low stony rises on rubbly calcrete, low benches on sheet calcrete, and non stony flats where the gypseous clay is at the surface. The rises have slopes of 1 - 2%; the flats are less than 1%. The larger flats mark the paths of old watercourses draining south westwards to the Everard salt flats. There are some small saline depressions adjacent to the Everard Land System.

**Elevation:** 60 to 100 m

**Relief:** Maximum relief on the gentle undulations is 5 m

**Soils:** Deep calcareous loams and clay loams are characteristic. They are associated with shallow stony soils on calcrete (rises) and deep loamy texture contrast and gradational soils on flats.

#### Main soils

**A5** Rubbly calcareous loam - very extensive (rises, flats)

**A6** Calcareous clay loam - common (flats)

#### Minor soils

**B2** Calcareous sandy loam over calcrete - stony benches

**D3** Hard loam over dispersive red - flats

**C4** Gradational clay loam - flats

**Main features:** The Martini Land System is a very gently undulating plain characterized by low stony rises or benches with rubbly calcareous soils. These have restricted water holding capacities and fertility problems associated with high carbonate and pH throughout the profile. Between the rises are flats with deeper calcareous loams and loam over clay soils with greater water holding capacities, but with restricted rootzone depths caused by moderate subsoil salinity and boron levels. Minor land types include stony benches with very shallow stony sandy loams on sheet calcrete, and swampy depressions with wet highly saline soils. The combination of these soil limitations and low rainfall results in low productive potential.



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

SLU	% of area	Main features #
IAA IAE	15.8 3.0	Depressions underlain by coarsely structured red clay. <b>IAA</b> Closed depressions. <b>IAE</b> Drainage depressions with gradients of less than 1%.  Main soils: <u>calcareous clay loam</u> - <b>A6</b> (E), with <u>rubbly calcareous loam</u> - <b>A5</b> (C), <u>hard loam over dispersive red clay</u> - <b>D3</b> (L) and <u>gradational clay loam</u> - <b>C4</b> (L). The soils are medium to fine textured and alkaline with a heavy, impermeable clay at depths ranging from 70 to 100 cm. Where this clay is shallow, restricted rootzones and reduced waterholding capacity are limitations. These soils also have high subsoil boron concentrations which are associated with moderate salinity, high sodicity and pH. The soils have high productive potential, provided that these limitations are deeper than about 75 cm. Flooding and associated siltation are occasional problems in IAE.
QKA	5.0	Low very gently undulating rises and benches with up to 20% surface calcrete stone cover and slopes of less than 2%, formed on sheet and rubbly calcrete of the Bakara Formation. The calcrete is underlain at depth (100-200 cm) by a red coarsely structured heavy clay.  Main soils: <u>calcareous sandy loam over calcrete</u> - <b>B2</b> (V) with <u>rubbly calcareous loam</u> - <b>A5</b> (C). Shallowness, stoniness and marginal fertility are the major soil limitations. These features, when considered with the low rainfall, indicate poor potential productivity.
SbA	75.4	Very gently undulating plain characterized by a complex of very low rises formed on rubbly carbonate, and depressions underlain by heavy clay sediments. The rises have up to 20% surface cover of calcrete pebbles and stones.  Main soils: <u>rubbly calcareous loam</u> - <b>A5</b> (V) on rises, with <u>calcareous clay loam</u> - <b>A6</b> (L) on flats, <u>calcareous sandy loam over calcrete</u> - <b>B2</b> (M) on rises and <u>gradational clay loam</u> - <b>C4</b> (M) on flats. The land is characterized by shallow stony soils and low rainfall resulting in permanent restrictions on productivity. Additional limitations include fertility problems induced by the high carbonate content and pH of the soils, and the moderately shallow depth to toxic levels of boron and associated salinity.
VAD	0.3	Samphire and saltbush flats formed on gypseous clay lakebed sediments. The flats are highly saline and wet for extended periods. They are only suitable for light grazing due to the low productivity and fragility of the vegetation. As well as being wet and saline, all soils are highly alkaline and have very high levels of sodium and boron near the surface.
VGB	0.5	Marginally saline flats formed on old gypseous lake floor sediments.  Main soil: <u>calcareous clay loam</u> - <b>A6</b> (D). The flats are marginally saline, limiting their cropping options and productive potential. Toxic boron levels and high pH further reduce production.

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

(D) Dominant in extent (&gt;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 (&lt;10% of SLU)



**Detailed soil profile descriptions:**

- B2** Calcareous sandy loam over calcrete (Petrocalcic, Lithocalcic Calcarosol)  
Calcareous sandy loam to clay loam with abundant calcrete fragments and nodules over sheet calcrete at about 25 cm.
- A5** Rubbly calcareous loam (Regolithic, Supracalcic / Lithocalcic Calcarosol)  
Calcareous sandy loam to clay loam grading to Class III B or III C carbonate rubble at about 30 cm, overlying a very highly calcareous light clay with decreasing rubble content, with a reddish clay from about 80 cm.
- A6** Calcareous clay loam (Pedal, Hypercalcic Calcarosol)  
Calcareous clay loam to light clay grading to a highly calcareous reddish well structured clay with soft Class I carbonate from about 40 cm, over substrate clay at about 80 cm.
- C4** Gradational clay loam (Hypercalcic, Red Dermosol)  
Medium thickness hard loam to light clay grading to a coarsely structured red clay with fine Class I carbonate from about 40 cm, overlying substrate clay at about 70 cm.
- D3** Hard loam over dispersive red clay (Hypercalcic, Red Sodosol)  
Medium thickness hard sandy loam to clay loam sharply overlying a dispersive red clay with soft Class I carbonate from about 40 cm grading to substrate clay at about 100 cm.

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

