

## WET BLACK CLAY ON MARL

**General Description:** *Well structured black clay over highly calcareous marly clay with a shallow watertable*

**Landform:** Low plain

**Substrate:** Marly clay of the Padthaway Formation

**Vegetation:** Saltwater tea tree



**Type Site:** Site No.: SE105

1:50,000 sheet:	6924-3 (Minecrow)	Hundred:	Minecrow
Annual rainfall:	600 mm	Sampling date:	26/09/05
Landform:	Level plain. Watertable at 78 cm.		
Surface:	Firm with no stones		

### Soil Description:

<i>Depth (cm)</i>	<i>Description</i>
0-19	Very dark grey light clay with fine polyhedral structure. Many roots present. Abrupt to:
19-30	Moist dark grey calcareous light medium clay with light grey mottles. Fine polyhedral structure, with many roots present. Sharp to:
30-41	A fragmented and very strongly cemented calcrete pan with seams of moist massive highly calcareous light grey light clay (10% of volume). Roots common. Sharp to:
41-61	Moist massive highly calcareous white sandy light clay (30% of volume) with many coarse calcarenite fragments. No roots present. Abrupt to:
61-78	Wet greyish brown clay loam with fine polyhedral structure. Sharp to:
78+	Watertable



**Classification:** Melanic, Petrocalcic, Lithocalcic, Calcarosol; medium, non-gravelly, clayey/clayey, shallow, or:  
Petrocalcic, Calcarosolic, Salic Hydrosol; medium, non-gravelly, clayey/clayey, shallow

## Summary of Properties

- Drainage:** Due to its good structure, the upper profile is quite permeable for a clay soil. The rubbly lower profile is also likely to be quite permeable. However, site drainage is poor due to the low flat topography and the presence of a shallow watertable.
- Fertility:** As indicated by the CEC in the table below, inherent fertility is naturally very high. P levels are adequate for pasture. K status is high, probably relating to the mineralogy of the clay. Sulphate sulphur is very high.
- pH:** Slightly alkaline at the surface, becoming very strongly alkaline below 10 cm. Alkaline soils with a pH greater than 8.4 are generally influenced by sodium bicarbonate, and are sodic. Soil pH greater than 9.2 in water is likely to restrict root growth.
- Rooting depth:** 41 cm.
- Barriers to root growth:**
- Physical:** No physical barriers in top 30 cm. Poorly structured clay occurs between 30 cm and 61 cm. A calcrete pan is present at 30 cm, however, this is fractured, allowing roots beyond this point. The carbonate gravel significantly reduces waterholding capacity between 30 and 61 cm. A fluctuating watertable is likely to saturate the lower part of the profile for significant periods.
- Chemical:** The soil is highly alkaline throughout much of the profile, and the soil is highly sodic below 10 cm. The moderate level of soil salinity will inhibit some plant species, however, the high pH and exchangeable sodium levels will be the dominant inhibitors of pasture growth. The high sodicity may also degrade the surface soils structure if the soil becomes non-saline enough to be dispersive.
- Water holding capacity:** Total available water is estimated to be around 45 mm within the root zone.
- Seedling emergence:** Fair to good. The clay surface may seal over and reduce emergence.
- Workability:** Fair. Clayey surface will become sticky and intractable when wet. Access will be restricted during the winter months, and the watertable may come to the surface.
- Erosion Potential:**
- Water:** Low
- Wind:** Low

## Laboratory Data

Depth cm	pH H <sub>2</sub> O	pH CaCl <sub>2</sub>	N mg/kg	CO <sub>3</sub> %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	Cl mg/kg	SO <sub>4</sub> -S mg/kg	Iron mg/kg	Trace Elements mg/kg (EDTA)				CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
													Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
0-10	7.5			0.3	0.25		2.1									18	6.6	5.7	0.8	1.2	4.4	
0-19	8.2	7.4	9	0.4	0.311		1.8	23	405		60.9	312				25	7.4	9.8	2.3	1.7	9.2	
19-30	9.3	8.3	5	7.4	0.367		0.53	7	589		84.5	410				36	7.3	17.0	8.8	2.7	24.4	
30-41	10.1			74.4	0.44		0.1									9	1.4	5.0	3.3	0.6	36.7	
41-61																						
61-69	9.2	8.0	8		0.294		0.48	2	475		77.4	323										
69-78	9.4			14.1	0.82		0.2									21	2.4	10.0	5.5	2.2	26.2	

**Note:** CEC figures were measured independently of exchangeable cations, using NH<sub>4</sub> extraction. ESP (exchangeable sodium percentage) is derived by dividing the exchangeable sodium value by the CEC. Shaded data estimated from samples collected in same pit on 23/03/05, mainly at 10 cm depth intervals.