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.:   SE107

1:50,000 sheet:	6924-4 (Gyp Gyp)	Hundred:	Landseer
Annual rainfall:	600 mm	Sampling date:	26/09/05
Landform:	Level plain		
Surface:	Firm, with no stones. Watertable at 65 cm.		

Soil Description:

Depth (cm)	Description
0-14	Moist slightly calcareous very dark grey light clay with fine polyhedral structure. Many roots present. Clear to:
14-22	Wet dark grey highly calcareous light clay with grey mottles. Fine polyhedral structure, with roots common. Gradual to:
22-41	Wet greyish brown weakly polyhedral highly calcareous light clay. Roots common. 7% fine calcrete gravel. Abrupt to:
41-50	Wet massive slightly calcareous dark greyish brown light medium clay. An occasional root present. Abrupt to:
50-68	Very abundant calcrete gravel (70%), with wet firm greyish brown calcareous light clay. Sharp to:
68+	Watertable and calcrete pan.

Classification: Melanic, Marly, Hypercalcic, Calcarosol; medium, non-gravelly, clayey / clayey, moderate
          or
          Calcarosolic, Salic Hydrosol; medium, non-gravelly, clayey / clayey, moderate

Summary of Properties

Drainage: Due to its good structure, the upper profile is quite permeable for a clay soil. Water is likely to perch on the more poorly structured clay sub soil. 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 high.

pH: Strongly alkaline throughout. Soil pH greater than 9.2 in water generally restricts root growth, and tolerant pasture species will be required.

Rooting depth: Most roots are restricted to the top 41cm of soil. An occasional root may be found below this to a depth of 68cm.

Barriers to root growth:

Physical: No physical barriers in top 30cm. Poorly structured clay occurs between 30cm and 61cm. A calcrete pan is present at 30cm, however, this is fractured, allowing roots beyond this point. The carbonate gravel will significantly reduce the waterholding capacity of the soil between 30 and 61cm. A fluctuating watertable is likely to saturate the lower part of the profile for significant periods.

Chemical: The soil is strongly alkaline and strongly sodic throughout. The moderate level of salinity in the soil surface and higher salinity in the subsoil appears to be maintaining a stable structure in soils that would otherwise be highly dispersive under non-saline conditions. The salinity will inhibit some plant species, however, the extreme pH and exchangeable sodium levels will be the dominant inhibitors of pasture growth.

Water holding capacity: Total available water is estimated to be around 55mm 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_2O	pH $CaCl_2$	N mg/kg	CO_3 %	EC 1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	Cl mg/kg	SO_4-S mg/kg	Iron mg/kg	Trace Elements mg/kg (EDTA) Cu	Fe	Mn	Zn	CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg Ca	Mg	Na	K	ESP
0-10	9.9			11.5		0.73	2.7										29	5.3	9.3	13.0	2.4	44.8
0-14	9.0	7.9	19		0.201		3.3	30	666		22.3	866										
14-22	9.4	8.0	7	22.7	0.25	1.07	1.68	18	764		21.4	641					28	3.7	10.0	13.0	2.0	46.4
22-41	9.5	8.3	3	41.8	0.67	1.43	0.63	11	688		21.8	391					23	2.2	10.2	12.5	2.5	54.3
41-50	9.4	8.5	4	54.3	0.736	1.35	0.53	3	925		17.3	812					19	2.8	8.5	7.7	2.0	40.5
50-68	9.5	8.3	3		0.649		0.48	7	560		15.2	291										

Note: CEC figures measured independently of exchangeable cations, using NH_4 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 10cm depth intervals.