THICK LOAM OVER BROWN CLAY

General Description: *Very thick gravelly loamy surface soil with a bleached subsurface layer, overlying a brown mottled clayey subsoil*

Landform: Rolling to steep low hills and hills.

Substrate: Mixture of colluvial gravelly clay and deeply weathered fine grained basement rock

Vegetation: Eucalyptus obliqua (messmate stringybark) forest.

Type Site:

Site No.:	CH156C	1:50,000 mapsheet:	6628-2 (Onkaparinga)
Hundred:	Onkaparinga	Easting:	303300
Section:	50	Northing:	6134600
Sampling date:	13/11/06	Annual rainfall:	900 mm average

Lower slope of rolling low hills, 10% slope. Hard setting surface with negligible stone fragments.

Soil Description:

Depth (cm)	*Description*
0-10	Dark brown friable loam with weak granular structure and 2-10% siltstone fragments. Clear to:
10-30	Strong brown (reddish yellow dry) firm massive loam with 2-10% quartz fragments. Gradual to:
30-50	Reddish yellow (pink dry) firm massive light clay loam with 2-10% quartz fragments. Gradual to:
50-70	Reddish yellow firm massive light clay loam with 20-50% siltstone, and 2-10% quartz and ironstone fragments. Clear to:
70-100	Strong brown, olive yellow and red firm medium clay with strong medium polyhedral structure and 20-50% quartzite and 2-10% ironstone fragments. Diffuse to:
100-160	Light yellowish brown, yellowish brown and light brownish grey firm medium clay with strong angular blocky structure and 10-20% quartzite and ironstone fragments.

Classification: Bleached, Mesotrophic, Brown Chromosol; very thick, slightly gravelly, loamy / clayey, very deep

Summary of Properties

Drainage: Moderately well to imperfectly drained. The subsoil and overlying subsurface layers may remain wet for up to several weeks following heavy or prolonged rainfall.

Fertility: Inherent fertility is low, as indicated by the exchangeable cation data. Organic matter in the surface layer provides adequate nutrient retention capacity, and concentrations of tested nutrient elements are adequate in the top 10 cm. Below 10 cm, nutrient retention capacity falls away substantially, as do nutrient concentrations. Cation leaching associated with acidification has caused significant loss of nutrient retention capacity.

pH: Neutral at the surface, acidic with depth.

Rooting depth: 130 cm in sampling pit, but few roots below 100 cm.

Barriers to root growth:

Physical: No apparent barriers although massive subsurface layers restrict optimal root distribution.

Chemical: There are no apparent chemical barriers, although an unusually high ratio of magnesium to other cations at depth may have implications for some crops.

Waterholding capacity: (Estimates for potential rootzone of grape vines)
Total available: 125 mm
Readily available: 70 mm

Seedling emergence: Fair to good, depending on friability of surface soil.

Workability: Hard surface tends to shatter if worked too dry, and puddle if worked too wet.

Erosion Potential:

Water: Moderate to moderately high.

Wind: Low.

Laboratory Data

Depth cm	pH H_2O	pH $CaCl_2$	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	Boron mg/kg	React Fe mg/kg	Trace Elements mg/kg (EDTA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Est. ESP
													Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
0-10	6.5	5.7	0	0.078		4.08	41	340	22	7.6	0.7	1529	4.61	267	31.1	5.53	14.1	10.1	3.04	0.13	0.75	0.9
10-30	5.8	4.9	0	0.028		1.27	4	90	6	3.2	0.5	1565	0.92	86	2.69	0.45	2.8	1.69	0.72	0.14	0.22	na
30-50	5.7	4.6	0	0.022		0.71	4	66	7	3.1	0.4	1146	0.24	46	1.13	0.29	1.5	0.67	0.59	0.13	0.14	na
50-70	5.9	4.8	0	0.016		0.31	2	54	8	3.4	0.3	1013	0.57	58	3.8	0.55	1.3	0.53	0.54	0.09	0.12	na
70-100	5.8	4.6	0	0.020		0.21	0	81	11	11.5	0.6	643	0.48	33	1.19	0.27	4.8	1.51	2.94	0.15	0.21	3.1
100-160	5.9	4.9	0	0.022		0.22	0	106	14	14.4	0.8	626	0.08	35	1.17	0.25	10.2	1.82	7.94	0.19	0.27	1.9

Note: Sum of cations, in a neutral to alkaline soil, approximates the CEC (cation exchange capacity), a measure of the soil's capacity to store and release major nutrient elements.
ESP (exchangeable sodium percentage) is derived by dividing the exchangeable sodium value by the CEC, in this case estimated by the sum of cations.

Further information: DEWNR Soil and Land Program