CLAY LOAM OVER SODIC RED CLAY

General Description: *Reddish brown clay loam overlying a well structured clay subsoil, calcareous at depth with abundant quartzite stones throughout*

Landform: Pediments associated with quartzite ranges

Substrate: Heavy clay sediments with abundant quartzite stones and soft carbonate segregations

Vegetation:

Type Site: Site No.: CU055

1:50,000 sheet:	6533-3 (Quorn)	Hundred:	Willochra
Annual rainfall:	375 mm	Sampling date:	17/11/95
Landform:	Drainage depression on upper slope of an undulating pediment, 12% slope		
Surface:	Firm with about 20% quartzite stones		

Soil Description:

Depth (cm)	*Description*
0-15	Reddish brown fine sandy clay loam with moderate coarse blocky structure and 20-50% quartzite stones. Clear to:
15-35	Red massive fine sandy clay loam with 20-50% quartzite stones. Abrupt to:
35-60	Dark reddish brown medium heavy clay with strong blocky structure and 20-50% quartzite stones. Gradual to:
60-85	Red medium heavy clay with strong polyhedral structure and 20-50% quartzite stones. Clear to:
85-130	Red calcareous medium heavy clay with strong polyhedral structure and 20-50% quartzite stones. Diffuse to:
130-175	Orange and red calcareous medium heavy clay with strong polyhedral structure and 20-50% quartzite stones. Clear to:
175-200	Soft weathering siltstone (saprolite).

Classification: Calcic, Subnatric, Red Sodosol; thick, moderately gravelly, clay loamy / clayey, very deep

Summary of Properties

Drainage Moderately well drained. The topsoil will stay wet for several days to a week after heavy rain due to slowly permeable subsoil.

Fertility Natural fertility is high, due to high clay and organic matter contents (as indicated by high CEC) and satisfactory exchangeable calcium level. Phosphorus levels are slightly low, but other nutrient levels appear adequate (note very high potassium).

pH Alkaline at the surface, strongly alkaline with depth. Note that pit sample is neutral in surface due to carbonate leaching in the drainage depression.

Rooting depth Few roots below 85 cm.

Barriers to root growth

Physical: Tight subsoil clay (sodic) prevents good root proliferation.

Chemical: High pH, high sodicity with moderate salinity and boron.

Water holding capacity Approximately 80 mm in rootzone (moderate) - higher where stone content is less.

Seedling emergence Good to fair, providing surface condition is maintained - these soils will set down hard if structure is destroyed by excessive cultivation.

Workability Good, provided surface condition is maintained. Surface quartzite and ironstone are highly abrasive.

Erosion Potential

Water: Water erosion potential is moderate due to the slope.

Wind: Wind erosion potential is low.

Laboratory Data

Depth cm	pH H_2O	pH $CaC1_2$	CO_3 %	EC1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	SO_4-S mg/kg	Boron mg/kg	Trace Elements mg/kg (DTPA)				CEC cmol (+)/kg	Exchangeable Cations cmol(+)/kg				ESP
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
Paddock	8.2	7.7	2.0	0.26	1.29	1.7	22	1195	19	2.5	0.99	8.5	11	1.1	28.9	26.60	5.10	0.54	3.71	1.9
0-15	7.3	6.9	0	0.15	0.85	1.8	16	556	15	1.5	-	-	-	-	22.7	16.63	4.99	0.19	1.53	0.8
15-35	8.3	7.4	0	0.06	0.51	0.6	7	176	11	1.3	-	-	-	-	12.9	10.19	2.27	0.26	0.31	2.0
35-60	8.7	7.6	0.1	0.16	0.71	0.5	4	219	13	3.4	-	-	-	-	31.1	15.16	10.70	3.14	0.61	10.1
60-85	9.2	8.3	0.2	0.41	2.03	0.2	<4	193	20	6.3	-	-	-	-	21.3	8.04	8.22	4.56	0.48	21.4
85-130	9.2	8.5	3.6	1.15	5.34	0.1	<4	208	150	15.7	-	-	-	-	24.7	7.32	8.95	10.12	0.57	41.0
130-175	8.5	8.1	0.1	1.97	7.87	0.1	5	197	442	12.6	-	-	-	-	27.3	7.67	8.91	10.51	0.53	38.5
175-200	7.7	7.2	0	1.34	5.43	<0.1	4	182	262	3.7	-	-	-	-	22.5	6.14	7.40	8.55	0.27	38.0

Note: Paddock sample bulked from cores (0-10 cm) taken around the pit.

CEC (cation exchange capacity) is 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.