Project Name: **Improving Soil Survey Field Measurement and Interpretation. LWRRDC Project No. 90/R16**
Project Code: **Morphology** **Site ID:** **CP320** **Observation ID:** **1**
Agency Name: **CSIRO Division of Soils (ACT)**

Site Information

Desc. By:	N.J. McKenzie	**Locality:**	
Date Desc.:	31/08/92	**Elevation:**	90 metres
Map Ref.:	Sheet No. : 9232-4-N 1:25000	**Rainfall:**	912
Northing/Long.:	6402700 AMG zone: 56	**Runoff:**	No Data
Easting/Lat.:	373700 Datum: AGD66	**Drainage:**	No Data

Geology

ExposureType:	Soil pit	**Conf. Sub. is Parent. Mat.:**	No Data
Geol. Ref.:	No Data	**Substrate Material:**	No Data

Land Form

Rel/Slope Class:	Undulating low hills 30-90m 3-10%	**Pattern Type:**	Low hills
Morph. Type:	Crest	**Relief:**	40 metres
Elem. Type:	Hillcrest	**Slope Category:**	Gently inclined
Slope:	6 %	**Aspect:**	135 degrees

Surface Soil Condition (dry): Firm

Erosion: Minor (sheet)

Soil Classification

Australian Soil Classification:
Brown Kurosol

ASC Confidence:
No analytical data are available but confidence is fair.

Mapping Unit: N/A
Principal Profile Form: Dy4.11
Great Soil Group: N/A

Site Disturbance: Complete clearing. Pasture, native or improved, cultivated at some stage

Vegetation: Low Strata - Tussock grass, <0.25m, Closed or dense. *Species includes - None recorded

Surface Coarse Fragments: No surface coarse fragments

Profile Morphology

A11	0 - 0.05 m	Dark greyish brown (10YR4/2-Moist); Light brownish grey (10YR6/2-Dry); ; Loam; Weak grade of structure, 5-10 mm, Subangular blocky; Rough-ped fabric; Moderately moist; Very firm consistence; 0-2%, fine gravelly, 2-6mm, subangular tabular, Siltstone, coarse fragments; Field pH 5.5 (Raupach); Common, fine (1-2mm) roots; Clear, Smooth change to -
A12	0.05 - 0.1 m	Dark greyish brown (10YR4/2-Moist); Light brownish grey (10YR6/2-Dry); , 7.5YR56, 10-20% , 5-15mm, Distinct; Clay loam, fine sandy; Massive grade of structure; Rough-ped fabric; Moderately moist; Very firm consistence; 0-2%, fine gravelly, 2-6mm, subangular tabular, Siltstone, coarse fragments; Field pH 5.5 (Raupach); Few, fine (1-2mm) roots; Clear, Smooth
A13	0.1 - 0.15 m	Dark greyish brown (10YR4/2-Moist); , 10YR41, 10-20% , 5-15mm, Faint; Clay loam; Massive grade of structure; Rough-ped fabric; Moderately moist; Very firm consistence; 0-2%, fine gravelly, 2-6mm, subangular tabular, Siltstone, coarse fragments; Field pH 5.5 (Raupach); Few, fine (1-2mm) roots; Abrupt, Smooth change to -
A2	0.15 - 0.19 m	Brown (10YR5/3-Moist); Very pale brown (10YR7/3-Dry); , 10YR42, 10-20% , 5-15mm, Faint; Clay loam, fine sandy; Massive grade of structure; Rough-ped fabric; Moderately moist; Very firm consistence; 0-2%, fine gravelly, 2-6mm, subangular tabular, Siltstone, coarse fragments; Field pH 6 (Raupach); Few, fine (1-2mm) roots; Abrupt, Wavy change to -
B21	0.19 - 0.3 m	Brown (10YR5/3-Moist); ; Medium heavy clay; Moderate grade of structure, 10-20 mm, Polyhedral; Rough-ped fabric; Moderately moist; Strong consistence; Common cutans, 10-50% of ped faces or walls coated, faint; Field pH 5.5 (Raupach); Few, fine (1-2mm) roots;
B21	0.3 - 0.4 m	Brown (10YR5/3-Moist); ; Medium heavy clay; Moderate grade of structure, 10-20 mm, Polyhedral; Rough-ped fabric; Moderately moist; Strong consistence; Common cutans, 10-50% of ped faces or walls coated, faint; Field pH 5.5 (Raupach); Few, fine (1-2mm) roots; Gradual, Wavy change to -
B22	0.4 - 0.6 m	Brown (10YR5/3-Moist); ; Heavy clay; Weak grade of structure, 20-50 mm, Polyhedral; Rough-ped fabric; Moderately moist; Very firm consistence; Common cutans, 10-50% of ped faces or walls coated, faint; Field pH 5.5 (Raupach); Few, fine (1-2mm) roots; Clear, Wavy change to -
C	0.6 - 1.1 m	Light yellowish brown (10YR6/4-Moist); , 10YR58;

Morphological Notes

A2 Is a lens of coarser material

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Observation Notes

Dark brown duplex soil with a lot of local variability in the B horizon thickness. In places the C underlies the A horizon.
Substrate material is 'Wooton Beds' weathered siltstone/sandstone @ 75cm.

Site Notes

Hilldale, 15m east of church fence, 5km north of road fence. (Morph 19)

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Laboratory Test Results:

Depth	pH	1:5 EC	Exchangeable Cations Ca	Mg	K	Na	Exchangeable Acidity	CEC	ECEC	ESP
m		dS/m				Cmol (+)/kg				%
0 - 0.05	5.32A	0.06A	5.5B	3.3	0.28	0.27		12.9A		2.09
0.05 - 0.1	5.27A	0.04A	4.8B	2.8	0.13	0.27		11.8A		2.29
0 - 0.2										
0 - 0.2										
0.1 - 0.15	5.46A	0.04A	4.1B	2.7	0.12	0.34		10.8A		3.15
0.15 - 0.19	5.6A	0.04A	2.7B	2.2	0.1	0.35		7.8A		4.49
0.19 - 0.3	5.62A	0.07A	4.9B	7.4	0.23	1.2		17.8A		6.74
0.2 - 0.4										
0.2 - 0.4										
0.3 - 0.4	5.51A	0.07A	5.4B	9.2	0.26	1.5		22.2A		6.76
0.4 - 0.6	5.21A	0.1A	5.3B	10.9	0.29	2.2		26.2A		8.40
0.6 - 1.1										

Depth	CaCO3	Organic C	Avail. P	Total P	Total N	Total K	Bulk Density	Particle Size Analysis GV	CS	FS	Silt	Clay
m	%	%	mg/kg	%	%	%	Mg/m3			%		
0 - 0.05		3.16B						1				
0.05 - 0.1		1.76B						4				
0 - 0.2							1.46					
							1.43					
							1.44					
							1.49					
0 - 0.2							1.46					
							1.43					
							1.44					
							1.49					
0.1 - 0.15		1.32B					1.47	3				
0.15 - 0.19		0.76B						5				
0.19 - 0.3		0.52B					1.51	2				
0.2 - 0.4							1.53					
							1.63					
							1.63					
0.2 - 0.4							1.53					
							1.63					
							1.63					
0.3 - 0.4		0.52B						0				
0.4 - 0.6		0.41B						0				
0.6 - 1.1												

Depth	COLE	Gravimetric/Volumetric Water Contents Sat.	0.05 Bar	0.1 Bar	0.5 Bar	1 Bar	5 Bar	15 Bar	K sat	K unsat
m					g/g - m3/m3				mm/h	mm/h
0 - 0.05										
0.05 - 0.1										
0 - 0.2		0.4E	0.38E	0.36E	0.32D		0.17F	0.13F	23.9D	6.3A
		0.39E	0.36E	0.34E	0.3D		0.2F	0.15F		
		0.4E	0.35E	0.34E	0.3D					
		0.41E	0.38E	0.36E	0.33D					

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0 - 0.2		0.4E	0.38E	0.36E	0.32D	0.17F	0.13F	23.9D	6.3A
		0.39E	0.36E	0.34E	0.3D	0.2F	0.15F		
		0.4E	0.35E	0.34E	0.3D				
		0.41E	0.38E	0.36E	0.33D				
0.1 - 0.15	0.017B								
0.15 - 0.19									
0.19 - 0.3	0.075B								
0.2 - 0.4		0.38E	0.36E	0.35E	0.33D	0.21F	0.19F	0.0007D	0.0003A
		0.35E	0.33E	0.32E	0.29D	0.2F	0.18F		
		0.36E	0.34E	0.32E	0.3D				
0.2 - 0.4		0.38E	0.36E	0.35E	0.33D	0.21F	0.19F	0.0007D	0.0003A
		0.35E	0.33E	0.32E	0.29D	0.2F	0.18F		
		0.36E	0.34E	0.32E	0.3D				
0.3 - 0.4									
0.4 - 0.6									
0.6 - 1.1									

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Laboratory Analyses Completed for this profile

15A2_CA	Exchangeable bases (Ca2+,Mg2+,Na+,K+) - 1M ammonium chloride at pH 7.0, pretreatment for soluble salts
15A2_CEC	Exchangeable bases- 1M ammonium chloride at pH 7.0, pretreatment for soluble salts
15A2_K	Exchangeable bases- 1M ammonium chloride at pH 7.0, pretreatment for soluble salts
15A2_MG	Exchangeable bases- 1M ammonium chloride at pH 7.0, pretreatment for soluble salts
15A2_NA	Exchangeable bases- 1M ammonium chloride at pH 7.0, pretreatment for soluble salts
3A1	EC of 1:5 soil/water extract
4A1	pH of 1:5 soil/water suspension
5A1	Chloride - 1:5 soil/water extract, potentiometric titration
6B2	Total organic carbon - high frequency induction furnace, volumetric
P10_GRAV	Gravel (%)
P10_S_0.20	0.20 micron (cumulative %) - Sedigraph
P10_S_1000	1000 micron (cumulative %) - Sedigraph
P10_S_125	125 micron (cumulative %) - Sedigraph
P10_S_2	2 micron (cumulative %) - Sedigraph
P10_S_20	20 micron (cumulative %) - Sedigraph
P10_S_2000	2000 micron (cumulative %) - Sedigraph
P10_S_250	250 micron (cumlative %) - Sedigraph
P10_S_31.2	31.2 micron (cumulative %) - Sedigraph
P10_S_500	500 micron (cumulative %) - Sedigraph
P10_S_63	63 micron (cumulative %) - Sedigraph
P3A1	Bulk density - g/cm3
P3B2VL_15	15 BAR Moisture m3/m3 - Volumetric using disturbed sample on pressure plate
P3B2VL_5	5 BAR Moisture m3/m3 - Volumetric using disturbed sample on pressure plate
P3B3VLb001	0.01 BAR Moisture m3/m3 - Volumetric using undisturbed 73mm diameter and 75mm height core on suction plate taken from center of large core (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P3B3VLb003	0.03 BAR Moisture m3/m3 - Volumetric using undisturbed 73mm diameter and 75mm height core on suction plate taken from center of large core (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P3B3VLb005	0.05 BAR Moisture m3/m3 - Volumetric using undisturbed 73mm diameter and 75mm height core on suction plate taken from center of large core (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P3B3VLb01	0.1 BAR Moisture m3/m3 - Volumetric using undisturbed 73mm diameter and 75mm height core on suction plate taken from center of large core (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P3B3VLb05	0.5 BAR Moisture m3/m3 - Volumetric using undisturbed 73mm diameter and 75mm height core on suction plate taken from center of large core (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P3B3VLbSAT	Saturated Moisture m3/m3 - Volumetric using undisturbed 73mm diameter and 75mm height core on suction plate taken from center of large core (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P4_50_McK	Unsaturated Hydraulic Conductivity - 50mm potential (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P4_sat_McK	Saturated Hydraulic Conductivity (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P5_LS_MOD	Modified linear shrinkage (McKenzie, Jacquier and Ringrose-Voase, AJSR, 1994, 32, 931-8)