

SECTION 8 - SOIL RELATIONSHIPS

8.1 Relation to Earlier Surveys

All previous surveys of this area have been conducted at reconnaissance level and thus did not permit mapping of individual soil types. However, there is general agreement that the dominant soils are grey cracking clays, and that the area is an undulating gilgaied depositional plain. Table 4 below is a summary of the terms used, in earlier surveys, to describe the area of the present survey.

Table 4 - Early surveys and descriptions of mapping units relevant to the Kalkee area

Survey/map () year of publication	Description of the mapping unit which included the Kalkee area
Skene (1956)	Friable, calcareous, self-mulching, grey, clay loams and clays over clay subsoils, usually not saline. Includes red-brown earths. Derived from unconsolidated sediments.
Northcote (1960a)	Dark, cracking, clay soils (Ug 5.2).
Northcote (1960b1)	Gilgai plains of cracking grey clays (Ug 5.2) with smaller areas of other cracking clays (Ug 3.2, Ug 5.16 and Ug 5.3) and broken by low rises.
Northcote (1960b2)	Cracking grey clays, well structured at the surface.
Skene (1961)	Friable grey clays of heavy texture dominant over red-brown earths and intermingled with brown soils of heavy texture. All derived from quaternary unconsolidated deposits.
Department of National Development (1963)	Grey and brown soils of heavy texture.
Northcote <i>et al</i> (1975)	Deep grey, self-mulching, cracking clays (Ug 5.24) on depositional plains.

8.2 Soil Classification

The dominant soil in the area is a grey cracking clay classified, using the Factual Key of Northcote (1971), as Class Ug 5.2. soil types mapped in this survey (see Appendix III) have been classified using this system and the Great Soil Group classification of Stace *et al.* (1968). The results are presented in Table 5.

Colour variation in the subsoils of the Kalkee clay soil group is reflected in the classifications of the representative profiles. Only two of the six described soils have similar factual key notations. For four of the soils the distinction is based on the colour of the immediate sub-surface horizons. Kc-4 (site A), Kc-1 and Kc-3 soils have, respectively, 'dark', 'grey' and 'brown' sub-surface clay horizons. Kc-1 and Kc-2 soils have 'grey clay' horizons but the colour hue in Kc-1 is yellower than 2.5Y. In the Kc-2 soil the corresponding horizon is redder than 2.5Y. Kc-2 and Kc-4 (site B) soils have identical principal profile forms. The Kc-5 soil has a sporadically bleached A2 horizon, a feature which is reflected in the section and class of the notation Ug 3.2.

With regard to the Great Soil Group classification and on the basis of the colour of the sub-surface horizon, the Kc-3 soil is a brown member of the grey brown and red clay group. The other Kalkee clay soils are grey members of this group.

Different and strong colours of the immediate sub-surface horizons of the Murra Warra soils are reflected in their classifications in both systems. The MWc-1 soil has the notation Ug 5.25 and is a brown member of the grey, brown and red clay group. The MWc-2 soil has the notation Ug 5.39 and is a red member of the clay group.

The remaining five soils which were not classified to the principal profile form level included two red-brown earths and two members of the grey, brown and red clay group.

Table 5 - Great Soil Group and Factual Key Classification of soil types

Profile	Soil Type	Classification	
		Great Soil Group	Factual key notation
9A210	Kc-1	Grey, brown and red clays	Ug 5.28
C210	Kc-2	“ “ “ “ “	Ug 5.24
A210	Kc-3	Grey, brown and red clays	Ug 5.35
Mnf Site A	Kc-4	Grey, brown and red clays	Ug 5.1
B210 Site B	Kc-4	“ “ “ “ “	Ug 5.24
G210	Kc-5	“ “ “ “ “	Ug 3.2
8B210	M ^w c-1	Grey, brown and red clays	Ug 5.35
3B210	M ^w c-2	Grey, brown and red clays	Ug 5.39
356	M ^w sl	Red-brown earths	D*
546	M ^w scl	“ “ “	“
528	MT-1	Grey, brown and red clays	Ug 5.4
517	MT-2	Grey, brown and red clays	Ug 5*
560	MT-3	No suitable group	Ug 5/D* ^f

* Data is inadequate to complete the classification

^f Profile consists of two sola

REFERENCES

Anon. (1961) – Resources Survey, Wimmera Region. Central Planning Authority, Government of Victoria.

Best – Trans. 4th Int. Congr. Soil Sci. 3:162 (1950).

Northcote, K.H. (1960a) – “Atlas of Australian Soils” Map and Legend No. 1 – Dominant Soils for Sheet 1, Port Augusta-Adelaide-Hamilton Area (C.S.I.R.O Aust. And Melb. Univ. Press, Melbourne)

Northcote, K.H. (1960b) – “Atlas of Australian Soils” Explanatory Data for Sheet 1, Port Augusta-Adelaide-Hamilton Area (C.S.I.R.O. Aust. And Melb. Univ. Press, Melbourne)

Northcote, K.H. (1964) – “Soil Map of Victoria” *In* Victorian Year Book No. 78 (Commonwealth Bureau of Census and Statistics, Victorian Office).

Northcote, K.H. (1971) – “A Factual Key for the Recognition of Australian Soils”. 3rd Edition (Rellim Technical Publications : Glenside, S.A.).

Northcote, K.H., Hubble, G.D., Isbell, R.F., Thompson, C.H. and Bettenay, E. (1975) – “A Description of Australian Soils” (C.S.I.R.O. Aust.).

Plumb, T.W. (1963) – Ed. “Soils”. 2nd Edition *In* “Atlas of Australian Resources, 2nd series (Dept. Nat. Dev., Canberra).

Sims, H.J. and Rooney, D.R. (1965) – Gypsum for difficult clay wheat growing soils. *J. Dep. Agric. Vict.* 63:401.

Skene, J.K.M. (1956) – “Soil Map of Victoria” (Soils Sec. Dept. Agric. Victoria).

Skene, J.K.M. (1961) – Physical Resources “Soils”, *In* Resources Survey, Wimmera Region, p. 77 (Central Planning Authority, Government of Victoria).

Stace, H.C.T., Hubble, G.D., Brewer, R., Northcote, K.H., Sleeman, J.R., Mulchay, M.J. and Hallsworth, E.G. (1968) – “A Handbook of Australian Soils”. (Rellim Technical Publications : Glenside S.A.).