GLR Glen Roy Land System

Area: 251.2 km^2

Landscape: Flat plains west and north of the Penola land system, with stony rises and swampy flats. Elevation ranges from below 50m in the north west to 60 m on the eastern edge. Relief is less than 2 m.

Annual rainfall: 605 – 690 mm average

Geology: Pleistocene Padthaway Formation calcareous lacustrine clays

Main soils:
B5 (40%) Shallow dark clay loam on limestone (Petrocalcic Black-Grey Dermosol)
E3 (12%) Brown or grey cracking clay (Brown-Grey Vertosol)
B2 (12%) Shallow calcareous loam on calcrete (Petrocalcic Calcarosol-Rudosol)
C5 (10%) Gradational dark clay loam (Calcic-Hypercalcic Brown-Grey-Black Dermosol-Calcarosol)

Minor soils:
E1 (8%) Black cracking clay (Black Vertosol)
M2 (5%) Deep friable gradational clay loam (Red-Brown-Grey- Black Dermosol)

Summary: The shallow dark clay soils which are extensive on the plains, are prone to water-logging and inundation in wet seasons (water tables can be shallow). Waterholding capacity is restricted by shallow calcrete, but this is often naturally fractured, allowing root penetration, but extensive sheet calcreted areas are relatively common. Salinity is low or of minor extent, but the adjoining Maoope Land System has extensive salinity. Soils are mostly fertile.

Soil Landscape Unit summary: Glen Roy Land System (GLR)

SLU	% of area	Component	Main soils	Prop#	Notes
MDAA	0.4	Elevated plain	B4B6	V	**MDAA** Very gently undulating low, broad rises and slightly elevated plains, showing low dune core topography, mostly with moderately deep to shallow with clay loam grading to well structured red clay, on calcrete; or often moderately deep to shallow clay loam sharply over well structured red clay, on calcrete; 10-30% deep gradational or texture contrast red clay loam over well structured red clay in elevated parts; or shallow dark clay loam over dark clay, on calcrete in low parts. 20-30% stony rises with shallow gradational red clay loam over well structured red clay on calcrete; or very shallow reddish clay loam on calcrete; or bare calcrete; 10-30% very shallow calcareous clay loam on calcrete, or texture contrast red clay loam over well structured red clay on calcrete. **MDB** Gently sloping rises, with shallow, gradational, or texture contrast, loam over well structured red clay on calcrete. Main soils: ***Elevated plains and rises:*** Shallow red loam on limestone - **B4** and Shallow sandy loam over red-brown clay on calcrete - **B6**. ***Stony rises:*** Shallow red loam on limestone - **B4**, Shallow
		Stony rise	B4B3B2	C	
MDB	0.4	Rise	B4B6	D	

					sandy loam on calcrete - **B3** and Shallow calcareous loam on calcrete - **B2**.
MNB	0.1	Dune range	H3B6	D	Dune range with deep bleached siliceous sand co-dominant with shallow sandy loam over red clay on calcreted calcarenite. Main soils: Bleached siliceous sand - **H3** and Shallow sandy loam over red-brown clay on calcrete - **B6**.
NlC	14.4	Plain	B5E1	V	**NlC** Plains with shallow dark cracking clay, on calcrete, or deep dark clay loam on calcareous clay; 10-30% deep dark cracking clay. <10% stony rises with very shallow calcareous clay loam, or reddish clay loam grading to well structured red clay on calcrete; 10-30% bare calcrete. <10% swamps with dark cracking clay soils, both deep and shallow on calcrete; 10-30% wet soils. **NlM** Plains with shallow dark cracking clay, on calcrete. 20-30% stony rises with very shallow calcareous clay loam, or shallow dark cracking clay, on calcrete; 10-30% bare calcrete. Main soils: ***Plains and swamps:*** Shallow dark clay loam on limestone - **B5** and Black cracking clay - **E1**. ***Stony rises:*** Shallow calcareous loam on calcrete - **B2**, Shallow red loam on limestone - **B4** and Shallow dark clay loam on limestone - **B5**.
		Stony rise	B2B4	M	
		Swamp	B5E1	M	
NlM	9.1	Plain	B5	V	
		Stony rise	B2B5	C	
NMM	1.2	Plain	F2	V	Plains with deep dark clay loam over poorly structured dark brown clay; 10-30% clay loam over dark grey clay or dark grey deep cracking clay. Main soils: ***Plains:*** Sandy loam over poorly structured brown or dark clay - **F2**. ***Stony rises:*** Shallow dark clay loam on limestone - **B5** and Shallow sandy loam over red-brown clay on calcrete - **B6**.
		Stony rise	B5B6	C	
NNU	0.6	Plain	C5E3	E	Plains with deep dark cracking clay over calcareous clay. Stony rises are co-dominant with shallow dark clay loam over dark calcareous clay on calcrete, or gradational or texture contrast reddish clay loam over well-structured red clay on calcrete. 20-30% swamps with mostly wet, dark cracking clay, both deep and shallow over calcrete. Main soils: ***Plains:*** Gradational dark clay loam – **C5** and Brown or grey cracking clay – **E3**. ***Stony rises:*** Shallow dark clay loam on limestone - **B5**, Shallow sandy loam over red-brown clay on calcrete - **B6** and Shallow red loam on limestone - **B4**. ***Swamps:*** Wet clay loam - **N3**, Gradational dark clay loam – **C5** and Brown or grey cracking clay – **E3**.
		Stony rise	B2B5	M	
		Swamp	N3C5E3	C	
NnE	0.8	Plain	B5B2	V	Plains with shallow, dark cracking clay over calcareous clay on calcrete; or very shallow calcareous clay on calcrete; 10-30% deep clay loam over poorly structured dark brown clay, or thin sand over poorly structured brown clay. <10% swamps with often wet, dark clay over dark calcareous clay on calcrete; 10-30% water filled.
		Swamp	B5N3	M	
		Stony rise	B2B5	M	
		Rise	F2G4	M	

					<10% stony rises with very shallow calcareous clay loam on calcrete; or shallow, dark clay loam over calcareous clay on calcrete; 10-30% bare calcrete or shallow gradational reddish clay loam over red clay on calcrete. <10% deep clay loam over poorly structured dark brown clay, or thin sand over poorly structured brown clay; 10-30% dark clay over dark calcareous clay on calcrete. Main soils: ***Plains and stony rises:*** Shallow dark clay loam on limestone - **B5** and Shallow calcareous loam on calcrete - **B2**. ***Swamps:*** Shallow dark clay loam on limestone - **B5** and Wet clay loam - **N3**. ***Rises:*** Sandy loam over poorly structured brown or dark clay - **F2** and Sand over yellow and brown clay - **G4**.
NPA	9.5	Plain	E3M2E1	D	**NPA** Plains with deep, dark-grey or black cracking clay, or clay loam grading to brown clay. <10% swamps with soils as for plains, often wet; 10-30% water filled. **NPG** Depressions with black cracking clay soils and clay loam grading to brown clay as above. Main soils: ***Plains:*** Brown or grey cracking clay – **E3**, Deep friable gradational clay loam - **M2** and Black cracking clay - **E1**. ***Swamps and depressions:*** Deep friable gradational clay loam - **M2**, Black cracking clay - **E1** and Wet clay loam - **N3**.
		Swamp	M2E1N3	M	
NPG	0.1	Depression	M2E1	D	
NpA	2.7	Plain	E3	D	**NpA** Plains with deep dark grey, cracking clay. **NpF** Plains with deep dark grey, cracking clay. 10-20% swamps with often wet, deep dark grey or black cracking clay; 10-30% peat soils. Main soils: ***Plains:*** Brown or grey cracking clay – **E3**. ***Swamps:*** Wet clay loam - **N3**, Black cracking clay - **E1** and Brown or grey cracking clay – **E3**.
NpF	0.2	Plain	E3	V	
		Swamp	N3E1E3	L	
NRA	1.0	Plain	G4	D	Plains with thin (<30cm) sand over poorly structured brown clay; 10-30% often wet, dark cracking clay. Main soils: Sand over yellow and brown clay - **G4**.
NSF	0.6	Plain	G3G5	V	Plains with deep acid sand over, often strongly acid brown clay soils; 10-30% deep clay loam grading to brown clay soils. 10-20% swamps with often wet, non-peaty clay loams, peat or water filled. Main soils: ***Plains:*** Thick sand over clay - **G3** and Sand over acidic clay - **G5**. ***Swamps:*** Wet clay loam - **N3** and Peaty soil – **N1**.
		Swamp	N3WW N1	L	
NuF	0.4	Plain	M4M2F2	V	Plains with clay loam over dark brown or grey clay soils, often poorly structured, 10-30% on calcareous rubble or marl substrate. 20-30% swamps with mostly wet, non-cracking clay soils. Main soils: ***Plains:*** Deep hard gradational sandy loam - **M4**, Deep friable gradational clay loam - **M2** and Sandy loam over poorly structured brown or dark clay - **F2**. ***Swamps:*** Wet clay loam - **N3**.
		Swamp	N3	C	
NvJ	4.9	Plain	G3	V	Plains with thick and thin sand over poorly structured

		Swamp	M2	E	brown clay soils. 30-60% swamps with deep non-cracking, dark clay, 10-30% wet soils or water filled swamps. Main soils: ***Plains:*** Thick sand over clay - **G3**. ***Swamps:*** Deep friable gradational clay loam - **M2**.
NYA	16.9	Plain	B5C5B2	D	**NYA** Plains with mostly shallow, dark cracking clay over calcreted marl, often very shallow calcareous clay loam over calcrete; 10-30% often wet, deep dark cracking clays or bare calcrete. <10% swamps, which have wet, dark non-cracking clays. **NYB** Stony plains with soils as above, but with no swamps or wet soils. **NYF** Plains with mostly shallow, dark cracking clay, over calcreted marl, but often deep over calcareous clay. Swamps are co-dominant with mostly wet, deep dark non-cracking clay, 10-30% clay loam over poorly structured dark brown-grey clay. **NYM** Plains with mostly shallow dark cracking clay, over calcreted marl; 10-30%deep, dark clay loam, or cracking clay over calcareous clay. Stony rises are co-dominant with shallow dark clay loam over calcareous dark clay on calcrete; 10-30% shallow calcareous clay loam on calcrete, or bare calcrete, or reddish clay loam grading to red clay on calcrete. <10% swamps with often wet, deep dark non-cracking clay; 10-30% water filled. **NYN** Stony plains with soils as for **NYB**; co-dominant stony rises with shallow dark clay loam over calcareous dark clay on calcrete; 10-30% shallow calcareous clay loam on calcrete. Main soils: ***Plains:*** Shallow dark clay loam on limestone - **B5**, Gradational dark clay loam – **C5** and Shallow calcareous loam on calcrete - **B2**. ***Stony rises:*** Shallow dark clay loam on limestone - **B5**. ***Swamps:*** Wet clay loam - **N3** and Deep friable gradational clay loam - **M2**.
		Swamp	B5N3	M	
NYB	1.6	Stony plain	B5C5	D	
NYF	1.7	Plain	B5C5	E	
		Swamp	N3M2	E	
NYM	31.3	Plain	B5	E	
		Stony rise	B5	E	
		Swamp	B5N3	M	
NYN	0.7	Stony plain	B5B2	E	
		Stony rise	B5	E	
Xd-	0.1	Lunette	A7M2B4	D	Lunettes with gradational, mostly calcareous, clay loam over calcareous clay on marl, or gradational shallow reddish clay loam over red clay on calcrete; 10-30% texture contrast shallow clay loam over red clay on calcrete, or very shallow calcareous clay loam on calcrete. Main soils: Calcareous clay loam on marl - **A7**, Deep friable gradational clay loam - **M2** and Shallow red loam on limestone - **B4**.
Xd-B	0.3	Lunette	B4B6	D	Lunettes with gradational or texture contrast, shallow reddish clay loam over red clay on calcrete; 10-30% very shallow clay loam on calcrete. Main soils: Shallow red loam on limestone - **B4** and Shallow sandy loam over red-brown clay on calcrete - **B6**.
Xq-	0.3	Swamp	N3	D	Swamps with wet dark clay loam over dark clay; 10-30% water filled. Main soils: Wet clay loam - **N3**.
XRC	0.2	Swamp	N3E3	D	**XRC** Swamps with, mostly wet, dark cracking clay; 10-30% non-cracking clay loam over dark clay.

XRe	0.5	Swamp	N3E3	V	**XRe** Swamps as above; 20-30% lunettes with calcareous sandy loam grading to calcareous clay on marl, or deep sand over brown clay. **XRf** Swamps with mostly wet dark clayey soils; but with 10-30% non-wet soils including deep black cracking clay, peat, or deep dark non-cracking clay soils. 10-20% stony rises with shallow dark clay loam over dark clay on calcrete; or very shallow calcareous clay loam on calcrete; 10-30% shallow red-brown loam on calcrete, or reddish clay loam grading to clay on calcrete, or calcareous gradational clay loam over clay on marl. Main soils: ***Swamps:*** Wet clay loam - **N3** and Brown or grey cracking clay – **E3**. ***Lunettes:*** Calcareous clay loam on marl - **A7** and Thick sand over clay - **G3**. ***Stony rises:*** Shallow dark clay loam on limestone - **B5** and Shallow calcareous loam on calcrete - **B2**.
		Lunette	A7G3	C	
XRf	0.2	Swamp	N3	V	
		Stony rise	B5B2	L	
XuC	0.03	Swamp	WWN3	D	**XuC** Mostly water filled swamps, but often wet dark clay loam over dark clay. **Xud** Swamps with wet dark clay loam over dark clay. 10-20% sandy rises with deep sand, mostly over brown clay, but often with coffee rock or organic pans. Main soils: ***Swamps:*** Wet clay loam - **N3**. ***Sandy rises:*** Thick sand over clay - **G3** and Wet highly leached sand - **I2**.
Xud	0.04	Swamp	N3	V	
		Sandy rise	G3I2	L	
Xw-	0.1	Swamp	WWN3	D	Mostly water filled swamps, but often wet dark clay loam over dark clay; 10-30% slightly saline areas. Main soils: ***Swamps:*** Wet clay loam - **N3**.

PROPORTION codes assigned to Soil Landscape Unit (SLU) components:

- D Dominant in extent (>90% of SLU)
- V Very extensive in extent (60–90% of SLU)
- E Extensive in extent (30–60% of SLU)
- C Common in extent (20–30% of SLU)
- L Limited in extent (10–20% of SLU)
- M Minor in extent (<10% of SLU)

Detailed soil pofile dscriptions:

A7 Calcareous clay loam on marl (Marly Calcarosol)
Dark calcareous clay with a marly subsoil (often saline in Upper SE). Often with shells and a peaty surface.

B2 Shallow calcareous sandy loam on calcrete (Petrocalcic Calcarosol)
Up to 40 cm calcareous loamy sand to sandy loam with variable calcrete rubble overlying calcreted calcarenite - rises.

B3 Shallow sandy loam on calcrete (Petrocalcic Rudosol)
Medium thickness non calcareous sandy loam, often having a slight clay increase with depth, over calcreted calcarenite shallower than 50 cm - rises.

B4 Red sandy loam over calcrete (Petrocalcic, Red Dermosol)
Medium thickness red sandy loam grading to friable red clay loam over calcreted calcarenite within 50 cm - rises.

B5 Shallow dark clay loam on limestone (Petrocalcic, Black Dermosol)
Black clay loam to light clay over calcreted limestone at shallow depth, grading to highly calcareous clay - flats.

B6 Shallow sandy loam over red-brown clay on calcrete (Petrocalcic, Red Kandosol)
Medium thickness sandy loam with slight ironstone gravel overlying a weakly structured reddish brown sandy clay on calcarenite within 50 cm - rises.

C5 Gradational dark clay loam (Calcic-Hypercalcic Brown-Grey-Black Dermosol-Calcarosol)
Dark clay loam over abundant 'soft lime'. >10% carbonate is the cut off between this and M2 soils.

E1 Black cracking clay (Black Vertosol)

E3 Brown or grey cracking clay (Brown-Grey Vertosol)

F2 Sandy loam over poorly structured brown or dark clay (Brown-Dark Sodosol-Chromosol)
Topsoil <30 cm over a poorly structured subsoil. Loamy, often sandy loam, to clay loamy texture contrast soil with a sodic/dispersive/poorly structured brown clayey subsoil. Often sandy loam, usually with a bleached horizon, and thin topsoil over a poorly structured B.

G3 Thick sand over clay (Hypercalcic, Brown Sodosol/ Chromosol)
Thick bleached sand with an organically darkened surface abruptly overlying a massive to coarsely structured brown to reddish yellow sandy clay to clay, calcareous with depth - rises.

G4 Sand over poorly structured clay (Sandy Brown-Red Sodosol-Chromosol)
Topsoil <30 cm over a poorly structured subsoil. Thin sandy texture contrast soil with a sodic /dispersive /poorly structured brown or red clayey subsoil. Can have some ironstone.

G5 Sand over acidic clay (Sandy Brown Kurosol)
Sandy texture contrast soil with a friable brown strongly acidic clayey to clay loamy subsoil. Very acidic soil; incipient Bh horizons; moderate depth topsoils. Some with ironstone.

H3 Deep bleached sand (Basic, Arenic, Bleached-Orthic Tenosol)
Grey sand over very thick bleached sand grading to yellow sand continuing below 100 cm.

I2 Wet highly leached sand (Fragic, Humic, Aquic Podosol)
Grey sand with a thick bleached A2 horizon, overlying a thin to thick layer of coffee rock, grading to pale brown sand sharply overlying a grey, brown and yellow mottled sandy clay loam to light clay.

M2 Deep friable gradational clay loam (Red-Brown-Grey- Black Dermosol)
Deep well structured red clay loamy soil.

M4 Deep hard gradational sandy loam (Hard Brown-Dark Kandosol- Dermosol)
Deep dark brown loamy to clay loamy soil grading to clay at depth. Hardsetting surface often with prismatic structures in the subsoil.

N1 Peat (Organosol)
Peaty soil.

N3 Seasonally waterlogged, non to marginally saline equivalents of soils listed above, viz.:

N3c	Wet **G3**
N3d	Wet **B5**
N3e	Wet **B7**

WW Water

Further information: DEWNR Soil and Land Program