

GRA Grassville Land System

Area:	489.2 km ²
Landscape:	Plains with calcareous rises and broad channels and flood-plains with many scalded areas
Annual rainfall:	210 – 260 mm average
Geology:	Calcreted and calcareous gravelly sediments of Pleistocene age dominate the broad alluvial plains. Holocene alluvium is associated with modern streams and creeks. Older alluvium forms lateral terraces and floodplain deposits.
Soils:	Deep loamy to clay loamy soils, both calcareous and non calcareous are predominant

Main soils

- A6** Gradational calcareous clay loam
- A4** Deep (rubbly) calcareous sandy loam to loam
- D4** Loam to clay loam over pedaric red clay

Minor soils

- A3** Deep moderately calcareous sandy loam to sandy clay loam
- A5** Rubbly calcareous loam on clay
- B2** Shallow calcareous sandy loam to loam on calcrete
- B6** Shallow loam over red clay on calcrete
- C1** Gradational sandy loam
- C3** Friable gradational clay loam
- E2** Red cracking clay
- M1** Deep alluvial sandy loam

Summary: The Grassville Land System comprises extensive plains with calcareous rises. Broad channels and floodplains are widespread with many scalded areas. Soils are mostly gradational calcareous, often rubbly on rises, with red sodic pedaric texture contrast soils on flats and flood-out areas.

Soil Landscape Unit summary: 32 Soil Landscape Units (SLUs) mapped in the Grassville Land System:

SLU	% of area	Component	Main soils	Prop#	Notes
H4E	<0.1	Depressions	C3E2	D	Depressions formed on unconsolidated sediments or deeply weathered rock. Ironstone or silcrete gravels are common. Main soils: <u>friable gradational clay loam - C3</u> and <u>red cracking clay - E2</u> , with <u>gradational calcareous clay loam - A6</u> .
H5Az	0.3	Flats	D4	D	Flats formed on unconsolidated sediments or deeply weathered rock. Ironstone or silcrete gravels are common. 10-50% scalded. Main soils: <u>sandy clay loam over pedaric red clay - D4</u> with <u>gradational calcareous clay loam - A6</u> .
HXA	0.2	Flats	D4A6	D	Flats formed on unconsolidated sediments or deeply weathered rock. Ironstone or silcrete gravels are common. 5-10% scalded.



					Main soils: <u>clay loam over pedaric red clay - D4</u> and <u>gradational calcareous clay loam - A6</u> .
ILB	5.1	Gently undulating flats	A6	D	Gently undulating flats formed on unconsolidated clay sediments (e.g. Blanchetown Clay Formation) or highly weathered rock. Slopes are 1-3%, relief is less than 30m. Main soils: <u>gradational calcareous clay loam - A6</u> , with <u>deep (rubbly) calcareous sandy loam - A4</u> .
IVU	1.4	Gently undulating rises	A6A4	V	Gently undulating flats formed on unconsolidated clay sediments (e.g. Blanchetown Clay Formation) or highly weathered rock. 5-10% of rises and 10-50% of flats are scalded. Main soils: Gently undulating rises: <u>gradational calcareous clay loam - A6</u> and <u>deep (rubbly) calcareous sandy loam - A4</u> . Flats: <u>sandy clay loam over pedaric red clay - D4</u> .
		Flats	D4	C	
IYA	2.8	Very gently undulating rises	A4A6	V	Gently undulating land formed on unconsolidated clay sediments (e.g. Blanchetown Clay Formation) or highly weathered rock. IYA Very gently undulating rises and flats. Slopes less than 1%. 5-10% of flats are scalded.
		Flats	D4	L	
IYB	23.6	Gently undulating rises	A4A6	V	IYB Gently undulating rises and flats. Slopes 1-3%. 10-50% of flats are scalded. IYU Very gently undulating rises and flats. Slopes less than 1%. 5-10% of rises and 10-50% of flats are scalded.
		Flats	D4	L	
IYU	0.2	Very gently undulating rises	A4A6	E	Main soils: Rises: <u>deep (rubbly) calcareous sandy loam - A4</u> and <u>gradational calcareous clay loam - A6</u> . Flats: <u>sandy clay loam over pedaric red clay - D4</u> , with <u>gradational sandy loam - C1</u> and <u>gradational calcareous clay loam - A6</u> .
		Flats	D4	E	
ItA	16.5	Gently undulating rises	A4A6	V	Gently undulating rises formed on deeply weathered material. Ironstone or silcrete gravels may occur. Slopes are less than 1%, relief is less than 30m. Main soils: Rises: <u>deep (rubbly) calcareous sandy loam - A4</u> and <u>gradational calcareous clay loam - A6</u> , with <u>shallow calcareous loam on calcrete - B2</u> and <u>deep moderately calcareous sandy clay loam - A3</u> . Flats: <u>sandy clay loam over pedaric red clay - D4</u> and <u>gradational sandy loam - C1</u> , with <u>gradational calcareous clay loam - A6</u> and <u>moderately calcareous sandy clay loam - A3</u> .
		Flats	D4C1	C	
IwA	1.2	Flats	A6C3	D	Flats formed on deeply weathered material. Ironstone or silcrete gravels may occur. IwA Flats. IwB Gently undulating flats. Main soils: Flats: <u>gradational calcareous clay loam - A6</u> and <u>friable gradational sandy clay loam - C3</u> , with <u>deep (rubbly) calcareous sandy loam - A4</u> and <u>sandy clay loam over pedaric red clay - D4</u> . Undulating land: <u>gradational calcareous clay loam - A6</u> and <u>deep (rubbly) calcareous sandy loam - A4</u> , with <u>friable gradational sandy clay loam - C3</u> and <u>sandy clay loam over pedaric red clay - D4</u> .
IwB	0.1	Gently undulating flats	A6A4	D	
IxA	8.2	Very gently undulating rises	A5A4	V	Rises and flats formed on unconsolidated clay sediments (e.g. Blanchetown Clay Formation) or highly weathered rock.



		Flats	D4	C	<p>IxA Very gently undulating rises and flats.</p> <p>IxB Gently undulating rises and flats.</p> <p>IxU Very gently undulating rises and flats. More than 50% of flats are scalded.</p> <p>IxV Gently undulating rises and flats. More than 50% of flats are scalded, and 5-10% are affected by gullyng.</p> <p>Ixp Gently undulating rises and flats. More than 50% of flats are scalded.</p> <p>Main soils:</p> <p>Rises: <u>rubbly calcareous loam on clay</u> - A5 and <u>deep (rubbly) calcareous sandy loam</u> - A4, with <u>gradational calcareous clay loam</u> - A6.</p> <p>Flats: <u>sandy clay loam over pedaric red clay</u> - D4, with <u>gradational calcareous clay loam</u> - A6.</p>
IxB	0.1	Gently undulating rises	A5A4	V	
		Flats	D4	C	
IxU	13.9	Very gently undulating rises	A5A4	V	
		Flats	D4	C	
IxV	2.1	Very gently undulating rises	A5A4	V	
		Flats	D4	C	
Ixp	0.1	Gently undulating rises	A5A4	E	
		Flats	D4	E	
JPU	5.5	Flats	D4	V	
		Gently undulating rises	A6A4	C	
JPo	0.5	Flats	D4	D	
JPoo	0.8	Flats	D4	D	
JPp	0.4	Flats	D4	D	
JPt	1.9	Flats	D4	D	
JPy	8.8	Flats	D4	D	
JbU	0.1	Flats	D4	D	
KFB	0.6	Gently undulating plain	A6A4	D	
KLB	2.2	Flats	A4A5	V	
		Rises	A4	C	
KLV	0.5	Flats	A4A5	V	
		Gently undulating rises	A6A4	C	



					<u>gradational calcareous clay loam - A6</u> , with <u>shallow calcareous loam on calcrete - B2</u> , <u>deep moderately calcareous sandy clay loam - A3</u> and <u>friable gradational sandy clay loam - C3</u> .
KVE	0.6	Flats	A6	D	Flats formed on calcareous outwash sediments derived from basement rock. Minor scalding. Main soils: <u>gradational calcareous clay loam - A6</u> , with <u>red cracking clay - E2</u> .
KXB	0.3	Gently undulating plain	M1A3	E	Pediments, flats and low rises formed on outwash sediments. KXB Gently sloping pediments, slopes 1-3%. KXE Flats and low rises. 5-10% of flats are scalded, and 5-10% are affected by gulying. Main soils: Plains and flats: <u>deep alluvial sandy loam - M1</u> , and <u>deep moderately calcareous sandy loam - A3</u> . Rises: <u>deep (rubbly) calcareous sandy loam - A4</u> and <u>rubbly calcareous loam on clay - A5</u> , with <u>shallow calcareous sandy loam on calcrete - B2</u> and <u>gradational calcareous clay loam - A6</u> .
		Rises	A4	E	
KXE	0.2	Flats	M1A3	V	Main soils: Plains and flats: <u>deep alluvial sandy loam - M1</u> , and <u>deep moderately calcareous sandy loam - A3</u> . Rises: <u>deep (rubbly) calcareous sandy loam - A4</u> and <u>rubbly calcareous loam on clay - A5</u> , with <u>shallow calcareous sandy loam on calcrete - B2</u> and <u>gradational calcareous clay loam - A6</u> .
		Rises	A5A4	L	
KgB	0.1	Rises	A4A6	D	Gently undulating rises, slopes 1-3% and relief up to 30 m. Main soils: <u>deep (rubbly) calcareous sandy loam - A4</u> and <u>gradational calcareous clay loam - A6</u> , with <u>friable gradational sandy clay loam - C3</u> .
QXB	1.5	Rises	B2A4	V	Gently undulating rises and depressions with most soils shallow over calcrete. Slopes are 1-3%, relief is up to 30 m. Main soils: Rises: <u>shallow calcareous sandy loam on calcrete - B2</u> and <u>deep (rubbly) calcareous sandy loam - A4</u> . Depressions: <u>gradational calcareous clay loam - A6</u> and <u>deep (rubbly) calcareous sandy loam - A4</u> , with <u>sandy clay loam over pedaric red clay - D4</u> .
		Depressions	A6A4	L	
QjU	0.2	Rises	B2	E	Complex of calcrete rises and flats formed on clayey sediments. Main soils: Rises: <u>shallow calcareous loam on calcrete - B2</u> , with <u>shallow loam over red clay on calcrete - B6</u> and <u>deep (rubbly) calcareous sandy loam - A4</u> . Flats: <u>clay loam over pedaric red clay - D4</u> and <u>deep moderately calcareous loam - A3</u> .
		Flats	D4A3	E	

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 profile descriptions:

- A3** Deep moderately calcareous sandy loam to sandy clay loam (Regolithic, Calcic Calcarosol)
Calcareous sandy loam to sandy clay loam grading to a loamy to clayey subsoil without a significant carbonate accumulation in the subsoil, grading to medium to fine grained alluvium.
- A4** Deep (rubbly) calcareous sandy loam (Regolithic, Hypercalcic / Lithocalcic Calcarosol)
Calcareous sandy loam to loam grading to a very highly calcareous sandy clay loam to light clay with variable rubble, continuing below 120 cm.
- A5** Rubbly calcareous loam on clay (Regolithic, Supracalcic / Hypercalcic Calcarosol)
Calcareous loam grading to a very highly calcareous rubbly sandy clay loam to light clay, over a clayey substrate deeper than 60 cm, but within 120 cm.
- A6** Gradational calcareous clay loam (Pedal, Hypercalcic / Supracalcic Calcarosol)
Calcareous clay loam grading to a well structured very highly calcareous (sometimes rubbly) clay, over a red clayey substrate within 120 cm.
- B2** Shallow calcareous sandy loam to loam on calcrete (Petrocalcic, Calcic / Lithocalcic Calcarosol)
Stony calcareous sandy loam, often with a very highly calcareous more clayey subsoil, over sheet calcrete within 50 cm. This grades to rubbly carbonate over weathering basement rock within 150 cm.
- B6** Shallow loam over red clay on calcrete (Petrocalcic, Red Chromosol / Kandosol)
Loam over red clay on calcrete within 50 cm.
- C1** Gradational sandy loam (Hypercalcic, Red Kandosol)
Friable sandy to loamy topsoil grading to massive red-brown alkaline loamy to clay loamy subsoil, highly calcareous with depth, over alluvium.
- C3** Friable gradational clay loam (Calcic / Hypercalcic Red Dermosol)
Loam to clay loam grading to a friable red clay with abundant soft Class I carbonate within 50 cm, overlying alluvium within 100 cm.
- D4** Loam to clay loam over red friable clay (Calcic, Pedaric, Red Sodosol)
Thin to medium thickness loam to clay loam over a finely structured friable red clay, calcareous from about 50 cm, grading to fine or medium grained alluvium.
- E2** Red cracking clay (Epicalcareous, Epipedal, Red Vertosol)
Dark strongly structured clay grading to a well structured red calcareous medium to heavy clay continuing below 100 cm. Gypsum segregations often occur in subsoil.
- M1** Deep alluvial sandy loam (Calcareous, Regolithic, Brown-Orthic Tenosol)
Very thick brown sandy loam, usually calcareous with depth, continuing below 100 cm.

Further information: [DEWNR Soil and Land Program](#)

