

PTO Paratoo Land System

Range of rocky hills, running southwest to northeast, parallel with and southeast of the Barrier Highway, near Paratoo.

Area: 253.0 km²

Landscape: Low hills, rises, and pediments occur on the southeast of the main ranges. External drainage is into the Manunda Creek in the south, which eventually joins the Paratoo Creek drainage system, which drains the northern part.

Average rainfall: 225 - 285 mm average

Geology: Proterozoic Adelaide Geosyncline rocks, predominantly Ulupa Siltstone Formation, bounded on the northwest by Pepuarta Tillite and Enorama Shale. Quaternary sediments occur on pediments and alluvial plains between highland areas. Pleistocene Telford Gravel occurs on some outwash slopes.

Soils: Shallow stony soils, often calcareous, forming in basement rock, dominate rises and ranges, in association with rock outcrop. Deeper loamy to clay loamy soils, often calcareous, and usually with more clayey subsoils, occur on pediments, outwash slopes and flats.

Main soils:

On rock

L1a Shallow stony loam

RR Rock outcrop

On outwash

A5 Rubbly calcareous loam to clay loam on clay

D4 Clay loam over pedaric red clay

Minor soils:

On rock

A2 Shallow calcareous loam to sandy loam

B2 Shallow calcareous loam on calcrete

C2 Gradational loam to sandy loam on rock

D1 Loam to clay loam over clay on rock

D7 Loam over poorly structured clay on rock

L1b Shallow stony sandy loam

L1c Shallow stony loamy sand

On outwash

A3 Deep moderately calcareous loam

A4 Deep (rubbly) calcareous sandy loam to loam

A6 Gradational calcareous clay loam

A7 Calcareous clay loam on marl

A8 Gypseous calcareous loam

C3 Friable gradational clay loam

C4 Gradational sandy clay loam

D2 Clay loam over red clay

E2 Red cracking clay

M3 Deep gravelly sandy clay loam

N2 Wet saline soil



Summary:

The Paratoo Land System consists of steep ranges, hills and rises with pediments and alluvial plains. Much of the landscape resides on Proterozoic siltstones. Soils are shallow rocky loams on the hills and rises; texture contrast crumbly (pedaric) soils are extensive on pediments and plains, with, less commonly, calcareous gradational soils on older pediments.

Soil Landscape Unit summary: 59 Soil Landscape Units (SLUs) mapped in the Paratoo Land System:

SLU	% of area	Component	Main soils	Prop #	Notes
AEA	0.2	Gently undulating rises	L1RR	D	Non-arable rocky rises and low hills formed on mostly fine grained rocks. Soils are very shallow.
AEB	6.8	Rolling rises	L1RR	D	<p>AEA Gently sloping rises. Relief is < 30m, slopes are 1-3%.</p> <p>AEB Rolling rises. Relief is 9-30m, slopes are 10-30%.</p> <p>AEC Rolling low hills. Relief is 30-90m, slopes are 3-10%.</p> <p>AED Steep rises. Relief is 9-30m, slopes are 30-50%.</p> <p>AEG Undulating rises with moderate gullying (10-20% of land affected). Relief is less than 30m, slopes are 3-10%.</p> <p>AEg Undulating rises with 10-20% eroded watercourses and 10-50% scalding. Relief is less than 30m, slopes are 3-10%.</p> <p>AEH Rolling rises, moderately gullied (10-20% of land affected). Relief is 9-30m, slopes are 10-30%.</p> <p>AEJ Steep rises with eroded watercourses (10-20% of land affected). Relief is 9-30m, slopes are 30-50%.</p> <p>AEK Steep hills. Eroded watercourses (10-20% of land affected). Relief is greater than 90m, slopes are 30-60%.</p> <p>AEN Rolling rises, with 10-50% scalding or sheet erosion. Relief is 9-30m, slopes are 10-30%.</p> <p>Main soils: <u>shallow stony loam</u> - L1a and <u>rock outcrop</u> - RR, with <u>loam over clay on rock</u> - D1 and <u>shallow calcareous loam</u> - A2.</p>
AEC	0.4	Rolling low hills	L1RR	D	
AED	2.2	Steep rises	L1RR	D	
AEG	1.1	Undulating rises	L1RR	D	
AEg	1.1	Undulating rises	L1RR	D	
AEH	9.0	Rolling rises	L1RR	D	
AEJ	0.4	Steep rises	L1RR	D	
AEK	14.4	Steep hills	L1RR	D	
AEN	0.1	Rolling rises	L1RR	D	
AGA	0.2	Undulating rises	L1RRC2	D	<p>Hills and rises on fine grained rocks with shallow non calcareous soils and extensive rock outcrop.</p> <p>AGA Undulating rises. Slopes 3-10%</p> <p>AGB Rolling rises. Slopes 10-20%.</p> <p>AGh Rolling rises with eroded watercourses and scalding. Slopes 10-20%.</p> <p>Main soils: <u>shallow stony loam</u> - L1a, <u>rock outcrop</u> - RR and <u>gradational loam on rock</u> - C2.</p>
AGB	0.2	Rolling rises	L1RRC2	D	
AGh	0.1	Rolling rises	L1RRC2	D	
AKD	0.8	Steep low hills	L1RR	D	<p>Steep low hills on quartzite with sandy, shallow rocky soils over hard rock. Relief is less than 90m, slopes are 30-60%.</p> <p>Main soils: <u>shallow stony loamy sand</u> - L1c and <u>rock outcrop</u> - RR, with <u>shallow calcareous loam</u> - A2.</p>
AYB	0.2	Rolling rises	A2L1RR	D	<p>Rises formed on calcareous siltstone or other fine grained rocks. Extensive rock outcrop.</p> <p>AYB Rolling rises, 10-20% slope.</p> <p>AYM Undulating rises. 10-50% scalded or sheet eroded. Relief is less than 30m, slopes are 3-10%.</p> <p>Main soils: <u>shallow calcareous loam</u> - A2, <u>shallow stony loam</u> - L1a and <u>rock outcrop</u> - RR.</p>
AYM	1.2	Undulating rises	A2L1RR	D	
AZD	0.2	Steep low hills	L1RR	V	Steep low rocky hills formed on Ulupa Siltstone Formation



		Pediments	D4D2D1	C	siltstones and shales, with 10-20% pediments formed on fine grained outwash or rock. Relief < 90m, hillslopes are 30-60%. Main soils: Rises: <u>shallow stony sandy loam - L1b</u> and <u>rock outcrop - RR</u> . Pediments: <u>clay loam over pedaric red clay - D4</u> , <u>clay loam over red clay - D2</u> and <u>clay loam over (pedaric) clay on rock - D1</u> .
DaJ	0.6	Valley flats	D1D4C2	D	Flats and pediments formed on fine grained rocks and associated outwash, with mostly clay loamy surfaces. DaJ Valley floors and lower slopes. 5-10% of land is gullied and subsoils are slightly saline. Dam Undulating pediments. Moderately gullied (10-20%) and scalded (10-50%). Main soils: <u>clay loam over clay on rock - D1</u> , <u>clay loam over pedaric red clay - D4</u> and <u>gradational loam on rock - C2</u> .
Dam	0.9	Undulating pediments	D1D4C2	D	
DSB	0.2	Pediments	D1C2D7	V	Complex of pediments formed on fine grained rocks, and 20-30% rocky outcrop. DSB Gently undulating pediments. Slopes 1-3%, relief <30m. DSG Gently sloping pediment. Moderately gullied. Slopes are 1-3%, relief is less than 30m. Main soils: Pediments: <u>loam over (pedaric) clay on rock - D1</u> , <u>gradational loam on rock - C2</u> , and <u>loam over poorly structured clay on rock - D7</u> . Rocky areas: <u>shallow stony loam - L1a</u> and <u>rock outcrop - RR</u> .
		Rock outcrops	L1RR	C	
DSG	1.0	Pediments	D1C2D7	V	
		Rock outcrops	L1RR	C	
DTI	5.9	Gently undulating rises	D1D7	D	Gently undulating rises on fine grained rock. 15-25% rock outcrop. Moderately gullied (5-10%) and scalded (5-10%). Slopes are 1-3%, relief is less than 30m. Main soils: <u>clay loam over (pedaric) clay on rock - D1</u> and <u>loam over poorly structured clay on rock - D7</u> , with <u>rock outcrop - RR</u> and <u>shallow stony loam - L1a</u> .
EDB	0.1	Gently undulating rises	C2L1	D	Rises formed on medium to coarse grained rock. EDB Gently undulating rises with 10-30% rock outcrop. Slopes are 1-3%, relief is less than 30m. EDW Undulating rises. Moderately scalded (10-50%). Relief is less than 30m, slopes are 3-10%. Main soils: <u>gradational sandy loam on rock - C2</u> and <u>shallow stony loamy sand - L1c</u> , with <u>rock outcrop - RR</u> .
EDW	0.6	Undulating rises	C2L1	D	
EEV	0.4	Gently undulating rises	A2	D	Gently undulating rises formed on fine grained rocks. Moderately scalded (10-50%). Slopes are 1-3%, relief <30m. Main soils: <u>shallow calcareous loam - A2</u> , with <u>shallow stony loam - L1a</u> , <u>rock outcrop - RR</u> , and <u>deep (rubbly) calcareous sandy loam - A4</u> .
EHB	0.7	Gently sloping plains	A2	V	Plains and pediments formed on calcareous siltstones and limestones, often calcreted, with 10-20% rocky outcrops. EHB Gently undulating pediment plains with slopes of 1-3%, and 10-20% rocky rises with slopes of 3-10%. EHm Undulating pediments. Moderately gullied (10-20%) and scalded (10-50%). Slopes are 3-10%. EHY Valley flat and lower slopes, moderately scalded (10-
		Rocky outcrops	RR	L	
EHm	0.3	Undulating pediments	A2	V	
		Rocky outcrops	RR	L	
EHY	1.8	Valley flats	A2	V	



		Rocky outcrops	RR	L	50% of land affected). Main soils: Plains and Pediments: <u>Shallow calcareous sandy loam - A2</u> , with <u>shallow calcareous sandy loam on calcrete - B2</u> and <u>shallow stony sandy loam - L1b</u> . Rocky rises: <u>rock outcrop - RR</u> with <u>shallow stony sandy loam - L1b</u> .
EVC	0.2	Undulating rises	A2	V	Rises with 20-30% rock outcrops and shallow calcareous soils formed on fine-grained calcareous rocks. Slopes are 3-10%, relief is 9-30m. Main soils: Rises: <u>shallow calcareous loam - A2</u> , with <u>rubbly calcareous loam on clay - A5</u> ; <u>shallow calcareous loam on calcrete - B2</u> . Rocky areas: <u>rock outcrop - RR</u> , with <u>shallow stony loam - L1a</u> .
		Rocky outcrops	RR	C	
JLI	1.5	Gently undulating plain	D1D4A3	D	Plains and creek flats formed on fine grained rocks and outwash sediments. JLI Gently sloping pediment plains. Moderately scalded (5-10% of area). Slopes are 1-3%, relief is less than 9m. JLo Creek flats. 10-20% gully erosion, 10-50% scalded. JLoo Creek flats. Over 20% gully erosion, 10-50% scalded. Main soils: <u>clay loam to loam over pedaric red clay - D4</u> and <u>loam over (pedaric) clay on rock - D1</u> , with <u>deep moderately calcareous loam - A3</u> and <u>loam over poorly structured red clay on rock - D7</u> .
JLo	0.8	Creek flats	D4D1	D	
JLoo	2.9	Creek flats	D4D1	D	
JMPz	1.3	Plains	D4	D	Pediments, plains and creek flats with quartz gravelly surfaces. JMPz Plains. Moderately gullied (10-20%), severely scalded (over 50%) and saline. Slopes are less than 1%. JMQz Gently sloping pediments. Moderately gullied (10-20%), severely scalded (over 50%) and saline. Slopes 1-3%. Main soil is <u>clay loam over pedaric red clay - D4</u> .
JMQz	2.1	Gently sloping plains	D4	D	
JPI	8.0	Pediments	D4A5	D	Pediments and plains formed on fine grained outwash sediments derived from basement rocks. JPI Gently sloping pediments. Moderately gullied (10-20%) and scalded (5-10%). Slopes are 1-3%. JPo Creek flats. Moderately gullied (10-20%) and scalded (10-50%). JPu Plains. Moderately gullied (10-20%), severely scalded (over 50%). Main soils: <u>clay loam over pedaric red clay - D4</u> and <u>rubbly calcareous clay loam on clay - A5</u> , with <u>gradational loam on rock - C2</u> .
JPo	1.9	Creek flat	D4A5	D	
JPu	2.4	Plains	D4A5	D	
JZG	1.7	Pediments	D4A5	V	Complex of pediments and flats on fine grained outwash, and 20-30% rocky outcrops. JZG Gently sloping pediments. Moderately gullied (10-20%). Slopes are 1-3%. JZH Undulating pediments. Moderately gullied (10-20%). Slopes are 3-10%. JZI Gently undulating pediments. Moderately gullied (10-20%) and scalded (10-50%). Slopes are 1-3%. JZLz Gently undulating pediments. Moderately gullied (10-20%), moderately scalded (10-50%), and saline. Slopes 1-3%. JZoo Creek flats. Severely gullied (over 20%), moderately
		Rocky outcrops	RR	C	
JZH	0.2	Pediments	D4A5	V	
		Rocky outcrops	RR	C	
JZI	4.0	Pediments	D4A5	V	
		Rocky outcrops	RR	C	
JZLz	2.0	Pediments	D4A5	V	
		Rocky outcrops	RR	C	
JZoo	0.9	Creek flats	D4A5	D	
		Rocky outcrops	RR	C	



JZQz	0.9	Pediments	D4A5	V	scalded (10-50%). JZQz Gently undulating pediments. Moderately gullied and saline, severely scalded (over 50%). Slopes 1-3%. Main soils: Pediments: <u>clay loam over pedaric red clay - D4</u> and <u>rubbly calcareous clay loam on clay - A5</u> , with <u>deep moderately calcareous loam - A3</u> . Rocky rises: <u>rock outcrop - RR</u> , with <u>shallow stony loam - L1a</u> .
		Rocky outcrops	RR	C	
KBG	1.1	Gently undulating pediments	A5C3	D	Gently undulating pediments formed on fine grained outwash with clay loam surfaced soils. Moderately gullied (10-20%). Slopes are 1-3%. Main soils: <u>rubbly calcareous clay loam on clay - A5</u> and <u>friable gradational clay loam - C3</u> .
KcG	0.9	Gently undulating pediments	A5D4C4	D	Gently sloping pediments formed on fine grained outwash. Moderately gullied (10-20%). Slopes are 1-3%. Main soils: <u>rubbly calcareous clay loam on clay - A5</u> , <u>clay loam over pedaric red clay - D4</u> and <u>gradational sandy clay loam - C4</u> .
KFI	1.6	Pediments	A5	D	Pediments and plains formed on fine grained outwash. KFI Gently sloping pediments. Moderately gullied (10-20%) and scalded (10-50%). Slopes are 1-3%. KFPz Plains. Moderately gullied (10-20%), severely scalded (over 50%) and saline. KFV Gently sloping pediments. Moderately scalded (10-50%). Slopes are 1-3%. Main soils: <u>rubbly calcareous clay loam on clay - A5</u> with <u>clay loam over pedaric red clay - D4</u> .
KFPz	3.1	Plains	A5	D	
KFV	1.9	Pediments	A5	D	
KgG	2.1	Pediments	M3	D	Gently sloping pediments formed on stony outwash sediments. Moderate gully erosion (10-20%). Slopes are 1-3%, relief is less than 9m. Main soils: <u>deep gravelly sandy clay loam - M3</u> and <u>rubbly calcareous loam on clay - A5</u> .
KIH	0.5	Undulating pediments	D1D4E2	D	Undulating pediments formed on fine grained sediments and rocks. Moderate gully erosion. Slopes are 3-10%. Main soils: <u>clay loam over clay on rock - D1</u> , <u>clay loam over pedaric red clay - D4</u> and <u>red cracking clay - E2</u> .
KLB	0.8	Pediments	A5	D	Gently sloping pediments formed on fine grained rocks (sometimes calcreted), and outwash. Slopes are 1-3%. Main soils: <u>rubbly calcareous loam on clay - A5</u> with <u>shallow calcareous loam - A2</u> , <u>gradational loam on rock - C2</u> and <u>shallow calcareous loam on calcrete - B2</u> .
KMI	0.9	Gently undulating pediments	A5D4	D	Gently sloping pediment and lower valley formed on fine grained alluvium. 10-20% gullied land and 10-50% scalded. Slopes are 1-3%. Main soils: <u>rubbly calcareous loam on clay - A5</u> and <u>loam over pedaric red clay - D4</u> .
KNI	0.3	Valley floors	A5D4	D	Valley floors formed on fine grained alluvium. Up to 50% of land is scalded and 10-20% is gullied. Slopes are 1-3%. Main soils: <u>rubbly calcareous loam on clay - A5</u> and <u>loam over pedaric red clay - D4</u> , with <u>friable gradational clay loam - C3</u> .
KOMz	1.1	Gently sloping pediments	A5	D	Pediments and plains formed on fine grained alluvium.



KOV	0.9	Gently sloping plains	A6A5	D	<p>KOMz Gently sloping pediments. Moderately gullied (10-20%), moderately scalded (10-50%) and saline. Slopes are 1-3%, relief is less than 9m.</p> <p>KOV Gently sloping pediment plains. Moderately scalded (10-50%).</p> <p>Main soils: <u>rubbly calcareous clay loam on clay</u> - A5 and <u>gradational calcareous clay loam</u> - A6, with <u>clay loam over pedaric red clay</u> - D4 and <u>deep (rubbly) calcareous loam</u> - A4.</p>
KQB	0.2	Pediments	A5	V	<p>Complex of pediments on clayey alluvium and 20-30% stony rises on fine grained rocks.</p> <p>KQB Gently undulating pediments and rises. Slopes 1-3%.</p> <p>KQG Gently undulating pediments and rises. Moderately gullied. Slopes are 1-3%.</p>
		Low rises	A2	C	
KQG	1.8	Pediments	A5	V	<p>KQI Gently undulating pediments and rises. Moderately gullied (10-20%) and scalded (10-50%). Slopes are 1-3%.</p> <p>Main soils:</p> <p>Pediments: <u>rubbly calcareous clay loam on clay</u> - A5, with <u>clay loam over pedaric red clay</u> - D4.</p> <p>Rises: <u>shallow calcareous loam</u> - A2, with <u>shallow calcareous loam on calcrete</u> - B2 and <u>rock outcrop</u> - RR.</p>
		Low rises	A2	C	
KQI	0.5	Pediments	A5	V	<p>Main soils:</p> <p>Pediments: <u>rubbly calcareous clay loam on clay</u> - A5, with <u>clay loam over pedaric red clay</u> - D4.</p> <p>Rises: <u>shallow calcareous loam</u> - A2, with <u>shallow calcareous loam on calcrete</u> - B2 and <u>rock outcrop</u> - RR.</p>
		Low rises	A2	C	
XO-	0.4	Swamps	A7A8	D	<p>Moderately saline swamps formed on gypseous marls.</p> <p>Main soils: <u>calcareous clay loam on marl</u> - A7 and <u>gypseous calcareous loam</u> - A8, with <u>wet saline soil</u> - N2</p>

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

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

Detailed soil profile descriptions:

- A2** Shallow calcareous loam to sandy loam (Paralithic, Hypercalcic / Lithocalcic Calcarosol)
Calcareous stony loam to sandy loam grading to soft or rubbly carbonate over weathering dolomite or calc-siltstone within 50 cm.
- A3** Deep moderately calcareous loam (Regolithic, Calcic Calcarosol)
Calcareous 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 to 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 to clay loam on clay (Regolithic, Supracalcic / Hypercalcic Calcarosol)
Calcareous loam to clay 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.
- A7** Calcareous clay loam on marl (Marly, Hypercalcic Calcarosol)
Dark calcareous clay with a marly subsoil.
- A8** Gypseous calcareous loam (Gypseous Calcarosol)
Deep calcareous loam with abundant fine gypsum.



- B2** Shallow calcareous loam on calcrete (Petrocalcic, Calcic / Lithocalcic Calcarosol)
Stony calcareous 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.
- C2** Gradational loam to sandy loam on rock (Calcic / Hypercalcic Red Dermosol)
Loam to sandy loam grading to a friable red clay loam to clay with soft Class I carbonate within 50 cm, grading to weathering rock within 100 cm.
- C3** Friable gradational clay loam (Calcic / Hypercalcic Red Dermosol)
Friable clay loam grading to a well structured red clay with abundant soft Class I carbonate within 50 cm, overlying alluvium within 100 cm.
- C4** Gradational sandy clay loam (Sodic, Hypercalcic, Red Dermosol)
Hard setting sandy clay loam grading to a coarsely structured dispersive red clay, highly calcareous with depth, over clayey alluvium. Includes eroded former texture contrast soils.
- D1** Loam to clay loam over clay on rock (Hypercalcic / Calcic, Red Chromosol)
Medium thickness hard gravelly loam to clay loam over a friable and finely structured red clay, calcareous with depth, grading to weathering basement rock within 100 cm.
- D2** Clay loam over red clay (Calcic / Hypercalcic, Red Chromosol)
Hard setting clay loam (with variable quartzite stones) abruptly overlying a well structured red clay with soft Class I carbonate at depth.
- D4** Clay loam over red friable clay (Calcic, Pedaric, Red Sodosol)
Thin to medium thickness clay loam over a finely structured friable red clay, calcareous from about 50 cm, grading to fine or medium grained alluvium.
- D7** Loam over poorly structured clay on rock (Calcic / Hypercalcic, Red Sodosol)
Medium to thick hard loam sharply overlying a coarsely structured dispersive red clay, calcareous with depth, grading to highly weathered kaolinized siltstone or quartzite.
- 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. Often containing gypsum segregations in subsoil.
- L1a** Shallow stony loam (Paralithic, Leptic Tenosol)
Shallow stony loam, often calcareous with depth, overlying weathering fine grained rock shallower than 50 cm.
- L1b** Shallow stony sandy loam (Paralithic, Leptic Tenosol)
Shallow stony sandy loam, often calcareous with depth, overlying weathering fine to medium grained sandstone or tillite shallower than 50 cm.
- L1c** Shallow stony loamy sand (Paralithic, Leptic Tenosol)
Shallow stony loamy sand, often calcareous with depth, overlying quartzite shallower than 50 cm.
- M3** Deep gravelly sandy clay loam (Basic, Fluvic, Clastic Rudosol OR Basic, Regolithic, Red-Orthic Tenosol)
Thick to very thick sandy clay loam to sandy loam with more than 50% quartzite stones overlying stony alluvium.
- N2** Wet saline soil (Calcarosolic, Salic Hydrosol)
Seasonally wet, saline clay loam.
- RR** Rock outcrop.

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

