KET Ketchowla Land System

Area: 160.5 km^2

Landscape: Undulating rocky rises, occasionally steep, with shallow stony soils

Annual rainfall: 215 – 300 mm average

Geology: Proterozoic siltstones, quartzites, tillites forming north-south trending ridges with Holocene alluvial/colluvial deposits on the flanks.

Main soils:
A2 (36%) Calcareous loam on rock Paralithic Calcarosol
L1 (33%) Shallow soil on rock Rocky Rudosol-Tenosol

Minor soils:
RR (8%) Bare rock
A3 (5%) Deep moderately calcareous loam Calcic Calcarosol
C2 (4%) Gradational loam on rock Shallow Red Dermosol-Kandosol-Calcarosol
D4 (4%) Loam over pedaric red clay Pedaric Red Sodosol-Dermosol

Summary: The Ketchowla Land System consists of range of hills, often steep, formed on Proterozoic Adelaide Geosyncline rocks. The main soils are shallow, often calcareous soils with deeper gradational calcareous soils and red gradational and texture contrast soils on alluvium/colluvium.

Soil Landscape Unit summary: Ketchowla Land System (KET)

SLU	% of area	Component	Main soils	Prop#	Notes
AAB	1.6	Low hills	L1A2	D	Rises and hills with shallow rocky calcareous soils formed on fine-grained rocks. Rock outcrops are common. **AAB** Rolling rises as above. Relief: 9-30m, slopes are 10-30%. **AAD** Steep hills as above. Relief: over 90m, slopes: 30-50%. **AAg** Undulating rises and ridges. Relief is less than 30m, slopes are 3-10%. 5-10% of land is affected by eroded watercourses and scalding affects 10-50% of land. **AAh** Rolling rises and ridges. 5-10% land affected by eroded watercourses & scalding affects 10-50% of land. Relief: 9-30m, slopes: 10-30%. **AAj** Steep hills. 5-10% of land is affected by eroded watercourses and scalding affects 10-50% of land. Relief is 30-90m, slopes are 30-50%. **AAm** Undulating rises with 10-20% gullied land and 5-50% scalding. Relief is less than 30m, slopes are 3-10%. Main soils: Shallow stony soils on rock **- L1** and Calcareous loam on rock – **A2**.
AAD	2.9	Steep hills	L1A2	D	
AAg	0.3	Rises	L1A2	D	
AAh	3.7	Rises	L1A2	D	
AAj	12.5	Steep hills	L1A2	D	
AAm	2.2	Rises	L1A2	D	
ABB	0.6	Rises	L1	D	Rises and hills with linear rocky quartzite outcrops and shallow rocky soils on interbedded fine-grained rocks. **ABB** Rolling rises. Relief is less than 30m, slopes are 10-30%. **ABD** Steep low hills. Relief is 30-90m, slopes are 30-60%. **ABE** Steep hills. Relief is 90-300m, slopes are 30-60%. **ABG** Undulating rises as above. 10-20% gullied and eroded watercourses. Relief is less than 30m, slopes are 3-10%. Main soils: Shallow stony soils on rock **- L1** Rock outcrop - **RR** is common.
ABD	0.6	Steep hills	L1	D	
ABE	2.0	Steep hills	L1	D	
ABG	0.8	Rises	L1	D	
ADG	6.9	Rises	A2L1	D	Non-arable rocky rises and hills formed on limestones and calc-siltstones with very shallow loamy soils.
ADH	2.5	Low hills	A2L1	D	

ADI	0.7	Low hills	A2L1	D	**ADG** Undulating rises with eroded watercourses. Relief is less than 30m, slopes are 3-10%. **ADH** Rolling rises with eroded watercourses. Relief is 9-30m, slopes are 10-30%. **ADI** Rolling low hills with eroded watercourses. Relief is 30-90m, slopes are 3-10%. Main soils: Calcareous loam on rock – **A2** and Shallow stony soils on rock - **L1**.
AIB	1.8	Rises	L1A2	D	Rises and hills with very shallow sandy loam, or rock outcrop or shallow gradational loam over red clay loam on fine-grained rock. **AIB** Rolling rises. Relief is 9-30m, slopes are 10-30%. **AID** Steep hills. Relief is 90-300m, slopes are 30-60%. **AIH** Rolling rises with more than 20% gullied land and 0-5% scalded. Relief is 9-30m, slopes are 3-10%. **AII** Rolling rises. 5-10% gullied land. Relief is 9-30m, slopes are 3-10%. **AIM** Undulating rises on lower slopes of range. Up to 10% saline land. Relief is less than 30m, slopes are 3-10%. **AIg** Gently sloping rises. 5-10% gullied land and 10-50% saline land. Slopes are 1-3%, relief is less than 30m. Main soils: Shallow stony soils on rock **- L1** and Calcareous loam on rock – **A2**.
AID	0.3	Steep hills	L1A2	D	
AIH	1.7	Rises	L1A2	D	
AII	1.0	Rises	L1A2	D	
AIM	0.3	Lower slopes	L1A2	D	
AIg	9.8	Rises	L1A2	D	
AJg	0.5	Rises	L1C2	E	Rises and fans with shallow soils formed on fine-grained rocks (Ulupa Siltstone). Less than 20% of soils have secondary carbonate. Soils on rises are shallow over calcareous rocks with deeper soils on fans. **AJg** Gently undulating rises and fans. Moderately gullied and scalded. Salinity occurs on less than 10% of land. Non-arable. **AJh** Undulating rises and fans. Moderately gullied and scalded. Salinity occurs on less than 10% of land. Non-arable. Main soils: ***Rises:*** Shallow stony soils on rock - **L1** and Gradational loam on rock - **C2**. ***Fans:*** Clay loam over pedaric red clay - **D4**, Deep moderately calcareous loam - **A3** and Deep alluvial loam - **M1**.
		Fans	D4A3 M1	E	
AJh	0.7	Rises	L1C2	E	
		Fans	D4A3 M1	E	
AYA	0.7	Rise	A2L1	D	Hills and rises on fine-grained rocks, especially siltstones of the Tapley Hill Formation. **AYA** Undulating rises with shallow calcareous loam on calcareous siltstone or other fine grained rocks, or bare rock. Relief is less than 30m, slopes are 3-10%. **AYB** Rolling rises. Relief is less than 30m, slopes are 10-30%. **AYD** Very steep low hills. Relief: 30-90m; slopes: 50-100%. **AYT** Steep low hills with scree slopes. Relief is 30-90m, slopes are 50-100%. Main soils: Calcareous loam on rock – **A2** and Shallow stony soils on rock **- L1**.
AYB	0.2	Low hill	A2L1	D	
AYD	4.2	Steep hills	A2L1	D	
AYJ	4.2	Steep hills	A2L1	D	
AYT	0.2	Steep peak	A2L1	D	
DBB	3.5	Rise	D1A2	E	Gently sloping rise and fans formed on basement rocks with texture contrast soils with clay-loamy surfaces and containing carbonate in the subsoils. Relief is less than 9m, slopes are 1-3%. Main soils: ***Rises:*** Clay loam over pedaric red clay on rock - **D1** and Calcareous clay loam on rock – **A2**. ***Fans:*** Clay loam over pedaric red clay - **D4**, Deep moderately calcareous loam - **A3** and Deep alluvial loam - **M1**.
		Fan	D4A4 M1	E	

EHB	0.3	Rises	A2	D	Gently sloping rises on calcareous siltstones and limestones such as those of the ABC Range Quartzite Formation of the Wilpena Group. Slopes are 3-10%, relief is 9-30m. Main soils: Calcareous loam on rock – **A2**.
EOG	3.1	Rise	A2	V	Rises and fans with pulverulent calcareous soils **EOG** Gently undulating rises. Slopes are 1-3%, relief is less than 30m. Moderately gullied (10-20%) **EOc** Undulating rises and fans. Moderately gullied and up to 10% saline land. Relief is less than 30m, slopes are 3-10%. Main soils: ***Rises:*** Calcareous loam on rock – **A2**. ***Fans:*** Deep moderately calcareous sandy loam - **A3** and Deep alluvial loam - **M1**.
		Fan	A3 M1	C	
EOc	6.2	Rise	A2	V	
		Fan	A3 M1	C	
EVB	0.5	Rise	A2L1	D	Rises with rock outcrops and shallow calcareous soils formed on fine-grained calcareous rocks. **EVB** Gently sloping rises with shallow calcareous loam over calc-siltstones. 20-30% rocky outcrops. Slopes are 1-3%, relief is less than 30m. **EVC** Undulating rises and fans. Slopes are 3-10%, relief is less than 9-30m. Main soils: ***Rises:*** Calcareous loam on rock – **A2** and Shallow stony soils on rock - **L1**. ***Fans:*** Deep moderately calcareous sandy loam - **A3** and Deep (rubbly) calcareous sandy loam **-A4**.
EVC	9.2	Rise	A2L1	V	
		Fan	A3A4	C	
EZW	6.6	Rises	A2	V	Undulating rises with mostly shallow calcareous soils on weathered siltstones of the Tapley Hill Formation and the Tarcowie Siltstone. Fans are associated landforms. Gullying affects 5-10% of land, scalding affects around 10-50%. Subsoils are moderately saline. Slopes are 3-10%, relief is less than 30m.
		Fans	A3 M1	C	Main soils: ***Rises:*** Calcareous loam on rock – **A2**. ***Fans:*** Deep moderately calcareous loam - **A3** and Deep alluvial loam - **M1**.
JIl	0.5	Fan	D4D3	D	Gently sloping alluvial fan with red texture-contrast soils. Gullying affects 5-50% of land. Scalding affects nearly 50% of land. Slopes are 1-3%, relief is less than 9m. Main soils: Loam over pedaric red clay - **D4** and Loam over poorly structured red clay - **D3**.
JLyy	0.2	Drainage depression	D3D4	D	Creek flat with more than 20% pedaric, texture contrast (loam over crumbly red clay) soils, but less than 20% calcareous gradational soils. Severely gullied (over 20%) and scalded (over 50%), non-saline. Main soils: Loam over poorly structured red clay - **D3** and Loam over pedaric red clay - **D4**.
JMq	0.1	Fan	D4D3	D	Plains and fans with stony, pedaric, red, texture contrast soils with quartz gravel on the surface. **JMq** Gently sloping fans. Severely scalded (over 50%). **JMu** Severely scalded (over 50%) flats with moderately scalded drainage depressions. Moderately saline. Main soils: Loam over poorly structured red clay - **D3** and Clay loam over pedaric red clay - **D4**.
JMu	0.2	Flat	D4D3	D	
JPl	1.9	Fan	D4C3	D	Pediments and plains with texture contrast soils formed on outwash sediments derived from basement rocks. Calcareous in some part of the profile. More than 20% of soils
JPo	0.3	Drainage depression	D4C3	D	

JPv	0.3	Fan	D4C3	D	are pedaric (fine crumbly structure in subsoils). **JPl** Gently sloping fans with 10-20% land gullied and 5-10% scalded. Relief is less than 9m, slopes are 1-3%. **JPo** Drainage depression. Moderately gullied (10-20%) and scalded (10-50%). **JPv** Gently sloping fan, moderately gullied (10-20%) and severely scalded (more than 50%). Subsoils are saline. Slopes are 1-3%, relief is less than 9m. Main soils: Clay loam over pedaric red clay - **D4** and Loam over poorly structured red clay - **D3**.
JYB	1.0	Fan	D4A3	V	Gently sloping fans and rises. More than 50% of pediment soils have loam or clay-loam surfaces and more than 10% are Calcarosols. Slopes are 1-3%, relief is less than 9m. Main soils: ***Fans:*** Clay loam over pedaric red clay - **D4** and Deep moderately calcareous loam - **A3**. ***Rises****:* Calcareous loam on rock **– A2**.
		Rise	A2	C	
JZH	0.1	Fan	D4A3		Fan-basement rock complex with gently sloping fans with red texture contrast soils and 20-30% rocky rises with shallow texture contrast soils. **JZH** Undulating pediments. Moderately gullied. Slopes are 3-10%, relief is less than 9m. **JZl** Gently undulating fan and rocky rise complex. The pediments have between 10-50% of gullied land, with 20-75% scalded. Rises are not affected. Slopes are 1-3% on fans and 3-10% on rises. **JZv** Gently undulating fan and rocky rise complex. 10-50% of land on pediments is scalded, and gullying affects 10-20%. Slopes are 1-3% on pediments and 3-10% on rises. Main soils: ***Fans:*** Clay loam over pedaric red clay - **D4** and Deep moderately calcareous loam - **A3**. ***Rises:*** Calcareous loam on rock – **A2** and Shallow stony soils on rock **- L1**.
JZl	0.5	Fan	D4A3	E	
		Rise	A2L1	E	
JZv	1.0	Fan	D4A3	V	
		Rise	A2L1	C	
KQU	0.3	Flat	A3D4 C3	D	Pediment and basement-rise complexes with mostly calcareous gradational soils. **KQU** Flats and rises. Moderately scalded (5-10%). **KQo** Flats and rises. Moderately gullied (10-20%) and scalded (10-50%). Main soils: Deep (rubbly) calcareous sandy loam **-A4**, Loam over pedaric red clay - **D4** and Friable gradational sandy clay loam - **C3**.
KQo	0.2	Flat	A3D4 C3	D	
KVG	1.1	Fan	A3A4	C	Gently sloping fans formed on calcareous outwash sediments derived from basement rock. More than 90% of soils are calcareous throughout (Calcarosols). Moderately saline soils throughout. Moderately gullied (10-20%). Main soils: Deep moderately calcareous sandy loam - **A3** and Deep (rubbly) calcareous sandy loam **-A4**.

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:

A2/L1 Shallow calcareous loam (Paralithic, Hypercalcic / Lithocalcic Calcarosol) (**A2**) **OR** Shallow stony loam (Calcareous, Paralithic, Leptic Tenosol) (**L1**)

A3 Deep moderately calcareous (sandy) loam (Calcic Calcarosol)
Calcareous (sandy) loam topsoil grading into loamy-clay loamy subsoil without a significant CO_3 buildup in the subsoil (<20% CO_3 in subsoil). Pediment type Calcarosols.

A4 Deep (rubbly) calcareous loam (Hypercalcic-Lithocalcic Calcarosol)
Calcareous sandy-clay loamy topsoil grading into loamy-clay loamy subsoil with a significant CO_3 buildup in the subsoil. Often rubbly. Soil usually >120 cm in depth

C2 Gradational loam on rock (Calcic / Hypercalcic Red Dermosol)
Loam to clay loam grading to a friable red clay with soft Class I carbonate within 50 cm, grading to weathering rock within 100 cm.

C3 Gradational clay loam (Calcic / Hypercalcic Red Dermosol)
Loam to clay loam grading to a friable red clay with soft Class I carbonate within 50 cm, grading to alluvium within 100 cm.

D1 Loam over red clay on rock (Hypercalcic / Calcic, Red Chromosol / Sodosol)
Medium thickness hard gravelly loam over a red clay, friable and finely structured (D1), to hard, coarsely structured and dispersive (D7), calcareous with depth, grading to weathering basement rock within 100 cm.

D3 Loam over poorly structured red clay (Calcic-Hypercalcic Red Sodosol-Chromosol)
Topsoil <30 cm over poorly structured subsoil. Hard-setting loamy to clay loamy texture-contrast soil with a prismatic/poorly structured red alkaline clayey subsoil. Often with a thin topsoil. Can have slightly to moderately calcareous surface soil.

D4 Loam over red friable clay (Calcic, Pedaric, Red Sodosol)
Thin to medium thickness fine sandy loam to loam over a finely structured friable red clay, calcareous from about 50 cm, grading to fine or medium grained alluvium.

L1 Shallow stony loam (Paralithic, Leptic Tenosol)
Shallow stony loam, often calcareous throughout or with depth, overlying weathering rock shallower than 50 cm.

M1 Alluvial loam (Orthic Tenosol)
Very thick loam with variable gritty or more-clayey lenses, formed over recent alluvium.

Further information: DEWNR Soil and Land Program