UDN Udnawadloo Land System

Area: 123 km^2

Landscape: Pediments with low hard rock rises between the ranges of Black Rock and Barra Hill Land Systems, north of Peterborough. Named from the ephemeral Udnawadloo Creek which drains westward towards Black Rock Plain.

Annual rainfall: 275 - 375 mm range, with over 80% receiving 300 - 350 mm annual average

Geology: Saddleworth Formation siltstones, dolomites, Appila Tillite and Quaternary valley fill alluvium

Topography: Gently sloping pediments and rises, with broad valley floors between the range land systems to the east and west.

Elevation: 550 m asl on the upper pediments and rises, grading to 480 m asl in the valley floor at the northern end of the land system.

Relief: Slopes are generally 1 - 2%, with relief of around 10 - 20 m over 1 km on the pediments and plains.

Typical soils: Clay loam/loam over friable red clay (Sodosol), occurs on alluvial plains and are very common on lower slopes above drainage depressions. Often scalded.

Calcareous sandy clay loam grading to clay with soft carbonate segregations at depth (Calcarosols)

Shallow calcareous clay loam to loam over hard rock (Tenosols/Calcarosols)

Calcareous loam-clay loam grading to highly calcareous clay loam-clay (Calcarosols) occur on lower slopes and valley floors.

Main soils:

A2	(27%)	Calcareous loam on rock	(Paralithic Calcarosol)
L1	(16%)	Shallow soil on rock	(Rocky Rudosol-Tenosol)
A5	(15%)	Rubbly calcareous loam on clay	(Supracalcic-Lithocalcic Calcarosol on clay)
RR	(13%)	Bare rock	

Minor soils:

D4	(7%)	Loam over pedaric red clay	(Pedaric Red Sodosol-Dermosol)
M3	(6%)	Deep gravelly soil	(Gravelly Kandosol-Tenosol)
A6	(4%)	Gradational calcareous clay loam	(Pedal Hypercalcic-Lithocalcic Calcarosol on clayey subsoil)
D2	(4%)	Loam over red clay	(Calcic-Hypercalcic Red Chromosol-Sodosol)

Summary: The Udnawadloo Land System is a broad valley situated between the ranges of the Black Rock and Barra Hill Land Systems. Pediments with low rises create an undulating landscape. Soils are mostly shallow and calcareous over rock, although deeper calcareous rubbly soils over clay substrates do occur.

Soil Landscape Unit summary: Udnawadloo Land System

SLU	% of area	Component	Main soils	Prop#	Notes
AAA	2.6	Undulating rises	L1RRA2	D	Rises to low hills on limestone and calc-siltstone with very shallow loamy soils. **AAA** Undulating rises with shallow rocky soils or bare rock outcrop. Relief is less than 30m, slopes are 3-10%. **AAB** Rolling rises. Relief is less than 30m, slopes are 10-30%. **AAC** Rolling low hills. Relief is 30-90m, slopes are 3-10%. **AAG** Undulating rises as above with eroded watercourses (10-20% of land affected). Relief is less than 30m, slopes are 3-10%. **AAI** Rolling low hills with eroded watercourses; over 20% of land affected by gullying. Relief is 30-90m, slopes are 3-10%. Main soils: Shallow stony soils on rock **- L1**, Rock outcrop - **RR** and Calcareous loam on rock – **A2**.
AAB	0.7	Rolling rises	L1RRA2	D	
AAC	2.2	Rolling low hills	L1RRA2	D	
AAG	0.8	Undulating rises	L1RRA2	D	
AAI	4.0	Rolling low hills	L1RRA2	D	
AYB	4.5	Rolling rises	A2L1RR	D	Hills and rises on fine-grained rocks, especially siltstones of the Tapley Hill Formation. More than 20% of soils contain secondary carbonate. **AYB** Rolling rises. Relief is less than 30m, slopes are 10-30%. **AYC** Rolling low hills. Slopes are 10-30%, relief is 30-90m. **AYD** Very steep low hills. Relief is 30-90m; slopes are 50-100%. **AYG** Undulating rises with 10-20% gullied land. Relief is less than 30m, slopes are 3-10%. Main soils: Calcareous loam on rock – **A2** and Shallow stony soils on rock - **L1** and Bare rock – **RR**.
AYC	6.6	Rolling low hills	A2L1RR	D	
AYD	4.5	Very steep low hills	A2L1RR	D	
AYG	8.7	Undulating rises	A2L1RR	D	
DSC	0.4	Shallow pediment	D1C2D7	V	Pediments and rises complexes with shallow, clay-loamy surfaced, duplex soils over rock with more than 20% outcropping rock. **DSC** Undulating pediment with shallow sandy loam over red clay on rock. 20-30% bare rock. Relief is less than 30m, slopes are 3-10%. Main soils: Clay loam over pedaric red clay on rock - **D1**, Gradational red-brown clay loam over rock-**C2**, Loam over poorly structured clay on rock -**D7** and Shallow stony soils on rock **- L1**.
EEC	0.5	Undulating rises	A2	D	Undulating rises with mostly gradational calcareous soils, containing carbonate concretions or hard calcrete fragments. Relief is less than 30m, slopes are 3-10%. Main soils: Calcareous loam on rock – **A2**.
EFC	1.9	Undulating rises	A2D7L1	D	Undulating rises with only minor scalding, with moderately shallow soils overlying hard calcareous rocks, typically Hawker Group siltstones and limestones. Relief is less than 30m, slopes are 3-10%. Main soils: Calcareous loam on rock – **A2**, Loam over poorly structured clay on rock - **D7** and Shallow stony soils on rock **- L1**.

EHC	3.0	Undulating rises	A2L1	V	Undulating rises and pediments on calcareous rocks especially Appila Tillite Formation in this case. Relief is less than 30m, slopes are 3-10%. Main soils: ***Rocky rises:*** Calcareous loam on rock – A2, Shallow stony soils on rock - L1. ***Pediments:*** Calcareous loam on rock – **A2**.
		Undulating pediments	A2	C	
EOm	12.0	Undulating rises	A2A6	D	Undulating rises with pulverulent calcareous soils formed mainly on siltstones and shales with gradational calcareous sandy loam over clay loam on weathered rock; or deep gradational calcareous loam over rubbly clay loam. Moderately gullied and scalded. Relief is less than 30m, slopes are 3-10%. Main soils: Calcareous loam on rock – **A2** and Gradational calcareous clay loam - **A6**.
ERB	0.9	Gently undulating rises	A2L1RR	D	Gently undulating rises with shallow dark brown clay loamy calcareous soils on calc-siltstones and shales typically Saddleworth Formation here. Slopes are 1-3%, relief is 9-30m. Main soils: Calcareous clay loam on rock – **A2** and Shallow stony soils on rock **- L1**. Bare rock – **RR** is common.
EVB	1.7	Gently undulating rises	A2	V	Rises with rock outcrops and shallow calcareous soils formed on fine-grained calcareous rocks. **EVB** Gently undulating rises with gradational calcareous sandy loam over clay loam on weathered rock; 10-30% shallow calcareous sandy loam on rock, or bare rock. 20-30% bare rock. Slopes are 1-3%, relief is less than 30m. **EVC** Undulating rises with soils as above. Slopes are 3-10%, relief is less than 9-30m. **EVW** Undulating rises. 5-10% of land is gullied and 5-10% is scalded and. subsoils are moderately saline. Slopes are 3-10%, relief is 9-30m. Main soils: Calcareous loam on rock – **A2** and Bare rock – **RR**.
		Rocky outcrops	RR	C	
EVC	0.2	Undulating rises	A2	V	
		Rocky outcrops	RR	C	
EVW	3.7	Undulating rises	A2	V	
		Rocky outcrops	RR	C	
EZR	1.3	Undulating rises	A2A5B2	V	Undulating rises with mostly shallow calcareous soils on weathered siltstones of the Tapley Hill Formation and the Tarcowie Siltstone Soils have high salinity throughout. Relief is less than 30m, slopes are 3-10%. Main soils: *Rises:* Calcareous loam on rock **– A2**, Rubbly calcareous loam on clay - **A5** and Shallow calcareous loam on calcrete - **B2**. *Rocky outcrops:* Bare rock – **RR**.
		Rocky outcrops	RR	C	
JEB	0.2	Gently undulating pediments	D2C3	D	Gently undulating pediments with clay-loam surfaced, texture contrast soils formed in alluvium. Slopes are 1-3%, relief is less than 9m Main soils: Loam over red clay - **D2** and Friable gradational clay loam - **C3**.
JFG	8.0	Gently undulating pediments	D2D4C1	D	Gently undulating pediments with mostly red texture contrast soils with clay loam surfaces, calcareous soils occupy more than 20% and other gradational soils occupy more than 10%. 10-20% of land is gullied and subsoils are moderately saline. Slopes are 1-3%, relief is less than 9m.

					Main soils: Loam over red clay - **D2**, Loam over pedaric red clay - **D4** and Gradational sandy loam - **C1**.
JLB	1.1	Gently undulating pediments	D4	D	Plains and pediments with more than 20% pedaric, texture contrast (loam over crumbly red clay) soils, but less than 20% calcareous gradational soils. **JLB** Gently sloping pediments with loam over crumbly red clay; 10-30% deep moderately calcareous loam over clay. Slopes are 1-3%, relief is less than 9m. **JLC** Undulating pediments. Slopes are 3-10%, relief is less than 9m. Main soils: Clay loam over pedaric red clay - **D4** and Loam over pedaric red clay on rock - **D1**, with minor occurrences of Deep moderately calcareous loam - **A3**.
JLC	0.5	Undulating pediments	D4	D	
JPFF	0.2	Valley flat	D4A5	D	Valley flat with texture contrast soils formed on outwash sediments derived from basement rocks. Calcareous in some part of the profile. More than 20% of soils are pedaric (fine crumbly structure in subsoils). Severely gullied (>20% of land is affected). Main soils: Loam over pedaric red clay - **D4** and Rubbly calcareous loam on clay - **A5**.
JVJ	1.2	Drainage depression	D4D2C1	D	Drainage depression with texture contrast soils formed on outwash sediments derived from basement rocks. Most soils have sandy loam surfaces and consist of mixed Sodosols (with red, crumbly clay subsoils) and Kandosols (weakly structured red gradational soils) or Dermosols (well structured red gradational soils). Moderately gullied (10-20%). Main soils: Sandy loam over pedaric red clay - **D4**, Sandy loam over red clay - **D2** and Gradational sandy loam - **C1**.
JZC	0.3	Pediment	D4A5	V	Undulating pediment-basement rock complex. Pediments have red texture contrast soils with clay loam over crumbly red clay, or rubbly calcareous loam on clay and up to 30% rocky rises with shallow texture contrast soils. Slopes are 3-10%, relief is less than 9m. Main soils: ***Pediments and plains:*** Loam over pedaric red clay - **D4** and Rubbly calcareous loam on clay - **A5** with minor Deep moderately calcareous sandy loam - **A3**. ***Rocky rises:*** Bare rock - **RR**.
		Rocky outcrops	RR	C	
KFJ	2.3	Drainage depression	A5	D	Pediments with calcareous gradational soils and more than 20% red pedaric texture contrast soils. Moderate salinity with 10-50% of land affected. **KFJ** Drainage depression. Moderately gullied (10-20%). **KFR** Undulating pediments. Moderately scalded. (10-50%) Slopes are 3-10%, relief is less than 9m. Main soils: Rubbly calcareous loam on clay - **A5** with over 20% Loam over pedaric red clay - **D4**.
KFR	0.6	Undulating pediments	A5	D	
KgB	3.6	Pediment	M3	D	Pediments and flats with over 50% gradational calcareous soils of which most have more than 20%gravel or stone (non-pedogenic). **KgB** Gently undulating pediment Slopes are 1-3%, relief is less than 9m. **Kgo** Creek flat with deep loam, often calcareous and rubbly. Moderately scalded (10-50%) and gullied (10-20%).
Kgo	3.7	Creek flat	M3	D	
KgV	0.8	Pediment	M3	D	

					KgV Gently undulating pediment. Moderately scalded (10-50%). Slopes are 1-3%, relief is less than 9m. Main soils: Deep gravelly soil -**M3**. Rubbly calcareous loam on clay - **A5** is subdominant.
KQC	0.4	Pediment	A5	V	Pediment and basement-rise complexes with mostly calcareous gradational soils. **KQC** Undulating pediments with deep rubbly calcareous loam over clay. 10-30% clay loam over crumbly red clay. 20-30% rises with shallow calcareous loam over rock or bare rock. Slopes are 3-10%, relief is less than 9m on pediments and 9-30m on rises. **KQG** Gently undulating pediments and rises as above. Moderately gullied. Slopes are 1-3%, relief is less than 9m. Main soils: Rubbly calcareous loam on clay - **A5** on pediments and Calcareous loam on rock – **A2** on rises.
		Shallow rises	A2	C	
KQG	16.6	Pediment	A5	V	
		Shallow rises	A2	C	
KVV	0.2	Gently sloping plain	A6	D	Gently sloping pediments formed on calcareous outwash sediments derived from basement rock. More than 90% of soils are calcareous throughout (Calcarosols). Moderately scalded. Slopes are 1-3%, relief is less than 9m. Main soils: Gradational calcareous clay loam - **A6**. Less commonly occurring soils are: Rubbly calcareous loam on clay - **A5** and Deep moderately calcareous loam - **A3**.

PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

- 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.

A5 Rubbly calcareous loamy sand on clay (Supracalcic-Lithocalcic Calcarosol on clay)
Calcareous loamy sand topsoil grading into loamy-clay loamy subsoil on a clayey substrate. Usually rubbly. Clayey substrate occurs at >60 cm and <120 cm.

A6 Gradational calcareous clay loam (Pedal Hypercalcic-Lithocalcic Calcarosol on clayey subsoil)
Calcareous loams to clay loams grading into brown-red clay. Often rubbly.

B2 Shallow calcareous loam on calcrete (Petrocalcic Calcarosol-Rudosol)
Shallow, grey to reddish calcareous sandy to clay loamy soil on calcrete. This includes calcareous Petrocalcic Rudosols.

C1 Gradational sandy loam (Calcic-Hypercalcic Kandosol-Calcarosol)
Friable sandy to loamy topsoil grading into massive red-brown alkaline loamy to clay loamy subsoil.

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 red clay, friable and finely structured, calcareous with depth, grading to weathering basement rock within 100 cm.

D2 Hard loam over red clay (Calcic / Hypercalcic, Red Chromosol)
Hard setting sandy loam to clay loam (with variable quartzite stones) abruptly overlying a well structured red clay with soft Class I carbonate at depth.

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.

D7 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.

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

M3 Deep gravelly soil (Gravelly Kandosol-Tenosol)
Deep uniform loamy alluvial soils with at least 50% gravel in the major part of the profile.

RR Bare rock

Further information: DEWNR Soil and Land Program