HUD Huddleston Land System

Rises and low hills separating Rocky River and Crystal Brook plains in the Crystal Brook - Huddleston area

Area: 98.8 km^2

Annual rainfall: 395 – 530 mm average

Geology: Tertiary age sandstones and unconsolidated clayey sands, sandy clays and some heavy clays, capped by soft to semi-hard (occasionally rubbly) carbonates. The Tertiary sediments are altered in places to form silcretes (extremely hard silica rich rocks). Locally derived sandy clay outwash deposits occur on lower slopes.

Topography: Erosion of a once extensive blanket of Tertiary sediments overlying basement rock has formed undulating rises and low hills, with occasional steeper knobs. Tertiary remnants are commonly protected from further erosion by hard silcrete capping which occurs on knobs, breakaways and dissection slopes. These often have moderately steep slopes. Elsewhere, slopes are generally less than 10%. Outwash slopes are gently inclined with gradients of 2 - 5%. Watercourses are well defined and eroded in places.

Elevation: The elevation of the western edge, adjacent to the Crystal Brook plain is 100 m. The highest point of the Land System is White Cliff Hill (a silcreted remnant) at 346 m.

Relief: 20 - 60 m

Soils: The characteristic soils are hard and sandy, with dispersive clay subsoils. Calcareous sandy loams are also extensive. Clay loamy gradational soils (often calcareous), shallow soils over rock, and sands are limited in extent.

Main soils

Soils formed over Tertiary sediments and sandstone

D5 Hard loamy sandy over coarsely structured red clay
D2 Sandy loam over well structured red clay
A4a Calcareous sandy loam
C1 Gradational sandy loam

Minor soils

Soils formed on Tertiary sediments

A2a Shallow calcareous sandy loam
D3a Hard sandy loam over dispersive red clay
C4/C3 Gradational clay loam
A6 Calcareous clay loam
E2 Red cracking clay
L1a Loam over silcrete

Deep soils formed on alluvium

A4b Calcareous sandy loam
C3 Gradational clay loam
D3b Hard sandy loam over dispersive red clay

Shallow soils formed on weathered rock

A2b Shallow calcareous loam
L1b Shallow stony loam

Main features: The Huddleston Land System is mainly undulating arable land characterized by poorly structured sandy loam soils. Marginal fertility, poor infiltration, reduced moisture storage capacity, and patchy crop growth due to emergence/root growth problems are

typical of these soils. Other soils include deep, well structured and inherently fertile clay loamy soils, and shallow, often calcareous, stony soils over silcrete or sandstone. Erosion potential is moderate to high throughout.

Soil Landscape Unit summary: 11 Soil Landscape Units (SLUs) mapped in the Huddleston Land System:

SLU	% of area	Main features #
AXB	0.1	Non arable rocky rises or low hills with slopes of 15-25% formed on deeply weathered basement rock or Tertiary sediments and variably capped by ferricrete (ironstone) and / or silcrete. Main soils: loam over silcrete - **L1a** (E), shallow calcareous loam and sandy loam - **A2a/A2b** (E) and shallow stony loam - **L1b** (C). These small areas are non arable because of their extensive rockiness, moderate slopes and shallow, low fertility soils.
EQD EQI	0.8 0.6	Rises formed on silcreted Tertiary sediments with 10-20% silcrete outcrop and boulders. **EQD** Rises with slopes of 8-20%. **EQI** Dissected slopes of 10-20% with eroded watercourses. Main soils: sandy loam over well structured red clay - **D2** (E) and shallow calcareous sandy loam - **A2a** (E), with loam over silcrete - **L1a** (L). Use of these isolated rises is primarily limited by the extensive outcrops of silcrete and associated shallow stony soils. The remainder of the land is arable but with limitations due to erosion potential, shallow soils, fertility and highly abrasive surface stones.
HJB HJC HJD HJI	16.5 9.5 36.1 17.1	Rises and low hills formed on Tertiary sandstones and related unconsolidated sediments. **HJB** Rises with slopes of 2-5%. **HJC** Rises with slopes of 4-10%. **HJD** Low hills with slopes of 4-12%. **HJI** Low hills with slopes of 4-12% and eroded watercourses. Main soils: hard loamy sand over coarsely structured red clay - **D5** (E) and sandy loam over well structured red clay - **D2** (E), with calcareous sandy loam - **A4a** (C) and gradational sandy loam - **C1** (L). These slopes are highly erodible due to their predominantly sodic soils and sandy textured surfaces. Eroded watercourses indicate substantial historic erosion. The hard setting surfaces shed water, reducing profile storage, are difficult to work and may cause patchy emergence.
IWB	2.7	Rises with slopes of 2-5% with up to 10% surface ironstone gravel formed on Tertiary sandstones, clayey sands to sandy clays or heavy clays and capped by soft to rubbly carbonate. Main soils: calcareous sandy loam - **A4a** (E), with hard sandy loam over dispersive red clay - **D3a** (C) and gradational clay loam - **C4/C3** (L). The rises are fully arable and potentially productive although the mixture of soils has a variety of slight limitations including poor structure, shallow root zone depth, moderate fertility (attributable to sandy and calcareous soils) and boron toxicity.
JJB JJC	9.5 3.9	Outwash fans formed on fine grained outwash sediments. **JJB** Slopes of 1-3%. **JJC** Slopes of 3-6%. Main soils: hard sandy loam over dispersive red clay - **D3b** (E) and gradational clay loam - **C3** (E), with calcareous sandy loam - **A4b** (L). The slopes are fully arable, the main limitation being the poor soil structure of the predominant dispersive D3b soils. Hard setting surfaces and dispersive subsoils cause excessive runoff, restricted workability and patchy emergence. Soil fertility is sub-optimal because of the generally sandy nature of the topsoil.
TAZ	3.2	Gently undulating crests and upper slopes with gradients of up to 4% formed on clayey sediments of Tertiary or Quaternary age. Main soils: gradational clay loam - **C3** (E) and calcareous clay loam - **A6** (E), with red cracking clay - **E2** (L). These gentle slopes have few limitations with predominantly deep, fertile, well drained soils and minimal erosion potential.

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:

A2a Shallow calcareous sandy loam (Paralithic, Lithocalcic Calcarosol)
Calcareous sandy loam with soft or rubbly carbonate at shallow depth overlying calcreted Tertiary sandstone within 50 cm.

A2b Shallow calcareous loam (Paralithic, Hypercalcic / Lithocalcic Calcarosol)
Calcareous sandy loam to clay loam with soft or rubbly carbonate at shallow depth grading to weathering basement rock within 50 cm.

A4a Calcareous sandy loam (Regolithic, Hypercalcic / Lithocalcic Calcarosol)
Calcareous sandy loam to sandy clay loam grading to soft Class I or III A carbonate, or rubbly Class III B or III C carbonate from about 50 cm, overlying Tertiary sandstone, clayey sand or sandy clay.

A4b Calcareous sandy loam (Regolithic, Hypercalcic / Supracalcic Calcarosol)
Calcareous sandy loam to sandy clay loam grading to soft Class I or III A carbonate, or rubbly Class III B carbonate from about 50 cm, overlying medium textured alluvium.

C1 Gradational sandy loam (Hypercalcic, Red Kandosol)
Medium to thick soft sandy loam over a massive red clayey sand to sandy clay loam with soft carbonate segregations, forming in sandstone at about 60 cm.

A6 Calcareous clay loam (Pedal, Hypercalcic Calcarosol)
Calcareous clay loam to light clay grading to soft or occasionally rubbly very highly calcareous clay at about 50 cm over red heavy clay.

C3 Gradational clay loam (Hypercalcic, Red Dermosol)
Medium thickness friable clay loam grading to a well structured red clay with soft Class I carbonate from about 50 cm, overlying clayey alluvium.

C4/C3 Gradational clay loam (Hypercalcic, Red Dermosol)
Medium thickness friable clay loam grading to a coarsely structured red clay with soft Class I carbonate from about 50 cm, overlying a coarsely structured red clay.

D2 Sandy loam over well structured red clay (Hypercalcic, Red Chromosol)
Medium thickness hard sandy loam over a well structured red clay with soft Class I carbonate from about 50 cm, over sandy sediments, sandstone or alluvium.

D3a Hard sandy loam over dispersive red clay (Calcic, Red Sodosol)
Medium to thick hard setting sandy loam to sandy clay loam sharply overlying a coarsely structured dispersive red clay, with soft Class I carbonate from about 60 cm, over Tertiary sandy clay or sandstone.

D3b Hard sandy loam over dispersive red clay (Calcic, Red Sodosol)
Medium to thick hard setting sandy loam to sandy clay loam sharply overlying a coarsely structured dispersive red clay, with soft Class I carbonate from about 60 cm, over alluvium.

D5 Hard loam sand over coarsely structured red clay (Hypercalcic / Lithocalcic, Red Sodosol)
Medium to thick hard setting loamy sand to sandy loam sharply overlying a coarsely structured dispersive red clay with soft to rubbly Class III A, III B or III C carbonate at about 60 cm over sandstone, sandy clay or clayey sediments.

E2 Red cracking clay (Self-mulching / Epipedal, Red Vertosol)
Red self-mulching to coarsely structured clay, grading to a heavy coarsely structured red clay with variable soft carbonate throughout.

L1a Loam over silcrete (Silpanic, Leptic Tenosol)
Shallow sandy loam to clay loam overlying hard silcrete.

L1b Shallow stony loam (Calcareous, Paralithic, Leptic Tenosol)
Shallow stony loam to clay loam directly overlying basement siltstone or sandstone with carbonate segregations within 50 cm.

Further information: DEWNR Soil and Land Program