SPV Springbank Valley Land System

Undulating rises, outwash fans and flats in the Springbank Valley area, south west of Burra

Area: 27.6 km^2

Annual rainfall: 400 – 475 mm average

Geology: The land system is underlain by siltstones of the Saddleworth Formation, interbedded with more quartzitic rocks of the Undalya Quartzite and Appila Tillite. These rocks have been dissected, primarily along the line of strike, and the valleys infilled by locally derived clayey and gritty alluvium. The rocks and sediments are partially mantled by fine aeolian carbonates.

Topography: The land system includes the upper catchments of two north flowing water courses. Springbank Valley is the more easterly catchment. The catchments are separated by a reef of Undalya Quartzite, which is prominent as two moderately steep low hills. The catchments comprise a simple sequence of creek flats grading to gently inclined outwash fans in turn grading to undulating rises formed on basement rock. Except for the low quartzite hills, slopes are less than 12%.

Elevation: 610 m in the south east, to 490 m where the water courses leave the System

Relief: Maximum relief is 60 m (quartzite highs). Elsewhere, relief is 20 - 40 m

Soils: Most soils are moderately deep to shallow over basement rock. They have sandy loam to loam surfaces, with red clayey subsoils, although skeletal types with no subsoil are common on steeper and rocky land. On lower slopes, profiles are similar but deeper, and underlain by alluvium.

Main soils

Soils formed on basement rocks

D1 Hard loam over well structured red clay on rock
L1 Shallow stony sandy loam
D7 Hard sandy loam over dispersive red clay on rock

Soils formed on outwash sediments

D3 Hard sandy loam over dispersive clay
C3/M2 Gradational loam

Main features: Except for some isolated steep rocky ground, the Springbank Valley Land System is fully arable. Soils are moderately deep to deep and generally fertile, but poor surface structure is widespread on the dominant loamy texture contrast soils. This condition causes excessive runoff and associated erosion, and emergence / early growth problems. Dispersive subsoil clays, extensive on valley floors, present the additional problems of waterlogging and root growth impairment. Gypsum applications and modified surface management practices can help overcome these problems. Acidification is a potential problem which should be monitored.

Soil Landscape Unit summary: 7 Soil Landscape Units (SLUs) mapped in the Springbank Valley Land System

SLU	% of area	Main features #
ABH	7.3	Rocky rises to 30 m high formed on interbedded siltstones, tillites and quartzites, with up to 20% rock outcrop and 20% or more surface stone. Slopes are 10-25%. Most water courses are eroded. Main soils: shallow stony sandy loam - **L1** (V), with hard loam over well structured red clay on rock - **D1** (C). This land is too steep and rocky for any agricultural uses other than rough grazing. Much of the land has been eroded in the past, so maintenance of surface cover and control of run off are the main management issues.
DBC	40.8	Undulating rises to 40 m high with slopes of 4-12%, minor rock outcrop and minor water course erosion. Main soils: hard loam over well structured red clay on rock - **D1** (E) and hard sandy loam over dispersive red clay on rock - **D7** (E). Shallow stony sandy loam - **L1** (L) occurs on harder rock strata. Although the predominant soils are moderately deep and fertile, they are poorly structured, have low infiltration rates, high erodibilities, poor workability and unfavourable root growth conditions. Erosion control is critical on these soils, which are particularly susceptible to rilling. However with careful management to improve soil structure, they can be productive.
ETD	4.7	Isolated rises up to 60 m high formed on Undalya Quartzite. Slopes are 10-25%. There is extensive rock outcrop and surface stone. Main soils: shallow stony sandy loam - **L1** (E), hard sandy loam over dispersive red clay on rock - **D7** (E) and hard loam over well structured red clay on rock - **D1** (E). The extent of rocky outcrop, the moderate slopes, shallow soils and high erosion potential limit the use of most of this land to grazing.
JBJ	10.6	Drainage depressions with slopes of less than 2% formed on clayey and sandy outwash sediments. Water courses are generally eroded. Main soils: hard sandy loam over dispersive clay - **D3** (E) and gradational loam - **C3/M2** (E). Although deep and moderately fertile, these soils have poorly structured surfaces, shed water readily and are highly erodible. The land is subject to considerable run on water from adjacent steeper slopes, so control of water flow and maintenance of surface cover are critical. Soil acidity and salinity should be monitored on this land.
JXB JXC JXJ	14.9 15.6 6.1	Outwash fans, lower slopes and drainage depressions formed on a complex of clayey to sandy outwash sediments and basement rocks. **JXB** Fans with slopes of 2-4% and minor gully erosion. **JXC** Fans with slopes of 4-12% and minor gully erosion. **JXJ** Lower slopes and drainage depressions with slopes of 3-10% and eroded water courses. Main soils: hard sandy loam over dispersive clay - **D3** (C) and gradational loam - **C3/M2** (C) on outwash slopes and hard loam over well structured red clay on rock - **D1** (E) on rises. The soils are mostly deep and moderately fertile, but with hard setting surfaces causing excessive runoff (and erosion), and emergence / early growth problems. Soil acidity and salinity should be monitored on this land.

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:

C3/M2 Gradational loam (Calcic / Hypercalcic, Red Dermosol)
Medium thickness hard loam to clay loam grading to a well structured red clay, usually calcareous with depth.

D1 Hard loam over well structured red clay on rock (Calcic, Red Chromosol)
25 - 35 cm hard siltstone and quartz gravelly fine sandy loam to clay loam abruptly overlying a well structured red clay, calcareous with depth, grading to weathering siltstone within 100 cm.

D3 Hard sandy loam over dispersive clay (Brown / Red Sodosol)
30 - 60 cm hard gritty sandy loam to sandy clay loam abruptly overlying a dispersive coarsely structured brown or red mottled clay, continuing below 100 cm.

D7 Hard sandy loam over dispersive red clay on rock (Calcic, Red Sodosol)
15 - 30 cm hard quartz gravelly sandy loam to loam abruptly overlying a coarsely structured dispersive red clay, calcareous with depth, grading to weathering tillite, sandstone or quartzitic shale.

L1 Shallow stony sandy loam (Paralithic / Lithic, Leptic Tenosol / Rudosol)
Variable thickness stony sandy loam to clay loam grading to hard or weathered basement rock, usually within 50 cm.

Further information: DEWNR Soil and Land Program