

# FLV Flairville Land System

Upper catchment of Bundaleer Creek

**Area:** 62.2 km<sup>2</sup>

**Annual rainfall** 440 – 585 mm average

**Geology:** Siltstones of the Saddleworth Formation with interbedded more quartzitic rocks of the Undalya Quartzite and Watervale Sandstone Formations. The rocks are variably capped by fine carbonates of aeolian origin. These occur in the weathered zone as soft or rubbly segregations, leached out in some soils. Fine grained alluvium, from the erosion of underlying rocks, occurs as valley infill with a similar veneer of carbonate.

**Topography:** The area comprises a north - south valley of undulating lower slopes and valley floors, with some isolated steeper low hills, in the upper catchment of Bundaleer Creek. In the south, slopes are gentle (up to 10%), with alternating rises of basement rock, and broad valleys of alluvium. In the north, the valleys are narrower and are flanked by steeper (up to 30% slope), rockier rises and low hills.

**Elevation:** The highest point in the north is 570 m; the lowest point (in the south) is 280 m

**Relief:** Maximum relief (from valley floor to the crest of a basement rock high) is 70 m

**Soils:** Soils on hillslopes are moderately deep to shallow overlying basement rock. Loamy texture contrast and gradational types are typical, with calcareous and shallow stony forms. Deeper texture contrast and gradational loams are characteristic of lower slopes and flats, together with cracking clays.

## Main soils

*Soils formed on basement rock on hillslopes*

**C2** Gradational loam

**D1** Loam over friable red clay on rock

**A2** Calcareous loam

*Soils formed in alluvium on lower slopes and flats*

**M2** Deep gradational loam

## Minor soils

*Soils formed on basement rock on hillslopes*

**L1a** Shallow stony loam over weathering rock

**L1b/B3** Shallow stony loam over hard rock or calcrete

*Soils formed in alluvium on lower slopes and flats, or in highly weathered rock on slopes*

**E2** Red cracking clay

**D3** Sandy loam over dispersive red clay

**D2** Sandy loam over well structured red clay

**Main features:** The Flairville Land System comprises undulating mainly arable slopes with predominantly loamy soils of moderate to high fertility. These are generally moderately deep with clayey subsoils, although there are calcareous and shallow types as well. These shallower types are common on the steeper semi to non arable slopes which are more widespread in the north. Deeper texture contrast soils are predominant on lower slopes and creek flats. The main limitations to productivity are poor surface soil structure throughout, moderately steep rocky slopes and sporadic saline seepage.



**Soil Landscape Unit summary:** 13 Soil Landscape Units (SLUs) mapped in the Flairville Land System:

| SLU               | % of area          | Main features #   |
|-------------------|--------------------|---|
| AAC               | 3.1                | Rocky low hills and hills with slopes of 10-40% formed on mainly fine grained rocks. Main soils: <u>shallow stony loam over hard rock</u> - <b>L1b/B3</b> (E), with <u>calcareous loam</u> - <b>A2</b> (C), <u>loam over friable red clay on rock</u> - <b>D1</b> (L) and <u>gradational loam</u> - <b>C2</b> (L). The hills are non arable due to the roughness of the terrain, moderate slopes and shallow stony soils. Rocky outcrops limit accessibility in places. Runoff is rapid and exposure is high, so a significant proportion of rainfall does not infiltrate the soil. However, areas of deeper soils are potentially productive for grazing.  |
| DAC               | 3.8                | Gentle slopes of 5-10% formed on very fine grained basement rocks. Main soils: <u>loam over friable red clay on rock</u> - <b>D1</b> (E), <u>gradational loam</u> - <b>C2</b> (E) and <u>deep gradational loam</u> - <b>M2</b> (C). The slopes are potentially productive with moderately deep, fertile well drained soils. The main limitation is erosion potential due to the slope of the land.  |
| DCB<br>DCC<br>DCD | 0.4<br>35.0<br>8.4 | Rises and low hills formed on fine grained rocks.<br><b>DCB</b> Low rises with slopes of 2-3%.<br><b>DCC</b> Undulating rises and low hills with slopes of 4-10%.<br><b>DCD</b> Moderate stony slopes of 10-20%.<br>Main soils: <u>loam over friable red clay on rock</u> - <b>D1</b> (E) and <u>gradational loam</u> - <b>C2</b> (E), with <u>calcareous loam</u> - <b>A2</b> (C) and <u>shallow stony loam over weathering rock</u> - <b>L1a</b> (L). These slopes are arable; the main limitations being hard setting surface soils causing excessive runoff and contributing to erosion and workability problems. Although some soils are shallow and calcareous, most are moderately deep and fertile.   |
| ESC<br>ESD        | 2.0<br>10.8        | Semi arable rises formed on fine grained basement rock. There is 10-20% rocky outcrop and surface stone.<br><b>ESC</b> Slopes of 4-10%.<br><b>ESD</b> Slopes of 8-20%.<br>Main soils: <u>gradational loam</u> - <b>C2</b> (E), and <u>calcareous loam</u> - <b>A2</b> (E), with <u>shallow stony loam over weathering rock</u> - <b>L1a</b> (L) and <u>shallow stony loam over hard rock</u> - <b>L1b/B3</b> (M). Rocky reefs, shallow stony soils and sometimes moderate slopes limit cropping of these areas. The arable land is generally confined to strips between the reefs of rock. Water erosion is a potential problem because of the high runoff from the shallow soils and rocky areas.  |
| JEJ<br>JEe        | 1.5<br>10.6        | Lower slopes and drainage depressions formed on fine grained alluvium.<br><b>JEJ</b> Slopes and depressions with eroded watercourses.<br><b>JEe</b> Slopes and depressions with eroded watercourses and sporadic salinity.<br>Main soils: <u>sandy loam over dispersive red clay</u> - <b>D3</b> (E) and <u>sandy loam over well structured red clay</u> - <b>D2</b> (E) with <u>deep gradational loam</u> - <b>M2</b> (L). These valley floors and creek flats are mostly arable, although watercourses dissect the land to a disruptive extent (and some are eroded). The main soil limitation is poor structure and hardness, leading to excessive runoff (contributing to erosion), difficult workability and patchy emergence. Sporadic salinity adjacent to creeks is serious enough to affect productivity.    |
| JXC               | 1.5                | Complex of outwash fans and intervening basement rock rises. Slopes are 3-10%.<br>Main soils: deep <u>sandy loam over dispersive red clay</u> - <b>D3</b> (E) and <u>sandy loam over well structured red clay</u> - <b>D2</b> (E) on fans, and shallower <u>loam over friable red clay on rock</u> - <b>D1</b> (L) and <u>gradational loam</u> - <b>C2</b> (M), with <u>calcareous loam</u> - <b>A2</b> (M) on rises. The soils on the fans are deep and naturally fertile, but are generally poorly structured in the surface and often dispersive in the subsoil. This leads to excessive runoff and erosion, difficulty in working and patchy emergence. Soils on the rises are better structured, but all land is prone to water erosion. The land which has been eroded in the past is particularly susceptible. |
| KUB<br>KUC<br>KUP | 17.5<br>3.4<br>2.0 | Outwash fans and flats formed on fine grained alluvium.<br><b>KUB</b> Fans with slopes of 2-5%.<br><b>KUC</b> Fans with slopes of 4-10%<br><b>KUP</b> Marginally saline flats with slopes of less than 2%.<br>Main soils: <u>deep gradational loam</u> - <b>M2</b> (E) and <u>red cracking clay</u> - <b>E2</b> (E). This land is potentially highly productive having deep, fertile and moderately well drained soils. The main limitation is salinity, but at least grazing productivity can be maintained through establishment of salt tolerant pastures.   |



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

|  |                                       |
|--|---------------------------------------|
| (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** Calcareous loam (Paralithic, Calcic / Lithocalcic Calcarosol)  
Calcareous stony loam grading to highly calcareous clay loam to clay with soft Class III A or rubbly Class III B/C carbonate at shallow depth, grading to weathering rock by 75 cm.
- C2** Gradational loam (Calcic / Lithocalcic, Red Dermosol)  
Loam to clay loam grading to a well structured red clay over soft Class III A (or rubbly Class III B/C) carbonate underlain by weathering rock within 100 cm.
- D1** Loam over friable red clay on rock (Calcic / Lithocalcic, Red Chromosol)  
Hard loam to clay loam abruptly overlying a well structured red clay with soft Class III A or rubbly Class III B/C carbonate at shallow depth grading to weathering rock within 100 cm.
- D2** Sandy loam over well structured red clay (Calcic, Red Chromosol)  
Hard setting sandy loam to clay loam sharply overlying a well structured red clay with minor soft Class I carbonate at depth over alluvium.
- D3** Sandy loam over dispersive red clay (Calcic / Eutrophic, Red Sodosol)  
Hard setting sandy loam to clay loam sharply overlying a coarsely structured often dispersive red clay usually with minor soft Class I carbonate at depth over alluvium.
- E2** Red cracking clay (Epipedal, Red Vertosol)  
Red cracking clay, with a coarsely structured and calcareous subsoil over alluvium.
- L1a** Shallow stony loam over weathering rock (Calcareous / Basic, Paralithic, Leptic Tenosol)  
Stony loam to clay loam grading to weathering rock, often with soft carbonate in fissures.
- L1b/B3** Shallow stony loam over hard rock (Lithic / Petrocalcic, Leptic Rudosol)  
Stony loam overlying hard rock or calcrete at shallow depth.
- M2** Deep gradational loam (Calcic / Eutrophic, Red / Black Dermosol)  
Loam to clay loam grading to a well structured red or dark clay over soft Class I carbonate (sometimes absent) underlain by alluvium.

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

