

# BIF Big Flat Land System

Broad flats between Springton and Mount Crawford

**Area:** 25.2 km<sup>2</sup>

**Annual rainfall:** 680 – 755 mm average

**Geology:** The landscape comprises two main geological features. Most of the area is underlain by sandy to sandy clay sediments derived from erosion and redeposition of surrounding coarse grained Kanmantoo Group rocks. Scattered among the sediments are remnants of an older land surface, possibly formed on Tertiary age materials. These are deeply weathered, kaolinized and ferruginized. Ironstone gravels on the surface and in the soil are indicators of these materials.

**Topography:** The landscape is a very gently inclined peneplain with a gradient of less than 2% to the north west. On the eastern margin, where sediments have accumulated against higher ground, slopes may reach 6%. The original land surface (possibly of Tertiary age) appears to have been very weakly dissected by moderately well to poorly defined water courses, with a general flow direction to the north west. This has created a complex of low flat topped rises and intervening alluvial flats, usually with relief of less than 5 m.

**Elevation:** 460 m on the eastern side to 410m in the west

**Relief:** Less than 5 m with occasional rises to 10 m

**Soils:** The soils of the flats usually have loamy to sandy texture contrast profiles with brown or grey subsoil clays. Rises are ironstone or sand over clay soils.

## Main soils

### *Flats*

**G4** Loamy sand over dispersive brown clay

**G3a** Sand over dispersive brown clay

**F2a** Loam over grey clay

### *Low rises*

**J2** Ironstone gravelly loamy sand

## Minor soils

### *Flats*

**F2b** Sandy loam over brown acidic sandy clay

**M1** Gradational loamy sand

**M3a** Deep gravelly sand

### *Low rises*

**G3b** Sand over brown clay

**M3b** Deep gravelly sand

**Main features:** The Big Flat Land System is unusual for the Mount Lofty Ranges in being predominantly a plain. The main soils are deep but characterized by clayey subsoils (often dispersive) which tend to perch water. Waterlogging is a common limitation, especially on creek flats. Associated with the restricted water flow is salt accumulation, and there are areas of poor plant growth due to the effects of salinity. Low rises scattered across the plain have ironstone soils. Low natural fertility is a common feature of all soils. Although most soils are calcareous with depth, some are



acidic at the surface. Much of the land is covered by radiata pine plantations (except for the marginally saline and wet flats). Drains have been installed in places to assist with water removal.

**Soil Landscape Unit summary:** 4 Soil Landscape Units (SLUs) mapped in the Big Flat Land System:

SLU	% of area	Main features #
FiA	5.0	<p>Gently undulating very low rises less than 10 m high with slopes of 1-2%, formed on deeply weathered kaolinized Tertiary sediments.</p> <p>Main soils: <u>ironstone gravelly loamy sand</u> - <b>J2</b> (E), <u>sand over brown clay</u> - <b>G3b</b> (E) and <u>deep gravelly sand</u> - <b>M3b</b> (L). These soils are deep but infertile. Some waterlogging is possible, but generally these are the better drained soils of the Land System. The sandy surfaces are prone to wind erosion and acidification.</p>
LEK	84.3	<p>Complex of broad flats (70% of area) and very low rises, less than 5 m high (30% of area). The flats are formed on alluvial sand, clayey sand and sandy clay alluvium derived from the erosion of coarse grained metamorphic rocks. They have slopes of less than 2%. The rises are similar to the more pronounced mapped rises of <b>FiA</b>.</p> <p>Main soils of the flats: <u>loamy sand over dispersive brown clay</u> - <b>G4</b> (C), <u>loam over grey clay</u> - <b>F2a</b> (C), <u>sand over dispersive brown clay</u> - <b>G3a</b> (L) and <u>sandy loam over acidic brown sandy clay</u> - <b>F2b</b> (M). The soils of the rises are as for FiA. These soils of the flats are deep but generally imperfectly drained due to dispersive clayey subsoils which perch water. Salts have accumulated in places as a result of inadequate leaching. Natural fertility is moderately low, and some soils are acidic.</p>
LIH	4.4	<p>Slopes of 3-6% formed on sandy outwash sediments. Water courses are occasionally eroded.</p> <p>Main soils: <u>sand over dispersive brown clay</u> - <b>G3a</b> (E), <u>gradational loamy sand</u> - <b>M1</b> (E) and <u>deep gravelly sand</u> - <b>M3a</b> (L). The soils are deep but infertile, subject to waterlogging and highly erodible. Productivity potential is low.</p>
LJe	6.3	<p>Creek flats formed on alluvium. Water courses are commonly eroded. A substantial part of the land is marginally saline.</p> <p>Main soils: <u>loamy sand over dispersive brown clay</u> - <b>G4</b> (E) and <u>loam over grey clay</u> - <b>F2a</b> (E). Poor drainage and salinity are the main limitations of these soils. Their land use potential is limited to grazing or revegetation for conservation.</p>

# 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:***Flats*

- G4** Loamy sand over dispersive brown clay (Calcic, Brown Sodosol)  
Thick brown sand to light sandy clay loam with a bleached A2 layer, sharply overlying a yellow brown, grey brown and red mottled clay with columnar structure, grading to a Class I carbonate layer of fine calcareous segregations at 70 cm.
- F2a** Loam over grey clay (Eutrophic, Grey Sodosol)  
Medium thickness grey loam with a bleached A2 horizon, overlying a dark grey and yellowish brown mottled clay with strong blocky structure.
- G3a** Sand over dispersive brown clay (Mesonatric, Brown Sodosol)  
Thick grey sand with a bleached A2 horizon, overlying a yellow brown, dark brown and grey mottled sandy clay to clay with coarse prismatic structure, grading to a sandier sediment below 100 cm.
- F2b** Sandy loam over brown acidic sandy clay (Natric, Brown Kurosol)  
Thick massive grey loamy sand to loam with a bleached and quartz gravelly A2 layer, overlying a brown mottled sandy clay loam to sandy clay with coarse prismatic structure, grading to medium to fine textured stony alluvium from about 100 cm.
- M1** Gradational loamy sand (Eutrophic, Brown Kandosol)  
Very thick brown sand with bleached and rusty mottles, grading to a brown clayey sand to light sandy clay loam at about 100 cm, grading to coarse textured alluvium.
- M3a** Deep gravelly sand (Petroferric, Bleached-Orthic Tenosol)  
Very thick gravelly loamy sand with a bleached and stony A2 layer, overlying iron cemented sand.

*Low rises*

- J2** Ironstone gravelly loamy sand (Ferric, Mesotrophic, Yellow Kandosol)  
Thick brown ironstone gravelly loamy sand with a pale A2 horizon, overlying a brownish yellow and orange sandy clay loam to sandy clay with ironstone gravel throughout.
- G3b** Sand over brown clay (Bleached, Mesotrophic, Brown Chromosol)  
Thick grey sand with a bleached A2 horizon containing ironstone and sandstone gravel, overlying a brown, yellow and red sandy clay loam to clay, grading to weakly cemented sandstone or sandy clay within 100 cm.
- M3b** Deep gravelly sand (Acidic, Regolithic, Bleached-Orthic Tenosol)  
Thick grey gravelly loamy coarse sand to coarse sandy loam with a bleached A2 horizon containing more than 50% quartz gravel and cobbles, overlying a yellow gravelly sandy clay loam grading to gravel and stone beds in a clay matrix.

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

