HUS Humbug Scrub Land System

Rolling to moderately steep low hills between Para Wirra and Inglewood

Area: 35.3 km^2

Annual rainfall: 565 – 810 mm average

Geology: The land is underlain by schists and gneisses of the Barossa Complex. These are deeply weathered on gentler slopes, but generally fresh weathering rock is within 100 cm, and often 50 cm of the surface. Remnants of an old Tertiary land surface occur in the north, and are characterized by quartz gravelly sands to sandy clays. Both the Tertiary sediments and the basement rocks have been lateritized in the past. The deep weathering profiles persist on upper slopes and summit surfaces, and are characterized by ironstone deposits. Alluvium derived from localized erosion and deposition is a minor component overall.

Topography: The landscape is dominated by rolling to moderately steep low hills. A typical topo-sequence includes a more or less flat topped residual deep weathering summit surface, a moderately to strongly dissected hillslope, and a narrow creek flat. Ironstone gravel, stones and boulders are common on crests. Basement rock outcrop and surface stone are extensive on steeper hillslopes and minor on gentle slopes. The northern part of the System drains into the South Para River; the southern part is in the Little Para catchment.

Elevation: 250 - 380 m

Relief: Up to 70 m

Soils: Although there is considerable variability in the soils, they all have the common feature of sandy to sandy loam surfaces, with abundant gravels and stones. Moderately deep texture contrast types over basement rocks dominate, with shallow stony soils, ironstone soils and deep texture contrast soils as limited components. Moderately deep sands are minor.

Main soils

Soils formed in weathering basement rock on hillslopes

K4a Acidic sandy loam over brown clay on fresh weathering rock
K4b Acidic sandy loam over brown clay on deeply weathered rock
L1 Shallow stony sandy loam

Soils formed in alluvium or deeply weathered rock on lower slopes or flats

F1 Sandy loam over brown mottled clay over alluvium
F1/K1 Sandy loam over brown mottled clay over deeply weathered rock

Minor soils

Soils formed on Tertiary residuals

M3 Stony gradational loamy sand
G2/G5 Bleached sand over sandy clay loam

Ironstone soils

J2a Ironstone soil over Tertiary sediments
J2b Ironstone soil over basement rock

Soils formed in alluvium or deeply weathered rock on lower slopes or flats

F2 Sandy loam over poorly structured brown clay

Main features: The Humbug Scrub Land System is dominated by moderately steep to rolling hillslopes, often capped by flat topped ironstone or quartz gravelly crests, and separated by narrow creek flats. The soils are invariably sandy to sandy loam surfaced, most with more clayey subsoils. Many are very gravelly. Very low fertility is the characteristic feature of the soils, so consequently much of the land is undeveloped, even though a third is potentially arable.

Soil Landscape Unit summary: 6 Soil Landscape Units (SLUs) mapped in the Humbug Scrub Land System:

SLU	% of area	Main features #
AeC AeD	67.2 12.7	Rolling to steep low hills and hills formed on schists and gneisses of the Barossa Complex. Drainage depressions are narrow and infilled with locally derived sediments. Rock outcrop and stone vary from minor on gentler slopes to extensive on steep slopes. **AeC** Rolling low hills with minor rock and stone and well defined but unmappable drainage depressions; relief is up to 70 m and slopes are 18-30%. **AeD** Steep to very steep rocky hillslopes with narrow crests and drainage depressions; relief is up to 70 m and slopes are 30-80%. The soils are mixed texture contrast and shallow stony types. Main soils: Shallow stony sandy loam - **L1** (E) on steeper rocky slopes Acidic sandy loam over brown clay on rock - **K4a** (E) Acidic sandy loam over brown clay on kaolinized rock - **K4b** (L) Sandy loam over brown mottled clay - **F1** and **F1/K1** (L) on flats and lower slopes These soils are shallow to moderately deep, and generally infertile and acidic, and well to moderately well drained. Only the slopes of AeC are readily accessible to machinery, so productive potential is severely limited. Much of the steeper land remains under scrub. Productivity potential of the moderate slopes of AeC is low to moderate.
CjD	9.7	Gently rolling low hills with slopes of 10-18% and relief to 30 m, formed on Barossa Complex schists and gneisses. Drainage depressions are broad (up to 100 m wide) and where wider are mapped as **LBE**. There is little or no rock outcrop. The soils are mostly texture contrast types, either moderately deep over rock, or deep over kaolinitic weathering rock or alluvium. Main soils: Acidic sandy loam over brown clay on rock - **K4a** (E) Acidic sandy loam over brown clay on kaolinized rock - **K4b** (C) Sandy loam over brown mottled clay - **F1** and **F1/K1** (L) on flats and lower slopes Shallow stony sandy loam - **L1** (L) on minor rocky slopes Ironstone soil - **J2b** (M) on some upper slopes The soils are generally deep enough that water holding capacity is not a major limitation, but they are infertile, acidic and imperfectly drained in places, particularly lower slopes. Erodibility is high. Although overall productivity potential is low, the land has some horticultural value where water is available.
FbZ	4.6	Upper slopes and summit surfaces (flat topped crests) underlain by deeply weathered and lateritized schists. Slopes are variable, up to 15%, with some surface ironstone. Soils are characterized by ironstone gravel. Main soils: Ironstone soil - **J2b** (E) Acidic sandy loam over brown clay on kaolinized rock - **K4b** (E) These soils are deep, but imperfectly drained, infertile and acidic. Productive potential is low.
FiZ	4.0	Summit surfaces with gently sloping crests, moderately inclined (up to 15% slope) as they grade away to the hillsides below. The landscape is formed on deeply weathered kaolinized Tertiary age sands and sandy clays, usually occurring as thin remnants on basement rock. Surface ironstone is common, often occurring as large boulders. The soils are sandy surfaced and usually gravelly. Most have yellow to brown clayey subsoils forming in highly weathered sandstones or gravel beds. Main soils: Ironstone soil - **J2a** (E) Stony gradational loamy sand - **M3** (C) Bleached sand over sandy clay loam - **G2/G5** (L) Sandy loam over brown mottled clay - **F1/K1** (L) These soils are extremely infertile and acidic. They have very little development potential.

LBE	1.8	Drainage depressions and creek flats formed on medium to fine grained alluvium. The soils are deep and mostly texture contrast over alluvium. Main soils: Sandy loam over brown mottled clay - **F1** (E) Sandy loam over poorly structured brown clay - **F2** (E) These soils are deep but imperfectly to poorly drained. They commonly have hard setting surfaces, bleached A2 layers and tight, poorly structured mottled clayey subsoils. With appropriate species and fertilizer programmes, pasture productivity can be high, but horticultural productivity depends on improvements in drainage as well. There is sporadic saline seepage and water courses are highly susceptible to erosion.

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:

Soils formed in weathering basement rock on hillslopes

K4a Acidic sandy loam over brown clay (Bleached, Mesotrophic, Brown Chromosol)
Medium thickness gravelly brown loamy sand to light sandy clay loam, overlying a yellowish red to strong brown finely structured clay subsoil grading to weathering rock within 100 cm.

K4b Acidic sandy loam over brown clay on kaolinized rock (Bleached-Mottled, Mesotrophic, Brown Chromosol)
Medium thickness gravelly brown loamy sand to light sandy clay loam, overlying a yellowish red to strong brown finely structured clay subsoil grading to soft kaolinitic schist or gneiss continuing below 200 cm.

L1 Shallow stony sandy loam (Acidic, Lithic, Bleached-Leptic Tenosol)
Thick, greyish, very gravelly loamy sand to sandy loam with a bleached A2 horizon, grading to hard schist, gneiss or metasandstone by 50 cm.

Soils formed on Tertiary residuals

M3 Stony gradational loamy sand (Acidic, Mesotrophic, Yellow Kandosol)
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.

G2/G5 Bleached sand over sandy clay loam (Bleached, Mesotrophic, Brown Kurosol)
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 Tertiary sandstone within 100 cm.

Ironstone soils

J2a Ironstone soil over Tertiary sediments (Ferric, Mesotrophic, Brown Kandosol)
Thick brown very 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.

J2b Ironstone soil over basement rock (Bleached-Ferric, Mesotrophic, Brown Kurosol)
Medium thickness grey brown loamy sand with a bleached A2 horizon containing over 50% ironstone gravel, overlying a yellow brown clay with soft red inclusions of weathered ironstone, grading to a greyish silty clay forming in weathering schist or micaceous sandstone deeper than 200 cm.

Soils formed in alluvium or deeply weathered rock on lower slopes or flats

F1 Sandy loam over brown mottled clay (Bleached-Mottled, Eutrophic, Brown Chromosol)
Thick sandy loam to sandy clay loam, with a bleached and gravelly A2 horizon, overlying a yellowish brown, brown and red mottled, firm, coarsely structured sandy to medium clay.

F1/K1 Sandy loam over brown mottled clay (Bleached-Mottled, Eutrophic, Brown Chromosol)
Thick grey brown sandy loam to light sandy clay loam with a bleached and gravelly A2 horizon, overlying a firm, coarsely structured brown, yellow and red mottled heavy clay subsoil, grading to weathering schist or gneiss below 100 cm.

F2 Sandy loam over poorly structured brown clay (Eutrophic, Mottled-Subnatric, Brown Sodosol)
Thick greyish brown massive loamy sand to loam with a bleached A2 horizon, overlying a yellowish brown, brown and grey mottled clay with coarse prismatic structure.

Further information: DEWNR Soil and Land Program