

# PIC Piccadilly Land System

Undulating to rolling rises and low hills in the Uraidla - Stirling area

**Area:** 24.2 km<sup>2</sup>

**Annual rainfall:** 870 – 1,055 mm average

**Geology:** Most of the land is formed on fine, medium and coarse grained sandstones of the Aldgate Formation. These are associated with broad lenses of Barossa Complex schists and gneisses. Locally derived coarse to medium grained alluvial sediments occupy narrow drainage depressions and broader lower slopes and valley flats.

**Topography:** The land system is geologically similar to the Carey Gully System, but its topography is much more subdued. The rolling rises and low hills typical of the Piccadilly System are much lower and more gently sloping - virtually all of the land is less than 30% slope. A prominent feature of the landscape is the Piccadilly Valley itself, a broad depositional area of gentle lower slopes and valley flats. Most of the land drains into the Onkaparinga River via Cox Creek.

**Elevation:** 400 m in the southeast to 580 m in the northwest

**Relief:** 20 - 60 m

**Soils:** The soils are predominantly shallow to moderately deep over weathering rock. Most are texture contrast or gradational types with sandy loam to loam surfaces and well structured clayey subsoils. There are shallow stony soils on the minor rocky or steeper slopes. A range of texture contrast or deep coarse to medium textured soils occurs on the alluvium of creek flats and lower slopes.

## Main soils

### *Soils formed on weathering basement rock*

**K4a** Acidic sandy loam over brown clay on gneiss

**K1** Acidic gradational brown loam

**K4b** Acidic sandy loam over brown clay on sandstone

**K5** Acidic gradational sandy loam

## Minor soils

### *Soils formed on alluvium or deeply weathered rock*

**F1a** Sandy loam over brown sandy clay loam over alluvium

**F1b** Sandy loam over brown clay over alluvium

**F1c** Sandy loam over brown clay on deeply weathered rock

**M1a** Deep sandy loam over alluvium

**M1b** Deep gradational sandy loam over alluvium

**M2** Deep gradational clay loam over alluvium

### *Soils formed on weathering basement rock*

**K2a** Acidic clay loam over mottled brown and red clay

**K2b** Acidic loam over brown clay

**L1** Shallow sandy loam

**Main features:** The Piccadilly Land System is characterized by sandy loam to loam soils with well structured clayey subsoils on moderate slopes. Topographically, nearly all of the land is suitable for horticulture, but substantial areas in the south are urbanized. Historically the land has been extensively used for a variety of horticultural enterprises, and most of the land has high potential due to the combination of moderately deep and moderately well drained soils, cool climate and good quality groundwater. However, erosion and associated water pollution have caused problems in the past. Urban pressures are gradually forcing the traditional land uses elsewhere.



**Soil Landscape Unit summary:** 9 Soil Landscape Units (SLUs) mapped in the Piccadilly Land System:

SLU	% of area	Main features #
AfC	13.6	<p>Rolling low hills formed on schists and gneisses of the Barossa Complex. There is minor rock and stone. Relief &lt; 60 m and slopes are 18-30%. Most soils are texture contrast with loamy surfaces over clayey subsoils. These are formed on basement rock on hillslopes and local alluvium on lower slopes and in depressions and valleys. Shallow stony soils are minor overall, and restricted to steeper or rocky slopes.</p> <p>Main soils: <u>Acidic sandy loam over brown clay</u> - <b>K4a</b> (E)  <u>Shallow sandy loam</u> - <b>L1</b> (L) on steeper rocky slopes  <u>Acidic loam over brown clay</u> - <b>K2b</b> (L) on fine grained inter-beds  <u>Sandy loam over brown sandy clay loam</u> - <b>F1a</b> (L) on alluvial flats</p> <p>This land is non-arable, but is suitable for perennial crops. The soils are moderately deep to deep, and fertility and structure are adequate. Acidity and erosion need to be managed. High magnesium and / or sodium in deep subsoils indicate the need for careful irrigation management to avoid toxic accumulations in the rootzone.</p>
AuC AuD	4.3 0.3	<p>Rolling to steep low hills formed on medium to coarse grained Aldgate Sandstones, with minor siltstones, and associated lower slope and valley floor sediments derived from localized erosion and re-deposition. Slopes mostly 15-40%, but as low as 8% on broader crests; up to 60% on some steeper hills. Relief &lt; 50 m. Rock outcrop is minor overall, but amount to 20% coverage on steeper slopes. Up to 20% surface quartz and sandstone. Drainage depressions narrow and un-mappable.</p> <p><b>AuC</b> Rolling, slightly rocky low hills with relief of up to 50 m and slopes of 16-30%. Drainage depressions are narrow with well defined watercourses.</p> <p><b>AuD</b> Steep, short rocky slopes of 30-60%.</p> <p>Shallow sandy loam soils are typical. Some have clayey subsoils, others are formed directly over rock. Deeper sandy loams over clay occur on lower slopes.</p> <p>Main soils: <u>Acidic sandy loam over brown clay</u> - <b>K4b</b> (V)  <u>Acidic gradational sandy loam</u> - <b>K5</b> (C)  <u>Shallow sandy loam</u> - <b>L1</b> (C)  <u>Acidic gradational brown loam</u> - <b>K1</b> (M) on fine grained rocks  <u>Sandy loam over brown sandy clay loam</u> - <b>F1a</b> (M) } on lower slope alluvium  <u>Deep gradational sandy loam</u> - <b>M1b</b> (M) }</p> <p>Land is mostly non-arable due to steep terrain and often shallow, stony soils. Soils are infertile and acidic, but moderately well to rapidly drained. They are highly erodible, so virtually all of the land is susceptible to severe erosion if exposed. The slopes are generally suitable for perennial horticultural crops and floriculture, provided that soil conservation management is of a high standard.</p>
AvC	32.6	<p>Rolling low hills formed on interbedded sandstones and siltstones of the Aldgate Sandstone Formation. Relief is up to 50 m and slopes are 18-30%, and up to 40% on some short slopes. Watercourses are well defined in drainage depressions up to 100 m wide. Soils are mostly moderately deep over bedrock. Surface soils are generally sandy loams to loams, with some sandier types on limited strata of coarse grained rocks. Subsoils are invariably friable yellow, brown or orange clays, but gravelly and sandier subsoils occur on coarser grained rocks. Deep sandy to loamy soils with sandy clay loam to clay subsoils are typical of lower slopes and drainage depressions.</p> <p>Main soils: <u>Acidic sandy loam over brown clay</u> - <b>K4b</b> (E) } on fine grained rocks  <u>Acidic gradational brown loam</u> - <b>K1</b> (C) }  <u>Acidic gradational sandy loam on rock</u> - <b>K5</b> (L) } on steeper and rocky slopes  <u>Shallow stony sandy loam</u> - <b>L1</b> (L) }  <u>Sandy loam over brown sandy clay loam</u> - <b>F1a</b> (M) } on lower slopes and creek flats  <u>Deep gradational sandy loam</u> - <b>M1b</b> (M) }</p> <p>The soils are moderately deep and usually well drained, although infertile and acidic. Although land is non-arable and erosion potential is high, potential for perennial horticulture is generally good.</p>



BtD	4.9	<p>Moderate slopes with negligible rock and stone formed on schists and gneisses of the Barossa Complex. Relief is less than 30 m and slopes are 10-18%. The soils are generally texture contrast with loamy surfaces overlying clayey subsoils. These are formed on basement rock on hillslopes and local alluvium on lower slopes and in depressions and valleys.</p> <p>Main soils: <u>Acidic sandy loam over brown clay</u> - <b>K4a</b> (E)  <u>Acidic loam over brown clay</u> - <b>K2b</b> (E)  <u>Sandy loam over brown sandy clay loam</u> - <b>F1a</b> (L) } lower slopes and  <u>Sandy loam over brown clay on deeply weathered rock</u> - <b>F1c</b> (L) } alluvial flats</p> <p>Land is semi arable, marginally suitable for cultivated crops, but well suited to perennial crops. Soils are moderately deep to deep, with satisfactory inherent fertility and structure, although acidity and erosion need to be managed. There is a tendency for the soils to have high deep subsoil magnesium and / or sodium, so careful irrigation management is required to avoid toxic accumulations in the rootzone.</p>
CsD	30.7	<p>Rolling rises and low hills formed on interbedded sandstones and siltstones of the Aldgate Sandstone Formation. Relief is 20 to 50 m and slopes are 8-18%. Watercourses are well defined in drainage depressions up to 100 m wide. Soils are mostly moderately deep over bedrock. Surface soils are generally sandy loams to loams, with some sandier types on limited strata of coarse grained rocks. Subsoils are invariably friable yellow, brown or orange clays, but gravelly and sandier subsoils occur on coarser grained rocks. Deep sandy to loamy soils with sandy clay loam to clay subsoils are predominant on lower slopes and in drainage depressions.</p> <p>Main soils: <u>Acidic sandy loam over brown clay</u> - <b>K4a</b> (E)  <u>Acidic gradational brown loam</u> - <b>K1</b> (C) } on fine grained rocks  <u>Acidic clay loam over brown and red mottled clay</u> - <b>K2a</b> (L) }  <u>Acidic gradational sandy loam</u> - <b>K5</b> (L)  <u>Sandy loam over brown sandy clay loam</u> - <b>F1a</b> (L) } on lower slopes and creek flats  <u>Deep gradational sandy loam</u> - <b>M1b</b> (M) }</p> <p>These slopes are semi arable; the soils are moderately deep and usually well drained, although infertile and acidic. Erosion potential is high, and severe erosion has occurred in the past as a result of poor soil management. However, potential for perennial horticulture is generally good.</p>
LDB LDC LDE	1.3 2.8 9.5	<p>Gentle lower slopes and creek flats formed on coarse grained alluvial deposits derived from the erosion of sandstones.</p> <p><b>LDB</b> Lower slopes of 2-4%.  <b>LDC</b> Lower slopes of 4-10%.  <b>LDE</b> Drainage depressions.</p> <p>Most soils have sandy and often gritty surfaces overlying brown, yellow, grey and red sandy clay loam to clay subsoils. There are also deep coarse textured alluvial soils.</p> <p>Main soils: <u>Sandy loam over brown sandy clay loam</u> - <b>F1a</b> (E)  <u>Sandy loam over brown clay</u> - <b>F1b / F1c</b> (C)  <u>Deep sandy loam</u> - <b>M1a</b> (L)  <u>Deep gradational sandy loam</u> - <b>M1b</b> (L)  <u>Deep gradational clay loam</u> - <b>M2</b> (L)</p> <p>These soils are deep and imperfectly to moderately well drained. Natural fertility is moderately low and most soils are acidic. The soils are potentially productive (provided fertility is maintained), but may require drainage to prevent waterlogging. Erosion is a threat on most of the land, and traditional market gardening practices in the past have caused significant soil loss.</p>

# 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:

*Soils formed on weathering basement rock*

#### **K1** Acidic gradational brown loam (Eutrophic, Brown Dermosol)

Medium thickness loamy surface soil, becoming clay loamy and gravelly with depth, overlying an orange, friable clay subsoil, grading to soft shale or siltstone.



- K2a** Acidic clay loam over brown and red mottled clay (Eutrophic, Brown / Red Kurosol)  
Medium thickness loam to clay loam with a bleached and gravelly A2 layer, over a red and brown mottled well structured medium to heavy clay, grading to weathering siltstone from about 100 cm.
- K2b** Acidic loam over brown clay (Eutrophic, Brown Chromosol)  
Medium thickness fine sandy loam to loam with a gravelly A2 layer, over a strong brown well structured clay grading to fine sandstone within 100 cm.
- K4a** Acidic sandy loam over brown clay (Bleached, Eutrophic, Brown Chromosol)  
Thick sandy loam to loam with a pale coloured or bleached and gravelly A2 horizon, overlying a brown or yellowish red, well structured clay grading to weathering gneiss by 100 cm.
- K4b** Acidic sandy loam over brown clay (Bleached, Mesotrophic, Brown Kurosol)  
Medium to thick, gravelly loamy sand to sandy loam surface soil, with a bleached and very gravelly A2 horizon, overlying a yellowish brown, red and brown sandy clay to clay subsoil grading to weathering sandstone by 100 cm.
- K5** Acidic gradational sandy loam (Bleached-Acidic, Mesotrophic, Yellow Kandosol)  
Thick, gravelly loamy coarse sand to coarse sandy loam surface soil with a bleached and very gritty and gravelly A2 horizon, overlying a brown or yellow sandy clay loam to sandy clay subsoil with abundant rock fragments, grading to coarse grained sandstone.
- L1** Shallow sandy loam (Acidic, Paralithic, Bleached-Leptic Tenosol)  
Thick, very gravelly loamy sand to sandy loam, overlying a brown gravelly clayey sand, grading to weathering sandstone or gneiss by 50 cm.

*Hard loamy soils with deep brown clayey subsoils*

- F1a** Sandy loam over brown sandy clay loam (Bleached-Mottled, Eutrophic, Brown Chromosol)  
Thick dark brown loamy sand to light sandy clay loam with a bleached A2 horizon, overlying a yellow brown and grey brown sandy clay loam to light clay with coarse prismatic structure, grading to a grey, brown and yellow mottled clayey sand.
- F1b** Sandy loam over brown clay (Bleached-Mottled, Hypocalcic, Brown Chromosol)  
Thick loamy sand to sandy clay loam with a strongly bleached A2 horizon, overlying a yellowish brown, grey and red mottled clay grading to fine grained alluvium, weakly calcareous at base.
- F1c** Sandy loam over brown clay on deeply weathered rock (Bleached-Mottled, Mesotrophic, Brown Kurosol)  
Thick grey loamy sand to loam with a gravelly and bleached A2 horizon, overlying a brown, yellowish brown and red coarsely prismatic sandy clay to clay, becoming siltier and greyer with depth. Soft weathering sandstone occurs from about 150 cm.

*Deep uniform to gradational sandy loam soils*

- M1a** Deep sandy loam (Regolithic, Brown-Orthic Tenosol / Eutrophic, Brown Kandosol)  
Thick brown sandy loam, overlying a grey to brown silty sand to silty clay loam with weak prismatic structure, grading to variable sandy, gritty and clayey alluvial sediments.
- M1b** Deep gradational sandy loam (Bleached-Acidic, Mesotrophic, Grey Kandosol)  
Very thick sandy loam surface soil, with a bleached A2 horizon, grading to a dark grey massive light sandy clay loam to sandy clay, overlying clayey sand alluvium.

*Deep clay loamy soils*

- M2** Deep gradational clay loam (Grey Dermosol)  
Medium thickness black clay loam grading to a coarsely structured dark grey clay, becoming yellow and brown mottled and more clayey with depth, overlying variable alluvium or buried soils.

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

