

# WIH Wilson Hill Land System

Undulating to rolling low hills extending from inland of Victor Harbor to the coast west of Parsons Beach

**Area:** 32.0 km<sup>2</sup>

**Annual rainfall:** 675 – 800 mm average

**Geology:** The land is underlain by metasiltstones and phyllites of the Tappanappa Formation, with minor interbedded metasandstones. These rocks are within a metre or so of the surface over 75% of the area. A distinctive feature of the Tappanappa Formation in this area is its shallow saline groundwater table. Saline seepages are a feature of the Land System. Over 15% of the area, the rocks are covered by deep weathering profiles, with laterite development. These areas, confined to flat topped crests, are remnants of a presumably much more extensive land surface which has been considerably dissected. Unconsolidated sandy clays and clays, containing some remnant ferricrete (ironstone) cover the remaining 10% of the area. Although mapped as Permian glacial and fluvio-glacial deposits (Geological Survey of SA, 1962), these sediments may be of Tertiary age. Fine grained windblown carbonates sporadically mantle the rocks and sediments near the coast, typically as a patchy subsurface layer.

**Topography:** The Wilson Hill Land System is a dissected elevated plain. The original land surface is preserved as scattered flat topped crests (summit surfaces), which fall away to gently or moderately inclined slopes, created by the down cutting of watercourses including the Waitpinga Creek system which drains the bulk of the land. In the north, the land drains into the Inman River catchment. Saline seepages are common in drainage depressions, but also occur on mid slopes where saline water tables intersect the land surface.

**Elevation:** 0 m to 226 m

**Relief:** Up to 80 m

**Soils:** The predominant soils have hard loamy surfaces overlying red clayey subsoils forming in soft weathering basement rock. There is a range of other soils formed on rock, but they are limited overall. Several distinctive sandy to sandy clay loam texture contrast soils (similar to soils of the Waitpinga Land System) occur on Tertiary? sediments. Ironstone soils are common on flat topped ridges.

**Main soils:**

- K2** Loam over red clay on basement rock
- J2** Ironstone soil on deeply weathered lateritized rock
- L1** Shallow stony loam on basement rock
- D3** Sandy loam over red dispersive clay on alluvium

**Minor soils:**

*Soils formed on basement rock*

- D1** Loam over red clay with carbonate
- K1** Gradational loam
- K4** Sandy loam over brown clay

*Soils forming in Tertiary? age sediments*

- F2** Sandy loam over dispersive brown clay
- G3** Sand over sandy clay

*Soils forming in alluvium*

- F1** Sandy loam over brown clay



**Main features:** The Wilson Hill Land System is undulating to moderately steep land formed on fine grained basement rocks of the Tappanappa Formation. Almost a quarter of the land is moderately steep to steep, although mostly accessible for land management operations. The flattest land occurs on summit surfaces and upper slopes (a further quarter of the area) where the basement rocks are covered by deep weathering lateritic profiles, or younger unconsolidated clayey sediments. These give rise to sandy or sandy loam texture contrast soils with impeded drainage and marginal fertility. The majority of the land is undulating to gently rolling and characterized by red loamy soils, moderately deep and fertile, but affected by widespread, although very patchy, saline seepage. The bulk of the land has high productive potential, but irrigation is risky given the salinity problem. Maximum water use should be a target of any land use.

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

SLU	% of area	Main features #
AAC	4.6	<p>Moderately steep frontal slopes dropping steeply into the sea along their southern edge. Slopes are 10-30%. Underlying rocks are metamorphosed siltstones of the Tappanappa Formation. They outcrop sporadically on the steeper slopes. The soils are loamy, often shallow over rock, but usually with a red clayey subsoil.</p> <p>Main soils: <u>Shallow stony loam</u> - <b>L1</b> (E)  <u>Loam over red clay</u> - <b>K2</b> (E)</p> <p>The soils are fertile, but variable depth and moderately steep slopes limit their use to grazing. Severe exposure is an additional limitation.</p>
AkC AkD	1.7 0.8	<p>Moderately steep to steep escarpment slopes bounding the Parawa Plateau and the glacial valley to the north. This feature extends from Back Valley through Willow Creek and Mt. Robinson to Baker Knob in the west. The landscape also includes the rolling to steep low hills and dissection slopes of the plateau from Silverton to Deep Creek and Mt Robinson. Parent rocks are metasandstones and metasiltsstones of the Backstairs Passage Formation. Slopes range from 15% to 80% generally, although there are some precipitous slopes on the escarpment west of Hay Flat. Watercourses are very well defined in narrow channels. Rock outcrop and surface stone are limited to extensive, depending on slope.</p> <p><b>AkC</b> Upper escarpment slopes and rolling low hills with relief to 70 m and slopes of 15-30%.  <b>AkD</b> Rocky, steep escarpment and stream dissection slopes with relief to 120 m and slopes of 30-80%.</p> <p>The soils are mostly shallow and stony, with hard rock at 50 cm or less. However, there are some deeper soils with yellow or orange friable clay subsoils forming from weathering rock.</p> <p>Main soils: <u>Sandy loam over brown clay</u> - <b>K4</b> (E)  <u>Gradational loam</u> - <b>K1a</b> (E)  <u>Shallow stony loam</u> - <b>L1a</b> (L)  <u>Shallow stony sandy loam</u> - <b>L1b</b> (L)</p> <p>The soils on these slopes are moderately fertile, although acidic, well drained and have reasonable waterholding capacity (except the shallower forms on steep slopes). There are minor saline seepages in some watercourses. Most of the land is used for grazing, although there are significant pine plantations. Where water is available and exposure is not a problem, horticultural potential is high.</p>
AoC AoD Aom	13.0 0.4 2.2	<p>Moderately steep to steep slopes formed on metasiltsstones and phyllites of the Tappanappa Formation. Slopes range from 5% on rises and crests through to 60% on slopes adjacent to deeply dissected watercourses. Relief varies from 30 m to 80 m. Outcropping rock and surface stone are increasingly common on steeper slopes.</p> <p><b>AoC</b> Moderate slopes to 80 m high with slopes of 18-30%.  <b>AoD</b> Steep rocky slopes hillslopes to 40 m high with slopes of 30-60%.  <b>Aom</b> Moderately steep to steep rocky slopes adjacent to the lower reaches of Waitpinga Creek.</p> <p>The predominant soils are loamy with characteristic red clay subsoils. Shallow forms without clay subsoils occur on steeper slopes. Soils typical of adjacent landscapes occur on sandier rock strata.</p> <p>Main soils: <u>Loam over red clay</u> - <b>K2</b> (E)</p>



		<p><u>Shallow stony loam</u> - <b>L1</b> (C)  <u>Gradational loam</u> - <b>K1</b> (L)  <u>Sandy loam over brown clay</u> - <b>K4</b> (L)</p> <p>These soils are fertile and mostly moderately deep (<b>AoC</b>), but the slopes prevent uses involving regular cultivation. The presence of saline groundwater in this landscape (refer <b>BpM</b> / <b>BpN</b> below) indicates that irrigation is probably not sustainable. However, pasture production potential is high.</p>
BpM BpN	10.2 35.7	<p>Undulating rises and rounded hills, and rolling low hills formed on metasilstones and phyllites with interbedded pyrites of the Tappanappa Formation. Slopes range from 5% to 18%. Relief varies from 30 m to 70 m. Outcropping rock is rare and there is up to 5% surface stone in places. Saline seepages are a distinctive feature of these landscapes.</p> <p><b>BpM</b> Undulating rises and rounded crests with relief to 30 m and slopes of 5-10%.  <b>BpN</b> Rolling low hills and slopes with relief to 60 m and slopes of 10-18%.</p> <p>The predominant soils are loamy with characteristic red clay subsoils. Shallow forms without clay subsoils occur on steeper slopes. Soils typical of adjacent landscapes occur on sandier rock strata.  Main soils: <u>Loam over red clay</u> - <b>K2</b> (V)  <u>Gradational loam</u> - <b>K1</b> (M)  <u>Sandy loam over brown clay</u> - <b>K4</b> (M)  <u>Shallow stony loam</u> - <b>L1</b> (M)  <u>Sandy loam over red dispersive clay</u> - <b>D3</b> (M) } on lower slopes and drainage  <u>Sandy loam over brown clay</u> - <b>F1</b> (M) } depressions</p> <p>These soils are moderately deep to deep, and inherently fertile. However, saline water tables which are associated with this geological formation are near the surface over significant areas. Apart from the immediate effect on pasture productivity, salinization of watercourses and dams, and reduction in utility of groundwater for irrigation, limit the land use options in these units. There is potential for the development of acid sulfate conditions in saline waterlogged areas.</p>
DnC DnD	1.2 5.5	<p>Moderate slopes with frequent watercourses (facing the sea), and gently undulating crests, formed on metasilstones of the Tappanappa Formation. Slopes range from 3% to 20% and relief varies from 20 to 60 metres. There is occasional rock outcrop.</p> <p><b>DnC</b> Gently undulating crests with slopes of 1-5%.  <b>DnD</b> Moderately inclined slopes of 5-20%.</p> <p>Most soils have loamy surfaces over red clay subsoils. Variations are due to the presence of soft carbonate accumulations in the subsoil, and depth to rock.  Main soils: <u>Loam over red clay with carbonate</u> - <b>D1</b> (E)  <u>Loam over red clay</u> - <b>K2</b></p> <p>These soils are mostly deep, well drained and inherently fertile, but poor surface soil structure causes excessive runoff. There is minor salinity in drainage depressions. The land is potentially productive and at least semi arable, but the dissection of the land and the degree of coastal exposure limit the practicality of uses other than grazing.</p>
FfZ	15.0	<p>Gently inclined summit surfaces (plateaux) underlain by deeply weathered, kaolinized and lateritized basement rocks. Surface ironstone is characteristic. The soils are predominantly deep with variable ironstone gravel.</p> <p>Main soil: <u>Ironstone soil</u> - <b>J2</b> (D)</p> <p>These soils are deep, but with impeded drainage and relatively low natural fertility. Intensive uses are limited by these problems and the exposure of the landscapes on crests. Productive potential is moderately low.</p>
HZC	9.2	<p>Undulating upper slopes with gradients of 2-10%. The parent sediments are sandy clays and clays, containing some remnant ferricrete (ironstone). Watercourses occupy shallow depressions. They are eroded in places, with minor saline seepage. All main soils have well developed texture contrast profiles with loamy to sandy surfaces and subsoils ranging from heavy clays to friable sandy clay loams. Variations between soils are due to differences in the texture of the underlying sediments.</p> <p>Main soils: <u>Sandy loam over dispersive brown clay</u> - <b>F2</b> (E)  <u>Sand over sandy clay</u> - <b>G3</b> (E)  <u>Sandy loam over red dispersive clay</u> - <b>D3</b></p> <p>Soils are deep but often imperfectly drained due to the widespread occurrence of dispersive clay subsoils. Natural fertility is low (G3) to moderate (F2 and D3). All soils are highly erodible. Salinity in adjacent land, and in groundwater presumably underlying this land, limits irrigation opportunities.</p>
WB-	0.5	Coastal cliffs.



# 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 basement rock*

**D1** Loam over red clay with carbonate (Calcic, Red Chromosol)

Thick dark reddish brown loam to clay loam with a paler coloured and gravelly A2 horizon, overlying a dark reddish brown clay with strong polyhedral structure, highly calcareous from about 75 cm, grading to weathering metamorphosed siltstone, usually deeper than 100 cm.

**K1** Gradational loam (Eutrophic, Brown Dermosol)

Medium thickness dark brown loam to clay loam with a paler brown gravelly clay loam A2 horizon, grading to a yellowish red to orange clay with strong polyhedral structure and increasing rock fragments with depth. Weathering metamorphosed siltstone or phyllite occurs at about 100 cm.

**K2** Loam over red clay (Eutrophic, Red Chromosol)

Medium thickness dark brown fine sandy loam to clay loam with a paler coloured and gravelly A2 horizon, overlying a reddish brown and greyish brown heavy clay with strong blocky structure, grading to weathering phyllite, schist or metasiltstone by 100 cm.

**K4** Sandy loam over brown clay (Eutrophic, Brown Chromosol)

Medium to thick brown loamy sand to fine sandy loam with a bleached and gravelly A2 horizon, overlying a reddish brown and brown mottled firm sandy to heavy clay grading to weathering metagreywacke by 100 cm.

**L1** Shallow stony loam (Basic, Paralithic, Leptic Tenosol)

Thick stony dark brown sandy loam to loam with a paler coloured and very stony A2 horizon forming in weathering phyllite, schist or metasiltstone, hard by 60 cm.

#### *Soils forming in Tertiary? age sediments*

**F2** Sandy loam over dispersive brown clay (Eutrophic, Brown Sodosol)

10 - 30 cm hard setting dark brown sandy loam to sandy clay loam with a very hard, massive and bleached A2 layer sharply overlying a greyish brown and yellowish brown mottled medium heavy clay with coarse prismatic structure, continuing below 100 cm.

**G3** Sand over sandy clay (Ferric, Eutrophic, Brown Chromosol)

15 - 45 cm grey soft loamy sand with a pale grey or bleached A2 layer containing up to 50% ironstone nodules, over a brown, yellowish brown or red sandy clay to medium clay with weak to moderate subangular blocky structure, becoming brighter yellow and red with depth grading to soft sandstone from about 100 cm.

#### *Soils forming in deeply weathered lateritized rock*

**J2** Ironstone soil (Ferric, Eutrophic, Brown Kandosol)

Medium thickness grey brown sandy loam with a paler coloured and ironstone gravelly A2 horizon, overlying an ironstone gravelly yellow sandy clay loam grading to a yellowish brown and red clay with variable ironstone fragments, becoming red and grey mottled from about 70 cm.

#### *Soils forming in alluvium*

**D3** Sandy loam over red dispersive clay (Eutrophic, Red Sodosol)

Medium thickness hard setting fine sandy loam with a hard bleached A2 layer, abruptly overlying a coarsely blocky red clay.



**F1** Sandy loam over brown clay (Bleached-Mottled, Eutrophic, Brown Chromosol)

Thick hard fine sandy loam with a bleached A2 layer over a yellowish brown, greyish brown and red mottled clay with coarse blocky structure, continuing below 100 cm.

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

