

# LON Longmarsh Land System

Gently undulating sandhill country between Currency Creek and Finniss

**Area:** 39.1 km<sup>2</sup>

**Annual rainfall:** 460 – 525 mm average

**Geology:** The landscape is underlain by Blanchetown Clay which is near the surface (ie within a metre) in places. Elsewhere it is covered by younger alluvial sediments with textures of clayey sand through to sandy light clay. These sediments are mostly capped by soft or rubbly carbonates. Extensive deposits of white Molineaux Sand overlie the land surface.

**Topography:** The System includes the two peninsulas lying between the estuaries of the Finniss River, Tookayerta Creek and Currency Creek. The landscape is dominated by parallel to jumbled sandhills. The intervening swales are usually flat, but gently undulating rises also occur. Downcutting by the estuary waters has created moderately steep slopes around the margins of the System.

**Elevation:** 0 m (Lake level) to 50 m in the north west

**Relief:** Less than 10 m except for lake banks which are up to 20 m high

**Soils:** The soils characteristically have thick bleached sandy surfaces overlying subsoils which vary from sands to sandy clay loams to clays.

## Main soils

### *Soils on sandy flats*

**G3b** Thick sand over clay

### *Soils on sandhills*

**H3a** Deep bleached siliceous sand

**H3c** Coarse siliceous sand

**G3a** Thick sand over clay

## Minor soils

### *Soils on sandy rises*

**B7a** Shallow sand over clay on calcrete

**G2a** Bleached sand over sandy clay loam

**G4a** Sand over poorly structured clay

### *Soils on sandy flats*

**B7b** Shallow sand over clay on calcrete

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### *Soils on sandhills*

**H3b** Moderately deep bleached siliceous sand

### *Soils on sandy loam flats and rises*

**D5** Hard loamy sand over red clay

**F2** Sandy loam over poorly structured brown clay

**A5** Calcareous loam



**Main features:** The Longmarsh Land System is characterized by sandy soils. A third of these are very deep sandhill soils, with very low fertility, and prone to water repellence and wind erosion. The flats and low rises associated with the sandhills have mainly thick sand over clay soils, also infertile, water repellent and susceptible to wind erosion. These are prone to waterlogging due to perching of water on the clay. Hard loamy texture contrast soils and calcareous loams are limited in extent.

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

SLU	% of area	Main features #
GRB	3.4	Gently undulating low rises formed on clayey sands and sandy clays, overlain by very highly calcareous Woorinen Formation Class III carbonates, with varying amounts of rubble. Slopes are up to 4%. Low sand dunes occur sporadically. There is no surface drainage pattern and minor surface calcrete stone. Soils are generally sandy surfaced, often with rubbly calcrete at shallow depth. Main soils: <u>Sand over poorly structured clay</u> - <b>G4a</b> (V) <u>Shallow sand over clay on calcrete</u> - <b>B7a</b> (L) on rises <u>Sand over poorly structured clay</u> - <b>G4b</b> (L) on flats <u>Thick sand over clay</u> - <b>G3a</b> (M) on sandhills These soils have low natural fertility and restricted water holding capacities due to the often shallow depth to dispersive clayey subsoils and hostile carbonate layers. They are susceptible wind erosion, and water erosion on sloping sites. Most have marginally saline subsoils. Some deeper sands are prone to acidification.
GSB	1.6	Gently undulating rises formed on Tertiary or Pleistocene sandy clays to clays, variably calcified by soft to hard Class III carbonates of the Woorinen Formation. Slopes are up to 4% and there is minor surface calcrete. There is no defined surface drainage pattern. Soils are either sandy or rubbly. Main soils: <u>Bleached sand over sandy clay loam</u> - <b>G2a</b> (V) <u>Calcareous loam</u> - <b>A5</b> (L) The sandy soils are moderately deep to deep but low fertility and prone to wind erosion. The calcareous soils are shallower, but are more fertile. All soils are well drained.
GbB	18.8	Gently undulating rises of aeolian sands overlying alluvial clayey sands to sandy clays at shallow depth. Slopes of the rises are 2-3%, and relief is less than 10 m. Soils are all sandy. Main soils: <u>Moderately deep bleached siliceous sand</u> - <b>H3b</b> (E) <u>Thick sand over clay</u> - <b>G3a</b> (E) <u>Very deep bleached siliceous sand</u> - <b>H3a</b> (M) These soils are all moderately deep to deep sands. They are infertile, and prone to water repellence and wind erosion. The sands with clayey subsoils are prone to waterlogging after wet periods due to perching on the clay.
GcA	1.1	Flats formed on Pleistocene sandy clay to heavy clay. Soils are deep sandy to loamy texture contrast types with sodic subsoils. Main soils: <u>Sand over poorly structured clay</u> - <b>G4b</b> (V) <u>Sandy loam over poorly structured brown clay</u> - <b>F2</b> (C) These soils are imperfectly drained due to the tendency of water to perch on the dispersive clay subsoils. Root growth is also impeded by these clays. Salinity is moderately high in the subsoil. Fertility is low (sandy soils) to moderate (loamy soils).
GhA	6.8	Swales and flats formed on clayey sands to sandy clays. Soils are mixed sandy or sandy loam surfaced texture contrast types. Main soils: <u>Hard loamy sand over red clay</u> - <b>D5</b> (E) <u>Bleached sand over sandy clay loam</u> - <b>G2b</b> (C) <u>Sand over poorly structured clay</u> - <b>G4b</b> (L) D5 soils are moderately well drained, moderately fertile and have fair to good subsoil structure. G2b and G4b soils are imperfectly drained with low fertility and fair to poor subsoil structure.
GID	8.4	Banks of the Finnis River and Tookayerta Creek, cutting through layers of aeolian sands and alluvial clayey sands and sandy clays. Slopes range from 5% to 40%. Soils are variable, depending on the nature of the underlying sediments. All have sandy surfaces. Main soils: <u>Coarse siliceous sand</u> - <b>H3c</b> (E) <u>Thick sand over clay</u> - <b>G3a</b> (E)



		<u>Bleached sand over sandy clay loam</u> - <b>G2a</b> (L) These soils are well to rapidly drained, with low fertility and prone to water repellence and wind erosion. The slopes are susceptible to water erosion.
GtA	23.7	Swales and flats associated with recent aeolian sand deposits. The soils generally have thicker sandy surfaces than other flats and swales. Main soil is <u>thick sand over clay</u> - <b>G3b</b> (dominant). Drainage is moderate to imperfect, fertility is low, but the thickness of surface soil allows greater root zone depth and moisture holding capacity than in other lower lying areas.
GxA	0.3	Depressions with calcrete at shallow depth. Soils are sandy and shallow. Main soil: <u>Shallow sand over clay on calcrete</u> - <b>B7b</b> (D) These soils are marginally saline and imperfectly drained, with low fertility and waterholding capacity. Agricultural potential is very limited.
O-B	32.3	Jumbled to longitudinal dunes formed on loose, windblown medium to coarse sands. Soils are deep and sandy. Main soils: <u>Very deep bleached siliceous sand</u> - <b>H3a</b> (E) <u>Coarse siliceous sand</u> - <b>H3c</b> (E) These soils are infertile and prone to wind erosion. Water repellence is a common problem.
SdB	1.5	Gently undulating low rises underlain by Blanchetown Clay capped by rubbly to soft Woorinen Formation carbonates. There is up to 10% surface calcrete stone. Main soils: <u>Calcareous loam</u> - <b>A5</b> (E) <u>Hard loamy sand over red clay</u> - <b>D5</b> (E) These soils have pronounced carbonate layers at shallow depth. Non rubbly forms restrict root growth. Rubbly forms do not affect root growth but limit available water supply. Underlying heavy clay impedes deep drainage.
TTA	0.6	Flats formed on Pleistocene Clay and characterized by gilgai microrelief. Soils are variable, but always underlain by heavy clay within 100 cm. Main soils: <u>Brown-grey cracking clay</u> - <b>E3</b> (E) <u>Sandy loam over poorly structured brown clay</u> - <b>F2</b> (C) <u>Sand over poorly structured clay</u> - <b>G4b</b> (C) These soils are moderately fertile (exception is the sandy G4b soil), and deep, but are susceptible to waterlogging, mild salinity and boron toxicity.
Vt- VtD	0.7 0.8	Lake fringe flats, periodically inundated. <b>Vt-</b> Discontinuous sections of lake shore. No soils data. Erosion is the main concern. <b>VtD</b> Saline swamps. Soils are thin and black with medium to fine textures underlain by sandy sediments or buried soils. Salinity and wetness limit agricultural potential to light grazing.

# 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 on sandhills

#### **G3a** Thick sand over clay (Mesotrophic, Brown Sodosol)

Very thick pale brown sand, overlying an orange sandy clay loam to light clay with weak columnar structure, grading to a yellow, red and brown clayey sand to sandy clay from 110 cm.

#### **H3a** Very deep bleached siliceous sand (Basic, Arenic, Bleached-Orthic Tenosol)

Very thick white loose sand, organically darkened at the surface, overlying a yellow loose sand, grading to a pale brown sand from 125 cm.

#### **H3b** Moderately deep bleached siliceous sand (Basic, Arenic, Bleached-Orthic Tenosol)

Thick white sand, organically darkened at the surface, overlying a yellow sand grading to a buried sand over clay soil at variable depths below 100 cm.

#### **H3c** Coarse siliceous sand (Basic, Arenic, Bleached-Orthic Tenosol)

Up to 250 m white coarse sand over a brown sand to clayey sand.



*Soils on sandy rises***B7a** Shallow sand over clay on calcrete (Petrocalcic, Brown Chromosol)

Thin brown sand to sandy loam with a pink A2 horizon, overlying orange sandy clay loam to light clay with calcrete fragments. At 30 cm is a layer of massive or rubbly calcrete, grading to a pale brown very highly calcareous clayey sand to sandy clay.

**G2a** Bleached sand over sandy clay loam (Lithocalcic, Mottled-Subnatric, Brown Sodosol)

Very thick pale brown loose sand, overlying a yellowish brown and red mottled clayey sand to light sandy clay loam, grading to a sandy clay loam with soft to rubbly Class III carbonate from 85 cm. The profile becomes sandier with depth.

**G4a** Sand over poorly structured clay (Supracalcic, Subnatric, Brown Sodosol)

Medium thickness brown sand with a thin bleached A2 horizon, overlying a brown and red columnar sandy clay becoming more clayey and massive with depth, grading to a very highly calcareous pale brown clayey sand to sandy clay with up to 50% carbonate nodules (Class III A or B carbonate). This is underlain by a brown, yellow, grey and red sandy clay from 70 cm.

*Soils on sandy flats***B7b** Shallow sand over clay on calcrete (Lithocalcic, Brown Sodosol)

Medium thickness dark brown sand to light sandy clay loam with a pale brown A2 horizon, overlying a dark brown and yellow sandy clay loam to light clay with coarse columnar, grading to coarse blocky structure. The profile is formed on a rubbly or platy calcrete pan (Class III C carbonate) from 40 cm. Under the pan is a yellow and grey highly calcareous clay.

**G2b** Bleached sand over sandy clay loam (Sodic, Eutrophic, Brown Chromosol)

Thick to very thick dark brown sand with a bleached A2 horizon, overlying a reddish yellow massive sandy clay loam to sandy clay, grading to brown, red and yellow, massive clayey sand at 80 cm.

**G3b** Thick sand over clay (Calcic, Mottled-Mesonatric, Brown Sodosol)

Thick grey sand with a strongly bleached A2 horizon, overlying a yellowish brown, brown and red mottled sandy clay with coarse columnar structure, more clayey with depth, and highly calcareous (Class I carbonate) from 80 cm.

**G4b** Sand over poorly structured clay (Calcic, Mottled-Mesonatric, Brown Sodosol)

Medium thickness brown sand to light sandy clay loam with a hard massive bleached A2 horizon, overlying a brown, grey and red mottled clay with coarse columnar structure, calcareous with soft carbonate segregations from 45 cm (Class I carbonate). The carbonate grades to sandy clay or heavy clay (Blanchetown Clay) at 60 cm.

*Soils on sandy loam flats and rises***D5** Hard loamy sand over red clay (Hypercalcic, Red Chromosol)

Medium thickness massive dark brown loamy sand to sandy loam with a paler A2 horizon, overlying a yellowish red sandy clay loam to clay with strong blocky structure and abundant soft to nodular calcareous segregations (Class III A, B or C carbonate) from 45 cm, grading to yellow and brown clayey sand to sandy clay alluvium from 65 cm.

**F2** Sandy loam over poorly structured brown clay (Calcic, Mottled-Subnatric, Brown Sodosol)

Medium thickness grey brown massive loamy sand to sandy clay loam with a paler and sandier A2 horizon, overlying a brown, grey and yellow heavy clay with strong blocky structure, highly calcareous from 50 cm (Class I carbonate layer). The carbonate grades to Blanchetown Clay at 70 cm.

**A5** Calcareous loam (Lithocalcic Calcarosol)

Calcareous sandy loam grading to a highly calcareous sandy clay loam over Class III C carbonate rubble from about 20 cm, underlain by Blanchetown Clay at about 85 cm.

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

