

# PTI Point Tinline Land System

Old calcreted dunes and plains on Kangaroo Island's southern coast. The system is bordered by the sea to the east, shell sand dunes to the south and west, and by plains, rises and lagoons to the north. The system is named after Point Tinline, which is situated on the western side of D'Estrees Bay.

**Area:** 231.6 km<sup>2</sup>

**Annual rainfall:** 530 – 610 mm average

**Geology:** Most of the area is covered by Pleistocene age Bridgewater Formation calcreted calcarenite. This material covers older sediments. This area was once sea floor, with an island or islands just west of present day Seal Bay. The process of formation of this area can be visualised as follows: the land was covered by wind-deposited shell sand dunes; these dunes were subject to leaching, which caused carbonate to accumulate below the surface; the surface sand was then blown off, exposing the layer of enriched carbonate to the elements; then exposure to wetting and drying caused the cap of the enriched carbonate layer to harden into calcrete, giving the present condition of calcrete capped calcarenite on which shallow soils have formed.

A few areas of recent shell sand dunes occur along the coast: Semaphore Sand and Gantheaume Sand members of St. Kilda Formation.

A small area of older sediments is exposed on a rise just south-west of Murray Lagoon, where the thin calcrete cap has been 'dissolved', revealing Pliocene-Quaternary age clayey colluvium, covered by sandy topsoil.

**Topography:** Old jumbled dunes, plains and depressions. In some depression areas the calcrete has been 'dissolved', resulting in deeper soils which usually overlie a massive enriched carbonate layer.

**Elevation:** From sea level to 80 m on the rise just west of Seal Bay. Mostly plains and flats are 10 - 20 m above sea level; and dunes are from 20 - 60 m above sea level.

**Relief:** Mostly from 10 - 20 m. Reaches a maximum of 40 m on the slopes of the rises just west of Seal Bay.

**Main Soil:** **B3-B2** Shallow to very shallow soil on calcrete

**Minor Soils:**

- B7** Shallow to very shallow texture contrast soil on calcrete
- H3-B8-G3-B7** Moderate to shallow depth sandy soil on calcrete
- A1-B1** Moderate to shallow shelly soil on calcrete
- H1** Shell sand
- B1** Shallow to very shallow shelly soil on calcrete
- B3-B2-B1** Very shallow organic soil on calcrete
- C1-A4** Deep to moderate depth loamy to sandy soil
- G4-G3** Sandy topsoil on sodic clay

**Main Features:** The land system is mostly non-arable due to shallow rubbly soils. Native scrub covers most of this area. Nature conservation is the main priority here.



**Soil Landscape Unit summary:** Point Tinline Land System (PTI)

SLU	% of area	Main features #
M-A M-B M-C	0.1 0.1 0.02	<p>Non-arable sheet calcrete areas.</p> <p>Main soils: mostly not soil, but calcrete outcrop (<b>RR</b>). With areas of very shallow loamy to sandy soil on calcrete: this soil is usually dark and organic, and can be non calcareous, calcareous, or occasionally shelly <b>B3-B2-B1</b> (<i>Petrocalcic Rudosol</i>).</p> <p><b>M-A</b> – level to slightly sloping (0-3%, 1e)  <b>M-B</b> – slopes (3-10%, 2e)  <b>M-C</b> – slopes (10-20%, 3e)</p>
MpA MpD MpE MpYA	0.6 0.1 0.03 0.4	<p>Non-arable to semi-arable calcreted areas: with shallow to very shallow soils.</p> <p>Main soils: shallow loamy to sandy topsoil over sandy to clay loamy subsoil, often with a calcareous layer, on calcrete <b>B3-B7</b> (<i>Petrocalcic Sodosol-Chromosol-Tenosol</i>). With minor to limited areas with loamy to sandy topsoil, often rubbly, over brown sodic clay loam to clay, which is highly calcareous in the subsoil or lower subsoil <b>G4-G3</b> (<i>Brown Sodosol</i>).</p> <p><b>MpA</b> – gently undulating to level plain (1e)  <b>MpD</b> – slopes (10-20%, 4e, 2g)  <b>MpE</b> – depressions  <b>MpYA</b> – low calcreted dunes on rise (dunes &lt;5m: slopes 1-6%, 2-3e)</p>
MgA MgB MgC MgE MgYA MgYB MgYC	41.7 0.2 0.7 0.4 5.8 17.2 14.2	<p>Non-arable calcreted areas: with shallow to very shallow soils.</p> <p>Main soils: shallow rubbly loamy to sandy soil, mostly with non-calcareous surfaces, on calcrete <b>B3-B2</b> (<i>Petrocalcic Tenosol-Calcarosol</i>). Minor areas of loamy to sandy topsoil over sodic sandy clay loam, on calcrete at shallow depth, on non-dune areas <b>B7</b> (<i>Petrocalcic Sodosol-Chromosol</i>).</p> <p><b>MgA</b> – gently undulating to level calcreted plain/flat, often with isolated low calcreted jumbled dunes (&lt;5m, 1e)  <b>MgB</b> – calcreted slope (1-4%, 2e)  <b>MgC</b> – rise (slopes: 4-12%, 3e)  <b>MgE</b> – calcreted depression  <b>MgYA</b> – mostly low calcreted jumbled dunes (&lt;5m, 2e)  <b>MgYB</b> – mostly calcreted jumbled dunes (5-15m, 3e)  <b>MgYC</b> – mostly high calcreted jumbled dunes (&gt;15m, 4e)</p>
MjYC	3.1	<p>Non-arable sandy and calcreted areas: with moderate depth to shallow bleached sandy soils and shell sand soils.</p> <p>Main soils: moderate to shallow depth bleached sand on calcrete <b>H3-B8</b> (<i>sandy Petrocalcic Tenosol</i>). With moderate depth to shallow shell sands <b>A1-B1</b> (<i>Petrocalcic Shelly Calcarosol</i>). Minor to limited deeper shell sands (<b>H1</b>).</p> <p><b>MjYC</b> – high jumbled dunes (&gt;15m, 2e)</p>
MbE MbYB MbYC	0.2 0.7 0.1	<p>Non-arable calcreted areas: with moderate depth to shallow shelly soils.</p> <p>Main soils: mostly moderate depth to shallow fine shell sand on calcrete <b>A1-B1</b> (<i>Petrocalcic Shelly Calcarosol</i>). With some deeper soils (<b>H1</b>).</p> <p><b>MbE</b> – depression  <b>MbYB</b> – jumbled dunes (5-15m)  <b>MbYC</b> – high jumbled dunes (&gt;15m, 2e)</p>
MdA MdC MdE MdYA MdYB MdYC	0.4 0.3 0.5 0.5 3.4 0.6	<p>Non-arable calcreted areas: with shallow to very shallow calcareous soils.</p> <p>Main soils: shallow rubbly loamy to sandy calcareous soil on calcrete <b>B2</b> (<i>Petrocalcic Calcarosol</i>).</p> <p>With minor to limited shallow rubbly loamy to sandy non-calcareous soil on calcrete <b>B3</b> (<i>Petrocalcic Tenosol</i>). With deeper and sandier soils in some depressions and on some lower slopes: <b>H3-G3</b> and/or <b>A1</b> (<i>sandy Petrocalcic Tenosol-Sodosol-Chromosol</i> and/or <i>Petrocalcic Shelly Calcarosol</i>) [see 478].</p> <p><b>MdA</b> – gently undulating to level calcreted plain/flat (1e)</p>



		<p><b>MdC</b> – rise (slopes 4-12%, 3e)  <b>MdE</b> – depression/swale (1e)  <b>MdYA</b> – mostly low calcreted dunes (&lt;5m, 2e)  <b>MdYB</b> – mostly calcreted dunes (5-15m, 3e)  <b>MdYC</b> – mostly high calcreted dunes (&gt;15m, 4e)</p>
MaB MaC MaYA	0.2 0.1 0.2	<p>Non-arable calcreted areas: with shallow to very shallow shelly soils.  Main soils: shallow sandy shell soil on calcrete <b>B1</b> (<i>Petrocalcic Shelly Rudosol</i>). With some shallow sandy to loamy calcareous to non-calcareous soil on calcrete <b>B2-B3</b> (<i>Petrocalcic Calcarosol-Tenosol</i>).</p> <p><b>MaB</b> – concave slopes (mostly 2-4%, 2e)  <b>MaC</b> – slopes (4-12%, 3e)  <b>MaYB</b> – mostly calcreted dunes (5-15m, 3e)</p>
MeE MeYA	1.6 3.3	<p>Non-arable partially calcreted low-lying areas: with shallow and deep soils.  Main soils: shallow rubbly sandy to loamy soil which is calcareous to non-calcareous on calcrete <b>B2-B3</b> (<i>Petrocalcic Calcarosol-Tenosol</i>). With deeper sandy to loamy calcareous soil <b>C1-A4</b> (<i>Tenosol-Calcarosol</i>). Some soils can be shelly (<b>B1-A1</b>).</p> <p><b>MeE</b> – depressions; often with low dunes.  <b>MeYA</b> – low-lying: low dunes and flats (dunes: &lt;5m, 1-2e)</p>
MiYB MiYC	0.4 1.8	<p>Non-arable sandy and calcreted areas: with moderate depth to shallow bleached sandy soils.  Main soils: mostly moderate to shallow depth bleached sand on calcrete <b>H3-B8-G3-B7</b> (<i>sandy Petrocalcic Tenosol-Sodosol-Chromosol</i>). With some deeper soils.</p> <p><b>MiYB</b> – jumbled dunes (5-15m)  <b>MiYC</b> – high jumbled dunes (&gt;15m, 2e)</p>
PkE	0.1	<p>Arable to semi-arable depression flats.  Main soils: sandy to loamy topsoil over brown sodic clay, with fine carbonate in the lower subsoil <b>G4-G3</b> (<i>Brown Sodosol</i>). With minor to limited shallow soil on calcrete <b>B7</b> (<i>Petrocalcic Sodosol-Chromosol-Tenosol</i>).</p> <p><b>PkE</b> – depression flat/swale</p>
PIB PIC	0.2 0.5	<p>Arable to semi-arable slopes and depressions.  Main soils: sandy to loamy topsoil, often rubbly, over brown sodic clay loam to clay, which is highly calcareous in the subsoil or lower subsoil <b>G4-G3</b> (<i>Brown Sodosol</i>). Minor to limited shallow soil on calcrete <b>B7</b> (<i>Petrocalcic Sodosol-Chromosol-Tenosol</i>).</p> <p><b>PIB</b> – low rise (slopes 1-3%, 2-1e)  <b>PIC</b> – slopes with some depression areas (slopes 1-6%, 3-2e, 2g, 2s)</p>
WGD WGE	0.2 0.1	<p>Non-arable coastal shell sand dunes.  Main soils: shell sand soil <b>H1</b> (<i>Shelly Rudosol</i>).</p> <p><b>WGD</b> – jumbled coastal dunes (5-15m, 7a)  <b>WGE</b> – low jumbled coastal dunes (&lt;5m, 5-7a)</p>
WT-	0.03	Rocky reefs.

# Classes in the 'Soil Landscape Unit summary' table (eg. 2-1e, 3w, 2y, etc) describe the predominant soil and land conditions, and their range, found in Soil Landscape Units. The number '1' reflects minimal limitation, while increasing numbers reflect increasing limitation. Letters correspond to the type of attribute:

a - wind erosion      e - water erosion      f - flooding      g - gullyng  
r - surface rockiness      s - salinity      w - waterlogging      y - exposure



**Detailed soil profile descriptions:****Main Soil:**

- B3-B2** Shallow to very shallow soil on calcrete (*Petrocalcic Tenosol-Calcarosol*)  
Shallow to very shallow rubbly loamy to sandy soil on calcrete. Sometimes calcareous throughout; often with a calcareous subsoil layer just above the calcrete; and sometimes with a bleached subsurface layer. Old dunes, plains, rises and depressions.

**Minor Soils:**

- B7** Shallow to very shallow texture contrast soil on calcrete (*Petrocalcic Sodosol-Chromosol-Tenosol*)  
Shallow to very shallow loamy to sandy topsoil, usually with a bleached layer, over brown often sodic sandy clay loam to light clay, on calcrete. Oldest dune areas and rises; often associated with deeper sodic-texture contrast soils with clay subsoil.
- H3-B8-G3-B7** Moderate to shallow depth sandy soil on calcrete (*sandy Petrocalcic Tenosol-Sodosol-Chromosol*)  
Moderate depth to shallow sandy soil with a bleached layer, and sometimes with a clay loamy subsoil, on calcrete. Old dune areas, rises and depressions.
- A1-B1** Moderate to shallow shelly soil on calcrete (*Petrocalcic Shelly Calcarosol*)  
Moderate to shallow depth fine dark grey to grey shell sand on calcrete. There is usually a pronounced organic build-up in surface layers. Some carbonate has leached from surface layers, and reprecipitated in subsoil layers. Dunes and depressions.
- H1** Shell sand (*Shelly Rudosol*)  
Deep fine shell white-grey sand soil. Found on recently deposited dunes.
- B1** Shallow to very shallow shelly soil on calcrete (*Petrocalcic Shelly Rudosol*)  
Shallow to very shallow fine white-grey shell sand on calcrete. Recent drifts of shelly material covering old dune areas and rises.
- B3-B2-B1** Very shallow organic soil on calcrete (*Petrocalcic Rudosol*)  
Very shallow dark and organic rich, rubbly loamy to sandy soil on calcrete. Sometimes calcareous. Found on wind-swept coastline where the land surface is a mosaic of bare calcrete outcrop and calcrete covered with a thin veneer of soil.
- C1-A4** Deep to moderate depth loamy to sandy soil (*Tenosol-Calcarosol*)  
Loamy to sandy topsoil, often with hard carbonate fragments, over highly calcareous loamy to sandy subsoil. The carbonate enriched subsoil can sometimes be hard and massive, forming a 'soft' pan. Depressions.
- G4-G3** Sandy topsoil on sodic clay (*Brown Sodosol*)  
Medium thickness to thick sandy or sometimes light sandy loam topsoil, sometimes with hard carbonate fragments, over brown sodic clay. Fine carbonate accumulation occurs in the lower subsoil. Plains/swales and rises.

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

