

BTP Bute-Thomas Plain Land System

Raised gently undulating to level plains and gently undulating rises. It consists of two main parts: the Bute plateau; and the Thomas Plain rise or plateau.

Area: 127.2 km²

Landscape: The Bute plateau mainly consists of a raised gently undulating to level plains; while the Thomas Plain area to the south consists of slopes and slight slopes forming a flat-topped rise. These areas are remnant bedrock highs – and are directly comparable to the Paskeville plateau area to the south.

The plateau and rises are formed of reddish clayey sediments (Hindmarsh Clay) – most likely derived from the weathering of ancient quartzitic rocks from the Proterozoic. Much more recent accessions of fine carbonate dust have infused into the upper layers of this clay. Calcareous loess (Woorinen Formation) has been deposited in places, varying in thickness from a 10 - 60 cm surface layer blanketing the clay, to deposits up to several metres thick. Carbonate nodules and concretions are associated with much of this material. The oldest deposits of calcareous loess have become calcreted in some areas. The most recent deposition has been that of calcareous siliceous sand (Molineaux Sand), which forms longitudinal mallee sand dunes and sandy rises in some areas.

The Bute plateau has been affected by the incursions of wind-blown calcareous sediments to a much lesser extent than the Thomas Plain area. Consequently the majority of soils on the Bute plateau are formed in Hindmarsh Clay. However, the Thomas Plain area has significant stretches of newer soils overlying the Hindmarsh Clay base.

Annual rainfall: 365 – 395 mm average

Main soils: **A5-A4** Calcareous loam (around 39% of area)
A6 Gradational calcareous clay loam (around 29% of area)

Other soils: **D3-C4** Clay loam and loam over red clay (around 15% of area)
B2 Shallow calcareous loam on calcrete (around 9% of area)
H2 Siliceous sand (approximately 4% of area)
B3 Shallow loam on calcrete (approximately 2% of area)

Summary: The system is predominantly arable. The most common soil has a calcareous to non calcareous clay loamy to loamy topsoil grading to a red clayey subsoil. Deep to moderate depth calcareous loams and clays loams are also common. The land is used for rotational cropping and some grazing. The main limitations include boron and sodium accumulations in clayey subsoils; restricted internal drainage where clayey subsoils occur; fine carbonate and alkaline soil conditions limiting the availability of certain nutrients, especially in those soils which have the highest surface soil fine carbonate contents.

Sand dune soils need careful management due to their low fertility and high to moderate potential for wind erosion; while soils with powdery calcareous surfaces (formed from calcareous loess) have a moderate low to moderately wind erosion potential. Shallow and stony soils are common in the southern part of the system: these limit moisture holding capacity and production potential.



Soil Landscape Unit summary: Bute-Thomas Plain Land System (BTP)

SLU	% of area	Main features #
ICA ICE	1.2 0.7	<p>Plains with mainly calcareous soils formed in reddish clayey sediments with some calcareous soils formed in medium textured wind deposited sediments with minor hard carbonate rubble.</p> <p>Main soils: <i>gradational clay loam A6</i> with medium thickness clay loam to loam topsoil. With limited areas of very low rises with <i>calcareous loam A5-A4</i>: these have medium thickness loamy to sandy topsoil over clay loamy to loamy subsoil. With minor to limited areas of <i>clay loam and loam over red clay D3-C4</i> with medium thickness non-calcareous to slightly calcareous clay loamy to loamy topsoils.</p> <p>ICA – relatively low lying plains situated between sand dunes, with calcareous and some non-calcareous clay loamy to loamy surface soils over reddish clayey material; with about 10-20% of soils calcareous loamy to sandy surface soils over loamy to clay loamy material (slopes 0-1%).</p> <p>Related soil profiles:</p> <ul style="list-style-type: none"> – Haplic Argillaceous Hypercalcic Calcarosol; medium, non-gravelly, clay loamy/clayey, moderate – flat – Haplic Argillaceous Calcic Calcarosol; medium, non-gravelly, loamy/clayey, moderate – flat – Sodic Calcic Red Chromosol; medium, non-gravelly, loamy/clayey, moderate – flat – Haplic—Supracalcic Calcarosol; thick, non-gravelly, loamy/loamy, moderate – slope <p>ICE – depression, with calcareous and some non-calcareous clay loamy to loamy surface soils over reddish clayey material; with limited to common areas of soils with calcareous loamy to sandy surface soils over loamy to clay loamy material (slopes 0-1%, 3w, 1e, 1-2a).</p>
IMA IMB IMZ	3.8 6.4 1.1	<p>Plains, slopes, and the Thomas Plain plateau surface. All situated on or adjacent to the Thomas Plain rise.</p> <p>Main soils: <i>gradational calcareous clay loam A6</i>, with some related soils with non calcareous surfaces D3-C4. Also some <i>calcareous loam A5-A4</i> occur on very low rises.</p> <p>IMA – gently undulating plains (slopes 0-1.5%).</p> <p>IMB – slopes (slopes 0.5-3%).</p> <p>IMZ – plateau surface (slopes 0-1%).</p>
IOA IOAu IOB IOZ	32.1 14.5 2.6 0.8	<p>The raised plains, slopes and rises of the Bute plateau.</p> <p>Main soils: <i>gradational calcareous clay loam A6</i>, with some related soils with non calcareous surfaces D3-C4. And extensive areas of <i>calcareous loam A5-A4</i> usually on very low rises. Minor areas of <i>siliceous sand B2</i> on low dunes and sandy rises in land unit 'IOAu'.</p> <p>IOA – level plain to gently undulating plain (slopes 0-1%).</p> <p>IOAu – level to gently undulating plain with 2-10% low sand dunes and sandy rises (slopes 0-1%).</p> <p>IOB – slopes (slopes 0.5-3%)</p> <p>IOZ – rise surface (slopes 0-1.5%).</p>
QeB QeZ	3.0 1.9	<p>Calcreted slopes and plateau surfaces.</p> <p>Main soils: <i>shallow calcareous loam on calcrete B2</i>, with some <i>shallow loam on calcrete B3</i>. Also with limited to common areas of <i>calcareous loam A4-A5</i>, and various soils with clayey subsoils A6-D3-C4.</p> <p>QeB – slopes (slopes 0.5-3%).</p> <p>QeZ – plateau surfaces (slopes <1%).</p>
QfA QfB	2.8 8.5	<p>Calcreted slopes and plains.</p> <p>Main soils: <i>shallow calcareous loam on calcrete B2</i>, with some related non calcareous soils B3. Also with limited to common areas of <i>rubbly calcareous loam A4-A5</i>, and various related soils with clayey subsoils A6-D3-C4.</p> <p>QfA – level to gently undulating plains (slopes 0-1%).</p> <p>QfB – slopes (slopes 0.5-3%).</p>
QRA	0.3	<p>Calcreted plains</p> <p>Main soils: <i>shallow calcareous loam on calcrete B2</i>, with some <i>shallow loam on calcrete B3</i>.</p> <p>QRA – mid-level plains (slopes 0-1%).</p>
SDA SDB	8.0 2.6	<p>Plains and slopes dominated by calcareous loess deposits.</p> <p>Main soils: <i>calcareous loam A4-A5</i>. With extensive areas of soils with non calcareous surface soils: <i>clay loam and loam over red clay D3-C4</i> and possibly some <i>gradational sandy loam C1</i>.</p>



		SDA – gently undulating plains (slopes 0-1.5%). SDB – slopes (slopes 0.5-3%).
SSA	5.7	Plains dominated by calcareous loess deposits. Main soils: <i>calcareous loam</i> A4-A5 . With some <i>gradational clay loam</i> A6 and limited areas of sand dunes with <i>siliceous sand</i> H2 . SSA – gently undulating plains with limited areas of low dunes and sandy rises (slopes 0-1%).
U-D	0.7	Single mallee sand dunes. Dune soils: <i>siliceous sand</i> H2 . U-D – single low sand dune (3-4a)
UAG	0.2	Plains with >60% mallee sand dunes and sandy rises. Dune soils: <i>siliceous sand</i> H2 . Swale soils: <i>gradational calcareous clay loam</i> A6 . UAG – mallee dunefields with 60-90% low dunes and sandy rises overlying level plains (4-1a).
UCJ	2.5	Rise with >30% mallee sand dunes and sandy rises. Dune soils: <i>siliceous sand</i> H2 . Swale soils: <i>rubbly calcareous loam</i> A4 . UCJ – rise/plateau surface overlain with 30-60% sandy rises (3a).
UEF	0.7	Plains with >60% mallee sand dunes and sandy rises. Dune soils: <i>siliceous sand</i> H2 . Swale soils: <i>gradational calcareous clay loam</i> A6 , with some <i>calcareous loam</i> A5 . UEF – mallee dunefields with 60-90% sand dunes overlying level plains (4-2a).

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 soils**

- A5-A4** *Calcareous loam* [Lutaceous-Argillaceous Hypercalcic Calcarosols; loamy-sandy/clay loamy-loamy]. Grey brown medium thickness calcareous loamy to sandy topsoil over clay loamy to loamy subsoil with abundant fine carbonate. Profiles range from having minor to abundant carbonate rubble. Many of these soils are underlain by a clayey substrate within 120 cm of the surface (soil **A5**). Typically found on slight highs.
- A6** *Gradational calcareous clay loam* [Argillaceous Hypercalcic Calcarosols; clay loamy-loamy/clayey]. Medium thickness calcareous brown to red brown clay loamy to loamy topsoil grading to a reddish clayey subsoil with abundant fine carbonate, which is underlain by blocky heavy red clay (Hindmarsh Clay). Found on flats, depressions and slopes. Closely related to soils **D3-C4**, but with calcareous surfaces.

Other soils:

- D3-C4** *Clay loam and loam over red clay* [Sodic Hypercalcic-Calcic Red Chromosol-Dermosol; clay loamy-loamy/clayey]. Red brown medium thickness non-calcareous to slightly calcareous clay loamy to loamy topsoil over reddish clayey subsoil with abundant fine carbonate, which is underlain by blocky heavy red clay (Hindmarsh Clay). Found on flats, depressions and slopes. Closely related to soil **A6**, but either texture contrast or with non calcareous (to slightly calcareous) surfaces.
- B2** *Shallow calcareous loam on calcrete* [Petrocalcic Calcarosol]. Grey brown to brown calcareous loams and sandy loams overlying calcrete at shallow depth.
- H2** *Siliceous sand* [Arenic Calcic Calcarosol-Tenosol; sandy/sandy-loamy]. Deep to moderate depth brown to reddish loamy sands. Soils are mostly calcareous throughout, however, some are non calcareous in the topsoil. Subsoils are occasionally as heavily textured as sandy loam. An accumulation of fine carbonate occurs in the subsoil or lower subsoil. Found on mallee sand dunes and sandy rises.
- B3** *Shallow loam on calcrete* [Petrocalcic Tenosol]. Brown to red brown sandy loams overlying calcrete at shallow depth. Soils are non calcareous in the surface, but can be calcareous in the subsoil.

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

