

# LAD Lake Ada Land System

The Lake Ada basin, consisting of an old lagoon floor area including Lake Ada, its lagoonal margins, some other lagoonal depressions, and the lower reaches of the Eleanor River. To the north and west lies the central plateau area; to the east a narrow rise and then the Murray Lagoon Basin area; to the south the non arable old calcreted dune landscapes.

**Area:** 33.1 km<sup>2</sup>

**Annual rainfall:** 550 – 590 mm average

**Geology:** Largely Pleistocene age lagoon deposits of brown mottled clay. Areas of recent alluvium have been deposited, via drainage from the central plateau, consisting of brown mottled clay which can include buried ironstone gravel layers, and which overlies older lagoon deposits. These clays are generally overlain by loamy topsoil layers. Holocene age lacustrine deposits around Lake Ada itself, consist of grey mottled clays with fine calcium carbonate. Generally sandy topsoil layers overlie these clays. Minor areas of lunette deposits adjoin the eastern and northern edges of Lake Ada, and the eastern edges of present and past lagoonal depressions. A few remnant, slightly elevated areas of Pliocene-Quaternary age colluvium occur, where ironstone gravel overlies mottled brown highly weathered clayey sediments: these areas are related to nearby plateau landscapes.

**Topography:** An old lagoon floor area: including Lake Ada, its lagoonal margins, some other lagoonal depressions, and the lower reaches of the Eleanor River. Minor areas of lunettes occur. This system contains the lower reaches of the Eleanor River and Wittow Creek, and includes a number of drainage depressions, often saline, which drain the central plateau into the basin. Low lying alluvial plains occur where some of these drainage depressions abut the old lagoonal floor area. Some low rises occur: they are less than 10m high and are mostly situated at the margins of this basin.

Two main drainage areas occur: the land-locked low lying area surrounding Lake Ada in the east; and the low lying area encompassing the lower reaches of the Eleanor River in the west, which is drained via the Eleanor River into the Southern Ocean. A low narrow rise separates these two low lying areas.

**Elevation:** From just less than 10 m at the lowest point in the west of the system, to around 30 m at the plateau margins.

**Relief:** Less than 10m

**Main soils:**

<b>F2-G4</b>	<u>Loam or sand over brown clay</u>
<b>G3-F1-N2-N3</b>	<u>Sand or loam over grey clay</u>
<b>J2</b>	<u>Ironstone soil</u>

**Minor soil:**

<b>B7</b>	<u>Shallow sand over clay on calcrete</u>
<b>H3-I1</b>	<u>Bleached siliceous sand</u>
<b>B3</b>	<u>Shallow sandy loam to sand on calcrete</u>



**Main features:** Arable to non-arable low-lying area with poor drainage. Topsoils are loamy to sandy. Most soils have loamy to sandy topsoils over sodic clay. Most of the area suffers from wetness and poor drainage. Saline seepage occurs, especially along the drainage depressions originating from the higher central plateau, and on the adjacent alluvial plains. The lagoonal depressions vary from marginally saline to highly saline. Many subsoils are composed of sodic clay, and so are dispersive and poorly structured. These relatively impermeable subsoils add to the problem of wetness in this low lying system. Fine carbonate occurs in some subsoils or lower subsoils, especially in the recent lacustrine sediments around Lake Ada, and soils adjacent to the old calcreted dune landscapes.

**Soil Landscape Unit summary:** Lake Ada Land System (LAD)

SLU	% of area	Main features #
FUK	8.9	Slightly elevated plains dominated by texture contrast soils with ironstone gravel. Main soils: ironstone soil <b>J2</b> ( <i>Ferric Brown Sodosol</i> ). With loams over brown clay <b>F2</b> ( <i>Brown Sodosol</i> ). Possibly some soils overlie weathering rock at moderate depth. <b>FUK</b> – gently undulating plains and slopes with areas of raised subsoil salinity (slopes 0-1.5%, 3-2s, 3-2w) Summary: remnant slightly raised ironstone areas. Some of the better drained areas in this system, however, subsoils are relatively impermeable and seasonal perched water tables can occur. The ironstone gravel restricts fertility as it 'fixes' phosphorous.
PkU PkUw	10.5 0.4	Alluvial depressions with texture contrast soils. Main soils: sandy loams to sands over brown clay <b>F2-G4</b> ( <i>Brown Sodosol</i> ) <b>PkU</b> – alluvial depression/drainage area with 10-50% non arable saline land; the rest being marginally saline (4*s, 5w) <b>PkUw</b> – wet alluvial depression (4s, 7w) Summary: an alluvial plain on an old lagoon area. These low lying areas are mostly limited by seasonal wetness and marginal salinity caused by a saline water table not far below the land surface. Patches of non arable saline land occur.
PmA	6.4	Slightly elevated plains with texture contrast soils: some shallow on calcrete or with calcrete fragments. Main soils: sands or sandy loams over brown, or possibly over grey clay, some with calcareous lower subsoils <b>G4-F2</b> ( <i>Brown Sodosol</i> and possibly some <i>Grey Sodosol</i> ). With some shallow sand over clay on calcrete <b>B7</b> ( <i>Petrocalcic Grey Sodosol</i> ). Minor areas of shallow sandy loams or sands on calcrete <b>B3</b> ( <i>Petrocalcic Tenosol</i> ). <b>PmA</b> – level to gently undulating plains (0-1%, 3-4w, 2s, 2r) Summary: slightly elevated plains on an old lagoon area. Mostly limited by seasonal waterlogging.
PoA	5.9	Raised plains and slight slopes with texture contrast soils: some with ironstone gravel. Main soils: sands or sandy loams over clay <b>G4-F2</b> ( <i>Brown Sodosol</i> ). With ironstone soil <b>J2</b> ( <i>Ferric Brown Sodosol</i> ). <b>PoA</b> – gently undulating plains (0-1.5%, 1-2e, 3w, 2s) Summary: raised plains and slight slopes, mostly limited by seasonal waterlogging.
VbA VbB VbBw VbC	11.0 11.2 0.7 1.6	Old lagoonal plains dominated by texture contrast soils. Main soils: sandy loams and sands over brown, and some over grey clay: <b>F2-G4</b> with some <b>G3-F1</b> ( <i>Brown Sodosol</i> with some <i>Grey Sodosol</i> ). <b>VbA</b> – old lagoonal plains/flats with raised subsoil salinity levels (3s, 4w) <b>VbB</b> – old lagoonal flats with marginal salinity (4s, 5w) <b>VbBw</b> – wet old lagoonal shallow depression with marginal salinity (4s, 7w) <b>VbC</b> – highly saline old lagoonal flats (5s, 5w) Summary: low lying old lagoonal flats, mostly limited by wetness and saline seepage caused by a saline watertable not far below the land surface.



XVS XVV XVU XVJ	2.5 4.6 5.5 1.3	<p>Modern watercourses with wet texture contrast soils.</p> <p>Main soils: wet sandy loams and sands over grey clay <b>N3-N2</b> (<i>Sodosolic Hydrosol</i>). Some brown, deep sandy loams may occur <b>M1</b> (loamy Tenosol)</p> <p><b>XVS</b> – watercourse, wet and slightly saline: mostly covered with large eucalypts (3-2s, 7w)  <b>XVV</b> – watercourse, wet and marginally saline: (4s, 7w)  <b>XVU</b> – swampy drainage areas, wet and marginally saline: (4-3s, 7w)  <b>XVJ</b> – creek flats (3s, 5w)</p> <p>Summary: wet non arable drainage areas which are prone to flooding.</p>
ZA-	7.3	<p>Saline drainage depressions with wet texture contrast soils.</p> <p>Main soils: thick to very thick sandy loams to sands over grey clay <b>F1-G3-N2</b> (<i>Grey Sodosol</i> or <i>Sodosolic Hydrosol</i>). Some brown, deep sandy loams may occur <b>M1</b> (loamy Tenosol)</p> <p><b>ZA-</b> – saline drainage depressions (5-4s, 7-5w, 2e, 2g)</p> <p>Summary: salinized drainage depressions originating from the central plateau area, usually with 50% or more saline land, predominantly along the drainage lines themselves. These areas are non arable due to wetness and are prone to flooding.</p>
ZF- ZP- ZQ- ZR- ZS-	2.9 8.4 8.2 0.2 0.2	<p>Lagoons.</p> <p>Main soils: wet sands and light sandy loams over grey, or sometimes brown clay <b>N2-G3</b> (<i>Sodosolic Hydrosol</i>; sometimes <i>Grey Sodosol</i>, or even <i>Brown Sodosol</i>)</p> <p><b>ZF-</b> – shallow lake: Lake Ada. (8w)  <b>ZP-</b> – swampy lagoonal margins (4s, 7w)  <b>ZQ-</b> – lagoonal depressions/lagoon margins, with marginal salinity: mostly covered by melaleuca shrubs; prone to inundation (5s, 7w)  <b>ZR-</b> – saline lagoonal depressions/lagoon margins: with melaleuca and bare patches; prone to inundation/seasonally inundated (7s, 7w)  <b>ZS-</b> – highly saline lagoonal depression: mostly bare and salt encrusted; seasonally inundated (8s, 7-8w)</p> <p>Summary: lagoons which are subject to inundation, and lakes. The lagoons are saline to marginally saline due to saline watertables not far below, or at, the land surface.</p>
ZL0 ZL6 ZL7	0.9 0.5 1.0	<p>Lunettes with sandy texture contrast soils:</p> <p>Main soils: sand over brown clay <b>G4</b> (<i>Brown Sodosol</i>)</p> <p><b>ZL0</b> – lunette (2-5m high, 3w)  Summary: this lunette is covered by broombush shrubs and low mallee habit eucalypts.</p> <p>Lunettes with deep sandy soils:</p> <p>Main soils: deep to moderate depth bleached siliceous sands, overlying a clayey substrate <b>H3-I1</b> (<i>Tenosol-Podosol</i>). Probably with some sands over grey clay <b>G3</b> (<i>Grey Sodosol</i>).</p> <p><b>ZL6</b> – low lunettes (&lt;2m high, 4w, 4-3s)  <b>ZL7</b> – lunettes (mostly 2-5m high, 1w)</p> <p>Summary: the higher lunette is well drained and arable. Wind erosion risk and water repellence are potential limitations on this sandy lunette. The low lunettes, which occur on two sides of Lake Ada, are non arable due to wetness and saline seepage.</p>

# 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:**

- F2-G4** Loam or sand over brown clay (*Brown Sodosol*). Medium thickness, thick or occasionally very thick topsoil: dark brown to grey-brown light sandy loam, sandy loam or loamy sand surface soil over a lighter coloured subsurface layer of sand to sandy loam which is usually bleached. This overlies yellow-brown, olive-brown, or occasionally light brown dispersive clay subsoil with yellow-brown, red-brown, olive-brown, olive, grey and/or red mottles. Below this, at deep to moderate depth, is a substrate of grey lacustrine clay with yellow, yellow-brown and/or red mottles. The lower subsoil or substrate can be calcareous in recent lacustrine sediments around Lake Ada, and on soils adjacent to the old calcreted dune landscapes. A thin layer of ironstone gravel can occur in, or on the clay subsoil on alluvial plains, and some ironstone nodules can occasionally be found spread throughout the clayey subsoil. Found on old lagoonal flats, alluvial flats, drainage depressions, lagoonal margins and an old lunette.
- G3-F1-N2-N3** Sand or loam over grey clay (*Grey Sodosol* or *Sodosolic Hydrosol*). Medium thickness to very thick topsoil (often thin in lagoons): dark brown to dark grey-brown sand to fine sandy loam surface soil over a lighter coloured subsurface layer which is often bleached. This overlies sodic and usually dispersive grey or olive-grey lacustrine clay subsoil with olive, olive-brown or yellow-brown mottles. Usually calcareous in the lower subsoil on lagoon margins, or subsoils in lagoons. Found on wet old lagoonal depressions and low lying flats, lagoonal margins, lagoons and drainage depressions.
- J2** Ironstone soil (*Ferric Brown Sodosol*). Thick topsoil with ironstone gravel: grey-brown loam to light sandy loam surface soil over a subsurface layer of sandy loam to loamy sand which can be bleached. This overlies yellow-brown or olive-brown clay subsoil often with some red, brown, or yellow-brown mottles. The upper subsoil is usually dispersive. Found on slight rises (<10 m high), usually on the margins of the basin.

**Minor soil:**

- B7** Shallow sand over clay on calcrete (*Petrocalcic Grey Sodosol*). Medium thickness sand with a bleached subsurface layer, over olive-grey sodic clay subsoil, on calcrete at shallow depth. Slight rises and plains on the margins of the old calcreted dune landscapes.
- H3-I1** Bleached siliceous sand (*Tenosol-Podosol*). Deep to moderate depth bleached sands overlying a clayey substrate. On some lunettes and possibly minor areas in some drainage depressions.
- B3** Shallow sandy loam to sand on calcrete (*Petrocalcic Tenosol*). Shallow soil with a thin light sandy loam to loamy sand surface soil and a bleached loamy sand subsurface layer, directly overlying calcrete. Usually the thin soil layer just above the calcrete is calcareous. Found on margins of the old calcreted dune landscapes.

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

