

MCT Marcollat Land System

Plains associated with the Marcollat watercourse

Area: 345.3 km²

Annual rainfall: 515 – 575 mm average

Geology: The Land System is formed on calcareous clays and limestones of the Padthaway Formation. These are calcreted, particularly on the eastern side. Low hummocks of Molineaux Sand are scattered across much of the land surface.

Topography: Seasonally wet and marginally to highly saline flats associated with the Marcollat watercourse. The System includes the corridor adjacent to the defined water course, which flows northwards to Jip Jip Waterhole, and also includes the extensive flats further north which have no defined natural drainage pattern. Water from this area moves northwards into the sandhill and swamp complex of the McNamara Land System. The most notable topographic features of the land are the watercourse (a series of swamps linked by natural or artificial channels) and some drains, and the mosaic of very low sandy hummocks in the north. These hummocks are fifty to several hundred metres wide and may cover 25% of the land surface.

Elevation: 15 - 30 m

Relief: Minor ridges (outliers of the Peacock Land System) are up to 30 m high, but the relief of 98% of the Land System is less than 5 m (low sandy and stony rises).

Soils: The landscape is dominated by sand over clay soils (many wet and saline), and shallow sandy soils (with or without clayey subsoils) over calcrete.

Main soils

- N2** Wet saline soils – poorly to very poorly drained flats and depressions
- N2a** Gradational clay loam
- N2b** Shallow calcareous soil over calcrete
- N2c** Deep sand
- N2d** Sandy loam over clay
- N2e** Sand over clay
- N2f** Calcareous loam
- N2g** Shallow sand over clay on calcrete
- N2h** Shallow clay loam over calcrete
- B7a** Shallow sand over clay on calcrete - better drained flats
- B3a** Shallow stony loamy sand on calcrete - better drained and stony flats

Minor soils

Flats

- A7** Calcareous clay loam on marl
- B2a** Shallow calcareous loam on calcrete
- B4a** Shallow red loam on limestone
- B5** Shallow dark clay loam on limestone
- B6a** Shallow sandy loam over red-brown clay on calcrete
- F1** Sandy loam over brown clay
- F2** Sandy loam over poorly structured brown or dark clay



- G3a** Thick sand over clay
G4a Sand over poorly structured clay
M2 Deep friable gradational clay loam
M4 Clay loam over poorly structured clay

Swamps

- N3** Wet soil
N3a Gradational clay loam
N3b Sand over clay
N3c Shallow dark clay loam on limestone

Sandy rises

- H3** Deep bleached sand
G2 Sand grading to sandy clay loam
G3b Thick sand over clay
G4b Sand over poorly structured clay

Stony rises

- B2b** Shallow calcareous sandy loam on calcrete
B3b Shallow stony loamy sand on calcrete
B4b Shallow red loam on limestone
B6b Shallow sandy loam over red-brown clay on calcrete
B7b Shallow sand over clay on calcrete

Main features: The Marcollat Land System is a plain with a gradual fall to the north, characterized by imperfectly to poorly drained sand over clay soils, being increasingly affected by rising saline groundwater tables. Much of the land is too saline for conventional pasture species.

Soil Landscape Unit summary: 41 Soil Landscape Units (SLUs) mapped in the Marcollat Land System:

SLU	% of area	Main features #
MHB MHC MHU MHb MHh	0.7 0.6 0.2 0.3 0.2	<p>Series of parallel ridges with a NNW-SSE orientation, up to 30 m high with slopes of 3-6%. The ridges are formed on calcreted calcarenite. They are partially overlain by sand spreads, which tend to be more extensive on the eastern slopes. There is variable surface stone on the non-sandy slopes.</p> <p>MHB Gently sloping undulating rises with 2-10% saline depressions. MHC Undulating rises to low hills with up to 2% saline depressions. MHU Gently undulating rises with about 30 marginally saline depressions. MHb Gently sloping undulating rises with about 5% saline depressions. MHh Gently sloping undulating rises with about 15% marginally saline to saline depressions.</p> <p>Main soils: <u>deep bleached sand</u> - H3 (E) and <u>sand grading to sandy clay loam</u> - G2 (L). These soils are deep with low fertility, moderate water holding capacity and rapid drainage. They are prone to water repellence, acidification and wind erosion. A range of shallow soils includes <u>shallow stony loamy sand on calcrete</u> - B3b (L), <u>shallow red loam on limestone</u> - B4b (M), <u>shallow sand over clay on calcrete</u> - B7b (M) and <u>shallow calcareous sandy loam on calcrete</u> - B2b (M). These soils are semi-arable due to limited water holding capacity, surface stoniness and marginal to moderate fertility. Other minor soils include <u>thick sand over clay</u> - G3b on slopes and a range of <u>wet saline soils</u> - N2 in depressions.</p>
NAA NAa	3.7 13.5	<p>Flat plains with occasional very low stony or sandy rises formed on calcreted sediments of the Padthaway Formation. Groundwater tables are within two metres of the surface.</p> <p>Main soils: <u>shallow sand over clay on calcrete</u> - B7a (E) and <u>shallow stony loamy sand on calcrete</u> - B3a (E). The plains are moderately well (NAA) to imperfectly (NAa) drained, with corresponding moderately low (NAA) to moderately high (NAa) salinity. The land is being increasingly affected</p>



		<p>by rising saline watertables. Inherent soil fertility is moderately low as is waterholding capacity (due to shallow depth to calcrete). There are no physical impediments to root growth above the calcrete.</p> <p>The sandier soils may be water repellent in some seasons. There is up to 5% surface calcrete stone with heavier patches.</p>
NAb	4.7	<p>Flat to gently undulating plains with very low stony rises formed on calcreted sediments of the Padthaway Formation. Groundwater tables within two metres of the surface over much of the area.</p> <p>Main soils: <u>shallow stony loamy sand on calcrete</u> - B3b (E) and <u>shallow sand over clay on calcrete</u> - B7b (E).</p> <p>This land is imperfectly drained with moderately high salinity. It is being increasingly affected by rising saline groundwater tables. Soil fertility is low to moderately low, and water-holding capacity is low. Although calcrete is at shallow depth, there are no soil structure impediments to root growth. There is up to 10% surface calcrete stone on flats, and up to 20% on rises. This is a stonier variant of NAa.</p>
NDe NDr	2.2 0.8	<p>NDe Flat plains with occasional low sandy or stony rises formed on calcreted clays and limestones of the Padthaway Formation. Groundwater tables are within two metres of the surface over much of the area.</p> <p>NDr Plains as above, with about 20% sandy rises.</p> <p>Main soils: <u>shallow sand over clay on calcrete</u> - B7a (E), <u>shallow stony loamy sand on calcrete</u> - B3a (L), and <u>sand over poorly structured clay</u> - G4a (L), with <u>wet / saline sand over clay on calcrete</u> - N2g (M) in wetter areas.</p> <p>Minor soils on rises include sandy G3b, G2 and H3 soils, with shallow stony B3b and B7b soils. Flats are imperfectly to poorly drained.</p> <p>Dispersive subsoils and/or shallow groundwater tables prevent adequate drainage. Salinity is moderately high. The land is being increasingly affected by rising saline groundwater tables. Soil fertility is moderate to moderately low, water holding capacity is moderate. Surface soils are usually sandy (no limitations to root growth), but subsoils are commonly dispersive, preventing even root growth. There is minor surface stone (calcrete), with up to 20% on stony rises.</p>
NMA NMa NMk	1.3 1.0 0.5	<p>Flat plains with occasional very low sandy rises and up to 15% swamps formed on calcreted sediments of the Padthaway formation. Groundwater tables are within two metres of the surface.</p> <p>NMA Level plains with about 15% marginally saline swamps</p> <p>NMa Level plains with about 5% saline swamps</p> <p>NMk Level plains with about 15% saline swamps and about 15% sandy rises.</p> <p>Main soils on plains: <u>shallow sand over clay on calcrete</u> - B7a (V) and <u>sand over poorly structured clay</u> - G4a (L), with various <u>wet saline soils</u> - N2e, N2g and N2h (M).</p> <p>Minor soils on flats: <u>wet sand over clay</u> - N3b and <u>shallow dark clay loam on limestone</u> - B5.</p> <p>Sandy soils G3b, H3 and G2 occur on minor sandy rises.</p> <p>The predominant flats are imperfectly to poorly drained with moderate to high levels of salinity. The land is being increasingly affected by rising saline groundwater tables.</p>
NSs	1.8	<p>Marginally saline plains with 20-30% saline swamps and 20-30% sandy rises.</p> <p>Main soils on flats: <u>thick sand over clay</u> - G3a (C) with <u>sand over poorly structured clay</u> - G4a (L) and <u>shallow dark clay loam on limestone</u> - B5 (L). <u>Thick sand over clay</u> - G3b (L), <u>deep bleached sand</u> - H3 (M) and <u>sand grading to sandy clay loam</u> - G2 (M) occur on sandy rises, and <u>wet saline soils</u> - N2g and N2h occur in swamps.</p> <p>Waterlogging and salinity are the main management issues on the flats, with rising saline watertables exacerbating the problem. Low fertility is an additional problem on the predominant sandy soils. The sandy rises are not affected by salinity, but are infertile and are susceptible to water repellence and wind erosion.</p>
NTs	2.7	<p>Very gently undulating plains with about 10% saline depressions, 5% non saline swamps, and 20-30% sandy rises.</p> <p>Main soils: <u>thick sand over clay</u> - G3a (E), with <u>sand over poorly structured clay</u> - G4a (L). <u>Deep bleached sand</u> - H3 (L), <u>thick sand over clay</u> - G3b (M) and <u>sand over poorly structured clay</u> - G4b (M) occur on sandy rises, with <u>wet saline soils</u> - N2e and N2h and <u>wet sand over clay</u> - N3b and <u>dark clay on limestone</u> - N3c in swamps.</p> <p>Waterlogging and salinity are the main management issues on the flats, with rising saline water</p>



		tables exacerbating the problem. Low fertility is an additional problem on the predominant sandy soils. The sandy rises are not affected by salinity, but are infertile and are susceptible to water repellence and wind erosion.
NZF NZK NZa NZk	2.6 1.1 0.1 6.7	<p>Flat plains with occasional very low stony and sandy rises and swamps formed on calcreted sediments of the Padthaway formation. Groundwater tables are within two metres of the surface.</p> <p>NZF Plains with 20-30% marginally saline to saline swamps and 10-20% stony rises. NZK Plains with 20-30% saline swamps and up to 10% sandy rises. NZa Plains with 10-20% saline swamps. NZk Plains with 20-30% saline swamps and up to 10% sandy rises.</p> <p>Main soils on plains: <u>shallow sand over clay on calcrete</u> - B7a (E), with <u>thick sand over clay</u> - G3a (L) and <u>shallow dark clay loam on limestone</u> - B5 (L). <u>Wet saline variants of these soils</u> - N2g and N2h (L) are predominant in swamps. <u>Thick sand over clay</u> - G3b and <u>deep bleached sand</u> - H3 are minor on sandy rises. The plains have moderately high salinity and are extensively waterlogged, limiting land use to grazing of tolerant pastures. Low fertility is an additional problem. Sandy rises are not saline, but are infertile and prone to water repellence and wind erosion.</p>
NmD NmF Nmf	0.7 9.2 2.0	<p>Plains with 15-25% swamps and minor sandy rises, formed on calcreted sediments of the Padthaway Formation. Groundwater tables are within two metres of the surface.</p> <p>NmD Plains with 10-20% saline swamps and 10-20% sandy rises. NmF Plains with 20-30% marginally saline swamps. Nmf Plains with 20-30% saline swamps.</p> <p>Main soils on plains: <u>shallow sand over clay on calcrete</u> - B7a (V) and <u>shallow dark clay loam on limestone</u> - B5 (C). Saline variants of these soils, N2g and N2h (L) occur in swamps. Minor sandy soils on rises are H3, G2 and G3b. The two predominant soils are marginally saline and being increasingly affected by rising groundwater tables. In addition, both are shallow with restricted water holding capacity, while the B7a soils have low fertility. The heavier B5 soils are potentially the most productive, but pasture mixes based on waterlogging and salt tolerant species are necessary.</p>
Nto Ntv	0.3 0.1	<p>Loamy plains with up to 30% swamps and limited sandy and stony rises formed on calcreted sediments of the Padthaway Formation. Groundwater tables are within two metres of the surface.</p> <p>Nto Plains and rises with 10-20% saline swamps and about 30% sandy and stony rises. Ntv Plains with 20-30% saline swamps.</p> <p>Main soils: <u>sandy loam over brown clay</u> - F1 (E) and <u>thick sand over clay</u> - G3a (L), with <u>deep friable gradational clay loam</u> - M2 (M). Swamp soils are limited overall and include saline variants of the above soils, viz. N2d, N2e and N2a, as well as <u>saline clay loam over calcrete</u> - N2h. Shallow stony soils (B3b and B7b) occur on limited stony rises which include 10-20% outcropping sheet calcrete. Deep sandy soils (G3b, H3 and G2) occur on limited sandy rises. The plains are moderately saline and subject to waterlogging, requiring some adaptation of pasture composition and management. The main soils have moderate to low fertility, but good waterholding capacity. The soils of the rises are well drained and non saline, but suffer from limited waterholding capacities (stony rises) and poor fertility (sandy rises).</p>
NvA	0.8	<p>Level plain with up to 10% marginally saline swamps and up to 10% stony rises. Underlying materials are calcreted sediments of the Padthaway Formation. Groundwater tables are generally deeper than two metres.</p> <p>Main soils: <u>thick sand over clay</u> - G3a (E), <u>sandy loam over brown clay</u> - F1 (E), and <u>shallow dark clay loam on limestone</u> - B5 (L). Heavy textured marginally saline wet soils (B5 and M2) occur in swamps, with a range of shallow stony soils (B2b, B3b, B6b, B7b and sheet rock) on rises. The soils of the plains are generally deep (B5 excepted) with adequate water holding capacities. Fertility varies from low (sandy types) to high (clay loam types). Winter waterlogging is a moderate limitation.</p>
Nys	1.3	<p>Loamy to clayey plains formed on calcreted sediments of the Padthaway Formation. There are 30-40% saline swamps and 20-30% sandy rises. Groundwater tables are within two metres of the surface.</p> <p>Soils of the plains: <u>clay loam over poorly structured clay</u> - M4 (L), <u>calcareous clay loam over marl</u> -</p>



		<p>A7 (L), <u>shallow calcareous loam on calcrete</u> - B2a (M) and <u>shallow red loam on limestone</u> - B4a (M).</p> <p>These soils are seasonally waterlogged and marginally saline. Tolerant species are needed for satisfactory pasture production. Soil fertility is moderate to high, and profiles are mostly deep (exceptions are minor B2 and B4 types).</p> <p><u>Wet saline gradational clay loam</u> - N2a (L) and <u>wet saline clay loam over calcrete</u> - N2h (L) occur in swamps. These areas have limited productive potential.</p> <p>Soils of the sandy rises are <u>thick sand over clay</u> - G3b (L), <u>deep bleached sand</u> - H3 (M) and <u>sand over poorly structured clay</u> - G4b (M).</p> <p>Although deep and non saline, fertility is low. G3 and G4 profiles subject to seasonal waterlogging due to perched watertables. These soils are also prone to water repellence and wind erosion.</p>
XqD	0.1	<p>Semi-permanent marginally saline swamp.</p> <p>Main soils: <u>wet gradational clay loam</u> - N3a and <u>wet saline sandy loam over clay</u> - N2d.</p> <p>This land has limited productive potential.</p>
ZD-	<0.1	<p>Seasonal or permanent salt lakes, underlain by calcareous clays and marls.</p> <p>Main soil: <u>saline calcareous loam</u> - N2f.</p> <p>Calcareous loamy soils, generally shallow over calcrete occur on minor low lunettes on lake margins. The prolonged inundation and high salinity of this land limits usage to opportunistic light grazing, but care is needed to protect halophytic vegetation.</p>
ZLxA	0.8	<p>Small low lunettes surrounding saline swamps, formed on medium to fine grained calcareous sediments blown up from dry lake floors.</p> <p>The surface of these sediments has hardened to calcrete, giving rise to <u>shallow calcareous sandy loam</u> - B2b, <u>shallow red loam</u> - B4b and <u>shallow loam over red-brown clay</u> - B6b (all over calcrete within 50 cm). This land is well drained and non saline, with moderately fertile soils, although shallow depth restricts waterholding capacity.</p>
ZnG	0.3	<p>Complex of saline flats (50%), low sand rises (40%) and swamps (10%), formed on limestones and clayey sediments of the Padthaway Formation, partially overlain by Recent windblown sands.</p> <p>Main soils:</p> <p>Flats: <u>wet saline sand over clay (on calcrete)</u> N2e/N2g</p> <p>Rises: <u>sand grading to sandy clay loam</u> - G2 and <u>deep bleached sand</u> - H3</p> <p>Swamp: <u>wet highly saline gradational clay loam</u> - N2a, <u>deep highly saline sand</u> - N2c and <u>highly saline calcareous loam</u> - N2f.</p> <p>The flats are imperfectly to poorly drained and highly saline due to shallow watertables and low permeability subsoils. Sandy rises are rapidly drained and non-saline. The sandy soils of the rises are susceptible to water repellence and wind erosion.</p> <p>Swamps are very poorly drained and extremely saline. Inherent soil fertility is moderately low on the flats to very low on sandy rises. Waterholding capacity of soils is moderate.</p>
ZnJ Znj	3.3 0.8	<p>ZnJ Flat plains with occasional small (unmappable) swamps, and sandy or stony rises formed on clayey and limestone sediments of the Padthaway Formation. The land is seasonally waterlogged and affected by saline groundwater tables.</p> <p>Znj Plains where salinity is higher and which is subject to inundation in wet years.</p> <p>Main soils: <u>wet /saline sand over clay</u> - N2e (E) and <u>sand over saline clay on calcrete</u> - N2g (E).</p> <p>This land is imperfectly to poorly drained, due to shallow water tables and dispersive clay subsoils. Salinity is high (ZnJ) to very high (Znj). The land is influenced by rising saline ground watertables. Soil fertility is moderately low and waterholding capacity is moderate. Surface structure is not limiting, but dispersive subsoils prevent satisfactory root growth.</p> <p>Most soils require salt tolerant species for productive pasture growth (i.e. clovers and conventional perennial grasses will not persist on most of this land).</p>
ZnM Znm	26.1 5.4	<p>ZnM Very gently undulating plains with occasional small (unmappable) swamps, and approximately 25% of the area covered by sandy rises up to two metres high. The land is formed on clayey and limestone sediments of the Padthaway Formation, partially overlain by Recent windblown sands. The land is seasonally waterlogged and affected by saline groundwater tables.</p> <p>Znm Plains where salinity is higher and which is subject to inundation in wet years.</p> <p>Main soils: <u>wet saline sand over clay</u> - N2e (E) and <u>sand over saline clay on calcrete</u> - N2g (C) on</p>



		flats and swampy areas, with <u>deep bleached sand</u> - H3 (L) and <u>sand grading to sandy clay loam</u> - G2 (L) on rises. The plains are imperfectly to poorly drained, due to shallow water tables and dispersive clay subsoils. Salinity is high (ZnM) to very high (Znm). Sandy rises are well drained and not saline. Soils of the flats are moderately fertile and have dispersive subsoils which prevent satisfactory root growth. On the rises, soils are highly infertile, and prone to water repellence and wind erosion, but they have no physical constraints. There are no surface stones or rock outcrops. Most soils on the flats require salt tolerant species for productive pasture growth (i.e. clovers and conventional perennial grasses will not persist on most of this land).
Zpf Zpk Zpl Zps	1.2 0.4 0.2 0.6	Plains with extensive swamps and up to 20% sandy and stony rises formed on calcreted sediments of the Padthaway formation. These landscapes generally occur on the western edge of the plains adjacent to the ranges of the Peacock Land System. Zpf Plains with 40-50% saline swamps Zpk Plains with about 40% saline swamps and up to 10% sandy rises Zpl Plains with about 20% swamps and lunettes, and 10% stony and sandy rises Zps Plains with 40-50% saline swamps and 10-20% sandy rises Main soils: Plains: <u>wet saline sand over clay</u> - N2e and <u>sand over saline clay on calcrete</u> - N2g Swamp: <u>wet highly saline gradational clay loam</u> - N2a , <u>deep highly saline sand</u> - N2c and <u>highly saline calcareous loam</u> - N2f . Up to 80% of swamps have semi-permanent water. Rises: <u>thick sand over clay</u> - G3b , <u>deep bleached sand</u> - H3 , <u>sand grading to sandy clay loam</u> - G2 , <u>shallow sandy loam on calcrete</u> - B3b , <u>sand over brown clay on calcrete</u> - B7b and outcropping sheet calcrete. The soils of the plains are deep, have moderately low fertility and moderate water holding capacity. Drainage is poor, salinity is high and the land is seasonally inundated. The majority of the area supports only salt tolerant species. Waterlogging, salinity, marginal fertility and poor subsoil structure combine to restrict productive potential of this land. The swamps have very limited potential due to prolonged inundation and severe salinity. The soils of the sandy rises are deep and well to moderately well drained, but have low fertility and moderate waterholding capacity. They are susceptible to water repellence and wind erosion. The soils on the stony rises are well drained, but are shallow and stony with limited waterholding capacity and moderately low fertility.
ZQ-	<0.1	Marginally saline swamps formed on calcareous clays and marls. Most of the area is seasonally permanently inundated, with <u>wet gradational clay loam</u> - N3a and <u>wet saline calcareous loam</u> - N2f occurring around the edges. These soils are deep, have moderate fertility, high waterholding capacity, but are poorly drained and with high to very high salinity.
ZS-	1.5	Saline swamps formed on calcareous clays and marls. These are natural features, representing the lowest points in the local landscape. They are usually seasonally inundated. Vegetation is commonly a reflection of the level of salinity. Cutting grass is common on moderately saline land, tea tree and samphire on highly saline land, while extremely saline land is usually bare. Main soils: <u>wet highly saline grey clay</u> - N2a (E), <u>wet saline calcareous loam</u> - N2f (E) and <u>wet highly saline sand</u> - N2c (C). The swamps are very poorly drained, seasonally inundated, and very highly to extremely saline. They are too saline for any production other than opportunistic light grazing, provided that halophytic vegetation is protected.
Zsf	0.4	Depressions with 40-50% saline swamps, occurring within undulating rises formed on calcreted calcarenite. Groundwater tables are often within two metres of the surface. Main soils: <u>wet saline sand over clay</u> - N2e and <u>sand over saline clay on calcrete</u> - N2g (better drained land), with <u>wet highly saline gradational clay loam</u> - N2a , <u>deep highly saline sand</u> - N2c and <u>highly saline calcareous loam</u> - N2f (swamps). Up to two thirds of the swamps have semi-permanent water. The soils of the plains are deep to moderately deep, with moderate to high water holding capacity and moderately low to low fertility. Poor drainage and high salinity are the main limitations however. The swamps have little productive value, other than some opportunistic grazing.

PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

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|--|---------------------------------------|
| (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:

- A7** Calcareous loam (Calcarosol over Sodosol)
Medium thickness black calcareous loam to clay loam (often shelly), overlying a bleached sand abruptly overlying a grey and brown mottled sandy clay loam to clay within 100 cm.
- B2a** Shallow calcareous loam on calcrete (Hypocalcic, Petrocalcic Calcarosol)
Thin to medium thickness calcareous sandy loam to clay loam becoming more calcareous, more clayey and greyer with depth, overlying calcreted lagoonal sediments at less than 50 cm.
- B2b** Shallow calcareous sandy loam on calcrete (Petrocalcic, Calcic Calcarosol)
Thin calcareous loamy sand to sandy clay loam overlying calcreted calcarenite within 30 cm
- B3a** Shallow stony loamy sand on calcrete (Petrocalcic, Leptic Tenosol)
Medium thickness loamy sand to sandy loam overlying a layer of mixed calcrete rubble and pockets of brown sandy clay grading to calcreted lagoonal sediments.
- B3b** Shallow stony loamy sand on calcrete (Petrocalcic, Brown Kandosol / Petrocalcic, Leptic Tenosol)
Medium to thick loamy sand with a bleached A2 layer, sometimes with a thin brown friable light sandy clay loam subsoil, over calcreted calcarenite.
- B4a** Shallow red loam on limestone (Petrocalcic Red / Brown Dermosol)
Shallow to moderate depth well structured red to brown loam to clay loam on limestone, calcreted limestone or calcrete.
- B4b** Shallow red loam on limestone (Petrocalcic, Red Dermosol)
Medium thickness red sandy loam to loam grading to friable red clay loam over calcreted calcarenite within 50 cm.
- B5** Shallow dark clay loam on limestone (Petrocalcic, Black Dermosol)
Black clay loam to light clay over calcreted limestone at shallow depth, grading to highly calcareous clay.
- B6a** Shallow sandy loam over red-brown clay on calcrete (Lithocalcic / Petrocalcic, Brown / Red Chromosol)
Thin sandy loam over a brown to red sandy clay to clay on limestone or calcreted sandy clay within 50 cm.
- B6b** Shallow sandy loam over red-brown clay on calcrete (Supracalcic / Petrocalcic, Red Chromosol)
Thin sandy loam to light sandy clay loam abruptly overlying a red clay on calcreted calcarenite within 50 cm.
- B7a** Shallow sand over clay on calcrete (Petrocalcic, Brown Chromosol / Sodosol)
Medium thickness sand to loamy sand overlying yellowish brown friable to poorly structured clay on limestone or calcreted sandy clay within 50 cm.
- B7b** Shallow sand over clay on calcrete (Petrocalcic, Brown Chromosol / Kandosol)
Medium to thick loamy sand to sand with a bleached A2 layer abruptly overlying a brownish friable light sandy clay loam to sandy clay over calcreted calcarenite.
- F1** Sandy loam over brown clay (Hypercalcic, Brown Chromosol)
Medium thickness sandy loam to sandy clay loam abruptly overlying a brown and yellow friable clay, highly calcareous from shallow depth, overlying calcreted sandy clay or limestone.
- F2** Sandy loam over poorly structured brown or dark clay (Hypercalcic, Brown Sodosol)
Medium thickness sandy loam to sandy clay loam abruptly overlying a brown poorly structured and dispersive heavy with abundant soft carbonate from about 40 cm, grading to clayey sediments with depth.
- G2** Sand grading to sandy clay loam (Mesotrophic, Yellow Kandosol)
Thick bleached sand, organically darkened at surface, over a yellow and red friable massive sandy clay loam.
- G3a** Thick sand over clay (Calcic, Brown Chromosol)
Thick to very thick bleached sand to loamy sand with an organically darkened surface abruptly overlying a friable yellowish brown and red sandy clay, grading to sandy clay loam to sandy clay with variable fine to rubbly carbonate.
- G3b** Thick sand over clay Hypercalcic, Brown Sodosol/ Chromosol)
Thick bleached sand with an organically darkened surface abruptly overlying a massive to coarsely structured brown to reddish yellow sandy clay to clay, calcareous with depth
- G4a** Sand over poorly structured clay (Hypercalcic / Lithocalcic, Brown Sodosol)
Medium thickness loamy sand abruptly overlying a coarsely structured dispersive brown and yellow brown mottled clay, with rubbly to soft carbonate at shallow depth, grading to calcreted sandy clay or limestone.



- G4b** Sand over poorly structured clay (Supracalcic / Lithocalcic, Brown Sodosol)
Medium thickness loamy sand abruptly overlying a coarsely structured dispersive brown and yellow brown mottled clay, with rubbly at shallow depth overlying calcreted calcarenite.
- H3** Deep bleached sand (Basic, Arenic, Bleached-Orthic Tenosol)
Thick to very thick bleached sand, organically darkened at the surface over yellow sand continuing below 100 cm.
- M2** Deep friable gradational clay loam Calcic, Mottled-Sodic, Grey Dermosol)
Thin to medium thickness clay loam over a well structured brown or grey clay grading to brown mottled clay with depth.
- M4** Clay loam over poorly structured clay (Sodic, Hypocalcic, Brown Dermosol / Kandosol)
Loam to light clay grading to a coarsely structured brown or grey mottled clay, weakly calcareous at depth.
- N2a** Wet saline gradational clay loam (Dermosolic, Salic Hydrosol)
Medium thickness dark grey to black clay loam to clay grading to a well structured dark grey clay with minor carbonates and a water table within 100 cm.
- N2b** Shallow calcareous soil over calcrete (Petrocalcic, Calcarosolic, Salic Hydrosol)
Thin highly calcareous dark clay over a very highly calcareous pale mottled clayey sand with sporadic weak calcrete pans and water table within 100 cm.
- N2c** Wet saline deep sand (Sandy Calcarosolic / Tenosolic Salic Hydrosol)
Thick bleached (calcareous) sand over a grey and yellow mottled clayey sand in a water table at about 100 cm. Sand commonly overlain by organic mat or dark clay loam up to 10 cm thick.
- N2d** Sandy loam over clay (Sodosolic, Salic Hydrosol)
Medium thickness loamy sand to sandy loam abruptly overlying a black to greyish brown mottled sandy clay (seasonally saturated), with marl or rubbly to soft carbonate in a clayey matrix at depth and a watertable within 100 cm.
- N2e** Sand over clay (Sodosolic, Salic Hydrosol)
Medium thickness loamy sand abruptly overlying a grey and yellow brown mottled clay (seasonally saturated), with rubbly to soft carbonate at depth and a water table within 100 cm.
- N2f** Wet saline calcareous loam (Calcarosolic, Salic Hydrosol)
Grey very highly calcareous loam grading to a pale grey clay loam over a white very highly calcareous silty clay loam by about 30 cm, with a water table within 100 cm.
- N2g** Shallow wet saline sand over clay on calcrete (Petrocalcic, Sodosolic, Salic Hydrosol)
Bleached sand overlying a coarsely structured mottled grey sandy clay loam to clay, with a calcrete pan within 50 cm and a saline water table at depth within 100 cm.
- N2h** Shallow wet saline clay loam over calcrete (Petrocalcic, Dermosolic, Salic Hydrosol)
Black clay loam to light clay over calcreted limestone at shallow depth, grading to highly calcareous clay with a water table within 100 cm.
- N3a** Wet gradational clay loam (Natric, Dermosolic, Oxyaquic Hydrosol)
Seasonally saturated variant of soil M2 above.
- N3b** Sand over clay (Calcareous, Sodosolic, Oxyaquic Hydrosol)
Seasonally saturated variant of soils G3a / G4a above.
- N3c** Shallow dark clay loam on limestone (Petrocalcic, Dermosolic, Oxyaquic Hydrosol)
Seasonally saturated variant of soil B5 above.

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

