MIS Milkys Road Land System

Gently undulating rises and slightly raised plains extending around three sides of Salt Lagoon. Much of this system is part of an old beach ridge, while other areas are lunette/dune deposits associated with Salt Lagoon. The system is surrounded by plains and lagoons, and is named after Milkys Road which runs along the eastern edge of Salt Lagoon.

Area: 10.4 km^2

Annual rainfall: 510 – 530 mm average

Geology: The main south-west to north-east running rise of this system is an old beach ridge, formed from Quaternary age lowest member Bridgewater Formation. Bridgewater Formation consists of calcreted calcarenite underlain by highly calcareous unconsolidated sediments. These calcareous sediments are underlain by unrelated non-calcareous clayey sediments. Areas occur where the Bridgewater material has 'dissolved' away and soils have formed on the non-calcareous clays. This system has extensive areas of sand deposition, mostly blown in from lagoonal floors and surrounding sandy plains. The north-eastern end of this system has sand dune/old lunette deposits, while a sandy lunette borders the north-east shore of Salt Lagoon. The raised plains to the west of Salt Lagoon are underlain by Tertiary age Hallett Cove Limestone and clayey Pleistocene age lacustrine sediments, however, this area is also covered with sand deposits derived from surrounding areas.

Topography: Gently undulating rises and slightly raised plains, with some lunettes. Slopes rarely exceed 4%. Sand dunes and hummocky sand deposits occur; as does calcreted dune, summit surface and rise topography.

Elevation: From 10 m above sea level to 28 m at the highest point

Relief: Typically 10 m or less. Reaches 20 m on some slopes

Main Soils:
G3-**G4** Sand over sodic clay
I1-**H3** Very thick sands

Minor Soils:
B7-**B3** Shallow soil on calcrete
B8-**B3** Very shallow soils on calcrete

Main Features: Arable to semi-arable, with some non-arable areas. Topsoils are mostly sandy. The main soils are sandy over brown sodic clay; and shallow soil on calcrete. Sandy soils and topsoils, which are often thick or very thick, are infertile and pose a wind erosion risk when exposed. Soils on calcrete are limited by stoniness and low water holding capacity due to shallow depth and the presence of carbonate rubble. Clayey subsoils are usually sodic and so are poorly structured and dispersive. Water is able to percolate through the sandy surface soil, but is then restricted by the relatively impermeable clayey subsoil, resulting in lateral water flow along the top of the clay to lower-lying areas. Fine carbonate often occurs in lower subsoils.

Soil Landscape Unit summary: Milkys Road Land System (MIS)

SLU	% of area	Main features #
ZL7	1.6	Semi-arable sandy lunette. This lunette is adjacent to the north-east shore of Salt Lagoon. Main soils: very thick sands - deep to moderate depth bleached sands: neutral over alkaline **I1**-**H3** (*Podosol-Tenosol*). **ZL7** – sandy lunette (2-5m) Summary: the main issues are the very low fertility, low waterholding capacity, high wind erosion risk and strong water repellence due to the sandy nature of these soils.
OZK OZg	8.3 8.5	Semi-arable to arable hummocky sand spreads; many underlain by calcrete. Main soils: very thick sands - deep to moderate depth bleached sands **I1**-**H3** (*Podosol-Tenosol*). **OZK** – hummocky sand spread **OZg** – hummocky sand spread on gentle slopes (3-10%) Summary: the main issues are the very low fertility, low waterholding capacity, high wind erosion risk and strong water repellence due to the sandy nature of these soils.
OYC OYK	16.5 2.2	Semi-arable to arable sand dunes and hummocky sand spreads; with some shallow soils on calcrete. Sand dunes are underlain by calcrete. Some areas have had sand blown off, exposing the calcrete base. Main soils: very thick sands - deep to moderate depth bleached sands **I1**-**H3** (*Podosol-Tenosol*). With 10-30% sandy shallow soil on calcrete **B3** (*Petrocalcic Tenosol*). **OYC** – dunes (5-15m) with low dunes (<5m) **OYK** – hummocky sand spreads. Summary: the main issues on the deeper sandy soils are the very low fertility, low waterholding capacity, high wind erosion risk and strong water repellence; while the shallow soils on calcrete are restricted by stoniness (calcrete rubble) and low waterholding capacity.
PcZk	5.1	Mostly arable rising ground with thick sandy deposits; and some shallow soil on calcrete and very thick sands (hummocky sand deposits). Main soils: sand over sodic clay - thick sandy topsoil, some with hard carbonate rubble, over sodic clay **G3** (*Brown Sodosol*). With 10-30% sandy shallow soil on calcrete **B3** (*Petrocalcic Tenosol*). With 10-20% very thick sands underlain by calcrete or clay **I1**-**H3** (*Podosol-Tenosol*). **PcZk** – summit surface, gently undulating (1-3%, Ie) Summary: Main issues are infertility, wind erosion risk, water repellence and reduced waterholding capacity due of the sandy soils, and the sodic nature of the clayey subsoils. Also areas with shallow soils occur which are stony (calcrete rubble) and have low waterholding capacity.
PdA	2.9	Mostly arable thick sandy deposits on plains; with deep to moderate depth sands. Main soils: sand over sodic clay - thick sandy topsoil over sodic clay **G3** (*Brown Sodosol*). With 10-30% very thick sands underlain by calcrete or clay **I1**-**H3** (*Podosol-Tenosol*). **PdA** – raised plain (0-2%, Ie) Summary: the main issues are the infertility, wind erosion risk, water repellence and reduced waterholding capacity due to sandy soils, and the sodic nature of those soils with clayey subsoils.
PbA PbB PbU	18.5 4.7 0.3	Mostly arable thick, with some medium thickness, sandy deposits on plains and slopes. Plains and the slopes of rises (calcreted at the summit). Main soils: sand over sodic clay – mostly thick sandy topsoil, some with ironstone nodules, over sodic clay **G3**-**G4** (*Brown Sodosol*). **PbA** – plains (0-2%, Ie) **PbB** – slopes (2-4%, IIe) **PbU** – depression with 10-50% saline seepage. Summary: the main issues are the infertility, wind erosion risk, water repellence and reduced waterholding capacity due to the sandy soils, and the sodic nature of the clayey subsoils.
PaZ	12.3	Mostly arable thick sandy deposits on rising ground. Main soils: sand over sodic clay - thick sandy topsoil, often with ironstone nodules, over sodic clay **G3** (*Brown Sodosol*).

		PaZ – summit surface, gently undulating (0-3%, Ie) Summary: the main issues are the infertility, wind erosion risk, water repellence and reduced waterholding capacity due to the sandy soils, and the sodic nature of the clayey subsoils.
MrA MrB MrC MrYA	4.0 5.8 2.2 4.0	Non-arable to semi-arable calcreted, dune topography, rises, slopes and swales; with deep to moderate depth sand deposits. Main soils: shallow soil on calcrete - sandy soil over sandy loam to sandy clay loam on calcrete **B7**-**B3** (*Petrocalcic Chromosol-Tenosol*). With 10-30% very thick sands **I1**-**H3** (*Podosol-Tenosol*). **MrA** – plain or swale area (0-1.5%, Ie) **MrB** – slopes (1.5-3%, IIe). Sloping down to Salt Lagoon. **MrC** – rise/slopes (3-10%, IIIe) **MrYA** – low jumbled dune topography (<5m) Summary: the main issues are the stoniness (calcrete rubble) and low waterholding capacity of the shallow soils; and the very low fertility, low waterholding capacity, high wind erosion risk and strong water repellence of the deeper sandy soils.
MpZ	2.9	Non-arable calcreted ridges. Remnant linear ridges: probably old shorelines. These are older formations than those of the 'Mr' areas. Main soils: shallow soil on calcrete - sandy to loamy soil over sandy loam to light sandy clay on calcrete. Some soils are calcareous in subsoil directly above the calcrete (or are calcareous through-out on slopes adjacent to Salt Lagoon) **B7**-**B3**-**B2** (*Petrocalcic Chromosol-Tenosol*). 20-60% very shallow soil on calcrete - sandy to loamy soil **B8**-**B3** (*Petrocalcic Rudosol*) and calcrete outcrops. **MpZ** – ridges/slopes (1.5-4%, II-IIIe) Summary: areas dominated by very shallow and stony soils.

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 - gullying
r - surface rockiness	s - salinity	w - waterlogging	y - exposure

Detailed soil profile descriptions:

Main Soils:

G3-**G4** Sand over sodic clay (*Brown Sodosol*). Thick to medium thickness, neutral to acid loamy sand to sand over bleached sand, sometimes with ironstone nodules, and occasionally with hard carbonate fragments; over yellow-brown to olive-brown sodic clay with some olive and/or red mottles. Often with fine carbonate at depth. Plains and slopes.

I1-**H3** Very thick sands (*Podosol-Tenosol*). Very thick, neutral to acid sand to loamy sand over bleached sand, over sand usually with some accumulated iron and organic compounds (this layer is occasionally alkaline); on a substrate of sodic clay or calcrete. Dunes and hummocky sand spreads.

Minor Soils:

B7-**B3** Shallow soil on calcrete (*Petrocalcic Chromosol-Tenosol*). Shallow, neutral to acid loamy sand to light sandy loam over yellow-brown sandy loam to sandy light clay (sometimes this layer consists mostly of calcrete fragments); on calcrete. Some soils have accumulations of fine carbonate directly overlying the calcrete. Old dune topography, ridges, rises and swales.

B8-**B3** Very shallow soils on calcrete (*Petrocalcic Rudosol*). Very shallow sandy to loamy soil on calcrete. Areas of calcrete outcrop also occur. These soils are usually intimately associated with the shallow soils on calcrete. Ridges, old dune topography, rises and swales.

Further information: DEWNR Soil and Land Program