

MRE Mount Rescue Land System

(Based on the description by A. K. McCord in "A Description of Land in the Southern Mallee of South Australia")

Scattered dunefields extending from the Victorian border in the Hundred of Fisk west to Carcuma

Area: 478.1 km²

Annual rainfall: 370 – 475 mm average

Geology: The System is formed over Tertiary age Parilla Sand, overlain by a discontinuous veneer of Blanchetown Clay equivalent. However the main geological material is Molineaux Sand, which has blown over the older landscape and has been reworked into dunes covering 80% of the land surface. There are minor isolated occurrences of Bridgewater Formation calcarenites. These are remnants of an ancient coastal dune. In the north is a minor area of calcreted Parilla Sand on a ridge which is an extension of the Marmon Jabuk Range.

Topography: The Mt. Rescue Land System is characterized by fields of parabolic and jumbled dunes occupying about 80% of the area. There are moderate and small dunes but high dunes are predominant. The older Tertiary sediments are near the surface in the swales and flats between the dunes. These are sandy where underlain by Parilla Sand, and clayey where Blanchetown Clay equivalent overlies the Parilla Sand. The ratio of sandy to clayey flats is about 3:1. Rises formed on calcreted calcarenite and calcreted Parilla Sand are outliers of the Archibald Range and Marmon Jabuk Land Systems respectively. These are minor in extent.

Elevation: 50 - 150 m

Relief: 5 - 50 m

Soils: Sandy soils are predominant. These include deep sands and sand over clay types

Main soils

H3 Deep siliceous sand - very extensive (dunes)

G3 Thick sand over sandy clay – common (sandy flats)

Minor soils

D3 Sandy loam over dispersive clay - clayey flats

A4/B2 Calcareous sandy loam over calcrete - calcreted rises

G1 Loamy sand over sandy clay loam on rubble - calcreted rises

Main features: The clayey flats are well suited to cropping, and the sandy flats are marginal due to low fertility, wind erosion potential and water repellence. However, the flats account for only 20% of the land area. The dunes, occupying 80% of the area, are highly susceptible to wind erosion and water repellence, and are very infertile. Most of the area is consequently uncleared. The sandy flats and low dunes have potential for irrigated horticulture, provided that erosion can be controlled.



Soil Landscape Unit summary: 12 Soil Landscape Units (SLUs) mapped in the Mount Rescue Land System:

SLU	% of area	Main features #
GkA	9.8	<p>Depressions and flats formed on Tertiary sands and clays with less than 10% low sandy ridges. Main soils: <u>thick sand over sandy clay</u> - G3 (V) and <u>sandy loam over dispersive clay</u> - D3 (C) with <u>deep siliceous sand</u> - H3 (M) on sand ridges.</p> <p>Key properties:</p> <p>Drainage: Well drained generally. Moderately well drained (sandy loam flats) and rapidly drained (sand ridges).</p> <p>Fertility: Low to very low (sandy soils). Moderate (sandy loams).</p> <p>Physical condition: No restrictions except for dispersive clay subsoils on minor heavier flats.</p> <p>AWHC: Low (sandy soils). Moderate (sandy loams).</p> <p>Salinity: Low.</p> <p>Erosion potential: Water: Low. Wind: Moderate to moderately high (sandy flats). Low (sandy loams), high (sand ridges).</p> <p>Water repellence: Moderate to strong (sands). Nil (sandy loams).</p> <p>Rockiness: Nil.</p> <p><u>Summary:</u> The predominantly sandy soils have low fertility and are susceptible to wind erosion and water repellence. The sandy loam soils have few limitations for cropping, although shallow subsoil clays may restrict drainage and rooting depth.</p>
GIA	4.1	<p>Depressions formed on Tertiary sands and clays with 10-30% low sandy ridges. Main soils: <u>thick sand over sandy clay</u> - G3 (E) and <u>sandy loam over dispersive clay</u> - D3 (L) with <u>deep siliceous sand</u> - H3 (C) on sand ridges.</p> <p>Key properties:</p> <p>Drainage: Well drained generally. Moderately well drained (sandy loam flats) and rapidly drained (sand ridges).</p> <p>Fertility: Low to very low (sandy soils). Moderate (sandy loams).</p> <p>Physical condition: No restrictions except for dispersive clay subsoils on minor heavier flats.</p> <p>AWHC: Low (sandy soils). Moderate (sandy loams).</p> <p>Salinity: Low.</p> <p>Erosion potential: Water: Low. Wind: Moderate to moderately high (sandy flats). Low (sandy loams), high (sand ridges).</p> <p>Water repellence: Moderate to strong (sands). Nil (sandy loams).</p> <p>Rockiness: Nil.</p> <p><u>Summary:</u> The predominantly sandy soils have low fertility and are susceptible to wind erosion and water repellence. The sand ridges are particularly at risk if exposed. The sandy loam flats have few limitations for cropping, although shallow subsoil clays may restrict drainage and rooting depth.</p>
MHB	0.3	<p>Isolated low stony rises formed on Bridgewater Formation calcarenites. These are outliers of the Archibald Range Land System (refer for details).</p>
O-A	75.8	<p>Moderate to steep parabolic or jumbled siliceous sand hills, more than 12 metres high, formed on Molineaux Sand.</p> <p>Main soils: <u>deep siliceous sand</u> - H3 (V) throughout, and <u>thick sand over sandy clay</u> - G3 (L) on lower slopes and swales. Some swales are prone to seepage.</p> <p>Key properties:</p> <p>Drainage: Rapid. Imperfect in minor wet swales.</p> <p>Fertility: Very low.</p> <p>Physical condition: No limitations (soft to loose sand). Clayey subsoils, where present, are friable.</p> <p>AWHC: Moderately low to moderate.</p> <p>Salinity: Low.</p> <p>Erosion potential: Water: Low. Wind: High to very high.</p>



		<p>Water repellence: Strong. Rockiness: Nil.</p> <p><u>Summary:</u> The land is dominated by high sandhills with very low fertility, and prone to water repellence and wind erosion. Much of it has not been cleared. The predominant high sand hills are unsuitable for farming.</p>
OAE OAF OAG OAI OAJ OAL	3.3 2.0 1.2 0.9 0.8 0.8	<p>Dunefields with sand ridges formed on Molineaux Sand overlying Tertiary sediments.</p> <p>OAE 60-90% high sand ridges. OAF 60-90% moderate sand ridges. OAG 60-90% low sand ridges. OAI 30-60% moderate sand ridges. OAJ 30-60% low sand ridges. OAL 60-90% high sand ridges with minor swales prone to seepage.</p> <p>Main soils: <u>deep siliceous sand - H3 (V)</u> on ridges, and <u>thick sand over sandy clay - G3 (C)</u> with <u>sandy loam over dispersive clay - D3 (M)</u> on flats.</p> <p>Key properties: Drainage: Rapidly (dunes) to well drained (flats). Imperfect drainage in minor wet swales. Fertility: Very low (dunes), low (sandy flats) and moderate (sandy loam flats) Physical condition: No restrictions except for dispersive clay subsoils on minor heavier flats. AWHC: Low (sandy soils) to moderate (sandy loam soils). Salinity: Low. Erosion potential: Water: Low. Wind: Very high to extreme (dunes), high (sandy flats), low (sandy loam flats) Water repellence: Strong (dune sands), moderate (sandy flats), nil (sandy loam flats). Rockiness: Nil.</p> <p><u>Summary:</u> The sandy ridges are too infertile and susceptible to wind erosion and water repellence for sustainable cropping, but the flats have some potential, particularly where surfaces are loamier. However, potential productivity on the predominant sand over clay soils is limited by low fertility, water repellence and wind erosion potential.</p>
OCa	1.0	<p>Undulating slopes formed on calcreted Parilla Sand overlain by 60-90% jumbled siliceous sand dunes. These slopes represent an outlier of the Marmon Jabuk Land System.</p> <p>Main soils: <u>deep siliceous sand - H3 (V)</u> on dunes with <u>loamy sand over sandy clay loam on rubble - G1 (L)</u> and <u>calcareous sandy loam over calcrete - A4/B2 (L)</u> on flats and low rises.</p> <p>Key properties: Drainage: Rapidly to well drained. Fertility: Low to very low. Physical condition: There are no impediments to root growth. AWHC: Moderately low to moderate. Salinity: Low. Erosion potential: Water: Low. Wind: Moderate to high. Water repellence: Strong. Rockiness: Nil.</p> <p><u>Summary:</u> The land is characterized by sandy rises and dunes with very low fertility well drained soils prone to water repellence and erosion. The shallower soils over calcrete between the dunes are potentially more productive.</p>
QXB	<0.1	<p>Rises formed on calcreted Parilla Sand, with less than 10% sand dunes. These rises represent an outlier of the Marmon Jabuk Land System.</p> <p>Main soils: <u>calcareous sandy loam over calcrete - A4/B2 (E)</u> and <u>loamy sand over sandy clay loam on rubble - G1 (E)</u>.</p> <p>Key properties: Drainage: Rapidly to well drained. Fertility: Moderately low to low. Physical condition: There are no impediments to root growth above the calcrete. AWHC: Low to very low (calcareous soils). Moderate (texture contrast soils).</p>



		Salinity: Low.
	Erosion potential:	Water: Moderately low. Wind: Low (calcareous soils) to moderate (texture contrast soils).
	Water repellence:	Nil to moderate.
	Rockiness:	Up to 20% surface calcrete and occasional reefs.
<u>Summary:</u> The slopes are generally arable, with the main limitations due to restricted waterholding capacity and stoniness (calcareous soils), and low fertility, wind erosion potential and water repellence (texture contrast soils).		

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

(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:

A4/B2 Calcareous sandy loam over calcrete (Regolithic / Petrocalcic, Lithocalcic Calcarosol)

Medium thickness calcareous light sandy clay loam over rubbly or sheet calcrete, becoming softer with depth and grading to Tertiary sediments below 100 cm.

D3 Sandy loam over dispersive clay (Hypocalcic, Red Sodosol)

Medium thickness sandy loam to light sandy clay loam abruptly overlying a coarsely structured dispersive red sandy clay, slightly calcareous with depth, grading to clayey Parilla Sand or Blanchetown Clay equivalent below 100 cm.

G1 Loamy sand over sandy clay loam on rubble (Lithocalcic, Brown Chromosol)

Medium thickness loamy sand abruptly overlying a thin brown sandy clay loam with rubbly calcrete at less than 50 cm depth. Rubble grades to soft carbonate with Tertiary sediments deeper than 100 cm.

G3 Thick sand over sandy clay (Eutrophic, Red Chromosol)

Thick loose bleached sand, organically darkened at the surface, abruptly overlying a yellowish red sandy clay becoming more sandy with depth grading to indurated Tertiary sand at depths of 100 to 200 cm.

H3 Deep siliceous sand (Basic, Arenic, Bleached-Orthic / Yellow-Orthic Tenosol)

Thick pale yellow loose sand, organically darkened at the surface, grading to bright yellow sand at depths between 50 and 100 cm, continuing below 200 cm.

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

