

OWE Owen Land System

Undulating rises north and east of Owen

Area: 70.6 km²

Annual rainfall: 385 – 490 mm average

Geology: The land is underlain by basement rocks which have an influence on the topography, but have a minimal role in soil formation as they are rarely near the surface. Most of the land surface is formed on Tertiary sediments overlying the basement. The sediments are variable, but massive sandy clays are most common. Heavy clays and sandstones also occur. Drainage depressions and outwash fans are underlain by locally derived fine to medium grained alluvium. All sediments are mantled by aeolian carbonates. These are usually soft and fine grained, but in places they have hardened to rubbly or even sheet rock forms. This development is particularly marked on the western edge of the system.

Topography: Undulating rises form the bulk of the Land System. Watercourses flowing in a general westerly direction have cut valleys through the Tertiary sediments to create the undulating land surface. The main streams are Wilderness Creek (coming from the north east) and Stockyard Creek (from the east). These streams converge on a very gently sloping fan south of Owen and then dissipate on the Balaklava plains. Slopes are generally in the range of 1-10%.

Elevation: 250 m in the north east to 70 m in the south west

Relief: Maximum relief is 40 m.

Soils: The soils are a mixture of sandy loams over red clay and calcareous loams.

Main soils

D2 Sandy loam over red clay - extensive (rises)

A6 Calcareous loam - extensive (rises and fans)

D3a Sandy loam over coarsely structured red clay - limited (rises)

D3b Loam over dispersive red clay - limited (drainage depressions)

Minor soils

C3 Gradational clay loam - drainage depressions

A4 Rubbly calcareous loam - rises

L1/B2 Loam over sandstone or calcrete - rises

C1 Gradational loamy sand - rises

Main features: The Owen Land System is characterized by undulating rises with mainly sandy to sandy loam textured soils having moderately low fertility and high erodibility. The sandier types are susceptible to compaction if over worked and wind erosion if exposed, while the loamier types are prone to hard setting and associated reduced infiltration, workability difficulties and patchy emergence. Calcareous soils are sub dominant on the rises but very extensive on outwash fans. They have no structural problems, but their high pH may induce nutrient deficiencies, and shallow rubbly forms are prone to moisture deficit in spring. The land is fully arable, but overall production potential is moderate. Nutrition and erosion control are the main management issues.



Soil Landscape Unit summary: 6 Soil Landscape Units (SLUs) mapped in the Owen Land System:

SLU	% of area	Main features #
HJB HJC	60.4 4.4	Rises formed on Tertiary sediments, mainly sandy clays, but also including heavy clays and sandstones. There are minor outcrops of sandstones and silcretes in the north. HJB Undulating rises to 30 m high with slopes of 1-4%. HJC Short slopes of 4-10% adjacent to drainage depressions. Main soils: <u>sandy loam over red clay</u> - D2 (V), with <u>sandy loam over coarsely structured red clay</u> - D3a (L), <u>calcareous loam</u> - A6 (L), <u>rubbly calcareous loam</u> - A4 (M), <u>loam over sandstone or calcrete</u> - L1/B2 (M) and <u>gradational loamy sand</u> - C1 (M). The Main soils: generally deep, but natural fertility is moderately low due to the sandy surfaces. The sandier types are prone to compaction if over worked. The loamier types tend to set hard. All are susceptible to water erosion, even on the gentle slopes of HJB. The sandier forms are also prone to wind erosion. The calcareous soils tend to be more clayey and have better nutrient retention characteristics; although lime induced deficiencies may occur. The rubbly forms are sometimes shallow and may not have enough moisture storage capacity to enable crops and pastures to finish satisfactorily in dry finishes.
JEE	13.0	Drainage depressions with slopes of 1-3% formed on clayey alluvium. Watercourses are well defined and eroded in places in the upper sections, but tend to lose their definition as gradients decrease in their downstream sections. Main soils: <u>loam over dispersive red clay</u> - D3b (V) with <u>gradational clay loam</u> - C3 (C). These soils are deep and fertile but the D3b profiles are poorly structured. Impeded infiltration, subsurface waterlogging and patchy emergence are likely in places. Deep subsoil salinity levels are moderate, but unlikely to cause a problem.
KNA KNB	11.1 4.7	Outwash fans formed on medium grained alluvium. KNA Slopes of less than 2%. KNB Slopes of 2-4%. Main soil: <u>calcareous loam</u> - A6 (D). This soil is deep and friable, but alkaline, which may affect nutrient availability. Except for slight erosion potential in KNB there are no other apparent limitations.
SWC	6.4	Rises formed on a basement rock high, covered by rubbly and soft carbonates of the Woorinen Formation. Relief is up to 40 m and slopes are 3-8%. There is 10-20% surface calcrete stone. Main soils: <u>rubbly calcareous loam</u> - A4 (E) and <u>calcareous loam</u> - A6 (E) with <u>sandy loam over red clay</u> - D2 (C) and <u>sandy loam over coarsely structured red clay</u> - D3a (L). The predominant soils are shallow and highly calcareous. Spring time moisture deficits and possibly lime induced nutrient deficiencies are the main limitations. Most of the land is sufficiently sloping to require banking for erosion control.

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** Rubbly calcareous loam (Regolithic, Supracalcic / Lithocalcic Calcarosol)
10 - 30 cm calcareous loam grading to a highly calcareous clay loam over Class III B/C rubble from 30 cm, becoming more clayey and less rubbly with depth. Common on rises.
- A6** Calcareous loam (Regolithic / Pedal, Hypercalcic Calcarosol)
20 - 40 cm calcareous loam to clay loam grading to a highly calcareous brown clay loam to light clay with abundant soft carbonate from 35 cm, over Tertiary clay or alluvium at about 100 cm.



- C1** Gradational loamy sand (Hypercalcic, Red Kandosol)
30 cm soft loamy sand grading to red light sandy clay loam, highly calcareous from 60 cm.
- C3** Gradational clay loam (Calcic, Red Dermosol)
10 - 30 cm loam to clay loam grading to a well structured red clay, calcareous from about 50 cm, over clayey alluvium.
- D2** Sandy loam over red clay (Hypercalcic, Red Chromosol)
10 - 30 cm soft to firm sandy loam to loamy sand abruptly overlying a red moderately well structured sandy clay to medium clay with abundant soft carbonate from 50 cm, grading to Tertiary sandy clay or clay deeper than 80 cm.
- D3a** Sandy loam over coarsely structured red clay (Hypercalcic, Red Sodosol)
10 - 30 cm soft to firm sandy loam to loamy sand abruptly overlying a red coarsely structured sandy clay to medium clay with abundant soft carbonate from 50 cm, grading to Tertiary sandy clay or clay deeper than 80 cm.
- D3b** Loam over dispersive red clay (Calcic, Red / Brown Sodosol)
10 - 30 cm hard loam to clay loam abruptly overlying a coarsely structured red or brown dispersive clay, calcareous from about 50 cm grading to clayey alluvium.
- L1/B2** Loam over sandstone or calcrete (Lithic, Leptic Tenosol OR Petrocalcic, Calcic / Supracalcic Calcarosol)
20 - 40 cm loam directly overlying hard Tertiary sandstone or calcrete. Profile may be calcareous or non calcareous.

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

