

APO Apoinga Land System

Apoinga Lagoon basin

Area: 25.1 km²

Annual rainfall: 465 – 535 mm average

Geology: The Apoinga Land System lies along the north - south axis of an anticlinal structure. Saddleworth Formation siltstones underlie the centre of the basin and they are flanked on both the western and eastern sides by coarser grained and more quartzitic rocks of the Appila Tillite. Locally derived alluvial/colluvial sediments have accumulated in the floor of the basin, and on adjacent outwash fans. Fine grained carbonate of aeolian origin is common as soft segregations mantling both rocks and sediments, at depths below 50 cm.

Topography: The Apoinga Land System is an internally draining basin bounded on the east and west by abrupt quartzite ridges, and by well defined watersheds at the northern and southern ends. The landscape comprises gently inclined alluvial/colluvial outwash fans and basement rock rises around the rim of the basin, grading to a flat valley floor. The Apoinga Lagoon lies in the centre of the basin. The water table associated with the lagoon is sufficiently salty that where it is within a metre or two of the soil surface, saline seepages have developed.

Elevation: 550 m adjacent to the quartzite ridges, to 450 m at the lagoon

Relief: Maximum relief (basement rock rises) is 30 m

Soils: Sandy loam texture contrast soils predominate, on both slopes and flats. There are also shallow stony soils on steeper slopes, and deep gradational loams or cracking clays on flats.

Main soils

Soils formed over outwash sediments

F2 Hard sandy loam over dispersive brown mottled clay

M2 Gradational clay loam

E2/E3 Red / brown cracking clay

Soils formed on basement rocks

D7 Hard sandy loam over dispersive red clay

Minor soils

Soils formed on basement rocks

D1/C2 Loam over friable red clay

L1 Shallow stony sandy loam

Main features: The Apoinga Land System is characterized by two contrasting facets. The slopes and rises have predominantly hard setting sandy loam surface soils over dispersive clays and, depending on position on the slope, are subject to either high runoff or waterlogging, and erosion, poor emergence/early growth and acidification. Fertility is moderate. The flats are characterized by deep clayey soils with high natural fertility, but which are subject to saline seepage and associated waterlogging. Erosion control and increased water use efficiency through soil structure amelioration, fertility maintenance and acidity correction are the key management issues.



Soil Landscape Unit summary: 10 Soil Landscape Units (SLUs) mapped in the Apoinga Land System:

SLU	% of area	Main features #
DXH	5.6	Complex of undulating rises formed on Saddleworth Formation siltstones, and outwash fans formed on locally derived sediments. Slopes are 3-10%. There is up to 20% surface siltstone and quartzite, but negligible rock outcrop. Main soils: <u>loam over friable red clay - D1/C2</u> (E) on rises, and <u>hard sandy loam over dispersive brown mottled clay - F2</u> (E) on outwash fans. The unit lies at the foot of a horseshoe-shaped amphitheatre, which creates large volumes of runoff, so erosion potential is high. The soils are moderately deep and fertile, but have poorly structured surfaces, adding to the potential for erosion.
DZC DZH	28.7 5.7	Complex of undulating rises formed on coarse grained and quartzitic Appila Tillite, and outwash fans on locally derived outwash sediments. There is up to 20% surface sandstone and quartzite, but negligible rock outcrop. DZC Slopes of 3-10%, with occasional steep low knobs. DZH Valley with slopes of 6-12% and eroded water courses. Main soils: <u>hard sandy loam over dispersive red clay - D7</u> (E) and <u>hard sandy loam over dispersive brown mottled clay - F2</u> (E) over rock and outwash sediments respectively. These soils are moderately deep but typically have hard gritty sandy surfaces and poorly structured dispersive subsoils. These properties result in high runoff in places, waterlogging in others, and restrictions on emergence/early growth. The land is also difficult to work. Soil erodibility is high, so even gentle slopes are highly susceptible to erosion. Acidity is a further potential problem.
ETD	1.8	Stony slopes of 10-20% and 30 m high formed on Appila Tillite. There is 10-20% surface quartzite and sandstone. Main soils: <u>hard sandy loam over dispersive red clay - D7</u> (E) and <u>shallow stony sandy loam - L1</u> (E). This small area of rough moderately steep lightly timbered ground provides useful stock shelter, but has limited potential for more intensive uses. Principal limitations are shallow stony soils and erosion potential.
JHC JHG	3.6 12.4	Outwash fans formed on gritty outwash sediments. JHC Slopes of 5-10%. JHG Slopes of 2-4% with eroded water courses. Main soil: <u>hard sandy loam over dispersive brown mottled clay - F2</u> (D). These soils are deep but typically have hard gritty sandy surfaces and poorly structured dispersive subsoils. These properties result in high runoff in places, waterlogging in others, and restrictions on emergence/early growth. The land is also difficult to work. Soil erodibility is high, so even gentle slopes are highly susceptible to erosion. Acidity is a further potential problem.
KUK KUL KUP	7.3 24.1 2.2	Outwash fans and valley flats formed on clayey sediments. KUK Flats with slopes of less than 2% and sporadic saline seepage. KUL Fans with slopes of 2-4% and sporadic saline seepage. KUP Level flats with moderate to high levels of salinity throughout. Main soils: <u>gradational clay loam - M2</u> (E) and <u>red / brown cracking clay - E2/E3</u> (E). This land is potentially highly productive having deep fertile soils. The main limitations are salinity and associated waterlogging, particularly on the lower lying areas. On higher ground, productivity potential is high. On land too saline for cropping (KUP) and salt affected parts of KUK and KUL, establishment of salt tolerant pasture species can maintain productivity.
ZF-	8.6	Apoinga Lagoon

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

- (D) Dominant in extent (>90% of SLU)
- (V) Very extensive in extent (60–90% of SLU)
- (E) Extensive in extent (30–60% of SLU)
- (C) Common in extent (20–30% of SLU)
- (L) Limited in extent (10–20% of SLU)
- (M) Minor in extent (<10% of SLU)



Detailed soil profile descriptions:*Soils forming on outwash sediments*

- F2** Hard sandy loam over dispersive brown mottled clay (Brown Sodosol)
Thick quartz gravelly sandy loam to sandy clay loam with a bleached A2 layer, abruptly overlying a coarsely structured brown and red mottled clay, continuing below 100 cm.
- M2** Gradational clay loam (Red Dermosol)
Medium thickness clay loam to clay grading to a red well structured heavy clay, usually calcareous with depth.
- E2/E3** Red / brown cracking clay (Red / Brown Vertosol)
Red brown to grey brown granular to blocky clay grading to a coarsely structured red or brown heavy clay with variable soft carbonate at depth.

Soils formed on basement rocks

- D7** Hard sandy loam over dispersive red clay (Calcic, Red Sodosol)
Medium thickness quartz gravelly sandy loam abruptly overlying a coarsely structured red clay grading to quartzitic rock within 100 cm.
- D1/C2** Loam over friable red clay (Calcic, Red Chromosol / Dermosol)
Medium thickness loam to clay loam over a well structured red clay, usually calcareous with depth grading to weathering siltstone within 100 cm. The boundary between the loamy surface and the clayey subsoil is abrupt in the Chromosols and gradual in the Dermosols.
- L1** Shallow stony sandy loam (Lithic, Leptic Tenosol / Rudosol)
Medium to thick stony sandy loam to clay loam directly overlying basement rock within 50 cm.

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

