## **KIA** Kia-Ora Land System

**Area:** 315.0 km<sup>2</sup>

Landscape: Gently undulating pediments, plains and rises, weakly dissected by broad drainage

lines trending north west to south east. Scalding and gullying are common.

**Annual rainfall:** 205 – 235 mm annual average.

**Geology:** Alluvial deposits ranging from Pleistocene calcareous rubbles and calcretes through

Holocene to present day floodplain sediments, mostly sandy clay loams to clays.

Soils: Calcareous sandy loams to clay loams formed in alluvium or localized outwash

deposits are predominant. Red loamy surfaced texture contrast soils are also

common.

Main soils (on alluvium / outwash)

A4 Deep (rubbly) calcareous sandy loam

A3 Deep moderately calcareous loam to clay

**A6** Gradational calcareous clay loam to loam

**D4** Loam to clay loam over pedaric red clay

## Minor soils

On alluvium / outwash

**A5** Rubbly calcareous sandy clay loam on clay

C1 Gradational sandy loam

**M2** Deep friable gradational clay loam

M4 Hard gradational sandy clay loam

On basement rock

A2 Shallow calcareous loam

**L1** Shallow stony loam

**RR** Rock outcrop

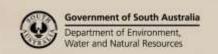
**Summary:** The Kia-Ora Land System consists of weakly dissected, gently undulating pediment

plains and rises with gradational calcareous soils and some red texture contrast soils.

Scalding and gullying are common.

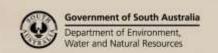
Soil Landscape Unit summary: 26 Soil Landscape Units (SLUs) mapped in the Kia-Ora Land System:

SLU	% of area	Component	Main soils	Prop#	Notes
AIH	0.1	Ridges	L1 A2	D	Rolling rises formed on fine grained rock. Relief is 9-30m, slopes are 3-10%. More than 20% of land affected by gullying, and up to 5% is scalded.  Main soils: shallow stony loam - L1 and shallow calcareous loam - A2, with rock outcrop - RR.
AYA	0.4	Rises	A2	D	Undulating rises formed on fine grained rocks, especially siltstones of the Tapley Hill Formation. Relief is less than 30m, slopes are 3-10%.  Main soils: shallow calcareous loam - A2 and shallow stony loam - L1.
JLp	0.1	Flats	D4A3	D	Flats formed on medium grained alluvium. Scalding affects 10-50% of the land.  Main soils: sandy clay loam over pedaric red clay - D4 and deep moderately calcareous loam - A3, with hard gradational sandy clay loam - M4 and rubbly calcareous sandy clay loam on clay - A5.





73.61			D	1	
JMb	0.6	Fans	D4A3	V	Fans, plains and creek flats formed on fine grained
TM.	1 5	Low rises	A4	L	outwash sediments with surface quartz gravel.
JMp	1.5	Flats	D4A3	D	JMb Gently sloping fans and low rises. 5-10% of fans are affected by gullying.
JMu	0.1	Flats	D4A3	D	JMp Flats, more than 50% scalded.
JMv	0.4	Fans	D4A3	D	JMu Flats, more than 50% scaladed and 10-20% affected by gullying.  JMv Gently sloping fans with slopes of 1-3%. More than 50% scaladed and 10-20% affected by gullying.  Main soils:  Fans and flats: clay loam over pedaric red clay - D4 and deep moderately calcareous clay loam - A3.  Rises: deep (rubbly) calcareous sandy loam - A4, with deep moderately calcareous loam - A3 and gradational
JPE	0.6	Drainage	D4	D	calcareous loam - A6.  Drainage depressions, fans and plains formed on
		depressions			outwash sediments derived from basement rocks.
JPU	0.5	Flats	D4	D	JPE Drainage depressions.
JPo	3.0	Drainage depressions	D4	D	JPU Flats, 10-50% scalded.
JPp	0.3	Plains	D4	D	JPo Drainage depressions. 10-20% affected by gullying,
JPq	0.5	Fans	D4	D	10-50% scalded.
JPt	0.6	Drainage depressions	D4	D	JPp Plains, more than 50% scalded. JPq Gently sloping fans, 1-3% slope. More than 50%
JPu	1.7	Flats	D4	V	scalded.
JPyy	3.4	Low rises Drainage	A4 D4	C	JPt Drainage depressions. More than 50% scalded. JPu Flats and low rises. More than 50% of flats are
		depressions			scalded, and 10-20% affected by gullying.  JPyy Drainage depressions. More than 50% scalded and more than 20% affected by gullying.  Main soils:  Fans and flats: sandy clay loam over pedaric red clay -  D4, with deep moderately calcareous loam - A3, gradational calcareous clay loam - A6, hard gradational sandy clay loam - M4 and gradational sandy loam - C1.  Rises: deep (rubbly) calcareous sandy loam - A4, with deep moderately calcareous loam - A3 and gradational calcareous loam - A6.
KFL	7.3	Gently undulating plains Flats	A4 A6	V	Gently undulating plains and flats formed on medium grained alluvium.  KFL Gently sloping low rises and flats, 1-3% slope.  KFV Gently sloping fans, rises and flats, 1-3% slope. Flats
KFV	33.6	Gently undulating plains Flats	A4 A4	V	are more than 50% scalded. <b>KF1</b> Gently sloping fans and drainage depressions, 1-3% slope. More than 50% scalded and 10-20% affected by gullying.
KFl	17.8	Gently	A4	V	Main soils:
KFI	17.0	undulating plains	7.4		Gently undulating plains: deep (rubbly) calcareous sandy loam - A4, with deep moderately calcareous
		Flats	A6	С	loam - A3 and gradational calcareous loam - A6.  Flats: gradational calcareous sandy clay loam - A6, with sandy clay loam over pedaric red clay - D4, deep moderately calcareous loam - A3 and gradational sandy loam - C1.
KLB	21.8	Gently undulating plains	A4A3	V	Plains, fans and rises formed on medium grained alluvial deposits.  KLB Gently undulating plains, 1-3% slope, with drainage
	_	Drainage depressions	D4	С	depressions. <b>KLC</b> Undulating rises, 3-10% slope, with flats.
KLC	0.6	Rises	A4	V	KLb Fans, 1-3% slope with 5-10% eroded watercourses,
777 1	2.2	Flats	A3	С	and undulating rises, 3-10% slope and up to 30 m high.
KLb	0.3	Fans	A4A3	V	Main soils:





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		Rises	A4A2	L	Plains and fans: deep (rubbly) calcareous sandy loam -
					A4 and deep moderately calcareous loam - A3, with
					sandy clay loam over pedaric red clay - <b>D4</b> and
					gradational sandy loam - C1.
					Depressions: clay loam over pedaric red clay - D4, with
					deep moderately calcareous clay loam - A3,
					gradational calcareous clay loam - A6 and gradational
					sandy loam - C1.
					Rises: deep (rubbly) calcareous sandy loam - A4, with
					shallow calcareous loam - A2.
					Flats: deep moderately calcareous sandy clay loam -
					A3, with gradational sandy loam - C1 and sandy clay
***					loam over pedaric red clay - <b>D4</b> .
KQm	0.2	Fans	A3A4	D	Fans formed on coarse grained outwash, slopes 3-10%.
					10-50% scalded, and 5-10% affected by gullying.
					Main soils: <u>deep moderately calcareous loam</u> - <b>A3</b> and
					deep (rubbly) calcareous sandy loam - A4, with
					gradational sandy loam - C1 and shallow calcareous
					<u>loam</u> - <b>A2</b> .
KVA	0.3	Flats	A3	D	Rises and plains formed on calcareous outwash
KVB	1.7	Rises	A4A3	V	sediments derived from basement rock.
		Flats	A3	С	KVA Flats.
KVV	2.2	Rises	A4A3	٧	KVB Gently sloping rises and flats, 1-3% slope.
		Flats	A3	С	KVV Gently undulating rises and flats, 1-3% slope. 10-50%
					scalded.
					Main soils:
					Rises: (rubbly) calcareous sandy loam - A4 and deep
					moderately calcareous clay loam - A3, with gradational
					sandy clay loam - M4 and sandy clay loam over pedaric
					<u>red clay</u> - <b>D4</b> .
					Flats: deep moderately calcareous clay loam - A3, with
					gradational calcareous clay loam - A6 and clay loam
					over pedaric red clay - <b>D4</b> .
XOA	0.4	Flats	A3	D	Floodplain flat, swampy and marginally saline, with
					clayey calcareous soils on alluvium. Up to 5% scalded.
					Main soils: <u>deep moderately calcareous clay</u> - <b>A3</b> , with
					deep friable gradational clay loam - M2.

# PROPORTION codes assigned to Soil Landscape Unit (SLU) components:

- 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:

- A2 <u>Shallow calcareous loam (Paralithic, Hypercalcic / Lithocalcic Calcarosol)</u>
  Calcareous stony loam grading to soft or rubbly carbonate over weathering dolomite or calc-siltstone within 50 cm.
- A3 Deep moderately calcareous loam to clay (Regolithic, Calcic Calcarosol)

  Calcareous loam to light clay grading to a clay loamy to clayey subsoil without a significant carbonate accumulation in the subsoil, grading to medium to fine grained alluvium.
- A4 Deep (rubbly) calcareous sandy loam (Regolithic, Hypercalcic / Lithocalcic Calcarosol)
  Calcareous sandy loam grading to a very highly calcareous sandy clay loam to light clay with variable rubble, continuing below 120 cm.
- A5 Rubbly calcareous sandy clay loam on clay (Regolithic, Hypercalcic / Lithocalcic Calcarosol)
  Calcareous sandy clay loam grading to a very highly calcareous rubbly sandy clay loam to light clay, over a clayey substrate deeper than 60 cm, but within 120 cm.
- A6 Gradational calcareous clay loam to loam (Pedal, Hypercalcic / Supracalcic Calcarosol)
  Calcareous loam to clay loam grading to a well structured very highly calcareous (sometimes rubbly) clay, over a red clayey substrate within 120 cm.
- C1 <u>Gradational sandy loam (Hypercalcic, Red Kandosol)</u>
  Friable sandy to loamy topsoil grading to massive red-brown alkaline loamy to clay loamy subsoil, highly calcareous with depth, over alluvium.
- D4 Loam to clay loam over red friable clay (Calcic, Pedaric, Red Sodosol)
  Thin to medium thickness loam to clay loam over a finely structured friable red clay, calcareous from about 50 cm, grading to fine or medium grained alluvium.
- L1 <u>Shallow stony loam (Paralithic, Leptic Tenosol)</u>
  Shallow stony loam, often calcareous with depth, overlying weathering fine grained rock shallower than 50 cm.
- M2 <u>Deep friable gradational clay loam (Calcic, Red / Brown Dermosol)</u>
  Friable loam to light clay grading to a well structured red or brown dark clay, calcareous with depth, over alluvium.
- M4 <u>Hard gradational sandy clay loam (Calcic, Brown / Red Dermosol / Kandosol)</u>
  Hard setting sandy loam to sandy clay loam grading to a poorly structured to massive hard red or brown sandy clay to clay, weakly to moderately calcareous with depth, over alluvial sediments.
- RR Rock outcrop

Further information: <u>DEWNR Soil and Land Program</u>

