

CHI Chinamans Hat Hill Land System

Area:	223.7 km ²
Landscape:	Ranges with steep to moderate slopes. Rock outcrop is common on steep slopes. Soils are mostly shallow.
Annual rainfall:	240 – 330 mm average
Geology:	Proterozoic sediments form the ranges including glacially derived Umberatana Group tillite, siltstones, quartzite and dolomite. Burra Group shales and siltstones occur between the ranges where topographic relief is more subdued.
Main soils:	L1 (32%) Shallow soil on rock (Rocky Rudosol-Tenosol) A2 (30%) Calcareous loam on rock (Paralithic Calcarosol)
Minor soils:	C2 (7%) Gradational loam on rock (Shallow Red Dermosol-Kandosol-Calcarosol) D1 (7%) Loam over clay on rock (Shallow Calcic-Hypercalcic Red Chromosol) A3 (7%) Deep moderately calcareous loam (Calcic Calcarosol) RR (5%) Bare rock M1 (5%) Deep sandy loam (Brown-Grey-Red Kandosol-Tenosol)
Summary:	The Chinamans Hat Hill Land System consists of ranges which form a flattened loop shape surrounding the Pandappa Land System. Soils are shallow, often calcareous formed over glacial and peri-glacial Proterozoic rocks of the Umberatana Group. Deeper gradational and texture contrast soils occur on fans, pediments and in alluvial plains.

Soil Landscape Unit summary: Chinamans Hat Hill Land System (CHI)

SLU	% of area	Component	Main soils	Prop#	Notes
AAA	0.7	Rise	L1A2	D	Rises and hills with shallow rocky calcareous soils formed on fine-grained rocks. Rock outcrops are common. Relief is less than 30m, slopes are 3-10%.
AAB	1.5	Ridge	L1A2	D	
AAg	9.2	Rise Fan	L1A2 A3M1	V L	
AAh	0.4	Ridge	L1A2	D	AAA Undulating rises. Relief is less than 30m, slopes are 3-10%. AAB Rolling rises and ridges. Relief: 9-30m, slopes: 10-30%. AAg Undulating rises and ridges. Relief is less than 30m, slopes are 3-10%. 5-10% of land is affected by eroded watercourses and scalding affects 10-50% of land. AAh Rolling rises and ridges. 5-10% of land is affected by eroded watercourses and scalding affects 10-50% of land. Relief is 9-30m, slopes are 10-30%. AAj Steep rises and ridges. 5-10% of land is affected by eroded watercourses and scalding affects 10-50% of land. Relief is 9-30m, slopes are 30-50%. Main soils: <u>Shallow stony soils on rock - L1</u> and <u>Calcareous loam on rock - A2</u> .
AAj	0.1	Ridge	L1A2	D	
ABH	1.8	Rise	L1A2	V	Rolling rises and fans with linear rocky quartzite outcrops and shallow rocky soils on interbedded fine-grained rocks. Watercourses are eroded. Relief is 9-30m, slopes are 10-30%. Main soils: Rises: Main soils: <u>Shallow stony soils on rock - L1</u> and
		Fan	A3M1	L	



					Calcareous loam on rock – A2. Fans: <u>Deep moderately calcareous loam - A3</u> and <u>Deep alluvial loam - M1</u> .
ADA	1.9	Rise	A2L1	D	Non-arable rocky rises with thin soil cover formed on limestone and calc-siltstone with very shallow loamy soils.
ADB	6.4	Fan	A3M1	L	
ADD	7.2	Steep hills	A2L1	D	ADA Undulating rises with very shallow stony calcareous soils formed on Skillagoollee Dolomite and calcareous fine-grained rock. Relief is less than 30m, slopes are 3-10%. ADB Rolling rises and fans. Relief is 9-30m, slopes are 10-30%. ADD Steep low hills and fans. Relief: 30-90m, slopes: 30-50%. Main soils: Rises: <u>Calcareous loam on rock – A2</u> and <u>Shallow stony soils on rock - L1</u> . Fans: <u>Deep moderately calcareous loam - A3</u> and <u>Deep alluvial loam - M1</u> .
		Fan	A3M1	M	
AED	2.5	Rolling hills	L1D1	V	Non-arable rocky rises and low hills formed on mostly fine-grained rocks. Soils are very shallow and more than 20% are petrocalcic (contain a calcrete layer).
		Fan	A3M1	L	
AEE	10.8	Steep hills	L1D1	D	AED Steep rises with very shallow soils as above. Relief is 9-30m, slopes are 30-50%. AEE Steep hills. Relief is greater than 90m, slopes are 30-60%. Main soils: Hills: <u>Shallow stony soils on rock - L1</u> and <u>Loam over clay on rock - D1</u> . Fans: <u>Deep moderately calcareous loam - A3</u> and <u>Deep alluvial loam - M1</u> .
AIA	2.5	Rise	L1C2	V	Rises with very shallow sandy loam, or rock outcrop or shallow gradational loam over red clay loam on fine-grained rock.
		Fan	A3M1	L	
AIK	3.3	Escarpment	L1C2	D	AIA Gently undulating rises and fans. Slopes are 1-3%, relief is less than 30m. AIK Steep hilly escarpment. Watercourses are eroded. Relief is greater than 90m, slopes are 30-60%. Main soils: Rises and hills: <u>Shallow stony soils on rock - L1</u> and <u>Gradational loam on rock - C2</u> . Fans: <u>Deep moderately calcareous loam - A3</u> and <u>Deep alluvial loam - M1</u> .
AJA	4.8	Rise	L1C2	V	Rises and fans with shallow soils formed on fine-grained rocks (Umberatana Group tillites). Less than 20% of soils have secondary carbonate. Soils on rises are shallow over calcareous rocks with deeper soils on fans.
		Fan	D4A3 M1	C	
AJB	3.7	Rise	L1C2	V	AJA Gently undulating rises and fans. Slopes are 1-3%, relief is less than 30m.
		Fan	D4A3 M1	L	
AJC	0.9	Rise	L1C2	D	AJB Undulating rises and fans. Relief is less than 30m, slopes are 3-10%. AJC Rolling rises and fans. Relief is 9-30m, slopes are 10-30%. Main soils: Rises: <u>Shallow stony soils on rock - L1</u> and <u>Gradational loam on rock - C2</u> . Fans: <u>Clay loam over pedaric red clay - D4</u> , <u>Deep moderately calcareous loam - A3</u> and <u>Deep alluvial loam - M1</u> .
AWB	4.2	Low hills	L1A2	D	Undulating low hills with shallow rocky soils formed on quartzites with more than 50% interbedded calcareous rocks. More than 20% of soils have secondary carbonate accumulations. Relief is 30-90m, slopes are 3-10%. Main soils: <u>Shallow stony soils on rock - L1</u> and <u>Calcareous</u>



					<u>loam on rock – A2</u> and <u>Bare rock – RR.</u>
AYA	3.4	Rise	A2L1	V	Hills and rises on fine-grained rocks, especially siltstones of the Tapley Hill Formation. More than 20% of soils contain secondary carbonate.
		Fan	A3M1	L	
AYB	4.3	Ridge	A2L1	D	
AYD	5.1	Ridge	A2L1	D	
AYG	2.9	Rise	A2L1	V	AYA Undulating rises. Relief: less than 30m, slopes: 3-10%. AYB Rolling rises. Relief is less than 30m, slopes are 10-30%. AYD Very steep low hilly ridges. Relief is 30-90m; slopes are 50-100%. AYG Undulating rises with 10-20% gullied land. Relief is less than 30m, slopes are 3-10%. Main soils: <u>Calcareous loam on rock – A2</u> and <u>Shallow stony soils on rock – L1</u> and <u>Bare rock – RR.</u>
		Fan	A3M1	C	
AxT	0.2	Rise	L1	D	Rolling rises on fine-grained Proterozoic metamorphic rocks with no carbonate present. Scree slopes are common. Relief is less than 30m, slopes are 10-30% Main soils: <u>Shallow stony soils on rock – L1.</u>
DBB	3.4	Rise	D1A2	E	Gently sloping rise and fans formed on basement rocks with texture contrast soils with clay-loamy surfaces and containing carbonate in the subsoils. Relief is less than 9m, slopes are 1-3%. Main soils: Rises: <u>Clay loam over pedaric red clay on rock – D1</u> and <u>Calcareous clay loam on rock – A2.</u> Fans: <u>Clay loam over pedaric red clay – D4</u> , <u>Deep moderately calcareous loam – A3</u> and <u>Deep alluvial loam – M1.</u>
		Fan	D4A3 M1	E	
Daw	0.3	Undulating rise	D1A2	D	Undulating rises with predominantly pedaric, sodic, red, texture-contrast soils with loam or clay-loam surfaces. Moderately gullied and severely scalded. Main soils: <u>Clay loam over pedaric red clay on rock – D1</u> and <u>Calcareous clay loam on rock – A2.</u>
EDC	0.3	Rise	L1A2	D	Undulating rises with gradational red loamy sand on rock or very shallow loamy sand on rock. 10-30% rock outcrop. Relief is less than 30m, slopes are 3-10%. Main soils: <u>Shallow stony soils on rock – L1</u> and <u>Calcareous clay loam on rock – A2.</u>
EHB	0.9	Undulating rise	A2	V	Gently sloping rises and pediments on calcareous siltstones and limestones such as those of the ABC Range Quartzite Formation of the Wilpena Group. Slopes: 1-3%, relief: 9-30m. Main soils: Rises: <u>Calcareous loam on rock – A2</u> and <u>Shallow stony soils on rock – L1.</u> Fans: <u>Deep moderately calcareous loam – A3</u> and <u>Deep alluvial loam – M1.</u>
		Fan	A3M1	C	
EOB	4.0	Rise	A2	V	Gently undulating rises with pulverulent calcareous soils formed mainly on Wilpena Group calc-siltstones. Slopes are 1-3%, relief is less than 30m. Main soils: Rises: <u>Calcareous loam on rock – A2.</u> Fans: <u>Deep moderately calcareous loam – A3</u> and <u>Deep alluvial loam – M1.</u>
		Fan	A3M1	E	
EUC	2.0	Rise	L1A2	V	Undulating rises with a complex of red clayey soils and shallow calcareous soils and red texture contrast soils with calcareous subsoils. Main soils: Rises: <u>Shallow stony soils on rock – L1</u> and <u>Calcareous loam on rock – A2.</u> Fans: <u>Deep moderately calcareous loam – A3</u> and <u>Deep alluvial loam – M1.</u>
		Fan	A3M1	E	
EZC	5.2	Rise	A2C2	V	Gently undulating rises with shallow calcareous sandy loam



		Fan	A3A4	E	over rock, or deep rubbly calcareous sandy loam over clay. 20-30% rocky outcrops. Slopes: 1-3%, relief is less than 30m. Main soils: Rises: <u>Calcareous loam on rock - A2</u> and <u>Gradational loam on rock - C2</u> . Fans: <u>Deep moderately calcareous loam - A3</u> and <u>Deep (rubbly) calcareous sandy loam - A4</u> .
JLE	0.7	Drainage depression	D4C3	D	Drainage depression with more than 20% pedaric, texture contrast (loam over crumbly red clay) soils, but less than 20% calcareous gradational soils. Main soils: <u>Clay loam over pedaric red clay - D4</u> and <u>Friable gradational clay loam - C3</u> .
JPE	0.4	Drainage depression	D4	D	Drainage depression with texture contrast soils formed on outwash sediments derived from basement rocks. Calcareous in some part of the profile. More than 20% of soils are pedaric (fine crumbly structure in subsoils). Main soils: <u>Clay loam over pedaric red clay - D4</u> .
KAo	1.2	Drainage depression	M2D4	D	Drainage depressions with well-structured, often calcareous, uniform or texture-contrast soils formed in outwash sediments. Moderately gullied (10-20%) and scalded (0-5%). Main soils: <u>Deep friable gradational clay loam - M2</u> and <u>Clay loam over pedaric red clay - D4</u> .
KFJ	0.4	Fan	A5A4	D	Fans with calcareous gradational soils and more than 20% red pedaric texture contrast soils. Moderate salinity with 10-50% of land affected (dry saline land). Moderately scalded (5-10%). Main soils: <u>Rubbly calcareous loam on clay - A5</u> and <u>Deep (rubbly) calcareous sandy loam - A4</u> .
KQC	0.4	Fan	A4A3	D	Fans with mostly calcareous, moderately saline, gradational soils. KQC Undulating fans. Slopes are 3-10%, relief is less than 9m. KQH Undulating fans. Moderately gullied (10-20%). Slopes are 3-10%, relief is less than 9m. KQI Rolling fans. Moderately gullied (10-20%). Main soils: <u>Deep (rubbly) calcareous sandy loam - A4</u> and <u>Deep moderately calcareous loam - A3</u> .
KQH	0.7	Fan	A4A3	D	
KQI	0.3	Fan	A4A3	D	
KXJ	1.0	Drainage depression	M1A3	D	Drainage depression and rises with uniform or gradational soils formed on outwash sediments. Some hard-rock rises also occur. Soils are calcareous in some part of the profile. <50% have >20% gravel & stone. Moderately gullied (5-10%). Main soils: Drainage depression: <u>Deep alluvial loam - M1</u> and <u>Deep moderately calcareous loam - A3</u> . Rises: <u>Shallow stony soils on rock - L1</u> and <u>Calcareous loam on rock - A2</u> .
		Rise	L1A2	M	
KZC	0.3	Rise	L1C2	E	Undulating rises and fans with deep sandy loam grading to rubbly clay, or gradational loam over red clay on rock. KZC Undulating rises and fans. Slopes are 3-10%, relief is less than 9m.
		Fan	A3M1	E	
KZH	0.8	Fan	A3M1	V	Undulating fans and rises, moderately gullied (5-10%). Slopes are 3-10%, relief is less than 9m. Main soils: Rises: <u>Shallow stony soils on rock - L1</u> and <u>Gradational loam on rock - C2</u> . Fans: <u>Deep moderately calcareous loam - A3</u> and <u>Deep alluvial loam - M1</u> .
		Rise	C2A2	C	

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/L1** Shallow calcareous loam (Paralithic, Hypercalcic / Lithocalcic Calcarosol) (A2) OR Shallow stony loam (Calcareous, Paralithic, Leptic Tenosol) (L1).
- A3** Deep moderately calcareous (sandy) loam (Calcic Calcarosol)
Calcareous (sandy) loam topsoil grading into loamy-clay loamy subsoil without a significant CO₃ buildup in the subsoil (<20% CO₃ in subsoil). Pediment type Calcarosols.
- A4** Deep (rubby) calcareous loam (Hypercalcic-Lithocalcic Calcarosol)
Calcareous sandy-clay loamy topsoil grading into loamy-clay loamy subsoil with a significant CO₃ buildup in the subsoil. Often rubby. Soil usually >120 cm in depth.
- A5** Rubby calcareous loamy sand on clay (Supracalcic-Lithocalcic Calcarosol on clay)
Calcareous loamy sand topsoil grading into loamy-clay loamy subsoil on a clayey substrate. Usually rubby.
- C2** Gradational loam on rock (Calcic / Hypercalcic Red Dermosol)
Loam to clay loam grading to friable red clay with soft Class I carbonate within 50 cm, grading to weathering rock within 100 cm.
- C3** Gradational clay loam (Calcic / Hypercalcic Red Dermosol)
Loam to clay loam grading to friable red clay with soft Class I carbonate within 50 cm, grading to alluvium within 100 cm.
- D1** Loam over red clay on rock (Hypercalcic / Calcic, Red Chromosol / Sodosol)
Medium thickness hard gravelly loam over a red clay, friable and finely structured (D1), to hard, coarsely structured and dispersive (D7), calcareous with depth, grading to weathering basement rock within 100 cm.
- D4** Loam over red friable clay (Calcic, Pedaric, Red Sodosol)
Thin to medium thickness fine sandy loam to loam over finely structured friable red clay, calcareous from about 50 cm, grading to fine or medium grained alluvium.
- L1** Shallow stony loam (Paralithic, Leptic Tenosol)
Shallow stony loam, often calcareous throughout or with depth, overlying weathering rock shallower than 50 cm.
- M1** Alluvial loam (Orthic Tenosol)
Very thick loam with variable gritty or more-clayey lenses, formed over recent alluvium.
- M2** Deep friable gradational clay loam (Red-Brown-Grey- Black Dermosol)
Deep well structured red clay loamy soil.

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

