

EAR East Avenue Range Land System

Area: 169.0 km²

Landscape: Dune range of low rises with swampy flats between the Kennion and Lucindale ranges, with some salinity in the northern end.

Annual rainfall: 610 – 710 mm average

Geology: Calcreted calcarenite of the Pleistocene Bridgewater Formation on ridges, with Pleistocene lagoonal deposits of the Padthaway Formation on flats.

Main soils:

- H3** (22%) Bleached siliceous sand (sandy Bleached Tenosol)
- B7** (20%) Shallow sand over clay on calcrete (sandy Petrocalcic Sodosol-Chromosol)
- I1** (16%) Highly leached sand (Aeric Podosol)
- B6** (12%) Shallow loam over red-brown clay on calcrete (Petrocalcic Red Chromosol-Kandosol)

Minor soils:

- RR** (8%) Bare calcrete
- G3** (7%) Thick sand over clay (sandy Brown-Red Chromosol-Sodosol)
- B3** (6%) Shallow sandy loam on calcrete (Petrocalcic Red Tenosol-Kandosol-Rudosol)

Summary: The deep sands have water repellence, excessive drainage and low fertility limitations, whereas the shallow soils over calcrete are limited in their productivity by low moisture storage and restricted available rooting depth.

Soil Landscape Unit summary: East Avenue Range (EAR)

SLU	% of area	Component	Main soils	Prop#	Notes
MAB	0.4	Rise	B3RR	D	Gently undulating calcreted former beach ridges with stony, very shallow red and brown loam, occasionally over red clay, on calcrete. >50% bare calcrete. Main soils: <u>Shallow sandy loam on calcrete - B3</u> and <u>Rock or exposed calcrete - RR</u> .
MEB	1.6	Stony rise	B3	V	Gently undulating stony rises with shallow sandy loam, occasionally on red clay, on calcreted calcarenite. 10-20% dunes with water repellent, mostly bleached, acid, siliceous sand. Main soils: Rises: <u>Shallow sandy loam on calcrete - B3</u> . Dunes: <u>Highly leached sand - I1</u> . <u>Bleached siliceous sand - H3</u> .
		Dune	I1H3	L	
MFB	0.5	Low rise	B6B3 B9	D	Low rises with shallow loam or sand, mostly over red clay, but often on dark yellow-grey clay in swales, on calcrete. 10-30% of rise areas have shallow calcareous loam on calcrete or bare rock. Main soils: <u>Shallow sandy loam over red-brown clay on calcrete - B6</u> , <u>Shallow sandy loam on calcrete - B3</u> and <u>Shallow clay loam over brown or dark clay on calcrete - B9</u> .
MGE	0.7	Depression	B7B5	D	Depression with shallow sandy loam over poorly structured brown clay on calcrete; or shallow dark clay loam over dark clay on calcrete. 10-30% bare calcrete. Main soils: <u>Sand over friable brown clay on calcrete - B7</u> and



MHB	11.1	Dune	H3	E	<p><u>Shallow dark clay loam on limestone - B5.</u></p> <p>MHB Gently sloping calcarenite ridges with deep bleached siliceous sands on dunes, often over brown sandy clay. Co-dominant are shallow stony rises with shallow siliceous sand on calcrete or bare rock, occasionally sandy loam on red clay on calcrete.</p> <p>MHC Undulating slopes on calcarenite range as for MHB but with 10-30% of rise areas have rock outcrop or shallow sand on calcrete or deep siliceous sand.</p> <p>MHD Rolling hills and rises with shallow, often bleached, sand over calcrete and deep, water repellent, bleached sands; 10-30% shallow sandy loam over red clay on calcrete.</p> <p>MHQ Undulating rises and low hills as for MHC; <10% swales with deep sand over brown clay, often poorly structured; or shallow bleached sand on calcrete.</p> <p>Main soils: Dunes: <u>Bleached siliceous sand - H3.</u> Stony ranges: <u>Shallow sandy loam on calcrete - B3</u> and <u>Rock or exposed calcrete - RR.</u> Dune ranges: <u>Bleached siliceous sand - H3</u>, <u>Highly leached sand - I1</u> and <u>Sand over friable brown clay on calcrete - B7.</u> Swales: <u>Thick sand over clay - G3</u>, <u>Sand over friable brown clay on calcrete - B7</u> and <u>Shallow sand on calcrete - B8.</u> Hills and rises: <u>Shallow sandy loam on calcrete - B3</u>, <u>Highly leached sand - I1</u> and <u>Shallow sand on calcrete - B8.</u></p>
		Stony range	B3RR	E	
MHC	37.3	Dune range	H3I1B7	D	
MHD	0.2	Hill/Rise	B3I1B8	D	
MHQ	2.0	Dune range	H3I1B7	D	
		Swale	G3B7 B8	M	
MNC	8.7	Dune range	H3B6	D	
MND	1.0	Dune range	B3RR H3	D	
MRA	1.2	Plain	B6B7 G3	D	
MRB	7.9	Undulating plain	B6B7 G3	D	
MWO	1.2	Undulating plain	G3B7	D	
		Swampy swale	G3N3	M	
MWT	6.2	Undulating plain	G3B7	V	
		Swampy swale	G3N3	L	
MYA	0.7	Plain	B7B8 B3	D	
MYB	0.8	Undulating plain	B6B8 B3	D	
MYK	1.0	Plain	B7B8	V	



		Swamp	B3 M4A7	L	over poorly structured dark brown clay or calcareous clay loam grading to calcareous grey clay on marl; 10-30% sand over brown clay. Main soils: Plains: <u>Sand over friable brown clay on calcrete - B7</u> , <u>Shallow sand on calcrete - B8</u> , <u>Shallow sandy loam over red-brown clay on calcrete - B6</u> and <u>Shallow sandy loam on calcrete - B3</u> . Swamps: <u>Deep hard gradational sandy loam - M4</u> and <u>Calcareous clay loam on marl - A7</u> .
MZO	5.8	Plain Swamp	B6B7 N3	D M	Plains with shallow loam over red clay, or poorly structured brown clay, on calcrete. <10% swamps with wet dark clay loam over dark clay, mostly on calcrete. Main soils: Plains: <u>Shallow sandy loam over red-brown clay on calcrete - B6</u> and <u>Sand over friable brown clay on calcrete - B7</u> . Swamps: <u>Wet clay loam - N3</u> .
NDA	0.2	Plain	B7G3	D	Plains with shallow sand over poorly structured brown clay on calcrete; or deep sand over brown clay. Main soils: <u>Sand over friable brown clay on calcrete - B7</u> and <u>Thick sand over clay - G3</u> .
Nsj	0.8	Swale	G3N3	D	Swales with deep sand over brown clay, often wet; 10-30% moderately saline wet soils, 10-30% moderately well drained deep siliceous sand, with clay or coffee rock at depth. Main soils: <u>Thick sand over clay - G3</u> and <u>Wet clay loam - N3</u> .
NvA	0.4	Plain	G4	D	Plains with thin sand or sandy loam over poorly structured brown clay. Main soils: <u>Sand over yellow and brown clay - G4</u> .
OFB	0.2	Dune Stony range	I1H3 B3B6	D M	OFB High dunes with deep, water repellent acid, bleached siliceous sand. <10% stony ranges with shallow sandy loam, often over red clay, on calcreted calcarenite; 10-30% on poorly structured clay in swales and lower slopes. OFC Dunes with deep, bleached, acid, water repellent, siliceous sand. OFD Low dunes as above. OFq Low dunes as above; 10-20% swales with bleached sand over brown sandy clay loam to clay; often wet. Main soils: Dunes: <u>Highly leached sand - I1</u> , <u>Bleached siliceous sand - H3</u> . Stony rises: <u>Shallow sandy loam on calcrete - B3</u> and <u>Shallow sandy loam over red-brown clay on calcrete - B6</u> . Swales: <u>Bleached sand over sandy clay loam - G2</u> and <u>Wet clay loam - N3</u> .
OFC	0.1	Dune	I1	D	
OFD	0.2	Low dune	I1	D	
OFq	0.4	Low dune	I1	V	
		Swale	G2N3	L	
OHC	2.2	Dune Stony rise	I1H3 B3	D M	OHC Dunes with deep, water repellent acid, bleached siliceous sand. <10% stony rises with shallow sandy loam, occasionally over red clay, on calcreted calcarenite, which outcrops occasionally also. OHD Low dunes, <10% stony rises, soils as for OHC . Main soils: Dunes: <u>Highly leached sand - I1</u> , <u>Bleached siliceous sand - H3</u> . Stony rises: <u>Shallow sandy loam on calcrete - B3</u> .
OHD	1.6	Dune Stony rise	I1H3 B3	D M	
PEE	0.8	Swale	I2	D	Sand plains and swales with deep, poorly drained, acid, bleached, siliceous sand over coffee rock or clay. Main soils: Low dunes: <u>Wet highly leached sand - I2</u> .
Xqm	0.9	Swamp Sandy rise	N3I2 I1I2	V L	Xqm Swamps with deep, mostly wet, poorly drained bleached siliceous sand over coffee rock or clay; 10-30% water filled. 10-20% sandy rises with well to moderately drained deep bleached
XqS	0.7	Swamp	N3I2	D	



					sand. Occasional stony rise. XqS Drainage depression with soils as for Xqm . Main soils: Swamps: <u>Wet clay loam - N3</u> and <u>Wet highly leached sand - I2</u> . Sandy rises: <u>Highly leached sand - I1</u> and <u>Wet highly leached sand - I2</u> .
XRC	0.1	Swamp	N3	D	Swamps with wet dark, cracking clay soils with minor peats. Main soils: <u>Wet clay loam - N3</u> .
XtC	0.1	Swamp	N1	D	Peat swamps. Main soils: <u>Peaty soil - N1</u> .
XuC	0.7	Swamp	N3	D	XuC Swamps with mostly non-peaty, wet sandy soils. 10-30% peat.
XuD	0.2	Swamp	N3	V	
		Sandy rise	G3I2	L	Xud Non-peaty dark clay loamy swamps with 20-30% sandy rises with deep sand over brown clay, or deep sand on coffee rock.
XuF	1.0	Swamp	N3	V	Xuf Swamps as for Xud above, with stony rises and/or very shallow over calcrete.
		Stony rise	B2B3 B5	C	
XuL	0.1	Swamp	N3	V	XuL Swamps as for Xud ; 10-30% water filled. 20-30% stony rises with often calcareous, thin, dark, clay loam on calcrete.
		Stony rise	B2B3 B5	C	
XuV	0.1	Drainage depression	N3	D	XuV Drainage depressions with soils as for Xud ; 10-30% water filled or with saline wet soils. Main soils: Swamps: <u>Peaty soil - N1</u> and <u>Wet clay loam - N3</u> . Sandy rises: <u>Thick sand over clay - G3</u> and <u>Wet highly leached sand - I2</u> . Stony rises: <u>Shallow calcareous loam on calcrete - B2</u> , <u>Shallow sandy loam on calcrete - B3</u> and <u>Shallow dark clay loam on limestone - B5</u> .
XwC	0.9	Swamp	N3N2	D	Swamps with wet non-saline and moderately saline sandy loam over dark clay; 10-30% water filled or with bleached sand over brown clay. Main soils: <u>Peaty soil - N1</u> and <u>Wet saline clay loam - N2c</u> .
ZR-	0.1	Lagoonal depression	N2A7	D	Saline lagoonal depression with often wet, calcareous dark clay loam grading to clay, on marl; occasionally on calcrete. Main soils: <u>Wet saline clay loam - N2c</u> and <u>Calcareous clay loam on marl - A7</u> .

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

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:

- A7** Calcareous clay loam on marl (Marly Calcarosol)
Dark calcareous clay with a marly subsoil (often saline in Upper SE). Often with shells and a peaty surface.
- B2** Shallow calcareous sandy loam on calcrete (Petrocalcic Calcarosol)
Up to 40 cm calcareous loamy sand to sandy loam with variable calcrete rubble overlying calcreted calcarenite - rises.
- B3** Shallow sandy loam on calcrete (Petrocalcic Rudosol)
Medium thickness non calcareous sandy loam, often having a slight clay increase with depth, over calcreted calcarenite shallower than 50 cm - rises.



- B5** Shallow dark clay loam on limestone (Petrocalcic, Black Dermosol)
Black clay loam to light clay over calcreted limestone at shallow depth, grading to highly calcareous clay - flats.
- B6** Shallow sandy loam over red-brown clay on calcrete (Petrocalcic, Red Kandosol)
Medium thickness sandy loam with slight ironstone gravel overlying a weakly structured reddish brown sandy clay on calcarenite within 50 cm - rises.
- B7** Shallow sand over sandy clay on calcrete (Petrocalcic, Brown Chromosol)
Medium thickness sand overlying brown friable sandy clay to clay on limestone or calcreted sandy clay within 50 cm - flats.
- B8** Shallow sand on calcrete (Petrocalcic, Bleached-Leptic Tenosol)
Thick bleached sand over calcreted calcarenite within 50 cm - rises.
- B9** Shallow clay loam over brown or dark clay on calcrete (Clay loamy Petrocalcic Sodosol)
Poorly structured, often coarse prismatic, clay loam grading to brown or dark clay on calcrete.
- G2** Bleached sand over sandy clay loam (sandy Brown-Red Chromosol)
Sandy texture contrast soil with a bleached A2 and a friable brown-red sandy clay loam to sandy loam subsoil.
- G3** Thick sand over clay (Hypercalcic, Brown Sodosol/ Chromosol)
Thick bleached sand with an organically darkened surface abruptly overlying a massive to coarsely structured brown to reddish yellow sandy clay to clay, calcareous with depth - rises.
- G4** Sand over poorly structured clay (Sandy Brown-Red Sodosol-Chromosol)
Topsoil <30 cm over a poorly structured subsoil. Thin sandy texture contrast soil with a sodic /dispersive /poorly structured brown or red clayey subsoil. Can have some ironstone.
- H3** Deep bleached sand (Basic, Arenic, Bleached-Orthic Tenosol)
Grey sand over a very thick bleached sand grading to yellow sand continuing below 100 cm.
- I1** Highly leached sand (Fragic, Pipey, Aeric Podosol)
Grey sand with a very thick bleached A2 layer, over dark brown and yellow massive soft to semi-hard clayey sand (coffee rock), grading to softer yellow and brown sand to sandy clay loam from about 80 cm.
- I2** Wet highly leached sand (Fragic, Humic, Aquic Podosol)
Grey sand with a thick bleached A2 horizon, overlying a thin to thick layer of coffee rock, grading to pale brown sand sharply overlying a grey, brown and yellow mottled sandy clay loam to light clay.
- M4** Deep hard gradational sandy loam (Hard Brown-Dark Kandosol- Dermosol)
Deep dark brown loamy to clay loamy soil grading to clay at depth. Hardsetting surface often with prismatic structures in the subsoil.
- N1** Peat (Organosol)
Peaty soil.
- N2c** Wet saline clay loam (Dermosolic, Salic Hydrosol)
Medium thickness dark grey to black clay loam to clay grading to well-structured dark grey clay with minor carbonates and a water table within 100 cm.
- N3** Seasonally waterlogged, non to marginally saline equivalents of soils listed above, viz.:
N3c Wet **G3**
N3d Wet **B5**
N3e Wet **B7**
- RR** Bare rock

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

