

# NGW Nangwarry Land System

**Area:** 345.2 km<sup>2</sup>

**Landscape:** Gently undulating plain with deep sandy soils, mostly well drained with only occasional dunes and swamps in swales. The land system occurs in the Tarpeena-Nangwarry district. Occasional limestone (calcarenite) rises occur with shallow red soils. Elevation is around 70m asl, but up to 98m on the eastern edge near "The Gap". Relief is mostly around 5 - 10 metres, with occasional rises up to 28 m especially on the eastern edge.

**Annual rainfall:** 645 – 760 mm average

**Geology:** Pleistocene-Holocene Molineaux Sand quartz sands

**Main soils:**

<b>I2</b>	(33%)	Wet highly leached sand	(Aquic or Semi-Aquic Podosol)
<b>G3</b>	(27%)	Thick sand over clay	(sandy Brown-Red Chromosol-Sodosol)
<b>I1</b>	(20%)	Highly leached sand	(Aeric Podosol)

**Minor soils:**

<b>N3</b>	(4%)	Wet soil (non to moderately saline)	(Sodosolic-Calcarosolic-Dermosolic Hydrosol)
<b>G5</b>	(4%)	Sand over acidic clay	(sandy Brown Kurosol)
<b>G2</b>	(4%)	Bleached sand over sandy clay	(sandy Brown-Red Chromosol-Sodosol)
<b>H3</b>	(4%)	Bleached siliceous sand	(sandy Bleached Tenosol)

**Summary:** This land system contains significant areas of relatively well-drained land which is used extensively for forestry. Soils are mostly sandy, have low fertility and are acidic.

## Soil Landscape Unit summary: Nangwarry Land System (NGW)

SLU	% of area	Component	Main soils	Prop #	Notes
MCH	0.1	Rise	B6B7	D	Gently undulating karstic rises with loam over poorly structured brown clay and deep gradational loam over brown clay. Shallow rises: 40% loam over poorly structured brown clay; 40% loam over well structured red clay; 10-30% shallow loam; all over calcreted calcarenite. <10% swamps with peaty and non-peaty soils.  Main soils: <b>Rises:</b> <u>Shallow sandy loam over red-brown clay on calcrete</u> - <b>B6</b> and <u>Sand over friable brown clay on calcrete</u> - <b>B7</b> . <b>Swamps:</b> <u>Peaty soil</u> - <b>N1</b> and <u>Wet clay loam</u> - <b>N3</b> .
		Swamp	N1N3	M	
OFB	1.2	Dune	I1I2	D	<b>OFB</b> Deep moderately to highly leached siliceous sands on large, broad, high linear dunes. <b>OFC</b> As above, dunes. <b>OFD</b> As above, low dunes. <b>OFK</b> As above, sand spreads & hummocks <b>OFq</b> As above low dunes with 30-60% wet sands and sand over clay in swales.  Main soils: <b>Dunes:</b> <u>Highly leached sand</u> - <b>I1</b> ; <u>Wet highly leached sand</u> - <b>I2</b> . <b>Low dunes:</b> <u>Wet highly leached sand</u> - <b>I2</b> , <u>Highly leached sand</u> - <b>I1</b> and <u>Sand over acidic clay</u> - <b>G5</b> . <b>Wet swales:</b> <u>Wet highly leached sand</u> - <b>I2</b> ; <u>Wet clay loam</u> - <b>N3</b> .
OFC	5.2	Dune	I1	D	
OFD	2.7	Low dune	I2G5	D	
OFK	0.0	Hummock	I2G5	D	
OFq	2.7	Low dune	I1I2	V	
		Wet swale	I2N3	E	



PBA	4.9	Plain	I2	D	<p><b>PBA</b> Sand plains with well-drained, deep, leached siliceous sands and 20-30% poorly-drained, deep sands, which are underlain by impervious, black clays or coffee rock, especially in swales. Water tables occur at around 180cm below plains.</p> <p><b>PBB</b> Gently undulating as above.</p> <p><b>PBj</b> As for PBB with 10-20% swamps with sandy loam, occasionally peaty, soils.</p> <p>Main soils:  <b>Plains:</b> <u>Thick sand over clay - G3</u>, <u>Highly leached sand - I1</u> and <u>Wet highly leached sand - I2</u>.  <b>Swamps:</b> <u>Wet clay loam - N3</u>.</p>
PBB	8.8	Undulating plain	I1I2	D	
PBj	0.9	Plain Swamp	G3I2 N3	V L	
PCB	2.4	Plain/rise Swamp	H3G3I2 N3	D M	<p>Gently undulating sand plain with deep acid sand on rises, often with coffee rock in subsoils, clay subsoils on lower slopes and flats or swales. Dark brown loamy volcanic ash soils co-dominant. &lt;10% swamps with sandy loam, occasionally peaty, soils.</p> <p>Main soils:  <b>Plains:</b> <u>Bleached siliceous sand - H3</u>, <u>Thick sand over clay - G3</u> and <u>Wet highly leached sand - I2</u>.  <b>Swamps:</b> <u>Wet clay loam - N3</u>.</p>
PDB	0.5	Plain	B3B7	D	<p>Gently undulating plain with very shallow red sand, often with poorly structured brown clay over calcrete. 10-30% exposed calcrete. Very low relict beach ridge trending NE-SW.</p> <p>Main soils: <u>Shallow sandy loam on calcrete - B3</u> and <u>Sand over friable brown clay on calcrete - B7</u>.</p>
PEA	0.2	Flat	I2I1	D	<p><b>PEA</b> Poorly drained swale and small plains with deep siliceous acid sands with coffee rock or slowly permeable clays in the subsoils. &lt;10% swamps.</p> <p><b>PEa</b> As above, with 10-30% sand dunes, 10-20% swamps, mostly non-peaty, but 10-30% peaty.</p> <p><b>PEi</b> As for PEA above, with 20-30% swamps.</p> <p><b>PEj</b> As for PEB but with 20-30% swamps.</p> <p>Main soils:  <b>Plains and rises:</b> <u>Wet highly leached sand - I2</u>, <u>Highly leached sand - I1</u>, <u>Sand over acidic clay - G5</u>; <u>Bleached siliceous sand - H3</u>.  <b>Swamps:</b> <u>Peaty soil - N1</u> and <u>Wet clay loam - N3</u>.</p>
PEa	0.3	Plain/rise Swamp	I2H3 N3	V L	
PEi	2.2	Plain Swamp	I2G5H3 N1N3	V C	
PEj	4.0	Plain/rise Swamp	I2G5H3 N1N3	V C	
PFA	1.9	Plain	I2I1G3	D	<p>Sand plain with moderately to well drained deep acid bleached sands on coffee rock or yellow-brown poorly structured acid clay.</p> <p>Main soils: <u>Wet highly leached sand - I2</u>, <u>Highly leached sand - I1</u> and <u>Thick sand over clay - G3</u>.</p>
PFa	2.4	Plain Low dune	I2I1G3 I1	V L	<p><b>PFa</b> As above, 10-20% low dunes with well drained acid sands.</p> <p><b>PFj</b> As above, 20-30% peaty, non-peaty &amp; water-filled swamps.</p> <p>Main soils:  <b>Plains:</b> <u>Wet highly leached sand - I2</u>, <u>Highly leached sand - I1</u> and <u>Thick sand over clay - G3</u>.  <b>Low dunes and sandy rises:</b>  <u>Wet highly leached sand - I2</u>, <u>Highly leached sand - I1</u>.  <b>Swamps:</b> <u>Peaty soil - N1</u> and <u>Wet clay loam - N3</u>.</p>
PFj	0.5	Rise Swamp	I2 N1N3WW	V C	
PKB	0.6	Plain	G3G5I2	D	
					<p>Gently undulating plain, typically with large red gums, with deep acid sand, mostly over brown, acid to strongly acid clay; mostly poorly drained. Coffee rock underlies the deep sand soils.</p> <p>Main soils: <u>Thick sand over clay - G3</u>, <u>Sand over acidic clay - G5</u> and <u>Wet highly leached sand - I2</u>.</p>



PPA	3.2	Plain	G3	D	<b>PPA</b> Sand plain with deep bleached wet sand over clay or coffee rock
		Swamp	N3N1	M	
PPa	7.7	Plain	G3	V	<b>PPa</b> Plains with poorly drained deep acid sands over coffee rock or acid brownish clay. 10-20% well drained bleached sands on low dunes.
		Low dune	I1G3	L	
PPb	14.5	Plain	I2G3	V	<b>PPb</b> Gently undulating plains & rises as for PPa.
		Sand rise	I1I2	C	
PPB	2.2	Rise	I1I2	D	<b>PPB</b> Gently undulating, as above, very wet swales
PPE	0.3	Broad depression	G3	V	<b>PPE</b> Broad depression, deep sand over brownish clay soils.
		Swamp	N3	L	
PPi	1.2	Plain	G3I2	V	<b>PPi</b> Plain as above, with 20-30% non-peaty acid swamps. Main soils: <b>Plains:</b> <u>Thick sand over clay - G3</u> ; <u>Wet highly leached sand - I2</u> . <b>Dunes and rises:</b> <u>Highly leached sand - I1</u> , <u>Wet highly leached sand - I2</u> and <u>Thick sand over clay - G3</u> . <b>Swamps:</b> <u>Peaty soil - N1</u> and <u>Wet clay loam - N3</u> . <b>Depressions:</b> <u>Thick sand over clay - G3</u> .
		Swamp	N3	C	
PQi	0.2	Plain	G3	V	<b>PQi</b> Sand plain with mostly acid, deep moderately well drained sand over acid brown clay; 20-30% swamps with wet sandy soils and occasionally dark clay soils.
		Swamp	N3	C	
PQiE	0.6	Swampy plain	G3N3	D	<b>PQiE</b> As above, depression.
PQp	1.5	Plain	G3I2	V	<b>PQp</b> Swampy plain, as above, with 10-20% poorly defined swamps and flats with dark brown clay and loam over mottled clay soils. Some ironstone gravel in sub-surface horizons. Main soils: <b>Plains:</b> <u>Thick sand over clay - G3</u> ; <u>Wet highly leached sand - I2</u> . <b>Swamps:</b> <u>Wet clay loam - N3</u> and <u>Deep friable gradational clay loam - M2</u> . <b>Swampy plains:</b> <u>Thick sand over clay - G3</u> ; <u>Wet clay loam - N3</u> .
		Swamp	N3M2	L	
PRB	24.2	Plain	G3I2	D	<b>PRB</b> Gently undulating plain with deep leached sand over brown clay or coffee rock, poorly drained, low fertility.
PRi	1.0	Swamp	N3N1	C	
PRi	1.0	Plain	G5G3	V	<b>PRi</b> Plain as above with 20-30% swamps with loamy and peaty soils. 10-30% water filled. Main soils: <b>Plains:</b> <u>Thick sand over clay - G3</u> , <u>Sand over acidic clay - G5</u> and <u>Wet highly leached sand - I2</u> . <b>Swamps:</b> <u>Wet clay loam - N3</u> and <u>Peaty soil - N1</u> .
		Swamp	N3N1	C	
XqC	0.1	Swamp	N3M2G3	D	<b>XqC</b> Swamps with non-peaty dark clay soils and 20-30% sandy rises with deep sand over brown clay soils. Main soils: <u>Wet clay loam - N3</u> , <u>Deep friable gradational clay loam - M2</u> and <u>Thick sand over clay - G3</u> .
XRC	0.1	Swamp	N3E3	D	<b>XRC</b> Swamps with dark grey clay soils, often cracking.
XRd	0.3	Swamp	N3E3	V	
XRd	0.3	Sandy rise	I2G5	C	<b>XRd</b> As above with 20-30% sandy rises with deep acid sand, often over brown clay. Main soils: <b>Swamps:</b> <u>Wet clay loam - N3</u> ; <u>Brown or grey cracking clay - E3</u> . <b>Sandy rises:</b> <u>Wet highly leached sand - I2</u> and <u>Sand over acidic clay - G5</u> .
XuC	1.0	Swamp	N3	D	<b>XuC</b> Swamps with mostly non-peaty wet soils, but peats occur in up to 30% of areas.
XuD	0.0	Swamp	N3	V	
XuU	0.6	Sandy rise	I2	C	<b>XuD</b> Non-peaty swamps with 20-30% sandy rises with deep sand over brown clay soils.
		Drainage depression	N3N1	V	
XuU	0.6	Swamp	N3N1	C	<b>XuU</b> Drainage depression as for XuC above, with 10-30% deep sand over grey clay soils. Main soils: <b>Swamps and drainage depressions:</b> <u>Wet clay loam - N3</u> and <u>Peaty soil - N1</u> . <b>Sandy rises:</b> <u>Wet highly leached sand - I2</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:

- 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.
- 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.
- E3** Brown or grey cracking clay (Brown-Grey Vertosol)
- 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.
- G5** Sand over acidic clay (Sandy Brown Kurosol)  
Sandy texture contrast soil with a friable brown strongly acidic clayey to clay loamy subsoil. Very acidic soil; incipient Bh horizons; moderate depth topsoils. Some with ironstone.
- H3** Deep bleached sand (Basic, Arenic, Bleached-Orthic Tenosol)  
Grey sand over 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.
- M2** Deep friable gradational clay loam (Red-Brown-Grey- Black Dermosol)  
Deep well structured red clay loamy soil.
- N1** Peat (Organosol)  
Peaty soil.
- N3** Seasonally waterlogged, non to marginally saline equivalents of soils listed above, viz.:  
**N3c** Wet **G3**  
**N3d** Wet **B5**  
**N3e** Wet **B7**
- WW** Water.

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

