

# BKA Bowaka Land System

**Area:** 81.0 km<sup>2</sup>

**Landscape:** Stranded marine plain south of Kingston, SE, consisting of a mostly flat, swampy, calcreted plain with shallow calcareous dark clay loams and some loams over clay on the better drained, slightly elevated parts. Granitic influence in the substrate of some soils.

**Annual rainfall:** 615 – 645 mm average

**Geology:** Lacustrine deposits of the Pleistocene Padthaway Formation

**Main soils:**

- B6** (36%) Shallow loam over red-brown clay on calcrete (Petrocalcic Red Chromosol-Kandosol)
- B3** (14%) Shallow sandy loam on calcrete (Petrocalcic Red Tenosol-Kandosol-Rudosol)
- B2** (13%) Shallow calcareous loam on calcrete (Petrocalcic Calcarosol-Rudosol)

**Minor soils:**

- B7** (9%) Shallow sand over clay on calcrete (sandy Petrocalcic Sodosol-Chromosol)
- B8** (8%) Shallow bleached sand on calcrete (sandy Petrocalcic Rudosol-Tenosol)
- RR** (5%) Bare calcrete
- B5** (4%) Shallow dark clay loam on limestone (Petrocalcic Black-Grey Dermosol)
- N3** (4%) Wet soil (non to moderately saline) (Sodosolic-Calcarosolic-Dermosolic Hydrosol)
- N2** (3%) Saline soil (Salic-Hypersalic Hydrosol)

**Summary:** The main soil limiting factors are shallowness, low waterholding capacity and stoniness. Salinity becomes a problem, particularly on the western edge adjacent to the Kingston Land System, but moderate salinity can occur throughout, affecting productive capacity of the land. Coastal exposure is a limiting factor for many crops.

**Soil Landscape Unit summary:** Bowaka Land System (BKA)

SLU	% of area	Component	Main soils	Prop#	Notes
MBA	1.5	Stony rise	B8B3RR	D	Gently undulating low calcreted former beach ridges with bleached sand over calcrete; or stony, very shallow red and brown loam, occasionally over red clay, on calcrete. <50% bare calcrete.  Main soils: <u>Shallow sand on calcrete - B8</u> , <u>Shallow sandy loam on calcrete - B3</u> and <u>Rock or exposed calcrete - RR</u> .
MEB	3.0	Stony rise	B8B3	E	Stony rises with shallow bleached sandy loam on calcrete or shallow sandy loam, occasionally over thin red clay on calcrete. Coarse granitic sands in calcreted substrate. 20-30% dunes with deep siliceous sand. 20-30% plains with shallow sandy loam, often over poorly structured brown clay, on calcrete; less commonly, deep siliceous sandy rises, or bare calcrete, or wet saline soils in swamps.
		Dune	H3	C	
		Plain	B3B7	C	



					<p>Main soils:  <b>Stony rises:</b> <u>Shallow sand on calcrete - B8</u> and <u>Shallow sandy loam on calcrete - B3</u>.  <b>Dunes:</b> <u>Bleached siliceous sand - H3</u>.  <b>Plains:</b> <u>Shallow sandy loam on calcrete - B3</u> and <u>Sand over friable brown clay on calcrete - B7</u>.</p>
MXg	8.7	Plain	B8B3	V	<p>Plains with shallow bleached sand on calcrete or shallow sandy loam, occasionally over thin red clay on calcrete. 10-30% bare calcrete or deep siliceous sand.</p> <p>Main soils:  <b>Plains:</b> <u>Shallow sand on calcrete - B8</u> and <u>Shallow sandy loam on calcrete - B3</u>.  <b>Swamps:</b> <u>Wet saline clay loam - N2c</u> and <u>Wet clay loam - N3</u>.</p>
		Swamp	N2N3	L	
VaH	9.1	Plain	B3B8	V	<p><b>VaH</b> Plains with shallow sandy loam, often bleached, over calcreted marine sediments or limestone. 10-20% sand rises with deep calcareous siliceous sand. &lt;10% flats with wet, slightly to moderately saline, sandy loam, often on calcrete.</p>
		Sand Rise	H2	L	
		Saline flat	N3N2	M	
VaT	2.6	Stony plain	B2	D	<p><b>VaT</b> Stony plain with shallow grey calcareous loam on calcreted marine sediments or limestone.</p> <p>Main soils:  <b>Plains:</b> <u>Shallow sandy loam on calcrete - B3</u> and <u>Shallow sand on calcrete - B8</u>.  <b>Sand rises:</b> <u>Deep brown sand - H2</u>.  <b>Saline flats:</b> <u>Wet clay loam - N3</u> and <u>Wet saline clay loam - N2c</u>.  <b>Stony plains:</b> <u>Shallow calcareous loam on calcrete - B2</u>.</p>
VfN	3.9	Plain	B2B8	V	<p>Plains with shallow grey calcareous loam, or shallow bleached siliceous sand, on calcreted marine sediments or limestone. 10-20% sandy rises with deep calcareous siliceous sand.</p> <p>Main soils:  <b>Plains:</b> <u>Shallow calcareous loam on calcrete - B2</u> and <u>Shallow sand on calcrete - B8</u>.  <b>Sandy rises:</b> <u>Deep brown sand - H2</u>.</p>
		Sandy rise	H2	L	
VgA	5.8	Plain	B6	D	<p><b>VgA</b> Plains with shallow loam over red clay on calcreted marine sediments or limestone.</p> <p><b>VgV</b> Plains as above; 10-20% swampy flats with shallow, mostly calcareous grey clay loam, often on dark grey clay, on calcreted marine sediments; or wet, moderately saline clay loam.</p> <p>Main soils:  <b>Plains:</b> <u>Shallow sandy loam over red-brown clay on calcrete - B6</u>.  <b>Swampy flats:</b> <u>Shallow calcareous loam on calcrete - B2</u>, <u>Shallow dark clay loam on limestone - B5</u> and <u>Wet saline clay loam - N2c</u>.</p>
VgV	26.2	Plain	B6	V	
		Swampy flat	B2B5N2	L	
VhA	0.7	Plain	B5B2	D	<p>Plains with shallow calcareous clay loam, mostly on dark clay, on calcreted marine sediments; 10-30% wet soils.</p> <p>Main soils: <u>Shallow dark clay loam on limestone - B5</u> and <u>Shallow calcareous loam on calcrete - B2</u>.</p>
ViN	1.0	Plain	B2B8	E	<p>Plains with shallow calcareous loam or bleached siliceous sand, on calcreted marine sediments. 30-60% sand rises with deep calcareous siliceous sand or shallow bleached sand on calcrete.</p>
		Low sandy rise	H2B8	E	



					<p>Main soils:  <b>Plains:</b> <u>Shallow calcareous loam on calcrete</u> - <b>B2</b> and <u>Shallow sand on calcrete</u> - <b>B8</b> and <u>Thick sand over clay</u> - <b>G3</b>.  <b>Sandy rises:</b> <u>Deep brown sand</u> - <b>H2</b> and <u>Shallow sand on calcrete</u> - <b>B8</b>.</p>
VkQ	27.8	Plain	B3B7B6	V	<p>Plains with shallow loamy sand, often over red, or poorly structured brown, clay, on calcreted marine sediments; 10-30% shallow calcareous loam on calcrete. 10-20% depressions with shallow calcareous loam on calcrete often on poorly structured brown clay, on calcreted marine sediments; or wet non-saline soils; 10-30% bare calcrete.</p> <p>Main soils:  <b>Plains:</b> <u>Shallow loam on calcrete</u> - <b>B3</b>, <u>Sand over friable brown clay on calcrete</u> - <b>B7</b> and <u>Shallow sandy loam over red-brown clay on calcrete</u> - <b>B6</b>.  <b>Depressions:</b> <u>Shallow calcareous loam on calcrete</u> - <b>B2</b>, <u>Sand over friable brown clay on calcrete</u> - <b>B7</b> and <u>Wet clay loam</u> - <b>N3</b>.</p>
		Depression	B2B7N3	L	
VnH	7.5	Plain	B5B2	E	<p>Plains with shallow dark clay loam over dark grey clay on calcrete, often calcareous throughout; 10-30% bare calcrete. 20-30% stony rises with very shallow calcareous loam on calcrete. 20-30% saline swamps with wet, highly to moderately saline soils.</p> <p>Main soils:  <b>Plains:</b> <u>Shallow dark clay loam on limestone</u> - <b>B5</b> and <u>Shallow calcareous loam on calcrete</u> - <b>B2</b>.  <b>Stony rises:</b> <u>Shallow calcareous loam on calcrete</u> - <b>B2</b>.  <b>Salty swamps:</b> <u>Wet saline clay loam</u> - <b>N2c</b> and <u>Wet clay loam</u> - <b>N3</b>.</p>
		Stony rise	B2	C	
		Salty swamp	N2N3	C	
ZO-	1.6	Swamp	B5B9	D	<p>Swamps with shallow, moderately saline, dark clay or clay loam, often on brown or yellow-grey clay on calcrete. Main soils: <u>Shallow dark clay loam on limestone</u> - <b>B5</b> and <u>Shallow clay loam over brown or dark clay on calcrete</u> - <b>B9</b>.</p>
ZT-	0.6	Swamp	N2N3	V	<p>Swamps with highly to moderately saline sandy loam over dark clay. 20-30% dunes with deep calcareous sand.</p> <p>Main soils:  <b>Salty swamps:</b> <u>Wet saline clay loam</u> - <b>N2c</b> and <u>Wet clay loam</u> - <b>N3</b>.  <b>Dunes:</b> <u>Shell sand</u> - <b>H1</b>.</p>
		Dune	H1	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:**

- 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.
- H1** Shell sand (Shelly Rudosol)  
Very thick shell sand with no profile development other than slight organic darkening at the surface.
- H2** Siliceous sand (Sandy Calcarosol-Tenosol)  
Deep to moderate depth calcareous siliceous sand. Often with non-calcareous topsoil; can be non calcareous throughout. Sometimes the subsoil is a light sandy loam.
- 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.
- 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](#)

