ba BARREN GROUNDS Residual

Landscape—gently undulating to undulating rises with poorly drained depressions on Hawkesbury Sandstone plateau surface. Local relief is low (<30 m) with slopes <10%. Scattered benched rock outcrop and moderately incised drainage channels. Uncleared heath with scattered stands of low woodland.

Soils—moderately deep (50–150 cm) Sands (Uc4.14) occur on crests and upper slopes and Leached Sands (Uc2.12) on midslopes. Gleyed Podzolic Soils (Dg4.31) and Acid Peats (0) occur in drainage depressions.

Limitations—waterlogging, permanently high watertable, high organic matter, sodicity, high shrink-swell (topsoil), low fertility, high available water-holding capacity (topsoil).

LOCATION

Undulating rises on sandstone plateau surface with scattered poorly drained depressions on Moss Vale Tableland adjoining the Illawarra Escarpment. Examples include Barren Grounds, Buderoo and Brogers Creek.

LANDSCAPE

Geology

Hawkesbury Sandstone—medium- to coarse-grained quartzose sandstone with occasional lenticular mudstone interbeds.

Topography

Gently undulating to undulating rises with scattered poorly drained depressions (swamps). Local relief is <30 m with slopes <10%. Crests are broad, slopes are long and gently inclined with wide concave footslopes and moderately incised drainage lines. Localised sandstone outcrops occur on ridges and in drainage lines.

Vegetation

Predominately uncleared closed-heath with isolated stands of low woodland.

Common heath species include swamp heath (*Epacris paludosa*), prickly broom-heath (*Monotoca scoparia*), coral heath (*Epacris microphylla*), paroo lily (*Dianella caerulea*), christmas bell (*Blandfordia nobilis*), necklace fern (*Asplenium flabellifolium*), button grass (*Gymnoschoenus sphaerocephalus*), spear grass (*Stipa rudis*), wire grass (*Aristida vagans*), scrub she-oak (*Allocasuarina distyla*), marsh banksia (*Banksia paludosa*), dagger hakea (*Hakea teretifolia*), screw fern (*Lindsaea linearis*), common sundew (*Drosera spathulata*), slender rice flower (*Pimelea linifolia*), heath banksia

(*Banksia ericifolia*), pine-leaf geebung (*Persoonia pinifolia*), drumsticks (*Isopogen* spp.) and dog rose (*Bauera rubioides*).Common woodland species include silvertop ash (*Eucalyptus sieberi*) and red bloodwood (*Eucalyptus gummifera*) with understorey species—for example, broad-leaved geebung (*Persoonia levis*), flaky-barked tea-tree (*Leptospermum attenuatum*), hill banksia (*Banksia spinnulosa* var. *collina*), mountain devil (*Lambertia formosa*), waratah (*Telopea speciosissima*), old man banksia (*Banksia serrata*) and native holly (*Oxylobium ilicifolium*).

Further vegetation information is available in Jordan and Jordan (1987).

Land Use

Predominately nature reserves (Barren Grounds Nature Reserve) and Crown Lands Reserve, with some areas cleared for grazing.

Existing Erosion

Moderately incised drainage channels to bedrock (1 m).

SOILS

Dominant Soil Materials

ba1—Black sticky massive peaty sand (topsoil)

Colour	black (2.5YR 2/1)
Texture	sand
Structure	apedal massive
Fabric	sandy
pH	5.5
Stones	nil
Roots	abundant

ba2—Friable spongy waterlogged organic peat (topsoil)

Colour	brownish black (10YR 2/2) to black (10YR 2/1)
Texture	peat
Structure	apedal massive
Fabric	sandy
pH	4.0–5.0
Stones	nil
Roots	common to abundant

ba3—Brownish black humic coarse sand (subsoil)

Colour	black (2.5Y 2/1) to brownish black (10YR 3/1)
Texture	sand
Structure	apedal, single-grained
Fabric	sandy
pH	4.5
Stones	nil
Roots	nil

ba4—Dull yellowish brown sand (subsoil)

Colour	brown (10YR 5/3)
Texture	sand
Structure	apedal, single-grained
Fabric	sandy
pH	5.0
Stones	nil
Roots	common

ba5—Waterlogged gleyed clayey sand (subsoil)

Colour	light grey (10YR 8/1) to dull yellow orange (10YR 7/2) with pale yellow, light grey and orange mottles at depth
Texture	clayey sand to sandy clay loam
Structure	apedal massive
Fabric	earthy
pH	3.0–4.5
Stones	nil
Roots	few

Associated Soil Material

Up to 5 cm of leaf litter overlies some profiles especially midslope. Up to 30 cm bleached greyish yellow brown sand.

Occurrence and Relationships

Crests and upper slopes. Up to 30 cm of black sticky massive peaty sand **(ba1)** overlies <30 cm loose brownish black humic sand **(ba3)**. Boundary is gradual [Sands (Uc4.14)]. Total depth is approximately 100 cm.

Midslopes. Up to 5 cm of leaf litter overlies <30 cm of dull yellowish brown sand **(ba4)** which overlies <10 cm bleached greyish yellow brown sand. Boundaries are gradual [Leached Sands (Uc2.12)]. Total depth is <50 cm.

Drainage depressions. Up to 150 cm of friable spongy waterlogged organic peat **(ba2)** overlies <30 cm of bleached greyish yellow brown sand which overlies <200 cm waterlogged gleyed clayey sand **(ba5)**. The boundaries are sharp [Gleyed Podzolic Soils (Dg4.31)]. Occasionally **ba2** lies over bedrock [Acid Peats (0)]. Total soil depth varies between 150 cm and 300 cm.

LIMITATIONS TO DEVELOPMENT

Soil Limitations

ba1 Very high organic matter
Strongly acid

Low wet bearing strength
Sodicity

ba2 Very high organic matter
Very strongly acid
Low wet bearing strength
Very high available water-holding capacity

ba3 High organic matter
Low available water-holding capacity
Very strongly acid
Low fertility
Sodicity

ba4 High organic matter
Low available water-holding capacity
Strongly acid
Low fertility
Sodicity

ba5 Low permeability
Extremely acid
Low fertility
Sodicity

Fertility

General fertility is very low. The peat topsoil **(ba2)** is strongly acid with high organic matter. The subsoil materials have a low CEC, are often very strongly acid and are permanently waterlogged.

Erodibility

All of the soil materials have low erodibility as they consist of well-drained coarse sands.

Erosion Hazard

Erosion hazard for this soil landscape for non-concentrated flows is slight to very high. The calculated soil loss for the first 12 months of urban development ranges up to 70 t/ha for topsoils and 85 t/ha for exposed subsoils. The erosion hazard for concentrated flows is very high.

Surface Movement Potential

Except for **ba1** and **ba2** all materials are sufficiently coarse to be considered stable.

Landscape Limitations

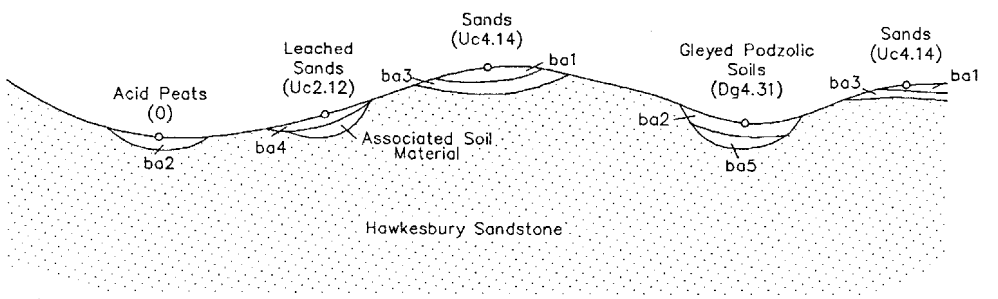
Flood hazard (localised)
Waterlogging
Permanently high watertable
Seasonal waterlogging
Water erosion hazard (localised)

Urban Capability

Generally low limitations for urban development. Localised high to severe limitations for urban development in poorly drained areas.

Rural Capability

Generally high to severe limitations for regular cultivation and for grazing.



■ ***Schematic cross-section of Barren Grounds soil landscape illustrating the occurrence and relationship of the dominant soil materials.***