



Source: Soil and Land Resources of the Hawkesbury-Nepean Catchment *interactive DVD*

Landscape—undulating to rolling rises and low hills on Hawkesbury Sandstone. Local relief 20–80 m, slopes 10–25%. Rock outcrop <25%. Broad convex crests, moderately inclined sideslopes with wide benches, localised rock outcrop on low broken scarps. Extensively cleared open-forest (dry sclerophyll forest) and eucalypt woodland.

Soils—shallow to moderately deep (30–100 cm) Yellow Earths (Gn2.24) and Earthy Sands (Uc5.11, Uc5.23) on crests and inside of benches; shallow (<20 cm) Siliceous Sands (Uc1.21) on leading edges of benches; localised Gleyed Podzolic Soils (Dg4.21) and Yellow Podzolic Soils (Dy4.11, Dy5.11, Dy5.41) on shale lenses; shallow to moderately deep (<100 cm) Siliceous Sands (Uc1.21) and Leached Sands (Uc2.21) along drainage lines.

Limitations—localised steep slopes, high soil erosion hazard, rock outcrop, shallow highly permeable soil, very low soil fertility.

LOCATION

Occurs extensively throughout the Hornsby Plateau and along the foreshores of Sydney Harbour and the Parramatta and Georges Rivers. Examples include areas of Northbridge, Forestville, Drummoyne, Balmain, Arcadia and Berrilee.

LANDSCAPE

Geology

Hawkesbury Sandstone, which is a medium to coarse-grained quartz sandstone with minor shale

and laminite lenses.

Topography

Undulating to rolling low hills with local relief 20–80 m and slopes of 10–25%. Sideslopes with narrow to wide outcropping sandstone rock benches (10–100 m), often forming broken scarps of <5 m.

Vegetation

The original dry sclerophyll woodland and open-forest have been extensively cleared. Low, dry sclerophyll open-woodland dominates ridges and upper slopes. Common species include red bloodwood *Eucalyptus gummifera*, yellow bloodwood *E. eximia*, scribbly gum *E. haemastoma*, brown stringybark *E. capitellata* and old man banksia *Banksia serrata*. On the more sheltered slopes, black ash *E. sieberi*, Sydney peppermint *E. piperita* and smooth-barked apple *Angophora costata* are common tree species. The dry sclerophyll understorey consists of shrubs from the families Epacridaceae, Myrtaceae, Fabaceae and Proteaceae.

Land use

Land use is mostly urban residential. Developed suburbs include Forestville, Northbridge and Drummoyne. Steeper sections are used for recreational purposes and often remain covered with native vegetation. Grazing occurs at Berrilee and there are small hobby farms in the north-west.

Existing Erosion

Severe sheet erosion occurs following bushfires, which destroy or damage stabilising vegetative cover. Minor gully erosion occurs along unpaved or poorly maintained roads and fire trails especially those frequented by four-wheel-drive vehicles and trail bikes.

Associated Soil Landscapes

Small areas (<40 ha) of Hawkesbury (**ha**) and Lambert (**la**) soil landscapes have been included within the GyMEA soil landscape. In many respects these landscapes have qualities in common with the GyMEA soil landscape.

SOILS

Dominant Soil Materials

gy1—Loose, coarse sandy loam. This is loamy sand to sandy loam with loose, apedal single-grained structure and porous sandy fabric. It generally occurs as topsoil (A1 horizon).

The colour often becomes lighter with depth and ranges from brownish-black (10YR 2/2), when organic matter is present, to bleached dull yellow-orange (10YR 7/2). It is often water repellent under native vegetation. The pH ranges from strongly acid (pH 4.0) to slightly acid (pH 6.0). Small sandstone and platy ironstone fragments, charcoal fragments and roots are common.

gy2—Earthy, yellowish-brown clayey sand. This is commonly yellowish-brown clayey sand with apedal massive structure and porous earthy fabric. It commonly occurs as subsoil over sandstone bedrock (B horizon). Where it is exposed at the surface it forms hardsetting topsoil.

Texture may increase gradually to a light sandy clay loam with depth. Colour is commonly yellowish-brown (10YR 6/8) and orange mottles are occasionally present with depth. The pH ranges from strongly acid (pH 4.0) to slightly acid (pH 6.5). Sandstone and ironstone fragments are common and are often concentrated in stone lines in the upper parts of this material. Charcoal fragments are common whilst roots are rare.

gy3—Earthy to weakly pedal, yellowish-brown sandy clay loam. This is commonly a yellowish-brown sandy clay loam to sandy clay with an apedal massive structure and an earthy porous fabric. It usually occurs as subsoil (B or C horizon) on coarse sandstone.

Texture is commonly sandy clay loam but may increase gradually with depth to sandy clay. Occasionally a weakly pedal structure of sub-angular blocky shaped peds are present. Peds are commonly rough-faced and porous and range in size from 5-20 mm. Colour is commonly yellowish brown (10YR 5/8, 6/6, 6/8; 2.5Y 5/6, 5/4). Orange mottles may occur with depth. The pH ranges from strongly acid (pH 4.5) to slightly acid (pH 6.0). Strongly weathered sandstone fragments are common. Roots and charcoal fragments are rare.

gy4—Moderately to strongly pedal, yellowish-brown clay. This is commonly a yellowish-brown sandy clay or light clay with a moderately to strongly pedal structure and either a smooth or rough-faced ped fabric. This material occurs as subsoil on shale bedrock (B and C horizons).

Peds ranging in size from 5–50 mm, are either smooth or rough-faced and are polyhedral to sub-angular blocky. Colour is commonly yellow-brown (10YR 6/6) but can vary from dark reddish-brown (2.5YR 3/6) to light grey (7.5YR 8/1). Red, orange and grey mottles are occasionally present at depth. The pH ranges from strongly acid (pH 4.0) to slightly acid (pH 6.0). Shale and ironstone fragments are often present, but charcoal fragments are absent, and roots are rare.

Associated Soil Materials

Litter and decomposing organic debris. In areas of natural bushland, litter and organic debris occur on the soil surface. The litter layer can be developed to depths of up to 10 cm. Charcoal fragments are common. This material is often found in debris dams in association with white, loose quartz sand.

White, loose quartz sand. A surface wash of quartz sand grains. It occurs in depositional areas such as small debris dams and fans on breaks of slope. It is often mixed with the litter layer and is usually water repellent.

Occurrence and Relationships

Crests. Generally up to 30 cm of loose, quartz sandy loam (**gy1**) overlies bedrock (Siliceous Sands and Lithosols (Uc 1.21)) or <30 cm of earthy, yellowish-brown clayey sand (**gy2**) (Earthy Sands (Uc5.11)). Occasionally (**gy2**) overlies up to 30 cm of yellow earthy/weakly pedal sandy clay loam (**gy3**) (Yellow Earths (Gn2.24)). Boundaries between soil materials are gradual. Total soil depth is <50 cm.

Where severe erosion has occurred, **gy2** or **gy3** is often exposed as a hardsetting layer at the surface. Bedrock is exposed in some areas, particularly where bushfires are frequent.

Sideslopes. The soils on the sideslopes are discontinuous and rock outcrop may cover up to 25% of the ground surface. On the outside of benches and areas close to rock outcrop, up to 20 cm of **gy1** overlies bedrock (Siliceous Sands/Lithosols (Uc1.21)). On the inside of benches, up to 30 cm of **gy1** overlies 10–30 cm of **gy2**. Occasionally **gy2** overlies up to 30 cm of **gy3**. The boundaries between soil materials are gradual. Total soil depth is 30–70 cm (Yellow Earths (Gn2.24), Earthy Sands (Uc5.11)).

Shale lenses. Where shale lenses occur on the inside of benches, up to 30 cm of **gy1** overlies up to 100 cm of strongly pedal yellowish-brown clay (**gy4**). The boundary between soil materials is sharp to clear. Total soil depth is <100 cm (Gleyed Podzolic Soils (Dg 4.21), Yellow Podzolic Soils (Dy 5.41)).

Drainage lines. Up to 100 cm of **gy1** overlies bedrock (Siliceous Sands (Uc1.2) and Leached Sands (Uc 2.21)).

LIMITATIONS TO DEVELOPMENT

Urban Capability

Generally, low to moderate capability for urban development.

Rural Capability

Land not capable of being grazed or cultivated.

Landscape Limitations

Erosion hazard

Rock outcrop

Rockfall hazard (localised)

Steep slopes (localised)

Shallow soil

Soil Limitations

gy1 High permeability
 Low available water capacity
 Stoniness
 Low fertility

gy2 Low available water capacity
 Stoniness
 Very low fertility
 Very strongly acid
 Very high aluminium toxicity

gy3 Low available water capacity
 Low wet strength (localised)
 Low permeability (localised)
 Stoniness (localised)
 Very low fertility
 Very strongly acid
 High aluminium toxicity

gy4 Low wet strength
 High erodibility
 Low permeability
 Low available water capacity
 Stoniness (localised)
 Very low fertility
 Very strongly acid
 Very high aluminium toxicity

Fertility

Very poor. The soils of this unit are generally shallow, stony, moderately acid and highly permeable with low available water capacities. They also have a low to very low nutrient status with very low phosphorus and nitrogen levels and very low CEC.

Erodibility

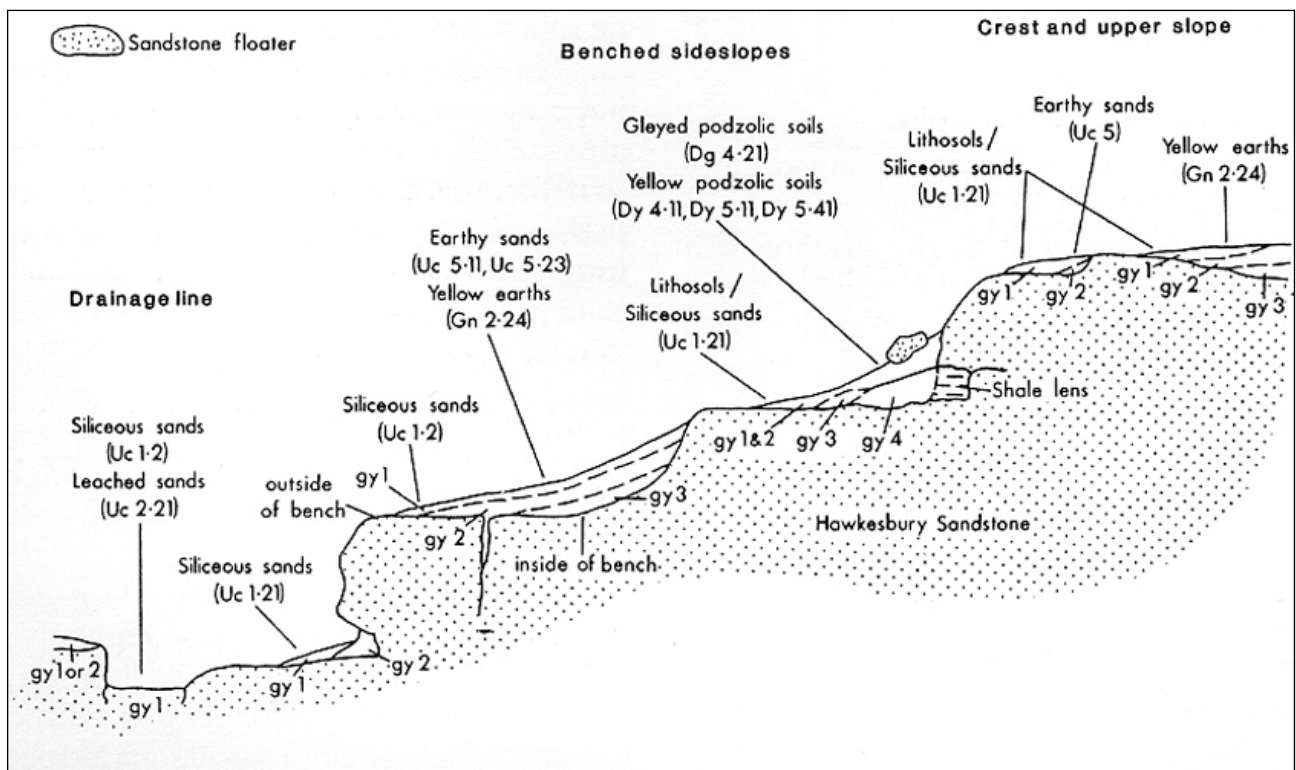
gy1 and **gy2** are composed of coarse sand grains and have very low erodibilities as they are freely drained and are held together by high organic matter contents (**gy1**) and/or non-dispersive clays (**gy2**). However, (**gy3**) is moderately erodible as it has a weakly coherent earthy fabric with low organic matter content. **gy4** is highly erodible as it is very low in organic matter and consists dominantly of fine sands in a clay matrix.

Erosion Hazard

The erosion hazard for non-concentrated flows is generally high to very high but can range from moderate to extreme. Calculated soil loss for the first twelve months of development range up to 19 t/ha for topsoil and 464 t/ha for subsoil. Soil erosion hazard for concentrated flows is high to extreme.

Surface Movement Potential

The shallow sandy soils are stable to slightly reactive. In isolated instances where **gy4** is >100 cm thick soils may be moderately reactive.



Schematic cross-section of GyMEA soil landscape illustrating the occurrence and relationship of the dominant soil materials.