



Landscape—level to gently undulating non-tidal beach ridges on marine sands. Local relief <3 m, slopes <5%. Watertable at a depth of <200 cm. Progressive beach ridges in sheltered bays. Extensively cleared closed-scrub and low eucalypt woodland.

Soils—deep (>200 cm) Siliceous Sands (Uc1.22, Uc5.11) and occasional Podzols (Uc2.3) on sandy rises, Humus Podzols (Uc4.2) in poorly drained areas, Calcareous Sands (Uc1.11, Uc1.13) near beaches.

Limitations—permanently high watertables, localised flooding, periodic waterlogging in depressions, very low to low soil fertility, localised areas of high soil erosion hazard.

LOCATION

This unit occurs on flat low-lying terrain at Woy Woy, Ettalong, Umina, Palm Beach and The Basin in the Narrabeen Hills; also at Clontarf, The Spit and Manly on the harbour foreshores. Most of the beaches in tidal, protected regions have similar small, flat, beach ridge areas. These are usually too small to be included on the map. Examples include Forty Baskets Beach, Sandy Bay and Little Manly.

LANDSCAPE

Geology

Holocene sediments of predominantly coarse to fine quartz sand, with shell fragments and occasionally silt.

Topography

Level to gently undulating, non-tidal, coastal sand flats. Local relief is <3 m. Elevation is <6 m with slopes <5%. Shore parallel beach ridges approximately 100 cm high are common (Hails, 1969). Where residential development has occurred, beach ridges have been levelled and swampy swales filled. The watertable generally occurs within 200 cm of the surface. On the seaward side of this unit the groundwater may be brackish and fluctuate with the tide. In some areas, drainage canals have been excavated to improve drainage.

Vegetation

Extensively cleared open-woodland, with occasional scrub. Dominant native species include coastal banksia *Banksia integrifolia*, old man banksia *B. serrata*, *B. aemula*, red bloodwood *Eucalyptus gummiifera*, smooth-barked apple *Angophora costata* and rough-barked apple *A. floribunda*. Common understorey species include bracken *Pteridium esculentum*, blady grass *Imperata cylindrica*, and coastal teatree *Leptospermum laevigatum*. Wetter areas are dominated by Port Jackson fig *Ficus rubiginosa* and bangalay *E. botryoides*.

Land use

This unit is commonly used for urban residential sites such as those at Woy Woy, Umina, Palm Beach, and Clontarf. Recreation areas occur at Clontarf picnic area and The Basin and there are small areas of natural bushland.

Existing Erosion

Little erosion occurs.

Associated Soil Landscapes

Tuggerah (tg) soil landscape may be occasionally included within Woy Woy soil landscape; Ettalong (et) soil landscape occurs in swamps associated with the Woy Woy soil landscape.

SOILS

Dominant Soil Materials

ww1—Dark brown loose loamy sand. This is dark brown coarse sand to sandy loam with loose apedal single-grained structure and sandy fabric. It occurs as topsoil (A1 horizon).

Colour is black (10YR 2/1) or dark brown (10YR 3/3), due to the presence of organic matter, but can range to a dull yellowish-brown (10YR 5/3). The pH ranges between strongly acid (pH 4.5) and slightly acid (pH 6.5). Occasionally shells and shell fragments are present. Roots are common whilst charcoal fragments are rare, and stones are absent.

ww2—Grey loose sand. This is grey bleached coarse sand with loose apedal single-grained structure and sandy fabric. It commonly occurs as an A2 horizon.

Colour is brownish grey (10YR 5/1), light grey (10YR 7/1) or dull yellowish orange (10YR 7/4). The pH ranges between moderately acid (pH 5.0) and slightly acid (pH 6.5). Roots and charcoal are rare, and stones are absent, but there are occasional shell fragments.

ww3—Brown loose sand. This is brown coarse sand with apedal single-grained structure and sandy fabric. It usually occurs as deep subsoil (B horizon).

Common colours include brown (7.5YR 4/4, 10YR 4/6, 5/6), greyish yellow-brown (10YR 4/2), dull yellow-orange (10YR 6/3). Grey mottles are often present in this material where it is frequently

waterlogged. The pH ranges between strongly acid (pH 4.0) and slightly acid (pH 6.0). Shell fragments are occasionally present, but roots, stones and charcoal fragments are absent.

Associated Soil Materials

The following soil materials from Tuggerah soil landscape occasionally occur at depth on old beach ridges: **tg4**—black soft sandy organic pan; and **tg5**—brown soft sandy iron pan.

Occurrence and Relationships

Well-drained beach ridges and sandy rises. Generally, 10–30 cm of dark brown loose loamy sand (**ww1**) overlies >150 cm of brown, loose sand (**ww3**). The total soil depth is >300 cm and the boundary between the soil materials is clear or gradual [Siliceous Sands (Uc 5.11)].

Poorly drained swales and depressions. Generally, 10–30 cm of **ww1** overlies up to 30 cm of grey, bleached loose sand (**ww2**) and >200 cm of **ww3**. Total soil depth is >3 m. Boundaries between soil materials are clear [Humus Podzols (Uc4.21, Uc4.24, Uc2.20)]. The depth of the watertable is usually 50–150 cm.

On some of the larger and older beach ridges, 10–30 cm of **ww1** overlies up to 200 cm of **ww2**. **ww2** overlies a black, soft sandy organic pan (**tg4**) and/or a brown soft sandy iron pan (**tg5**). **tg4** and **tg5** are underlain by **ww3** soil material [Podzols (Uc2.3)]. In swampy areas, 30 cm of dark brown-black, organic rich sandy loam or peaty loam topsoil overlies >100 cm of pale or dark brown sandy subsoil [Acid Peats (O) and Humus Podzols (Uc4.22)].

LIMITATIONS TO DEVELOPMENT

Urban Capability

Low to moderate capability for urban development.

Rural Capability

Not relevant.

Landscape Limitations

Flood hazard (localised)
Wind erosion hazard (localised)
Permanently high watertables
Waterlogging (localised)
Seasonal waterlogging (localised)
Non-cohesive soil

Soil Limitations

ww1 Low available water capacity
Low to very low fertility

ww2 Low available water capacity
Very low fertility

ww3 Low available water capacity
Low to very low fertility
Strongly acid
Strongly alkaline (localised)

Fertility

The general fertility is usually very low. The soil materials have low organic matter content, low available water capacity, very low CEC, and very low nutrient status.

Erodibility

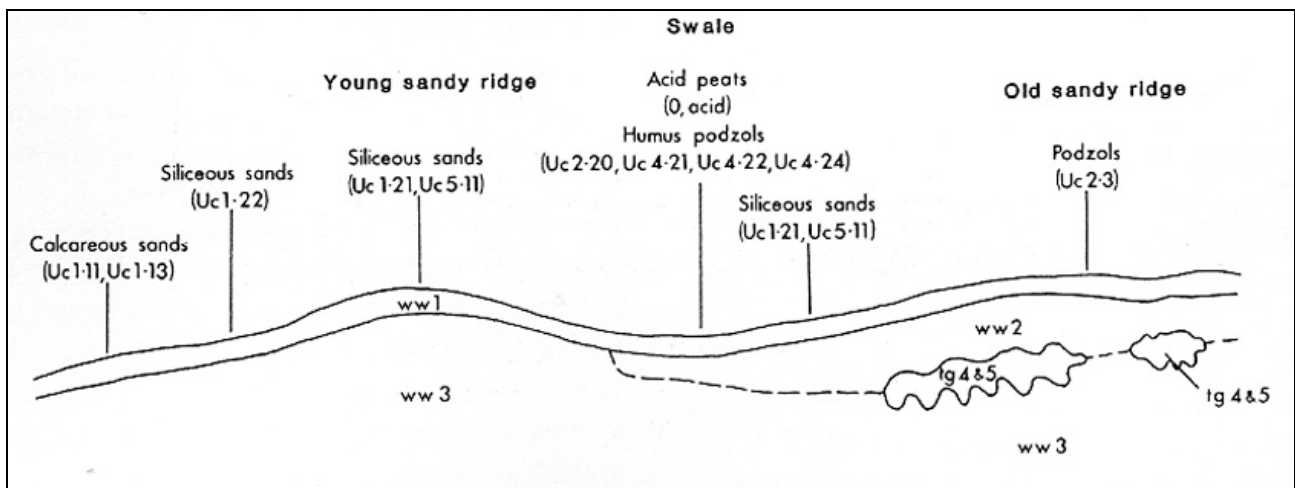
The soil materials all have very low erodibility as they consist of well drained coarse sands.

Erosion Hazard

The erosion hazard for non-concentrated flows is low. Calculated soil loss for the first twelve months of urban development ranges up to 4 t/ha for topsoil and 11 t/ha for subsoil. The erosion hazard for concentrated flows is moderate and for wind is high.

Surface Movement Potential

Sands are stable.



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