

do

DOYALSON



Landscape—gently undulating rises on Munmorah Conglomerate. Slope gradients <10%; local relief to 30 m. Broad crests and ridges and long gently inclined slopes. Predominantly cleared eucalypt open-forest.

Soils—moderately deep (50–150 cm) Yellow Earths (Gn2.24), Yellow Podzolic Soils (Dy2.21, Dy3.21) and Soloths (Dy2.41, Dy3.41) occur on sandstones and conglomerates; moderately deep (50–150 cm) Yellow Podzolic Soils (Dy2.11, Dy3.21), Soloths (Dy2.41) and some Red Podzolic Soils (Dr3.21) occur on fine-grained siltstones and claystone; moderately deep to deep (100–>150 cm) Yellow Leached Earths (Gn2.74), Grey Earths (Gn2.94), Soloths (Dy3.41) and Gleyed Podzolic Soils (Dg4.41) occur along drainage lines.

Limitations—high erosion hazard, foundation hazard (localised), high run-on (localised), mine subsidence district, seasonal waterlogging (localised), hardsetting, stoniness, strongly acid soils of low fertility.

Topography

Generally undulating rises with local relief to 30 m and slope gradients <10%. Broad crests and ridges and long gently inclined slopes are the major landform elements. Drainage lines are broad. Rock outcrop is usually absent.

Vegetation

The open-forest has been extensively cleared although some small areas of disturbed bushland remain. Common species include scribbly gum (*Eucalyptus haemastoma*), red bloodwood (*E. gummifera*), brown stringybark (*E. capitellata*), smooth-barked apple (*Angophora costata*) and grey gum (*E. punctata*). Understorey species include hill banksia (*Banksia spinulosa* var. *collina*), banksia (*Banksia oblongifolia*), and mountain devil (*Lambertia formosa*). Paperbarks (*Melaleuca* spp.) occur in poorly drained areas.

Land Use

Land use includes urban residential (for example, Doyalson, San Remo and Lake Munmorah), collieries (Munmorah State Coal Mine) and power stations (Munmorah). Some areas of grazing occur and uncleared bushland remains.

Included Soil Landscape

Small areas of Gorokan (**gk**) soil landscape have been included in the southern locations of the Doyalson soil landscape.

SOILS

Dominant Soil Materials

do1—Brown loose loamy sand. Brown loose sand to loamy sand with coarse-grained texture and single-grained structure with sandy fabric. It occurs as topsoil (A₁ horizon). When organic matter is high, weak sub-angular structure with rough ped fabric can occur. This material is often water repellent. The surface condition is loose or gravelly. Colour ranges from brownish black (10YR 3/1) to dull yellowish brown (10YR 5/3). The pH ranges from moderately acid

LOCATION

Gently undulating rises on Munmorah Conglomerate north of Tuggerah Lake on the Central Coast Lowlands. It includes the urban centres of Doyalson, Blue Haven, Lake Munmorah, San Remo, Bluff Point, Budgewoi, Mannering Park, Dora Creek, Morisset, Cooranbong and parts of Toronto.

LANDSCAPE

Geology

Narrabeen Group—Clifton Subgroup—Munmorah Conglomerate Formation: conglomerate, pebbly sandstone, grey green and grey siltstone and claystone. Some small areas of coarse quartz sandstone at the base of the Tuggerah Formation may have been included.

(pH 5.0) to slightly acid (pH 6.0). Gravel-sized sandstone rock fragments, quartz and conglomerate pebbles may be common. Roots are common and charcoal fragments often present.

do2—Hardsetting bleached yellowish brown clayey sand. Light yellow clayey sand with sandy fabric. It usually occurs as shallow subsoil (A₂ horizon) but is sometimes exposed at the surface (A₁ horizon).

This material is often hardsetting when dry. Colours range from dull yellowish brown (10YR 5/3) to dull yellow orange (10YR 7/3). Dry colours are often bleached (10YR 7/2 to 10YR 8/1). Pale orange mottles are often present along root channels. The pH ranges from strongly acid (pH 4.5) to moderately acid (pH 5.5). Roots are common, charcoal fragments are few and sandstone rock fragments, quartz and conglomerate pebbles are often present.

do3—Earthy bright yellowish brown sandy clay loam. Light sandy clay loam to sandy clay loam with massive structure and porous earthy fabric. It occurs as a subsoil (B horizon).

Texture usually increases with depth from light sandy clay loam to sandy clay loam. Occasionally texture reaches a clay with a moderately developed blocky structure. Infilled faunal casts are common in the upper portion of this material. Colour ranges from brown (10YR 4/4) to more common bright yellowish brown (10YR 6/6). Orange mottles are common. The pH ranges from strongly acid (pH 4.5) to moderately acid (pH 5.5). Sandstone rock fragments and quartz and conglomerate pebbles are often common, but roots are few and charcoal fragments are absent.

do4—Earthy light grey clay. Light grey sandy clay loam to medium clay with massive structure and dense earthy fabric. It occurs as deep subsoil overlying bedrock (B₃–C horizon).

Texture is dependent on the amount of clay in the parent material and may range from sandy clay loam to medium clay with coarse sand grains present.

Occasionally weak to moderate angular blocky structure is present. Colour ranges from common light grey (2.5Y 8/1, 10YR 8/1) to dull yellow orange (10YR 7/2, 10YR 6/4). Red, yellow or orange mottles are common. The pH ranges from strongly acid (pH 4.5) to slightly acid (pH 6.0). Stones including sandstone rock fragments, quartz and conglomerate pebbles are often present. Charcoal fragments are absent and roots are few.

do5—Strongly pedal clay. Light to medium clay with strongly developed structure and smooth ped fabric. It occurs as subsoil (B horizon) on fine-grained bedrock.

Ped size ranges considerably from small (5–20 mm) polyhedral and sub-angular blocky to large (20–100 mm) prismatic or sub-angular blocky. This material often has low wet bearing strength. Colour ranges from reddish brown (5YR 4/8) to dull yellow orange (10YR 7/2). Grey and/or orange and/or red mottles are often present and increase in number with depth. The pH ranges from moderately acid (pH 5.0) to slightly acid (pH 6.0). Small rock fragments are commonly present, roots are few and charcoal fragments are rare or absent.

Occurrence and Relationships

Coarse sandstones and conglomerates. Generally up to 10 cm of brown loose loamy sand (**do1**) overlies 10–30 cm of hardsetting bleached yellowish brown clayey sand (**do2**) and 30–60 cm of earthy bright yellowish brown sandy clay loam (**do3**) [Yellow Earths (Gn2.24), Yellow Podzolic Soils (Dy2.21, Dy3.21) and Soloths (Dy2.41, Dy3.41)]. **do3** occasionally overlies up to 50 cm of massive pale grey clay (**do4**). Occasionally **do1** has been eroded away and **do2** is exposed at the surface. Total soil depth ranges between 50 and 150 cm, and the boundaries are all gradational except for that between **do2** and **do3** which is clear.

Occasionally **do1** and **do2** overlie bedrock [Siliceous Sands and Lithosols (Uc1.22)]. Total soil depth is <50 cm.

Fine-grained substrate material. Occasional lenses of fine-grained bedrock such as siltstone and mudstone occur which have up to 10 cm of **do1** overlying up to 30 cm of **do2** and >100 cm of strongly pedal clay (**do5**) [Yellow Podzolic Soils (Dy2.11, Dy3.21), Soloths (Dy2.41) some Red Podzolic Soils (Dr3.21)]. Total soil depth is 75–200 cm, and the boundaries between soil materials are usually sharp.

Drainage lines and footslopes. Up to 20 cm of **do1** overlies up to 30 cm of **do2** which in turn overlies >100 cm of **do4** [Grey Earths (Gn2.94), Yellow Leached Earths (Gn2.74), Soloths (Dy3.41) and Gleyed Podzolic Soils (Dg4.41)].

LIMITATIONS TO DEVELOPMENT

Landscape Limitations

Erosion hazard
Seasonal waterlogging (localised)
High run-on (footslopes)
Mine subsidence district
Foundation hazard (localised)

Soil Limitations

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| do1 | Very low fertility
Strongly acid
Stoniness (localised)
Low available water-holding capacity
High permeability
High potential aluminium toxicity
Sodicity |
| do2 | Very low fertility
Strongly acid
Hardsetting surface
Stoniness (localised)
Sodicity
High erodibility
High potential aluminium toxicity
Low available water-holding capacity |
| do3 | Very low fertility
Strongly acid
Stoniness (localised)
Hardsetting surface
High potential aluminium toxicity
Low available water-holding capacity |
| do4 | Very low fertility
Low permeability
Strongly acid
Stoniness (localised)
Sodicity
High potential aluminium toxicity |

do5	Low permeability Low wet bearing strength Low fertility High plasticity High potential aluminium toxicity Moderate–high shrink-swell Strongly acid
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Fertility

Fertility of soil materials is generally very low. The soils are shallow to moderately deep, are gravelly, strongly acid, sodic, have little organic matter, with low CEC and nutrient status, low available water-holding capacity and high potential aluminium toxicity. Soil volumes for root penetration are often limited on crests, ridges and upper slopes. The general soil fertility is low.

Erodibility

	K factor	Non-concentrated flows	Concentrated flows	Wind
do1	0.031	moderate	high	low
do2	0.041	high	high	low
do3	0.028	moderate	moderate	low
do4	0.029	moderate	moderate	low
do5	0.018	low	very high	low

Erosion Hazard

	Non-concentrated flows	Concentrated flows	Wind
grazing	moderate	slight	slight
cultivation	high	high	slight
urban	moderate	high	slight

Foundation Hazard

The foundation hazard is generally low. Isolated areas where >50 cm of **do5** siltstone and mudstone subsoil occur, a high foundation hazard exists with high shrink-swell, high plasticity, low wet bearing strength and very high erodibility. Depth to subsoil is 10–40 cm. Total soil depth is 100–200 cm.

Urban Capability

Generally moderate limitations for urban development. Localised areas where >50 cm of **do5** occur have high to severe limitations for urban development.

Rural Capability

High to severe limitations for cultivation and moderate limitations for grazing.

