

This Technical Data Sheet describes the *typical average properties* of the specified soil.

It is essentially a summary of information obtained from one or more profiles of this soil that were examined and described during the Topoclimate survey or previous surveys. It has been prepared in good faith by trained staff within time and budgetary limits. However, no responsibility or liability can be taken for the accuracy of the information and interpretations. Advise should be sought from soil and landuse experts before making landuse decisions on individual farms and paddocks. The characteristics of the soil at a specific location may differ in some details from those described here.

No warranties are expressed or implied unless stated.

Soil name: **Glenelg**

Overview

Glenelg soils occupy about 14,800 ha on the intermediate terraces of the Waiau and Aparima rivers. They are formed into gravelly alluvium from the tuffaceous greywacke and basic volcanic rocks of the Takitimu mountains. Glenelg soils are well drained, with silt loam topsoil texture. The soils are stony in both the topsoil and subsoil, which limits the rooting depth and water holding capacity. They are used mainly for sheep and beef grazing. Glenelg soils can be seasonally dry, particularly in inland areas.

Soil classification

NZ Soil Classification (NZSC):

Cemented Firm Brown; rounded-stony; tuffaceous sandstone; silty

Previous NZ Genetic Classification:

Moderately to strongly leached intergrade between yellow-brown loams and yellow-brown earths

Classification explanation

The NZSC of the Glenelg soils is consistent with the previous classification. Glenelg soils are formed in alluvial deposits dominated by tuffaceous greywacke gravel, and have a cemented pan in the subsoil. The soils have silty textures in the topsoil. P-retention varies between 30% and 85%, depending on the degree of leaching.

Soil phases and variants

Identified units in the Glenelg soils are:

- Glenelg undulating shallow (GIU3): has gravel above 45cm depth; occurs on slopes of 0–7°
- Glenelg undulating shallow imperfectly drained (GIU3vi): has gravel above 45cm depth; imperfect drainage; occurs on slope of 0–7°

The soil properties described in this Technical Data Sheet are based on the most common phase, Glenelg undulating shallow (GLU3). Values for other phases and variants can be taken as being similar.

Associated soils

Some soils that commonly occur in association with Glenelg soils are:

- Braxton: has poor drainage
- Drummond: deeper soil with gravel between 45–90cm
- Papatotara: similar land surface in the lower Waiau valley, but have gravel between 45–90cm depth; have higher P-retention (80%+) than the Drummond soils

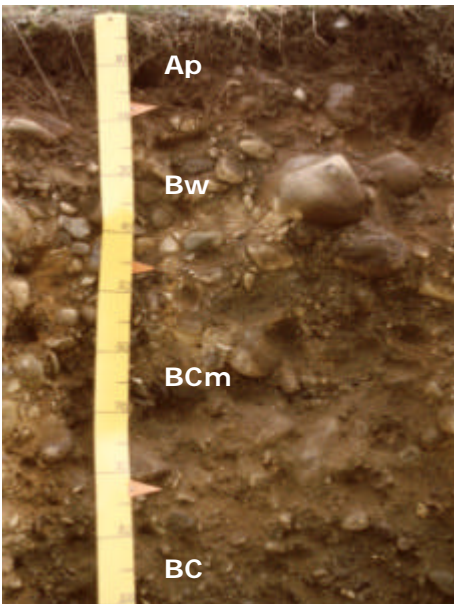
Similar soils

Some soils that have similar properties to Glenelg soils are:

- Monowai: formed on glacial outwash terraces; more strongly leached with P-retention consistently above 85%
- Oreti: formed on intermediate greywacke and schist terraces of the Oreti and Mataura rivers.

Typical profile features

The following is a 'generic' or composite profile description representing the most common combination of characteristics for this soil type. The actual profiles for which descriptions and data are available are listed at the end of this Technical Data Sheet.

Glenelg profile	Horizon	Depth (cm)	Description
	Ap	0–16	Brownish black slightly gravelly loamy silt; weak soil strength; moderately developed fine polyhedral structure; gravel slightly weathered and rounded; abundant roots
	Bw	16–45	Strong brown very gravelly loamy silt; compact particle packing; massive structure; gravel slightly weathered and rounded; abundant roots
	BCm	45–82	Greyish olive extremely gravelly sand; very dense particle packing; massive structure; gravel slightly weathered and rounded; no roots
	BC	82–90	Greyish olive extremely gravelly sand; dense particle packing; massive structure; gravel slightly weathered and rounded; no roots

Key profile features

Glenelg topsoils are 16–25cm deep and have moderate soil structure. Subsoils are generally structureless, due to the gravel, but strong leaching is reflected in the red-brown colours. They have a firm soil strength. Stones are slightly weathered throughout the profile. Pasture roots extend to 40–50 cm, with few roots at lower depths – depending on the gravel content and depth to the cemented pan.

Typical physical properties

Note: values in Italics are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ap	0–16	Low – Moderate	<i>Rapid</i>	Loamy silt	Slightly gravelly
Bw	16–45	–	<i>Rapid</i>	Loamy silt	Very gravelly
BCm	45–82	–	<i>Rapid</i>	Sand	Extremely gravelly
BC	82–90+	–	<i>Rapid</i>	Sand	Extremely gravelly

Profile drainage:	Well
Plant readily available water:	<i>Moderate–Low</i>
Potential rooting depth:	Shallow–slightly deep
Rooting restriction:	Extremely gravelly and cemented subsoil

Key physical properties

Rooting depth in Glenelg soils is restricted to varying degrees, depending on the gravel content and depth to the cemented pan in the subsoil. Plant available water varies from moderate to low depending on the quantity of gravel present. Textures are loamy silts and silt loams grading to sandy loams and sand. Topsoil clay content is 15–25%. Gravel occurs throughout the profile, with gravel content often above 70% in the subsoil.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ap	0–16	Moderate	High	High	Very low	Low	Low	Low	Low
Bw	16–45	Moderate	High	Moderate	Very low	Very low	Very low	Very low	Low
BCm	45–82	High	Moderate	Very low	Low	Very low	Very low	Very low	Low
BC	82–90	High	Low	Very low	Low	Very low	Very low	Very low	Low

Key chemical properties

Topsoil organic matter levels are 10–16%; P-retention values 50–75% and pH values moderate. Cation exchange values are high in the topsoil but decrease down the profile with base saturation values low. Available calcium, magnesium and potassium are low, as is reserve phosphorus and sulphur. Micro-nutrient levels are generally adequate.

Vulnerability to environmental degradation

Note: the vulnerability ratings given in the table below are generalised and should not be taken as absolutes for this soil type in all situations. The actual risk depends on the environmental and management conditions prevailing at a particular place and time. Specialist advice should be sought before making management decisions that may have environmental impacts. Where vulnerability ratings of Moderate to Very severe are indicated, advice may be sought from Environment Southland or a farm management consultant.

Vulnerability factor	Rating	Vulnerability compared to other Southland soils
Structural compaction	slight	These soils have a slight vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the good drainage, high organic matter and P-retention in the topsoil.
Nutrient leaching	very severe	These soils have a very severe vulnerability to leaching to groundwater. This rating reflects the low water-holding capacity and rapid permeability of the soil.
Topsoil erodibility by water	minimal	Due to the high organic matter level, the topsoil erodibility of these soils is minimal. Erodibility is highly dependent on management, particularly when there is no vegetation cover.
Organic matter loss	moderate	Vulnerability to long-term decline in soil organic matter levels is partly dependent on soil properties, and highly dependent on management practices (e.g., crop residue management and cultivation practices).
Waterlogging	nil	These soils have a nil vulnerability to waterlogging during wet periods. This rating reflects the good drainage and rapid permeability.

General landuse versatility ratings for Glenelg soils

Note: The versatility ratings in the table below are indicative of the major limitations for semi-intensive to intensive land use. These ratings differ from those used in the past in that sustainability factors are incorporated in the classification.

Refer to the Topoclimate district soil map or property soil map to determine which of the soil symbols listed below are applicable, then check the versatility ratings for that symbol in the appropriate table.

GIU3 (Glenelg undulating shallow)

GIU3vi (Glenelg undulating shallow imperfectly drained variant)

Versatility evaluation for soil GIU3, GIU3vi		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	shallow soils restricting root penetrability
Arable	Limited	shallow soil restricting root penetrability; stones
Intensive pasture	Moderate	Shallow soil
Forestry	Limited	Shallow soil restricting root penetrability

Soil profiles available for Glenelg soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
GIU3	CLT2	17	✓	✓	✓	
GIU3	YT12	9	✓	✓	✓	✓
GIU3	ZT1	43	✓	✓	✓	✓
Glu3vi	YT8	9	✓	✓	✓	✓
GIU3	KT6	5	✓	✓	✓	✓
GIU3	168/71/4	9	✓	✓		
GIU3	168/71/4	9	✓	✓		

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