

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: **Manapouri**

Overview

Manapouri soils occupy about 1300 ha on floodplains and low terraces in the Waiau valley. They are formed into fine alluvium derived from diorite, granite, tuffaceous greywacke and basic volcanic rocks. Manapouri soils are poorly drained, moderately deep to deep, and have silty textures. Present use is pastoral grazing with sheep and beef cattle. Climate is cool temperate with regular rainfall. Winters are cold.

Soil classification

NZ Soil Classification (NZSC):

Typic Recent Gley; Stoneless, silty

Previous NZ Genetic Classification:

Gley recent

Classification explanation

The NZSC for Manapouri soils is consistent with the previous classification. The soils are poorly drained due to a high groundwater table, and accumulation of sediment is sufficient that subsoils show little structural development. The soils are typically stone free, with silty textures.

Soil phases and variants

Identified units in the Manapouri soils are:

- Manapouri undulating deep (MpU1): has no gravel within 90cm depth; occurs on slopes of 0–7°
- Manapouri undulating moderately deep (MpU2): has gravel between 45 and 90cm depth; occurs on slopes of 0–7°

The soil properties described in this Technical Data Sheet are based on the most common phase, Manapouri undulating deep (MpU1). Values for other phases and variants can be taken as being similar. Where they differ significantly they are recorded with a separate versatility rating.

Associated soils

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

- Waiau: well drained, stony Recent soil from mixed Fiordland and Takitimu Mountains rocks; on slowly accumulating floodplain and low terraces
- Upukerora: well drained, stony Recent soil from mixed Fiordland and Takitimu Mountains rocks; on actively accumulating floodplain
- Otanomomo: very poorly drained peat soil

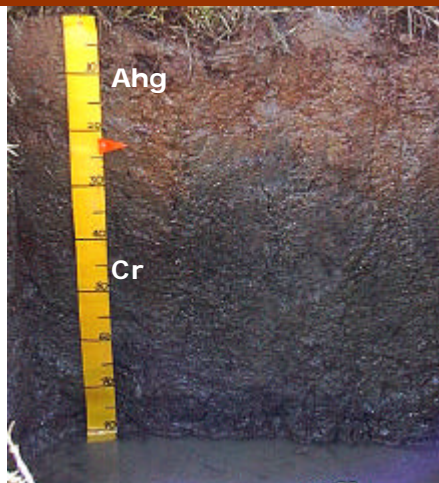
Similar soils

Some soils that have similar properties to Manapouri soils are:

- Dacre: occurs on floodplains of streams on the Southland plain; has acidic subsoils
- Jacobstown: occurs on floodplains of streams in eastern, northern and southern Southland and south Otago; they are more slowly accumulating with structured subsoils
- Braxton: moderately deep to deep Gley soil that occurs on terraces; has heavy silt loam to silty clay texture

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.

Manapouri profile	Horizon	Depth (cm)	Description
	Ahg	0–24	Brownish grey silt loam; common bright brown and dark reddish brown mottles; weakly developed medium polyhedral structure; common roots
	Cr	24–90+	Dark greenish grey silt loam; few dark reddish brown mottles; massive structure; common roots

Key profile features

Manapouri topsoils are 14–28cm deep with weakly developed structure. Subsoil structure is typically limited. The dominance of grey colours throughout the subsoil reflects the poor drainage of the soils.

Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ahg	0–24	Low – Moderate	<i>Moderate</i>	Silt loam	Gravel free
Cr	24–90+	Low – Moderate	<i>Slow</i>	Silt loam	Gravel free

Profile drainage: Poor
Plant readily available water: *High*
Potential rooting depth: Deep
Rooting restriction: Poor aeration in the subsoil

Key physical properties

Manapouri soils have a deep potential rooting depth, and high plant available water, but root development is likely to be limited by the poor aeration in the subsoil. Textures are silt loams with slightly peaty topsoil at some sites. Topsoil clay content is about 25–30%. The moderately deep phases have gravels between 45 and 90cm depth that will limit the rooting depth.

Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ahg	0–24	Moderate	High	High	High	High	Very high	Very low	Moderate
Cr	24–90+	Moderate	Very high	High	Moderate	High	High	Very low	Low

Key chemical properties

Topsoil organic matter values range from 8 to 13%; P-retention values 65–90%; pH values are moderate. Cation exchange values are high throughout the profile, with base saturation moderate to high. There are high levels of calcium and magnesium, but low potassium and sodium.

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 high organic matter and P-retention levels.
Nutrient leaching	slight	These soils have a slight vulnerability to leaching to groundwater. This rating reflects the slow permeability and high water-holding capacity.
Topsoil erodibility by water	slight	Due to the high organic matter and moderate clay levels, topsoil erodibility in these soils is slight. Erodibility is highly dependent on management, particularly when there is no vegetation cover.
Organic matter loss	minimal	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	severe	These soils have a severe vulnerability to waterlogging during wet periods. This rating reflects the poor drainage and slow permeability.

General landuse versatility ratings for Manapouri soils

Note: The versatility ratings in the table below are indicative of the major limitations for semi-intensive to intensive landuse. 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.

Manapouri undulating deep (MpU1)

Manapouri undulating moderately deep (MpU2)

Versatility evaluation for soil MpU1, MpU2		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Limited	Inadequate aeration during wet periods; risk of short-term waterlogging after heavy rain.
Arable	Limited	Inadequate aeration during wet periods; risk of short-term waterlogging after heavy rain.
Intensive pasture	Limited	Risk of short-term waterlogging after heavy rain.
Forestry	Limited	Inadequate aeration during wet periods; flooding risk.

Management practices that may improve soil versatility

- Careful management after heavy rain and wet periods will reduce the impact of short-term waterlogging. Intensive stocking, cultivation and heavy vehicle use should be minimised during these periods.
- Installation and maintenance of subsurface mole and tile drains will reduce the risk of short-term waterlogging.

Soil profiles available for Manapouri soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
MpU1	PT5	38	✓	✓	✓	✓
MpU1	KT5	5	✓	✓	✓	✓
MpU2	158/72/6	38	✓			

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