

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: **Upukerora**

### Overview

Upukerora soils occupy about 10,200 ha on active floodplains along the Waiau and Aparima rivers. They are formed into gravelly alluvium derived from the Fiordland, Takitimu, and Livingstone Mountains. Soils are variable due to the flood activity, but are typically gravelly with shallow rooting depth and moderate to low water holding capacity. They have sandy to light silt loam textures, are excessively well drained, and can be seasonally dry. Most areas of these soils are part of the flood channel of the Waiau and Aparima rivers, with fringe areas used for casual grazing with sheep and beef cattle. Climate is cool temperate with regular rainfall.

### Soil classification

**NZ Soil Classification (NZSC):** Typic Fluvial Recent; fragmental, granitic.

**Previous NZ Genetic Classification:** Recent

### Classification explanation

The NZSC of Upukerora soils is consistent with previous classifications. The soils are formed in mixed fluvial sediments dominated by granitic gravels (tuffaceous greywacke in the Mararoa, Wairaki and Aparima rivers). The soils are excessively well drained, with limited topsoil development, due to the dominance of gravel that occurs within 45cm depth. Texture is difficult to determine due to the gravel.

### Soil phases and variants

Identified units in the Upukerora soils are:

- Upukerora undulating shallow (UpU3): has gravel within 45cm depth; occurs on slopes of 0–7°

The soil properties described in this Technical Data Sheet are based on the most common phase, Upukerora undulating shallow (UpU3). 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 Upukerora soils are:

- Tuatapere: moderately deep to deep well drained soil; slightly older soil with more profile development
- Manapouri: moderately deep to deep poorly drained soil

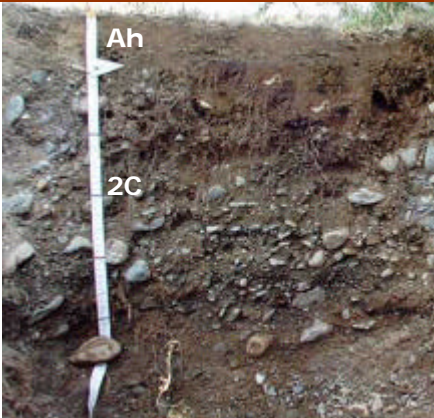
## Similar soils

Some soils that have similar properties to Upukerora soils are:

- Waiau: formed on the slowly accumulating floodplain and low terraces
- Riversdale: formed in mixed greywacke and schist gravels of the Mataura and Oreti rivers
- Howe: formed on the active floodplain of the Mataura and Oreti 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.

Upukerora profile	Horizon	Depth (cm)	Description
	Ah	0–9	Dark brown very slightly gravelly loamy silt; earthy structure; gravels rounded; abundant roots
	2C	9–90+	Brownish black extremely gravelly loamy sand; single grain structure; gravels rounded; many roots above 40cm

## Key profile features

Upukeroroa soils generally have a shallow topsoil that is weakly developed. There is no subsoil development into the gravels.

## Typical physical properties

Note: values in *Italics* are estimates

Horizon	Depth (cm)	Bulk density	Permeability	Texture	Gravel content
Ah	0–9	Moderate	<i>Rapid</i>	Loamy silt	Slightly gravelly
2C	9–90+	—	<i>Rapid</i>	Loamy sand	Extremely gravelly

**Profile drainage:** Well  
**Plant readily available water:** *Moderate*  
**Potential rooting depth:** Shallow  
**Rooting restriction:** Extremely gravelly subsoil

## Key physical properties

Upukerora soils have a shallow rooting depth, with moderate to low plant available water depending on the gravelliness of the subsoil. The soils are excessively well drained, with good aeration and rapid permeability. Textures are variable due to the gravels, with a topsoil clay content of 10–20%. Topsoils are often moderately to very gravelly, and very to extremely gravelly below.

## Typical chemical properties

Horizon	Depth (cm)	pH	P retention	CEC	BS	Ca	Mg	K	Na
Ah	0–9	Moderate	Low	Moderate	High	Moderate	Moderate	Moderate	Low
2C	9–90+	Moderate	Very low	Very low	High	Very low	Very low	Very low	Low

## Key chemical properties

The chemical properties of topsoils are variable. Typically organic matter content is about 3–6%, P-retention <30% and pH moderate (high 5s). Cation exchange is moderate to low with base saturation high. Available calcium, magnesium and potassium are moderate. Soil reserve phosphorus and sulphur levels are low. Micronutrient 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
<b>Structural compaction</b>	severe	These soils have a severe vulnerability to structural degradation by long-term cultivation, or compaction by heavy stocking and vehicles. This rating reflects the low clay, P-retention and organic matter content.
<b>Nutrient leaching</b>	very severe	These soils have a very severe vulnerability to leaching to groundwater. This rating reflects the good drainage, moderate–low water-holding capacity, and rapid permeability.
<b>Topsoil erodibility by water</b>	severe	Due to the low clay and organic matter levels, topsoil erodibility in these soils is severe. Erodibility is highly dependent on management, particularly when there is no vegetation cover.
<b>Organic matter loss</b>	severe	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).
<b>Waterlogging</b>	nil	These soils have a nil vulnerability to waterlogging during wet periods. This rating reflects the extremely well drained nature of the soil.

## General landuse versatility ratings for Upukerora 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.

### UpU3 (Upukerora undulating shallow)

Versatility evaluation for soil UpU3		
Landuse	Versatility rating	Main limitation
Non-arable horticulture	Unsuitable	Potential flood risk
Arable	Unsuitable	Potential flood risk
Intensive pasture	Limited	Potential flood risk; restricted rooting depth
Forestry	Unsuitable	Potential flood risk

### Management practices that may improve soil versatility

- Management of nutrient applications that minimise leaching losses
- Long-term cultivation should be carefully managed to minimise structural degradation
- Organic matter levels should be carefully maintained and enhanced

## Soil profiles available for Upukerora soils

Soil symbol	Profile ID	Topoclimate map sheet	Profile description available	Physical data available	Chemical data available	Profile photo available
UpU3	MT12	7	✓	✓	✓	✓
UpU3	CLT3	17	✓	✓	✓	✓
UpU3	PT3	38	✓	✓	✓	✓
UpU3	150/75/8	39	✓			

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