



# How to protect your well water

## Groundwater

### Groundwater contamination

Well water is drawn from groundwater resources. Groundwater originates from precipitation and surface water sources, like rivers and streams.

As this water moves down from the surface to recharge aquifers it can be affected by a range of human activities.

For example:

- leaching of chemicals/ seepage of contaminated stormwater at the land surface
- discharges from septic tanks/ underground fuel storage tanks below ground level.

The quality of groundwater is also influenced by its interaction with soil and rocks.

While this interaction can help remove some surface man-made contaminants, there are some naturally derived contaminants that can impact groundwater quality.

# How to minimise the risk

The best way to manage your drinking water supply is to protect the bore head and avoid likely sources of contamination.

This diagram provides a few tips for best practice.

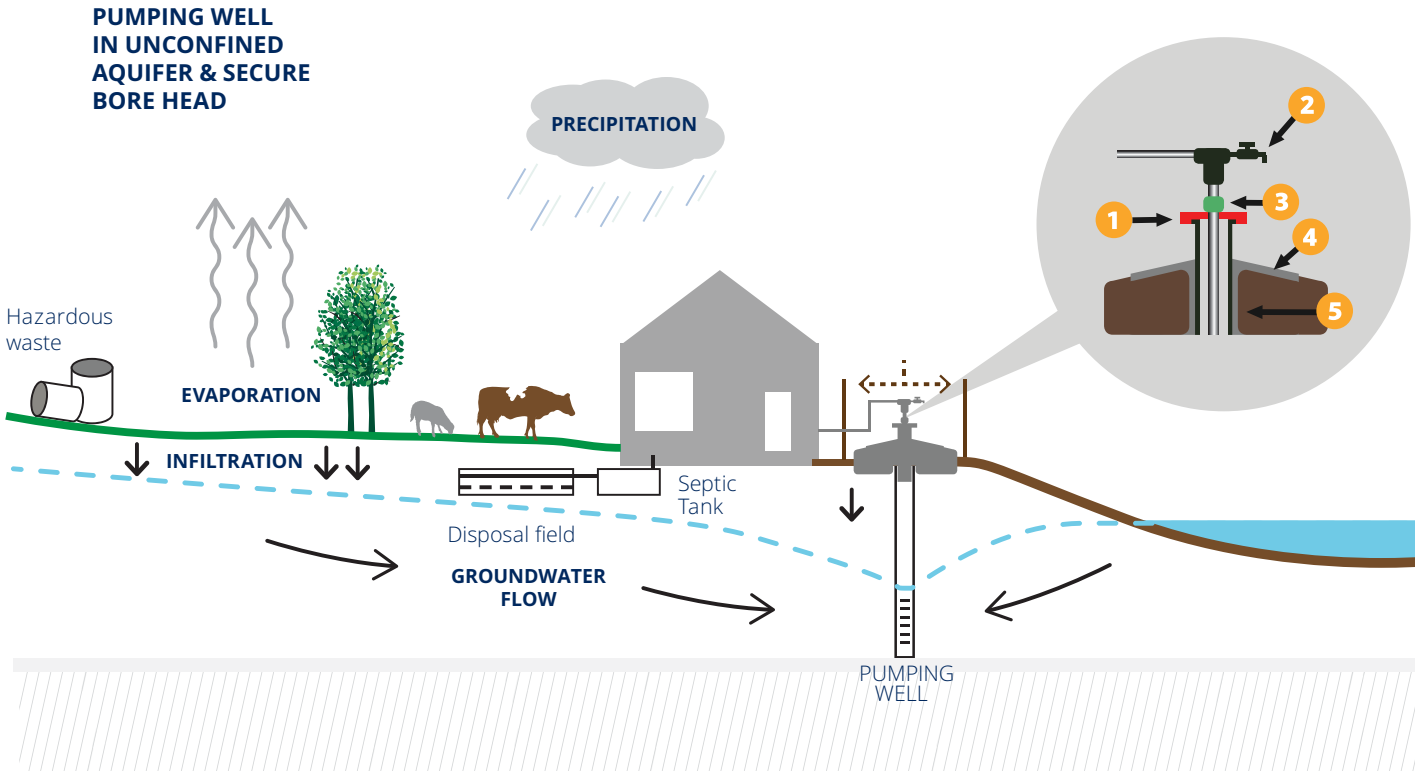
**1** The well casing must be elevated above ground and above stormwater and flood levels. The top of the well should be securely capped, and hoses or cables going into the well should be securely sealed.

**2** There must be a sample point to analyse the water if a problem is suspected.

**3** A backflow preventer must be installed to make sure no contaminants can siphon back into the bore.

**4** The area immediately around the bore casing must be sealed with a concrete apron that slopes away from the bore. This helps minimise any surface water flowing into the bore.

**5** A bentonite seal must be installed around the casing and should extend below ground level



## Arsenic

Arsenic levels in Otago groundwater are generally below the New Zealand Drinking Water Standards (NZDWS) Maximum Acceptable Value (MAV) of 0.01 mg/l. However, some samples from different groundwater basins around Otago have shown higher arsenic concentrations.

### Geological sources

Areas like Central Otago, the Wakatipu, and Wanaka basins, coincide with rock types (mainly schist) that contain minerals with high concentrations of arsenic. These rock types contain natural levels of arsenic that slowly leach out of the rocks and into the surrounding groundwater.

### Man-made contamination

Arsenic in groundwater can also originate from contaminated sites and old sheep dip sites. The distribution of elevated arsenic groundwater concentration varies across Otago and concentrations can fluctuate throughout the year.

It's important for bore owners to regularly test their water supply. It is also important to confirm the sampling procedures with the laboratory and ensure that the requested tests include arsenic.

## Test your water

The best way to check for potential water quality issues is to collect a water sample and have this tested by an independently accredited IANZ laboratory. Lab details can be found here:

[www.esr.cri.nz/expertise/water-environment](http://www.esr.cri.nz/expertise/water-environment)

## What to look for

The graphic below lists some parameters and the problems they cause. For more information go to: [www.health.govt.nz](http://www.health.govt.nz) and search for "groundwater bore".



Bacteria  
Viruses  
Protozoan cysts  
(Giardia, Cryptosporidium)

### Waterborne disease



Arsenic	Manganese
Boron	Nitrate and nitrite
Copper	Pesticides
Lead	

### Health problems



Colour, Hardness (total), Iron, pH, Taste and odour, Turbidity

**Taste, appearance, odour, staining, scale, corrosion**

*Direct signs of a contaminated water supply can be observed in its colour, odour, taste or cloudy appearance but there are other contaminants such as bacteria, nitrate and arsenic that cannot be seen.*

## Who looks after the water?

- Large water supplies: district or city councils
- Small water supplies: water suppliers
- Private water supply: landowners/self-suppliers who own their own water supply

## Who is responsible?

- Regional councils for the management of source catchments (*under the Resource Management Act*)
- Water suppliers for the water supply from the point of abstraction to the property (*under the Health Act*)
- Self-suppliers are covered by the Building Act 2004, which requires any building intended for use as a dwelling to have an adequate and convenient supply of water that is potable. Self-suppliers have to ensure their water is safe.

Further reading is available at: [www.health.govt.nz](http://www.health.govt.nz) (search: *household water supplies*). Advice around particular contaminants, individual water supply wells and groundwater quality is available from:

### Health Protection Officers

Public Health South  
Dunedin

[www.southernhealth.nz](http://www.southernhealth.nz)

Private Bag 1921, Dunedin 9054  
03 476 9800

Queenstown

PO Box 2180, Frankton Queenstown 9349  
03 450 9154

### Environmental Health Officer

Dunedin City Council

03 477 4000

Queenstown Lakes District Council

03 441 0499

Central Otago District Council

Alexandra

03 440 0056

Waitaki District Council Oamaru

03 433 0300 or 0800 108 081

Clutha District Council Balclutha

03 419 0200 or 0800 801 350

### Groundwater Scientists

Otago Regional Council

0800 474 082



Photos: QLDC



Visit [www.orc.govt.nz](http://www.orc.govt.nz)

or contact us on:

**0800 474 082**

ORC would like to acknowledge Horizons Regional Council for contributing to the information in this brochure