



Drinking Water

What is this?

Drinking water, also called potable water, is water that is safe to drink.

Why is it important?

Drinking water is an important environmental determinant of health.

Water is essential for life, but it can transmit disease. This can occur even in the wealthiest countries¹. Micro-organisms that can cause waterborne diseases include:

- Campylobacter
- Giardia
- Cryptosporidium

Waterborne disease can occur because water is insufficiently treated, the distribution system is inadequate (leaky or obsolete pipes), or there is unhygienic handling of stored household water supplies. Chemical contamination of water can be due to poor management of urban or industrial wastewater, agricultural runoff, or naturally occurring chemicals such as arsenic.

Drinking water management is crucial for the prevention and control of waterborne diseases. The availability of safe drinking water for all New Zealanders, irrespective of where they live, is a basic requirement for health. Safe drinking water contributes to community health and wellbeing, and also aids industrial and economic growth for our region.

Data²

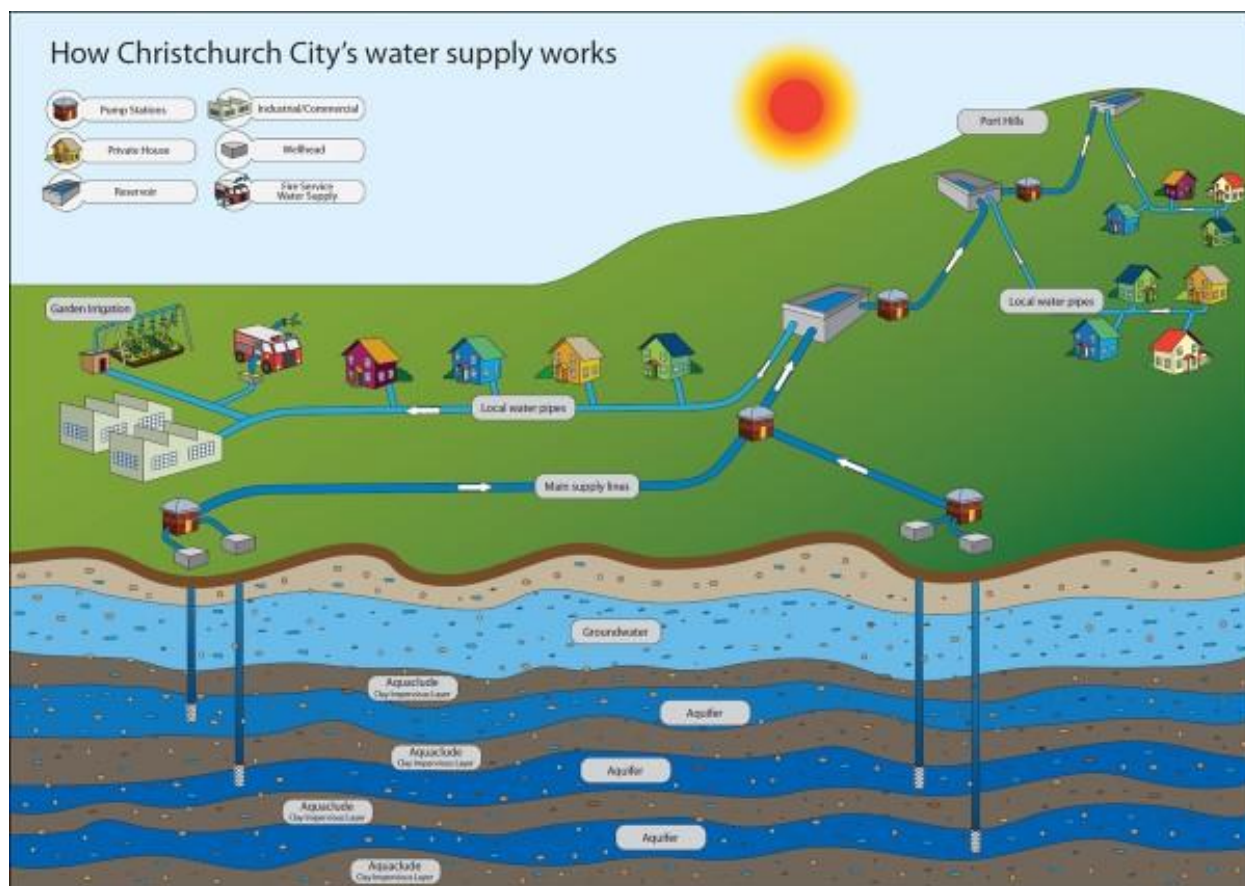
Most of Christchurch's drinking water comes from a series of groundwater aquifers that underlie the city. The water has been underground for a number of years (often decades), is not influenced by activity on the surface and has been naturally filtered by the layers of gravel that form the underground aquifers. Because of this, it is safe to drink without treatment.



Christchurch City Council operates 11 public water supplies that range from serving populations as small as 50 in Pigeon Bay to 255,000 in Christchurch Central. Not having to treat the water means that it has relatively low processing costs and is inexpensive to produce, compared to other cities in New Zealand. The exception is the North West Christchurch supply (serving 80,000 people) as it has some “younger” water mixed in to the supply. Work is being undertaken to replace those shallower wells with deeper, more secure water sources. Banks Peninsula’s water is sourced from a combination of surface water and shallow groundwater. Surface water is more at risk from activities in the catchment and always requires treatment to make it safe to drink.

The Christchurch City Council also maintains the public water supply infrastructure, which includes over 165 wells, several bulk storage reservoirs, more than 50 pumping stations, and over 3000km of piping. Water is delivered into water mains by electrically driven pumps keeping the mains pressurised and charged. Reservoirs help provide sufficient pressure to hill suburbs.

Figure 1. How Christchurch City’s water supply works³



The Health (Drinking Water) Amendment Act 2007⁴ requires compliance with the New Zealand Drinking Water Standards and it also requires water suppliers to prepare and implement Water Safety Plans.

The Drinking Water Standards for New Zealand⁵ are based on the World Health Organization guidelines. They establish maximum acceptable values (MAVs) for chemical and biological contaminants in New Zealand drinking water supplies.

All public water supplies managed by the City Council have approved Water Safety Plans. The latest annual review of drinking water quality in New Zealand found that 100% of the Christchurch City Council owned supplies (serving 343,890 people) received water from distribution zones that complied with Bacterial Standards, and 76% complied with Protozoal Standards. This is similar to the national rates of 96.8% and 80.0% compliance respectively⁶. The City Council operates a water testing laboratory and routinely tests drinking water for the presence of contaminants. The grading for most water supplies in New Zealand is available online in an easily searchable database.⁷.

Impact on inequalities

Those at greatest risk from contaminated drinking water supplies are children, older people and those who are in poor health. The drinking water supplied by Christchurch City Council is managed in accordance with the Drinking Water Standards to avoid risks to human health. However, not everyone has access to a Council managed supply. Some hospitals, schools, campgrounds and individuals or communities in rural areas have their own supplies. Private water supplies tend to be of poorer quality and these people or communities are at greater risk of waterborne illnesses. For these supplies, a Water Safety Plan is a useful tool that communities can implement themselves, but it is not a requirement.

Christchurch is one of the largest cities in the world to be able to source a compliant drinking water supply from groundwater with no treatment required. Although there are no immediate issues around the ability to serve the needs of the community, as demand on the aquifers increases, we are approaching the time when we will be using water faster than the aquifer can recharge. This will be worsened by future drought conditions due to climate change. Public water supplies in Banks Peninsula (other than Lyttelton Harbour Basin) which are often sourced from surface water already come under strain during summer periods when peak demand is coupled with lower stream flows. During these times, restrictions on outdoor water use are often put in place.



Solutions

Christchurch City Council has Water Safety Plans for their public water supplies. These plans outline how the City Council manages risks to the public water supplies to comply with Drinking Water Standards. These plans have been approved by Drinking Water Assessors at the Canterbury District Health Board, and use a risk management approach to governing water quality which features:

- Multiple barriers to reduce risk
- Identification of critical control points
- Management of catchments and aquifer intakes
- Appropriate treatment options
- Protection and maintenance of distribution systems

The City Council also has additional statutory plans and policies which contribute to the management of risks to the public drinking water supplies such as the City Plan⁸, District Plan⁹, the Greater Christchurch Urban Development Strategy¹⁰, the Christchurch City Council Water Supply Strategy 2009-2039¹¹, and the Christchurch City Council Surface Water Strategy 2009¹².

Improvements to public water supplies in Banks Peninsula and North West Christchurch have been identified in the City Council's Long-Term Council Community Plan 2009-2019¹³ as projects to be progressed.

Territorial authorities in Canterbury are also implementing the Canterbury Water Management Strategy.¹⁴ This strategy sets targets for water management in Canterbury for the next thirty years, to ensure that environmental, domestic and industrial demands for water are appropriately balanced. At a local level, zone committees will coordinate the implementation of area specific water strategies, including restrictions on supply for some organisations or industries.

Environment Canterbury (the regional council) administers the statutory framework for sustainable management of the region's resources, including sources of drinking water, through its Canterbury Land and Water Regional Plan¹⁵ and the Regional Policy Statement.¹⁶ Environment Canterbury policies restrict activities over areas where water is directly extracted or is recharging. Christchurch City Council also looks at options such as purchasing land surrounding water supplies where possible, or securing agreements which limit activities, like farming, that might contaminate the water supply.

"We never know the worth of water till the well is dry"

Thomas Fuller, Gnomologia, 1732



Data limitations

There are strong data collection systems in place to identify issues with public drinking water supplies. However, data on the quality of water for smaller supplies and non-council managed supplies are more limited as they are not required to be tested as frequently.

Connections with other issues

Contaminated Land, Recreational Water, Mahinga Kai.

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Prepared by Community and Public Health, a division of the Canterbury District Health Board.

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References

- ¹ World Health Organisation. (2010). *Water for health: WHO Guidelines for Drinking Water Quality*. Geneva: WHO.
http://www.who.int/water_sanitation_health/WHS_WWD2010_guidelines_2010_6_en.pdf
Accessed 27.07.2016.
- ² Information on drinking water was taken from Christchurch City Council's City Plan Monitoring, Ministry of Health Drinking-Water web site (www.drinkingwater.co.nz/), City Council Community Outcomes Monitoring, the Christchurch City Council Water Supply Strategy, and the Public Health Risk Management Plans for the public water supplies in urban Christchurch and Banks Peninsula, unless otherwise stated. Information has been verified by Judy Williamson, Drinking Water Assessor, CDHB.
- ³ <https://www.ccc.govt.nz/services/water-supply/learning-resources/where-our-water-comes-from/>
- ⁴ <http://www.legislation.co.nz/act/public/2007/0092/latest/DLM969835.html> Accessed 27.07.2016
- ⁵ Ministry of Health. (2008). *Drinking water standards for New Zealand 2005 (Revised 2008)*. Wellington: Ministry of Health.
<https://www.health.govt.nz/system/files/documents/publications/drinking-water-standards-2008-jun14.pdf> Accessed 27.07.2016
- ⁶ Ministry of Health. (2016.) *Annual Review of Drinking-water Quality in New Zealand 2015–2016*. <http://www.health.govt.nz/system/files/documents/publications/annual-report-drinking-water-quality-2014-2015-mar16.docx> Accessed 27.07.2016.
- ⁷ <http://www.drinkingwater.co.nz/supplies/supplies.asp>. Accessed 27.07.2016
- ⁸ <https://www.ccc.govt.nz/the-council/plans-strategies-policies-and-bylaws/plans/districtplans/operative-christchurch-city-plan/> Accessed 27.07.2016
- ⁹ <http://districtplan.ccc.govt.nz/PropertySearch/ContentContainer.html?page=districtplanhome>
Accessed 27.07.2016
- ¹⁰ <http://greaterchristchurch.org.nz/> Accessed 27.07.2016
- ¹¹ <https://www.ccc.govt.nz/assets/Documents/The-Council/Plans-Strategies-Policies-Bylaws/Strategies/WaterSupplyStrategy2009Full.pdf> Accessed 27.07.2016
- ¹² <https://www.ccc.govt.nz/assets/Documents/The-Council/Plans-Strategies-Policies-Bylaws/Strategies/SurfaceWaterStrategy2009.pdf> Accessed 27.07.2016
- ¹³ <https://www.ccc.govt.nz/assets/Documents/The-Council/Plans-Strategies-Policies-Bylaws/Plans/Long-Term-Plan/ltp2009/LTCCP2009-19Volume1-Intro-docs.pdf> Accessed 27.07.2016
- ¹⁴ <http://www.cwms.org.nz/> Accessed 27.07.2016
- ¹⁵ <http://www.ecan.govt.nz/OUR-RESPONSIBILITIES/REGIONAL-PLANS/LWRP/Pages/Default.aspx> Accessed 27.07.2016
- ¹⁶ <http://ecan.govt.nz/our-responsibilities/regional-plans/rps/Pages/regional-policy-statement.aspx> Accessed 27.07.2016

Read about the Te Pae Mahutonga Māori Health Model at
<http://www.hauora.co.nz/resources/tepaemahutongatxtvers.pdf>

