



# WELLINGTON

## The resilience question

Kaikoura's big shake has injected more urgency into a programme to ensure Wellington becomes more water resilient in the event of a major quake.  
By **Debra Harrington**, Water New Zealand Communications Advisor.

**T**he November shockwaves that shook the Wellington region's buildings – closing and condemning many in the central city – also rattled the capital's minds and helped focus the region on what could happen in the event of the big one striking

Mark Kinvig, Group Manager, Network Strategy and Planning at Wellington Water, says there's now a renewed focus on what the region needs to do to increase infrastructure resilience.

In a worst-case scenario some parts of the Wellington region could be without water for up to 100 days but over the next six months, Wellington Water, the Regional and City Councils will focus on how to encourage everyone in the region to store at least seven days of water. Wellington Water is also planning how to deal with wastewater in the event of a major disruption of Wellington's wastewater infrastructure.

"We have been working closely with our client councils for the past 18 months on water supply and wastewater resilience planning," says Kinvig.

"Then, after the November 2016 earthquake hit we are now working with local and central government to ensure that we understand what the priorities are in the short, medium and long term."

As well as ensuring that all Wellington residents have their own water stored to last at least seven days, a major part of Wellington Water's planning is addressing what will be needed after that first week following a major quake.

"It's also about what's going to happen during the time after the immediate aftermath but before broken infrastructure such as drinking water and wastewater networks are able to be restored. We have to understand what the alternative network options are and ensure we have planned for those other options."

The immediate programme, Kinvig says, effectively comes down to three distinct objectives.

"First, all residents need to be self-reliant for water for seven days because it's likely most of them will be without water in the network for a significantly longer period than that.

"Second, is how residents manage their sanitation needs after the wastewater pipes are seriously damaged and the city's wastewater system is no longer operating properly.

"Third, there's the operational response planning. In other words, making sure we understand what we need to do now to ensure that we are able to respond to the needs of the community after the initial seven days in terms of water supply and sanitation."

As part of the long term resilience planning for water supply, Wellington Water has also identified the significant projects that will be considered in councils' long term plans for the 2018/28 long term plan.

A major summit in December run by Wellington's new Mayor, Justin Lester made it clear that resilience has become a priority for the council. He pointed out that the earthquakes have reminded us that "we need to be moving faster".

Lester says there is a list of resilience upgrades urgently needed right across the city. These include strategic transport links such as the multimillion-dollar Transmission Gully roading link between Wellington and the Kapiti Coast.

Wellington's unique location at the bottom of the North Island surrounded by hills and sea and crossing a number of major fault lines means that the city's three main water supply treatment plants at Te Marua, Wainuiomata and Waterloo are remote from Wellington City and the western and southern suburbs. Key pipelines either cross major fault lines or run very close to them. Both Porirua and Wellington city residents are particularly vulnerable as all the water supply comes from pipes that have to cross the region's fault lines over a significant distance.

"Overall, we've got 400,000 people supplied via 2500 kilometres of pipe with the majority being a significant distance away from a water source," says Kinvig.



Long term projects underway to secure water supply for residents include a new 35 million-litre buried concrete reservoir above Prince of Wales Park in Mt Cook. This will provide an emergency water supply for major users and significantly increase water storage for the central business district in Wellington City. When finished, it will be buried under the ground and the surrounding area landscaped.

There is also a plan to build a cross harbour pipeline running between Lower Hutt and Wellington City. It could supply up to 33 million litres per day, about half the water normally supplied to Wellington City, as well as provide a supplementary or alternative supply to some parts of Wellington during normal operation or during maintenance of existing pipelines.

But there's a need to ensure Wellingtonians are prepared and able to be self-reliant, particularly in the short term.

Following the November quakes, there was a huge run on emergency 200 litre water tanks supplied by the councils – people had clearly woken up to the need for water storage.

Research has shown that up to 80 percent of Wellington residents claim to have stored emergency water.

“But we don't know that they've got enough for seven days. The message has to be that a couple of water bottles in the pantry won't go nearly far enough,” says Kinvig.

“We will be encouraging residents to store at least 20 litres per person per day.”

That's going to mean a major public engagement campaign in 2017.

One of the challenges facing the campaign is that storing a week's supply of water is far easier for some households than it is for others.

“What about apartment dwellers? How do they store water?”

Not only that, Kinvig points out that there could be up to 100,000 displaced people across the region in the event of a major quake, once, water pipes are broken and roads and rail links in and out of the city are damaged.

“This is 100,000 people who could literally be unable to get home or go back to their workplaces. What happens to them?”

The resilience work is finalising those answers but is focused on a multi-pronged approach between the immediate aftermath and the councils' ongoing 30 to 50 year pipe renewal



Konini Reservoir – Wainuiomata.

programmes, which include replacing at-risk pipes with new flexible earthquake-resilient pipes.

“You can't just focus on one part of the plan otherwise the whole system falls over after seven days or you wait 30 to 50 years before you're sufficiently resilient.

“Councils have done a lot of work in the past and are investing in resilience every year – renewing pipes, making reservoirs and pump stations stronger and installing emergency tanks.

“But we can't afford to wait 30 to 50 years to be sufficiently resilient – we need to encourage people to look after their own needs for the first week and have an operational plan in place to support the community beyond the first week.”

The short to medium term solutions will likely include suburban storage – this could take the form of giant water bladders that can be placed in car parks and sports grounds across the city. Some of these giant bladders can store up to one million litres of water. There is also discussion around containerised desalination plants, overland flexible piping and mobile water tankers.

Kinvig says, in the end, this is about risk reduction over the long term and closing the gaps through response programmes that are well integrated across the region. **WNZ**