WELLINGTON WATER

THREE WATERS REPORT AND OUTLOOK FOR THE QUARTER ENDED 30 SEPTEMBER 2014

WELLINGTON WATER

THREE WATERS REPORT AND OUTLOOK 1 July – 30 September 2014

Wellington Water was established through the merger of Capacity Infrastructure Services and the Water Supply Group of Greater Wellington Regional Council on 19 September 2014.

Every quarter, we intend to report against the water services outcomes our activities deliver on behalf of our client councils. We'll also include some headlines on what else the company has been up to, along with an overview of operating conditions.

Our job is to deliver the following three-waters outcomes for shareholders:

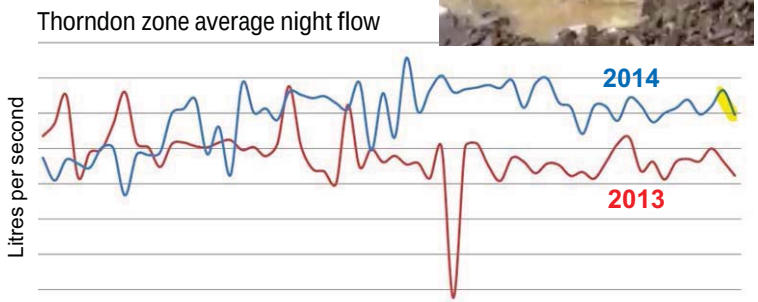
- Water across Wellington is **safe to drink**
- We are **respectful** to the environment
- Our networks are **resilient**, now and into the future.

We trust you enjoy reading it.

Colin Crampton, CE
Wellington Water Ltd

Leak busters

Tracking the rate of water flowing in metered zones during the very early hours of the morning (night flow) helps us identify leaks. This is a key tool in reducing water consumption.



When the blue line (this year) started bouncing above the red line (last year) in the Thorndon zone, this suggested a buried leak. Investigations revealed a service pipe that had snapped off the main, with water leaking into the ground. This break has been fixed.

Contents

WELLINGTON WATER

OPERATING CONDITIONS 1 July – 30 September 2014

Stable quarter allows solid progress on work programme

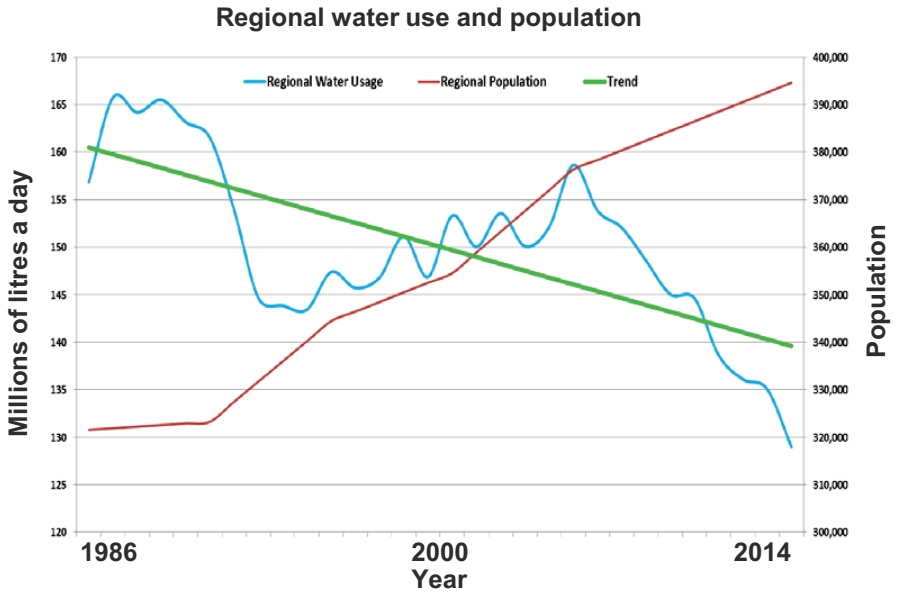
We have 282 capital works projects in our programme of work for clients for 2014-15, including 61 bulk water projects.

Progress has been good to date, with no major weather delays, or any other significant issues affecting project delivery at this stage.

The winter quarter holds the greatest risk to project delivery due to weather, while intense storms can lead to floods and slips. Protracted rainfall can even affect source water quality and supply management, as muddy river water is too expensive to treat. The forecast for the coming quarter is for 'average' rainfall.

There were no emergency events during the quarter, nor significant changes to operating or market conditions. Feedback from our suppliers indicates that with the Christchurch rebuild stabilising, the ability to service Wellington's needs is strong. This should ensure reasonable competition in tenders for work.

We are pleased to note there were **no injuries** to either Wellington Water staff or our contractors that resulted in lost time during the quarter.



Record low quarter for water

Water use in the region for the winter quarter (July – September) was the lowest for more than 30 years, despite the population of the four cities growing from just over 321,000 to around 400,000 in that time.

The September quarter is typically the lowest of the year, with the spring quarter generally the second highest.

WELLINGTON WATER

3 WATERS PERFORMANCE

1 July – 30 September 2014

OUTCOME 1. OUR WATER IS SAFE TO DRINK

Water quality standards all met this quarter

Water quality standards specify the maximum concentrations of microbial, chemical and radiological compounds in water acceptable for human health. The Drinking Water Standards of New Zealand also provide guidelines for aesthetic qualities, of taste, odour, and appearance. We achieved full compliance for the quarter.

Water supply conditions have been fair. River conditions meant we supplied water from storage lakes on 11 different occasions during the quarter, which is about average.

One storage lake was temporarily emptied to help in the treatment of geosmin, a harmless compound produced by bacteria that can affect taste.

At the same time we modified the newly installed lake liner. We found that as the lake emptied, different pressures above and beneath the liner could lead to it being damaged. The addition of small holes at the foot of the liner allows the pressure to equalise.

11,830,108,000 litres

delivered to 138,000 connections

Drinking water safety

Full compliance with the New Zealand Drinking Water Standards (DWSNZ 2005, 2008) for microbiological, chemical, aesthetic and reticulation measures

New connection applications

New connections are an indicator of growth. They are also a factor in our operating conditions.

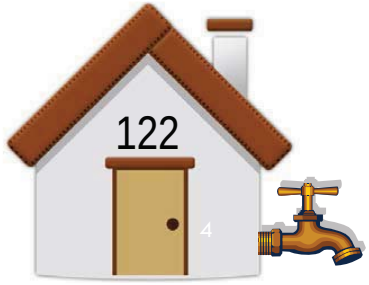
There are two phases or types of connection data. A new subdivision may require one application to serve dozens of future homes. Alternatively, subdivision for infill housing generally means an application as each new home is built.

We're interested in tracking this metric as a trend against other economic indicators, such as building consents.

Previous quarter

Previous year to date = 242

This quarter



Year to date (30 Sep) = 267

WELLINGTON WATER

3 WATERS PERFORMANCE

1 July – 30 September 2014

WATER SUPPLY NETWORK

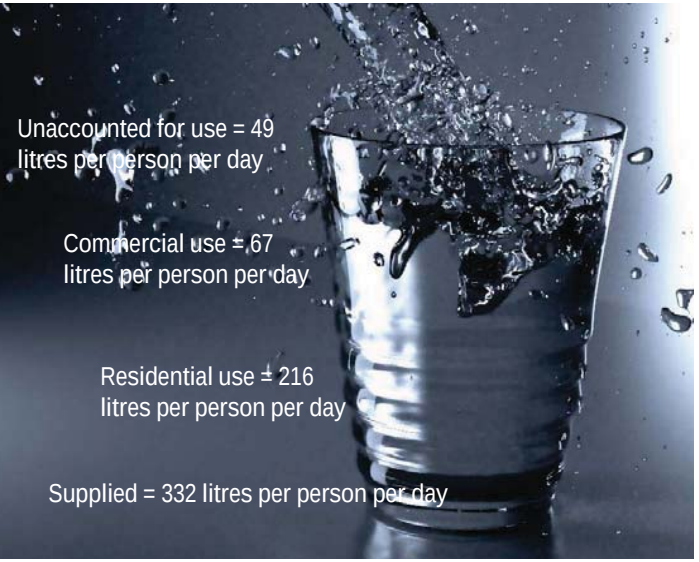
Why water use is declining

Leak detection and repair programmes, uptake of water efficient appliances including dual flush toilet cisterns, and water conservation education appear to be having an impact on the region's overall water use.

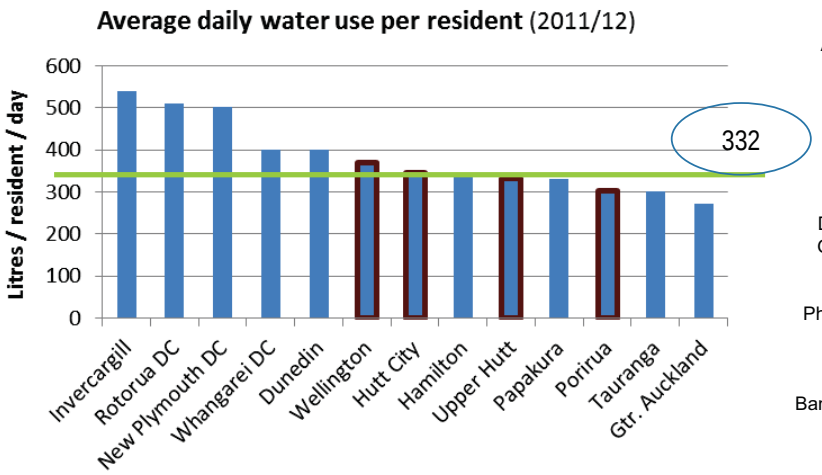
Without meters, we can only estimate where the water goes, but our best guess is that around 12-15% is lost through leakage or used in fire-fighting, hydrant flushing and other non-metered usage (including theft), Around 20-24% is used in commercial, metered premises – this figure differs from city to city. And at home we use the remaining 65% or so, or an estimated 210-225 litres each a day.

Despite the progress made, we can do a lot more. Effective water conservation measures will continue to push out the need to spend on expensive new storage and treatment infrastructure.

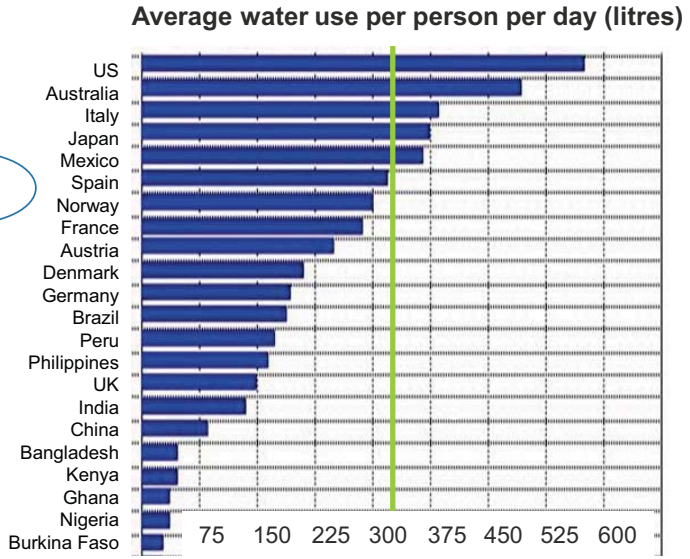
Water use by type (litres per person per day)



How we compare nationally ...



... and internationally



WELLINGTON WATER

3 WATERS PERFORMANCE

1 July – 30 September 2014

WATER SUPPLY OUTLOOK

The long range forecast: Fair

NIWA's three-month seasonal climate outlook for October-December predicts 75% probability of average or above-average river flows (80% for average or above-average rainfall) in the south-west of the North Island.

The chance of a weak El Nino weather event developing over the next three months is given as 67%. El Nino events tend to bring near-normal rainfall. This outlook doesn't raise any specific concerns for difficult water supply conditions during spring.

Over the three months July-September, total rainfall was below-normal in the Hutt catchment and near-normal in the Orongorongo and Wainuiomata catchments.

Hutt and Wainuiomata river flows were below average for September, having been above-average in August. The Hutt aquifer has been at near-normal levels for the last two months.

Waterloo treatment plant

Quality issues require investigations

Two separate source water quality issues have emerged that require additional treatment and/or maintenance work to ensure current standards are maintained.

One of the eight wells that provide water from the Waiwhetu aquifer (beneath Lower Hutt) to the Waterloo water treatment plant has been taken out of service temporarily due to iron bacteria. These bacteria are naturally-occurring and not harmful to health, but can reduce the clarity of water and so mask the presence of harmful organisms. The clarity of the water in the well is not presently sufficient to meet drinking-water standard maximums.

The aquifer provides around 40% of our drinking water needs. Six wells can deliver the maximum allowable water-take, so the immediate impact is a loss of backup, rather than a reduction in supply potential. Chlorine will be used to clean the well. We have the necessary resource consents to carry out this work, which will begin shortly.

Geological and Nuclear Sciences (GNS) has been engaged to investigate the possible causes of the iron bacteria and assess the level of risk that it poses. Findings from both the well cleaning and the well-field investigation report will guide our future steps.

At Te Marua, another naturally-occurring compound – geosmin – has raised concern about water quality in one of the two storage lakes. Water containing geosmin is safe to drink but can taste and smell 'earthy'. Geosmin in lake water isn't unusual and is commonly treated with activated carbon. However it spiked at an unusually high level last April, which prevented its complete removal from the treated water. The lake has since been emptied and refilled. Geosmin is currently present at a low level in one lake, which is easily treatable.

We've sourced a more effective activated carbon which will remove higher levels of geosmin – about three times more than we could last summer (which would have dealt with all but the very highest levels). We're also continuing investigations into the causes of geosmin and possible preventative solutions.

OUTCOME 2. RESPECT FOR THE ENVIRONMENT

Full resource consent compliance this quarter

There were five occasions during the quarter when partially treated wastewater was discharged from treatment plants. These were all associated with wet weather. These wet-weather overflows are a result of leakage and misconnections into the wastewater network. During periods of heavy rainfall, the increased volume of highly dilute wastewater can exceed the capacity of treatment plants. This is a known and common problem, and these discharges are consented by the Greater Wellington Regional Council.

A mechanical failure in a pumping station in Wellington resulted in untreated wastewater entering Wellington Harbour on September 10. GWRC did not record this incident as a breach of consent, due to our prompt response (via an alarm system) and follow-up actions taken.

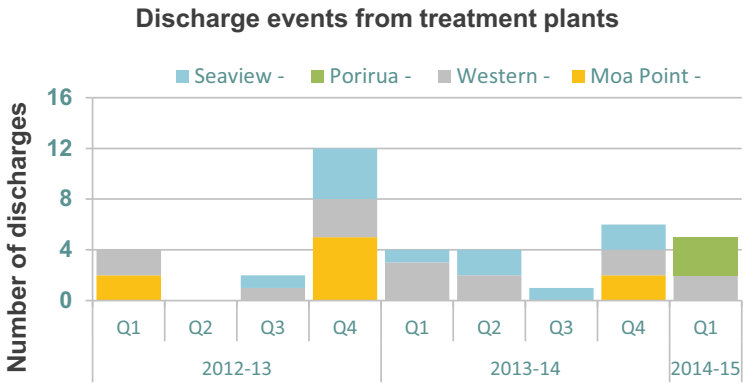
Consent compliance: Nature of work	Target	Track
Extracting water	Full compliance	✓
Discharging water	Full compliance	✓
Wastewater – dry weather overflows	Full compliance	✓ (No events)
Wastewater – wet weather overflows	Full compliance	✓ (5 events)
Stormwater discharges	Full compliance	✓
How we carry out our work	No issues this quarter	✓

WELLINGTON WATER

3 WATERS PERFORMANCE

1 July – 30 September 2014

WASTEWATER NETWORK



Discharge events, or overflows, are usually created by excess rainfall entering the wastewater network due to stormwater connections to wastewater pipes.

Wastewater treatment

Wellington Water is responsible for three wastewater treatment plants. One in Porirua serves the Porirua and north Wellington community. A small plant in Karori serves the approximately 14,000 residents of that suburb. And one at Moa Point serves the rest of Wellington city. A fourth plant at Seaview, Lower Hutt, serves the Hutt Valley including Wainuiomata.

The Porirua plant is the oldest and was commissioned in 1988. The Lower Hutt plant is the youngest, having been upgraded in 2001 to include full secondary treatment.

All four are activated sludge plants, meaning they use biological processes to treat waste. All must meet resource consent conditions that have common measures (for biochemical oxygen demand, suspended solid and faecal coliform counts), but the performance measures are slightly different for each plant.

The reason for these differences is the different outfall pipelines, receiving environments and requirements of councils at the time the consent was issued. Wellington City Council, for example, wanted a treatment plant that would not need to be expanded in the foreseeable future, due to the constrained area available for the plant. Hence Moa Point is the only one to have a long sea outfall.

The Hutt Valley plant discharges through a short outfall south of Pencarrow, well away from urban areas and into Cook Strait.

All wastewater treatment plants also have air discharge consents. As with effluent, these are also different due to the nature of the land use around the plant. The main Wellington plant is beside the airport with residential neighbours nearby. Both the Karori and Porirua plants are isolated from the public by green spaces and the Hutt Valley plant is in an industrial area.

All wastewater networks are affected by inflow and infiltration, which means increased flow to the plant during wet weather. Each of the plants has the ability to bypass this flow. Wellington, Karori and Porirua all screen this flow prior to discharge from normal outfall pipelines. Hutt Valley's plant can treat the full flow, but the outfall pipe cannot convey the peak flows to Pencarrow. This means bypass discharges from Seaview are fully treated but are discharged into the Waiwhetu stream instead of out the normal outfall. Each of the networks also has untreated bypasses upstream of the treatment plants during extreme wet weather events.

NATURAL RESOURCES

Regional Plan review

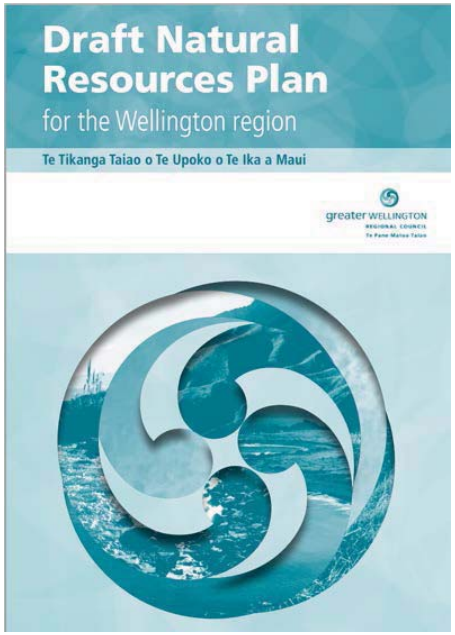
The draft Natural Resources Plan for the Wellington Region was released for public comment in mid-September by Greater Wellington Regional Council. When completed, it will replace the current five regional plans for discharges to land, soil, coast, air quality and freshwater.

Submissions and feedback on the draft close 30 November. Following that, a Proposed Regional Plan is due for release and a formal submissions process in mid-to-late 2015.

This draft plan builds on feedback, meetings and detailed analysis of plan provisions in the August 2013 "Working Document for Discussion" with Greater Wellington Regional Council's Environmental Policy Team. We have focused on the topics of water allocation, freshwater and coastal water quality, discharges of wastewater, discharges of stormwater and works in beds of streams and rivers. To date, the changes proposed to the Regional Plan provisions that would impact our work range in effect from minimal to significant.

Also, as part of the Regional Plan review process, five Whaitua (catchment) committees are being established by the Regional Council, with community representation, to examine water quality and allocation issues within each catchment. These committees will add catchment-specific chapters into the Regional Plan over the next few years, via plan variations or changes.

We anticipate providing technical support to the Whaitua committees and look forward to our continuing work as part of this collaborative process to strike a balance between protecting the region's precious natural assets and meeting the needs of people and their economic wellbeing.



The Natural Resources Plan will replace existing regional plans covering air, land and water management.

Wellington Water will be giving feedback to Te Upoko Taiao, the Natural Resource Management Committee, that oversees the plan review process.

WELLINGTON WATER

3 WATERS PERFORMANCE

1 July – 30 September 2014

OUTCOME 3. RESILIENCE

A resilient community plans for the future, adapts to change and is prepared for emergencies.

Resilience means that the water systems that we manage for councils are fit for and able to provide an agreed level of service, now and in future, with plans to deal with the unexpected.

Bulk water supply

Bulk water supply for Wellington's cities is vulnerable to a range of risks, including contamination, fire, flooding, loss of power or communications, earthquakes and shortage of source water.

The bulk water network of three surface-water collection areas (Hutt, Wainuiomata and Orongorongo) and the Waiwhetu aquifer, four water treatment plants and two storage lakes means adequate supply of treated water is available even if one water source or treatment plant is unavailable.

The two main pipelines that deliver water from treatment plants to the four cities are interconnected, so each city can be supplied from more than one source.

The twin Stuart Macaskill lakes (Te Marua) are a key part of water-supply resilience planning.

Stuart Macaskill lakes (Te Marua) facts:

3,350 million litres (ML)

maximum usable storage (untreated water)

Used when Hutt River water is too dirty to treat efficiently, such as after heavy rainfall, or when the river is too low to meet daily production needs, such as during a drought

Up to 80ML per day

can be treated from lakes (59% of average daily supply to the four cities)

42 days storage

from full, at max. daily production

(Assuming the maximum 80ML/day production and no refilling. During dry periods, use of lake water builds gradually as river-water availability declines.)

Heaviest use – 58%

maximum use of storage in a single event (summer 2008)

current days of water stored at max. daily production from lakes[1]

1: at 5/11/2014

WELLINGTON WATER

3 WATERS PERFORMANCE

1 July – 30 September 2014

NETWORK RESILIENCE

Key: On track | Minor concern | Concern

Network performance on track

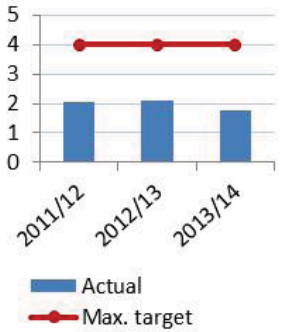
There were no major performance issues during the quarter.

A steel pile driven through a council wastewater main was repaired using remote cutting and relining processes.

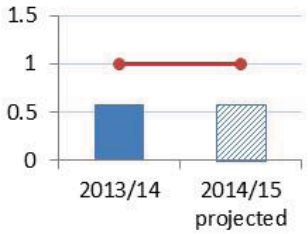
A section of the temporary stormwater main installed following the landslip in Priscilla Crescent, Wellington, was buried.

WATER

Unplanned water supply cuts

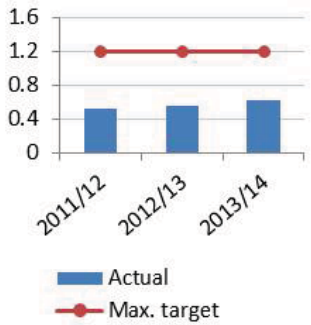


Attend time, urgent callouts

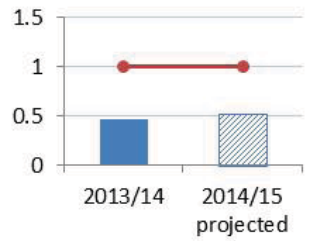


STORMWATER

Incidents per km of pipe

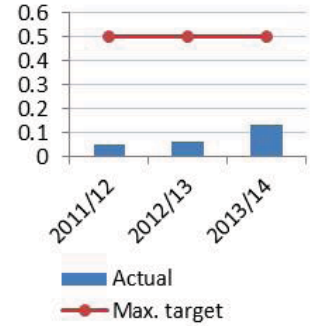


Attend time, overflows

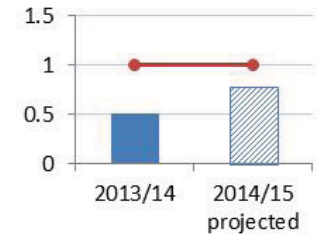


WASTE WATER

Blockages per km of pipe



Attend time, flooding events



NOTE: 2013/14 Attendance times measures exclude PCC.

HEALTH, SAFETY & CULTURE

Our vision: "Our people, suppliers and affected parties go home healthy and safe"

Health, Safety and Environment Manager appointed

Wellington Water is committed to health and safety. We've appointed a specialist H&S manager, Mike Spekreijse, to assume overall responsibility for this area. Mike reports directly to the CE.

"My goal is to make Wellington Water a leader in the area of health and safety. To me this is about getting us to a stage where we're proactive about seeking and reporting issues, not just reactive. Developing lead indicators, not just lag ones. Sure, that means we'll see an increased number of reports in this area – near misses for example. But to me that's a good thing. That's building a culture and understanding of good health and safety workplace practices as a part of our environment, not a compliance exercise. It's about taking health and safety focus from management reporting to the operational level."

"How we'll get there is why I'm here. Basically, everything's up for review, from existing policies and procedures to structures such as our Health and Safety committees. I'm a big fan of H&S committees, as knowledge and experience doesn't just sit with a few people. Auditing our performance against targets for things like training and industry meetings, as well as incidents, injuries, damage and the like will give us the information we need to improve and develop excellence. We'll be working to get as much of this in place as possible ahead of the new Health and Safety at Work Act coming into force from 1 April 2015."

"Prior to Wellington Water I've worked at Shell, BP, and Fulton Hogan. A long way back I worked at the Dunedin City Council and Wellington City Council in drainage engineering. So this is an area I've always had an interest in. Overall I've had 34 years experience in construction, with the last 15 in professional workplace health and safety management."

Steel shoring protects workers from potential collapses when carrying out work by open trenching.

Wellington Water requires contractors to shore trenches where workers will need to perform tasks, such as connecting pipes, at any risk of harm from collapses.

WELLINGTON WATER

BUSINESS PERFORMANCE

1 July – 30 September 2014

PROGRAMME DELIVERY

Commentary and outlook

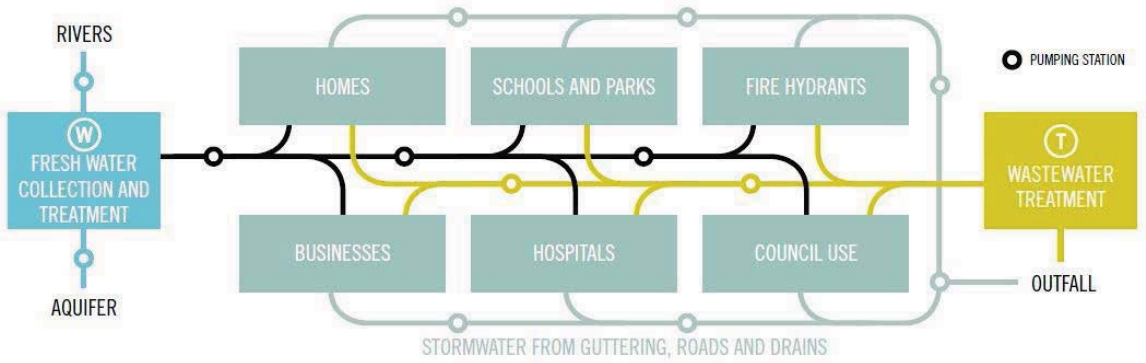
Wellington Water is managing 282 three-waters capital works projects for client councils during 2014-15. Overall we are on track to deliver this programme.

Project completions at this stage of the year are showing the typical lag behind expenditure. Five projects are off track as we work to resolve stakeholder issues. However, at this stage we see no factors that will significantly impact on our ability to deliver the programme to budget and schedule.

Three-waters assets under management	
Asset value	$2,767 million
Treatment plants	4 water, 3 wastewater
Pumping stations	251
Pipelines	6,670 km
Reservoirs	141
Connections	138,000

Key: On track; Minor concern; Concern

2014/15 programme	
Bulk water capital works	**61 projects, $7.5 million budget**
Retail water capital works	**75 projects, $18.2 million budget**
Stormwater capital works	**39 projects, $7.3 million budget**
Wastewater capital works	**68 projects, $22.4 million budget**



The three waters network