Wellington Water

Three Waters Report and Outlook

FOR THE QUARTER ENDED 30 JUNE 2015

Our water, our future.

Project manager Maria Maillo on site at a water main renewal project in Porirua. "This was an old asbestos-cement main which had a high risk of failure" Maria says. "Replacing it means the people of Titahi Bay will have a much more resilient supply."

Wellington Water has a $30 million programme of work for the region's drinking water network in the 2015-16 year. This work includes mains and pump station renewals, reservoir seismic upgrades, treatment plant replacements and telemetry improvements.

Market stays firm on projects, housing, and the falling dollar

Supplier feedback confirms wider reports and impacts of construction activity throughout the country. There are major infrastructure projects on the horizon for the Wellington region with the Transport Agency investing heavily in the region including the Transmission Gully and Mackays Crossing–Pekapeka highways. There is also significant work on the horizon strengthening 'earthquake prone' buildings. Auckland residential housing market constraints dominate headlines and we do expect a significant increase in activity up there, although to date this is not yet having significant impact here.

We note the capital goods price index for pipeline construction is trending higher than other civil construction categories. The fall in the NZ dollar may also increase pressure on construction supplies, at the very least through increased import and transport costs. We are monitoring these market forces and the impact these might have on market prices including material supply costs.

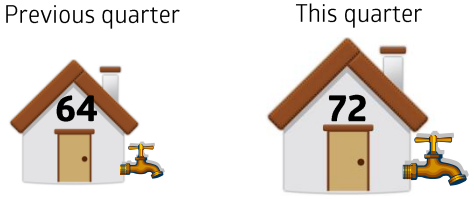
We're working with our consultants and contractors to ensure close alignment on a regional, integrated approach to health and safety ahead of new legislation.

The weather provided plenty of action for us over the quarter, with a swing from water restrictions to flooded properties within a month. This impacted on supply costs, notably electricity usage.

Contents

New connection applications

After a decline in the previous quarter, new connections have jumped, bringing the year to date figure slightly ahead of the previous year's.



Year to date = 136
This quarter, last year = 51
Year to date, last year = 127

OUTCOME 1

Our water is safe to drink

A quarter of two halves

We started in near drought, and ended with three 1%-2% probability floods affecting the region – all in all a great opportunity for us to engage with our stakeholders, and test our procedures.

Although rain in early April did little to replenish storage lakes, it did put a dampener on demand, to the point that we were confident in lifting garden watering restrictions with the end of daylight savings on 9 April*. We finished one of the driest summers on record with the lakes at about 50% capacity.

Lake One is still showing levels of geosmin higher than we'd like. Regular Outlook readers will know that geosmin is a harmless substance that can affect the taste of water. It's unusual to have levels this high at this time of time of year, so we've engaged the Cawthorn Institute to help us get a better understanding of what's going on. In the meantime we're not using Lake One water, and refreshing the lake when conditions are suitable.

As part of our investigation to update our data on the age of water in the Waiwhetu aquifer, we've been carrying out further testing and analysis. We expect conclusive information on this by October.

Within the extraction wells, iron bacteria remains a focus particularly with two (of the eight) aquifer bores. Two other bores have been out of service for turbidity, or cloudiness. We think some material may have been shaken up by the 24 April earthquake.

*With the exception of Upper Hutt, where restrictions remain in place year round

12,021.1 million litres of safe drinking water ✓ delivered to 138,500 connections.

In the same quarter last year (April – June 2014) we delivered 11,891.9 million litres.

This water met national drinking water standards, and our networks complied with Ministry of Health requirements. There were no reported incidents of public health relating to water.

High pressure cleaning equipment is guided into a Knights Road well casing. The casing extends 39 metres down from the surface.

OUTCOME 1

Our water is safe to drink

Safe water a feast for the senses

Drinking water delivered to our homes needs to tick the right boxes on four of our five senses – otherwise people tend to let their councils know about it. We expect water to not only be safe to drink, but to taste, look and smell great. And we want it to feel right too – in terms of pressure.

Most of the time, customers are happy with the product they receive – that is, they're not complaining about it. But from time to time we do get instances where the quality is not what people expect.

Changes in the quality of delivered water most often arise from local issues. Work being done on pipes, either by our contractors or on private jobs, can dislodge sediment. Air entering the system, during work perhaps to renew a pipe or repair a burst, can also create a cloudy appearance.

Another cause for complaints can be changes in the bulk supply mix. The four cities of the Wellington region receive water from four sources: the Hutt River, and the storage lakes at Te Marua, the Waiwhetu Aquifer and the Wainuiomata and Orongorongo rivers. Depending on where you live, you'll get a slightly different 'blend' of water from those four sources.

The chemical characteristics of each of these sources is slightly different, and that can affect taste. In addition, to meet Ministry of Health drinking water standards, we treat water to balance its acidity (pH), and add chlorine to disinfect the water.

Probably the biggest impact on bulk water taste and odour is the use of lake water. Most of the water we drink was flowing down a river two or three days ago, or has spent a year or more below ground. Lake water has been standing for some time, and that changes its quality.

Adding a significant amount of lake water, as we need to do when river supplies are too low or dirty to treat, can affect aesthetic qualities – but it is no less safe to drink. Often when we get a significant up-tick in complaint numbers, it's due to the introduction of lake water.

The fourth sense that water quality touches is, well, touch. With a gravity-fed system, pressure can be an issue for some hill-top houses. Developments carried out after reservoirs were installed can sometimes present a bit of a challenge for water supply, and some residents have had to install pumps.

One-off complaints about pressure might be sparked by a network burst. As the mains drain out due to the burst and the subsequent shutdown to make the repair, householders downstream of the break may notice and phone in a drop in pressure, before the water is cut off completely.

Clarity taste, odour and pressure complaints by city, for the previous quarter. None of these complaints were tracked back to a bulk supply issue.

	Clarity	Taste	Odour	Pressure
Hutt City	57	2	1	26
Porirua	1	4	0	4
Upper Hutt	9	1	1	1
Wellington	25	4	1	58

OUTCOME 2

We are respectful of the environment

Storms push up overflow events

The quarter was dominated by three intense rainfall events that overloaded stormwater networks, creating flooding. Due to inflow (mis-connected pipes) and infiltration (leakage) issues with networks across the four cities, these events led to wet-weather overflows at all four wastewater treatment plants, and four wastewater pump stations in each of Wellington and Hutt cities, and about 20 in Porirua. The Regional Council consents team was notified of all events.

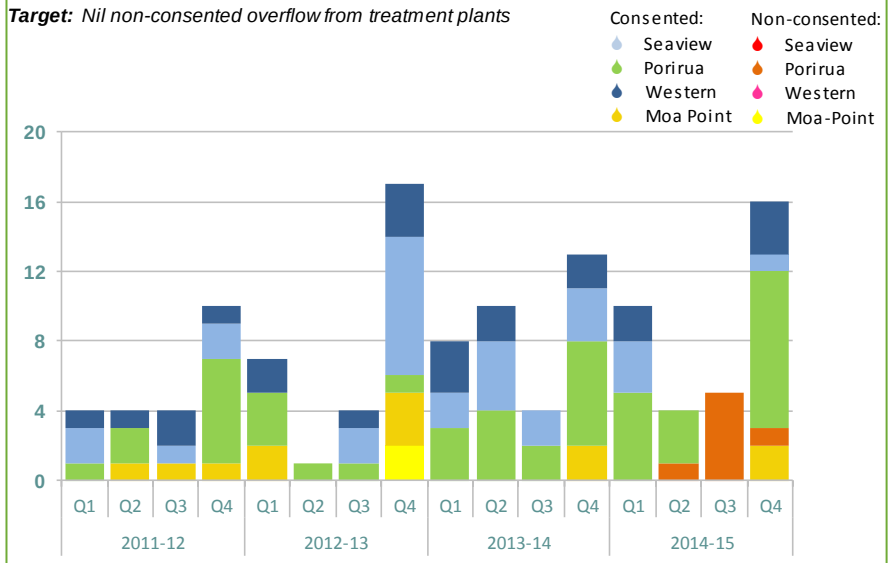
Consent compliance 1 Apr – 30 Jun 2015

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

As well as a non-consented overflow, the Porirua Wastewater Treatment Plant failed an effluent quality measure, after UV treatment equipment malfunctioned.

DISCHARGE EVENTS FROM TREATMENT PLANTS

Target: *Nil non-consented overflow from treatment plants*



The increase in discharges in Quarter 4 reflects the impact rain events have on our wastewater treatment plants.

Wet weather overflows from the network are consented provided we inform the Regional Council of their cause and duration. We had one non-consented overflow from the Porirua plant that prompted a query from the Regional Council. We are carrying out a major project to improve removing sludge from the wastewater treatment system. This will reduce the number of non-consented overflows.

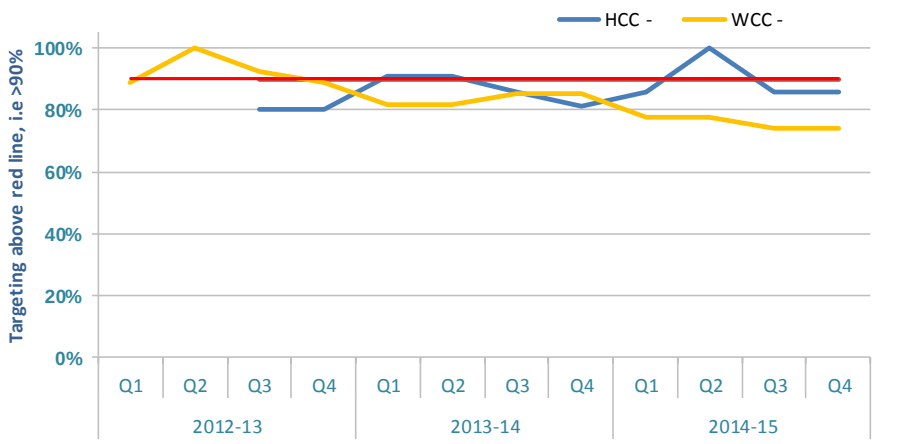
✗

OUTCOME 2

We are respectful of the environment

2.2 FRESH WATER QUALITY: % of sites compliant

Target: *90% of all freshwater sites have a rolling 12 month median < or = 1000cfu/100ml3*



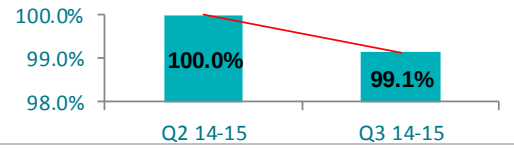
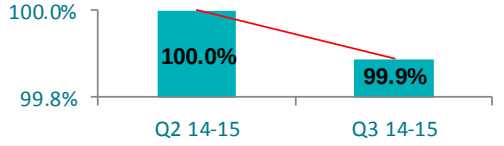
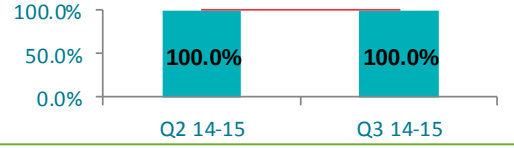
	Current	Target		Current	Target
HCC	86%	90%	PCC	Data due August-15	
UHCC	Data due August-15		WCC	74%	90%

Thirty-three freshwater sites have been monitored for several years in Wellington Hutt City, with monitoring in Porirua and Upper Hutt just under way. The decline in water quality is driving work in investigations, as well as information programmes.

HARBOUR QUALITY

Target: *Each monitored beach is open 90% of the days during bathing season (1 Nov - 31 Mar)*

Beach closures and wet/dry E.coli trend

	% of time beaches were closed (YTD)	% of time monitored beaches were open
Hutt City	0.5% ✓	
Porirua City Council	0.1% ✓	
Absolutely Positively Wellington City Council	0.0% ✓	

Bathing beach water quality remained within target for the two summer quarters.

OUTCOME 2

We are respectful of the environment

New measures shape strategy into action

Respect for the environment is one of our three key outcomes, and as such drives not only company and staff performance measurements, but how we work with our suppliers and communities.

Along with our Resilience outcome, we're developing metrics and targets that provide an account of our work in a way such that our clients and customers can see a direct link from levels of service, to key performance measures, to outcomes.

The aim is to create a picture that's easy to understand, as well as informative. Our performance measurement should improve transparency and accountability, by making it clearer what we're trying to achieve, how we're doing it, and how we're going. And it should show the relationship between investment and outcomes.

Ultimately, providing a better, broader understanding of these critical areas will improve knowledge in the community of three waters issues. Building this community awareness is itself one of our objectives.

The table (right) shows the performance metrics we're developing to tell a more complete story of the impact our activity has on the environment.

High level outcomes, on the left of the table, are achieved through performance in the related areas in the Commentary column. Each performance aspect would have its own measurement. For example, waste generation (at the top of the table) might decline if we employ successful strategies to reduce wastewater inputs, or are better at de-watering sludge (see next page).

Each aspect could then also be seen as a "lever" that can be pulled this way or that to achieve the desired effect.

Taken as a whole, the suite of measures and the outcomes will generate a commentary or narrative that helps keep track of our performance, and understand where we need to focus attention or investment.

Respectful of the Environment	Performance Commentary
We minimise waste	We generate waste from our regional water treatment plants and wastewater treatment plants which is deposited in various landfill sites
	Where possible we reduce the volume of waste arising from our processes by removing water
	BUT we do generate large volumes of waste from our treatment processes
We minimise our impact on waterways and the ocean	Our beaches are open for bathing more than 95% of the time
	The majority of our network overflows are within consented conditions
	BUT we do have overflows during wet weather and inflow and infiltration is an issue across the region
We minimise our impact on the natural and built environment	Our operations and improvement works are generally undertaken in accordance with consent conditions
	We generally mitigate the visual impact of our works on the environment
	BUT we know we have an impact on the harbour environment but we don't have sufficient information to understand the overall impact
We influence people's behaviour to minimise impact on the environment	We have a range of regional initiatives that contribute towards influencing people's behaviour
	Our customer surveys suggest that our customers understand the value of water and the impact they have on the environment
	The use of water per capita has been reducing over time
	BUT there is an opportunity to consolidate our education work across the region

OUTCOME 2

We are respectful of the environment

Getting to grips with sludge

Sludge is created at both ends of the water use cycle. That is, both drinking water and wastewater treatment plants generate sludge, and quite a lot of it.

At the supply end, sludge is what's left after the chemical coagulant used to attract and remove dirt from supply sources is collected and dried. And in wastewater, sludge is what remains after wastewater is biologically treated and the treated water is discharged to sea.

Extracting as much water as possible from sludge is important, as it reduces the volume to be disposed of, and therefore the cost to councils, ratepayers and the environment. Up to 40 tonnes of sludge a day is produced at Moa Point Wastewater Treatment plant, the largest in the region. But even water supply creates sludge, with 20 tonnes a month produced by the water treatment processes at Te Marua.

De-watered sludge is disposed of at landfills in Wellington, the Hutt Valley and Porirua.

Sludge from Moa Point is conveyed by pipe to the Southern landfill at Carey's Gully - a journey of some 8km. There it is de-watered by centrifuge, mixed with domestic and commercial waste and buried. The water extracted by the centrifuge is piped back to Moa Point for treatment. For Porirua and the Hutt Valley, as for Te Marua and Wanuiomata drinking water treatment plant, centrifuging is carried out onsite, and the remainder then trucked to landfill.

The Hutt Valley wastewater treatment plant has a sludge drier, which is a further treatment step to remove even more water after the centrifuge operation. This makes a product that is dry enough to be spread over land as a fertiliser, and some of the dried sludge is disposed of on forest land. The rest of it, as for that from Wellington and Porirua, is sent to the landfill.

Sludge management and disposal is a major cost and challenge for water utilities the world over. Studies looking at further treatment or processing to provide some useful outcome from this by-product often find transport costs outweigh any benefits obtained. That doesn't stop us looking for opportunities to minimise the amounts of sludge we are dealing with. For starters, we're looking at ways to get more water out of sludge at the Porirua treatment plant.

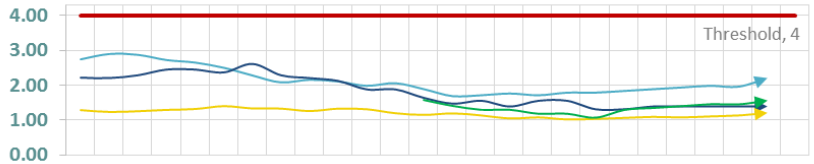
Sludge holding tanks at Carey's Gully were relined and re-roofed recently.

OUTCOME 3

Networks that are resilient, now and in the future

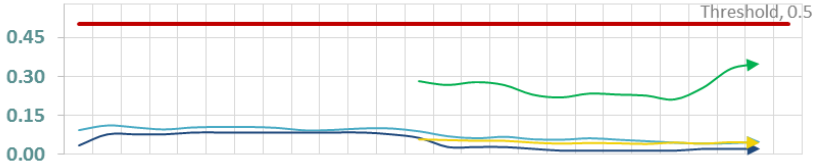
THREE WATERS NETWORK AVAILABLE TO CUSTOMERS

WATER pipe bursts per 1000 connections



✓

STORMWATER incidents per km



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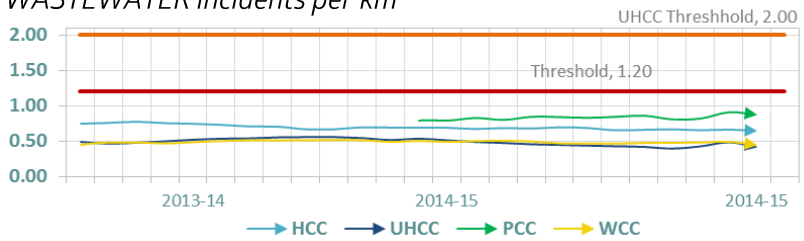
WASTEWATER incidents per km

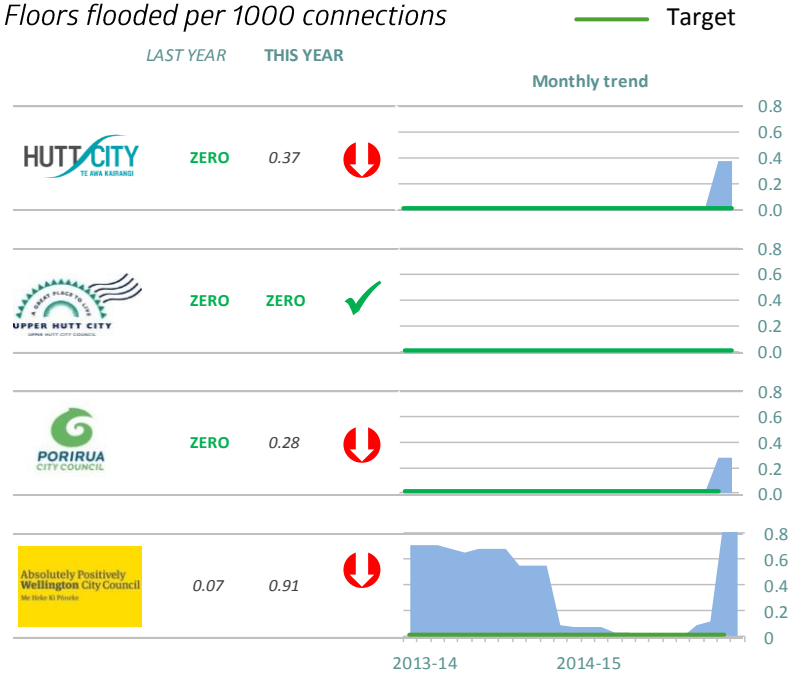


✓

Pipe bursts and blockages are below target thresholds. A fall in the rate of bursts implies that scheduled renewals are taking place in the right areas, and before it's too late. Stormwater and wastewater 'incidents' are mainly blockages. A jump in the stormwater numbers (eg PCC) could be a result of floodwaters washing debris into the system.

FLOOD EVENTS REDUCE

Floors flooded per 1000 connections



Floods caused by three low-probability storms saw dwellings inundated in three cities in the past quarter. Zero floors flooded is the target; the goal is for the trend over time to be heading towards the target.

OUTCOME 3

Networks that are resilient, now and in the future

High intensity rain storms wreak havoc on homes and traffic

We recorded 77 dwellings where stormwater entered habitable rooms, and another 61 properties where basements and garages were flooded, as a result of the three intense rainstorms that hit the Wellington region in late April and early May. Only Upper Hutt was spared as streams flooded and roads became rivers when piped networks were overwhelmed in the downpours.

Wellington Water mobilised our internal emergency response procedures to help coordinate the work of contractors and our own staff out in the field, as they worked to clear drains blocked by storm debris, help people affected by the flooding, and report on the extent of the flooding.

Stormwater networks are designed to deliver a level of service relating to rainfall event probabilities. Historically, the cities' pipes and drains were built to cope with 1-in-5 to 1-in-10 year storms (that is, with a 10-20% probability of being exceeded in any one year).

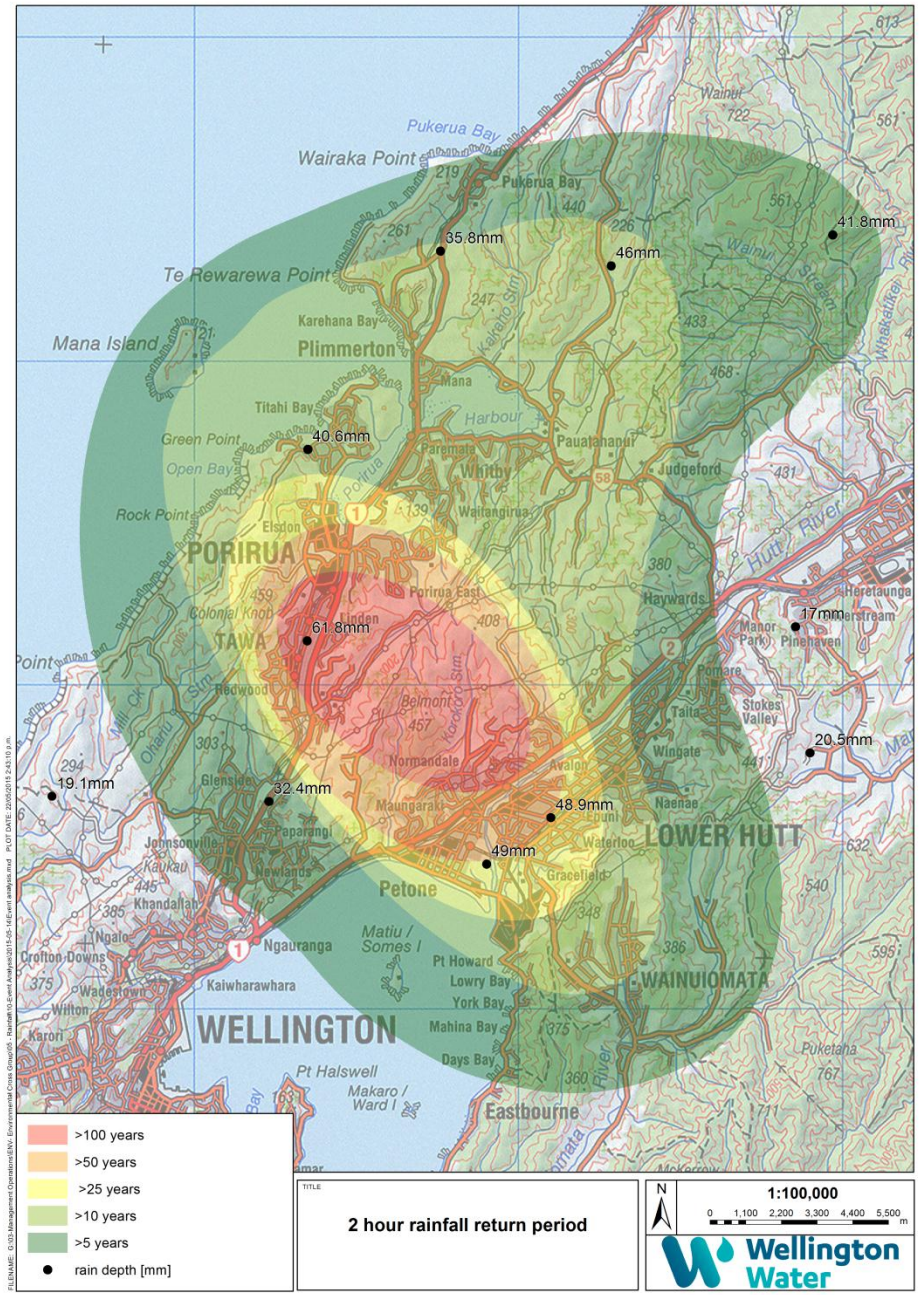
Over time, expectations and standards have improved, but of course existing infrastructure is still in place. The storms that caused such damage in April and May were around 1% probability ("one-in-100 year") events at their most intense.

When pipes and drains are overloaded, the plan is that surface water will follow roads and other designed overlandflow paths on its way to the sea. If these paths are obstructed, that's when water starts entering homes and businesses.

Resilience in this respect will be a matter not just of infrastructure upgrades and replacements, but of working with those people affected to co-develop solutions and mitigation measures.

Since the floods we've been working hard with our engineering partners to both prioritise areas for work, and develop solutions to reduce the risk of further flooding. There seems little question, however, that regardless of the probability measures, we'll face more challenges like this in the future.

Rainfall areas are generated using data from monitoring stations. The red zone indicates rain intensity with a 1% or lower probability of occurring in any one year



OUTCOME 3

Networks that are resilient, now and in the future

Resilience measures take shape

In previous issues of this report we've noted that we're developing a regional approach to resilience that would include a suite of performance measures. As with our Respect for the environment performance, we think these measures will work best in the context of an overall account, or narrative, to describe both our long term aims and medium term objectives for resilience. This will also make the links from outcomes, to strategies, to actions and performance clearer.

The 20-or so performance measures and seven strategic goals in the table (right) make up a picture of the region's state of resilience with respect to the three waters, as defined by network reliability, protection of people and property, preparation for the unexpected, and overall stewardship or custodial duty.

In common with the Respect measures, these too are being finalised for the 2015-16 year, and we expect to begin reporting on them in the next issue of the Outlook.

Resilient Now and in the Future	Performance Commentary
We minimise 3 waters service outages and impact on our customers	We minimise 3 waters service outages through efficient reactive maintenance and planned annual renewals
	Our customers are satisfied overall
	Our data suggests that we have relatively low volumes of blockages, breakages and bursts
We minimise the impact of flooding on people's lives	The flooding trends across the cities are not reducing over time
	We have had repeat flooding events in specific areas that are impacting people's lives and businesses
We provide an appropriate regional wide fire-fighting water supply	Our fire hydrant testing data suggests that our hydrants have a high level of compliance
	Property has not been destroyed by fire as a result of a poor performing fire hydrant
	BUT we don't have fire hydrants in all streets and we have not tested all hydrants
We operate and manage assets that are safe for our suppliers, people and customers	We are preparing our organisation for the legislative changes in health and safety
	BUT We do not yet have comprehensive reporting of health and safety issues to enable us to understand our current baseline
We plan for seismic resilience	We continue to renew our pipe network which increases its resilience over time and a significant amount of seismic retrofitting has been undertaken on key 3 waters assets across the Region.
	BUT We have a variable level of seismic resilience across the 3 waters
	Critical water services cross the fault line in several locations
	We have insufficient storage in high demand areas
	A significant % of the region's reticulation network is made up of fragile materials
	All infrastructure providers have not necessarily planned in an integrated way
We minimise the risks associated with the loss of water services due to land movement	We don't have high incidents of land movement impacting our water services
	BUT we don't fully understand the extent of the risks across the region
We plan for sustainable water sources, future demand, growth and climate change	We have planned for the provision of potable water over the next 30 years based on demographic trends
	The majority of our waste water treatment plants have the capacity to deal with population growth
	We allow for climate change in the design of our stormwater pipes and future demand modelling for potable water
	BUT one of our regional waste water treatment plants is at 100% capacity during wet weather due to inflow and infiltration and we have not yet taken a holistic regional approach to our climate change response

Wellington Water

Wellington Water: Health and Safety

Incident reporting improves learning

We're improving our reporting and visibility of incidents as we work towards our vision that "our people, suppliers and affected parties go home healthy and safe".

The top table (right) records all incidents, including near hit incidents. First Aid Injuries (below) is all work injuries treated by first aid techniques.

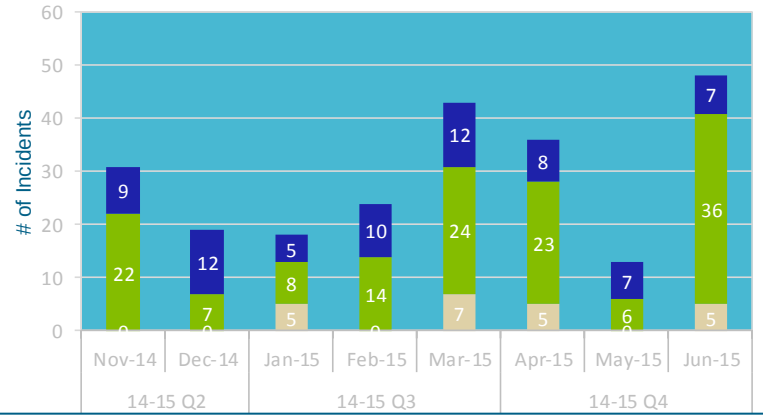
During the quarter there was one serious injury to a member of the public, whose motor scooter hit uneven ground at a worksite. Incorrect temporary traffic management was identified as a contributing factor. We've taken a number of steps as a result, including upskilling our staff on what to look for in this area, and requiring more detailed site specific safety management information from contractors.

The table at the far right shows we still have some way to go to get better information from our contractors and consultants on their health and safety performance.

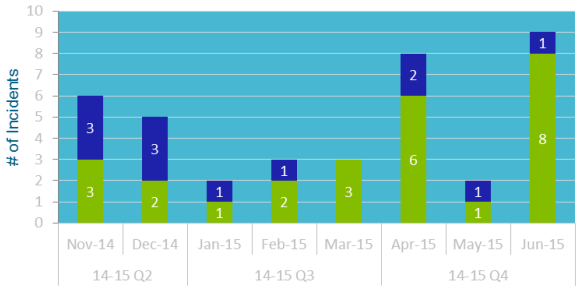
All Health and Safety Incidents

(includes first aid injuries, injuries , lost time injuries, medical treatment injuries, return to work injuries, serious harm injuries, moderate injury, near hit /miss incidents and hazards)

Benchmarking data has been obtained from the Business Leaders Safety Forum. WWL is comparing performance to the forum's figures for the mining, utilities and work management industry. This is the sector Watercare are contributing data to.

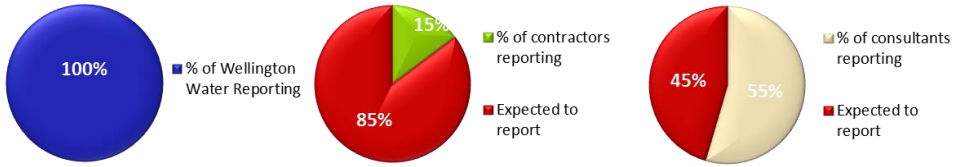


First Aid Injuries



Percentage of organisations reporting out of number expected

(as at May 2015)



Wellington Water: Programme delivery

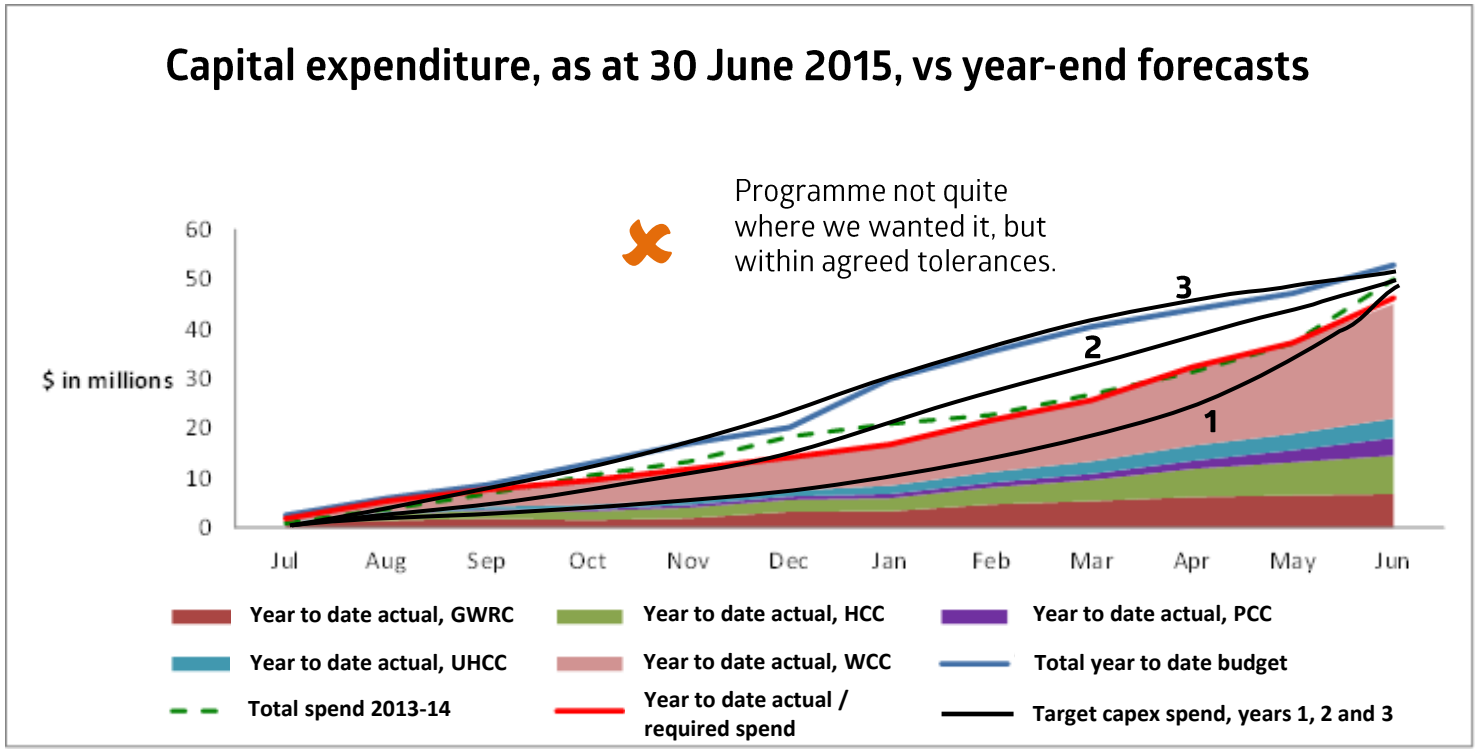
Early design briefs set up 2015-16 works programme

The capital works programme ramped up within the last quarter as forecast. Overall at year-end we achieved a project completion rate of 89% across the programme. 7% of projects were off track but significantly completed, and 4% of projects were on hold by councils.

Our year end budget variance after carry forwards was $1.45 million or approximately 2.4%.

We increased our carry forwards approved by Councils to $8 million, of which $5million is related to reprioritising work for Porirua City Council and the deferral of the Porirua harbour wastewater pipeline project. The extra carry forwards were agreed by Councils to allow for construction activity that could not be completed by the end of June.

The GWRC programme was revised earlier in the financial year to compensate for deferred projects, the revised programme has been delivered. A drop off in reactive maintenance as well as project savings increased year end underspend to 7.3% ($550,000), after carry forwards of $216,000.



We have progressed our "fast forward" programme in the last quarter, with over 90% of 2015-16 designs under way. We are also working through the 2016-17 programme – with the aim of having the majority of design briefs completed before October and all designs completed before July 2016.

Our capex spend target this year was line 2. The actual spend (red line) shows that programmes were carried out at a reasonably steady pace for most of the year, with a jump in the last quarter that still left us short of the target spend. We're aiming to smooth that line, so the bulk of the work is in progress by quarter three (line 3), and we complete the entire programme.

Wellington Water: National and local agendas

Staff members of Wellington Water, some of whom really should know better, brace themselves ahead of a mid-winter dip at Petone Beach. On the day, the wind-chill took temperatures to below zero degrees.

At the national level ...

Keeping abreast of issues and interests in the three waters at a national level has become a much more involved task than even just a year ago. Examples of national bodies and programmes with an interest in water and three waters management include:

- Treasury's National Infrastructure Plan
- Land Information NZ
- Local Government NZ's 3 Waters project
- Productivity Commission
- Local Government Risk Management Agency
- Water NZ
- Land and Water Forum
- Ministry for the Environment
- Department of Internal Affairs – non-financial performance measures
- Office of the Auditor General – annual plan signals intent to focus on water in 2017-18

We are developing a stakeholder engagement strategy that will help guide our interactions at both a national and local level, so we can better advise our shareholders and stakeholders.

Our engagements vary from being consulted on changes in the sector to situations where we play an active role influencing outcomes.

An example of the latter is the proactive stance we took on behalf of our clients with respect to the proposed disestablishment of a national waste tracking database. We're hopeful that some means of ensuring trade waste is tracked from collection to disposal remains in place. We are working with national industry bodies and the Ministry for the Environment to see if we can help bring about a positive outcome.

On the local level ...

Regional plan consultation has been concluded and will likely come into force in August.

We've established connection with the Porirua Whaitua group.

We're building our contacts with other infrastructure providers, in particular sharing our work on resilience.

We've developed a newsletter to help share with the broader public some of the work Wellington Water does on councils' behalf. It is also intended to encourage interest groups to have their say. Three Waters News will be sent to community organisations with a particular focus on aspects of water, such as stream protection groups, residents groups and service organisations.