Wellington Water

Three Waters Report and Outlook

FOR THE QUARTER ENDED 31 MARCH 2016

Our water, our future.

In the news: Reporter Jessy Edwards peers into the abyss, as Veolia's Stu Pearce lifts the lid on the milliscreens at Moa Point Treatment Plant and photographer Maarten Holl moves in for better shot.

Stuff and the Dominion Post held their noses and went in for a look at the world of wastewater, spending a morning focusing on the yucky side of the city, and the heroes that keep it out of sight.


stuff.co.nz National World Business Tech Sp

THE DOMINION P

CuriousCity: Fatbergs, stenchy sewers and thousands of litres of poo

JESSY EDWARDS

Our operating conditions

Leadership and engagement drive health and safety uptake

The new Health and Safety in the Workplace Act has generally been embraced by the market, as the swings and roundabouts effect of the new legislation comes into play. Creating a safer site may take a bit more work up front, but it can also mean the job gets done more quickly, as well as more safely.

The market has reached capacity, reflected in the fact that we are not receiving tenders for some jobs. This is a structural constraint that will need to be addressed to ensure value in the future.

We've shortlisted the members of our consultancy panel, stage one of our procurement strategy. The outcome has naturally has left some in this consulting community delighted, others disappointed, but most overall felt the process was a strong one. The panel has not yet come into operation; so it is a little early to tell if there has been a significant impact on the market. We're confident that the emphasis on using local support will ensure the sector remains vibrant, however, and the risk of losing local knowledge is minimised.

We're keeping a watching brief on the issue of construction material quality. Our use of the steel mesh products in question is minimal, but we'll follow up on the outcome of any investigations into these materials and advise our suppliers as appropriate.

A warm and dry summer tested our water supply network and made for great working conditions. We're ahead of where we've been in previous years in terms of completing our annual programme of work.

Contents

New connection applications

Four cities.

This quarter

Same quarter, last year

OUTCOME 1

Our water is safe to drink

Outcome	Strategic Goal	Aspirational Direction	Quarterly Status Q1	Q2	Q3	Q4	Current long term trend
Safe Drinking Water	**We provide safe and healthy drinking water**	Stay the same	●	●	●	○	●

Base restrictions see region through long dry summer

Although a strong El Nino was well signalled, no one could quite tell us what that would mean for the Wellington region.

And while it did deliver the second driest February on record, it also brought rain often enough to keep river and aquifer supply conditions just on the right side of worrisome.

By the end of daylight saving, on April 2, the Macaskill lakes were 75% full. And while river levels fall quickly after each rain event, we'd had enough of these to let restrictions end as planned.

Water Supply issues:

Algae – the storage lake not affected by geosmin is experiencing some issues with algae, not the least of which is that it clogs our filters. Previously this issue has disappeared by summer, and we're getting some expert advice on causes, risks, mitigations, and the impacts of longer dry spells and greater nutrient loads in the future.

13,899 million litres of safe drinking water delivered to 138,500 connections.

In the same quarter last year (Jan-Mar 2015) we delivered *13,279 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 issues relating to water. We did have a bit of a scare with a positive e-coli result from one reservoir sample, but a re-test was clear and there were no reports of illness, suggesting the sample may have been contaminated, rather than the reservoir. Regional Public Health was notified immediately, as per our protocols.

Wellington Water's Bruce Bates pilots David Kelly, of the Cawthron Institute, out onto Lake 1 at Te Marua. Dr Kelly was collecting algae samples, using our flash new piece of kit, a benthic sample grab. (See page 12 for an explanation of what that is.)

OUTCOME 1

Our water is safe to drink

Campaigning for a regional approach

Every year Wellingtonians are reminded that watering restrictions come into force with Daylight Saving – except in Upper Hutt, where they're in place year round.

We place advertisements in community papers, on the radio, in rates notices and on line, reminding people that the base level of restrictions mean you can only water on alternate days, according to your house number – except in Upper Hutt, where your watering days are based on days of the week.

And the differences don't end there. Some councils run restrictions via a bylaw; for others it's a policy. Some councils value enforcement, others prefer education.

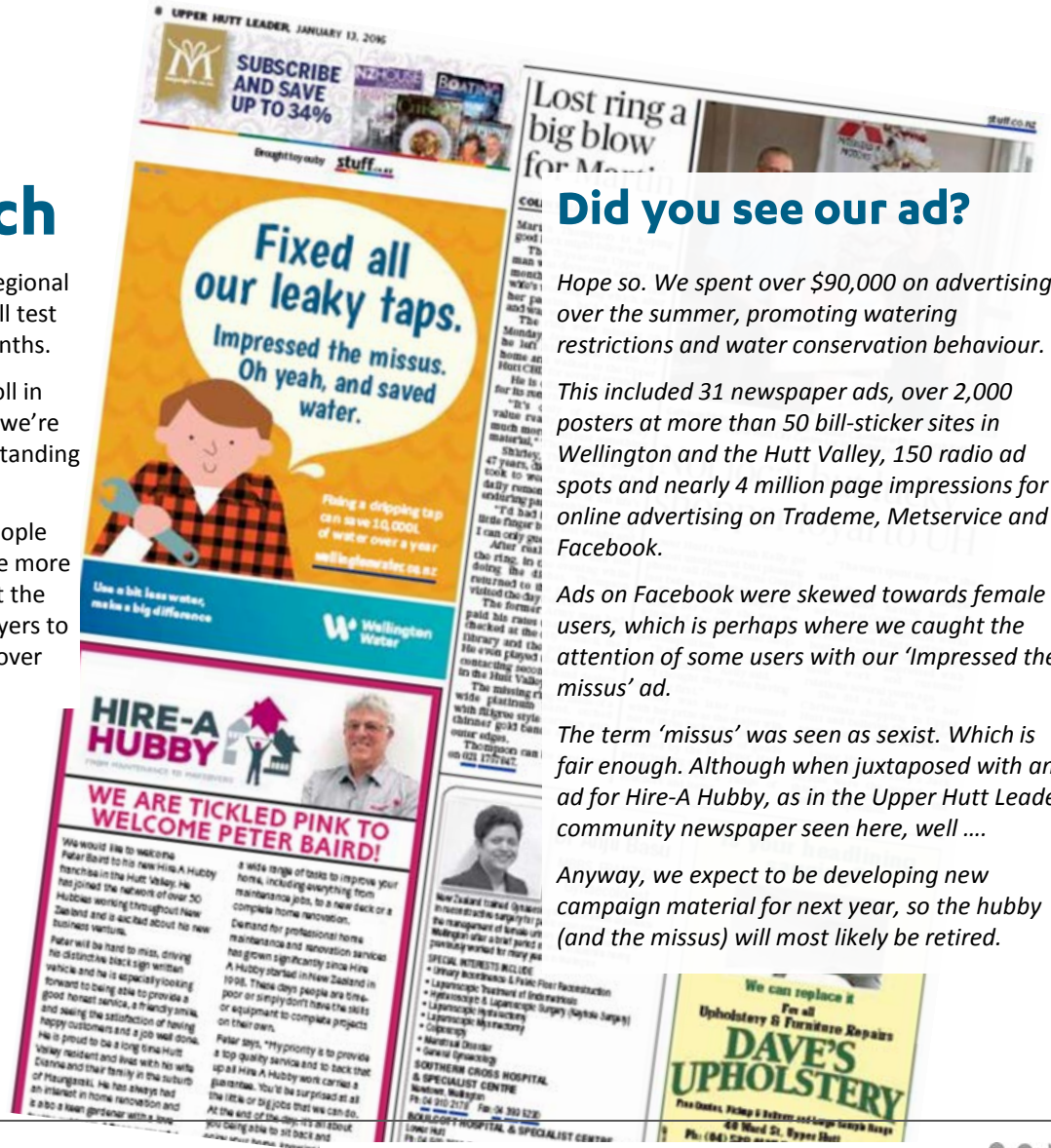
Now it may be that the Upper Hutt system is the better of the two. After all, it's easier to remember restrictions are always in place, and most people can tell you what day of the week it is more quickly than the date.

But because we all tend to zoom around the four cities, listen to the same radio stations, and read the same papers and websites, it seems logical that it would much more effective to have a single simple system for the whole region.

We're working on a proposal to develop a regional approach for watering restriction which we'll test with our client councils over the coming months.

While we may not have a system ready to roll in time for summer (elections are coming up), we're pretty sure we'll have a much better understanding of what works best.

And it's worth getting right. If we can get people on side with the value of restrictions, they're more likely to support them. That should push out the date (or day) when we need to go to ratepayers to ask them to invest in new storage to get us over the summer hump in water demand.



Did you see our ad?

Hope so. We spent over $90,000 on advertising over the summer, promoting watering restrictions and water conservation behaviour.

This included 31 newspaper ads, over 2,000 posters at more than 50 bill-sticker sites in Wellington and the Hutt Valley, 150 radio ad spots and nearly 4 million page impressions for online advertising on Trademe, Metservice and Facebook.

Ads on Facebook were skewed towards female users, which is perhaps where we caught the attention of some users with our 'Impressed the missus' ad.

The term 'missus' was seen as sexist. Which is fair enough. Although when juxtaposed with an ad for Hire-A Hubby, as in the Upper Hutt Leader community newspaper seen here, well ….

Anyway, we expect to be developing new campaign material for next year, so the hubby (and the missus) will most likely be retired.

OUTCOME 2

We are respectful of the environment

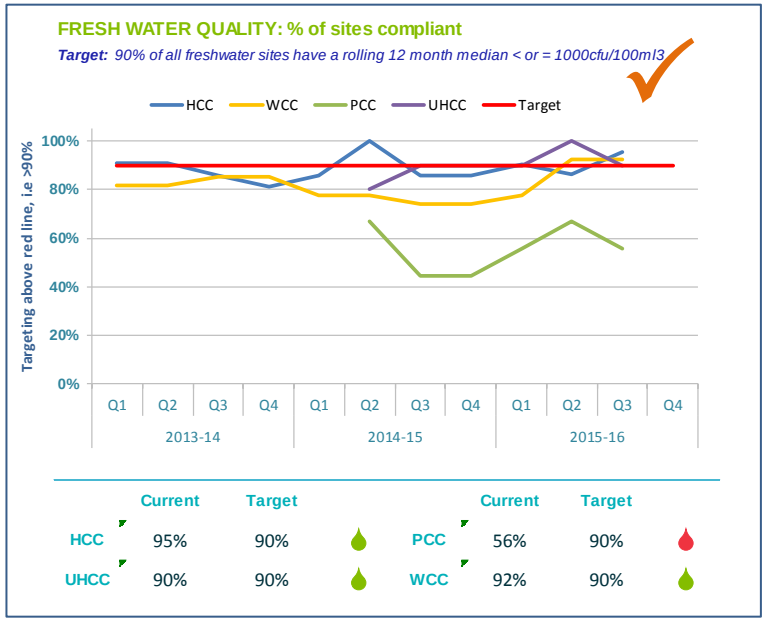
Beaches open for summer, but plenty left to do

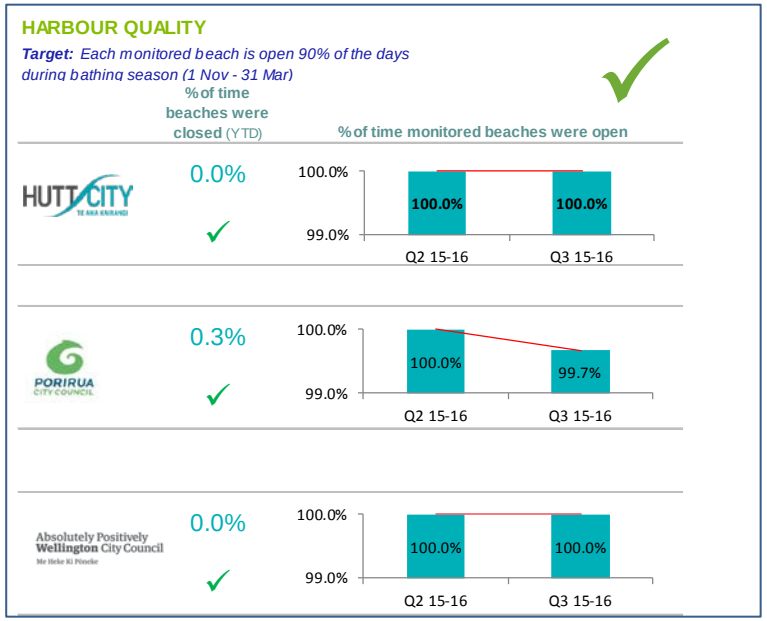
All Hutt and Wellington beaches were open all summer. There was a single bathing beach closure due to water quality issues during the quarter, at Porirua.

While some of the credit is perhaps due to drier weather and the lack of stress on the system from inflow and infiltration, our team has also been working hard to reduce overflows.

Unfortunately we did have a minor sludge discharge occurred when volumes overwhelmed capacity during maintenance work on the clarifiers at the Porirua Wastewater Treatment plant (see next page). As this was a perceived risk a maintenance consent had been obtained, so the plant remained compliant.

A second discharge occurred resulted in a warning letter from Greater Wellington Regional Council as it could have led to a discharge to land. Due to the mitigation measures we'd put in place, however, this didn't happen, and the warning was downgraded.





We have continuing challenges with freshwater quality in Porirua, and are continuing investigations in to the private and public network to identify leaks. It was encouraging to see all beaches open over summer, with a single exception

Outcome	Strategic Goal	Aspirational Direction	Quarterly Status Q1	Q2	Q3	Q4	Current long term trend
Respectful of the environment	We minimise our impact on waterways and the ocean	Improve					
	We minimise waste	Improve					
	We minimise our impact on the natural and built environment	Stay the same					
	We influence people's behaviour to minimise impact on the environment	Improve					

OUTCOME 2

We are respectful of the environment

Clarifier overhaul improves treatment plant outputs

Clarifier tanks like the one pictured right are the stage in which wastewater that has been screened and treated by a biological process settles. As solid material sinks to the bottom, clarified water flows over the top for final ultraviolet light treatment and discharge to sea.

The activated sludge – yes, that is the technical term – is channelled back to a centrifuge where we spin out the water before sending what's left to the landfill.

In the past month we've replaced the rotating bridge and scraper arms in one of the Porirua Wastewater Treatment Plant's three clarifier tanks.

Both the location of plant, near the Tasman Sea, and the nature of the work the scrapers do, place a pretty harsh load on their mechanical parts. Our operators reported an improved performance at the plant as soon as the work was complete.

Inlet pipe renewal improves flow

In a separate project the inlet pipe to the plant was renewed. This means more flow can be fully treated during storm events, when flow to the plant increases significantly.

The work didn't go completely without a hitch, however. A system control failure led to a small amount of wastewater overflowing to a contained channel. Regional council investigators were satisfied that no wastewater entered the environment.

Future work planned for the hard-working Porirua plant includes hydraulic upgrades and investigation into a sludge drier, which will reduce the load on the landfill.

A new rotating bridge and scraper arm is installed in one of the clarifier tanks at Porirua Wastewater treatment Plant.

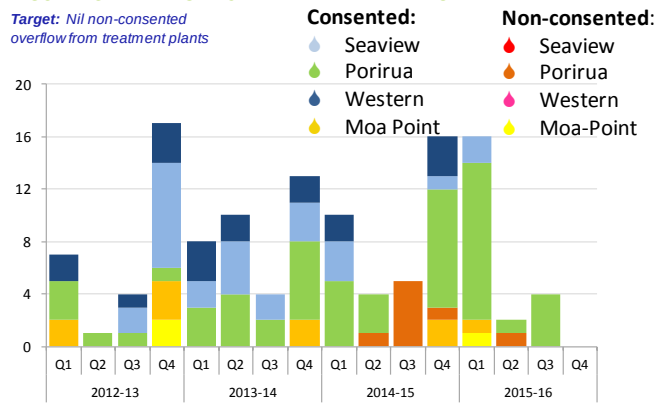
✓

We've maintained our overall consent compliance, but there were four discharge events from the Porirua treatment plant. One of these was a dry weather event, related to the maintenance work we were carrying out.

Consent compliance 1 Jan – 31 March 2016 (snapshot covering these activities)

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	Full compliance	✓

DISCHARGE EVENTS FROM TREATMENT PLANTS



OUTCOME 3

Networks that are resilient, now and in the future

Customer experience targets on track

Network service targets are on track across the region. Work continues for our stormwater team on design and construction to resolve longstanding flooding issues, and we've completed a procedure for testing critical fire hydrants.

A review of fire hydrant testing is under way, as are improvement to managing electrical hazards when working on large water mains.

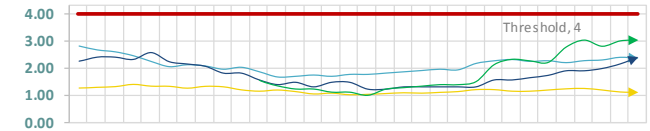
We're working with council planners to increase our understanding of housing intensification impacts, and with NIWA to overhaul our water supply strategic planning tool. This includes incorporating the latest climate change information into the regional water supply demand model and allowing for the likely future effects of sea level rise on our ability to extract water from the Lower Hutt aquifer.

Outcome	Strategic Goal	Aspirational Direction	Quarterly Status Q1	Q2	Q3	Q4	Current long term trend
Resilient now and in the future	We minimise 3 waters service outages and impact on our customers	Stay the same	●	●	●	○	●
	We minimise the impact of flooding on people's lives	Improve	●	●	●	○	●
	We provide an appropriate region wide fire-fighting water supply	Stay the same	●	●	●	○	●
	We operate and manage assets that are safe for our suppliers, people and customers	Improve	○	○	○	○	●
	We provide a seismically resilient network	Improve	○	○	○	○	●
	We minimise the risks associated with the loss of water services due to land movement	Improve	○	○	○	○	●
	We plan for sustainable water sources, future demand, growth and climate change	Improve	●	●	●	○	●

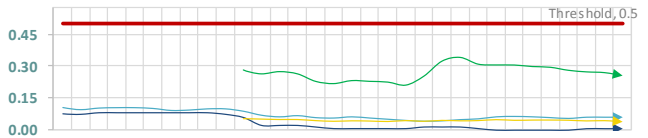
THREE-WATERS NETWORK AVAILABLE TO CUSTOMERS

Rolling 12mths of data

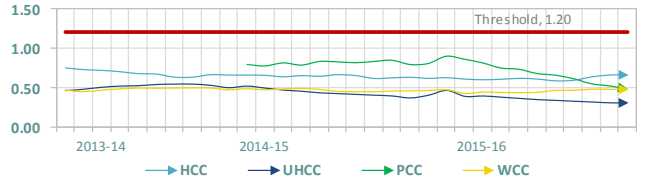
Water reticulation unplanned supply cuts per 1000 customers



STORMWATER Pipeline blockages per km of pipeline



WASTEWATER reticulation pipeline blockages per km



OUTCOME 3

Networks that are resilient, now and in the future

Making models real: mapping the region's flood-prone areas

Wellington Water is in the process of converting detailed hydraulic modelling results into draft flood maps. Hydraulic modelling is a complex and detailed process that uses data about water volumes and flow, and its interaction in the environment with geographical and built features.

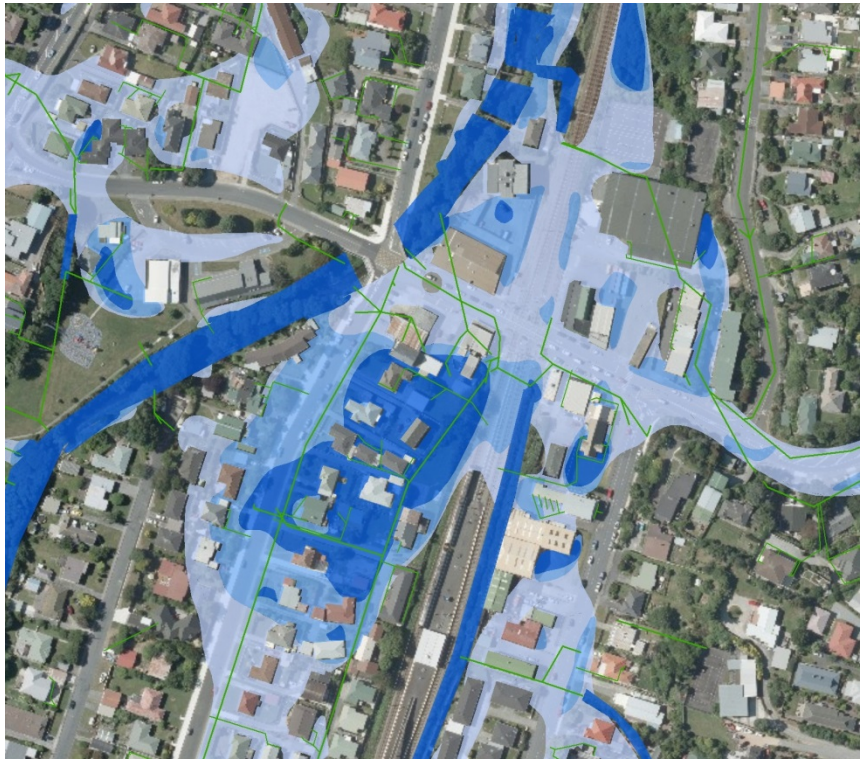
Developing a model helps with prediction and planning.

We've developed draft flood maps for parts of Tawa, which was hard hit in last year's autumn storms. As the maps are completed we intend to take the draft maps to the community to get their input. We're working with the Tawa Community Board and Greater Wellington Regional Council, who manage the Porirua Stream, to organise the timing and format for taking the maps to the community.

While they're a major inconvenience, high intensity rain storms are also an opportunity to improve our mapping. Community members will have valuable knowledge of the locations and causes of flood risks in the catchment, which we want to get hold of to refine and enhance the model and maps.

We also want to use this engagement to increase understanding of secondary or overland flowpaths – how they function, and what kind of standards we'll need to set around these to ensure in future.

The modelling of the Tawa catchment is part of Wellington Water's wider programme to model all the stormwater networks in Wellington City over the next four years. This information will be used to help inform and prioritise upgrades, manage flood risk and plan for emergencies. Currently we are also building models in Hataitai, Kilbirnie, Miramar the northern CBD and Island Bay. We are also modelling the stormwater networks in Stokes Valley and the Porirua CBD.



Climate change forecasts suggest intense rain events are likely to increase, meaning, most probably, more frequent events where the primary stormwater network (underground pipes and streams) is overloaded.
Overland flow paths are vital to reducing flood risk. Low lying depressions that don't have natural overland flow paths can experience deep ponding.
Modelling reveals different levels of ponding expected under different rain conditions. This will help with both asset and building planning decisions to reduce the risk to property.

OUTCOME 3

Networks that are resilient, now and in the future

Water supply resilience: service levels, and who owns them

We all know Wellington is vulnerable to quakes; it's also vulnerable to large parts of the economy disappearing for good should the city not get back to work pretty smartly.

Over the past quarter we've developed some draft levels of service to provide water and restore network services after a major quake

Currently, we're looking at a targets that:

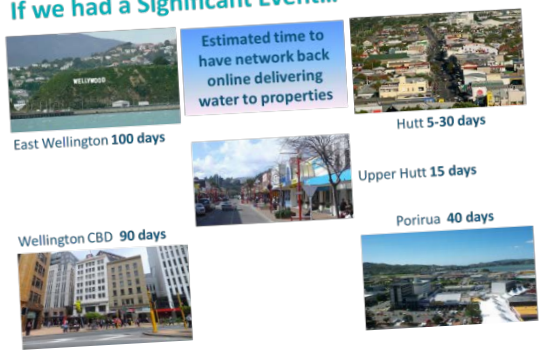
- see all customers looking after themselves over the first 7 days
- provide residential areas with water supply points within 7 days
- provide critical users (hospitals, care facilities etc) water from day 8
- have at least 80% of water services restored to residential and commercial property boundaries by day 30.

We're still in the process of getting feedback on these targets, as well as who the critical users are, where they are, and how well prepared they are. Once we do, we'll be able to look more closely at how we can achieve these levels of service: who needs to do what, and how quickly we should aim to do that.

There's a lot of work to do, and a lot riding on us all working together to give the region the best shot at thriving after a major earthquake. After all, if there was no water at work, how would we make any coffee?

These images and slides are from a presentation to councils that we're using for conversations around levels of service and how quickly we should expect to have services back up and running.

How long can we put up with walking to fetch water, or having a workplace without coffee?



Wellington Water: Health and Safety

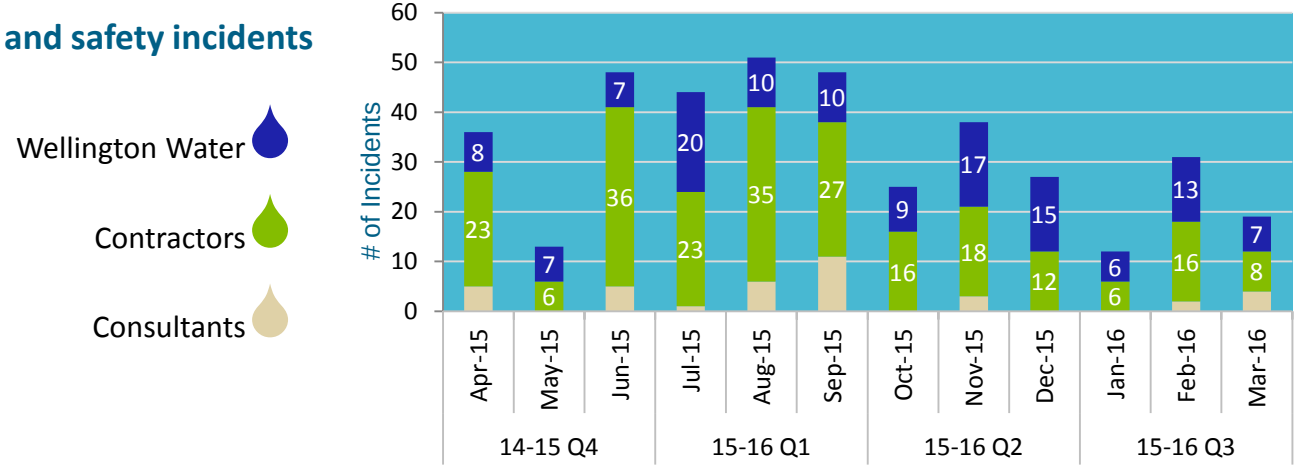
Trends show injury rates declining

One year's data has now been collected, and it shows a declining injury rate over the period.

This is a factor of improved reporting over 2015 and better quality information as more members of the supply chain reported in a consistent manner. We expect further improvements to data quality over the next 12 months.

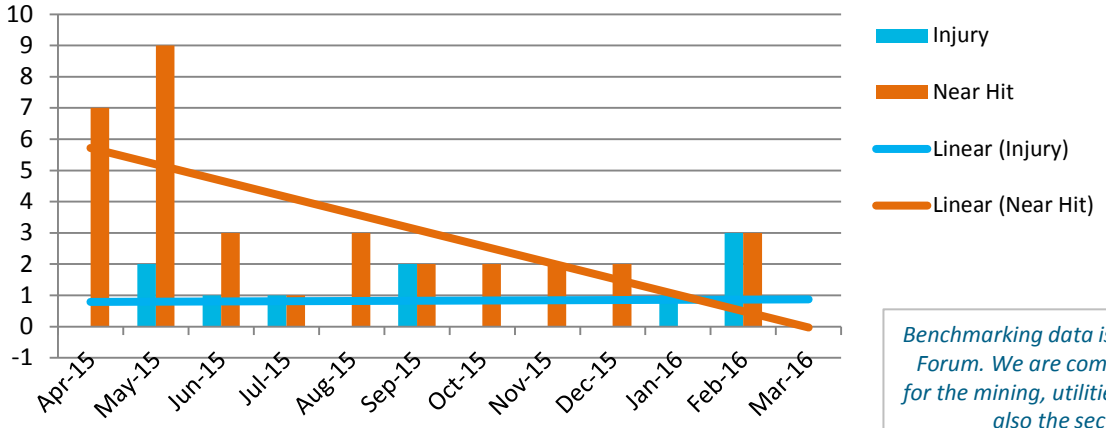
The graph below shows near hit incidents on a marked decline over the year (orange line).

All health and safety incidents



Injury Trends (Rolling 12 month)

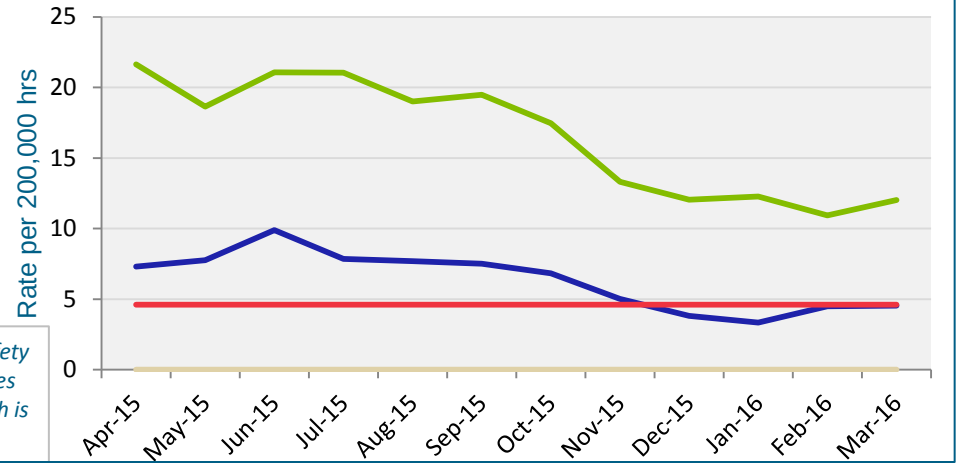
Contractors and consultants (from our database)



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

Benchmarking data is obtained from the Business Leaders Safety Forum. We are comparing performance to the forum's figures for the mining, utilities and work management industry, which is also the sector Watercare contributes data to.

Total injury frequency rate



Wellington Water: Health and safety

Just some of what we've done to get ready for the new Health and Safety Act
A revamped contractor H&S pre-assessment process
Pre-construction meetings between all relevant Person Controlling Business Units involved with projects (in trial; and to form part of our Safety in Design process)
A contractor-focused H&S Committee comprised of Senior Wellington Water Operational and Development staff to review performance and issues identified from contractors
Independent H&S auditing
Review our critical H&S processes and procedures with a risk based focus (in process)
Internal worker engagement on H&S policy development facilitated by H&S representatives
External worker engagement on H&S standards through working groups (trialled; to be embedded)

Service strike update

Service strikes are a major risk for our contractors. Despite improving techniques for detecting and recording where buried services such as telecoms, gas and electricity lie, the risk of hitting these is high, and the consequences can be deadly.

After an incident in which one worker suffered burns, we met with our contractors to discuss procedures, and issued a safety notice.

The proximity of these services to water pipes can mean added delays in restoring supply while the right people are brought in to do the work. We can't compromise though, on making sure our people come home safe and well each day.

Water

Safety Notice

29 March 2016

Leak detection – using a metal probe below ground surface

Wellington Water noted an incident where a leak detection contractor drove a metal probe through road seal in a private right of way and to a depth that struck and damaged a buried power supply cable. The incident, although no harm occurred had the potential for serious harm.
The cause of the utility strike resulted from a lack of observance of the basic fundamentals of the hazards associated with buried services. No mark out was undertaken and no locator was used.

****Reminder****

1. **Locate underground services** - Always locate underground cables and services before digging or driving metal stakes or probes
2. **Request a services mark out** - check with your local electricity retailer who will quickly locate and mark the position of the cables
3. **Underground services & cables are vulnerable** - Cables are not necessarily laid in a straight line and depths can vary in different situations. They are not designed to withstand a blow from a tool, or any other object

Web-based app supports safer work

To support our work in improving health and safety reporting and best practice we've developed a web-based application that allows all staff to log health and safety notes.

Based on the Q-Pulse quality management software, which we've been using already for risk management, incident reporting and quality audits, the new app will allow us to monitor and record incidents and improvements, as well as record training and competency requirements.

As it's web-based, Qpulse is accessible from desktops, tablets, and smart phones, meaning ideas and documents, processes and training can be accessed from anywhere.

Once we've ironed out any wrinkles, we'll be looking to roll it out to our contractors. This will be really helpful for sharing observations and improving worksite safety

Making incident reporting easy, such as through mobile apps, will increase awareness of risks and the steps that can be taken to avoid or mitigate them.

Wellington Water: Value for money

Algae fishing lands savings on test costs

We're required to take regular samples from the storage lakes to test for the presence of algae. With the discovery of a species that had the potential to be toxic, we needed to step up our testing regime.

By the time we were doing four samples a week, this was costing us $3,000. But by purchasing a handy little device, known as a benthic sample grab, for just under $1,700, we were able to knock back these costs by 70%. Not only that, but we could get tests done more quickly and up to six samples done a week. It paid for itself in its first week of use, and, as this testing is an ongoing requirement, over its lifetime this innovation will save hundreds of thousands of dollars.

The device works by being lowered to the lake bed from a boat or the intake tower. A tug on the line and the jaws of grab close on the algal mat. The sample is reeled up to the surface, transferred to a sterile tube, and sent off to the lab. Results come back in as little as 24 hours.

From top: Benthic sample grab, open and shut; grab sample; heading out on Lake 1 at Te Marua.

Helping out on a hot day at Upper Hutt College

The organisers of Upper Hutt College's all day sports event were a bit worried about the hot weather, and the risk of students dehydrating even if they did their remember their water bottles. They asked if we could help them with a solution.

We have emergency kits at most reservoirs, consisting of a stand pipe, hose and tap manifold - like a sawhorse with taps. On the day, we borrowed kits from two reservoirs and set them up at the school, where they did indeed prove pretty popular.

We're keen to look at more such opportunities to remind our communities of the value of water.

Wellington Water: National and local agendas

This is a four-tonne flexible joint that we're installing in the main water line between treatment plants in the Hutt Valley and Wellington city. The Flex-tend joint allows for a distortion of up to a metre, which will significantly reduce the risk of a rupture in the event of an earthquake.

At the national level ...

Working with national bodies on increased collaboration

There has been a bit of activity at the national level with Water NZ receiving positive feedback from its Water Utilities Association members on its proposal for increased collaboration. Members were very keen for a partnership approach with Local Government New Zealand and we understand discussions have started of this nature to look for alignments between their respective work programmes and for common areas of interest.

The Next Steps for Fresh Water consultation document was launched by the Minster for the Environment and the Minister for Primary Industries. The report focuses on improving water quality, seeking better environmental outcomes, considering how water can enable economic growth and improve Maori involvement in freshwater decision making. We are coordinating a response across some of our council and are considering the impacts of the proposals on our business.

We are also mindful of the Cabinet paper from the Minister of Local Government which outlines changes to legislation that gives the Local Government Commission new powers and talk about models for water and transport sectors. Our CCO model seems to be aligned with where the legislation is heading but we will need to consider implications for how our shareholders may choose to develop our model in the future.

On the local level ...

The Local Government Commission issued its draft "Analysis of the Three Waters in the Wellington Region" to councils of the region to comment on its accuracy before it is finalised. Once finalised the Wellington Water Board and management will consider its recommendations.

The report was positive. It says we are on the right track, and there are good opportunities to deliver increased value to our clients and customers. We'll work through those recommendations with our client councils.

We've been working to build relationships with the many players in the resilience space, including emergency and commercial organisations. Next steps are to work with critical customers across the region, to help build understanding of the levels of service and the steps we all need to take to achieve those.

We've also met with Ngati Toa and Port Nicholson Block Settlement Trust leadership to help ensure channels of communication are open there , and they have visibility over our work programme and wider activity.

And we completed our submission on the proposed natural resources plan, and await our hearing on that.

Wellington Water: Programme delivery

Value lies in long term approach to programme spend

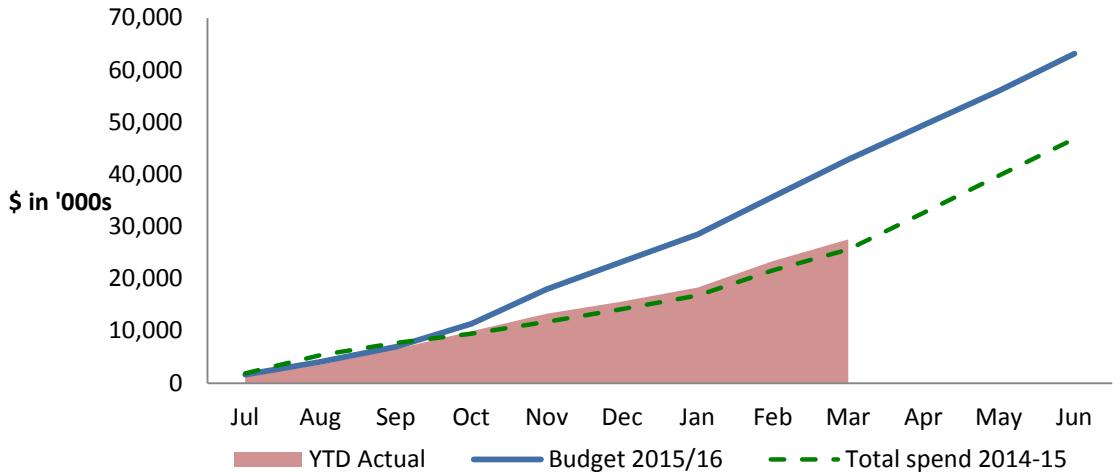
While delivering on the annual work programme is a high priority, our ultimate goal is to deliver our clients' three year programme, as set out in their Long Term Plans.

This approach provides better value to our clients, customers, us, and our suppliers. It gives us more flexibility to smooth work peaks – a key point of discussion with our suppliers. This means less risk to our people and our health and safety values, as we reduce the pressure to meet annual budget forecasts.

Smoothing the work programme also makes us less vulnerable to cost hikes through competition with other works, including other Council programmes, at year end. Heavy year-end workloads, between February and June, drive costs up, reducing value.

And our contractors prefer a smoother programme as well, as it helps them manage their resources – labour and equipment – more efficiently than having to negotiate a succession of peaks and troughs.

Capital expenditure, as at 31 March 2016, vs year-end forecasts



This is the first year of our three year programme and we have made a decision to delay some work to run across the financial year boundary, ensuring we transition across the year-end with a steady stream of work for our contractors.

Our project status to the end of March shows 234 of 295 projects are on track or have been completed.

A large amount of work under way is aimed at improving the resilience of the region's water supply network. This quarter we completed the Melrose Reservoir, began strengthening the main Tawa reservoir and completed design and tendering for strengthening works on two Hutt City reservoirs. We're progressing initial investigation and design work on two large bulk water pipeline replacement projects: over 5km of pipeline in Wainuiomata and a realignment away from Silverstream bridge. We installed seismic joints at Ngauranga pumping station, and began work to install flexible joints on the main pipeline supplying water from Waterloo and Wainuiomata treatment plants into Wellington City at Korokoro.