



Thinking ahead

Geoff Williams is a man to apply his grey matter to water matters. He talked to **Mary Searle Bell** about his passion for solving problems by measuring, monitoring and analysing.

If Geoff Williams is totally honest, he got into the water industry almost completely by accident. Geoff is a senior engineer responsible for asset management at Wellington Water, but back in the mid-90s, he had just graduated from Canterbury University and was off climbing Mt Kilimanjaro as part of a backpacking trip through Africa.

The plan then was for Geoff and his partner Jen to work and travel around the world, however, she secured a position at the University of Western Australia in Perth and Geoff followed. He applied for jobs suitable for a graduate engineer and was offered a role with the Water Corporation of Western Australia, which provides water services to the whole state.

It was a fascinating time to join the company – Western Australia was in the midst of a massive, decade-long drought and was needing to look for new water sources and innovations. And while Geoff and Jen’s plan was to stay for just one or two years before continuing their travels, nearly 10 years and two children later, they were still in Perth and Geoff was still with the Water Corp.

“It was a huge organisation, which made it easy to move around and have different positions within the company,” he says.

For the first two years, he was in the infrastructure planning branch, applying engineering theory to forward planning. Then came a two-year stint with the system monitoring and investigations team. Geoff describes this as a unique and specialised team – providing hydraulic performance testing, leak detection and pump performance testing services for the company.

“It was a hugely influential part of my career,” he says. “We travelled all over Western Australia from Esperance to Kununurra and everywhere in between, but most importantly we learnt to value the operations side of the business.”

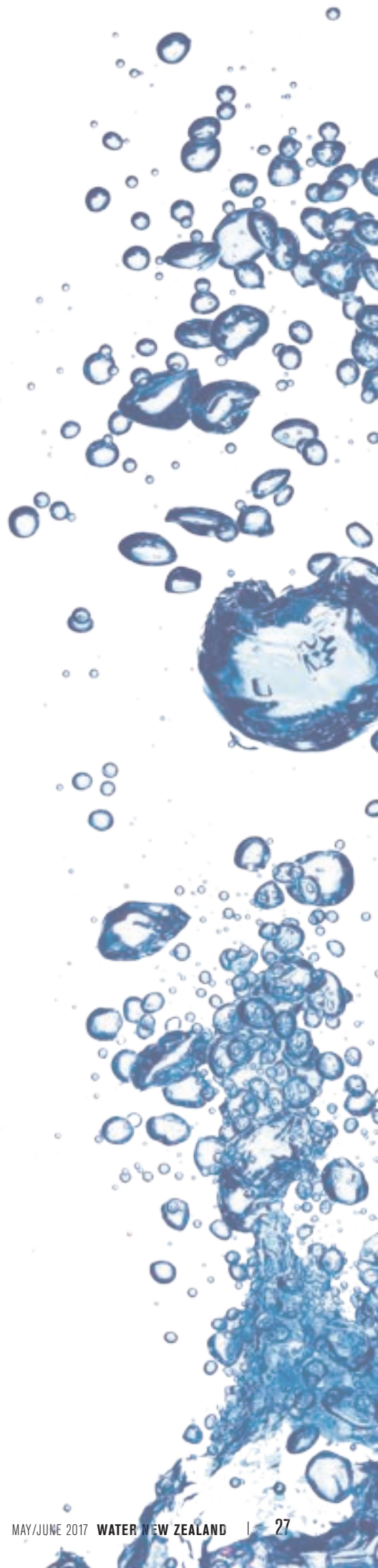
In those years Geoff developed a deep respect for the operations staff.

This was the beginning of Geoff’s passion for helping solve real problems by measuring, monitoring and analysing.

“It was also the beginning of something I’ve kept pretty much all my career – training myself to take the time to think deeply. When I do, I often get insights I wouldn’t otherwise.

“It was a brilliant job. It appealed to my sense of wanting to solve engineering problems, but also the huge geographical area we covered meant we saw a wide variety of issues.”

Geoff then spent a couple of years in a role learning all about drinking water quality management before returning to the systems investigation and monitoring team he loved, this time as its manager.



He describes it as good people, good expertise and great challenges.

“There were some specialist aspects to the role you wouldn’t often get exposure to. For example, they used thermodynamic testing to assess pump performance – measuring the effectiveness of a pump by monitoring the water temperature change across the pump. It’s not new, but it’s a bit niche and thoroughly fascinating theory.”

When Geoff returned to New Zealand in 2005, no one here was doing this.

“It was an obvious one for me – to introduce the technology to New Zealand, and we’ve been using it ever since.

“The Water Corporation had a strongly independent culture, and was willing to challenge the status quo,” explains Geoff. “That time in Western Australia was particularly good at bringing engineering theory and marrying it with a strong practical basis.”

“Don’t stop because things look complicated, or because no one else is doing it that way,” he advises. “I’d much rather try and fail than not try at all.”

“Our team there was unique in many respects – it had a great mix of theory and reality. It was a dream job.”

At the end of 2005, with a toddler and another baby on the way, Geoff and his wife decided to return to New Zealand to be nearer family. As Geoff’s preference was in bulk water supply, he was naturally biased toward this sector when he began his job hunt. As there are only two bulk water networks here, he found himself choosing between Wellington or Auckland for their new home.

The Greater Wellington Regional Council was actively looking for a new water source at the time, and he slipped nicely into an infrastructure planning role.

“However, per capita demand for water in Wellington consistently dropped faster than the population grew – we’re supplying less water now than we were 10 years ago – so the source development projects were deferred, and deferred again.”

After a couple of different positions in bulk water, Geoff was made team leader in the assets and compliance area. It was a position he thoroughly enjoyed for two years, but with young children at home, he chose to prioritise family and opted to return to a senior engineer role.

In late 2014, the council’s bulk water staff merged with Capacity Infrastructure Services to form Wellington Water, a company that manages three-waters services for five councils. This, in itself, creates a totally different feel, says Geoff, and has challenges that are not insignificant.

“We’re trying to achieve integrated service planning across the region,” he says. “There’s significant variability across

the asset base in terms of service standards, technology, asset condition and performance. One of our biggest challenges is to change the business from a focus on managing assets to delivering services – irrespective of water service or owner, and bring a total expenditure focus to investment decision-making. It’s a huge task when you don’t own the assets, so we have a strong focus on being a trusted advisor to our client councils.”

Geoff says Wellington Water is becoming an extremely capable and collaborative organisation, and has fantastic leadership.

“We have people with great skills and a passion for the water business. And thinking regionally across the water networks is just the way it should always have been from the start.

“I was looking at operational costs: What’s our biggest expense for bulk water? Our power bill. So I wondered what we could do to optimise costs. Could we buy it cheaper? Use it more effectively? This led to me learning all about the wholesale spot market in New Zealand and how hedge contracts can be used for risk mitigation.

“By being smarter about how we purchase power – buying from the spot market and managing price risk appropriately – we consistently save around \$100,000 per annum on our power bill. We also upgraded the water supply optimiser to receive a live update of the spot price forecast – purchasing power as smart as we can,” Geoff explains. “Not many councils do it, but it’s really a no brainer.”

The second strand of Geoff’s strategy was to see how they could use less power. And here is where he introduced thermodynamic pump performance testing to drive pump refurbishments – on a payback basis rather than based on asset condition. He also researched pump refurbishment techniques to minimise the internal recirculation that results in wear. This all led to significant improvements in the hydraulic efficiency of the pumps themselves.

“Don’t stop because things look complicated, or because no one else is doing it that way,” he advises. “I’d much rather try and fail than not try at all.”

Geoff also has a passion for strategic planning – particularly looking at how climate change may affect water sources in the long term. For example, how rising sea levels could affect the aquifer they draw water from, and applying the latest learning from IPCC global climate modelling.

“We engaged directly with hydrogeologists and the climate scientists at NIWA. We started with a blank sheet and took the science as far as we could – always keeping focused on how the work related to making better long-term decisions,” he says. “We’re getting some fascinating results out of that too – and not ones we expected either. For example, counterintuitive relationships between greenhouse gas concentrations and the impact on water availability.

“The future is looking very uncertain, and we need to start thinking about what this means for the type of infrastructure we’ll need long term – there’s more thought needed here,” he says.

“Rather than wait for someone else to solve these challenging problems, we need to proactively engage with the scientific experts – tell them our problems and work together to find solutions.” **WNZ**